Big Cedar Creek Stream Restoration
Final Year 3 Monitoring Report (2011)
Stanly County, North Carolina

EEP Project Number D06054-D

Submitted to/prepared for:

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1.0 EXECUTIVE SUMMARY

This Annual Report details the monitoring activities during the 2011 growing season on the Big Cedar Stream Restoration Site ("Site"). Construction of the Site, including planting of trees, was completed in February 2009. In order to document project success, 23 vegetation monitoring plots, 33 permanent cross-sections, 3,396 linear feet (LF) of longitudinal profiles, and 2 crest gauges were installed and assessed across the Site. The 2011-12 data represent results from the third year of vegetation and hydrologic monitoring.

Prior to restoration, the streams on the Site were channelized and riparian vegetation on the majority of the Site was absent. The riparian vegetation that was present on much of the Site consisted of successional and invasive species such as Chinese privet (*Ligustrum sinense)* and Japanese honeysuckle (*Lonicera japonica*). After construction, it was determined that 11,103 LF of perennial and intermittent channel along Big Cedar Creek (BCC) and six unnamed tributaries (UT1, UT2, UT3, UT1A, UT1B, and UT1C) were restored, 1,171 LF of Big Cedar Creek and UT1 were enhanced, and 539 LF of Big Cedar Creek and the northern most unnamed tributary (UT2) were preserved.

The 23 monitoring plots, 10 meters by 10 meters in size, were used to assess survivability of the woody vegetation planted on Site. They are located to represent the different zones within the project as directed by EEP monitoring guidance. The vegetation monitoring indicated a survivability range of 280 stems per acre to 1040 stems per acre with an overall average of 715 stems per acre. The site has met the Year 3 vegetative success criteria of 320 trees per acre and is still on track to meet the final year's vegetative success criteria of 260 trees per acre.

In general, the majority of the project's dimension, pattern, profile and in-stream structures have remained stable. Areas of concern documented during Year 2 were addressed through maintenance activities during the early spring of 2011 and will conclude with bioengineering (brush mattresses, geolifts, and live stakes) to be installed during March 2012. One bankfull event was observed and documented on Big Cedar and UT1 during Year 3.

2.0 PROJECT GOALS, BACKGROUND, & ATTRIBUTES

2.1 Project Location and Description

The Big Cedar Creek Restoration Site ("Site") is located in Stanly County, NC (Figure 1, Appendix A) approximately ten miles south of the City of Albemarle. The Site is part of the Yadkin River Basin within NCDWQ sub-basin 03-07-14 and USGS hydrologic unit 03040105060080.

The Site is part of the Piedmont physiographic province. Medina and others describe the Piedmont as, "… consist(ing) of generally rolling, well-rounded hills and ridges with a few hundred feet of elevation difference between the hills and valleys" (Medina, 2004). The local geology is typical of the Carolina Slate Belt lithotectonic province of central North Carolina, and is comprised of Proterozoic and Cambrian age siltstone, mudstone, and mafic hypabyssal intrusive rocks according to the 1 degree by 2 degree geologic map of the Charlotte Quadrangle prepared by the USGS (Goldsmith et al., 1988). Soil types at the site were researched using Natural Resources Conservation Service (NRCS) soil survey data for Stanly County, along with on-site evaluations. The predominant soil series within the floodplain area of the site is mapped as Oakboro silt loam series, a hydric soil.

The Big Cedar Creek Restoration Site drains predominately forested and agricultural lands, as well as a portion of the residential and commercial district of the town of Norwood. The Winston-Salem Southbound Railroad line parallels Big Cedar to the east, then turns to cross Big Cedar and UT1 upstream of their confluence.

To visit the Site, take Highway 52 for approximately ten miles south of Albemarle, turn right onto Mount Zion Church Road (1.25 miles south of the Town of Norwood). Follow Mount Zion Church Road for approximately 0.5 mile west to the intersection of Mount Zion Road and Big Cedar Creek. UT1, UT2, and the upstream reaches of Big Cedar Creek can be accessed from the farm road on the north side of Mount Zion Church Road, approximately 0.25 miles east of the intersection of the railroad and Mount Zion Church Road. Reach 5 and 6 of Big Cedar Creek can be accessed from a farm field approximately 0.1 mile west of the intersection of the railroad and Mount Zion Church Road.

2.2 Restoration Summary

2.2.1 Mitigation Goals and Objectives

The specific goals for the Big Cedar Creek Site Restoration Project were as follows:

- Create geomorphically stable conditions on the Big Cedar Creek project Site.
- Improve and restore hydrologic connections between the streams and their floodplains.
- Improve the water quality in the Big Cedar Creek and Rocky River watersheds.
- Improve aquatic and terrestrial habitat along the project corridor.

The primary objective of the Big Cedar Creek Restoration project was to accelerate the channel evolutionary processes by constructing channels with geomorphically stable cross sections, increased sinuosity, and access to the floodplain at bankfull stage. Flood attenuation, increased groundwater infiltration, and alleviation of bank stress resulted from providing floodplain access. Water quality improvements were made through fencing cattle out of the restored reaches and by reducing bank erosion throughout the project Site. Aquatic habitat was improved by providing geomorphically stable habitat features and through placement of in-stream habitat structures. Invasive vegetative species removal efforts and reforestation of the riparian buffer with native species complemented the restoration of Big Cedar Creek, UT1, UT2, UT3, UT1A, UT1B, and UT1C. Existing native trees were preserved onsite wherever feasible. The vegetative efforts will benefit both aquatic and terrestrial habitat as the site matures.

2.2.2 Project Description and Restoration Approach

The project involved the restoration, enhancement, and preservation of Big Cedar Creek and six unnamed tributaries to Big Cedar Creek. A total of 11,103 LF of stream channel were restored along Big Cedar Creek and six unnamed tributaries (UT1, UT2, UT3, UT1A, UT1B, and UT1C). Additionally, 1,171 LF of Enhancement II were applied along portions of Big Cedar Creek and UT1 and 539 LF of preservation were established along Big Cedar Creek and UT2. The Site has a history of general agricultural usage including cattle, cotton, and corn production. Prior to restoration, the streams on the project site were channelized and riparian vegetation on the majority of the Site had been removed. The riparian vegetation that was present on much of the Site consisted of successional and invasive species such as Chinese privet (*Ligustrum sinense)* and Japanese honeysuckle (*Lonicera japonica*). As a result of channelization, many of the project reaches were incised and lacked bankfull floodplain access.

For analysis and design purposes, Big Cedar Creek, UT1, and UT2 were divided into 11 reaches (As-built Plan Sheets, Appendix D). Big Cedar Creek flows from north to south entering the Site at the northern property line. The reaches on Big Cedar Creek were numbered sequentially from north to south. Big Cedar Creek Reach 1 starts at the northern property line and ends at the confluence with UT2. Big Cedar Creek Reaches 2 through 4 are located between this confluence and the Winston-Salem Southbound Railroad line crossing. Big Cedar Creek Reach 5 begins below the railroad crossing and continues to just upstream of Big Cedar's confluence with UT1. Reach 6 begins where Reach 5 ends and continues to the culvert at Mount Zion Church Road. UT1 flows from west to east entering the Site at the western most property line. The reaches on UT1 (1 through 4) were numbered sequentially from west to east. UT1 ends at its confluence with Big Cedar Creek. UT1 A, B, and C are tributaries to UT1 that flow north to south entering the Site along the northern side of conservation easement along UT1. UT1A, B, and C converge with UT1 in Reaches 4, 3, and 1 respectively. UT2 flows northwest to southeast entering the Site along the northern property line. UT2 ends at its confluence with Big Cedar Creek. UT3 flows east to west under the Winston-Salem Southbound Railroad line. UT3 enters the Site on the eastern side of the conservation easement along Big Cedar Creek and ends at its confluence with Big Cedar Creek Reach 3.

A holistic restoration approach was based on the condition of the overall Site and each reach's potential for restoration as determined during the site assessment. Design criteria for the proposed stream concept were selected based on the range of the reference data and the desired performance of the proposed channel. The developed design criteria were then compared to past projects built with similar conditions. Ultimately, these sites provide the best pattern and dimension ratios because they reflect site conditions after construction. While most reference reaches are in mature forests, restoration sites are in floodplains with little or no mature woody vegetation. This lack of mature woody vegetation severely alters floodplain processes and stream bank conditions. If past ratios did

not provide adequate stability or bedform diversity, they were not used. Conversely, if past project ratios created stable channels with optimal bedform diversity, they were incorporated into the design.

Following the initial application of design criteria, detailed refinements were made to accommodate the existing valley morphology and to promote natural channel adjustment following construction. For example, old meander scars in the Big Cedar Creek floodplain were incorporated for a more historical replication of channel alignment. The design philosophy employed at the Big Cedar Creek site was to use conservative design parameter values based on reference reach data and lessons learned from past projects. This allows the project to evolve in a positive direction as the permanent vegetation becomes established.

The overall restoration approach for the Site allows stream flows larger than bankfull flows to spread onto the floodplain, dissipating flow energies and reducing stress on streambanks. In-stream structures were used throughout all reaches to control streambed grade, reduce streambank stress, and promote bedform sequences and habitat diversity. The in-stream structures consisted of root wads, log vanes, log weirs, cross vanes, j-hooks, and constructed riffles. The wide variety of structures was used to promote a diversity of habitat features in the restored channel. Where grade control was a consideration, constructed riffles and grade control j-hooks were installed to provide long-term stability. Streambanks were stabilized using a combination of erosion control matting, temporary and permanent seeding, bare-root planting, and brush mattresses. The Site was planted with native vegetation and is protected through a permanent conservation easement. Table 1 provides a summary of the project approach depicted in Figure 2 in Appendix A.

Table 1. Project Mitigation Approach

Big Cedar Creek Restoration Site: EEP Contract No. D06054-D								
Project Segment or Reach ID	**Existing Footage (LF)**	**Mitigation Type ***	**Approach****	**Linear Footage (LF)**	**Mitigation Ratio**	**Mitigation Units**	**Stationing**	**Comment**
Big Cedar Creek - Reach 1	350	R	P2	603	1:1	603	10+00 to 16+03	Installed in-stream structures to control grade and reduce bank erosion. Priority 2 Restoration was used for this transitional reach to bring the channel up to the historic floodplain as quickly as possible.
Big Cedar Creek - Reach 2	1,016	R	P1	2,239	1:1	2,239	16+03 to 38+92	Installed in-stream structures to control grade and reduce bank erosion.
Big Cedar Creek - Reach 3	2,046	R	P1	1,827	1:1	1,827	38+92 to 57+19	Installed in-stream structures to control grade and reduce bank erosion.
Big Cedar Creek - Reach 4	976	R	P2	410	1:1	410	57+19 to 61+29	Installed in-stream structures to control grade and reduce bank erosion. Priority 2 was employed to tie the channel into the box culvert at the railroad crossing.
Big Cedar Creek - Reach 5	534	P	P	378	1:5	76	63+79 to 67+57	Preservation.

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Big Cedar Creek Restoration Site: EEP Contract No. D06054-D								
Project Segment or Reach ID	**Existing Footage (LF)**	**Mitigation Type ***	**Approach****	**Linear Footage (LF)**	**Mitigation Ratio**	**Mitigation Units**	**Stationing**	**Comment**
Big Cedar Creek - Reach 6	904	E	EII	1,046	1:2.5	418	67+57 to 78+03	Regraded banks, installed one grade control cross-vane and one log vane.
Unnamed Tributary 1 - Reach 1	1,998	R	P1, P2	1,248	1:1	1,248	10+46 to 22+94	Installed in-stream structures to control grade and reduce bank erosion. Priority 2 Restoration was used in the upstream, transitional section of the reach to bring the channel quickly up to the historic floodplain.
Unnamed Tributary 1 - Reach 2	759	R	P1	1,016	1:1	1,016	22+94 to 33+36	Installed in-stream structures to control grade and reduce bank erosion. The valley narrows and slopes increase to accommodate the decrease in floodplain area.
Unnamed Tributary 1 - Reach 3	1,518	R	P1	1,885	1:1	1,885	33+36 to 53+04	Installed in-stream structures to control grade and reduce bank erosion.
Unnamed Tributary 1 - Reach 4	935	R	P1	996	1:1	996	53+04 to 63+52	Installed in-stream structures to control grade and reduce bank erosion.
	125	E	EII	125	1:2.5	50	66+31 to 67+56	Regraded banks and existing riffle.
Unnamed Tributary 2	625	R	P1, P2	609	1:1	609	10+00 to 16+09	Installed in-stream structures to control grade and reduce bank erosion
	162	P	P	161	1:5	32	N/A	Preservation
Unnamed Tributary 3 to Big Cedar Creek	73	R	P1	73	1:1	73	11+08 to 11+82	Installed in-stream structures to control grade. Regraded banks, stabilized with matting, installed stable cattle crossing outside easement to protect reach.
Unnamed Tributary 1A	85	R	P1	85	1:1	85	10+41 to 11+26	Constructed new pattern to connect tributary to UT1. Installed coir matting and planted.
Unnamed Tributary 1B	33	R	P1	34	1:1	34	10+00 to 10+34	Constructed new pattern to connect tributary to UT1. Installed coir matting and planted.
Unnamed Tributary 1C	78	R	P1	78	1:1	78	10+54 to 11+32	Constructed new pattern to connect tributary to UT1. Installed coir matting and planted.

Table 1. Project Mitigation Approach

Big Cedar Creek Restoration Site: EEP Contract No. D06054-D								
Project Segment or Reach ID	**Existing Footage (LF)**	**Mitigation Type ***	**Approach****	**Linear Footage (LF)**	**Mitigation Ratio**	**Mitigation Units**	**Stationing**	**Comment**
Total linear ft of channel restored or preserved:				12,813				
Mitigation Unit Summation for Streams:				11,679				

* R = Restoration
E = Enhancement
P = Preservation

** P1 = Priority I
P2 = Priority II
P = Preservation
EII = Enhancement II

2.2.3 Project History, Contacts, and Attribute Data

Big Cedar Creek was restored by Baker through a full delivery contract with NCEEP. The chronology of the Big Cedar Creek Restoration Project is presented in Table 2. The contact information for all designers, contractors, and relevant suppliers is presented in Table 3. Relevant project background information is presented in Table 4.

Table 2. Project Activity and Reporting History

Big Cedar Creek Restoration Site: Project No. D06054-D			
Activity or Report	**Scheduled Completion**	**Data Collection Complete**	**Actual Completion or Delivery**
Restoration Plan Prepared	N/A	N/A	Jul-07
Restoration Plan Amended	N/A	N/A	Jul-07
Restoration Plan Approved	Mar-07	N/A	Jul-07
Final Design – (at least 90% complete)	N/A	N/A	Jun-07
Construction Begins	Oct-07	N/A	Nov-07
Temporary S&E mix applied to entire project area	NA	N/A	Dec-08
Permanent seed mix applied to entire project area	Dec-07	N/A	Dec-08
Planting of live stakes	Dec-07	N/A	Feb-09
Planting of bare root trees	Dec-07	N/A	Feb-09
End of Construction	Dec-07	N/A	Feb-09
Survey of As-built conditions (Year 0 Monitoring-baseline)	May-09	Feb-09	May-09
Year 1 Monitoring	Dec-09	Nov-09	Apr-10 (Final)
Year 2 Monitoring	Dec-10	Nov-10	Dec-10 (Final)
Year 3 Monitoring	Dec-11	Feb-12	Mar-12 (Final)
Year 4 Monitoring	Scheduled Dec-12	Scheduled Nov-12	N/A
Year 5 Monitoring	Scheduled Dec-13	Scheduled Nov-13	N/A

Table 3. Project Contact

Big Cedar Creek Restoration Site: Project No. D06054-D	
Designer	
Michael Baker Engineering, Inc.	8000 Regency Parkway, Suite 200 Cary, NC 27518 Contact: Kevin Tweedy, Tel. 919-463-5488
Construction Contractor	
River Works, Inc.	8000 Regency Parkway, Suite 200 Cary, NC 27518 Contact: Will Pedersen, Tel. 919-459-9001
Planting Contractor	
River Works, Inc.	8000 Regency Parkway, Suite 200 Cary, NC 27518 Contact: Will Pedersen, Tel. 919-459-9001
Seeding Contractor	
River Works, Inc.	8000 Regency Parkway, Suite 200 Cary, NC 27518 Contact: Will Pedersen, Tel. 919-459-9001
Seed Mix Sources	Mellow Marsh Farm, 919-742-1200
Nursery Stock Suppliers	International Paper, 1-888-888-7159
Monitoring Performers	
Michael Baker Engineering, Inc.	5550 Seventy-Seven Center Drive, Suite 320 Charlotte, NC 28217 Contact:
Stream Monitoring Point of Contact:	Ian Eckardt, Tel. 704-665-2200
Vegetation Monitoring Point of Contact:	Ian Eckardt, Tel. 704-665-2200

Table 4. Project Background

Big Cedar Creek Restoration Site: Project No. D06054-D	
Project County:	Stanly County, NC
Drainage Area:	
BCC Reach 1	2.85 mi^2
BCC Reach 2	2.91 mi^2
BCC Reach 3	3.30 mi^2
BCC Reach 4	3.35 mi^2
BCC Reach 5	4.67 mi^2
BCC Reach 6	4.71 mi^2
UT1 Reach 1	0.93 mi^2
UT1 Reach 2	0.98 mi^2
UT1 Reach 3	1.18 mi^2
UT1 Reach 4	1.21 mi^2
UT1A	0.02 mi^2
UT1B	0.12 mi^2

Table 4. Project Background

Big Cedar Creek Restoration Site: Project No. D06054-D	
UT1C	0.10 mi^2
UT2	0.55 mi^2
UT3	0.15 mi^2
Estimated Drainage % Impervious Cover:	
BCC Reach 1	<1%
BCC Reach 2	<1%
BCC Reach 3	<1%
BCC Reach 4	<1%
BCC Reach 5	<1%
BCC Reach 6	<1%
UT1 Reach 1	<1%
UT1 Reach 2	<1%
UT1 Reach 3	<1%
UT1 Reach 4	<1%
UT1A	0%
UT1B	0%
UT1C	0%
UT2	0%
UT3	0%
Stream Order:	
BCC Reach 1	3rd
BCC Reach 2	3rd
BCC Reach 3	3rd
BCC Reach 4	3rd
BCC Reach 5	3rd
BCC Reach 6	3rd
UT1 Reach 1	2nd
UT1 Reach 2	2nd
UT1 Reach 3	2nd
UT1 Reach 4	2nd
UT1A	1st
UT1B	1st
UT1C	1st
UT2	1st
UT3	1st
Physiographic Region:	Piedmont
Ecoregion:	Carolina Slate Belt

Table 4. Project Background

Big Cedar Creek Restoration Site: Project No. D06054-D	
Rosgen Classification of As-built:	
BCC Reach 1	E/C
BCC Reach 2	E/C
BCC Reach 3	E/C
BCC Reach 4	E/C
BCC Reach 5	B3/1c
BCC Reach 6	F→C
UT1 Reach 1	E/C
UT1 Reach 2	E/C
UT1 Reach 3	E/C
UT1 Reach 4	C
UT1A	E/C
UT1B	E/C
UT1C	E/C
UT2	E
UT3	E/C
Cowardin Classification	Riverine, Upper Perennial, Unconsolidated Bottom, Cobble-Gravel
Dominant Soil Types	
BCC Reach 1	Oa
BCC Reach 2	Oa
BCC Reach 3	Oa
BCC Reach 4	Oa
BCC Reach 5	Co
BCC Reach 6	Co, BaF
UT1 Reach 1	Oa
UT1 Reach 2	Oa, GoF
UT1 Reach 3	Oa, GoF
UT1 Reach 4	Oa, Co
UT1A	Oa
UT1B	Oa
UT1C	Oa
UT2	Oa
UT3	Oa
Reference site IDs	Unnamed Tributary to Rocky Creek, Richland Creek, Morgan Creek and Spencer Creek
USGS HUC for Project and Reference sites	03010103170030 (Project); 03040101080010 (Reference)
NCDWQ Sub-basin for Project and Reference	03-02-01 (Project); 03-07-02 (Reference)
NCDWQ classification for Project and Reference	C
Any portion of any project segment 303d listed?	No
Any portion of any project segment upstream of a 303d listed segment?	No
Reasons for 303d listing or stressor?	N/A
% of project easement fenced	50%

3.0 MONITORING PLAN

Channel stability, vegetation survival, and macroinvertebrate communities will be monitored on the project Site. Post-restoration monitoring will be conducted for five years following the completion of construction to document project success.

3.1 Stream Monitoring

Geomorphic monitoring of restored stream reaches will be conducted for five years to evaluate the effectiveness of the restoration practices. Monitored stream parameters include bankfull flows, stream dimension (cross-sections), pattern and profile (longitudinal profile survey), and photographic documentation. The methods used and any related success criteria are described below for each parameter. For monitoring stream success criteria, 33 permanent cross-sections, 2 crest gauges, and 104 photo identification points were established. The specific locations of these monitoring features are represented on the As-built plan sheets in Appendix D.

3.1.1 Bankfull Events

The occurrence of bankfull events within the monitoring period will be documented by the use of crest gauges and photographs on each project reach. Two crest gauges were installed on the floodplain within 10 feet of the restored channel. The crest gauges will record the highest watermark between site visits, and the gauge will be checked at each site visit to determine if a bankfull event has occurred. Photographs will be used to document the occurrence of debris lines and sediment deposition on the floodplain during monitoring site visits.

Two bankfull flow events must be documented at the crest gauge within the 5-year monitoring period. The two bankfull events must occur in separate years; otherwise, the stream monitoring will continue until two bankfull events have been documented in separate years.

3.1.2 Cross-sections

The 33 permanent cross-sections were installed throughout the entire Site. Within each project reach the distance interval between cross-sections was approximately equal to the combined length of 20 bankfull widths. An emphasis has been placed on riffle data collection because many of the project design parameters are based on riffle dimensions. This is reflected in a higher ratio of riffle to pool cross sections selected for monitoring. Each cross-section was marked on both banks with permanent pins to establish the exact transect used. A common benchmark will be used for cross-sections and consistently referenced to facilitate comparison of year-to-year data. The annual cross-sectional survey will include points measured at all breaks in slope, including top of bank, bankfull, inner berm, water surface, and thalweg, if the features are present.

There should be little change in As-built cross-sections and those surveyed in subsequent monitoring years. If changes do take place, they will be evaluated to determine if they represent a movement toward a more unstable condition (e.g., down-cutting or erosion) or a movement toward increased stability (e.g., settling, vegetative changes, deposition along the banks, or decrease in width/depth ratio). Riffle cross-sections will be classified using the Rosgen Stream Classification System, and all monitored cross-sections should fall within the quantitative parameters defined for channels of the design stream type.

3.1.3 Pattern

Annual measurements taken for the plan view of the Site will include sinuosity and meander width ratios. Radius of curvature measurements will be taken on newly constructed meanders for the first year of monitoring only. Pattern measurements should show little adjustment over the five year

monitoring period. If adjustments do occur, they will be evaluated to ensure that the new measurements fall within the quantitative parameters defined for channels of the design stream type.

3.1.4 Longitudinal Profile

A longitudinal profile will be completed annually during each year of the monitoring period. The profile will be conducted for at least 3,331 LF of restored stream reaches where pattern has been adjusted. The exact location of the annual longitudinal profile is marked on the As-built plan sheets in Appendix D. Measurements will include thalweg, water surface, inner berm, bankfull, and top of low bank. Each of these measurements will be taken at the head of each feature (e.g., riffle, run, pool, and glide) and at the maximum pool depth. The survey will be tied to a permanent benchmark.

The longitudinal profiles should show that the bedform features are remaining stable (i.e., they are not aggrading or degrading). The pools should remain deep, with flat water surface slopes, and the riffles should remain steeper and shallower than the pools. Bedforms observed should be consistent with those observed for channels of the design stream type.

3.1.5 Bed Material Analysis

One substrate sample was taken at a constructed riffle on UT1 to show a general particle distribution at the baseline condition. This data is provided in Appendix B. Six post-restoration pebble counts will be performed on Big Cedar, six on UT1, and two on UT2. Pebble counts will be conducted during post-restoration monitoring years 1, 3, and 5 at the time the cross sectional data is collected. This data will be compared to known distributions from the existing conditions surveys. Results should indicate either maintenance of seeded bed material or a progression towards previous distributions.

3.1.6 Watershed Observations

As part of the post-construction monitoring, any observed activities or changes in the watershed will be noted and connections to onsite observations will be drawn, where appropriate.

3.1.7 Photo Reference Sites

Photographs will be used to document restoration success visually. Reference stations will be photographed after construction and for five years following construction. Reference photos will be taken once a year, from a height of approximately five to six feet. Permanent markers will be established to ensure that the same locations (and view directions) on the Site are monitored during each monitoring period. Photographs taken at cross sections are provided in Appendix B, while structure photographs are shown in Appendix E.

3.1.7.1 Lateral Reference Photos

Reference photo transects will be taken at each permanent cross-section. Photographs will be taken of both banks at each cross-section. The survey tape will be centered in the photographs of the bank. The water line will be located in the lower edge of the frame, and as much of the bank as possible will be included in each photo. Photographers will make an effort to consistently document the same view in each photo point over time.

3.1.7.2 Structure Photos

Photographs will be taken at grade control structures along the restored streams. Photographers will make every effort to consistently document the same area in each photo point over time. Photographs will be used to evaluate channel aggradation or degradation, bank erosion, success of riparian vegetation, and effectiveness of erosion control measures subjectively. Lateral photos should not indicate excessive erosion or continuing degradation of the banks. A series of photos

over time should indicate successive maturation of riparian vegetation. The position of each structure photo point is located on the As-built plan sheets in Appendix D.

3.2 Vegetation Monitoring

Successful restoration of the vegetation on a mitigation site is dependent upon hydrologic restoration, active planting of preferred canopy species, and volunteer regeneration of the native plant community. In order to determine if the criteria are achieved, 23 vegetation monitoring quadrants were installed across the Site as directed by EEP monitoring guidance. The number of quadrants required is based on the plot number spreadsheet (07312006-2) provided by NCEEP that captures approximately five percent of the total conservation easement. The sizes of individual quadrants are 100 square meters for woody tree species. Vegetation monitoring will occur in the fall, prior to the loss of leaves. Individual quadrant data will be provided and will include species composition, density, and survivability. Individual seedlings will be marked to ensure that they can be found in subsequent monitoring years. Mortality will be determined from the difference between the previous year's living, planted seedlings and the current year's living, planted seedlings.

At the end of the first growing season, species composition, density, and survival will be evaluated. For each subsequent year, until the final success criteria are met, the Site will be evaluated between June and November.

The interim measure of vegetative success for the Site will be the survival of at least 320, three-year-old, planted trees per acre at the end of Year 3 of the monitoring period. The final vegetative success criterion will be the survival of 260, five-year old, planted trees per acre at the end of Year 5 of the monitoring period. While measuring species density is the current accepted methodology for evaluating vegetation success on restoration projects, species density alone may be inadequate for assessing plant community health. For this reason, the vegetation monitoring plan will incorporate the evaluation of additional plant community indices to assess overall vegetative success.

Herbaceous vegetation, primarily native grasses, were planted at the site shall have at least 80 percent coverage of the seeded/planted area. Any herbaceous vegetation not meeting these criteria shall be replanted. At a minimum, at all times ground cover at the project Site shall be in compliance with the North Carolina Erosion and Sedimentation Control Ordinance.

3.3 Biological Monitoring

Benthic macroinvertebrates can be used to assess quantity and quality of life in the creek. In particular, specimens belonging to the insect orders Ephemeroptera (mayflies), Plecoptera (stoneflies) and Trichoptera (caddisflies) are useful as an index of water quality. These groups are generally the least tolerant to water pollution and therefore are very useful indicators of water quality. Sampling for these three orders is referred to as EPT sampling. Because of the importance of biological success of a stream restoration project, benthic macroinvertebrate sampling will be conducted for post-restoration years 3, 4 and 5 on the Site.

Pre-construction monitoring was conducted at three sites within the project limits and at one upstream reference site in September 2006 (Figure 3). The results of this sampling event will be used as a baseline for comparison of post restoration monitoring results. Post restoration monitoring sites shall be located in the same general vicinity as the pre restoration monitoring sites. In general, post restoration monitoring results should show trends towards biological distributions similar to that observed at the reference site.

The sampling methodology shall follow the Qual 4 method listed in North Carolina Division of Water Quality's (NCDWQ) Standard Operating Procedures for Benthic Macroinvertebrates (2006). Laboratory identification of collected species will be conducted by a lab properly certified by NCDWQ.

3.4 Maintenance and Contingency Plan

Maintenance requirements vary from site to site and are generally driven by the following conditions:

- Projects without established, woody floodplain vegetation are more susceptible to erosion from floods than those with a mature, hardwood forest.
- Projects with sandy, non-cohesive soils are more prone to short-term bank erosion than cohesive soils or soils with high gravel and cobble content.
- Alluvial valley channels with wide floodplains are less vulnerable than confined channels.
- Wet weather during construction can make accurate channel and floodplain excavations difficult.
- Extreme and/or frequent flooding can cause floodplain and channel erosion.
- Extreme hot, cold, wet, or dry weather during and after construction can limit vegetation growth, particularly temporary and permanent seed.
- The presence and aggressiveness of invasive species can affect the extent to which a native buffer can be established.
- The presence of beaver can affect vegetation survivability and stream function.

Maintenance issues and recommended remediation measures will be detailed and documented in the monitoring reports. Factors that may have caused any maintenance needs, including any of the conditions listed above, shall be discussed. NCEEP approval will be obtained prior to any remedial action.

4.0 MONITORING RESULTS – 2011-12 YEAR 3 - MONITORING DATA

The five-year monitoring plan for the Site includes criteria to evaluate the success of the vegetation and stream components of the project. The specific locations of vegetation plots, permanent cross-sections, and the crest gauges are shown on the As-built plan sheets. Photo points, located at each of the grade control structures along the restored stream channel, are also located on the As-built plan sheets in Appendix D.

4.1 Stream Data

Third year monitoring dimension and profile data were sampled from November 2011 through February 2012. Results from the third year monitoring samples were compared with the As-built, Year 1, and Year 2 monitoring data. Permanent cross-sections (with photos) and As-built longitudinal data, as well as the quantitative pre-construction, reference reach, and design data used to determine the restoration approach are provided in Appendix B. The locations of the permanent cross-sections are shown on the As-built plan sheets in Appendix D.

4.1.1 Cross-section, Longitudinal Profile, and Bed Material Analysis Monitoring Results

Cross Sections

The 33 permanent cross-sections along the restored channels were re-surveyed to document stream dimension at the end of monitoring Year 3. Channel geometry for cross-sections 5, 9, 13, 22, and 32 was impacted by maintenance work completed during 2011.

Riffle cross-section 5 had experienced downcutting during Year 2. The riffle was reseeded with coarser bed material during Year 3, which brought the bed elevation up towards As-built conditions.

Cross-vane structures were installed in close proximity to riffle cross-sections 9 and 32 to center flow. The maintenance work slightly upstream of cross-section 9 resulted in a minor drop in bed elevation at cross-section 9. The installation of a cross-vane at cross-section 32 has deepened the channel transitioning the feature from a riffle to a scour or plunge pool.

During Year 3, the thalweg was re-centered and additional bed material was added along the left side of the channel at cross-section 13 to address the downcutting observed during Year 1 and Year 2.

The right floodplain at riffle cross-section 22 was raked and reseeded to address poor herbaceous cover. These activities resulted in slight elevation changes at and just beyond the right top of bank. All of the aforementioned changes in channel geometry will continue to be monitored.

Additional stream related information is discussed in Section 4.1.2 "Stream Problem Areas Plan View".

Longitudinal Profile

The Year 3 longitudinal profile was conducted during January and February 2012. A total of 3,396 LF was resurveyed along representative sections of the restored channels. Survey on Big Cedar Creek was conducted from As-built Station 12+75 to 18+01 and 47+00 to 57+19. Survey on UT1 started at As-built Station 13+75 to 30+19, while UT2 was resurveyed from As-built Station 11+00 to 13+07. The representative longitudinal profiles were resurveyed to document stream profile at the end of monitoring Year 3. Pool – to – pool spacing on BCC Reach 1 decreased slightly from the previous monitoring year (152 to 151 feet). The pool – to – pool spacing on BCC Reach 3 has increased slightly when compared to the As-built survey with a five foot (5-ft) average increase in spacing over the reach. No comparisons were available for Reach 2 as only one pool is present in the assessed survey area. The majority of riffle slopes in BCC Reaches 1, 2, and 3 remained similar to As-built values. Riffle slopes on Reaches 1 and 2 of UT1 were also similar to As-built conditions. The pool – to – pool spacing in UT1 Reach 1 remained similar to As-built values. Average pool spacing in Reach 2 of UT1 increased relative to previous monitoring years but remains within the designed spacing limits. Pool spacing on UT2 of 102 feet also increased when compared to the previous monitoring years and fell slightly outside the upper designed limit of 99 feet. Sinuosity was not calculated because only portions of each reach were surveyed.

The longitudinal profile and a summary of parameters measured are provided in Appendix B. Please note that this summary represents only the portions of the project that were surveyed.

Bed Material Analysis

Prior to construction, riffles were comprised of grain size particles ranging from fine clay to bedrock. The constructed riffles were seeded with onsite alluvium comprised mostly of fine gravel to large cobble size material. During Year 3, six pebble counts were performed on Big Cedar, six on UT1, and two on UT2. Overall, the majority of Year 3 pebble counts had slightly coarser particle sizes compared to Monitoring Year 1 values. The distributions of particle sizes, on average, were slightly larger in riffles and slightly finer in pools when compared to Year 1 counts. The changes in size distribution reflect the expected transport and deposition of finer material throughout the restored reaches. Year 3 pebble count data is provided in Appendix B.

4.1.2 Stream Problem Areas Plan View

The constructed stream channels are functioning as designed. During spring of 2011, repair work was completed to address bed degradation in select riffles, scour along the inner arm of J-hook structures, slight shifts in thalweg alignment due to deposition and toe erosion, and raw banks. The riffles experiencing bed degradation were reseeded with coarser bed material. Scour along the inner arm of J-hooks was addressed with additional stone protection. Thalweg realignment was achieved through a combination of riffle re-grading and strategic installation of cross-vane structures. Raw banks were

re-matted and reseeded. Several of these areas will receive additional bioengineering measures including live stakes, brush mattresses, and/or geolifts during March 2012. The repair work has resulted in an increase in the majority of visual assessment scores located in Table 5.

Minor stream problems observed during the 2011 visual assessment included an abandoned beaver dam, minor scour within a rootwad, fallen trees, and piping under a newly constructed cross-vane. These areas will be addressed during March 2012. Table B.1 Appendix B provides a summary of these problem areas. See Figures B1- B11 in Appendix B for an overview of all stream problem areas. Table B.2 in Appendix B has additional data further explaining the visual assessment scores.

Table 5. Visual Morphological Stability Assessment

Big Cedar Creek Restoration Site: Project No. D06054-D						
BCC Reach 1 (603 LF)						
Feature	**Initial**	**MY-01**	**MY-02**	**MY-03**	**MY-04**	**MY-05**
Riffles	100%	100%	100%	100%		
Pools	100%	100%	100%	100%		
Thalweg	100%	84%	83%	100%		
Meanders	100%	100%	100%	100%		
Bed General	100%	98%	99%	100%		
Bank Condition	100%	100%	100%	100%		
Vanes / J Hooks etc.	-----	-----	-----	-----		
Wads and Boulders	100%	100%	100%	100%		
BCC Reach 2 (2239 LF)						
Feature	**Initial**	**MY-01**	**MY-02**	**MY-03**	**MY-04**	**MY-05**
Riffles	100%	84%	87%	100%		
Pools	100%	100%	91%	100%		
Thalweg	100%	100%	93%	100%		
Meanders	100%	100%	96%	100%		
Bed General	100%	96%	95%	100%		
Bank Condition	100%	100%	82%	100%		
Vanes / J Hooks etc.	100%	93%	95%	100%		
Wads and Boulders	100%	94%	88%	100%		
BCC Reach 3 (1827 LF)						
Feature	**Initial**	**MY-01**	**MY-02**	**MY-03**	**MY-04**	**MY-05**
Riffles	100%	97%	97%	100%		
Pools	100%	100%	100%	100%		
Thalweg	100%	100%	77%	100%		
Meanders	100%	100%	95%	100%		
Bed General	100%	100%	94%	100%		
Bank Condition	100%	94%	93%	100%		
Vanes / J Hooks etc.	100%	96%	92%	100%		
Wads and Boulders	100%	100%	100%	100%		
BCC Reach 4 (410 LF)						
Feature	**Initial**	**MY-01**	**MY-02**	**MY-03**	**MY-04**	**MY-05**
Riffles	100%	100%	100%	100%		
Pools	100%	100%	100%	100%		
Thalweg	100%	100%	67%	100%		

Table 5. Visual Morphological Stability Assessment

Big Cedar Creek Restoration Site: Project No. D06054-D						
Meanders	100%	92%	92%	100%		
Bed General	100%	98%	88%	100%		
Bank Condition	100%	88%	80%	100%		
Vanes / J Hooks etc.	100%	100%	88%	100%		
Wads and Boulders	100%	100%	100%	100%		
BCC Reach 6 (969 LF)						
Feature	**Initial**	**MY-01**	**MY-02**	**MY-03**	**MY-04**	**MY-05**
Riffles	100%	100%	100%	100%		
Pools	100%	100%	100%	100%		
Thalweg	100%	100%	100%	100%		
Meanders	100%	100%	100%	100%		
Bed General	100%	100%	100%	100%		
Bank Condition	100%	100%	98%	98%		
Vanes / J Hooks etc.	100%	100%	100%	100%		
Wads and Boulders	-----	-----	-----	-----		
UT1 Reach 1 (1248 LF)						
Feature	**Initial**	**MY-01**	**MY-02**	**MY-03**	**MY-04**	**MY-05**
Riffles	100%	100%	100%	100%		
Pools	100%	100%	100%	100%		
Thalweg	100%	100%	100%	100%		
Meanders	100%	100%	100%	100%		
Bed General	100%	100%	100%	100%		
Bank Condition	100%	100%	100%	100%		
Vanes / J Hooks etc.	-----	-----	-----	-----		
Wads and Boulders	100%	100%	100%	100%		
UT1 Reach 2 (1016)						
Feature	**Initial**	**MY-01**	**MY-02**	**MY-03**	**MY-04**	**MY-05**
Riffles	100%	100%	100%	100%		
Pools	100%	100%	100%	100%		
Thalweg	100%	100%	100%	100%		
Meanders	100%	100%	100%	100%		
Bed General	100%	100%	100%	100%		
Bank Condition	100%	100%	99%	100%		
Vanes / J Hooks etc.	100%	100%	100%	100%		
Wads and Boulders	100%	100%	100%	100%		
UT1 Reach 3 (1885 LF)						
Feature	**Initial**	**MY-01**	**MY-02**	**MY-03**	**MY-04**	**MY-05**
Riffles	100%	98%	97%	100%		
Pools	100%	100%	96%	100%		
Thalweg	100%	100%	95%	100%		
Meanders	100%	100%	100%	100%		
Bed General	100%	100%	100%	100%		
Bank Condition	100%	97%	82%	100%		
Vanes / J Hooks etc.	100%	100%	100%	98%		
Wads and Boulders	100%	100%	100%	100%		

Table 5. Visual Morphological Stability Assessment

Big Cedar Creek Restoration Site: Project No. D06054-D						
UT1 Reach 4 (996 LF)						
Feature	**Initial**	**MY-01**	**MY-02**	**MY-03**	**MY-04**	**MY-05**
Riffles	100%	87%	87%	100%		
Pools	100%	90%	90%	100%		
Thalweg	100%	100%	71%	100%		
Meanders	100%	100%	29%	100%		
Bed General	100%	76%	87%	100%		
Bank Condition	100%	90%	50%	100%		
Vanes / J Hooks etc.	100%	100%	100%	100%		
Wads and Boulders	100%	100%	40%	100%		
UT1A (85 LF)						
Feature	**Initial**	**MY-01**	**MY-02**	**MY-03**	**MY-04**	**MY-05**
Riffles	-----	-----	-----	-----		
Pools	-----	-----	-----	-----		
Thalweg	-----	-----	-----	-----		
Meanders	-----	-----	-----	-----		
Bed General	100%	100%	93%	100%		
Bank Condition	100%	100%	100%	100%		
Vanes / J Hooks etc.	-----	-----	-----	-----		
Wads and Boulders	-----	-----	-----	-----		
UT1B (34 LF)						
Feature	**Initial**	**MY-01**	**MY-02**	**MY-03**	**MY-04**	**MY-05**
Riffles	-----	-----	-----	-----		
Pools	-----	-----	-----	-----		
Thalweg	-----	-----	-----	-----		
Meanders	-----	-----	-----	-----		
Bed General	100%	100%	100%	100%		
Bank Condition	100%	100%	100%	100%		
Vanes / J Hooks etc.	100%	100%	100%	100%		
Wads and Boulders	-----	-----	-----	-----		
UT1C (78 LF)						
Feature	**Initial**	**MY-01**	**MY-02**	**MY-03**	**MY-04**	**MY-05**
Riffles	-----	-----	-----	-----		
Pools	-----	-----	-----	-----		
Thalweg	-----	-----	-----	-----		
Meanders	-----	-----	-----	-----		
Bed General	100%	100%	100%	100%		
Bank Condition	100%	100%	100%	100%		
Vanes / J Hooks etc.	-----	-----	-----	-----		
Wads and Boulders	-----	-----	-----	-----		
UT2 (609 LF)						
Feature	**Initial**	**MY-01**	**MY-02**	**MY-03**	**MY-04**	**MY-05**
Riffles	100%	100%	94%	100%		
Pools	100%	100%	100%	100%		
Thalweg	100%	100%	100%	100%		

Table 5. Visual Morphological Stability Assessment

Big Cedar Creek Restoration Site: Project No. D06054-D						
Meanders	100%	100%	86%	100%		
Bed General	100%	100%	97%	100%		
Bank Condition	100%	100%	73%	100%		
Vanes / J Hooks etc.	100%	100%	96%	100%		
Wads and Boulders	100%	100%	75%	100%		
UT3 (73 LF within easement)						
Feature	**Initial**	**MY-01**	**MY-02**	**MY-03**	**MY-04**	**MY-05**
Riffles	-----	-----	-----	-----		
Pools	-----	-----	-----	-----		
Thalweg	-----	-----	-----	-----		
Meanders	-----	-----	-----	-----		
Bed General	100%	100%	100%	100%		
Bank Condition	100%	100%	100%	100%		
Vanes / J Hooks etc.	100%	100%	100%	100%		
Wads and Boulders	-----	-----	-----	-----		

4.2 Hydrology Data

On-site crest gauges documented the occurrence of one bankfull event during the third year monitoring period. The highest stage recorded during the third year monitoring period was 0.41 feet. Bankfull verification summaries are included in Table 6. Crest gauge locations are included in the As-built plan sheets in Appendix D. Bankfull verification photos are provided in Appendix E.

Table 6. Verification of Bankfull Events

Big Cedar Creek Restoration Site: Project No. D06054-D					
Station Number	**Date of Data Collection**	**Date of Occurrence of Bankfull Event**	**Method of Data Collection**	**Gage Height (feet)**	**Photo # (If available)**
BCC Reach 3	2/22/12	Between 12/8/10 and 2/22/12	Crest Gauge	0.41	BCC Crest Gauge – 2/22/12
UT1 Reach 4	2/22/12	Between 10/10/10 and 2/22/12	Crest Gauge	0.26	UT1 Crest Gauge – 2/22/12

4.3 Vegetation Data

Bare-root trees and shrubs were planted within all areas of the conservation easement. A minimum 50-foot buffer was established along all restored stream reaches. In general, bare-root vegetation was planted at a target density of 680 stems per acre, in an 8-foot by 8-foot grid pattern. Planting of bare-root trees and shrubs were completed in February 2009. The restoration plan for the Site specifies that the number of quadrants required is based on the CVS-NCEEP monitoring guidance. The number of quadrants required was determined using the plot number spreadsheet (07312006-2) provided by NCEEP that captures five percent of the total conservation easement. The sizes of individual quadrants are 100 square meters. A total of 23 vegetation plots, each 10 meters by 10 meters in size, were established across the restored site.

The average Year 3 density of planted bare root stems, based on the data from the 23 monitoring plots, is 715 stems per acre. The vegetation monitoring indicated a survivability range of 280 stems per acre to 1040 stems

per acre. Only 1 vegetation plot (15) did not meet the projected Year 3 success criteria of 320 trees per acre; however, the site average Year 3 density did meet the Year 3 vegetative success criteria of 320 trees per acre and is still on track to meet the final year's vegetative success criteria of 260 trees per acre.

No volunteer species were noted in any of the Site's vegetation plots, or were too small to verify. If any woody volunteer species are observed in subsequent monitoring years they will be flagged and added to the overall stems per acre assessment of the Site. The locations of the vegetation plots are shown on the As-built plan sheets in Appendix D.

Additional vegetation related information is listed below. Monitoring result tables and photos are located in Appendix C.

4.3.1 Vegetative Problem Areas

Year 1 monitoring noted that rocky, sandy soils are predominant throughout the site and have limited the establishment of herbaceous vegetation along the banks and within the floodplains of the restored reaches. Bare floodplain areas, noted during Year 2 monitoring, were limited mostly to floodplains of UT1 upstream of the stream crossing. Bare banks were present along some outer meander bends on Reaches 3 and 4 of UT1, along UT2, and in the downstream restored section of Big Cedar. These areas were lacking good vegetative growth and allowed for scour and pocket erosion to occur in the restored sections of the stream.

In April of 2011, banks experiencing erosion issues were re-graded and matted and any additional areas needing immediate ground cover stabilization were reseeded and mulched. Additional stabilization measures (vegetated geo-lifts and brush mattress) are scheduled to be installed in March 2012. These bio-engineered stabilization measures will be installed along outer meander bends of UT2 and Big Cedar Creek, as well as, on some meanders along Reaches 3 and 4 of UT1. Additional plantings within the identified bare areas along the stream banks and within the floodplains are also scheduled for March 2012.

A variety of invasive species are present throughout the site and consist of *Ligustrum sinese* (Chinese privet), *Lonicera japonica* (Japanese honeysuckle), and *Rosa multiflora* (multi-flora rose). Vegetation Plots 13 and 23 are located in areas identified as having a higher population of invasive species (Figure C1). Though present, these species are not currently affecting the establishment of native species within the identified Vegetation Plots nor are they dominant in any location Site-wide. However, in order to prevent these species from spreading and becoming more densely populated, an herbicidal spot treatment application will be scheduled during 2012.

See Table C.6 in Appendix C for problem area categories, locations, descriptions, causes, and photo log.

4.3.2 Vegetative Problem Area Plan View

See Figure C1 in Appendix C for an overview of all vegetative problem areas.

4.4 Benthic Macroinvertebrate Monitoring Data

Field sampling was conducted by Kristi Suggs, Ian Eckardt, and Christopher Tomsic of Baker. Laboratory identification of collected species was conducted by Wendell Pennington, lab supervisor with Pennington & Associates, which is certified by NCDWQ.

Benthic macroinvertebrate samples were collected on September 26th and 28th, 2011. Site 1, the reference site, is located approximately 200 linear feet upstream of the Site. Site 2 is located above the Winston-Salem Southbound Railroad line crossing at Station 32+00 on Big Cedar Creek while Site 3 is located approximately 300 LF upstream of Mount Zion Church Road at Station 75+00. Site 4 is located along UT1 at Station 51+00. Figure 3 illustrates the sampling site locations.

Benthic macroinvertebrates were collected to assess quantity and quality of life in the creek. In particular, specimens belonging to the insect orders Ephemeroptera (mayflies), Plecoptera (stoneflies) and Trichoptera (caddisflies) have a low tolerance to water pollution and are useful as an indicator of water quality. Sampling for these three orders is referred to as EPT sampling.

Habitat assessments using NCDWQ protocols were also conducted at each site. Physical and chemical measurements including water temperature, percent dissolved oxygen, dissolved oxygen concentration, pH, and specific conductivity were also recorded at each site. The habitat assessment field data sheets are located in Appendix F. Photographs were taken at Sites 1 through 4 to document stream and bank conditions at the time of sampling, and are located in Appendix F.

4.4.1 Benthic Macroinvertebrate Sampling Results and Discussion

A comparison between the pre- and post-construction monitoring results is presented in Table 7 with complete results presented in Appendix F.

Table 7. Pre-restoration vs. Post-restoration Benthic Macroinvertebrate Sampling Data

Summary of Pre-Restoration vs. Post-Restoration Benthic Macroinvertebrate Sampling Data

Metric	Site 1 Reference		Site 2 U/S BCC		Site 3 D/S BCC		Site 4 UT1 to BCC	
	Pre 9/13/06	Post 9/28/11	Pre 9/13/06	Post 9/28/11	Pre 9/13/06	Post 9/26/11	Pre 9/14/06	Post 9/26/11
Total Taxa Richness	20	7	15	24	18	21	16	11
EPT Taxa Richness	1	0	1	3	0	5	0	3
Total Biotic Index	6.76	6.95	7.85	7.53	8.38	5.95	8.18	7.80
EPT Biotic Index	7.2	n/a	2.5	7.14	n/a	6.34	n/a	7.27
Dominance in Common (%)	n/a	n/a	22	100	55	100	n/a	n/a
Habitat Assessment Rating	82	89	62	88	72	89	63	89
Water Temperature (˚C)	19.5	21.8	18.0	22.8	19.1	22.2	21.0	21.9
% Dissolved Oxygen (DO)	46.5	84.8	N/A	89.2	28.2	94.1	72.1	89.5
DO Concentration (mg/l)	4.16	7.45	6.06	7.67	2.6	8.17	6.42	N/A
pH	6.99	6.6	6.78	6.2	6.87	6.72	6.78	6.44
Conductivity (µmhos/cm)	170	120	170	120	23	150	190	150

At Site 1, the reference site, the post-construction community structure appears to have declined compared to that observed during the pre-construction monitoring period. Overall taxa richness and EPT taxa richness declined between 2006 and 2011. In addition the total biotic index increased from 6.76 to 6.95. These trends may reflect a stressor to water quality at this sampling location which has lead to the dominance of slightly more tolerance species.

Site 2, which underwent complete restoration, exhibited increased total taxa richness and EPT taxa richness. The total biotic index decreased slightly from 7.85 to 7.53, from 2006 to 2011. The EPT biotic index increased from 2.5 to 7.14, between 2006 and 2011 respectively. The increase indicates that the existing communities continue to be dominated by more tolerant species. This suggests that Site 2 has not recovered from the major disturbance to habitat caused by the in-stream construction techniques implemented onsite.

Currently Site 2 has 100 percent Dominance in Common (DIC) compared to the reference site, indicating that 100 percent of the dominant communities at the reference site are

dominant at Site 2. In pre-construction conditions, Site 2 had a DIC of 22 percent. The increase in DIC likely reflects in part the decrease in taxa richness at Site 1 and the increase of taxa richness post-construction at Site 2. Currently DIC may not be a good indicator of recolonization from refugia upstream (represented at Site 1). However the increase in total and EPT taxa richness does indicate that post-construction recolonization has begun.

Site 3 underwent enhancement in the form of bank stabilization and the installation of an in-stream structures. The overall taxa richness and EPT richness are greater than the pre-construction conditions. The total biotic index decreased from 8.38 to 5.95. The decrease in the biotic index reflects the addition of intolerant Ephemeroptera species such as *Leucrocuta* sp. (tolerance value of 2.4).

Currently Site 3 has a DIC of 100 percent with the reference site. In pre-construction conditions, Site 3 had a DIC of 55 percent. Due to the decline in overall water quality at the reference site this may not be a strong indicator for recolonization from refugia upstream (represented at Site 1). However the addition of EPT taxa and the decrease in the total biotic index suggest water quality is improving.

Site 4 underwent complete restoration, exhibiting a slight decrease in total taxa richness but an increase in EPT richness between 2006 and 2011. The total biotic index decreased from 8.18 to 7.8. The decrease in the biotic index reflects the presence of a slightly more intolerant species during Year 3 post-construction. Sample numbers indicate that water quality is improving and that recolonization is occurring.

Ideally, post restoration monitoring results should show trends towards biological distributions similar to that observed at the reference site. However it appears that the biological distributions at the reference site have declined since the baseline sampling. Increases in overall biological richness, EPT richness, and a decrease in biotic indices indicate improvement in benthic macroinvertebrate communities within the project site. It is anticipated that improvements in biotic indices will be seen in future monitoring reports as the project and buffer matures and communities continue to recolonize.

4.4.2 Habitat Assessment Results and Discussion

Site 1, the reference site, received an 89 on the Habitat Assessment Field Data Sheet. The site exhibited good riffle substrate, habitat diversity and shading. Riffles were a mix of bedrock, gravel and cobbles, moderately embedded with sand, and the pool bottoms were silty. Site 1 had a mature hardwood buffer with minimal breaks. Snags or logs were common within this section of the channel.

Site 2 received an 88 on the Habitat Assessment Field Data Sheet. The site exhibited excellent riffle pool sequencing, pattern, and stability, as well as good habitat diversity. Riffles were mostly gravel and cobbles, and the pool bottoms were silty. The riparian buffer for Site 2 could be classified as fallow field, with immature hardwood seedlings scattered throughout. Numerous types of instream habitat including rocks, snags, logs, macrophytes, and leafpacks were present. However, organic material such as sticks and leafpacks were not common. It is anticipated that as the project and buffer continue to mature, habitat will continue to improve and diversify.

Site 3 received an 89 on the Habitat Assessment Field Data Sheet. The site exhibited good riffle-pool sequencing, pattern and stability. Riffles were mostly gravel and cobbles, moderately embedded with sand, and the pool bottoms were silty. Unlike Site 2, the riparian buffer of Site 3 could be classified as mature forest, with minimal breaks in the canopy.

Site 4 received an 89 on the Habitat Assessment Field Data Sheet. The site exhibited excellent riffle-pool sequencing, pattern, and stability with good habitat diversity. Riffles were mostly gravel and cobbles, and the pool bottoms were silty. The riparian buffer of Site 4 could be classified as fallow field, with immature hardwood seedlings scattered throughout. Instream habitat including rocks, macrophytes, and leafpacks were present. However, organic material such as sticks and leafpacks were not common. It is anticipated that as the project and buffer continue to mature, habitat will continue to improve and diversify.

The restoration of pattern and dimension, as well as the addition of root wads, vanes, and armored riffles, have enhanced the overall in-stream habitat throughout the restoration sites. The immature riparian vegetation has had minimal effect on in-stream habitat at Sites 2 and 4, however future contributions from planted riparian vegetation will be evident as the woody plant species mature. Contributions will include in-stream structures such as sticks, leaf packs, and root mats.

The physical and chemical measurements of water temperature, percent dissolved oxygen, dissolved oxygen concentration, pH, and specific conductivity at all sites were within established norms for Piedmont streams (NCDWQ, 2007).

4.5 Areas of Concern

Overall the restored channels are functioning as designed with limited areas of concern. Maintenance on problem areas identified during 2011 has begun and will continue in March of 2012. Though invasive species are currently not affecting native vegetation, they will continue to be monitored and an herbicidal spot treatment application will be scheduled during 2012 for dense populations.

5.0 REFERENCES

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Appendix A

Figures

1. Vicinity Map
2. Project Summary Map
3. Macroinvertebrate Monitoring Map

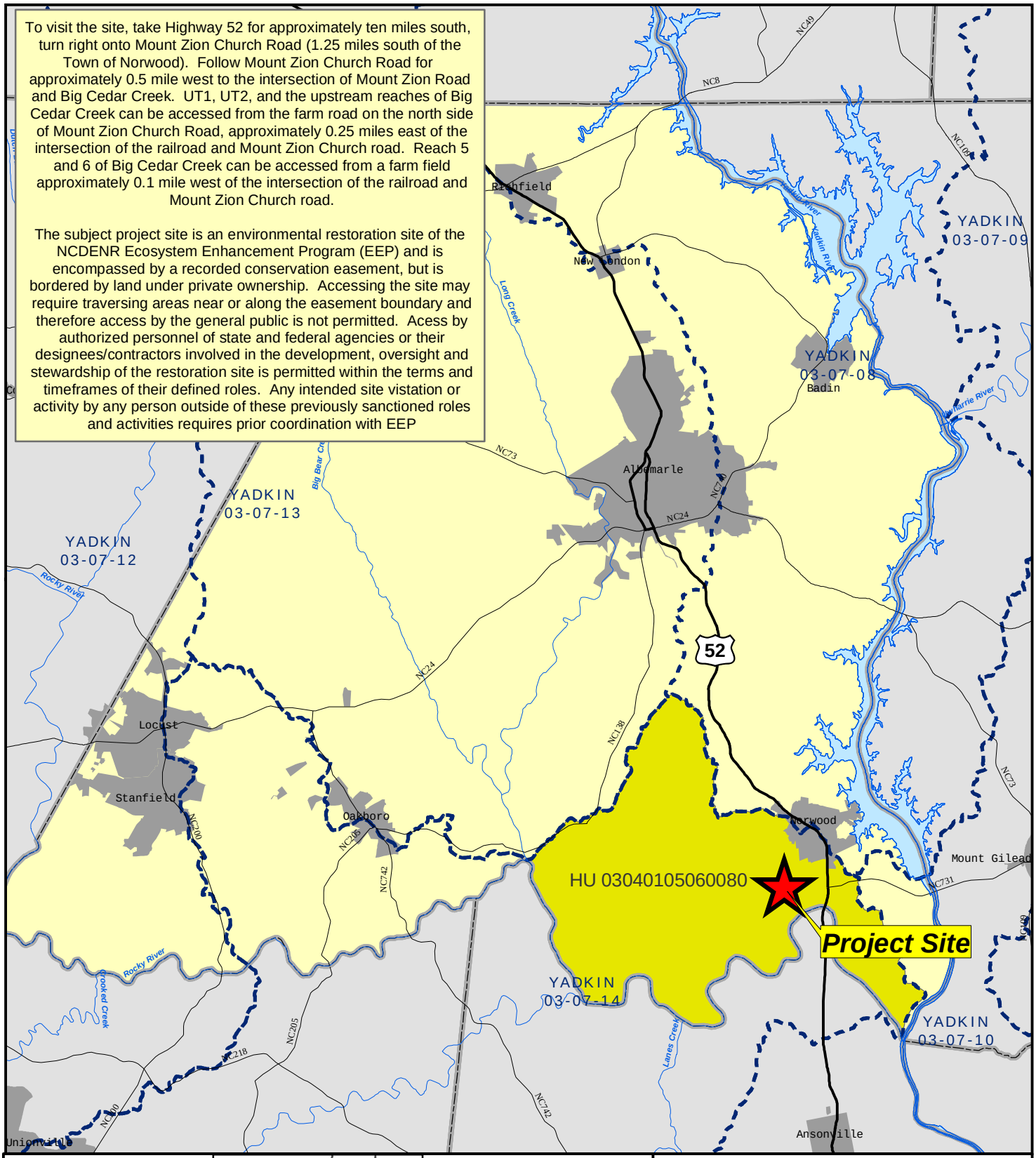


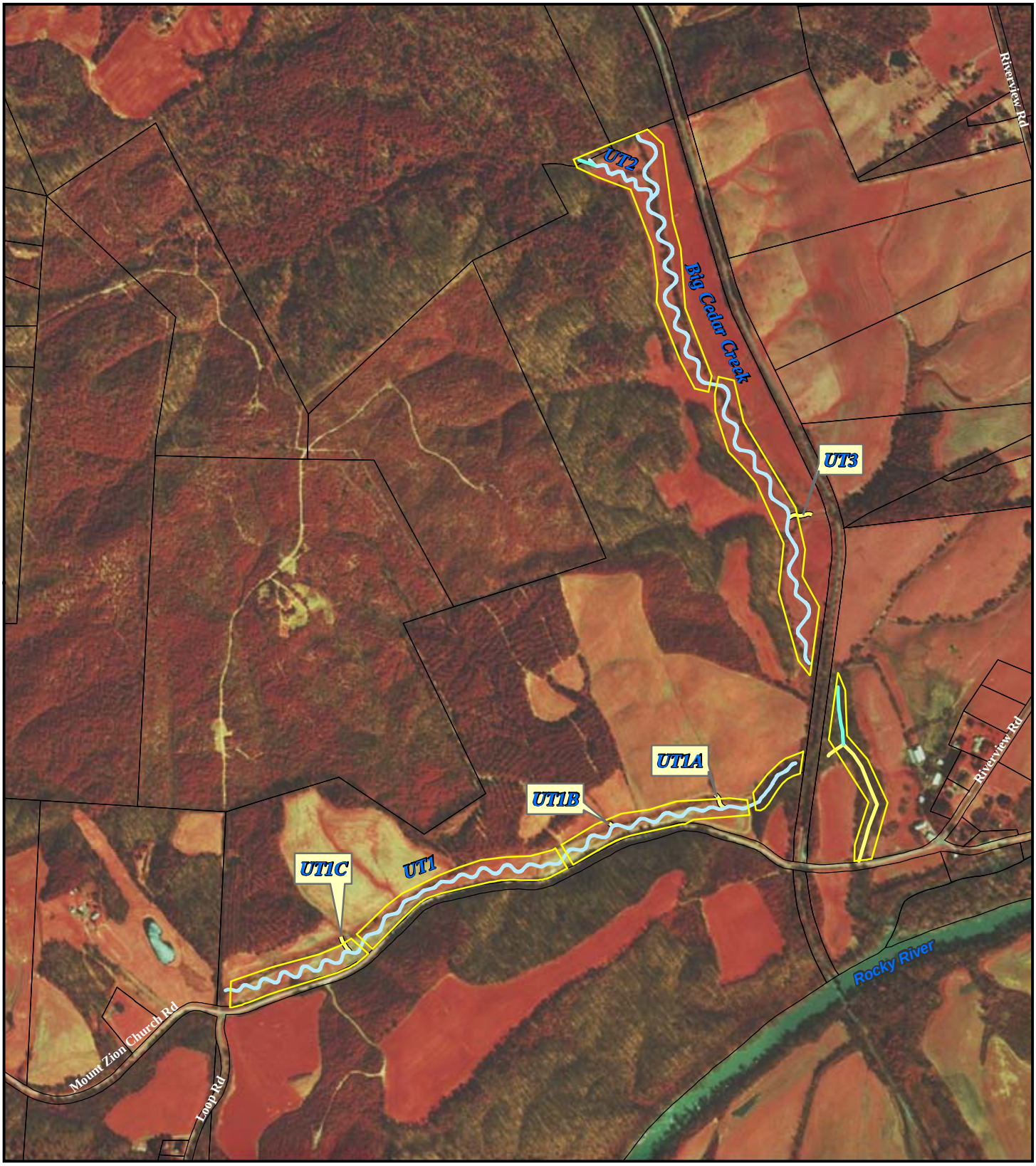
Figure 1: Vicinity Map

Big Cedar Creek Stream Restoration Project

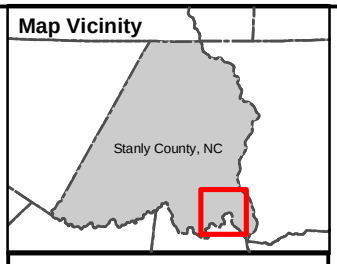
Annual Monitoring Plan - Year 3

Stanly County, NC

March 2012



Map Vicinity



EEP Project No. : D06054-D

LEGEND

- Preservation
- Enhancement
- Restoration
- Parcels
- Conservation Easement

0 500 1,000 Feet

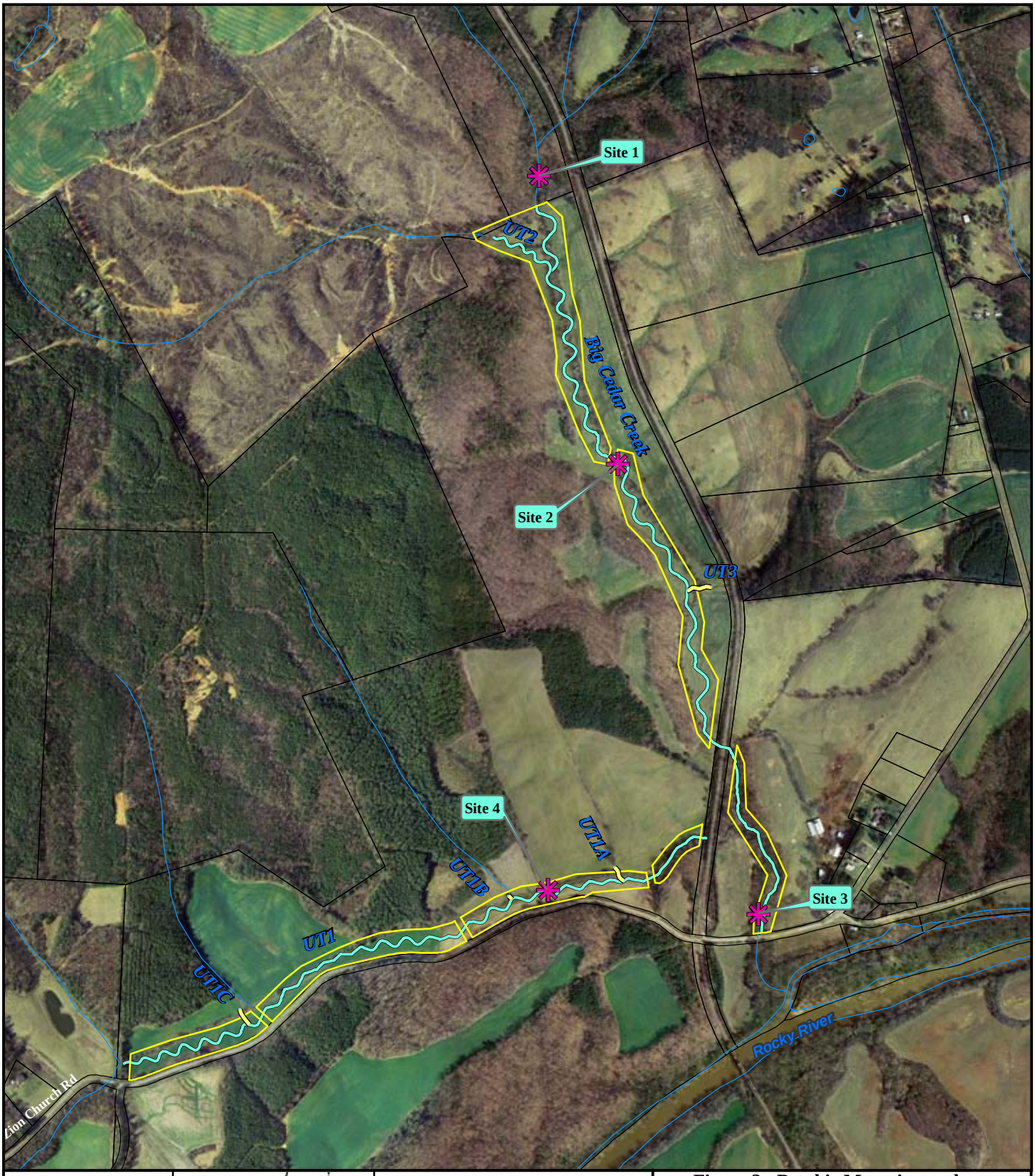
Figure 2: Restoration Summary

Big Cedar Creek Stream Restoration Project

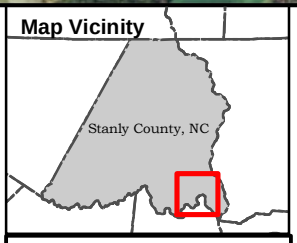
Annual Monitoring Plan - Year 3

Stanly County, NC

March 2012



Map Vicinity



EEP Project No. : D06054-D

LEGEND

- As-Built Streams
- Macroinvertebrate Sampling Sites
- Conservation Easement
- Parcels
- Streams

0 500 1,000 Feet

Figure 3: Benthic Macroinvertebrate Sampling Sites
Big Cedar Creek Stream Restoration Project
Annual Monitoring Plan - Year 3
Stanly County, NC

March 2012

Appendix B

Morphological Summary Data

Cross-section Plots

Profile Plots

Morphology Data Table 7 & 8

Tables B.1 & B.2

Representative Stream Problem Area Figures B1- B11

Representative Stream Problem Area Photos

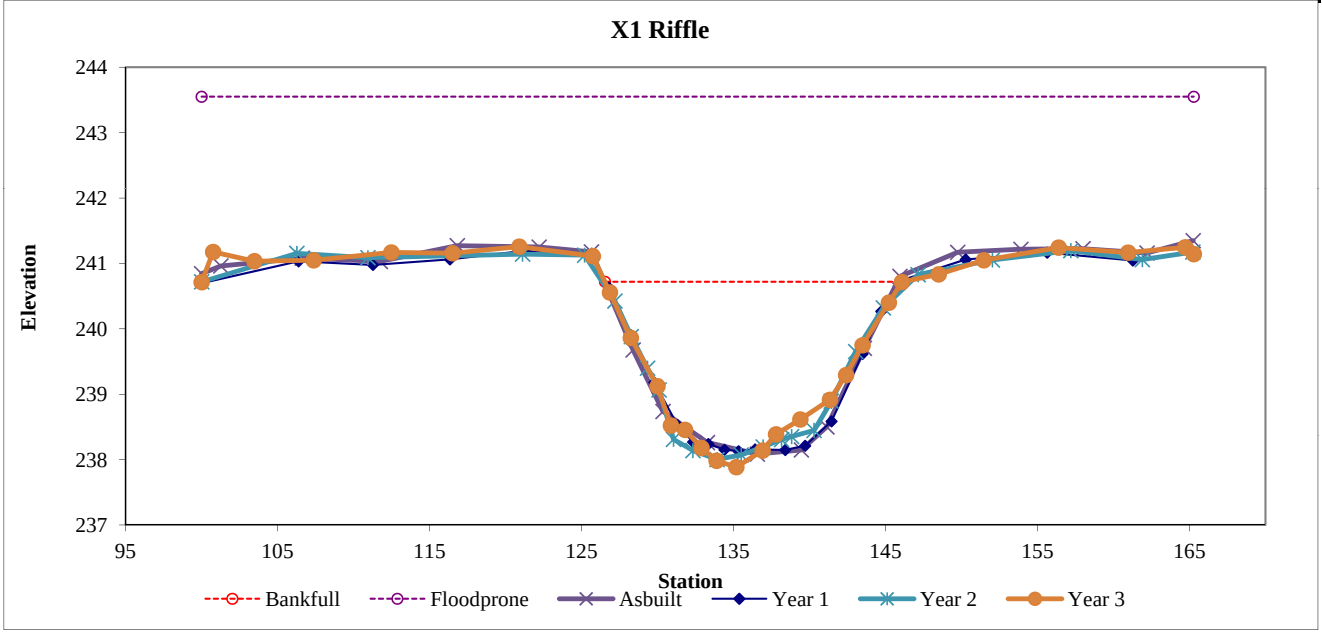
Permanent Cross Section X1

(Year 3 Monitoring Data - collected February 2012)

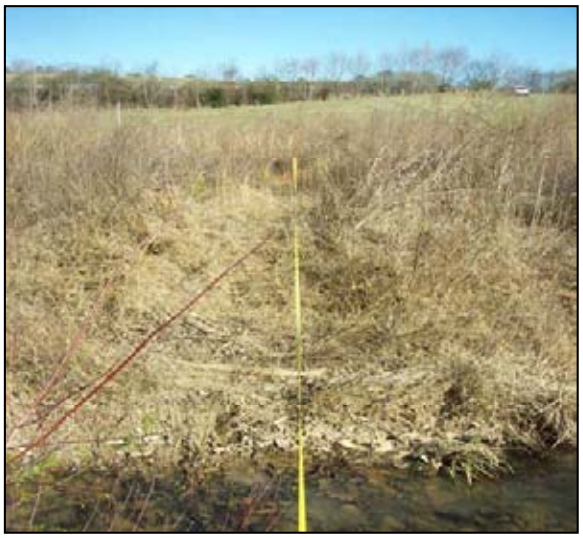
Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Riffle	C	33.9	19.54	1.73	2.83	11.27	1	3.3	240.72	240.72



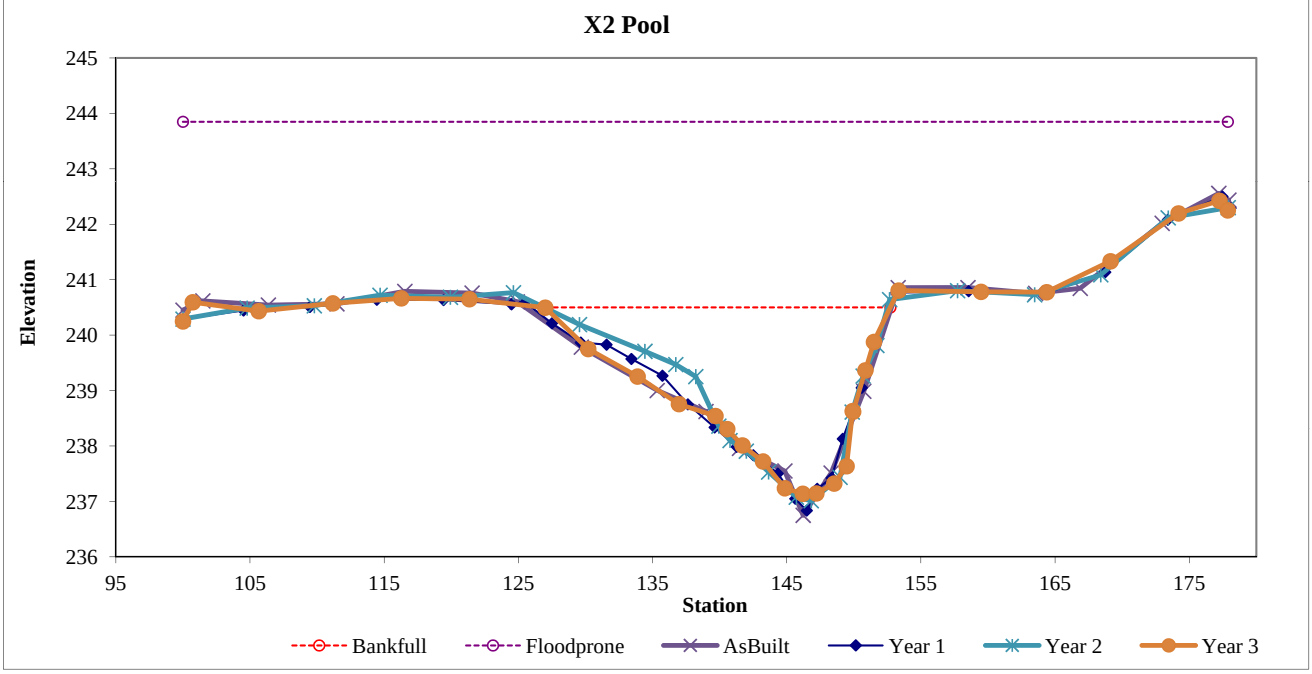
Permanent Cross Section X2
(Year 3 Monitoring Data - collected February 2012)



Looking at the Left Bank

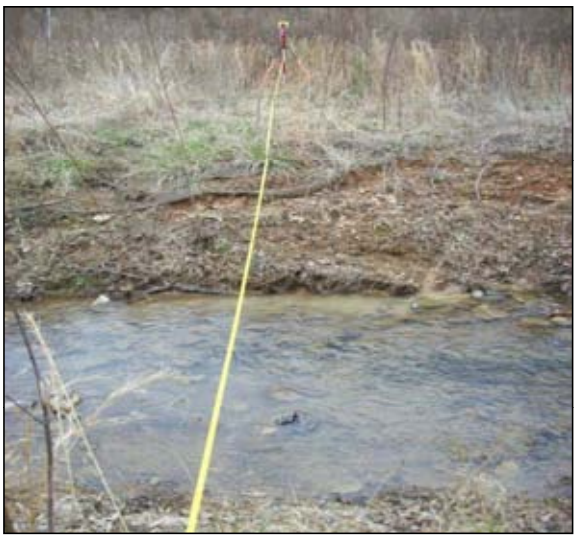
Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Pool		46.3	25.72	1.8	3.36	14.3	1		240.5	240.5



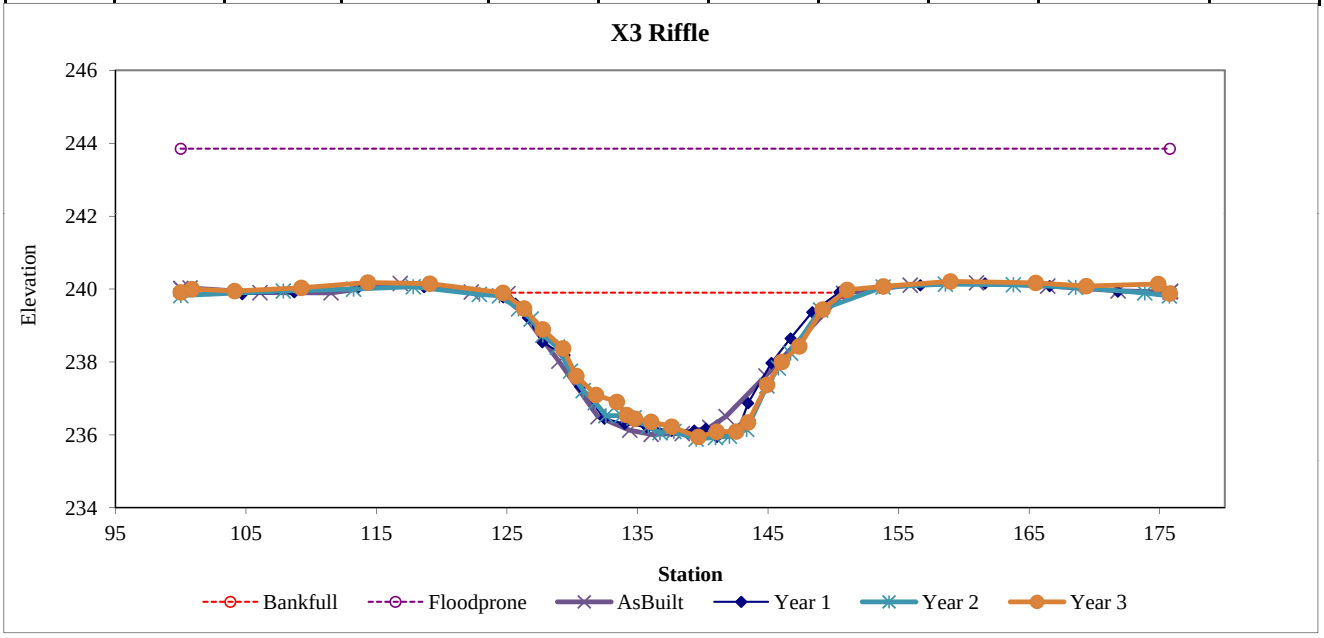
Permanent Cross Section X3
(Year 3 Monitoring Data - collected February 2012)

Looking at the Left Bank



Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Riffle	C	61.8	26.09	2.37	3.95	11.02	1	2.9	239.9	239.9

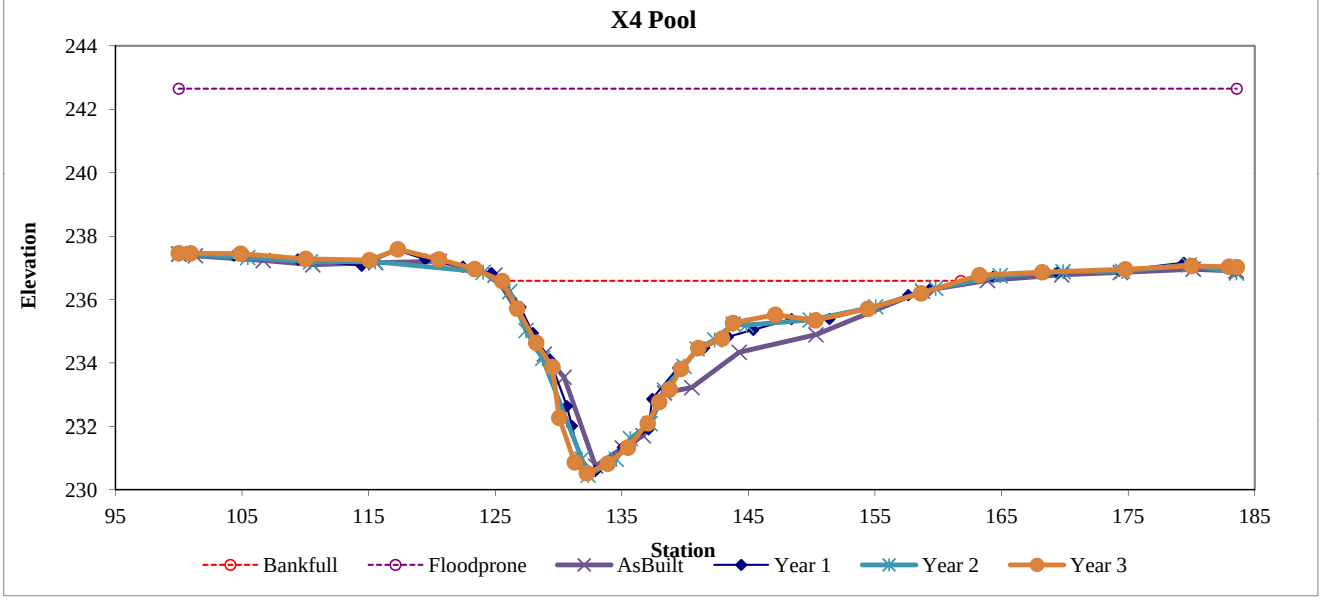


Permanent Cross Section X4
(Year 3 Monitoring Data - collected February 2012)

Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Pool		78.7	36.23	2.17	6.06	16.69	1		236.59	236.59



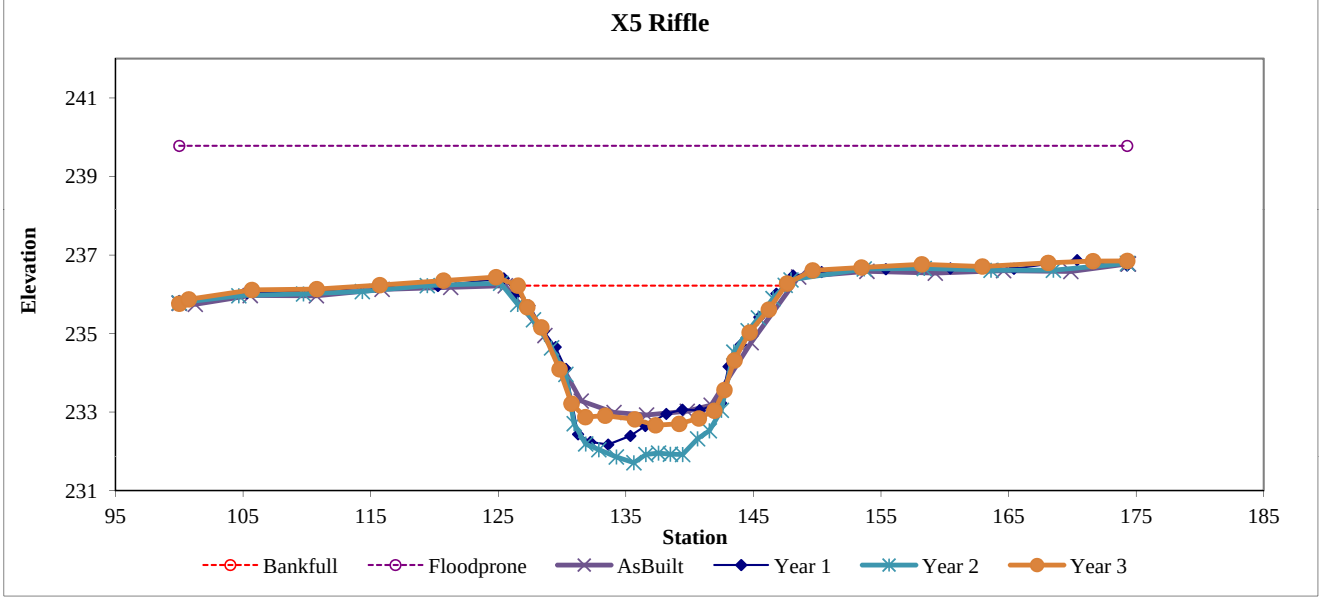
Permanent Cross Section X5

(Year 3 Monitoring Data - collected February 2012)

Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Riffle	E	51.4	20.99	2.45	3.56	8.56	1	3.5	236.22	236.22



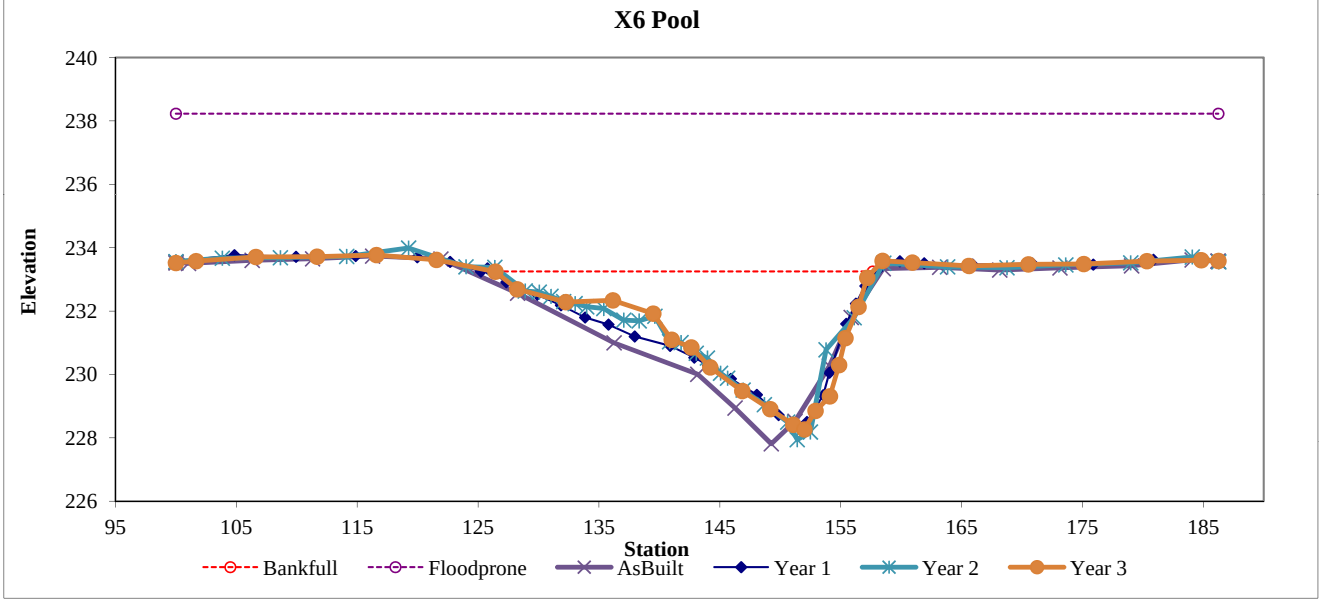
Permanent Cross Section X6

(Year 3 Monitoring Data - collected February 2012)

Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Pool		68.6	31.22	2.2	4.98	14.22	1		233.25	233.25

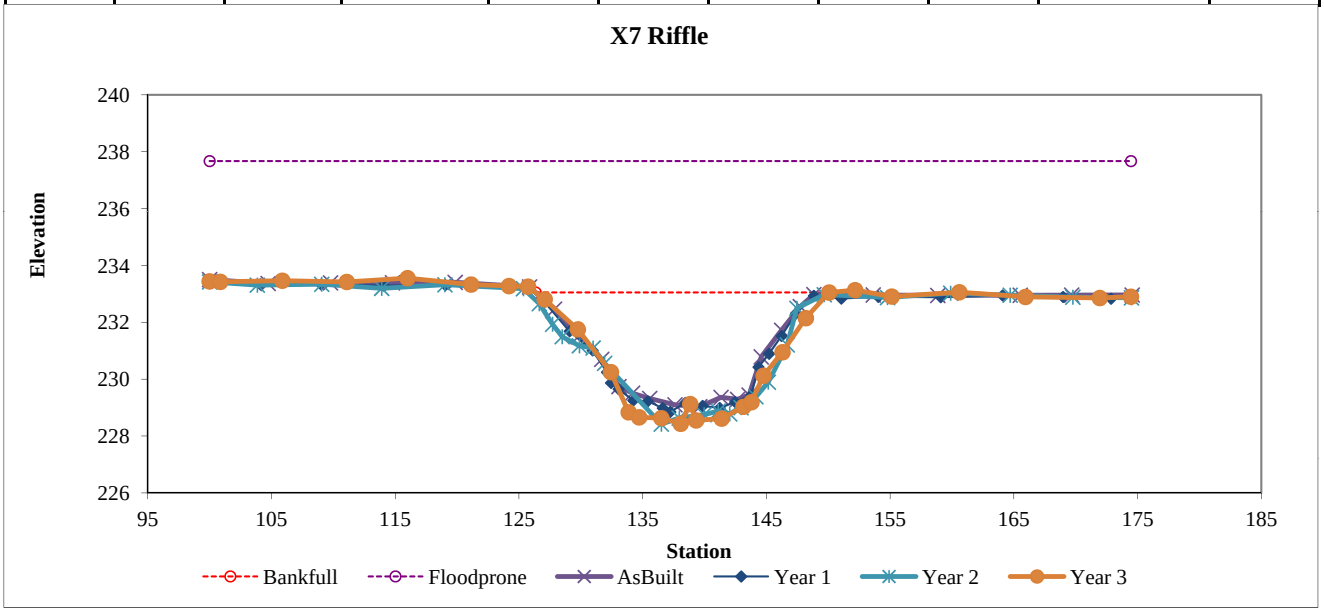


Permanent Cross Section X7
(Year 3 Monitoring Data - collected February 2012)

Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Riffle	E	66.6	23.71	2.81	4.62	8.44	1	3.1	233.05	233.05

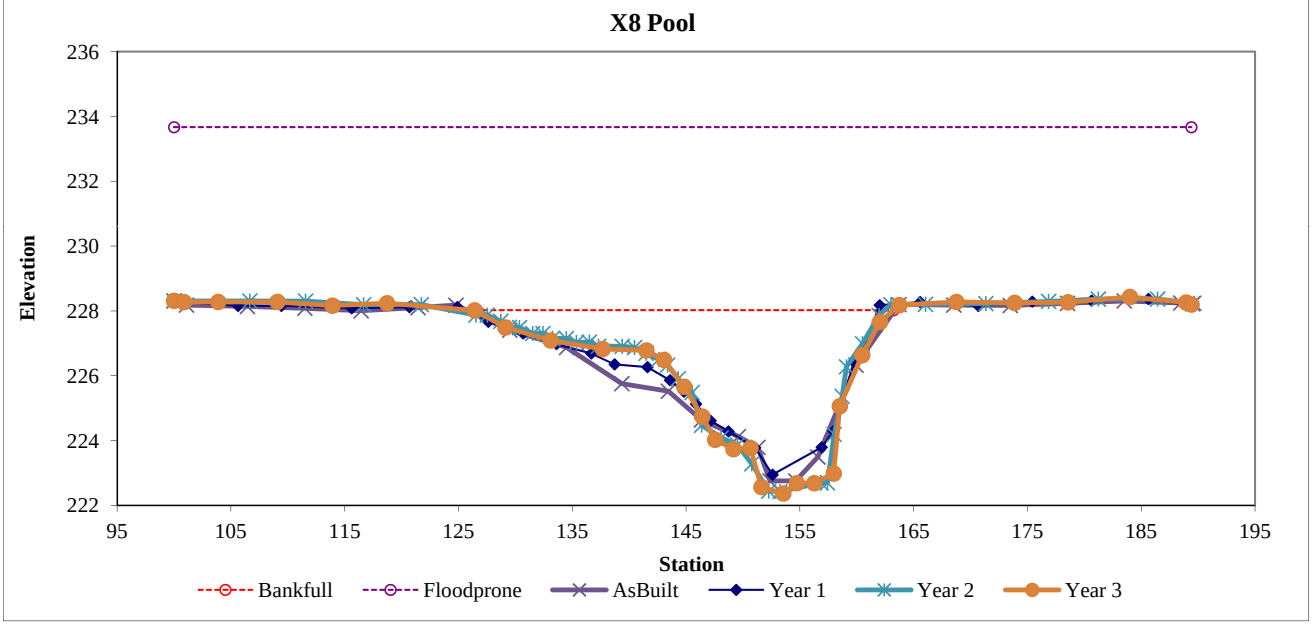


Permanent Cross Section X8
(Year 3 Monitoring Data - collected February 2012)

Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Pool		87.2	36.79	2.37	5.65	15.52	1		228.02	228.02

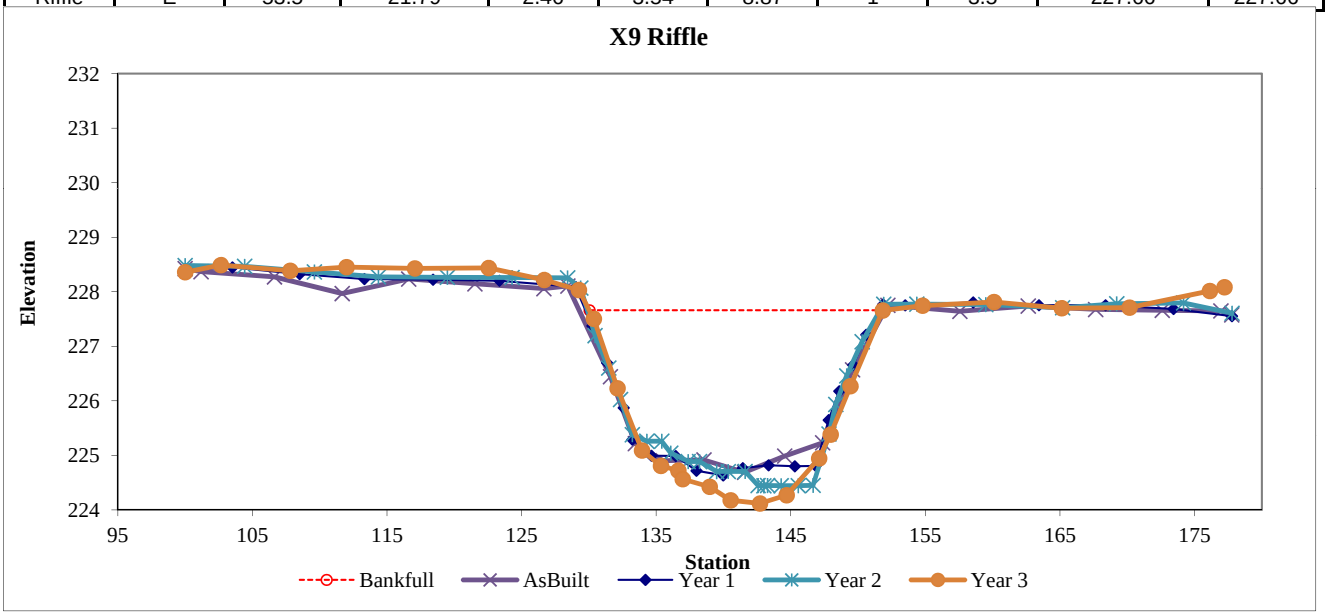


Permanent Cross Section X9
(Year 3 Monitoring Data - collected February 2012

Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Riffle	E	53.5	21.79	2.46	3.54	8.87	1	3.5	227.66	227.66

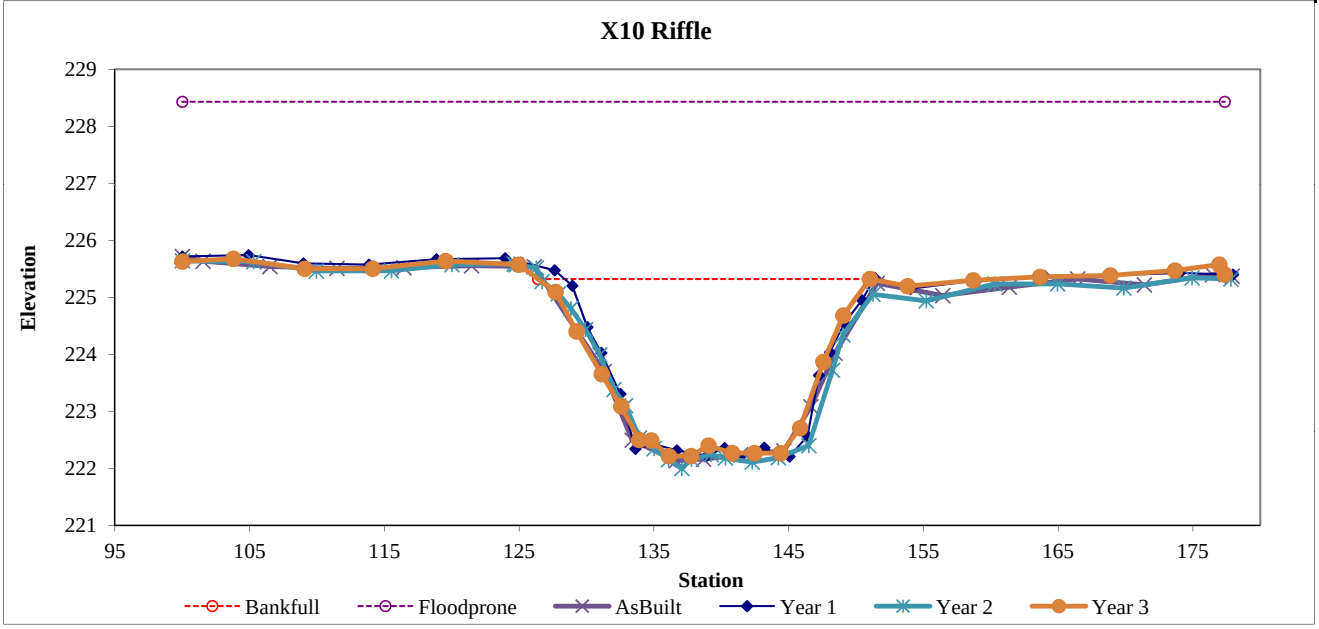


Permanent Cross Section X10
(Year 3 Monitoring Data - collected February 2012)

Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Riffle	C	51.1	24.63	2.08	3.11	11.86	1	3.1	225.32	225.32



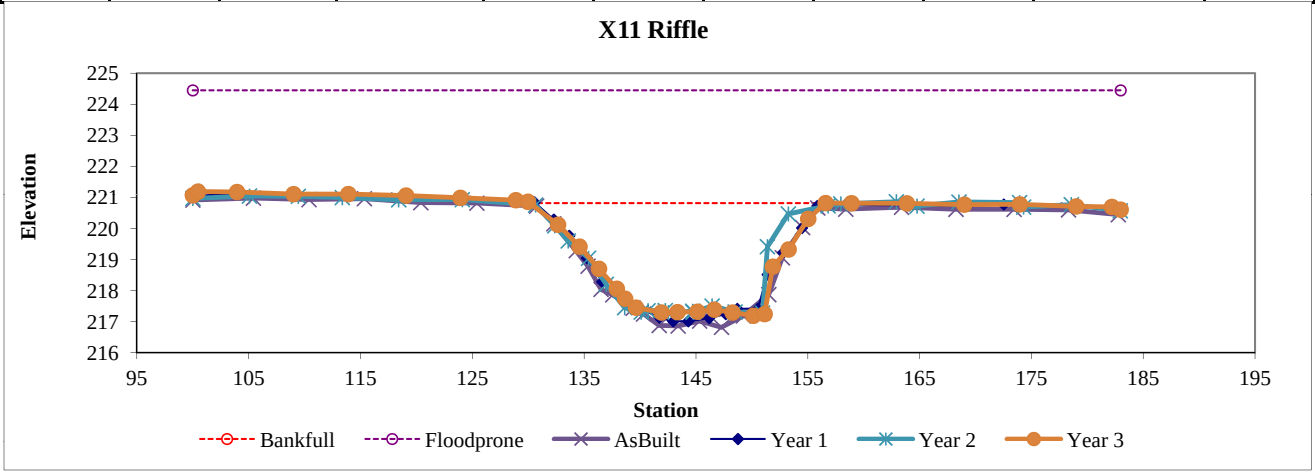
Permanent Cross Section X11

(Year 3 Monitoring Data - collected February 2012)

Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Riffle	C	62.2	26.47	2.35	3.63	11.26	1	3.1	220.82	220.82



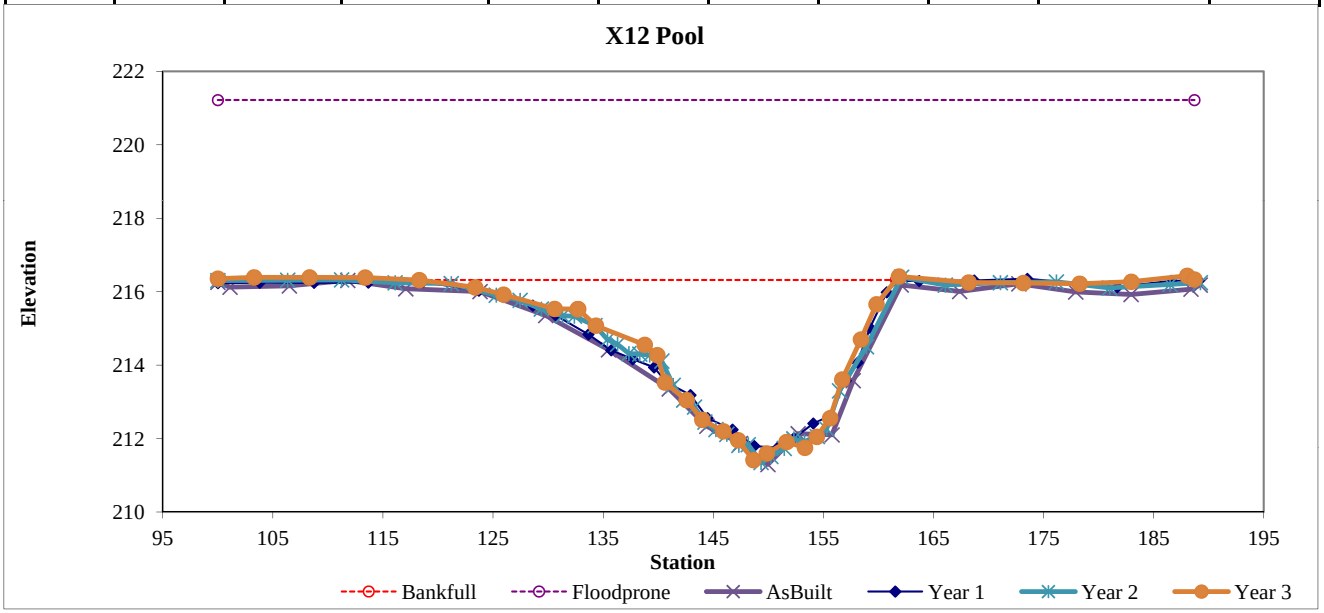
Permanent Cross Section X12

(Year 3 Monitoring Data - collected February 2012)

Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Pool		89.1	43.3	2.06	4.9	21.05	1		216.32	216.32



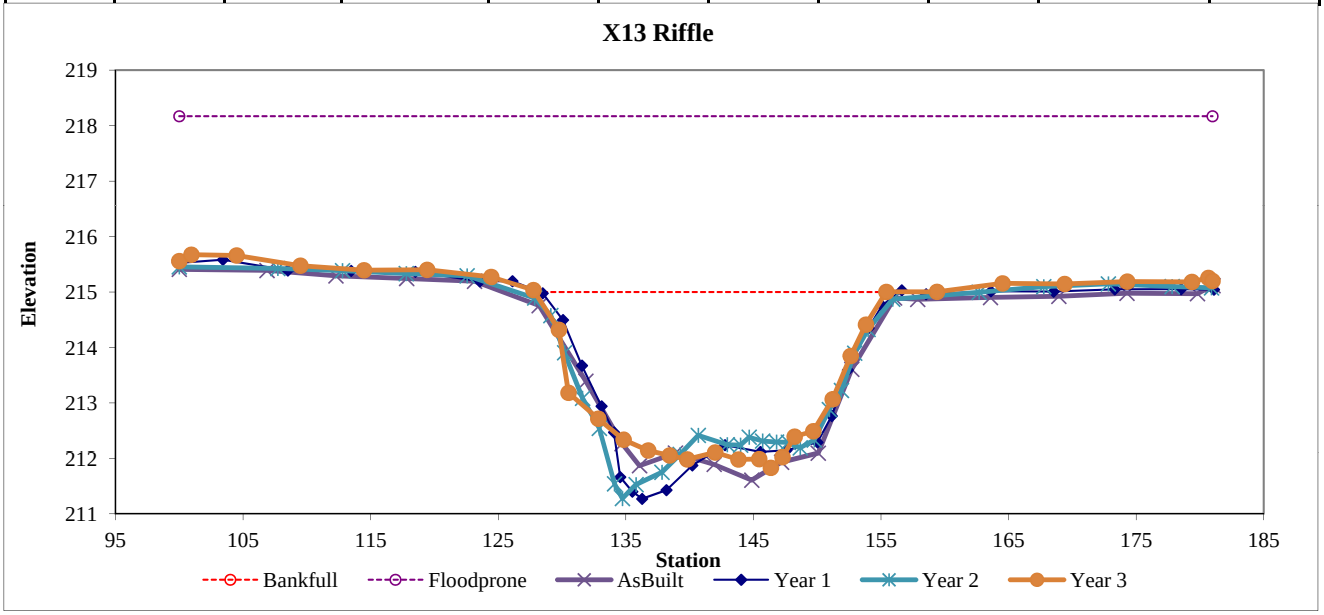
Permanent Cross Section X13

(Year 3 Monitoring Data - collected February 2012)

Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Riffle	C	61.5	27.56	2.23	3.17	12.35	1	2.9	215	215

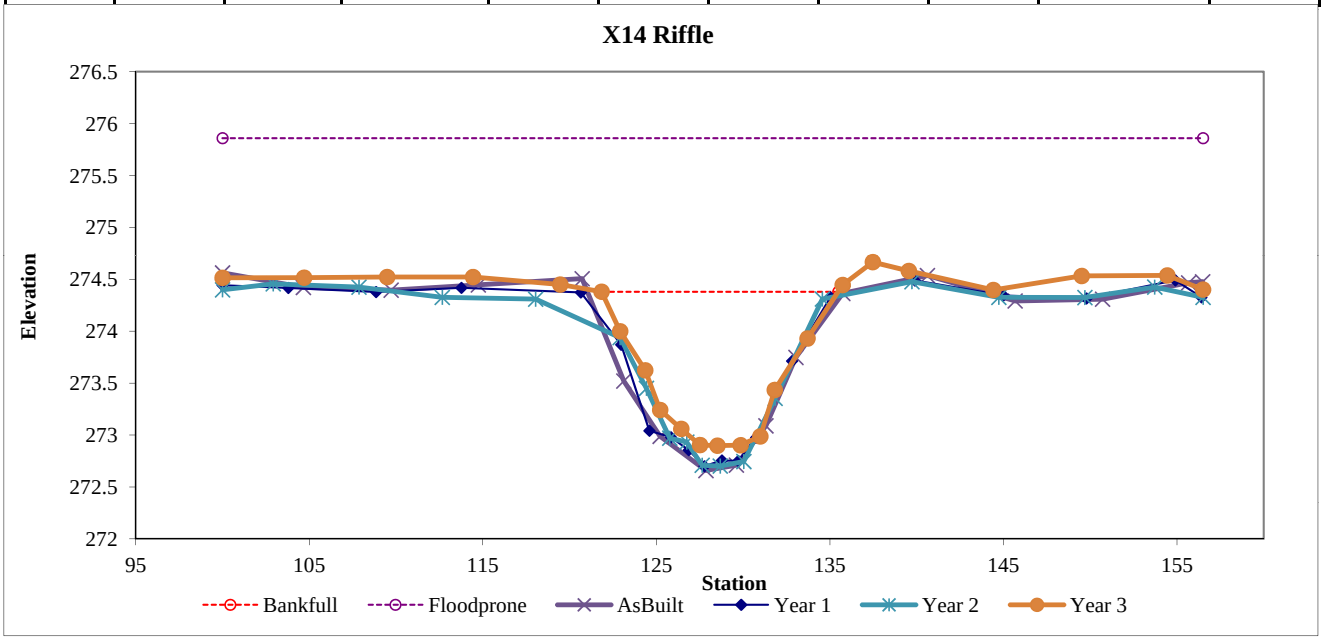


Permanent Cross Section X14
(Year 3 Monitoring Data - collected February 2012)

Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Riffle	C	12.6	13.63	0.93	1.48	14.72	1	4.1	274.38	274.38

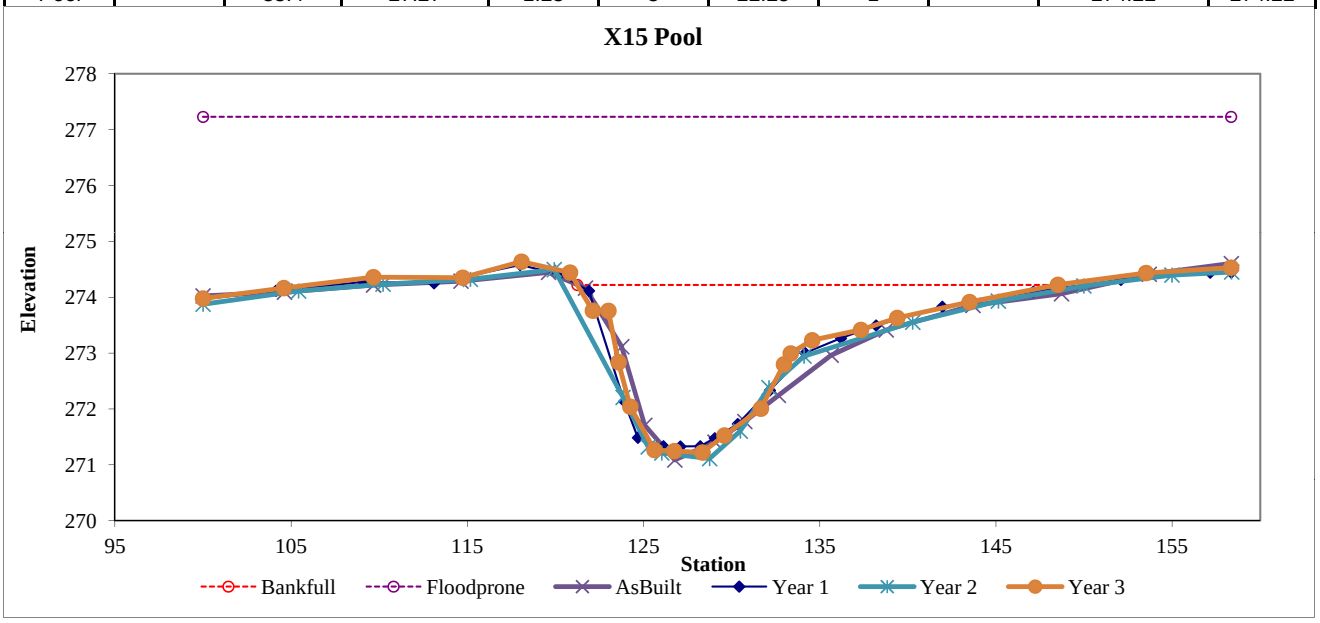


Permanent Cross Section X15
(Year 3 Monitoring Data - collected February 2012)

Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Pool		33.4	27.27	1.23	3	22.25	1		274.22	274.22



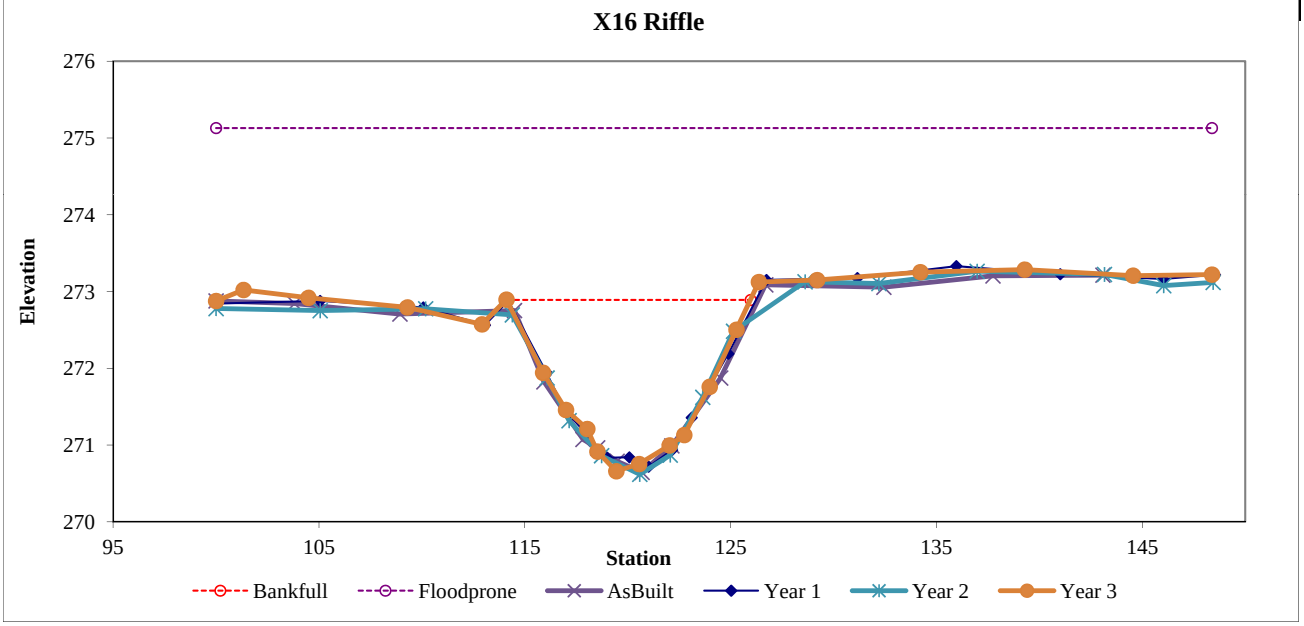
Permanent Cross Section X16

(Year 3 Monitoring Data - collected February 2012)

Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Riffle	E	16.3	11.86	1.37	2.24	8.65	1	4.1	272.89	272.89

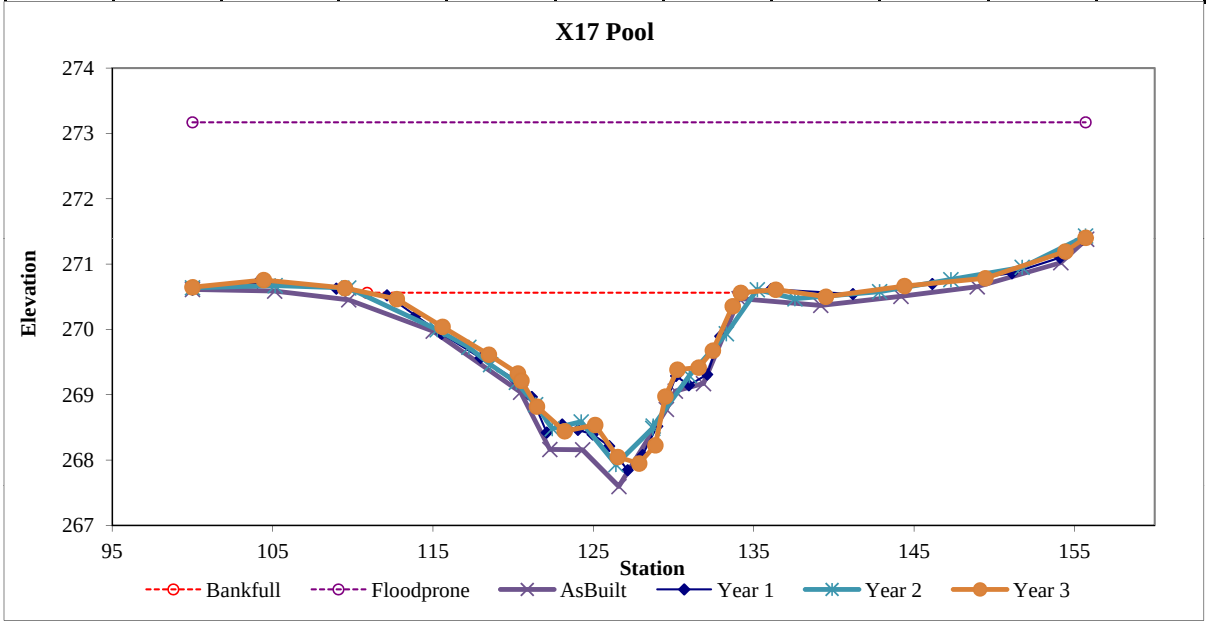


Permanent Cross Section X17
(Year 3 Monitoring Data - collected February 2012)

Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Pool		28.7	23.3	1.23	2.61	18.94	1		270.56	270.56

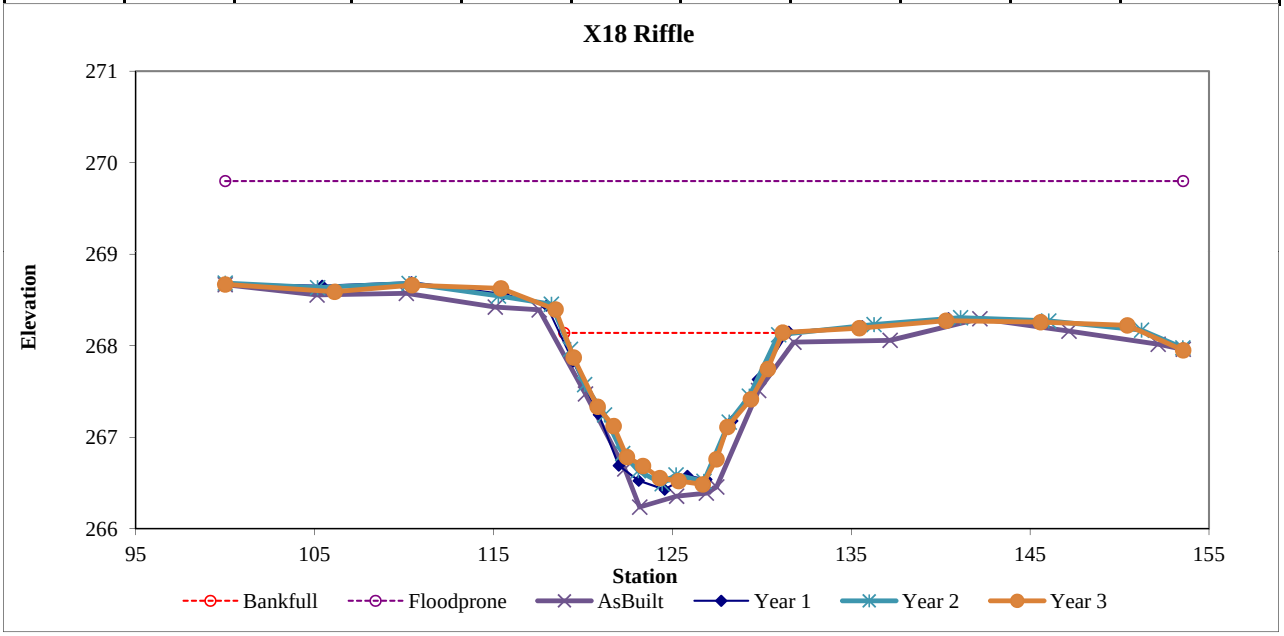


Permanent Cross Section X18
(Year 3 Monitoring Data - collected February 2012)

Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Riffle	C	12.9	12.22	1.05	1.66	11.6	1	4.4	268.14	268.14



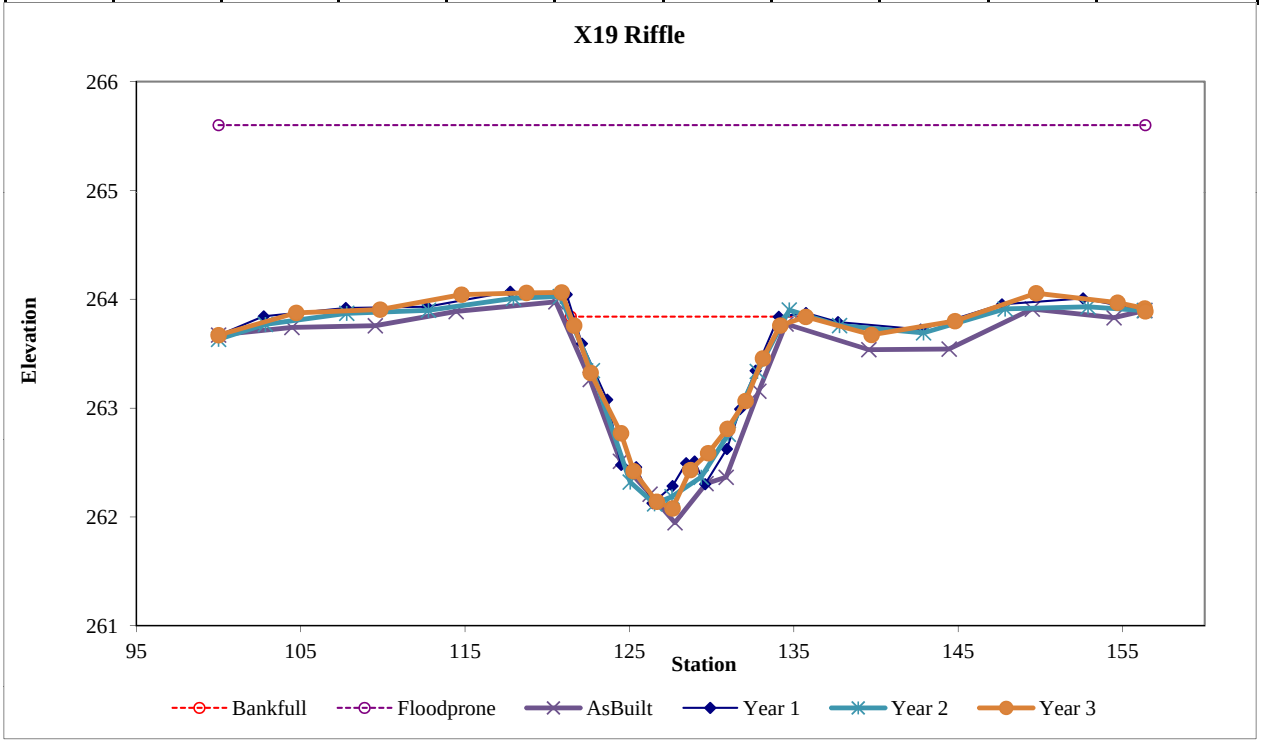
Permanent Cross Section X19

(Year 3 Monitoring Data - collected February 2012)

Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Riffle	C	13	14.29	0.91	1.76	15.74	1	3.9	264.03	264.03

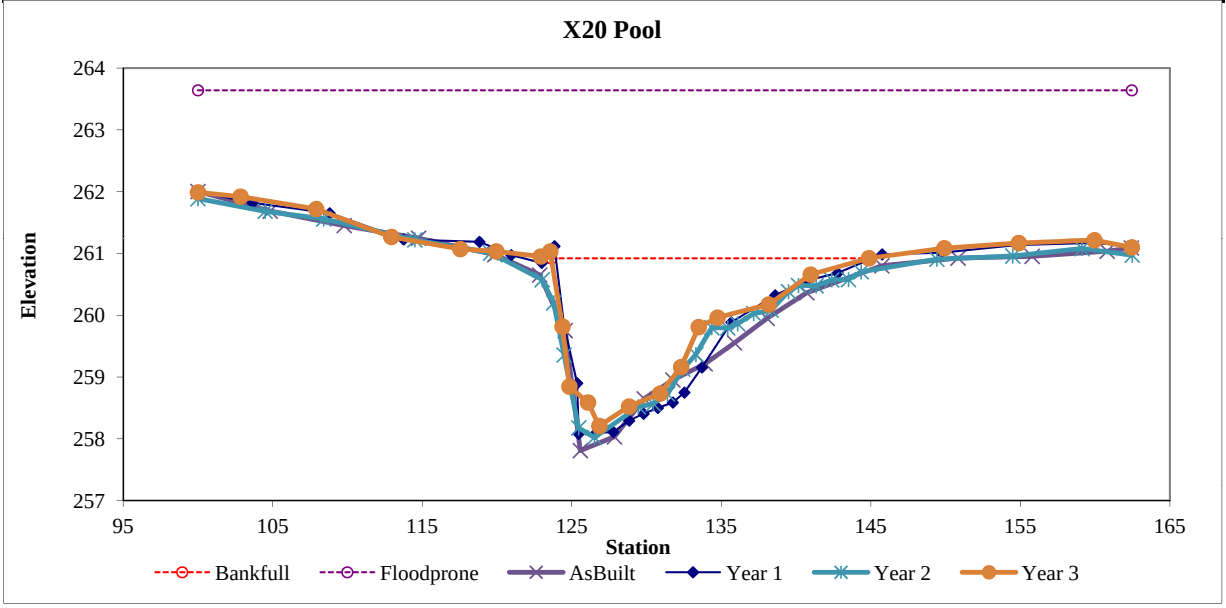


Permanent Cross Section X20
(Year 3 Monitoring Data - collected February 2012)

Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Pool		26.3	21.24	1.24	2.72	17.15	1		261.04	261.04



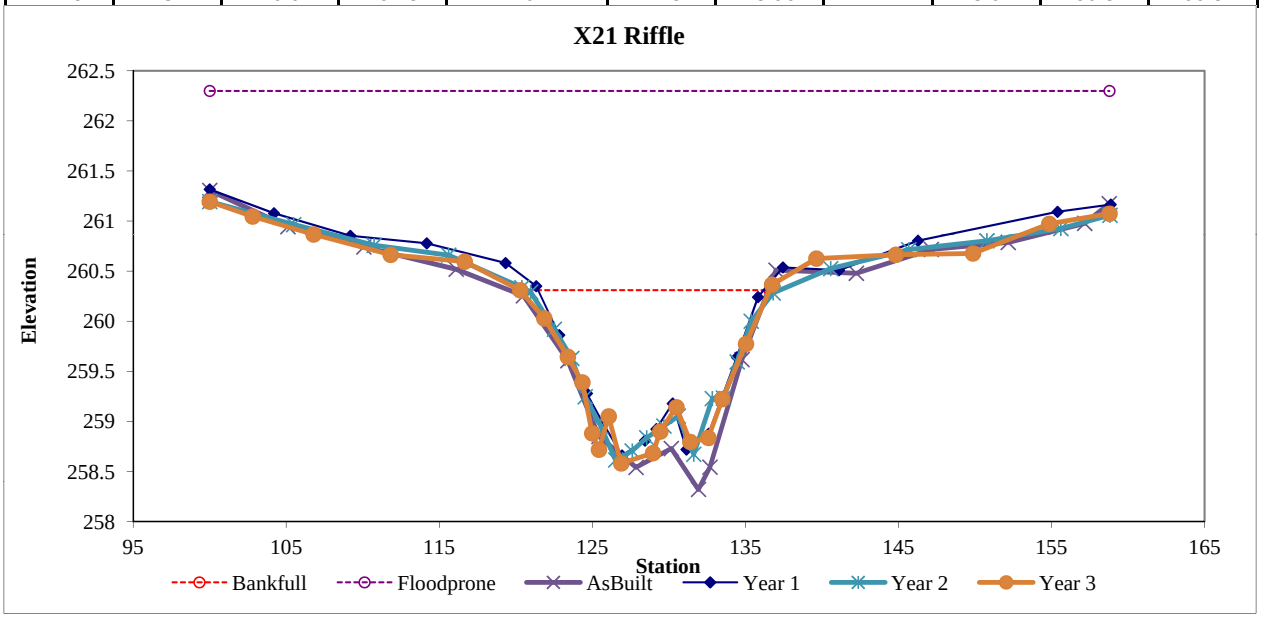
Permanent Cross Section X21

(Year 3 Monitoring Data - collected February 2012)

Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Riffle	C	16.6	16.28	1.02	1.73	15.96	1	3.6	260.31	260.31

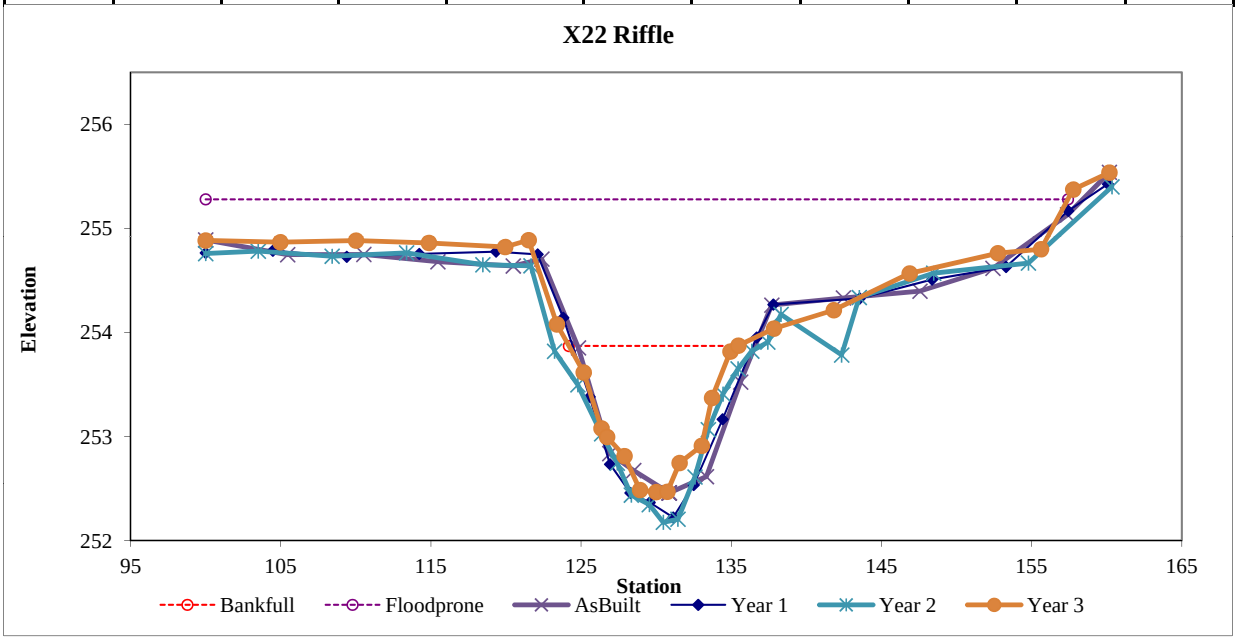


Permanent Cross Section X22
(Year 3 Monitoring Data - collected February2012)

Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Riffle	C	9.4	11.3	0.84	1.41	13.52	1	5.1	253.87	253.87

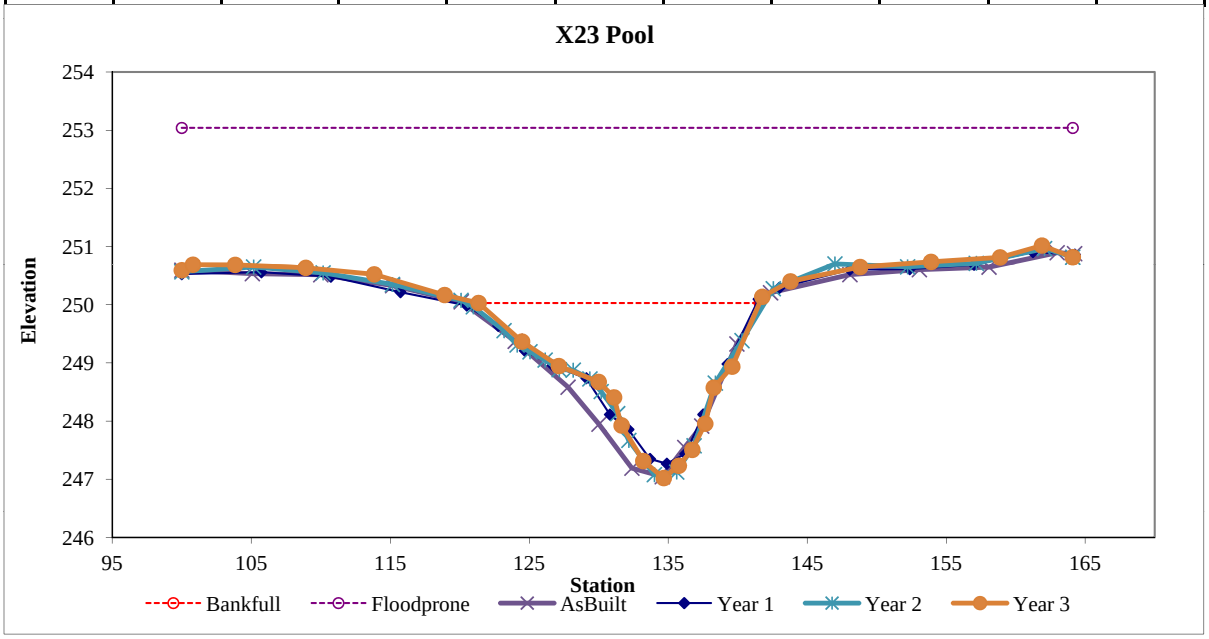


Permanent Cross Section X23
(Year 3 Monitoring Data - collected February 2012)

Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Pool		29.2	20.22	1.44	3.01	14	1		250.03	250.03

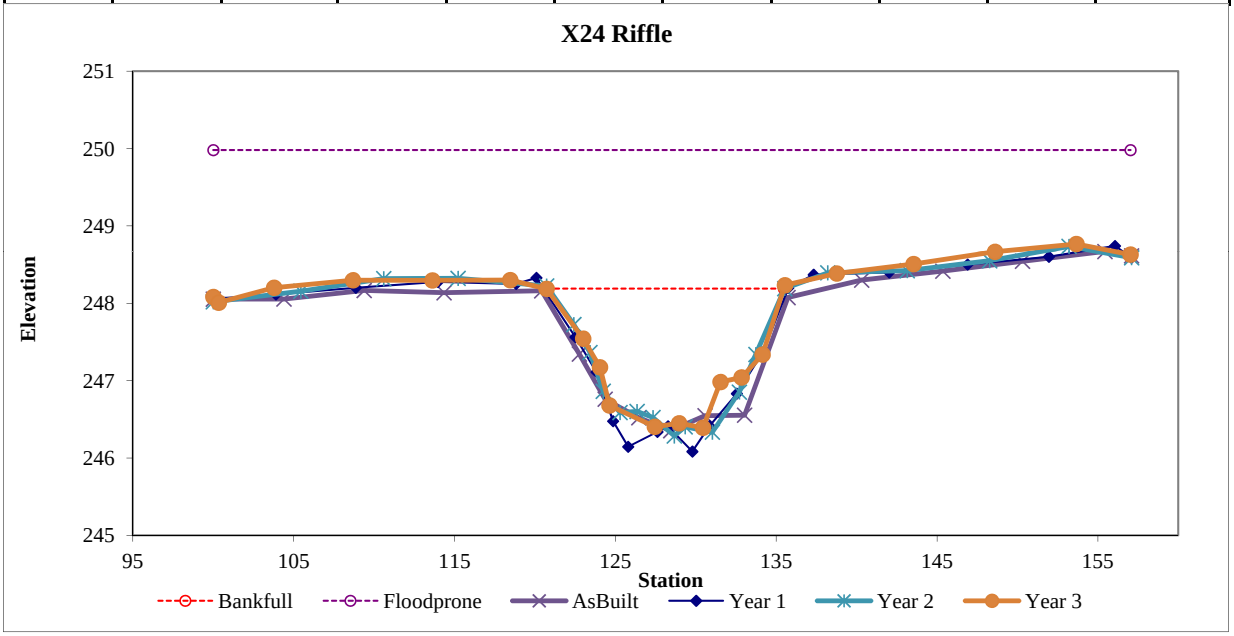


Permanent Cross Section X24
(Year 3 Monitoring Data - collected February 2012)

Looking at the Left Bank

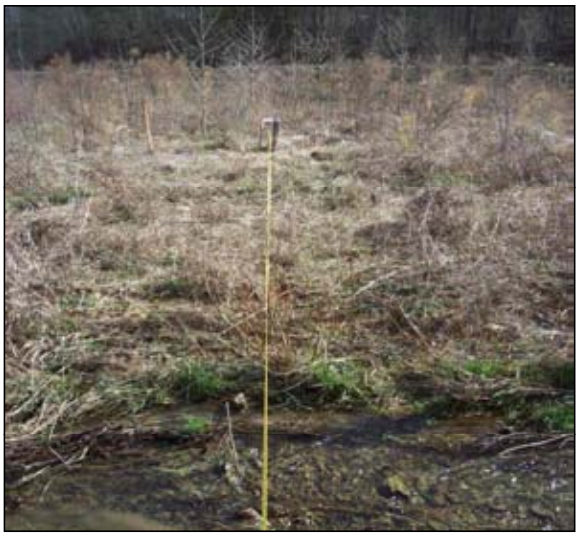
Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Riffle	C	17.3	14.75	1.17	1.79	12.58	1	3.9	248.19	248.19



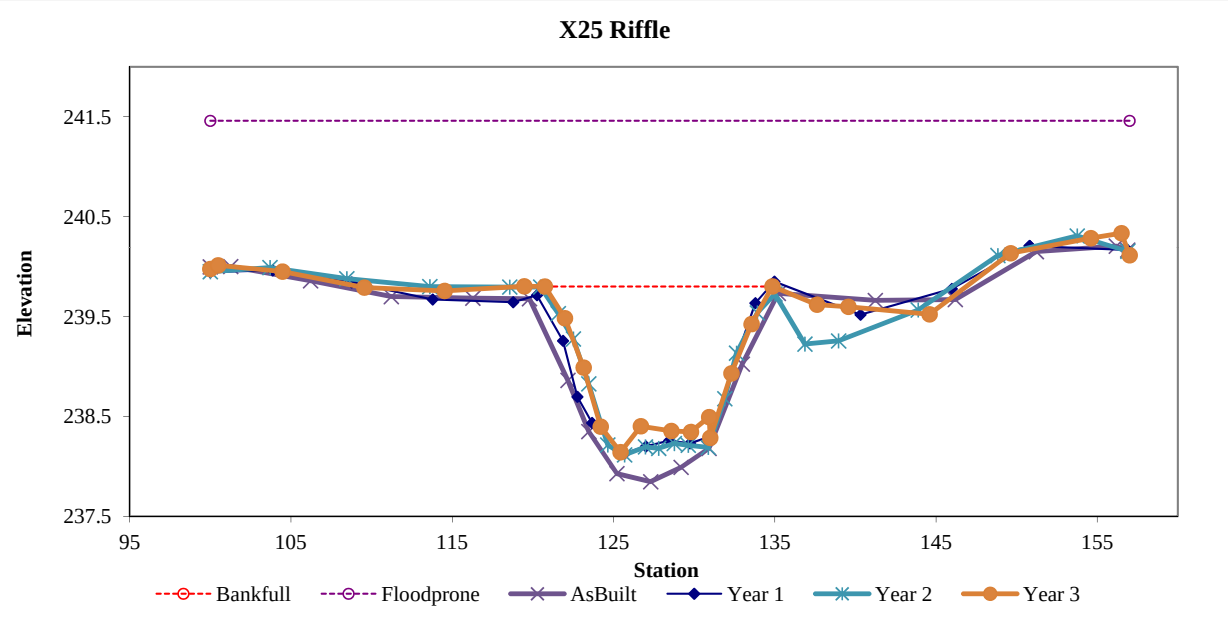
Permanent Cross Section X25
(Year 3 Monitoring Data - collected February 2012)

Looking at the Left Bank



Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Riffle	C	14.5	14.11	1.03	1.66	13.7	1	4	239.8	239.8

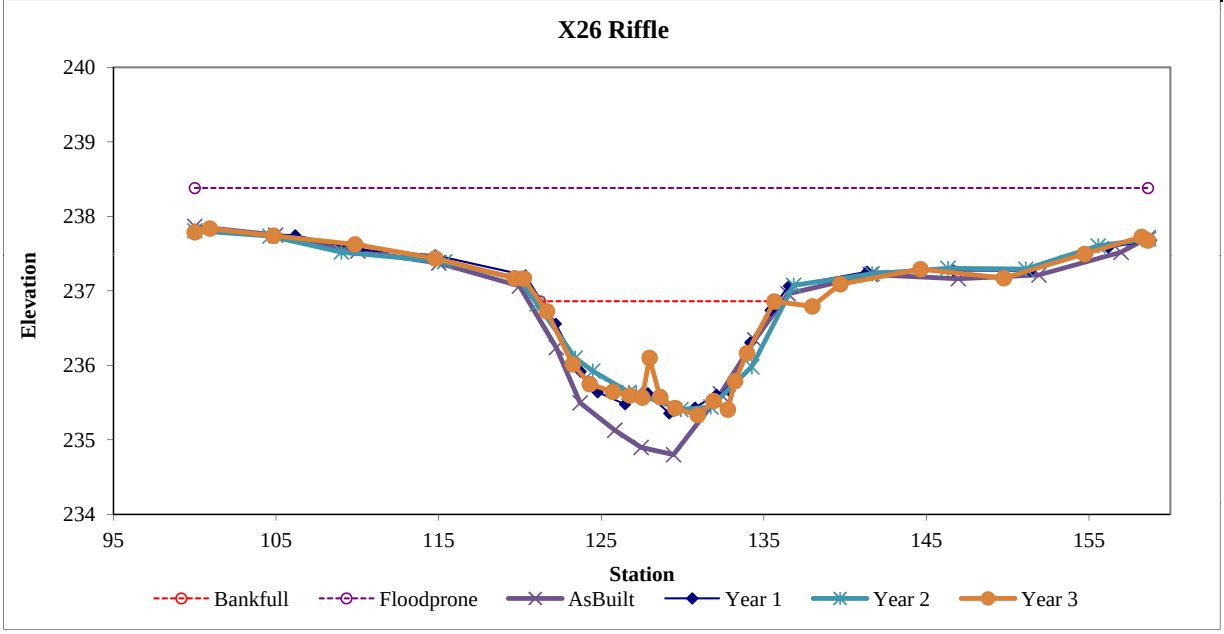


Permanent Cross Section X26
(Year 3 Monitoring Data - collected February 2012)

Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Riffle	C	14.6	14.41	1.01	1.53	14.26	1	4.1	236.86	236.86

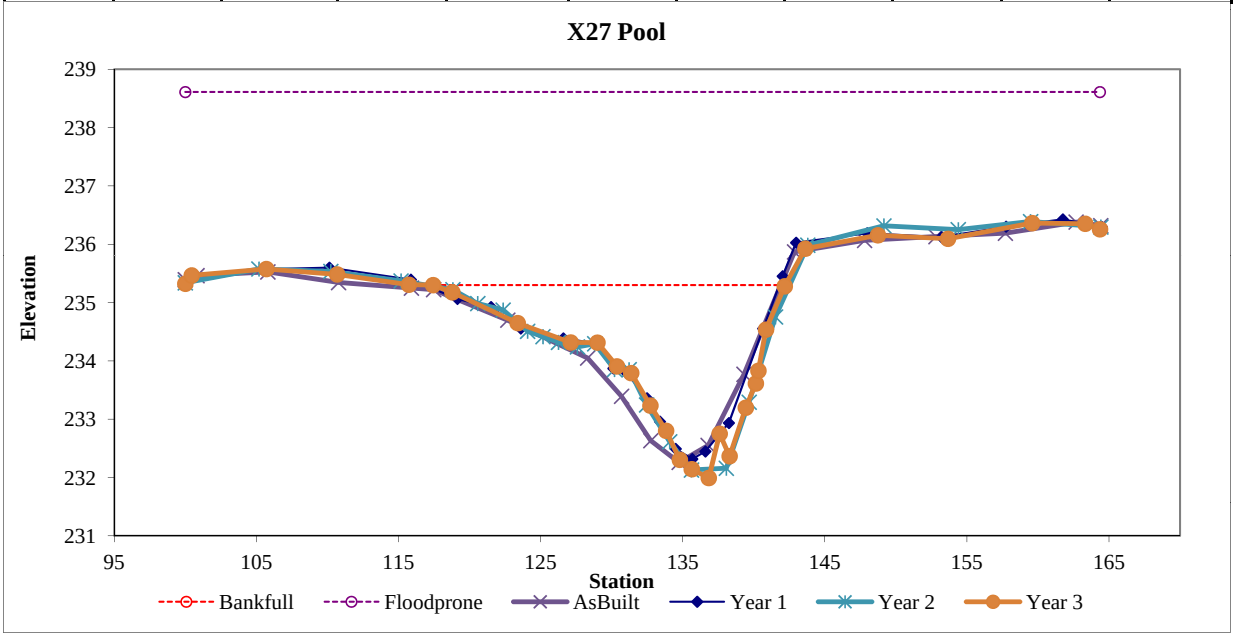


Permanent Cross Section X27
(Year 3 Monitoring Data - collected February 2012)

Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Pool		33.7	24.79	1.36	3.31	18.25	1		235.3	235.3

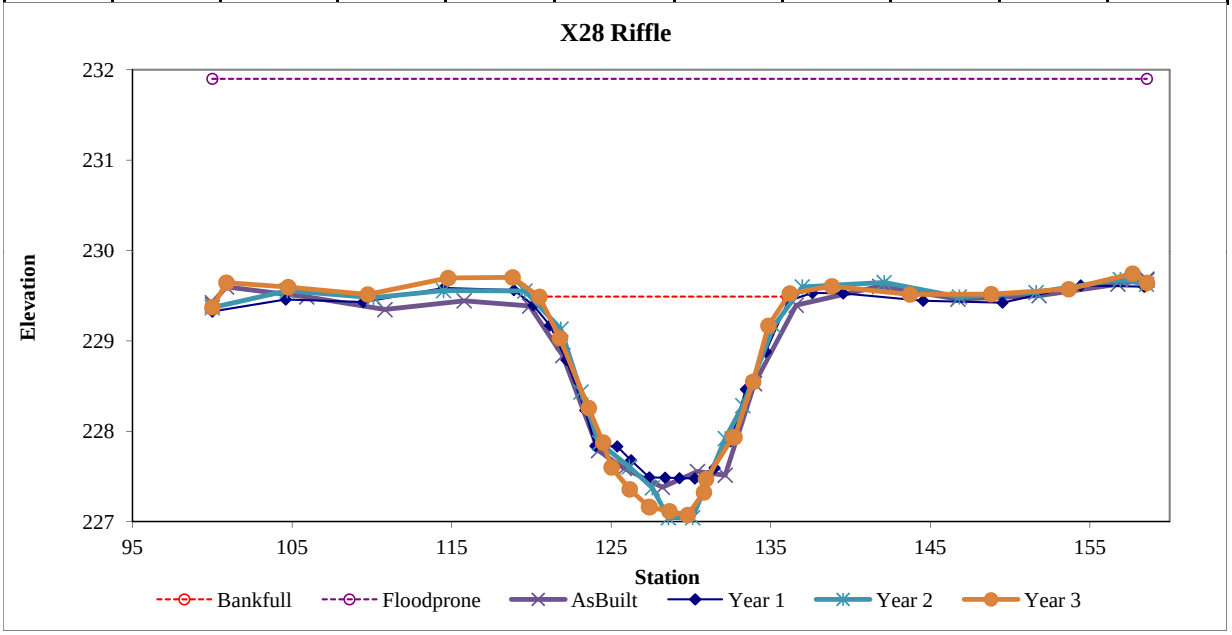


Permanent Cross Section X28
(Year 3 Monitoring Data - collected February 2012)

Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Riffle	C	22.8	15.55	1.46	2.41	10.62	1	3.8	229.49	229.49



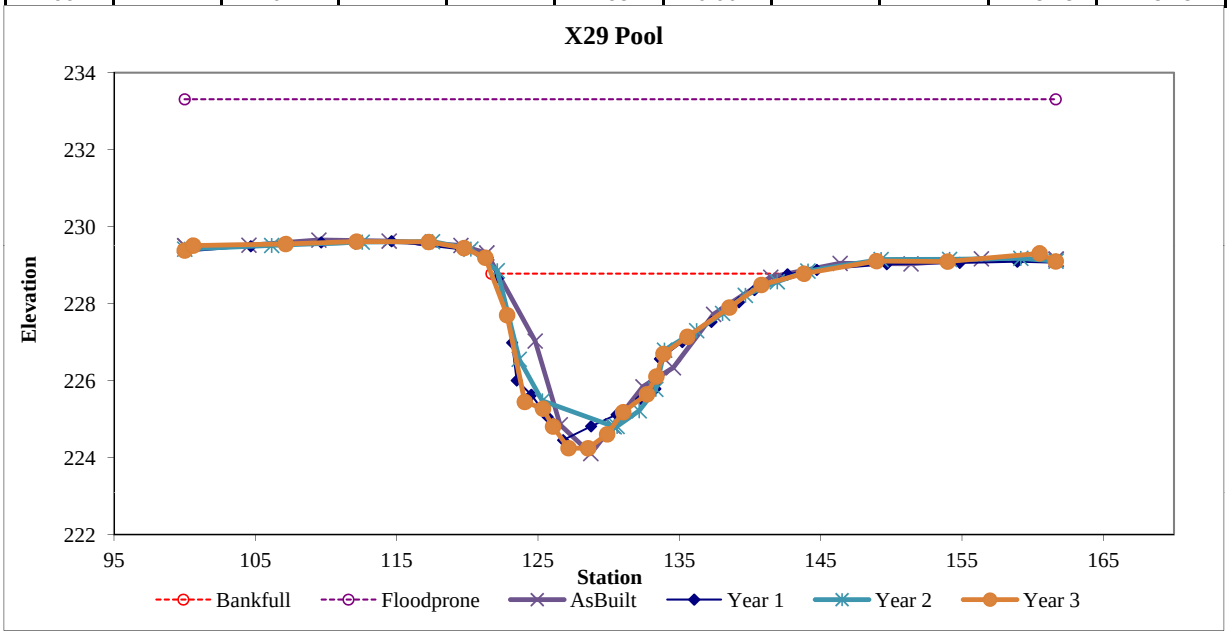
Permanent Cross Section X29

(Year 3 Monitoring Data - collected February 2012)

Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Pool		49.1	22.11	2.22	4.53	9.96	1		228.78	228.78

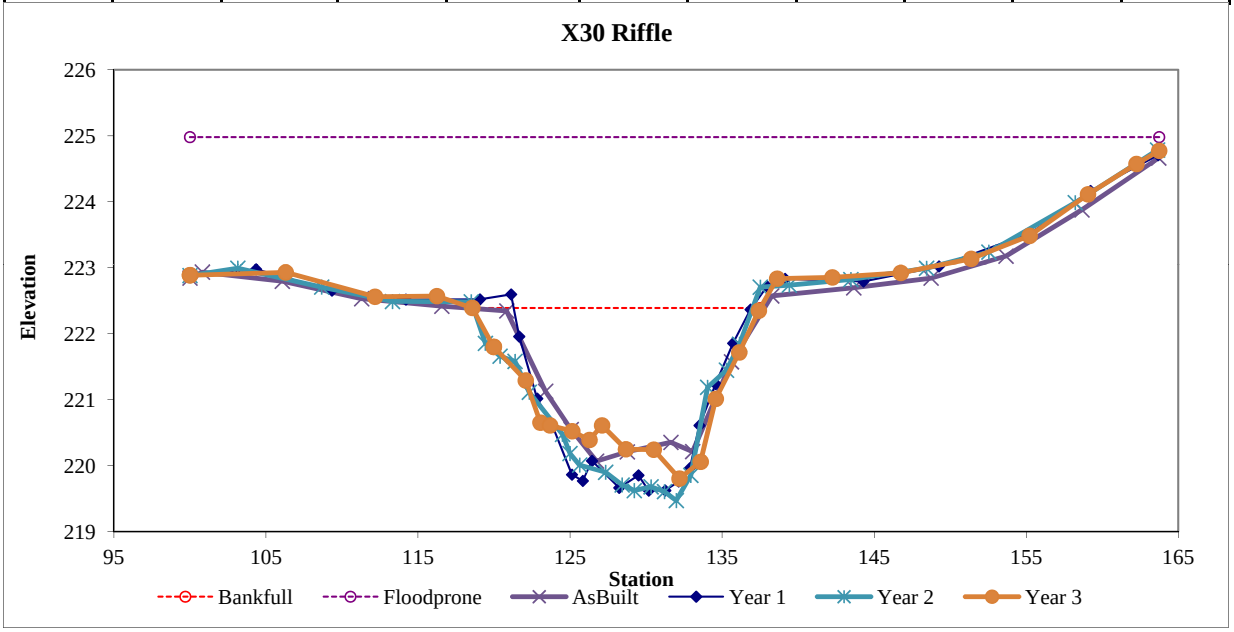


Permanent Cross Section X30
(Year 3 Monitoring Data - collected February 2012)

Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Riffle	C	29.4	18.95	1.55	2.59	12.2	1	3.4	222.39	222.39

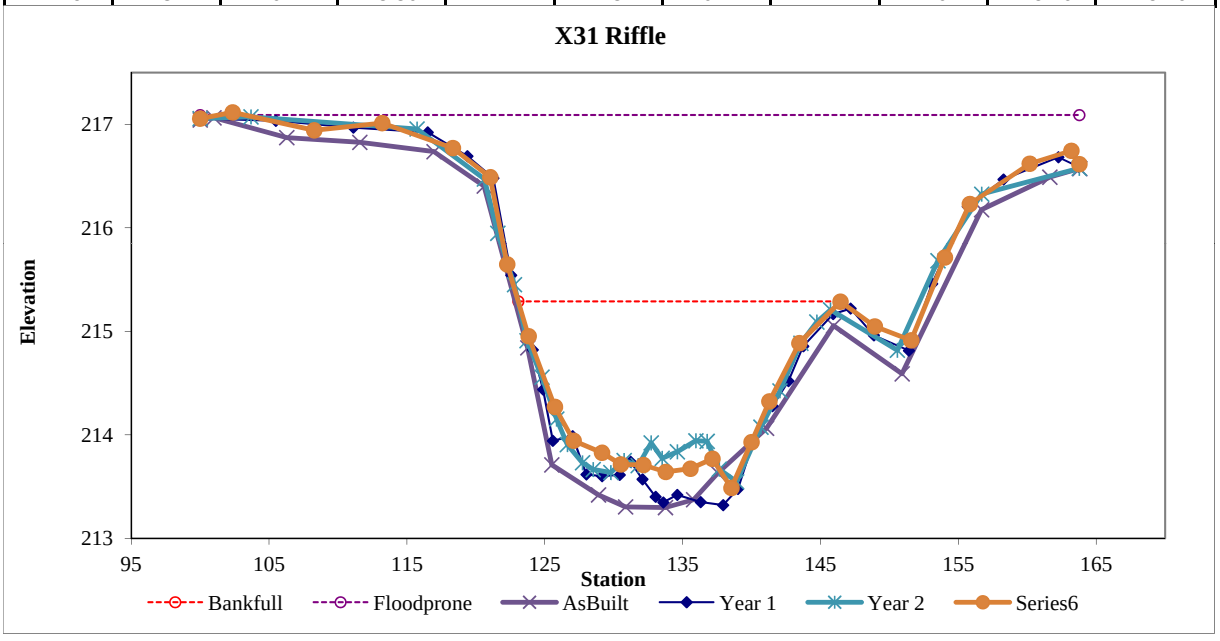


Permanent Cross Section X31
(Year 3 Monitoring Data - collected February 2012)

Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Riffle	C	26.7	23.36	1.14	1.8	20.42	1	2.6	215.29	215.29

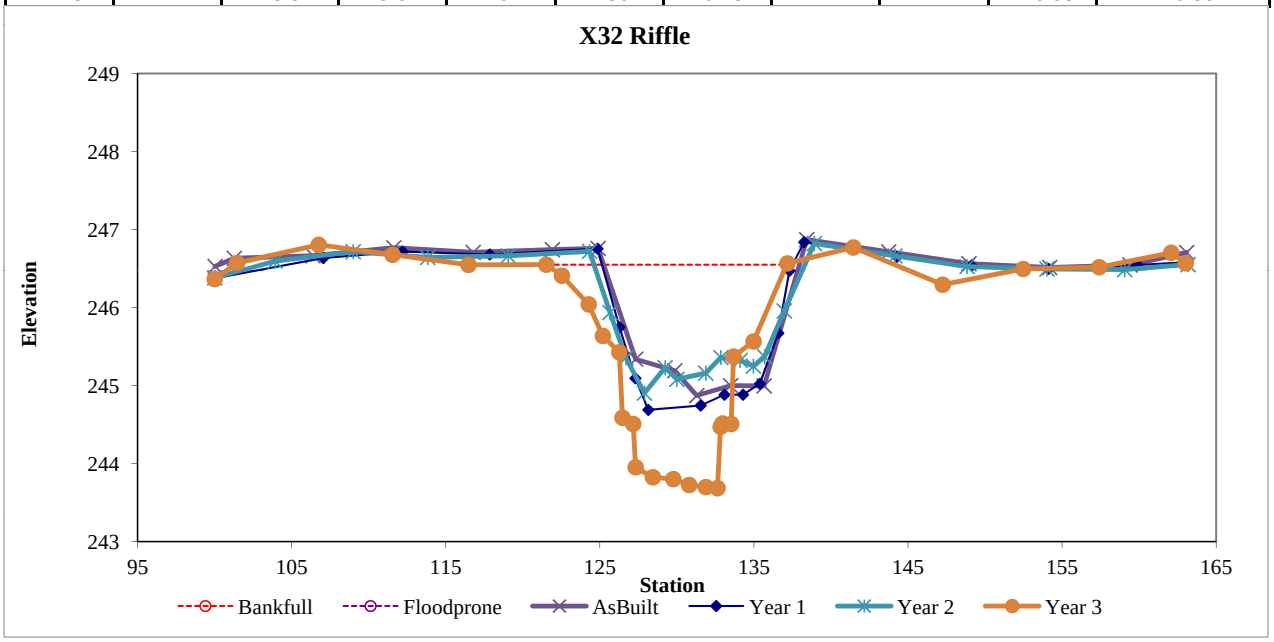


Permanent Cross Section X32
(Year 3 Monitoring Data - collected February 2012)

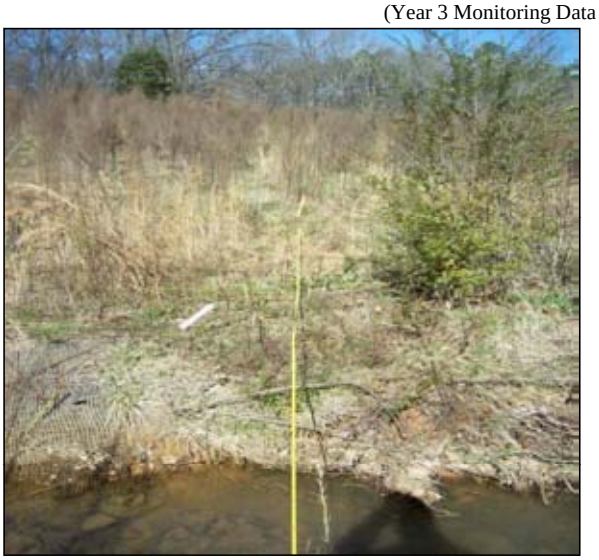
Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Riffle	E	23.8	15.61	1.52	2.86	10.25	1	4	246.55	246.55



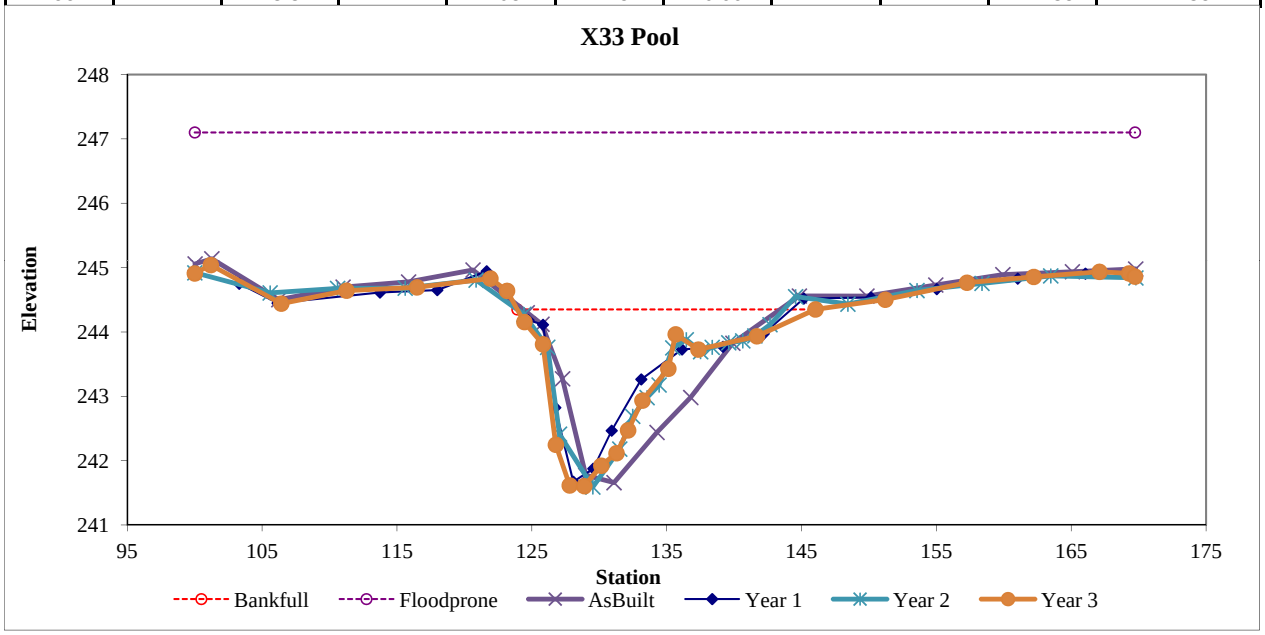
Permanent Cross Section X33
(Year 3 Monitoring Data - collected February 2012)

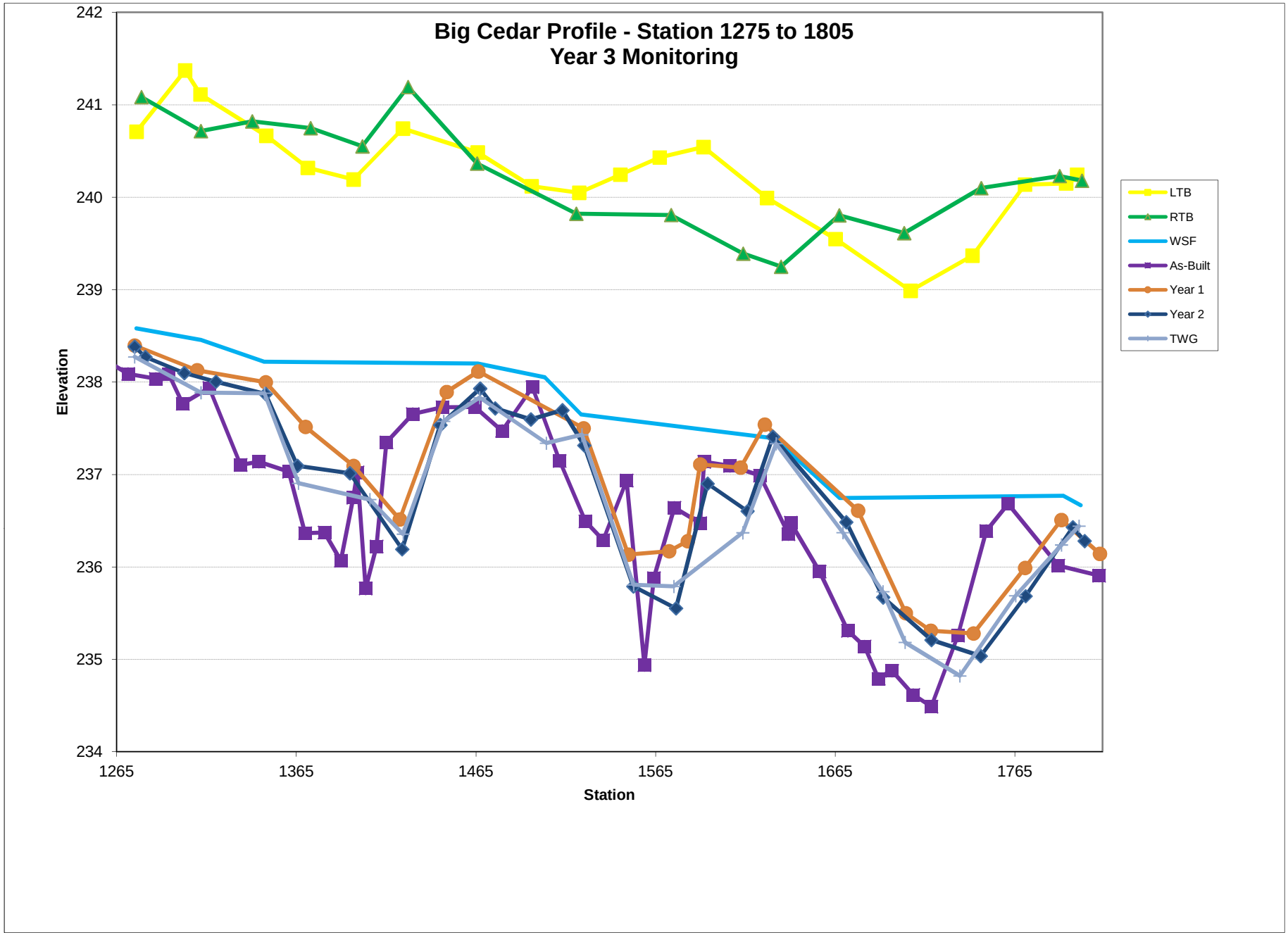


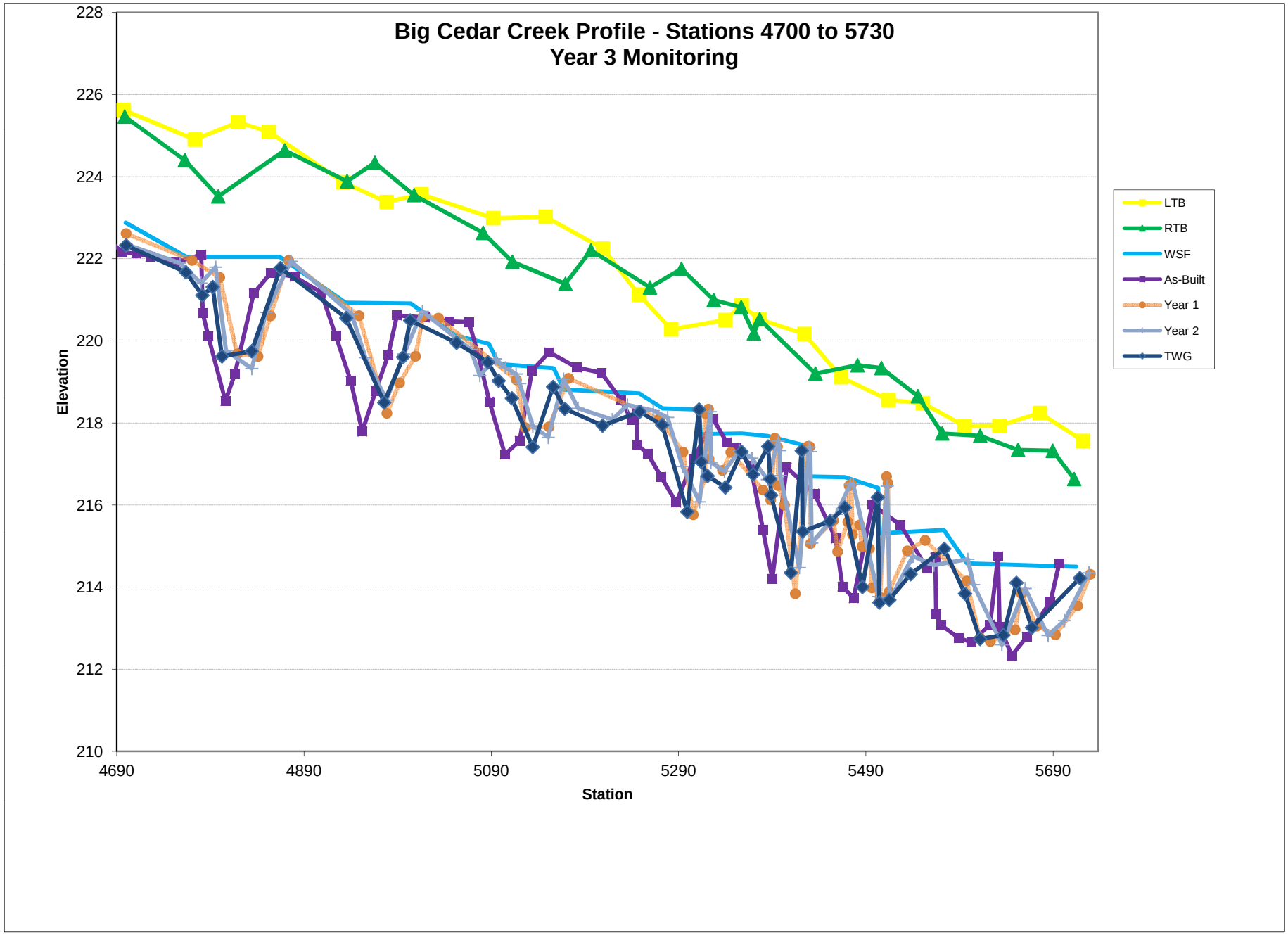
Looking at the Left Bank

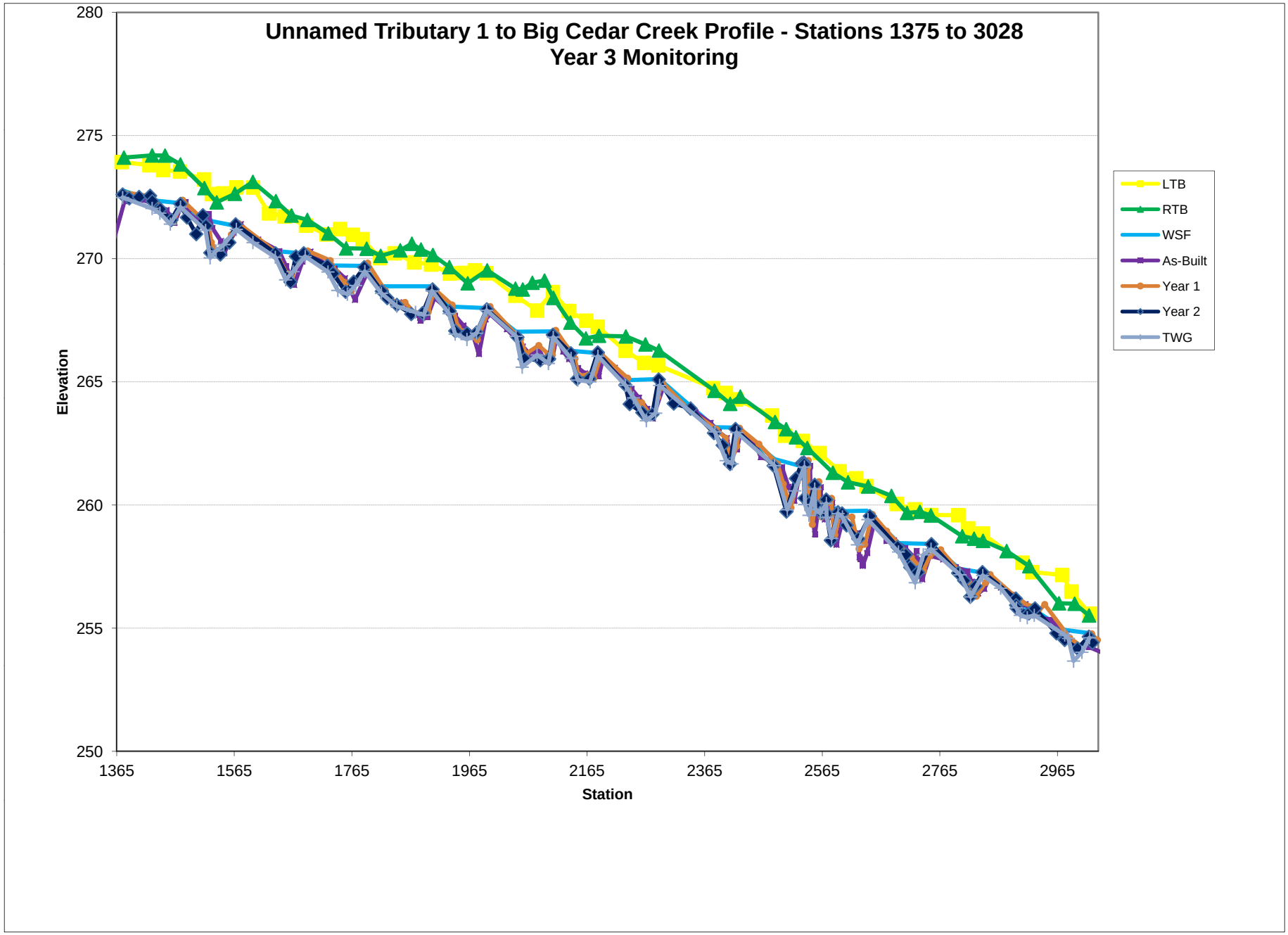
Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Pool		23.3	22.11	1.05	2.75	20.99	1		244.35	244.35




Big Cedar Profile - Station 1275 to 1805
Year 3 Monitoring
Elevation
242
241
240
239
238
237
236
235
234
1265
1365
1465
1565
1665
1765
Station
LTB
RTB
WSF
As-Built
Year 1
Year 2
TWG


Big Cedar Creek Profile - Stations 4700 to 5730
Year 3 Monitoring
Elevation
228
226
224
222
220
218
216
214
212
210
4690
4890
5090
5290
5490
5690
Station
LTB
RTB
WSF
As-Built
Year 1
Year 2
TWG


Unnamed Tributary 1 to Big Cedar Creek Profile - Stations 1375 to 3028
Year 3 Monitoring
Elevation
280
275
270
265
260
255
250
1365
1565
1765
1965
2165
2365
2565
2765
2965
Station
LTB
RTB
WSF
As-Built
Year 1
Year 2
TWG

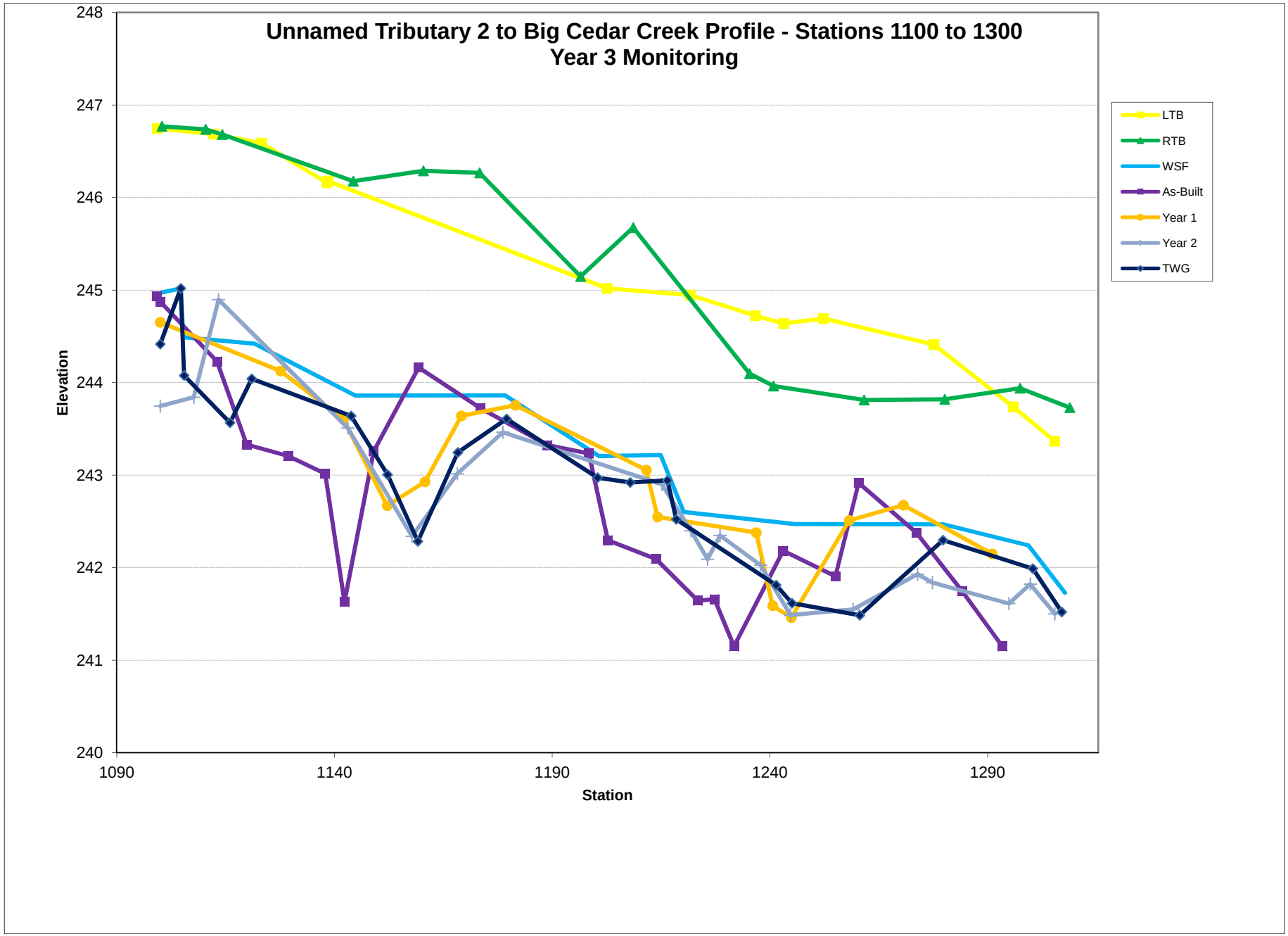

Unnamed Tributary 2 to Big Cedar Creek Profile - Stations 1100 to 1300
Year 3 Monitoring
Elevation
Station
248
247
246
245
244
243
242
241
240
1090
1140
1190
1240
1290
LTB
RTB
WSF
As-Built
Year 1
Year 2
TWG

Table 7. Baseline Stream Summary

Big Cedar Creek Restoration Site Contract No. D06054-D

#REF!

Parameter	USGS Gauge	Regional Curve Interval			Pre-Existing Condition						Reference Reach(es) Data Morgan Creek					
		LL	UL	Eq.	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n
Dimension and Substrate - Riffle																
BF Width (ft)	-----	10.0	35.0	18.7	-----	16.3	-----	-----	-----	1	-----	33.2	-----	-----	-----	2
Floodprone Width (ft)	-----	-----	-----	-----	-----	>126.6	-----	-----	-----	1	-----	77.5	-----	-----	-----	2
BF Mean Depth (ft)	-----	1.3	3.1	2.1	-----	2.3	-----	-----	-----	1	-----	2.3	-----	-----	-----	2
BF Max Depth (ft)	-----	-----	-----	-----	-----	2.8	-----	-----	-----	1	-----	2.8	-----	-----	-----	2
BF Cross-sectional Area (ft²)	-----	18.0	68.0	43.7	-----	36.7	-----	-----	-----	1	-----	75.1	-----	-----	-----	2
Width/Depth Ratio	-----	-----	-----	-----	-----	7.1	-----	-----	-----	1	-----	14.1	-----	-----	-----	2
Entrenchment Ratio	-----	-----	-----	-----	-----	>7.8	-----	-----	-----	1	-----	2.3	-----	-----	-----	2
Bank Height Ratio	-----	-----	-----	-----	-----	1.8	-----	-----	-----	1	-----	1.0	-----	-----	-----	2
d50 (mm)	-----	-----	-----	-----	-----	14.0	-----	-----	-----	-----	-----	3.0	-----	-----	-----	1
Pattern																
Channel Beltwidth (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Radius of Curvature (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Rc:Bankfull width (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Meander Wavelength (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Meander Width Ratio	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Profile																
Riffle Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Riffle Slope (ft/ft)	-----	-----	-----	-----	0.01	-----	-----	0.04	-----	-----	0.01	-----	-----	0.02	-----	2
Pool Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Pool Spacing (ft)	-----	-----	-----	-----	46.0	-----	-----	98.0	-----	-----	146.0	-----	-----	-----	-----	2
Pool Max Depth (ft)	-----	-----	-----	-----	-----	3.8	-----	-----	-----	-----	4.1	-----	-----	-----	-----	1
Pool Volume (ft³)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Substrate and Transport Parameters																
Ri% / Ru% / P% / G% / S%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
SC% / Sa% / G% / B% / Be%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
d16 / d35 / d50 / d84 / d95	-----	-----	-----	-----			<0.063 / 6 / 14 / 100 / 300						N/A / 1.2 / 3 / 77 / 800			
Reach Shear Stress (competency) lb/ft²	-----	-----	-----	-----	-----	0.88	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Max part size (mm) mobilized at bankfull (Rosgen Curve	-----	-----	-----	-----	-----	250.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Stream Power (transport capacity) W/m²	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Additional Reach Parameters																
Drainage Area (SM)	-----	-----	-----	-----	2.3	-----	-----	2.9	-----	-----	-----	-----	-----	8.4	-----	-----
Impervious cover estimate (%)	-----	-----	-----	-----		-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Rosgen Classificatior	-----	-----	-----	-----	-----	E4/1	-----	-----	-----	-----	-----	C4	-----	-----	-----	-----
BF Velocity (fps)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	6.6	-----	-----	-----	-----
BF Discharge (cfs)	-----	58.0	450.0	189.7	-----	-----	-----	-----	-----	-----	-----	524.0	-----	-----	-----	-----
Valley Length	-----	-----	-----	-----		350.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel length (ft)	-----	-----	-----	-----	-----	350.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Sinuosity	-----	-----	-----	-----	-----	1.00	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Water Surface Slope (Channel) (ft/ft)	-----	-----	-----	-----		0.0080	-----	-----	-----	-----	-----	0.0070	-----	-----	-----	-----
BF slope (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Bankfull Floodplain Area (acres)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BEHI VL% / L% / M% / H% / VH% / E%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel Stability or Habitat Metric	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Biological or Other	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Table 7. Baseline Stream Summary
Big Cedar Creek Restoration Site Contract No. D06054-D
BCC Reach 1 (603 LF)

Parameter	Design						As-built						Year 1						Year 2						Year 3					
Dimension and Substrate - Riffle	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n
BF Width (ft)	-----	20.0	-----	-----	-----	1	-----	19.6	-----	-----	-----	1	-----	19.5	-----	-----	-----	1	-----	21.1	-----	-----	-----	1	-----	19.5	-----	-----	-----	1
Floodprone Width (ft)	-----	87.0	-----	-----	-----	1	-----	65.3	-----	-----	-----	1	-----	65.2	-----	-----	-----	1	-----	65.2	-----	-----	-----	1	-----	65.3	-----	-----	-----	1
BF Mean Depth (ft)	-----	2.0	-----	-----	-----	1	-----	1.9	-----	-----	-----	1	-----	1.8	-----	-----	-----	1	-----	1.8	-----	-----	-----	1	-----	1.7	-----	-----	-----	1
BF Max Depth (ft)	-----	2.8	-----	-----	-----	1	-----	2.7	-----	-----	-----	1	-----	2.6	-----	-----	-----	1	-----	2.8	-----	-----	-----	1	-----	2.8	-----	-----	-----	1
BF Cross-sectional Area (ft²)	-----	39.0	-----	-----	-----	1	-----	37.0	-----	-----	-----	1	-----	35.6	-----	-----	-----	1	-----	36.9	-----	-----	-----	1	-----	33.9	-----	-----	-----	1
Width/Depth Ratio	-----	10.0	-----	-----	-----	1	-----	10.4	-----	-----	-----	1	-----	10.7	-----	-----	-----	1	-----	12.1	-----	-----	-----	1	-----	11.3	-----	-----	-----	1
Entrenchment Ratio	-----	4.4	-----	-----	-----	1	-----	3.3	-----	-----	-----	1	-----	3.3	-----	-----	-----	1	-----	3.1	-----	-----	-----	1	-----	3.3	-----	-----	-----	1
Bank Height Ratio	-----	1.0	-----	-----	-----	1	-----	1.0	-----	-----	-----	1	-----	1.0	-----	-----	-----	1	-----	1.0	-----	-----	-----	1	-----	1.0	-----	-----	-----	1
d50 (mm)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	26.0	-----	-----	-----	1.0	-----	-----	-----	-----	-----	-----	-----	49.2	-----	-----	-----	-----
Pattern																														
Channel Beltwidth (ft)	103.0	-----	-----	132.0	-----	3	106.6	116.1	109.8	132.0	13.8	3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Radius of Curvature (ft)	50.0	-----	-----	70.0	-----	3	48.0	59.7	61.0	70.0	11.1	3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Rc:Bankfull width (ft/ft)	2.5	-----	-----	3.5	-----	3	2.5	3.0	-----	3.6	-----	3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Meander Wavelength (ft)	281.0	-----	-----	285.0	-----	2	251.7	272.8	257.2	309.4	31.8	3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Meander Width Ratio	5.2	-----	-----	6.6	-----	3	5.4	-----	-----	6.7	-----	3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Profile																														
Riffle Length (ft)	-----	-----	-----	-----	-----	-----	52.0	69.0	73.0	83.0	12.9	3	58	66	66	72	-----	2	58	66	66	73	-----	2	57	64	64	71	-----	2
Riffle Slope (ft/ft)	0.0073	-----	-----	0.0079	-----	4	0.003	0.005	0.006	0.007	0.002	3	0.005	0.007	0.007	0.008	-----	2	0.004	0.007	0.007	0.009	-----	2	0.005	0.007	0.007	0.009	-----	2
Pool Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Pool Spacing (ft)	150.0	-----	-----	205.0	-----	4	128.0	172.0	155.0	232.0	44.0	3	-----	127.0	-----	-----	-----	1	-----	152.0	-----	-----	-----	1	-----	151.0	-----	-----	-----	1
Pool Max Depth (ft)	-----	6.5	-----	-----	-----	1	-----	3.9	-----	-----	-----	-----	-----	3.8	-----	-----	-----	1	-----	3.6	-----	-----	-----	1	-----	3.4	-----	-----	-----	1
Pool Volume (ft³)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Substrate and Transport Parameters																														
Ri% / Ru% / P% / G% / S%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	----
SC% / Sa% / G% / B% / Be%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	----
d16 / d35 / d50 / d84 / d95	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----				6 / 18 / 26 / 63 / 120			-----	-----	-----	-----	-----	----				<0.063 / 16 / 49 / 98 / 163		
Reach Shear Stress (competency) lb/f²	-----	0.31	-----	-----	-----	-----	-----	0.2	-----	-----	-----	1	-----	0.2	-----	-----	-----	1	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	----
Max part size (mm) mobilized at bankfull (Rosgen Curve	-----	80.0	-----	-----	-----	-----	-----	53.0	-----	-----	-----	1	-----	53.0	-----	-----	-----	1	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	----
Stream Power (transport capacity) W/m²	-----	-----	-----	-----	-----	-----	-----	11.6	-----	-----	-----	1	-----	11.8	-----	-----	-----	1	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	----
Additional Reach Parameters																														
Drainage Area (SM)	2.3	-----	-----	2.3	-----	-----	2.3	-----	-----	2.3	-----	-----	2.3	-----	-----	2.3	-----	-----	2.3	-----	-----	2.3	-----	-----	2.3	-----	-----	2.3	-----	-----
Impervious cover estimate (%)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Rosgen Classificatior	-----	E/C4	-----	-----	-----	-----	-----	E/C	-----	-----	-----	-----	-----	E/C	-----	-----	-----	-----	-----	E/C	-----	-----	-----	-----	-----	E/C	-----	-----	-----	-----
BF Velocity (fps)	-----	3.8	-----	-----	-----	-----	-----	4.1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF Discharge (cfs)	-----	150.0	-----	-----	-----	-----	-----	150.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Valley Length	-----	-----	-----	-----	-----	-----	-----	460.0	-----	-----	-----	-----	-----		-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel length (ft)	-----	573.0	-----	-----	-----	-----	-----	603.0	-----	-----	-----	-----	-----	337.0	-----	-----	-----	-----	-----	354.0	-----	-----	-----	-----	-----	354.0	-----	-----	-----	-----
Sinuosity	-----	1.30	-----	-----	-----	-----	-----	1.31	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Water Surface Slope (Channel) (ft/ft)	-----	0.0030	-----	-----	-----	-----	-----	0.002	-----	-----	-----	-----	-----	0.002	-----	-----	-----	-----	-----	0.002	-----	-----	-----	-----	-----	0.002	-----	-----	-----	-----
BF slope (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Bankfull Floodplain Area (acres)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BEHI VL% / L% / M% / H% / VH% / E%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel Stability or Habitat Metric	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Biological or Other	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Table 7. Baseline Stream Summary
Big Cedar Creek Restoration Site Contract No. D06054-D
#REF!

Parameter	USGS Gauge	Regional Curve Interval			Pre-Existing Condition						Reference Reach(es) Data Morgan Creek					
Dimension and Substrate - Riffle		LL	UL	Eq.	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n
BF Width (ft)	-----	12.0	39.0	18.8	-----	22.0	-----	-----	-----	1.0	-----	33.2	-----	-----	-----	2
Floodprone Width (ft)		-----	-----	-----	-----	33.0	-----	-----	-----	1.0	-----	77.5	-----	-----	-----	2
BF Mean Depth (ft)	-----	1.4	3.3	2.1	-----	1.8	-----	-----	-----	1.0	-----	2.3	-----	-----	-----	2
BF Max Depth (ft)	-----	-----	-----	-----	-----	2.6	-----	-----	-----	1.0	-----	2.8	-----	-----	-----	2
BF Cross-sectional Area (ft^2)	-----	23.0	85.0	44.3	-----	39.7	-----	-----	-----	1.0	-----	75.1	-----	-----	-----	2
Width/Depth Ratio	-----	-----	-----	-----	-----	12.2	-----	-----	-----	1.0	-----	14.1	-----	-----	-----	2
Entrenchment Ratio	-----	-----	-----	-----	-----	1.5	-----	-----	-----	1.0	-----	2.3	-----	-----	-----	2
Bank Height Ratio	-----	-----	-----	-----	-----	1.9	-----	-----	-----	1.0	-----	1.0	-----	-----	-----	2
d50 (mm)	-----	-----	-----	-----	-----	17.0	-----	-----	-----	1.0	-----	3.0	-----	-----	-----	1
Pattern																
Channel Beltwidth (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Radius of Curvature (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Rc:Bankfull width (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Meander Wavelength (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Meander Width Ratio	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Profile																
Riffle Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Riffle Slope (ft/ft)	-----	-----	-----	-----	0.0	-----	-----	0.0	-----	-----	0.01	-----	-----	0.02	-----	2
Pool Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Pool Spacing (ft)	-----	-----	-----	-----	40.0	-----	-----	242.0	-----	-----	146.0	-----	-----	-----	-----	2
Pool Max Depth (ft)	-----	-----	-----	-----	-----	4.2	-----	-----	-----	-----	4.1	-----	-----	-----	-----	1
Pool Volume (ft^3)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Substrate and Transport Parameters																
Ri% / Ru% / P% / G% / S%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
SC% / Sa% / G% / B% / Be%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
d16 / d35 / d50 / d84 / d95	-----	-----	-----	-----			<0.063 / 8 / 17 /85 / 350						N/A / 1.2 / 3 / 77 / 800			
Reach Shear Stress (competency) lb/f²	-----	-----	-----	-----	-----	0.7	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Max part size (mm) mobilized at bankfull (Rosgen Curve	-----	-----	-----	-----	-----	190.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Stream Power (transport capacity) W/m²	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Additional Reach Parameters																
Drainage Area (SM)	-----	-----	-----	-----	2.9	-----	-----	2.9	-----	-----	-----	-----	-----	8.4	-----	-----
Impervious cover estimate (%)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Rosgen Classification	-----	-----	-----	-----	-----	B4/1c	-----	-----	-----	-----	-----	C4	-----	-----	-----	-----
BF Velocity (fps)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	6.6	-----	-----	-----	-----
BF Discharge (cfs)	-----	72.0	530.0	192.6	-----	-----	-----	-----	-----	-----	-----	524.0	-----	-----	-----	-----
Valley Length (ft)	-----	-----	-----	-----	-----	1016.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel length (ft)	-----	-----	-----	-----	-----	1016.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Sinuosity	-----	-----	-----	-----	-----	1.00	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Water Surface Slope (Channel) (ft/ft)	-----	-----	-----	-----	-----	0.0077	-----	-----	-----	-----	-----	0.0070	-----	-----	-----	-----
BF slope (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Bankfull Floodplain Area (acres)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BEHI VL% / L% / M% / H% / VH% / E%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel Stability or Habitat Metric	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Biological or Other	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Table 7. Baseline Stream Summary
Big Cedar Creek Restoration Site Contract No. D06054-D
BCC Reach 2 (2239 LF)

Parameter	Design						As-built						Year 1						Year 2						Year 3					
Dimension and Substrate - Riffle	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n
BF Width (ft)	-----	23	-----	-----	-----	1	22.5	23.9	23.4	25.7	1.3	3	22.3	23.3	22.5	25.2	1.6	3	22.5	24.6	23.8	27.6	2.6	3	21.0	23.6	23.7	26.1	2.6	3
Floodprone Width (ft)	-----	100.0	-----	-----	-----	1	74.4	74.9	74.5	75.8	0.7	3	74.3	74.8	74.5	75.7	0.8	3	74.3	74.9	74.5	75.8	0.8	3	74.3	74.9	74.8	75.8	0.8	3
BF Mean Depth (ft)	-----	2.3	-----	-----	-----	1	2.2	2.4	2.4	2.5	0.1	3	2.3	2.5	2.5	2.6	0.2	3	2.3	2.6	2.7	2.7	0.3	3	2.4	2.5	2.5	2.8	0.2	3
BF Max Depth (ft)	-----	3.3	-----	-----	-----	1	3.3	3.6	3.5	3.9	0.2	3	3.8	4.0	4.1	4.2	0.2	3	3.9	4.4	4.6	4.6	0.4	3	3.6	4.0	4.0	4.6	0.5	3
BF Cross-sectional Area (ft^2)	-----	52.7	-----	-----	-----	1	49.7	56.6	56.9	63.1	5.5	3	56.2	57.6	57.6	59.0	1.4	3	61.4	62.9	62.8	64.5	1.5	3	51.4	59.9	61.8	66.6	7.8	3
Width/Depth Ratio	-----	10.0	-----	-----	-----	1	9.6	10.1	10.2	10.4	0.3	3	8.7	9.5	9.0	10.8	1.1	3	8.2	9.7	8.8	12.1	2.1	3	8.4	9.3	8.6	11.0	1.5	3
Entrenchment Ratio	-----	4.3	-----	-----	-----	1	3.0	3.2	3.2	3.3	0.1	3	3.0	3.2	3.3	3.3	0.2	3	2.8	3.1	3.1	3.3	0.3	3	2.9	3.2	3.1	3.5	0.3	3
Bank Height Ratio	-----	1.0	-----	-----	-----	1	1.0	1.0	1.0	1.0	0.0	3	1.0	1.0	1.0	1.0	0.0	3	1.0	1.0	1.0	1.0	0.0	3	1.0	1.0	1.0	1.0	0.0	3
d50 (mm)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	22.6	-----	-----	-----	1	-----	-----	-----	-----	-----	-----	-----	97.0	-----	-----	-----	1
Pattern																														
Channel Beltwidth (ft)	73.0	-----	-----	144.0	-----	14	72.4	99.2	99.7	144.0	18.9	14	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Radius of Curvature (ft)	44.0	-----	-----	77.0	-----	15	37.0	52.7	47.0	89.0	14.2	15	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Rc:Bankfull width (ft/ft)	1.9	-----	-----	3.3	-----	15	1.6	2.2	-----	3.8	-----	15	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Meander Wavelength (ft)	197.0	-----	-----	312.0	-----	13	184.9	229.4	216.6	297.5	33.1	14	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Meander Width Ratio	3.2	-----	-----	6.3	-----	14	3.0	-----	-----	6.0	-----	14	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Profile																														
Riffle Length (ft)	-----	-----	-----	-----	-----	-----	41.0	62.0	59.0	102.0	18.5	15	-----	-----	-----	38	-----	1	-----	-----	-----	41	-----	1	-----	-----	-----	37	-----	1
Riffle Slope (ft/ft)	0.0092	-----	-----	0.0144	-----	15	0.0070	0.0110	0.0110	0.0170	0.0030	15	0.020	0.020	0.020	0.020	-----	1	-----	0.024	-----	-----	-----	1	-----	0.017	-----	-----	-----	1
Pool Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Pool Spacing (ft)	110.0	-----	-----	223.0	-----	15	101.0	135.0	150.0	225.0	39.2	15	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Pool Max Depth (ft)	-----	5.2	-----	-----	-----	1	5.5	-----	-----	5.5	-----	2	5.2	-----	-----	5.7	-----	2	5.4	-----	-----	5.9	-----	2	5.0	-----	-----	6.1	-----	2
Pool Volume (ft^3)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Substrate and Transport Parameters																														
Ri% / Ru% / P% / G% / S%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
SC% / Sa% / G% / B% / Be%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
d16 / d35 / d50 / d84 / d95	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----			<0.063 / 10 / 22.6 / 80 / 150				-----	-----	-----	-----	-----	-----			53 / 79 / 97 / 155 / 180					
Reach Shear Stress (competency) lb/f²	-----	0.6	-----	-----	-----	-----	-----	0.62	-----	-----	-----	1	-----	1	-----	-----	-----	1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Max part size (mm) mobilized at bankfull (Rosgen Curve	-----	150.0	-----	-----	-----	-----	-----	170.0	-----	-----	-----	1	-----	200.0	-----	-----	-----	1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Stream Power (transport capacity) W/m²	-----	-----	-----	-----	-----	-----	-----	29.3	-----	-----	-----	1	-----	38.6	-----	-----	-----	1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Additional Reach Parameters																														
Drainage Area (SM)	2.3	-----	-----	3.1	-----	-----	2.3	-----	-----	3.1	-----	-----	2.3	-----	-----	3.1	-----	-----	2.3	-----	-----	3.1	-----	-----	2.3	-----	-----	3.1	-----	-----
Impervious cover estimate (%)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Rosgen Classificatior	-----	E/C4	-----	-----	-----	-----	-----	E/C	-----	-----	-----	-----	-----	E/C	-----	-----	-----	-----	-----	E/C	-----	-----	-----	-----	-----	E/C	-----	-----	-----	-----
BF Velocity (fps)	-----	3.5	-----	-----	-----	-----	-----	3.3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF Discharge (cfs)	-----	185.0	-----	-----	-----	-----	-----	185.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Valley Length	-----	1723.0	-----	-----	-----	-----	-----	1694.0	-----	-----	-----	-----	-----		-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel length (ft)	-----	2240.0	-----	-----	-----	-----	-----	2220.0	-----	-----	-----	-----	-----	200.0	-----	-----	-----	-----	-----	174.0	-----	-----	-----	-----	-----	174.0	-----	-----	-----	-----
Sinuosity	-----	1.30	-----	-----	-----	-----	-----	1.31	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Water Surface Slope (Channel) (ft/ft)	-----	0.0050	-----	-----	-----	-----	-----	0.0050	-----	-----	-----	-----	-----	0.0070	-----	-----	-----	-----	-----	0.0070	-----	-----	-----	-----	-----	0.0070	-----	-----	-----	-----
BF slope (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Bankfull Floodplain Area (acres)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BEHI VL% / L% / M% / H% / VH% / E%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel Stability or Habitat Metric	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Biological or Other	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Table 7. Baseline Stream Summary
Big Cedar Creek Restoration Site Contract No. D06054-D
#REF!

Parameter	USGS Gauge	Regional Curve Interval			Pre-Existing Condition						Reference Reach(es) Data Morgan Creek					
		LL	UL	Eq.	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n
Dimension - Riffle																
BF Width (ft)	-----	13.0	40.0	19.9	-----	19.5	-----	-----	-----	1	-----	33.2	-----	-----	-----	2
Floodprone Width (ft)	-----	-----	-----	-----	-----	>111.4	-----	-----	-----	1	-----	77.5	-----	-----	-----	2
BF Mean Depth (ft)	-----	1.4	3.5	2.2	-----	1.7	-----	-----	-----	1	-----	2.3	-----	-----	-----	2
BF Max Depth (ft)	-----	-----	-----	-----	-----	2.7	-----	-----	-----	1	-----	2.8	-----	-----	-----	2
BF Cross-sectional Area (ft^2)	-----	25.0	90.0	48.3	-----	32.8	-----	-----	-----	1	-----	75.1	-----	-----	-----	2
Width/Depth Ratio	-----	-----	-----	-----	-----	11.5	-----	-----	-----	1	-----	14.1	-----	-----	-----	2
Entrenchment Ratio	-----	-----	-----	-----	-----	>5.7	-----	-----	-----	1	-----	2.3	-----	-----	-----	2
Bank Height Ratio	-----	-----	-----	-----	-----	1.6	-----	-----	-----	1	-----	1.0	-----	-----	-----	2
d50 (mm)	-----	-----	-----	-----	-----	17.0	-----	-----	-----	1	-----	3.0	-----	-----	-----	1
Pattern																
Channel Beltwidth (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Radius of Curvature (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Rc:Bankfull Width (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Meander Wavelength (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Meander Width Ratio	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Profile																
Riffle Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Riffle Slope (ft/ft)	-----	-----	-----	-----	0.0100	-----	-----	0.0490	-----	-----	0.0140	-----	-----	0.0240	-----	2
Pool Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----
Pool Spacing (ft)	-----	-----	-----	-----	59.0	-----	-----	242.0	-----	-----	146.0	-----	-----	-----	-----	2
Pool Max Depth (ft)	-----	-----	-----	-----	-----	3.3	-----	-----	-----	-----	4.1	-----	-----	-----	-----	1
Pool Volume (ft^3)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Substrate and Transport Parameters																
Ri% / Ru% / P% / G% / S%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
SC% / Sa% / G% / B% / Be%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
d16 / d35 / d50 / d84 / d95	-----	-----	-----	-----			<0.063 / 8 / 17 / 85 / 350						N/A / 1.2 / 3 / 77 / 800			
Reach Shear Stress (competency) lb/f²	-----	-----	-----	-----	-----	0.4	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Max part size (mm) mobilized at bankfull (Rosgen Curve	-----	-----	-----	-----	-----	100.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Stream Power (transport capacity) W/m²	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Additional Reach Parameters																
Drainage Area (SM)	-----	-----	-----	-----	2.9	-----	-----	3.3	-----	-----	-----	-----	-----	8.4	-----	-----
Impervious cover estimate (%)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Rosgen Classification	-----	-----	-----	-----	-----	C4/1	-----	-----	-----	-----	-----	C4	-----	-----	-----	-----
BF Velocity (fps)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	6.6	-----	-----	-----	-----
BF Discharge (cfs)	-----	68.0	590.0	210.9	-----	-----	-----	-----	-----	-----	-----	524.0	-----	-----	-----	-----
Valley Length (ft)	-----	-----	-----	-----	-----	1860.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel length (ft)	-----	-----	-----	-----	-----	2046.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Sinuosity	-----	-----	-----	-----	-----	1.10	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Water Surface Slope (Channel) (ft/ft)	-----	-----	-----	-----	-----	0.0045	-----	-----	-----	-----	-----	0.0070	-----	-----	-----	-----
BF Slope (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Banfull Floodplain Area (Acres	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BEHI VL% / L% / M% / H% / VH% / E%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel Stability or Habitat Metric	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Biological or Other	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Table 7. Baseline Stream Summary
Big Cedar Creek Restoration Site Contract No. D06054-D
BCC Reach 3 (1827 LF)

Parameter	Design						As-built						Year 1						Year 2						Year 3					
Dimension and Substrate - Riffle	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n
BF Width (ft)	-----	24.4	-----	-----	-----	1	23.1	24.5	24.6	25.7	1.1	3	22.3	23.4	23.1	24.9	1.3	3	22.2	23.9	23.3	26.1	2.0	3	21.8	24.3	24.6	26.5	2.4	3
Floodprone Width (ft)	-----	100+	-----	-----	-----	1	77.8	79.5	77.9	82.9	2.4	3	77.8	79.6	78.0	82.9	2.9	3	77.8	79.5	77.8	83.0	3.0	3	77.2	79.2	77.4	83.0	3.3	3
BF Mean Depth (ft)	-----	2.1	-----	-----	-----	1	2.1	2.2	2.2	2.2	0.0	3	2.2	2.3	2.3	2.4	0.1	3	2.0	2.2	2.2	2.3	0.2	3	21.8	24.3	24.6	26.5	2.4	3
BF Max Depth (ft)	-----	3.0	-----	-----	-----	1	3.1	3.2	3.1	3.3	0.1	3	3.1	3.3	3.1	3.7	0.3	3	3.1	3.3	3.3	3.5	0.2	3	3.1	3.4	3.5	3.6	0.3	3
BF Cross-sectional Area (ft^2)	-----	52.1	-----	-----	-----	1	50.1	52.7	51.8	56.2	2.6	3	50.5	53.9	50.8	60.4	5.6	3	47.6	52.1	51.8	56.9	4.6	3	51.1	55.6	53.5	62.2	5.8	3
Width/Depth Ratio	-----	11.6	-----	-----	-----	1	10.7	11.4	11.7	11.8	0.5	3	9.8	10.2	10.3	10.5	0.4	3	9.5	11.0	11.4	12.0	1.3	3	8.9	10.7	11.3	11.9	1.6	3
Entrenchment Ratio	-----	4.1+	-----	-----	-----	1	3.2	3.3	3.2	3.4	0.1	3	3.3	3.4	3.4	3.5	0.1	3	3.2	3.3	3.3	3.5	0.2	3	3.1	3.2	3.1	3.5	0.2	3
Bank Height Ratio	-----	1.0	-----	-----	-----	1	1.0	1.0	1.0	1.0	0.0	3	1.0	1.0	1.0	1.0	0.0	3	1.0	1.0	1.0	1.0	0.0	3	1.0	1.0	1.0	1.0	0.0	3
d50 (mm)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	59.0	-----	-----	-----	1.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Pattern																														
Channel Beltwidth (ft)	52.0	-----	-----	114.0	-----	12	50.0	76.8	79.5	103.0	14.3	12	45.0	65.3	63.0	88.0	16.6	5	52.0	74.0	78.0	84.0	12.0	5	1.8	3.0	3.2	3.8	0.8	6
Radius of Curvature (ft)	44.0	-----	-----	83.0	-----	13	40.0	57.2	50.0	103.0	17.6	13	51.0	66.0	71.0	79.0	11.3	7	63.0	74.9	75.0	83.0	6.1	7	58.0	71.7	73.0	85.0	8.6	7
Rc:Bankfull width (ft/ft)	1.8	-----	-----	3.4	-----	13	1.6	-----	-----	4.2	-----	13	2.2	-----	-----	3.4	-----	7	2.6	-----	-----	3.5	------	7	2.4	3.0	3.0	3.5	0.4	7
Meander Wavelength (ft)	187.0	-----	-----	313.0	-----	11	176.5	240.0	247.6	285.0	35.6	13	176.0	236.0	236.0	291.0	53.5	5	156.0	231.4	230.0	292.0	61.2	5	176.0	237.2	230.0	301.0	59.2	5
Meander Width Ratio	2.1	-----	-----	4.7	-----	12	2.0	-----	-----	4.2	-----	12	1.9	-----	-----	3.8	-----	5	2.2	-----	-----	3.5	-----	5	1.8	3.0	3.2	3.8	0.8	6
Profile																														
Riffle Length (ft)	-----	-----	-----	-----	-----	-----	37	70	66	127	25	12	35	68	72	97	21	6	20	69	71	111	33	6	25	66	67	116	36	6
Riffle Slope (ft/ft)	0.0080	-----	-----	0.0169	-----	13	0.0020	0.0130	0.0110	0.0310	0.0076	13	0.009	0.016	0.017	0.025	0.010	6	0.001	0.011	0.015	0.036	0.010	6	0.002	0.015	0.014	0.032	0.010	6
Pool Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Pool Spacing (ft)	83.0	-----	-----	185.0	-----	13	87.0	140.0	141.0	183.0	26.4	13	90.0	130.0	128.0	130.0	32.0	6	84.0	138.0	134.0	173.0	33.4	6	76.0	135.0	142.0	174.0	37.7	6
Pool Max Depth (ft)	-----	5.2	-----	-----	-----	1	-----	5.4	-----	-----	-----	1	-----	5.2	-----	-----	-----	1	-----	5.4	-----	-----	-----	1	-----	5.65	-----	-----	-----	1
Pool Volume (ft^3)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Substrate and Transport Parameters																														
Ri% / Ru% / P% / G% / S%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
SC% / Sa% / G% / B% / Be%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
d16 / d35 / d50 / d84 / d95	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----			33 / 47 / 59 / 102 / 130				-----	-----	-----	-----	-----	-----			<0.063 / 20 /36 / 84 / 128			
Reach Shear Stress (competency) lb/f²	-----	0.8	-----	-----	-----	-----	-----	0.68	-----	-----	-----	1	-----	1.1	-----	-----	-----	1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Max part size (mm) mobilized at bankfull (Rosgen Curve	-----	190.0	-----	-----	-----	-----	-----	180	-----	-----	-----	1	-----	225	-----	-----	-----	1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Stream Power (transport capacity) W/m²	-----	-----	-----	-----	-----	-----	-----	36.8	-----	-----	-----	1	-----	51.2	-----	-----	-----	1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Additional Reach Parameters																														
Drainage Area (SM)	3.1	-----	-----	3.3	-----	-----	3.1	-----	-----	3.32	-----	-----	3.1	-----	-----	3.32	-----	-----	3.1	-----	-----	3.32	-----	-----	3.1	-----	-----	3.32	-----	-----
Impervious cover estimate (%)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Rosgen Classificatior	-----	E/C4	-----	-----	-----	N/A	-----	E/C	-----	-----	-----	-----	-----	E/C	-----	-----	-----	-----	-----	E/C	-----	-----	-----	-----	-----	E/C	-----	-----	-----	-----
BF Velocity (fps)	-----	3.7	-----	-----	-----	-----	-----	3.7	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF Discharge (cfs)	-----	195.0	-----	-----	-----	N/A	-----	195.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Valley Length	-----	-----	-----	-----	-----	-----	-----	1558.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel length (ft)	-----	1809.0	-----	-----	-----	-----	-----	1823.0	-----	-----	-----	-----	-----	1030.0	-----	-----	-----	-----	-----	1027.0	-----	-----	-----	-----	-----	1027.0	-----	-----	-----	-----
Sinuosity	-----	1.10	-----	-----	-----	-----	-----	1.17	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Water Surface Slope (Channel) (ft/ft)	-----	0.0077	-----	-----	-----	-----	-----	0.0060	-----	-----	-----	-----	-----	0.0080	-----	-----	-----	-----	-----	0.0080	-----	-----	-----	-----	-----	0.0080	-----	-----	-----	-----
BF slope (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Bankfull Floodplain Area (acres)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BEHI VL% / L% / M% / H% / VH% / E%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel Stability or Habitat Metric	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Biological or Other	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Table 7. Baseline Stream Summary
Big Cedar Creek Restoration Site Contract No. D06054-D
#REF!

Parameter	USGS Gauge	Regional Curve Interval			Pre-Existing Condition						Reference Reach(es) Data Morgan Creek					
		LL	UL	Eq.	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n
Dimension - Riffle																
BF Width (ft)	-----	13.0	40.0	20.0	-----	29.6	-----	-----	-----	-----	-----	33.2	-----	-----	-----	2
Floodprone Width (ft)	-----	-----	-----	-----	-----	>109.7	-----	-----	-----	-----	-----	77.5	-----	-----	-----	2
BF Mean Depth (ft)	-----	1.4	3.5	2.2	-----	1.6	-----	-----	-----	-----	-----	2.3	-----	-----	-----	2
BF Max Depth (ft)	-----	-----	-----	-----	-----	2.3	-----	-----	-----	-----	-----	2.8	-----	-----	-----	2
BF Cross-sectional Area (ft^2)	-----	25.0	90.0	48.8	-----	47.1	-----	-----	-----	-----	-----	75.1	-----	-----	-----	2
Width/Depth Ratio	-----	-----	-----	-----	-----	18.5	-----	-----	-----	-----	-----	14.1	-----	-----	-----	2
Entrenchment Ratio	-----	-----	-----	-----	-----	>3.7	-----	-----	-----	-----	-----	2.3	-----	-----	-----	2
Bank Height Ratio	-----	-----	-----	-----	-----	1.6	-----	-----	-----	-----	-----	1.0	-----	-----	-----	2
d50 (mm)	-----	-----	-----	-----	-----	17	-----	-----	-----	-----	-----	3.0	-----	-----	-----	1
Pattern																
Channel Beltwidth (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Radius of Curvature (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Rc:Bankfull Width (ft/ft)	-----	-----	-----	-----			-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Meander Wavelength (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Meander Width Ratio	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Profile																
Riffle Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Riffle Slope (ft/ft)	-----	-----	-----	-----	0.0138	-----	-----	0.0498	-----	-----	0.0140	-----	-----	0.0240	-----	2
Pool Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----
Pool Spacing (ft)	-----	-----	-----	-----	20.0	-----	-----	236.0	-----	-----	146.0	-----	-----	-----	-----	2
Pool Max Depth (ft)	-----	-----	-----	-----	-----	3.4	-----	-----	-----	-----	4.1	-----	-----	-----	-----	1
Pool Volume (ft^3)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Substrate and Transport Parameters																
Ri% / Ru% / P% / G% / S%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
SC% / Sa% / G% / B% / Be%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
d16 / d35 / d50 / d84 / d95	-----	-----	-----	-----			<0.063 / 5 / 17 / 120 / >2048						N/A / 1.2 / 3 / 77 / 800			
Reach Shear Stress (competency) lb/f²	-----	-----	-----	-----	-----	0.8	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Max Part Size (mm) mobilized at bankfull (Rosgen Curve	-----	-----	-----	-----	-----	200.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Stream Power (transport capacity) W/m²	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Additional Reach Parameters																
Drainage Area (SM)	-----	-----	-----	-----	3.3	-----	-----	3.4	-----	-----	-----	-----	-----	8.4	-----	-----
Impervious cover estimate (acres)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Rosgen Classificatior	-----	-----	-----	-----	-----	C4/1	-----	-----	-----	-----	-----	C4	-----	-----	-----	-----
Bankfull Velocity (fps)	-----	-----	-----	-----	-----	1.6	-----	-----	-----	-----	-----	6.6	-----	-----	-----	-----
BF Discharge (cfs)	-----	68.0	590.0	213.2	-----		-----	-----	-----	-----	-----	524.0	-----	-----	-----	-----
Valley Length (ft)	-----	-----	-----	-----	-----	887.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel length (ft)	-----	-----	-----	-----	-----	976.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Sinuosity	-----	-----	-----	-----	-----	1.10	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Water Surface Slope (Channel) (ft/ft)	-----	-----	-----	-----	-----	0.0090	-----	-----	-----	-----	-----	0.0070	-----	-----	-----	-----
BF slope (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Bankfull Floodplain Area (acres)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BEHI VL% / L% / M% / H% / VH% / E%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel Stablibity or Habitat Metric	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Biological or Other	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Table 7. Baseline Stream Summary
Big Cedar Creek Restoration Site Contract No. D06054-D
BCC Reach 4 (410 LF)

Parameter	Design						As-built						Year 1						Year 2						Year 3					
Dimension and Substrate - Riffle	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n
BF Width (ft)	-----	26.0	-----	-----	-----	1	-----	27.5	-----	-----	-----	1	-----	27.8	-----	-----	-----	1	-----	28.0	-----	-----	-----	1	-----	27.6	-----	-----	-----	1
Floodprone Width (ft)	-----	94.0	-----	-----	-----	1	-----	81.0	-----	-----	-----	1	-----	81.1	-----	-----	-----	1	-----	80.9	-----	-----	-----	1	-----	81.0	-----	-----	-----	1
BF Mean Depth (ft)	-----	2.2	-----	-----	-----	1	-----	2.1	-----	-----	-----	1	-----	2.3	-----	-----	-----	1	-----	2.1	-----	-----	-----	1	-----	2.2	-----	-----	-----	1
BF Max Depth (ft)	-----	3.0	-----	-----	-----	1	-----	3.2	-----	-----	-----	1	-----	3.7	-----	-----	-----	1	-----	3.6	-----	-----	-----	1	-----	3.2	-----	-----	-----	1
BF Cross-sectional Area (ft^2)	-----	57.2	-----	-----	-----	1	-----	58.3	-----	-----	-----	1	-----	62.6	-----	-----	-----	1	-----	59.7	-----	-----	-----	1	-----	61.5	-----	-----	-----	1
Width/Depth Ratio	-----	11.8	-----	-----	-----	1	-----	13.0	-----	-----	-----	1	-----	12.4	-----	-----	-----	1	-----	13.1	-----	-----	-----	1	-----	12.4	-----	-----	-----	1
Entrenchment Ratio	-----	3.6	-----	-----	-----	1	-----	3.0	-----	-----	-----	1	-----	2.9	-----	-----	-----	1	-----	2.9	-----	-----	-----	1	-----	2.9	-----	-----	-----	1
Bank Height Ratio	-----	1.0	-----	-----	-----	1	-----	1.0	-----	-----	-----	1	-----	1.0	-----	-----	-----	1	-----	1.0	-----	-----	-----	1	-----	1.0	-----	-----	-----	1
d50 (mm)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Pattern																														
Channel Beltwidth (ft)	58.0	-----	-----	91.0	-----	3	57.0	89.3	97.0	114.0	29.3	3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Radius of Curvature (ft)	52.0	-----	-----	53.0	-----	3	27.0	46.0	51.0	60.0	17.1	3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Rc:Bankfull width (ft/ft)	2.0	-----	-----	2.0	-----	3	1.0	-----	-----	2.2	-----	3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Meander Wavelength (ft)	207.0	-----	-----	247.0	-----	2	224.3	236.6	236.6	248.9	17.4	2	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Meander Width Ratio	2.2	-----	-----	3.5	-----	3	2.1	-----	-----	4.2	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Profile																														
Riffle Length (ft)	-----	-----	-----	-----	-----	-----	43.0	66.5	67.0	89.0	18.0	4	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Riffle Slope (ft/ft)	0.0119	-----	-----	0.0237	-----	4	0.0120	0.0140	0.0140	0.0160	0.0020	4	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Pool Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Pool Spacing (ft)	105.0	-----	-----	112.0	-----	2	118.0	122.0	122.0	126.0	-----	2	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Pool Max Depth (ft)	-----	5.0	-----	-----	-----	1	-----	4.7	-----	-----	-----	1	-----	4.3	-----	-----	-----	1	-----	4.9	-----	-----	-----	1	-----	4.9	-----	-----	-----	1
Pool Volume (ft^3)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Substrate and Transport Parameters																														
Ri% / Ru% / P% / G% / S%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
SC% / Sa% / G% / B% / Be%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
d16 / d35 / d50 / d84 / d95	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Reach Shear Stress (competency) lb/f²	-----	1.2	-----	-----	-----	-----	-----	1.1	-----	-----	-----	1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Max part size (mm) mobilized at bankfull (Rosgen Curve	-----	275.0	-----	-----	-----	-----	-----	260.0	-----	-----	-----	1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Stream Power (transport capacity) W/m²	-----	-----	-----	-----	-----	-----	-----	53.6	-----	-----	-----	1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Additional Reach Parameters																														
Drainage Area (SM)	3.3	-----	-----	3.4	-----	-----	3.3	-----	-----	3.4	-----	-----	3.3	-----	-----	3.4	-----	-----	3.3	-----	-----	3.4	-----	-----	3.3	-----	-----	3.4	-----	-----
Impervious cover estimate (%)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Rosgen Classificatior	-----	E/C4	-----	-----	-----	-----	-----	E/C	-----	-----	-----	-----	-----	E/C	-----	-----	-----	-----	-----	E/C	-----	-----	-----	-----	-----	E/C	-----	-----	-----	-----
BF Velocity (fps)	-----	3.5	-----	-----	-----	-----	-----	3.4	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF Discharge (cfs)	-----	199.0	-----	-----	-----	-----	-----	199.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Valley Length	-----	-----	-----	-----	-----	-----	-----	350.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel length (ft)	-----	400.0	-----	-----	-----	-----	-----	410.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Sinuosity	-----	1.10	-----	-----	-----	-----	-----	1.17	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Water Surface Slope (Channel) (ft/ft)	-----	0.0098	-----	-----	-----	-----	-----	0.0094	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF slope (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Bankfull Floodplain Area (acres)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BEHI VL% / L% / M% / H% / VH% / E%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel Stability or Habitat Metric	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Biological or Other	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Table 7. Baseline Stream Summary

Big Cedar Creek Restoration Site Contract No. D06054-D

#REF!

Parameter	USGS Gauge	Regional Curve Interval			Pre-Existing Condition						Reference Reach(es) Data Spencer Creek					
		LL	UL	Eq.	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n
Dimension and Substrate - Riffle																
BF Width (ft)	-----	7.0	26.0	11.5	-----	18.9	-----	-----	-----	1	-----	8.7	-----	-----	-----	1
Floodprone Width (ft)	-----	-----	-----	-----	-----	>135.3	-----	-----	-----	1	-----	228.5	-----	-----	-----	1
BF Mean Depth (ft)	-----	0.9	2.4	1.5	-----	0.8	-----	-----	-----	1	-----	1.2	-----	-----	-----	1
BF Max Depth (ft)	-----	-----	-----	-----	-----	1.8	-----	-----	-----	1	-----	1.9	-----	-----	-----	1
BF Cross-sectional Area (ft^2)	-----	10.0	38.0	20.4	-----	14.4	-----	-----	-----	1	-----	10.6	-----	-----	-----	1
Width/Depth Ratio	-----	-----	-----	-----	-----	23.6	-----	-----	-----	1	-----	7.3	-----	-----	-----	1
Entrenchment Ratio	-----	-----	-----	-----	-----	>7.2	-----	-----	-----	1	-----	26.3	-----	-----	-----	1
Bank Height Ratio	-----	-----	-----	-----	-----	1.6	-----	-----	-----	1	-----	1.0	-----	-----	-----	1
d50 (mm)	-----	-----	-----	-----	-----	18.0	-----	-----	-----	1	-----	8.6	-----	-----	-----	-----
Pattern																
Channel Beltwidth (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	24.0	-----	-----	52.0	-----	2
Radius of Curvature (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	5.4	-----	-----	22.1	-----	5
Rc:Bankfull Width (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.6	-----	-----	2.5	-----	5
Meander Wavelength (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	54.0	-----	-----	196.0	-----	2
Meander Width Ratio	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	2.8	-----	-----	6.0	-----	2
Profile																
Riffle Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Riffle Slope (ft/ft)	-----	-----	-----	-----	0.0180	-----	-----	0.1530	-----	2	0.010	-----	-----	0.067	-----	2
Pool Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
Pool Spacing (ft)	-----	-----	-----	-----	9.9	-----	-----	182	-----	-----	13.0	-----	-----	46.5	-----	5
Pool Max Depth (ft)	-----	-----	-----	-----	-----	2.2	-----	-----	-----	-----	-----	2.5	-----	-----	-----	1
Pool Volume (ft^3)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Substrate and Transport Parameters																
Ri% / Ru% / P% / G% / S%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
SC% / Sa% / G% / B% / Be%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
d16 / d35 / d50 / d84 / d95	-----	-----	-----	-----			<0.063 / 7 / 18 / 149 / >2048						0.06 / 3 / 8.6 / 77 / 180			
Reach Shear Stress (competency) lb/f²	-----	-----	-----	-----	-----	0.5	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Max part size (mm) mobilized at bankfull (Rosgen Curve	-----	-----	-----	-----	-----	125.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Stream Power (transport capacity) W/m²	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Additional Reach Parameters																
Drainage Area (SM)	-----	-----	-----	-----	0.7	-----	-----	0.9	-----	-----	-----	-----	-----	0.5	-----	-----
Impervious cover estimate (%)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Rosgen Classification	-----	-----	-----	-----	-----	C4/1	-----	-----	-----	-----	-----	E4/C4	-----	-----	-----	-----
BF Velocity (fps)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF Discharge (cfs)	-----	30.0	235.0	84.5	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Valley Length (ft)	-----	-----	-----	-----	-----	1,816.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel length (ft)	-----	-----	-----	-----	-----	1,998.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Sinuosity	-----	-----	-----	-----	-----	1.10	-----	-----	-----	-----	-----	1.10	-----	-----	-----	-----
Water Surface Slope (Channel) (ft/ft)	-----	-----	-----	-----	-----	0.0116	-----	-----	-----	-----	-----	0.0132	-----	-----	-----	-----
BF Slope (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Bankfull Floodplain Area (acres)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BEHI VL% / L% / M% / H% / VH% / E%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel Stability or Habitat Metric	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Biological or Other	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Table 7. Baseline Stream Summary
Big Cedar Creek Restoration Site Contract No. D06054-D
UT1 Reach 1 (1248 LF)

Parameter	Design						As-built						Year 1						Year 2						Year 3					
Dimension and Substrate - Riffle	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n
BF Width (ft)	-----	13.0	-----	-----	-----	1	11.6	13.2	13.2	14.7	1.3	3	12.0	12.8	12.8	13.7	0.9	3	11.9	13.5	12.0	16.5	2.6	3	11.9	12.6	12.2	13.6	0.9	3
Floodprone Width (ft)	-----	73.8	-----	-----	-----	1	48.4	52.8	53.6	56.5	3.3	3	48.5	52.8	53.5	56.4	4.0	3	48.4	52.8	53.5	56.4	4.0	3	48.4	52.8	53.6	56.5	4.1	3
BF Mean Depth (ft)	-----	1.2	-----	-----	-----	1	1.0	1.1	1.1	1.3	0.1	3	1.0	1.1	1.1	1.3	0.2	3	0.8	1.0	1.0	1.2	0.2	3	0.9	5.1	1.4	12.9	0.9	3
BF Max Depth (ft)	-----	1.7	-----	-----	-----	1	1.7	1.9	1.8	2.1	0.2	3	1.6	1.8	1.7	2.2	0.3	3	1.6	1.8	1.6	2.1	0.3	3	1.5	1.8	1.7	2.2	0.4	3
BF Cross-sectional Area (ft^2)	-----	15.3	-----	-----	-----	1	14.2	14.9	15.2	15.2	0.5	3	13.6	14.5	13.7	16.1	1.4	3	12.4	13.4	13.4	14.3	0.9	3	12.6	13.9	12.9	16.3	2.1	3
Width/Depth Ratio	-----	10.8	-----	-----	-----	1	8.8	11.8	12.3	14.2	2.2	3	9.0	11.6	12.1	13.7	2.4	3	9.9	14.0	11.6	20.4	5.7	3	8.7	11.7	11.6	14.7	3.0	3
Entrenchment Ratio	-----	5.7	-----	-----	-----	1	3.9	4.0	4.0	4.2	0.1	3	4.0	4.1	4.0	4.2	0.1	3	3.3	14.0	4.1	4.3	0.5	3	4.1	4.2	4.1	4.4	0.2	3
Bank Height Ratio	-----	1.0	-----	-----	-----	1	1.0	1.0	1.0	1.0	1.0	3	1.0	1.0	1.0	1.0	1.0	3	1.0	1.0	1.0	1.0	0.0	3	1.0	1.0	1.0	1.0	0.0	3
d50 (mm)	-----	-----	-----	-----	-----	-----	-----	39.0	-----	-----	-----	1	-----	62.0	-----	-----	-----	1	-----	-----	-----	-----	-----	1	-----	-----	-----	-----	-----	1
Pattern																														
Channel Beltwidth (ft)	29.0	-----	-----	64.0	-----	13	42.0	65.6	67.0	75.0	10.2	13	48.0	68.0	69.5	78.0	9.3	8	54.0	69.0	72.5	75.0	8.2	8	59.0	65.9	66.0	78.0	6.5	7
Radius of Curvature (ft)	28.0	-----	-----	40.0	-----	14	22.0	32.4	33.0	41.0	5.2	14	29.0	32.5	32.5	39.0	3.2	8	24.0	31.3	31.0	39.0	4.9	8	29.0	35.6	35.5	43.0	4.8	8
Rc:Bankfull width (ft/ft)	-----	-----	-----	-----	-----	-----	1.7	-----	-----	3.1	-----	1	2.3	-----	-----	3.1	-----	8	1.8	-----	-----	2.9	-----	8	2.3	2.8	2.8	3.4	0.4	8
Meander Wavelength (ft)	140.0	-----	-----	157.0	-----	12	111.3	151.9	150.7	174.0	15.9	12	150.0	156.6	157.0	166.0	5.4	7	146.0	155.3	154.0	166.0	6.3	7	153.0	158.1	158.0	168.0	5.3	7
Meander Width Ratio	2.2	-----	-----	4.9	-----	13	3.2	-----	-----	5.7	-----	13	3.8	-----	-----	6.1	-----	8	4.0	-----	-----	5.6	-----	8	4.7	5.2	5.2	6.2	0.5	7
Profile																														
Riffle Length (ft)	-----	-----	-----	-----	-----	-----	29.0	47.0	46.0	78.0	15.0	14	30.0	43.0	44.0	64.0	11.0	9	29.0	43.0	43.0	69.0	13.2	9	29.0	43.0	42.0	66.0	12.3	9
Riffle Slope (ft/ft)	0.0115	-----	-----	0.0230	-----	14	0.0000	0.0110	0.0120	0.0270	0.0081	14	0.0030	0.0220	0.0220	0.0370	0.0110	9	0.0070	0.0230	0.0210	0.0360	0.0090	9	0.008	0.020	0.019	0.029	0.010	9
Pool Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Pool Spacing (ft)	63.0	-----	-----	115.0	-----	13	61.0	95.0	102.0	113.0	17.0	13	70.0	102.0	104.0	128.0	22.0	9	63.0	104.0	102.0	137.0	27.9	8	63.0	101.0	101.0	130.0	22.9	8
Pool Max Depth (ft)	-----	-----	-----	-----	-----	-----	2.3	-----	-----	2.9	-----	2	2.2	-----	-----	2.7	-----	2	2.6	-----	-----	2.8	-----	2	2.6	-----	-----	3.0	-----	2
Pool Volume (ft^3)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Substrate and Transport Parameters																														
Ri% / Ru% / P% / G% / S%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
SC% / Sa% / G% / B% / Be%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
d16 / d35 / d50 / d84 / d95	-----	-----	-----	-----	-----	-----				12 / 24 / 39 / 110 / 160						20 / 40 / 62 / 110 / 150			-----	-----	-----	-----	-----	-----				<0.063 / <0.063 / 37 / 95 / 125		
Reach Shear Stress (competency) lb/f²	-----	0.5	-----	-----	-----	-----	-----	0.4	-----	-----	-----	1	-----	0.5	-----	-----	-----	1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Max part size (mm) mobilized at bankfull (Rosgen Curve	-----	125.0	-----	-----	-----	-----	-----	95.0	-----	-----	-----	1	-----	130.0	-----	-----	-----	1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Stream Power (transport capacity) W/m²	-----	-----	-----	-----	-----	-----	-----	24.4	-----	-----	-----	1	-----	33.4	-----	-----	-----	1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Additional Reach Parameters																														
Drainage Area (SM)	0.7	-----	-----	0.8	-----	-----	0.7	-----	-----	0.8	-----	-----	0.7	-----	-----	0.8	-----	-----	0.7	-----	-----	0.8	-----	-----	0.7	-----	-----	0.8	-----	-----
Impervious cover estimate (%)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Rosgen Classificatior	-----	E/C4	-----	-----	-----	-----	-----	E/C	-----	-----	-----	-----	-----	E/C	-----	-----	-----	-----	-----	E/C	-----	-----	-----	-----	-----	E/C	-----	-----	-----	-----
BF Velocity (fps)	-----	4.5	-----	-----	-----	-----	-----	4.6	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF Discharge (cfs)	-----	69.0	-----	-----	-----	-----	-----	69.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Valley Length	-----	-----	-----	-----	-----	-----	-----	959.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel length (ft)	-----	1276.0	-----	-----	-----	-----	-----	1247.0	-----	-----	-----	-----	-----	918.0	-----	-----	-----	-----	-----	910.0	-----	-----	-----	-----	-----	910.0	-----	-----	-----	-----
Sinuosity	-----	1.30	-----	-----	-----	-----	-----	1.30	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Water Surface Slope (Channel) (ft/ft)	-----	0.0080	-----	-----	-----	-----	-----	0.0060	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF slope (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.014	-----	-----	-----	-----	-----	0.0080	-----	-----	-----	-----	-----	0.0080	-----	-----	-----	-----
Bankfull Floodplain Area (acres)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BEHI VL% / L% / M% / H% / VH% / E%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel Stability or Habitat Metric	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Biological or Other	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Table 7. Baseline Stream Summary

Big Cedar Creek Restoration Site Contract No. D06054-D

#REF!

Parameter	USGS Gauge	Regional Curve Interval			Pre-Existing Condition						Reference Reach(es) Data Spencer Creek					
Dimension and Substrate- Riffle		LL	UL	Eq.	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n
BF Width (ft)	-----	7.0	27.0	11.8	-----	13.1	-----	-----	-----	1	-----	8.7	-----	-----	-----	1
Floodprone Width (ft)	-----	-----	-----	-----	-----	48.8	-----	-----	-----	1	-----	228.5	-----	-----	-----	1
BF Mean Depth (ft)	-----	0.9	1.5	1.5	-----	1.4	-----	-----	-----	1	-----	1.2	-----	-----	-----	1
BF Max Depth (ft)	-----	-----	-----	-----	-----	2.2	-----	-----	-----	1	-----	1.9	-----	-----	-----	1
BF Cross-sectional Area (ft^2)	-----	11.0	40.0	21.1	-----	18.5	-----	-----	-----	1	-----	10.6	-----	-----	-----	1
Width/Depth Ratio	-----	-----	-----	-----	-----	9.4	-----	-----	-----	1	-----	7.3	-----	-----	-----	1
Entrenchment Ratio	-----	-----	-----	-----	-----	3.7	-----	-----	-----	1	-----	26.3	-----	-----	-----	1
Bank Height Ratio	-----	-----	-----	-----	-----	2.1	-----	-----	-----	1	-----	1.0	-----	-----	-----	1
d50 (mm)	-----	-----	-----	-----	-----	40.0	-----	-----	-----	1	-----	8.6	-----	-----	-----	1
Pattern																
Channel Beltwidth (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	24.0	-----	-----	52.0	-----	2
Radius of Curvature (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	5.4	-----	-----	22.1	-----	5
Rc:Bankfull Width (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.6	-----	-----	2.5	-----	5
Meander Wavelength (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	54.0	-----	-----	196.0	-----	2
Meander Width Ratio	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	2.8	-----	-----	6.0	-----	2
Profile																
Riffle Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Riffle Slope (ft/ft)	-----	-----	-----	-----	0.0242	-----	-----	0.178	-----	2	0.0100	-----	-----	0.0670	-----	2
Pool Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
Pool Spacing (ft)	-----	-----	-----	-----	9.8	-----	-----	118.2	-----	-----	13.0	-----	-----	46.5	-----	5
Pool Max Depth (ft)	-----	-----	-----	-----	-----	2.1	-----	-----	-----	-----	-----	2.5	-----	-----	-----	1
Pool Volume (ft^3)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Substrate and Transport Parameters																
Ri% / Ru% / P% / G% / S%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
SC% / Sa% / G% / B% / Be%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
d16 / d35 / d50 / d84 / d95	-----	-----	-----	-----	<0.063 / 11 / 40 / >2048 / >2048						0.06 / 3 / 8.6 / 77 / 180					
Reach Shear Stress (competency) lb/f²	-----	-----	-----	-----	-----	1.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Max part size (mm) mobilized at bankfull (Rosgen Curve	-----	-----	-----	-----	-----	250.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Stream Power (transport capacity) W/m²	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Additional Reach Parameters																
Drainage Area (SM)	-----	-----	-----	-----	0.9	-----	-----	1.0	-----	-----	-----	-----	-----	0.5	-----	-----
Impervious cover estimate (%)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Rosgen Classification	-----	-----	-----	-----	-----	E4/1	-----	-----	-----	-----	-----	E4/C4	-----	-----	-----	-----
BF Velocity (fps)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF Discharge (cfs)	-----	30.0	260.0	87.7	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Valley Length (ft)	-----	-----	-----	-----	-----	759.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel length (ft)	-----	-----	-----	-----	-----	759.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Sinuosity	-----	-----	-----	-----	-----	1.00	-----	-----	-----	-----	-----	1.10	-----	-----	-----	-----
Water Surface Slope (Channel) (ft/ft)	-----	-----	-----	-----	-----	0.0140	-----	-----	-----	-----	-----	0.0132	-----	-----	-----	-----
BF Slope (ft/ft)	-----	-----	-----	-----	-----	0.0139	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Banfull Floodplain Area (Acres	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BEHI VL% / L% / M% / H% / VH% / E%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel Stability or Habitat Metric	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Biological or Other	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Table 7. Baseline Stream Summary
Big Cedar Creek Restoration Site Contract No. D06054-D
UT1 Reach 2 (1016)

Parameter	Design						As-built						Year 1						Year 2						Year 3					
Dimension and Substrate - Riffle	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n
BF Width (ft)	-----	15.0	-----	-----	-----	1	13.4	14.4	14.1	15.9	1.1	3	12.5	14.0	14.3	15.1	1.3	3	13.6	15.0	15.8	15.8	1.3	3	11.3	14.0	14.3	16.3	2.5	3
Floodprone Width (ft)	-----	85.5	-----	-----	-----	1	56.4	58.4	58.8	60.2	1.6	3	56.3	58.4	58.9	60.1	1.9	3	56.3	58.5	58.8	60.4	2.0	3	56.4	58.4	58.8	60.2	1.9	3
BF Mean Depth (ft)	-----	4.5	-----	-----	-----	1	1.1	1.1	1.1	1.2	0.0	3	1.0	1.1	1.1	1.2	0.1	3	1.0	1.0	1.1	1.1	0.1	3	0.8	0.9	0.9	1.1	0.1	3
BF Max Depth (ft)	-----	1.5	-----	-----	-----	1	1.8	1.9	1.8	1.9	0.1	3	1.7	1.8	1.7	2.1	0.2	3	1.7	1.8	1.8	2.0	0.2	3	1.4	1.6	1.7	1.8	0.2	3
BF Cross-sectional Area (ft^2)	-----	16.8	-----	-----	-----	1	14.5	16.3	16.3	17.9	1.4	3	13.0	15.5	16.0	17.4	2.2	3	14.4	15.5	15.4	16.6	1.1	3	9.4	13.0	13.0	16.6	3.6	3
Width/Depth Ratio	-----	13.6	-----	-----	-----	1	12.1	12.8	12.4	14.0	0.9	3	11.8	12.7	12.0	14.2	1.3	3	12.8	14.6	14.9	16.2	1.7	3	13.5	15.1	15.7	16.0	1.3	3
Entrenchment Ratio	-----	5.7	-----	-----	-----	1	3.7	4.1	4.2	4.3	0.3	3	3.9	4.2	4.2	4.5	0.3	3	3.7	3.8	3.8	3.9	0.1	3	3.6	4.2	3.9	5.1	0.8	3
Bank Height Ratio	-----	1.0	-----	-----	-----	1	1.0	1.0	1.0	1.0	1.0	3	1.0	1.0	1.0	1.0	1.0	3	1.0	1.0	1.0	1.0	0.0	3	1.0	1.0	1.0	1.0	0.0	3
d50 (mm)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Pattern																														
Channel Beltwidth (ft)	30.0	-----	-----	45.0	-----	10	29.0	45.3	48.0	58.0	11.7	10	30.0	46.5	49.5	57.0	10.6	6	41.0	49.0	49.5	59.0	6.5	5	41.0	49.0	49.5	59.0	6.5	6
Radius of Curvature (ft)	30.0	-----	-----	48.0	-----	11	20.0	35.3	36.0	47.0	6.2	11	25.0	28.0	29.0	30.0	2.0	5	28.0	39.0	40.0	46.0	7.1	4	32.0	44.8	46.5	52.0	7.0	6
Rc:Bankfull width (ft/ft)	2.0	-----	-----	3.2	-----	11	1.4	-----	-----	3.3	-----	1	1.8	-----	-----	2.1	-----	2	1.9	-----	-----	3.1	-----	2	2.3	3.2	3.3	3.7	0.5	6
Meander Wavelength (ft)	134.0	-----	-----	199.0	-----	9	68.6	145.1	146.3	222.4	44.6	11	166.0	184.8	186.0	199.0	13.6	5	173.0	185.4	183.0	201.0	10.6	5	166.0	184.6	179.0	200.0	14.6	5
Meander Width Ratio	2.0	-----	-----	3.0	-----	10	2.0	-----	-----	4.0	-----	1	2.1	-----	-----	4.1	-----	2	2.7	-----	-----	3.9	-----	2	2.9	3.5	3.5	4.2	0.5	6
Profile																														
Riffle Length (ft)	-----	-----	-----	-----	-----	-----	48.0	67.0	64.0	94.0	14.0	10	42	62	60	92	16	6	37	53	58	96	21	6	48	62	56	94	17	6
Riffle Slope (ft/ft)	0.01920	-----	-----	0.02800	-----	11	0.0080	0.0160	0.0170	0.0220	0.0045	10	0.021	0.024	0.025	0.032	0.004	6	0.020	0.020	0.020	0.030	0.000	6	0.02	0.02	0.02	0.02	0.00	6
Pool Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Pool Spacing (ft)	62.0	-----	-----	140.0	-----	11	17.0	74.0	77.0	116.0	28.0	11	41	85	90	110	24	7	47	90	84	101	19	7	78	97	96	119	13	6
Pool Max Depth (ft)	-----	3.5	-----	-----	-----	1	-----	2.6	-----	-----	-----	1	-----	2.9	-----	-----	-----	1	-----	2.7	-----	-----	-----	1	-----	2.7	-----	-----	-----	1
Pool Volume (ft^3)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Substrate and Transport Parameters																														
Ri% / Ru% / P% / G% / S%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
SC% / Sa% / G% / B% / Be%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
d16 / d35 / d50 / d84 / d95	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Reach Shear Stress (competency) lb/f²	-----	0.8	-----	-----	-----	-----	-----	0.8	-----	-----	-----	1	-----	1.0	-----	-----	-----	1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Max part size (mm) mobilized at bankfull (Rosgen Curve	-----	200.0	-----	-----	-----	-----	-----	200.0	-----	-----	-----	1	-----	215.0	-----	-----	-----	1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Stream Power (transport capacity) W/m²	-----	-----	-----	-----	-----	-----	-----	54.1	-----	-----	-----	1	-----	59.7	-----	-----	-----	1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Additional Reach Parameters																														
Drainage Area (SM)	0.8	-----	-----	0.9	-----	-----	0.8	-----	-----	0.9	-----	-----	0.8	-----	-----	0.9	-----	-----	0.8	-----	-----	0.9	-----	-----	0.8	-----	-----	0.9	-----	-----
Impervious cover estimate (%)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Rosgen Classificatior	-----	B4c	-----	-----	-----	-----	-----	E/C	-----	-----	-----	-----	-----	E/C	-----	-----	-----	-----	-----	E/C	-----	-----	-----	-----	-----	E/C	-----	-----	-----	-----
BF Velocity (fps)	-----	4.5	-----	-----	-----	-----	-----	4.7	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF Discharge (cfs)	-----	76.0	-----	-----	-----	-----	-----	76.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Valley Length	-----	-----	-----	-----	-----	-----	----	924.0	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----
Channel length (ft)	-----	1025.0	-----	-----	-----	-----	----	1016.0	-----	-----	-----	-----	----	740.0	-----	-----	-----	-----	----	734.0	-----	-----	-----	-----	----	734.0	-----	-----	-----	-----
Sinuosity	-----	1.00	-----	-----	-----	-----	----	1.10	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----
Water Surface Slope (Channel) (ft/ft)	-----	0.0128	-----	-----	-----	-----	----	0.0130	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----
BF slope (ft/ft)	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	----	0.014	-----	-----	-----	-----	----	0.014	-----	-----	-----	-----	----	0.014	-----	-----	-----	-----
Bankfull Floodplain Area (acres)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BEHI VL% / L% / M% / H% / VH% / E%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel Stability or Habitat Metric	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Biological or Other	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Table 7. Baseline Stream Summary
Big Cedar Creek Restoration Site Contract No. D06054-D
#REF!

Parameter	USGS Gauge	Regional Curve Interval			Pre-Existing Condition						Reference Reach(es) Data Spencer Creek					
Dimension and Substrate - Riffle		LL	UL	Eq.	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n
BF Width (ft)	-----	7.5	27.0	12.8	-----	17.6	-----	-----	-----	1	-----	8.7	-----	-----	-----	1
Floodprone Width (ft)	-----	-----	-----	-----	-----	>115.2	-----	-----	-----	1	-----	228.5	-----	-----	-----	1
BF Mean Depth (ft)	-----	1.0	2.5	1.6	-----	1.2	-----	-----	-----	1	-----	1.2	-----	-----	-----	1
BF Max Depth (ft)	-----	-----	-----	-----	-----	2.4	-----	-----	-----	1	-----	1.9	-----	-----	-----	1
BF Cross-sectional Area (ft^2)	-----	12.0	43.0	24.0	-----	20.9	-----	-----	-----	1	-----	10.6	-----	-----	-----	1
Width/Depth Ratio	-----	-----	-----	-----	-----	14.7	-----	-----	-----	1	-----	7.3	-----	-----	-----	1
Entrenchment Ratio	-----	-----	-----	-----	-----	>6.5	-----	-----	-----	1	-----	26.3	-----	-----	-----	1
Bank Height Ratio	-----	-----	-----	-----	-----	1.4	-----	-----	-----	1	-----	1.0	-----	-----	-----	1
d50 (mm)	-----	-----	-----	-----	-----	16.0	-----	-----	-----	1	-----	8.6	-----	-----	-----	-----
Pattern																
Channel Beltwidth (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	24.0	-----	-----	52.0	-----	2
Radius of Curvature (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	5.4	-----	-----	22.1	-----	5
Rc:Bankfull Width (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.6	-----	-----	2.5	-----	5
Meander Wavelength (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	54.0	-----	-----	196.0	-----	2
Meander Width Ratio	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	2.8	-----	-----	6.0	-----	2
Profile																
Riffle Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Riffle Slope (ft/ft)	-----	-----	-----	-----	0.0274	-----	-----	0.0628	-----	2	0.0100	-----	-----	0.0670	-----	2
Pool Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Pool Spacing (ft)	-----	-----	-----	-----	27.2	-----	-----	539.5	-----	-----	13	-----	-----	46.5	-----	5
Pool Max Depth (ft)	-----	-----	-----	-----	-----	2.1	-----	-----	-----	-----	-----	2.5	-----	-----	-----	1
Pool Volume (ft^3)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Substrate and Transport Parameters																
Ri% / Ru% / P% / G% / S%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
SC% / Sa% / G% / B% / Be%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
d16 / d35 / d50 / d84 / d95	-----	-----	-----	-----			<0.063 / 8 / 16 / 110 / 1024						0.06 / 3 / 8.6 / 77 / 180			
Reach Shear Stress (competency) lb/f²	-----	-----	-----	-----	-----	0.9	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Max part size (mm) mobilized at bankfull (Rosgen Curve	-----	-----	-----	-----	-----	225.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Stream Power (transport capacity) W/m²	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Additional Reach Parameters																
Drainage Area (SM)	-----	-----	-----	-----	1.0	-----	-----	1.2	-----	-----	-----	-----	-----	0.5	-----	-----
Impervious cover estimate (%)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Rosgen Classification	-----	-----	-----	-----	-----	C4/1	-----	-----	-----	-----	-----	E4/C4	-----	-----	-----	-----
BF Velocity (fps)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF Discharge (cfs)	-----	35.0	290.0	100.3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Valley Length (ft)	-----	-----	-----	-----	-----	1518.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel length (ft)	-----	-----	-----	-----	-----	1518.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Sinuosity	-----	-----	-----	-----	-----	1.00	-----	-----	-----	-----	-----	1.10	-----	-----	-----	-----
Water Surface Slope (Channel) (ft/ft)	-----	-----	-----	-----	-----	0.0134	-----	-----	-----	-----	-----	0.013	-----	-----	-----	-----
BF Slope (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Banfull Floodplain Area (Acres	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BEHI VL% / L% / M% / H% / VH% / E%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel Stability or Habitat Metric	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Biological or Other	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Table 7. Baseline Stream Summary
Big Cedar Creek Restoration Site Contract No. D06054-D
UT1 Reach 3 (1885 LF)

Parameter	Design						As-built						Year 1						Year 2						Year 3					
Dimension and Substrate - Riffle	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n
BF Width (ft)	-----	15.0	-----	-----	-----	1	15.1	15.5	15.3	16.2	0.5	3	14.0	15.6	15.8	16.9	1.5	3	14.2	15.2	14.7	16.6	1.0	3	14.1	14.4	14.4	14.8	0.3	3
Floodprone Width (ft)	-----	85.2	-----	-----	-----	1	56.9	57.5	57.1	58.6	0.8	3	56.9	57.6	57.1	58.8	1.0	3	56.9	57.6	57.1	58.7	0.8	3	57.0	57.6	57.0	58.6	0.9	3
BF Mean Depth (ft)	-----	1.2	-----	-----	-----	1	1.2	1.2	1.2	1.3	0.1	3	1.1	1.2	1.1	1.3	0.1	3	1.0	1.1	1.1	1.2	0.1	3	1.0	1.1	1.0	1.2	0.1	3
BF Max Depth (ft)	-----	1.5	-----	-----	-----	1	1.7	1.9	1.8	2.2	0.2	3	1.6	1.9	1.7	2.3	0.4	3	1.6	1.7	1.7	1.9	0.1	3	1.5	1.7	1.7	1.8	0.1	3
BF Cross-sectional Area (ft^2)	-----	17.3	-----	-----	-----	1	17.8	18.9	17.9	21.0	1.5	3	15.0	18.3	17.8	22.0	3.5	3	14.6	17.0	18.0	18.4	0.7	3	14.5	15.5	14.6	17.3	1.6	3
Width/Depth Ratio	-----	12.5	-----	-----	-----	1	12.6	12.8	12.7	13.1	0.2	3	12.9	13.3	13.1	14.0	0.6	3	12.0	13.6	13.9	15.0	0.7	3	12.6	13.5	13.7	14.3	0.9	3
Entrenchment Ratio	-----	5.7	-----	-----	-----	1	3.6	3.7	3.7	3.8	0.1	3	3.4	3.6	3.6	3.7	0.2	3	3.5	3.7	3.6	4.0	0.2	3	3.9	4.0	4.0	4.1	0.1	3
Bank Height Ratio	-----	1.0	-----	-----	-----	1	1.0	1.0	1.0	1.0	0.0	3	1.0	1.0	1.0	1.0	0.0	3	1.0	1.0	1.0	1.0	0.0	3	1.0	1.0	1.0	1.0	0.0	3
d50 (mm)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	37.0	-----	-----	-----	1	-----	-----	-----	-----	-----	1	-----	-----	-----	-----	-----	1
Pattern																														
Channel Beltwidth (ft)	22.0	-----	-----	65.0	-----	18	29.0	63.7	68.0	76.0	12.9	18	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Radius of Curvature (ft)	30.0	-----	-----	50.0	-----	19	29.0	38.4	37.0	52.0	6.8	19	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Rc:Bankfull width (ft/ft)	2.0	-----	-----	3.3	-----	19	1.9	-----	-----	3.4	-----	1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Meander Wavelength (ft)	127.0	-----	-----	198.0	-----	17	129.7	177.7	181.2	220.1	22.0	18	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Meander Width Ratio	1.5	-----	-----	4.3	-----	18	1.9	-----	-----	4.9	-----	18	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Profile																														
Riffle Length (ft)	-----	-----	-----	-----	-----	-----	31.0	55.0	59.0	85.0	15.0	18	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Riffle Slope (ft/ft)	0.0175	-----	-----	0.0354	-----	19	0.0100	0.0220	0.0200	0.0390	0.008	18	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Pool Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Pool Spacing (ft)	61.0	-----	-----	137.0	-----	19	23.0	94.0	106.5	134.0	30.0	20	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Pool Max Depth (ft)	-----	3.3	-----	-----	-----	1	3.0	-----	-----	3.0	-----	2	2.7	-----	-----	2.7	-----	2	2.9	-----	-----	3.1	-----	2	3.0	-----	-----	3.3	-----	2
Pool Volume (ft^3)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Substrate and Transport Parameters																														
Ri% / Ru% / P% / G% / S%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
SC% / Sa% / G% / B% / Be%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
d16 / d35 / d50 / d84 / d95	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	11.3 / 21 / 37 / 120 / 180												10 / 25 /37 / 95 / 170					
Reach Shear Stress (competency) lb/f²	-----	0.7	-----	-----	-----	-----	-----	0.8	-----	-----	-----	1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Max part size (mm) mobilized at bankfull (Rosgen Curve	-----	190.0	-----	-----	-----	-----	-----	200.0	-----	-----	-----	1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Stream Power (transport capacity) W/m²	-----	-----	-----	-----	-----	-----	-----	57.9	-----	-----	-----	1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Additional Reach Parameters																														
Drainage Area (SM)	0.9	-----	-----	1.1	-----	-----	0.9	-----	-----	1.1	-----	-----	0.9	-----	-----	1.1	-----	-----	0.9	-----	-----	1.1	-----	-----	0.9	-----	-----	1.1	-----	-----
Impervious cover estimate (%)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Rosgen Classificatior	-----	C4	-----	-----	-----	-----	-----	E/C	-----	-----	-----	-----	-----	E/C	-----	-----	-----	-----	-----	E/C	-----	-----	-----	-----	-----	E/C	-----	-----	-----	-----
BF Velocity (fps)	-----	5.5	-----	-----	-----	-----	-----	5.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF Discharge (cfs)	-----	95.0	-----	-----	-----	-----	-----	95.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Valley Length	-----	-----	-----	-----	-----	-----	-----	1571.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel length (ft)	-----	1954.0	-----	-----	-----	-----	-----	1885.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Sinuosity	-----	1.20	-----	-----	-----	-----	-----	1.20	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Water Surface Slope (Channel) (ft/ft)	-----	0.0118	-----	-----	-----	-----	-----	0.0120	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF slope (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Bankfull Floodplain Area (acres)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BEHI VL% / L% / M% / H% / VH% / E%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel Stability or Habitat Metric	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Biological or Other	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Table 7. Baseline Stream Summary

Big Cedar Creek Restoration Site Contract No. D06054-D

#REF!

Parameter	USGS Gauge	Regional Curve Interval			Pre-Existing Condition						Reference Reach(es) Data Spencer Creek					
Dimension and Substrate - Riffle		LL	UL	Eq.	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n
BF Width (ft)	-----	7.5	27.0	12.9	-----	23.1	-----	-----	-----	1	-----	8.7	-----	-----	-----	1
Floodprone Width (ft)	-----	-----	-----	-----	-----	69.2	-----	-----	-----	1	-----	228.5	-----	-----	-----	1
BF Mean Depth (ft)	-----	1.0	2.5	1.6	-----	1.0	-----	-----	-----	1	-----	1.2	-----	-----	-----	1
BF Max Depth (ft)	-----	-----	-----	-----	-----	1.8	-----	-----	-----	1	-----	1.9	-----	-----	-----	1
BF Cross-sectional Area (ft^2)	-----	12.0	43.0	24.4	-----	22.6	-----	-----	-----	1	-----	10.6	-----	-----	-----	1
Width/Depth Ratio	-----	-----	-----	-----	-----	23.1	-----	-----	-----	1	-----	7.3	-----	-----	-----	1
Entrenchment Ratio	-----	-----	-----	-----	-----	3.0	-----	-----	-----	1	-----	26.3	-----	-----	-----	1
Bank Height Ratio	-----	-----	-----	-----	-----	1.8	-----	-----	-----	1	-----	1.0	-----	-----	-----	1
d50 (mm)	-----	-----	-----	-----	-----	32.0	-----	-----	-----	1	-----	8.6	-----	-----	-----	1
Pattern																
Channel Beltwidth (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	24.0	-----	-----	52.0	-----	2
Radius of Curvature (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	5.4	-----	-----	22.1	-----	5
Rc:Bankfull Width (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.6	-----	-----	2.5	-----	5
Meander Wavelength (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	54.0	-----	-----	196.0	-----	2
Meander Width Ratio	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	2.8	-----	-----	6.0	-----	2
Profile																
Riffle Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Riffle Slope (ft/ft)	-----	-----	-----	-----	0.0264	-----	-----	0.2521	-----	-----	0.0100	-----	-----	0.0670	-----	2
Pool Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
Pool Spacing (ft)	-----	-----	-----	-----	34.4	-----	-----	156.4	-----	-----	13.0	-----	-----	46.5	-----	5
Pool Max Depth (ft)	-----	-----	-----	-----	-----	3.0	-----	-----	-----	-----	-----	2.5	-----	-----	-----	1
Pool Volume (ft^3)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Substrate and Transport Parameters																
Ri% / Ru% / P% / G% / S%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
SC% / Sa% / G% / B% / Be%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
d16 / d35 / d50 / d84 / d95	-----	-----	-----	-----			<0.063 / 11 / 32 / 100 / 180						0.06 / 3 / 8.6 / 77 / 180			
Reach Shear Stress (competency) lb/f^2	-----	-----	-----	-----	-----	0.8	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Max part size (mm) mobilized at bankfull (Rosgen Curve	-----	-----	-----	-----	-----	200.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Stream Power (transport capacity) W/m^2	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Additional Reach Parameters																
Drainage Area (SM)	-----	-----	-----	-----	1.2	-----	-----	1.2	-----	-----	-----	-----	-----	0.5	-----	-----
Impervious cover estimate (%)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Rosgen Classification	-----	-----	-----	-----	-----	C4/1	-----	-----	-----	-----	-----	E4/C4	-----	-----	-----	-----
BF Velocity (fps)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF Discharge (cfs)	-----	35.0	290.0	102.2	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Valley Length (ft)	-----	-----	-----	-----	-----	850.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel length (ft)	-----	-----	-----	-----	-----	935.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Sinuosity	-----	-----	-----	-----	-----	1.10	-----	-----	-----	-----	-----	1.10	-----	-----	-----	-----
Water Surface Slope (Channel) (ft/ft)	-----	-----	-----	-----	-----	0.0145	-----	-----	-----	-----	-----	0.0132	-----	-----	-----	-----
BF Slope (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Banfull Floodplain Area (Acres	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BEHI VL% / L% / M% / H% / VH% / E%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel Stability or Habitat Metric	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Biological or Other	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Table 7. Baseline Stream Summary
Big Cedar Creek Restoration Site Contract No. D06054-D
UT1 Reach 4 (996 LF)

Parameter	Design						As-built						Year 1						Year 2						Year 3					
Dimension and Substrate - Riffle	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n
BF Width (ft)	-----	16.0	-----	-----	-----	1	16.7	18.7	16.8	22.6	2.8	3	16.3	18.4	16.5	22.5	3.5	3	17.20	19.5	18.66	22.52	2.75	3	15.6	19.3	19.0	23.4	3.9	3
Floodprone Width (ft)	-----	87.0	-----	-----	-----	1	51.3	57.8	58.6	63.5	5.0	3	56.4	59.5	58.4	63.7	3.8	3	52.80	58.3	58.54	63.63	5.42	3	58.6	60.9	60.4	63.8	2.6	3
BF Mean Depth (ft)	-----	1.3	-----	-----	-----	1	1.2	1.3	1.3	1.5	0.1	3	1.2	1.5	1.3	2.0	0.4	3	1.11	1.4	1.36	1.82	0.36	3	1.1	1.4	1.5	1.6	0.2	3
BF Max Depth (ft)	-----	1.7	-----	-----	-----	1	1.8	2.0	2.0	2.3	0.2	3	1.9	2.3	2.0	3.0	0.6	3	1.66	2.4	2.51	3.01	0.68	3	1.8	2.3	2.4	2.6	0.4	3
BF Cross-sectional Area (ft^2)	-----	20.0	-----	-----	-----	1	21.3	24.8	25.3	27.8	2.7	3	20.6	27.2	27.7	33.2	6.3	3	23.35	27.4	25.05	33.93	5.68	3	22.8	26.3	26.7	29.4	3.3	3
Width/Depth Ratio	-----	12.3	-----	-----	-----	1	11.2	14.2	13.1	18.4	3.1	3	8.2	13.1	12.9	18.3	5.1	3	10.26	14.4	12.67	20.25	5.21	3	10.6	14.4	12.2	20.4	5.3	3
Entrenchment Ratio	-----	5.4	-----	-----	-----	1	2.3	3.2	3.5	3.8	0.7	3	2.5	3.3	3.6	3.9	0.7	3	2.09	3.0	3.40	3.41	0.76	3	2.6	3.1	2.9	3.8	0.6	3
Bank Height Ratio	-----	1.0	-----	-----	-----	1	1.0	1.0	1.0	1.0	1.0	3	1.0	1.0	1.0	1.0	0.0	3	1.0	1.0	1.0	1.0	0.0	3	1.0	1.0	1.0	1.0	0.0	3
d50 (mm)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	40.0	-----	-----	-----	1	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	----
Pattern																														
Channel Beltwidth (ft)	31.0	-----	-----	47.0	-----	7	38.0	55.3	41.0	112.0	26.4	7	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Radius of Curvature (ft)	32.0	-----	-----	50.0	-----	9	14.0	36.3	36.0	55.0	1.1	9	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Rc:Bankfull width (ft/ft)	2.0	-----	-----	3.1	-----	9	0.9	-----	-----	3.6	-----	9	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Meander Wavelength (ft)	133.0	-----	-----	168.0	-----	5	136.3	156.1	159.8	181.0	62.9	6	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Meander Width Ratio	1.9	-----	-----	2.9	-----	7	2.0	-----	-----	3.6	-----	7	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Profile																														
Riffle Length (ft)	-----	-----	-----	-----	-----	-----	37.0	55.0	54.0	79.0	13.0	10	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Riffle Slope (ft/ft)	0.0222	-----	-----	0.0301	-----	12	0.0050	0.0220	0.0230	0.0310	0.0070	10	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Pool Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Pool Spacing (ft)	64.0	-----	-----	105.0	-----	9	66.0	81.0	75.0	106.0	13.0	9	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Pool Max Depth (ft)	-----	4.0	-----	-----	-----	1	-----	4.6	-----	-----	-----	1	-----	4.3	-----	-----	-----	1	-----	4.0	-----	-----	-----	1	-----	4.5	-----	-----	-----	1
Pool Volume (ft^3)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Substrate and Transport Parameters																														
Ri% / Ru% / P% / G% / S%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
SC% / Sa% / G% / B% / Be%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
d16 / d35 / d50 / d84 / d95	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----			11.3 / 26 / 40 / 83 / 180				-----	-----	-----	-----	-----	-----			18 / 37 / 51 / 100 / 163			
Reach Shear Stress (competency) lb/f²	-----	1.1	-----	-----	-----	-----	-----	1.2	-----	-----	-----	1	-----	-----	-----	-----	-----	1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Max part size (mm) mobilized at bankfull (Rosgen Curve	-----	250.0	-----	-----	-----	-----	-----	290.0	-----	-----	-----	1	-----	-----	-----	-----	-----	1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Stream Power (transport capacity) W/m²	-----	-----	-----	-----	-----	-----	-----	68.2	-----	-----	-----	1	-----	-----	-----	-----	-----	1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Additional Reach Parameters																														
Drainage Area (SM)	1.1	-----	-----	1.2	-----	-----	1.1	-----	-----	1.2	-----	-----	1.1	-----	-----	1.2	-----	-----	1.1	-----	-----	1.2	-----	-----	1.1	-----	-----	1.2	-----	-----
Impervious cover estimate (%)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Rosgen Classificatior	-----	B4c	-----	-----	-----	-----	-----	C	-----	-----	-----	-----	-----	C	-----	-----	-----	-----	-----	E/C	-----	-----	-----	-----	-----	E/C	-----	-----	-----	-----
BF Velocity (fps)	-----	5.0	-----	-----	-----	-----	-----	4.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF Discharge (cfs)	-----	100.0	-----	-----	-----	-----	-----	100.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Valley Length	-----	-----	-----	-----	-----	-----	-----	915.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel length (ft)	-----	1501.0	-----	-----	-----	-----	-----	997.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Sinuosity	-----	1.00	-----	-----	-----	-----	-----	1.09	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Water Surface Slope (Channel) (ft/ft)	-----	0.0161	-----	-----	-----	-----	-----	0.0160	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF slope (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Bankfull Floodplain Area (acres)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BEHI VL% / L% / M% / H% / VH% / E%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel Stability or Habitat Metric	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Biological or Other	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Table 7. Baseline Stream Summary
Big Cedar Creek Restoration Site Contract No. D06054-D
#REF!

Parameter	USGS Gauge	Regional Curve Interval			Pre-Existing Condition						Reference Reach(es) Data Spencer Creek					
Dimension and Substrate - Riffle		LL	UL	Eq.	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n
BF Width (ft)	-----	5.5	21.0	9.2	-----	9.2	-----	-----	-----	1	-----	8.7	-----	-----	-----	1
Floodprone Width (ft)	-----	-----	-----	-----	-----	>142.2	-----	-----	-----	1	-----	228.5	-----	-----	-----	1
BF Mean Depth (ft)	-----	0.8	2.1	1.2	-----	1.2	-----	-----	-----	1	-----	1.2	-----	-----	-----	1
BF Max Depth (ft)	-----	-----	-----	-----	-----	1.6	-----	-----	-----	1	-----	1.9	-----	-----	-----	1
BF Cross-sectional Area (ft^2)	-----	7.0	27.0	14.3	-----	10.8	-----	-----	-----	1	-----	10.6	-----	-----	-----	1
Width/Depth Ratio	-----	-----	-----	-----	-----	7.7	-----	-----	-----	1	-----	7.3	-----	-----	-----	1
Entrenchment Ratio	-----	-----	-----	-----	-----	>15.5	-----	-----	-----	1	-----	26.3	-----	-----	-----	1
Bank Height Ratio	-----	-----	-----	-----	-----	1.3	-----	-----	-----	1	-----	1.0	-----	-----	-----	1
d50 (mm)	-----	-----	-----	-----	-----	15.0	-----	-----	-----	1	-----	8.6	-----	-----	-----	-----
Pattern		-----	-----													
Channel Beltwidth (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	24.0	-----	-----	52.0	-----	2
Radius of Curvature (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	5.4	-----	-----	22.1	-----	5
Rc:Bankfull Width (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.6	-----	-----	2.5	-----	5
Meander Wavelength (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	54.0	-----	-----	196.0	-----	2
Meander Width Ratio	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	2.8	-----	-----	6.0	-----	2
Profile																
Riffle Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Riffle Slope (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.0100	-----	-----	0.0670	-----	2
Pool Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
Pool Spacing (ft)	-----	-----	-----	-----	61.0	-----	-----	114.0	-----	-----	13.0	-----	-----	46.5	-----	5
Pool Max Depth (ft)	-----	-----	-----	-----	-----	2.2	-----	-----	-----	-----	-----	2.5	-----	-----	-----	1
Pool Volume (ft^3)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Substrate and Transport Parameters																
Ri% / Ru% / P% / G% / S%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
SC% / Sa% / G% / B% / Be%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
d16 / d35 / d50 / d84 / d95	-----	-----	-----	-----			<0.063 / 8 / 15 / 64 / 90						0.06 / 3 / 8.6 / 77 / 180			
Reach Shear Stress (competency) lb/f²	-----	-----	-----	-----	-----	1.3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Max part size (mm) mobilized at bankfull (Rosgen Curve	-----	-----	-----	-----	-----	300.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Stream Power (transport capacity) W/m²	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Additional Reach Parameters																
Drainage Area (SM)	-----	-----	-----	-----	0.5	-----	-----	0.6	-----	-----	-----	-----	-----	0.5	-----	-----
Impervious cover estimate (%)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Rosgen Classification	-----	-----	-----	-----	-----	G4	-----	-----	-----	-----	-----	E4/C4	-----	-----	-----	-----
BF Velocity (fps)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF Discharge (cfs)	-----	20.0	175.0	57.8	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Valley Length (ft)	-----	-----	-----	-----	-----	568.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel length (ft)	-----	-----	-----	-----	-----	625.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Sinuosity	-----	-----	-----	-----	-----	1.10	-----	-----	-----	-----	-----	1.10	-----	-----	-----	-----
Water Surface Slope (Channel) (ft/ft)	-----	-----	-----	-----	-----	0.0215	-----	-----	-----	-----	-----	0.0130	-----	-----	-----	-----
BF Slope (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Banfull Floodplain Area (Acres	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BEHI VL% / L% / M% / H% / VH% / E%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel Stability or Habitat Metric	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Biological or Other	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Table 7. Baseline Stream Summary
Big Cedar Creek Restoration Site Contract No. D06054-D
UT2 (609 LF)

Parameter	Design						As-built						Year 1						Year 2						Year 3					
Dimension and Substrate - Riffle	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n
BF Width (ft)	-----	13	-----	-----	-----	1	-----	13.4	-----	-----	-----	1	-----	13.2	-----	-----	-----	1	-----	14.4	-----	-----	-----	1	-----	15.6	-----	-----	-----	1
Floodprone Width (ft)	-----	74.0+	-----	-----	-----	1	-----	63.1	-----	-----	-----	1	-----	63.1	-----	-----	-----	1	-----	63.2	-----	-----	-----	1	-----	63.0	-----	-----	-----	1
BF Mean Depth (ft)	-----	1.1	-----	-----	-----	1	-----	1.4	-----	-----	-----	1	-----	1.5	-----	-----	-----	1	-----	1.2	-----	-----	-----	1	-----	1.5	-----	-----	-----	1
BF Max Depth (ft)	-----	1.4	-----	-----	-----	1	-----	1.9	-----	-----	-----	1	-----	2.1	-----	-----	-----	1	-----	1.8	-----	-----	-----	1	-----	2.9	-----	-----	-----	1
BF Cross-sectional Area (ft^2)	-----	14.3	-----	-----	-----	1	-----	18.1	-----	-----	-----	1	-----	20.1	-----	-----	-----	1	-----	17.4	-----	-----	-----	1	-----	23.8	-----	-----	-----	1
Width/Depth Ratio	-----	11.8	-----	-----	-----	1	-----	9.9	-----	-----	-----	1	-----	8.7	-----	-----	-----	1	-----	11.9	-----	-----	-----	1	-----	10.3	-----	-----	-----	1
Entrenchment Ratio	-----	5.7+	-----	-----	-----	1	-----	4.7	-----	-----	-----	1	-----	4.8	-----	-----	-----	1	-----	4.4	-----	-----	-----	1	-----	4.0	-----	-----	-----	1
Bank Height Ratio	-----	1.0	-----	-----	-----	1	-----	1.0	-----	-----	-----	1	-----	1.0	-----	-----	-----	1	-----	1.0	-----	-----	-----	1	-----	1.0	-----	-----	-----	1
d50 (mm)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	22.6	-----	-----	-----	1	-----	-----	-----	-----	-----	----	-----	34	-----	-----	-----	----
Pattern																														
Channel Beltwidth (ft)	46.0	-----	-----	55.0	-----	7	44.0	52.6	53.0	61.0	5.6	7	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Radius of Curvature (ft)	23.0	-----	-----	37.0	-----	7	25.0	31.6	30.0	43.0	6.4	7	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Rc:Bankfull width (ft/ft)	1.8	-----	-----	2.8	-----	7	2.5	-----	-----	3.6	-----	7	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Meander Wavelength (ft)	98.0	-----	-----	142.0	-----	6	99.0	122.4	120.5	147.8	17.0	6	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Meander Width Ratio	3.5	-----	-----	4.2	-----	7	5.4	-----	-----	6.7	-----	1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Profile																														
Riffle Length (ft)	-----	-----	-----	-----	-----	-----	20.0	40.8	43.0	56.0	12.5	8	20.0	26.0	28.0	30.0	5.3	3	29.0	31.0	39.0	58.0	16.2	3	23	31	28	41	9	9
Riffle Slope (ft/ft)	0.0230	-----	-----	0.0504	-----	8	0.0090	0.0280	0.0280	0.0490	0.0120	8	0.02	0.02	0.02	0.03	0.00	3	0.02	0.03	0.03	0.05	0.02	3	0.02	0.03	0.03	0.03	0.03	3
Pool Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Pool Spacing (ft)	62.0	-----	-----	99.0	-----	7	55.0	76.0	73.0	103.0	15.7	7	-----	93.0	-----	93.0	-----	1	-----	87.0	-----		-----	1	-----	102.0	-----		-----	1
Pool Max Depth (ft)	-----	3.6	-----	-----	-----	1	-----	2.5	-----	-----	-----	1	-----	2.6	-----	-----	-----	1	-----	3.0	-----	-----	-----	1	-----	2.8	-----	-----	-----	1
Pool Volume (ft^3)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Substrate and Transport Parameters																														
Ri% / Ru% / P% / G% / S%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
SC% / Sa% / G% / B% / Be%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
d16 / d35 / d50 / d84 / d95	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----			6.5 / 16 / 22.6 / 60 / 100				-----	-----	-----	-----	-----	-----			12 / 25 / 34 / 60 / 141			
Reach Shear Stress (competency) lb/f²	-----	0.9	-----	-----	-----	-----	-----	1.0	-----	-----	-----	1	-----	0.9	-----	-----	-----	1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Max part size (mm) mobilized at bankfull (Rosgen Curve	-----	220.0	-----	-----	-----	-----	-----	250.0	-----	-----	-----	1	-----	205.0	-----	-----	-----	1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Stream Power (transport capacity) W/m²	-----	-----	-----	-----	-----	-----	-----	44.0	-----	-----	-----	1	-----	34.5	-----	-----	-----	1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Additional Reach Parameters																														
Drainage Area (SM)	0.5	-----	-----	0.6	-----	-----	0.5	-----	-----	0.6	-----	-----	0.5	-----	-----	0.6	-----	-----	0.5	-----	-----	0.6	-----	-----	0.5	-----	-----	0.6	-----	-----
Impervious cover estimate (%)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Rosgen Classificatior	-----	E/C4	-----	-----	-----	-----	-----	E	-----	-----	-----	-----	-----	E	-----	-----	-----	-----	-----	E/C	-----	-----	-----	-----	-----	E/C	-----	-----	-----	-----
BF Velocity (fps)	-----	3.9	-----	-----	-----	-----	-----	3.1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF Discharge (cfs)	-----	56.0	-----	-----	-----	-----	-----	56.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Valley Length	-----	-----	-----	-----	-----	-----	-----	476.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel length (ft)	-----	605.0	-----	-----	-----	-----	-----	609.0	-----	-----	-----	-----	-----	191.0	-----	-----	-----	-----	-----	206.0	-----	-----	-----	-----	-----	206.0	-----	-----	-----	-----
Sinuosity	-----	1.20	-----	-----	-----	-----	-----	1.28	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Water Surface Slope (Channel) (ft/ft)	-----	0.0150	-----	-----	-----	-----	-----	0.0140	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF slope (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.011	-----	-----	-----	-----	-----	0.014	-----	-----	-----	-----	-----	0.014	-----	-----	-----	-----
Bankfull Floodplain Area (acres)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BEHI VL% / L% / M% / H% / VH% / E%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel Stability or Habitat Metric	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Biological or Other	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Table 8. Morphology and Hydraulic Monitoring Summary

Big Cedar Creek Restoration Site: Project No. D06054-D

Big Cedar Creek Reach 1 (603 LF)

	Cross-section 1 (Riffle)						Cross-section 2 (Pool)																	
Dimension and substrate	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5
Based on fixed baseline bankfull elevation																								
BF Width (ft)	19.6	19.5	21.1	19.5			28.0	27.3	27.0	25.7														
BF Mean Depth (ft)	1.9	1.8	1.8	1.7			1.8	1.7	1.7	1.8														
Width/Depth Ratio	10.4	10.7	12.1	11.3			15.7	15.7	16.0	14.3														
BF Cross-sectional Area (ft²)	37.1	35.6	36.9	33.9			50.1	47.5	45.3	46.3														
BF Max Depth (ft)	2.7	2.6	2.8	2.8			3.9	3.75	3.6	3.4														
Width of Floodprone Area (ft)	>64.7	>65.2	>65.22	>65.28			>78.0	>78.0	>77.9	>77.87														
Entrenchment Ratio	>3.3	3.3	3.1	3.3			N/A	N/A	N/A	N/A														
Bank Height Ratio	1.0	1.0	1.0	1.0			1.0	1.0	1.0	1.0														
Wetted Perimeter (ft)	23.4	23.1	24.6	23.0			31.6	30.7	30.3	29.3														
Hydraulic Radius (ft)	1.6	1.5	1.5	1.5			1.6	1.5	1.5	1.6														
Based on current/developing bankfull feature																								
BF Width (ft)																								
BF Mean Depth (ft)																								
Width/Depth Ratio																								
BF Cross-sectional Area (ft²)																								
BF Max Depth (ft)																								
Width of Floodprone Area (ft)																								
Entrenchment Ratio																								
Bank Height Ratio																								
Wetted Perimeter (ft)																								
Hydraulic Radius (ft)																								
Cross Sectional Area between end pins (ft^2)	-						-																	
d50 (mm)	-			49.22			-			<0.063														

Dimension and substrate	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5
Based on fixed baseline bankfull elevation																								
BF Width (ft)																								
BF Mean Depth (ft)																								
Width/Depth Ratio																								
BF Cross-sectional Area (ft²)																								
BF Max Depth (ft)																								
Width of Floodprone Area (ft)																								
Entrenchment Ratio																								
Bank Height Ratio																								
Wetted Perimeter (ft)																								
Hydraulic Radius (ft)																								
Based on current/developing bankfull feature																								
BF Width (ft)																								
BF Mean Depth (ft)																								
Width/Depth Ratio																								
BF Cross-sectional Area (ft²)																								
BF Max Depth (ft)																								
Width of Floodprone Area (ft)																								
Entrenchment Ratio																								
Bank Height Ratio																								
Wetted Perimeter (ft)																								
Hydraulic Radius (ft)																								
Cross Sectional Area between end pins (ft^2)																								
d50 (mm)																								

Table 8. Morphology and Hydraulic Monitoring Summary

Big Cedar Creek Restoration Site: Project No. D06054-D

Big Cedar Creek Reach 2 (2239 LF)

	Cross-section 3 (Riffle)						Cross-section 4 (Pool)						Cross-section 5 (Riffle)						Cross-section 6 (Pool)					
Dimension and substrate	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5
Based on fixed baseline bankfull elevation																								
BF Width (ft)	25.7	25.2	27.6	26.1			33.0	33.1	34.0	36.2			22.5	22.5	22.5	21.0			34.8	35.7	32.0	31.2		
BF Mean Depth (ft)	2.5	2.3	2.3	2.4			2.3	2.0	2.1	2.2			2.2	2.5	2.7	2.5			2.5	2.34	2.3	2.2		
Width/Depth Ratio	10.4	10.8	12.1	11.0			14.6	16.3	16.4	16.7			10.2	9.0	8.2	8.6			13.7	15.25	14.1	14.2		
BF Cross-sectional Area (ft²)	63.1	59.0	62.8	61.8			74.3	67.2	70.5	78.7			49.7	56.2	61.4	51.4			88.2	83.4	72.5	68.6		
BF Max Depth (ft)	3.9	3.8	3.9	4.0			5.5	5.7	5.9	6.1			3.3	4.2	4.6	3.6			5.5	5.21	5.4	5.0		
Width of Floodprone Area (ft)	>75.8	>75.7	>75.8	>75.78			>83.5	>83.5	>83.6	>83.57			>74.4	>74.3	>74.3	>74.29			>86.2	>86.2	>86.3	>86.24		
Entrenchment Ratio	>3.0	3.0	2.8	2.9			N/A	N/A	N/A	N/A			>3.3	3.3	3.3	3.5			N/A	N/A	N/A	N/A		
Bank Height Ratio	1.0	1.0	1.0	1.0			1.0	1.0	1.0	1.0			1.0	1.0	1.0	1.0			1.0	1.0	1.0	1.0		
Wetted Perimeter (ft)	30.6	29.9	32.1	30.8			37.5	37.1	38.1	40.6			26.9	27.5	27.9	25.9			39.9	40.4	36.5	35.6		
Hydraulic Radius (ft)	2.1	2.0	2.0	2.0			2.0	1.8	1.8	1.9			1.8	2.0	2.2	2.0			2.2	2.1	2.0	1.9		
Based on current/developing bankfull feature																								
BF Width (ft)																								
BF Mean Depth (ft)																								
Width/Depth Ratio																								
BF Cross-sectional Area (ft²)																								
BF Max Depth (ft)																								
Width of Floodprone Area (ft)																								
Entrenchment Ratio																								
Bank Height Ratio																								
Wetted Perimeter (ft)																								
Hydraulic Radius (ft)																								
Cross Sectional Area between end pins (ft²)	-						-						-						-					
d50 (mm)	-						-			<0.063			-			97.037			-					

	Cross-section 7 (Riffle)																							
Dimension and substrate	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5
Based on fixed baseline bankfull elevation																								
BF Width (ft)	22.3	22.3	23.8	23.7																				
BF Mean Depth (ft)	2.5	2.58	2.7	2.8																				
Width/Depth Ratio	8.9	8.65	8.8	8.4																				
BF Cross-sectional Area (ft²)	55.6	57.6	64.5	66.6																				
BF Max Depth (ft)	3.9	4.1	4.6	4.6																				
Width of Floodprone Area (ft)	>75.8	>74.5	>74.5	>74.46																				
Entrenchment Ratio	>3.4	3.3	3.1	3.1																				
Bank Height Ratio	1.0	1.0	1.0	1.0																				
Wetted Perimeter (ft)	27.3	27.5	29.2	29.3																				
Hydraulic Radius (ft)	2.0	2.1	2.2	2.3																				
Based on current/developing bankfull feature																								
BF Width (ft)																								
BF Mean Depth (ft)																								
Width/Depth Ratio																								
BF Cross-sectional Area (ft²)																								
BF Max Depth (ft)																								
Width of Floodprone Area (ft)																								
Entrenchment Ratio																								
Bank Height Ratio																								
Wetted Perimeter (ft)																								
Hydraulic Radius (ft)																								
Cross Sectional Area between end pins (ft²)	-																							
d50 (mm)	-																							

Table 8. Morphology and Hydraulic Monitoring Summary

Big Cedar Creek Restoration Site: Project No. D06054-D

Big Cedar Creek Reach 3 (1827 LF)

	Cross-section 8 (Pool)						Cross-section 9 (Riffle)						Cross-section 10 (Riffle)						Cross-section 11 (Riffle)					
Dimension and substrate	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5
Based on fixed baseline bankfull elevation																								
BF Width (ft)	38.8	37.0	34.5	36.8			23.1	22.3	22.2	21.8			24.6	23.1	23.3	24.6			25.0	24.9	26.1	26.5		
BF Mean Depth (ft)	2.5	2.3	2.3	2.4			2.2	2.3	2.3	2.5			2.1	2.2	2.0	2.1			2.5	2.4	2.2	2.4		
Width/Depth Ratio	15.6	15.8	15.0	15.5			10.7	9.8	9.5	8.9			11.7	10.5	11.4	11.9			9.9	10.3	12.0	11.3		
BF Cross-sectional Area (ft²)	96.4	86.6	78.9	87.2			50.1	50.5	51.8	53.5			51.8	50.8	47.6	51.1			63.2	60.4	56.9	62.2		
BF Max Depth (ft)	5.4	5.2	5.4	5.7			3.1	3.1	3.3	3.5			3.1	3.1	3.1	3.1			3.8	3.7	3.5	3.6		
Width of Floodprone Area (ft)	>89.5	>89.5	>89.6	>89.4			>77.8	>77.8	>77.8	>77.22			>77.9	>78	>77.8	>77.36			>82.5	>82.9	>82.9	>82.98		
Entrenchment Ratio	N/A	N/A	N/A	N/A			>3.4	3.5	3.5	3.5			>3.2	3.4	3.3	3.1			>3.3	3.3	3.2	3.1		
Bank Height Ratio	1.0	1.0	1.0	1.0			1.0	1.0	1.0	1.0			1.0	1.0	1.0	1.0			1.0	1.0	1.0	1.0		
Wetted Perimeter (ft)	43.8	41.6	39.0	41.5			27.5	26.9	26.8	26.7			28.8	27.5	27.4	28.8			30.0	29.7	30.5	31.2		
Hydraulic Radius (ft)	2.2	2.1	2.0	2.1			1.8	1.9	1.9	2.0			1.8	1.8	1.7	1.8			2.1	2.0	1.9	2.0		
Based on current/developing bankfull feature																								
BF Width (ft)																								
BF Mean Depth (ft)																								
Width/Depth Ratio																								
BF Cross-sectional Area (ft²)																								
BF Max Depth (ft)																								
Width of Floodprone Area (ft)																								
Entrenchment Ratio																								
Bank Height Ratio																								
Wetted Perimeter (ft)																								
Hydraulic Radius (ft)																								
Cross Sectional Area between end pins (ft^2)	-						-						-						-					
d50 (mm)	-			<0.063			-						-			35.9			-					

	Cross-section 8 (Pool)						Cross-section 9 (Riffle)						Cross-section 10 (Riffle)						Cross-section 11 (Riffle)					
Dimension and substrate	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5
Based on fixed baseline bankfull elevation																								
BF Width (ft)																								
BF Mean Depth (ft)																								
Width/Depth Ratio																								
BF Cross-sectional Area (ft²)																								
BF Max Depth (ft)																								
Width of Floodprone Area (ft)																								
Entrenchment Ratio																								
Bank Height Ratio																								
Wetted Perimeter (ft)																								
Hydraulic Radius (ft)																								
Based on current/developing bankfull feature																								
BF Width (ft)																								
BF Mean Depth (ft)																								
Width/Depth Ratio																								
BF Cross-sectional Area (ft²)																								
BF Max Depth (ft)																								
Width of Floodprone Area (ft)																								
Entrenchment Ratio																								
Bank Height Ratio																								
Wetted Perimeter (ft)																								
Hydraulic Radius (ft)																								
Cross Sectional Area between end pins (ft^2)																								
d50 (mm)																								

Table 8. Morphology and Hydraulic Monitoring Summary

Big Cedar Creek Restoration Site: Project No. D06054-D

Big Cedar Creek Reach 4 (410 LF)

	Cross-section 12 (Pool)						Cross-section 13 (Riffle)																	
Dimension and substrate	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5
Based on fixed baseline bankfull elevation																								
BF Width (ft)	38.0	37.2	40.6	43.3			27.5	27.8	28.0	27.56														
BF Mean Depth (ft)	2.3	2.2	2.2	2.1			2.1	2.3	2.1	2.23														
Width/Depth Ratio	16.3	17.1	18.4	21.1			13.0	12.4	13.1	12.35														
BF Cross-sectional Area (ft²)	88.5	80.7	89.5	89.1			58.3	62.6	59.7	61.5														
BF Max Depth (ft)	4.7	4.3	4.9	4.9			3.2	3.7	3.6	3.17														
Width of Floodprone Area (ft)	>89.2	>89.1	>89.2	>88.7			>81.0	>81.1	>80.9	>80.98														
Entrenchment Ratio	N/A	N/A	N/A	N/A			>2.9	2.9	2.9	2.9														
Bank Height Ratio	1.0	1.0	1.0	1.0			1.0	1.0	1.0	1.0														
Wetted Perimeter (ft)	42.6	41.6	45.0	47.4			31.7	32.4	32.2	32.0														
Hydraulic Radius (ft)	2.1	1.9	2.0	1.9			1.8	1.9	1.9	1.9														
Based on current/developing bankfull feature																								
BF Width (ft)																								
BF Mean Depth (ft)																								
Width/Depth Ratio																								
BF Cross-sectional Area (ft²)																								
BF Max Depth (ft)																								
Width of Floodprone Area (ft)																								
Entrenchment Ratio																								
Bank Height Ratio																								
Wetted Perimeter (ft)																								
Hydraulic Radius (ft)																								
Cross Sectional Area between end pins (ft²)	-						-																	
d50 (mm)	-						-																	

Dimension and substrate	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5
Based on fixed baseline bankfull elevation																								
BF Width (ft)																								
BF Mean Depth (ft)																								
Width/Depth Ratio																								
BF Cross-sectional Area (ft²)																								
BF Max Depth (ft)																								
Width of Floodprone Area (ft)																								
Entrenchment Ratio																								
Bank Height Ratio																								
Wetted Perimeter (ft)																								
Hydraulic Radius (ft)																								
Based on current/developing bankfull feature																								
BF Width (ft)																								
BF Mean Depth (ft)																								
Width/Depth Ratio																								
BF Cross-sectional Area (ft²)																								
BF Max Depth (ft)																								
Width of Floodprone Area (ft)																								
Entrenchment Ratio																								
Bank Height Ratio																								
Wetted Perimeter (ft)																								
Hydraulic Radius (ft)																								
Cross Sectional Area between end pins (ft²)																								
d50 (mm)																								

Table 8. Morphology and Hydraulic Monitoring Summary

Big Cedar Creek Restoration Site: Project No. D06054-D

UT1 Reach 1 (1248 LF)

	Cross-section 14 (Riffle)						Cross-section 15 (Pool)						Cross-section 16 (Riffle)						Cross-section 17 (Pool)					
Dimension and substrate	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5
Based on fixed baseline bankfull elevation																								
BF Width (ft)	14.7	13.7	16.5	13.6			33.3	34.8	24.2	27.3			11.6	12.0	11.9	11.9			24.3	22	25.3	23.3		
BF Mean Depth (ft)	1.0	1.0	0.8	0.9			1.3	1.1	1.3	1.2			1.3	1.3	1.2	1.4			1.3	1.3	1.3	1.23		
Width/Depth Ratio	14.2	14.2	20.4	14.7			26.8	30.5	19.3	22.3			8.8	9.0	9.9	8.7			18.7	16.4	20.2	18.94		
BF Cross-sectional Area (ft²)	15.2	13.7	13.4	12.6			41.6	39.8	30.5	33.4			15.2	16.1	14.3	16.3			31.6	29.5	31.6	28.7		
BF Max Depth (ft)	1.7	1.6	1.6	1.5			3.3	3.1	2.8	3.0			2.1	2.2	2.1	2.2			2.9	2.7	2.7	2.61		
Width of Floodprone Area (ft)	>56.5	>56.4	>56.5	>56.5			>57.2	>57.2	>58.4	>58.34			>48.4	>48.5	>48.4	>48.38			>55.8	>55.5	>55.7	>55.69		
Entrenchment Ratio	>3.8	4.0	3.3	4.1			N/A	N/A	N/A	N/A			>4.2	4.0	4.1	4.1			N/A	N/A	N/A	N/A		
Bank Height Ratio	1.0	1.0	1.0	1.0			1.0	1.0	1.0	1.0			1.0	1.0	1.0	1.0			1.0	1.0	1.0	1		
Wetted Perimeter (ft)	16.7	15.7	18.1	15.5			35.9	37.0	26.8	29.7			14.2	14.6	14.3	14.6			26.9	24.6	27.8	25.8		
Hydraulic Radius (ft)	0.9	0.9	0.7	0.8			1.2	1.1	1.1	1.1			1.1	1.1	1.0	1.1			1.2	1.2	1.1	1.1		
Based on current/developing bankfull feature																								
BF Width (ft)																								
BF Mean Depth (ft)																								
Width/Depth Ratio																								
BF Cross-sectional Area (ft²)																								
BF Max Depth (ft)																								
Width of Floodprone Area (ft)																								
Entrenchment Ratio																								
Bank Height Ratio																								
Wetted Perimeter (ft)																								
Hydraulic Radius (ft)																								
Cross Sectional Area between end pins (ft^2)	-						-						-						-					
d50 (mm)	-			36.88			-			<0.063			-						-					

	Cross-section 18 (Riffle)																							
Dimension and substrate	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5
Based on fixed baseline bankfull elevation																								
BF Width (ft)	13.2	12.8	12.0	12.2																				
BF Mean Depth (ft)	1.1	1.1	1.0	1.1																				
Width/Depth Ratio	12.3	12.1	11.6	11.6																				
BF Cross-sectional Area (ft²)	14.2	13.6	12.4	12.9																				
BF Max Depth (ft)	1.8	1.7	1.6	1.7																				
Width of Floodprone Area (ft)	>56.6	>53.5	>53.5	>53.55																				
Entrenchment Ratio	>4.0	4.2	4.3	4.4																				
Bank Height Ratio	1.0	1.0	1.0	1.0																				
Wetted Perimeter (ft)	15.4	15.0	14.1	14.3																				
Hydraulic Radius (ft)	0.9	0.9	0.9	0.9																				
Based on current/developing bankfull feature																								
BF Width (ft)																								
BF Mean Depth (ft)																								
Width/Depth Ratio																								
BF Cross-sectional Area (ft²)																								
BF Max Depth (ft)																								
Width of Floodprone Area (ft)																								
Entrenchment Ratio																								
Bank Height Ratio																								
Wetted Perimeter (ft)																								
Hydraulic Radius (ft)																								
Cross Sectional Area between end pins (ft^2)	-																							
d50 (mm)	39																							

Table 8. Morphology and Hydraulic Monitoring Summary

Big Cedar Creek Restoration Site: Project No. D06054-D

UT1 Reach 2 (1016 LF)

	Cross-section 19 (Riffle)						Cross-section 20 (Pool)						Cross-section 21 (Riffle)						Cross-section 22 (Riffle)					
Dimension and substrate	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5
Based on fixed baseline bankfull elevation																								
BF Width (ft)	13.4	12.5	13.6	14.3			21.2	22.0	22.3	21.2			15.9	15.1	15.8	16.3			14.1	14.3	15.8	11.3		
BF Mean Depth (ft)	1.1	1.0	1.1	0.9			1.3	1.4	1.1	1.2			1.1	1.1	1.0	1.0			1.2	1.2	1.1	0.8		
Width/Depth Ratio	12.4	12.0	12.8	15.7			16.8	15.6	19.5	17.2			14.0	14.2	16.2	16.0			12.1	11.8	14.9	13.5		
BF Cross-sectional Area (ft²)	14.5	13.0	14.4	13.0			26.7	31.1	25.5	26.3			17.9	16.0	15.4	16.6			16.3	17.4	16.6	9.4		
BF Max Depth (ft)	1.8	1.7	1.8	1.8			2.8	2.9	2.7	2.7			1.9	1.7	1.7	1.7			1.8	2.1	2.0	1.4		
Width of Floodprone Area (ft)	>56.4	>56.3	>56.3	>56.38			>62.4	>62.5	>62.5	>62.45			>58.8	>58.9	>58.8	>58.78			>60.1	>60.1	>60.4	>57.42		
Entrenchment Ratio	>4.2	4.5	3.9	3.9			N/A	N/A	N/A	N/A			>3.7	3.9	3.7	3.6			>4.3	4.2	3.8	5.1		
Bank Height Ratio	1.0	1.0	1.0	1.0			1.0	1.0	1.0	1.0			1.0	1.0	1.0	1.0			1.0	1.0	1.0	1.0		
Wetted Perimeter (ft)	15.6	14.5	15.7	16.1			23.8	24.8	24.6	23.7			18.1	17.3	17.8	18.3			16.4	16.7	17.9	13.0		
Hydraulic Radius (ft)	0.9	0.9	0.9	0.8			1.1	1.3	1.0	1.1			1.0	0.9	0.9	0.9			1.0	1.0	0.9	0.7		
Based on current/developing bankfull feature																								
BF Width (ft)																								
BF Mean Depth (ft)																								
Width/Depth Ratio																								
BF Cross-sectional Area (ft²)																								
BF Max Depth (ft)																								
Width of Floodprone Area (ft)																								
Entrenchment Ratio																								
Bank Height Ratio																								
Wetted Perimeter (ft)																								
Hydraulic Radius (ft)																								
Cross Sectional Area between end pins (ft^2)	-						-						-						-					
d50 (mm)	-						-						-						-					

Dimension and substrate	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5
Based on fixed baseline bankfull elevation																								
BF Width (ft)																								
BF Mean Depth (ft)																								
Width/Depth Ratio																								
BF Cross-sectional Area (ft²)																								
BF Max Depth (ft)																								
Width of Floodprone Area (ft)																								
Entrenchment Ratio																								
Bank Height Ratio																								
Wetted Perimeter (ft)																								
Hydraulic Radius (ft)																								
Based on current/developing bankfull feature																								
BF Width (ft)																								
BF Mean Depth (ft)																								
Width/Depth Ratio																								
BF Cross-sectional Area (ft²)																								
BF Max Depth (ft)																								
Width of Floodprone Area (ft)																								
Entrenchment Ratio																								
Bank Height Ratio																								
Wetted Perimeter (ft)																								
Hydraulic Radius (ft)																								
Cross Sectional Area between end pins (ft^2)																								
d50 (mm)																								

Table 8. Morphology and Hydraulic Monitoring Summary

Big Cedar Creek Restoration Site: Project No. D06054-D

UT1 Reach 3 (1885 LF)

	Cross-section 23 (Pool)						Cross-section 24 (Riffle)						Cross-section 25 (Riffle)						Cross-section 26 (Riffle)					
Dimension and substrate	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5
Based on fixed baseline bankfull elevation																								
BF Width (ft)	21.8	20.8	20.8	20.2			15.1	16.9	14.7	14.8			15.3	14.0	14.2	14.1			16.2	15.8	16.6	14.41		
BF Mean Depth (ft)	1.5	1.4	1.4	1.4			1.2	1.3	1.2	1.2			1.2	1.1	1.0	1.0			1.3	1.1	1.1	1.01		
Width/Depth Ratio	14.3	15.3	15.2	14.0			12.7	12.9	12.0	12.6			13.1	13.1	13.9	13.7			12.6	14	15.0	14.26		
BF Cross-sectional Area (ft²)	33.3	28.2	28.5	29.2			17.9	22.0	18.0	17.3			17.8	15.0	14.6	14.5			20.9	17.8	18.4	14.6		
BF Max Depth (ft)	3.0	2.7	2.9	3.0			1.7	2.3	1.9	1.8			1.8	1.6	1.6	1.7			2.2	1.7	1.7	1.53		
Width of Floodprone Area (ft)	>64.2	>64.3	>64.1	01061133755			>57.1	>57.1	>57.1	>57.03			>56.9	>56.9	>56.9	>57			>58.6	>58.8	>58.7	>58.62		
Entrenchment Ratio	N/A	N/A	N/A	N/A			>3.8	3.4	3.6	3.9			>3.7	3.6	4.0	4.0			>3.6	3.7	3.5	4.1		
Bank Height Ratio	1.0	1.0	1.0	1.0			1.0	1.0	1.0	1.0			1.0	1.0	1.0	1.0			1.0	1.0	1.0	1		
Wetted Perimeter (ft)	24.9	23.6	23.5	23.1			17.5	19.5	17.1	17.1			17.6	16.2	16.3	16.2			18.8	18.0	18.8	0		
Hydraulic Radius (ft)	1.3	1.2	1.2	1.3			1.0	1.1	1.1	1.0			1.0	0.9	0.9	0.9			1.1	1.0	1.0	0		
Based on current/developing bankfull feature																								
BF Width (ft)																								
BF Mean Depth (ft)																								
Width/Depth Ratio																								
BF Cross-sectional Area (ft²)																								
BF Max Depth (ft)																								
Width of Floodprone Area (ft)																								
Entrenchment Ratio																								
Bank Height Ratio																								
Wetted Perimeter (ft)																								
Hydraulic Radius (ft)																								
Cross Sectional Area between end pins (ft^2)	-						-						-						-					
d50 (mm)	-			6.6			-			37.06			-						-					

	Cross-section 27 (Pool)																							
Dimension and substrate	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5
Based on fixed baseline bankfull elevation																								
BF Width (ft)	24.3	25.9	23.6	24.8																				
BF Mean Depth (ft)	1.3	1.2	1.4	1.4																				
Width/Depth Ratio	18.1	19.2	16.8	18.3																				
BF Cross-sectional Area (ft²)	32.5	25.9	33.0	33.7																				
BF Max Depth (ft)	3.0	2.7	3.1	3.3																				
Width of Floodprone Area (ft)	>64.4	>64.5	>64.4	>64.36																				
Entrenchment Ratio	N/A	N/A	N/A	N/A																				
Bank Height Ratio	1.0	1	1.0	1.0																				
Wetted Perimeter (ft)	27.0	28.3	26.4	27.5																				
Hydraulic Radius (ft)	1.2	0.9	1.3	1.2																				
Based on current/developing bankfull feature																								
BF Width (ft)																								
BF Mean Depth (ft)																								
Width/Depth Ratio																								
BF Cross-sectional Area (ft²)																								
BF Max Depth (ft)																								
Width of Floodprone Area (ft)																								
Entrenchment Ratio																								
Bank Height Ratio																								
Wetted Perimeter (ft)																								
Hydraulic Radius (ft)																								
Cross Sectional Area between end pins (ft^2)	-																							
d50 (mm)	-																							

Table 8. Morphology and Hydraulic Monitoring Summary

Big Cedar Creek Restoration Site: Project No. D06054-D

UT1 Reach 4 (996 LF)

	Cross-section 28 (Riffle)						Cross-section 29 (Pool)						Cross-section 30 (Riffle)						Cross-section 31 (Riffle)					
Dimension and substrate	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5
Based on fixed baseline bankfull elevation																								
BF Width (ft)	16.7	16.3	17.2	15.6			19.2	20.6	22.0	22.1			16.8	16.5	18.7	19.0			22.6	22.5	22.5	23.36		
BF Mean Depth (ft)	1.3	1.3	1.4	1.5			2.2	2.3	2.1	2.2			1.5	2.0	1.8	1.6			1.2	1.2	1.1	1.14		
Width/Depth Ratio	13.1	12.9	12.7	10.6			8.7	9.0	10.3	10.0			11.2	8.2	10.3	12.2			18.4	18.3	20.3	20.42		
BF Cross-sectional Area (ft²)	21.3	20.6	23.4	22.8			42.0	47.1	46.8	49.1			25.3	33.2	33.9	29.4			27.8	27.7	25.1	26.7		
BF Max Depth (ft)	2.0	2.0	2.5	2.4			4.6	4.3	4.0	4.5			2.3	3.0	3.0	2.6			1.8	1.9	1.7	1.8		
Width of Floodprone Area (ft)	>58.6	>58.4	>58.5	>58.57			>61.7	>61.6	>61.6	>61.63			>63.5	>63.7	>63.7	63.7			51.3	>56.4	52.8	63.77		
Entrenchment Ratio	>3.5	3.6	3.4	3.8			N/A	N/A	N/A	N/A			>3.8	3.9	3.4	2.9			2.3	2.5	2.1	2.6		
Bank Height Ratio	1.0	1.0	1.0	1.0			1.0	1.0	1.0	1.0			1.0	1.0	1.0	1.0			1.0	1	1.0	1		
Wetted Perimeter (ft)	19.2	18.9	19.9	18.5			23.5	25.2	26.2	26.6			19.8	20.5	22.3	22.1			25.1	24.9	24.7	25.6		
Hydraulic Radius (ft)	1.1	1.1	1.2	1.2			1.8	1.9	1.8	1.8			1.3	1.6	1.5	1.3			1.1	1.1	1.0	1.0		
Based on current/developing bankfull feature																								
BF Width (ft)																								
BF Mean Depth (ft)																								
Width/Depth Ratio																								
BF Cross-sectional Area (ft²)																								
BF Max Depth (ft)																								
Width of Floodprone Area (ft)																								
Entrenchment Ratio																								
Bank Height Ratio																								
Wetted Perimeter (ft)																								
Hydraulic Radius (ft)																								
Cross Sectional Area between end pins (ft^2)	-						-						-						-					
d50 (mm)	-			50.94			-			14.83			-						-					

	Cross-section 28 (Riffle)						Cross-section 29 (Pool)						Cross-section 30 (Riffle)						Cross-section 31 (Riffle)					
Dimension and substrate	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5
Based on fixed baseline bankfull elevation																								
BF Width (ft)																								
BF Mean Depth (ft)																								
Width/Depth Ratio																								
BF Cross-sectional Area (ft²)																								
BF Max Depth (ft)																								
Width of Floodprone Area (ft)																								
Entrenchment Ratio																								
Bank Height Ratio																								
Wetted Perimeter (ft)																								
Hydraulic Radius (ft)																								
Based on current/developing bankfull feature																								
BF Width (ft)																								
BF Mean Depth (ft)																								
Width/Depth Ratio																								
BF Cross-sectional Area (ft²)																								
BF Max Depth (ft)																								
Width of Floodprone Area (ft)																								
Entrenchment Ratio																								
Bank Height Ratio																								
Wetted Perimeter (ft)																								
Hydraulic Radius (ft)																								
Cross Sectional Area between end pins (ft^2)																								
d50 (mm)																								

Table 8. Morphology and Hydraulic Monitoring Summary

Big Cedar Creek Restoration Site: Project No. D06054-D

UT2 (609 LF)

	Cross-section 32 (Riffle)						Cross-section 33 (Pool)																	
Dimension and substrate	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5
Based on fixed baseline bankfull elevation																								
BF Width (ft)	13.4	13.2	14.4	15.6			26.8	21.8	22.0	22.1														
BF Mean Depth (ft)	1.4	1.5	1.2	1.5			1.1	1.1	1.2	1.1														
Width/Depth Ratio	9.9	8.7	11.9	10.3			24.4	20.0	18.7	21.0														
BF Cross-sectional Area (ft²)	18.1	20.1	17.4	23.8			29.4	23.7	25.8	23.3														
BF Max Depth (ft)	1.9	2.1	1.8	2.9			2.9	2.9	3.0	2.8														
Width of Floodprone Area (ft)	>63.1	>63.1	>63.2	>63.02			>69.8	>69.8	>69.8	>69.73														
Entrenchment Ratio	>4.7	4.8	4.4	4.0			N/A	N/A	N/A	N/A														
Bank Height Ratio	1.0	1	1.0	1.0			1.0	1.0	1.0	1.0														
Wetted Perimeter (ft)	16.1	16.2	16.8	18.7			29.0	24.0	24.3	24.2														
Hydraulic Radius (ft)	1.1	1.2	1.0	1.3			1.0	1.0	1.1	1.0														
Based on current/developing bankfull feature																								
BF Width (ft)																								
BF Mean Depth (ft)																								
Width/Depth Ratio																								
BF Cross-sectional Area (ft²)																								
BF Max Depth (ft)																								
Width of Floodprone Area (ft)																								
Entrenchment Ratio																								
Bank Height Ratio																								
Wetted Perimeter (ft)																								
Hydraulic Radius (ft)																								
Cross Sectional Area between end pins (ft^2)	-						-																	
d50 (mm)	-			34.17			-			42.4														

Dimension and substrate	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5
Based on fixed baseline bankfull elevation																								
BF Width (ft)																								
BF Mean Depth (ft)																								
Width/Depth Ratio																								
BF Cross-sectional Area (ft²)																								
BF Max Depth (ft)																								
Width of Floodprone Area (ft)																								
Entrenchment Ratio																								
Bank Height Ratio																								
Wetted Perimeter (ft)																								
Hydraulic Radius (ft)																								
Based on current/developing bankfull feature																								
BF Width (ft)																								
BF Mean Depth (ft)																								
Width/Depth Ratio																								
BF Cross-sectional Area (ft²)																								
BF Max Depth (ft)																								
Width of Floodprone Area (ft)																								
Entrenchment Ratio																								
Bank Height Ratio																								
Wetted Perimeter (ft)																								
Hydraulic Radius (ft)																								
Cross Sectional Area between end pins (ft^2)																								
d50 (mm)																								

Table B.1. Stream Problem Areas Big Cedar Creek Restoration Site: Project No. D06054-D			
BCC Reach 2			
Feature Issue	**Station No.**	**Suspected Cause**	**Photo Number**
Other	28+50, Right Floodplain	Conservation easement fence damage caused by fallen tree	SPA 1
Other	38+25, Right Floodplain	Conservation easement fence damage caused by fallen tree	SPA 2
BCC Reach 3			
Feature Issue	**Station No.**	**Suspected Cause**	**Photo Number**
Bed Scour/Degradation	46+60, Right Bank	Location of old beaver lodge	SPA 3
Other	46+90	Abandoned beaver dam	SPA 4
BCC Reach 6			
Feature Issue	**Station No.**	**Suspected Cause**	**Photo Number**
Other	77+10, Right Bank	Right bank of stream altered by fallen/uprooted tree	SPA 5
UT1 Reach 3			
Feature Issue	**Station No.**	**Suspected Cause**	**Photo Number**
Engineered Structures - back or arm scour	39+75	Scour behind boulder sill due to loss of seal	SPA 6

Table B2. Visual Morphological Stability Assessment
Big Cedar Creek Restoration Site: Project No. D06054-D

BCC Reach 1 (603 LF)

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

BCC Reach 2 (2220 LF)

Feature Category	Metric (per As-Built and reference baselines)	(# Stable) Number Performing as Intended	Total number per As-Built[1]	Total Number / feet in unstable state	% Performing in Stable Condition	Feature Perfomance Mean or Total
A. Riffles	1. Present?	12	12	N/A	100	
	2. Armor stable (e.g. no displacement)?	12	12	N/A	100	
	3. Facet grades appears stable?	12	12	N/A	100	
	4. Minimal evidence of embedding/fining?	12	12	N/A	100	
	5. Length appropriate?	12	12	N/A	100	**100%**
B. Pools	1. Present? (e.g. not subject to severe aggradation or migration?)	15	15	N/A	100	
	2. Sufficiently deep (Max Pool D:Mean Bkf >1.6?)	15	15	N/A	100	
	3. Length appropriate?	15	15	N/A	100	**100%**
C. Thalweg	1. Upstream of meander bend (run/inflection) centering?	15	15	N/A	100	
	2. Downstream of meander (glide/inflection) centering?	15	15	N/A	100	**100%**
D. Meanders	1. Outer bend in state of limited/controlled erosion?	15	15	N/A	100	
	2. Of those eroding, # w/concomitant point bar formation?	N/A	N/A	N/A	N/A	
	3. Apparent Rc within spec?	15	15	N/A	100	
	4. Sufficient floodplain access and relief?	15	15	N/A	100	**100%**
E. Bed General	1. General channel bed aggradation areas (bar formation)	N/A	N/A	0/0	100	
	2. Channel bed degradation - areas of increasing down-cutting or head cutting?	N/A	N/A	0/0	100	**100%**
F. Bank	1. Actively eroding, wasting, or slumping bank	N/A	N/A	0/0	100	**100%**
G. Vanes	1. Free of back or arm scour?	13	13	N/A	100	
	2. Height appropriate?	13	13	N/A	100	
	3. Angle and geometry appear appropriate?	13	13	N/A	100	
	4. Free of piping or other structural failures?	13	13	N/A	100	**100%**
H. Wads/ Boulders	1. Free of scour?	16	16	N/A	100	
	2. Footing stable?	16	16	N/A	100	**100%**

[1] 3 riffles were converted to cross vanes during Year 3 repair work. Initally there were 15 riffles and 10 vanes.

Table B2. Visual Morphological Stability Assessment
Big Cedar Creek Restoration Site: Project No. D06054-D

BCC Reach 3 (1823 LF)

Feature Category	Metric (per As-Built and reference baselines)	(# Stable) Number Performing as Intended	Total number per As-Built[1]	Total Number / feet in unstable state	% Performing in Stable Condition	Feature Perfomance Mean or Total
A. Riffles	1. Present?	12	12	N/A	100	
	2. Armor stable (e.g. no displacement)?	12	12	N/A	100	
	3. Facet grades appears stable?	12	12	N/A	100	
	4. Minimal evidence of embedding/fining?	12	12	N/A	100	
	5. Length appropriate?	12	12	N/A	100	**100%**
B. Pools	1. Present? (e.g. not subject to severe aggradation or migration?)	13	13	N/A	100	
	2. Sufficiently deep (Max Pool D:Mean Bkf >1.6?)	13	13	N/A	100	
	3. Length appropriate?	13	13	N/A	100	**100%**
C. Thalweg	1. Upstream of meander bend (run/inflection) centering?	13	13	N/A	100	
	2. Downstream of meander (glide/inflection) centering?	13	13	N/A	100	**100%**
D. Meanders	1. Outer bend in state of limited/controlled erosion?	13	13	N/A	100	
	2. Of those eroding, # w/concomitant point bar formation?	N/A	N/A	N/A	N/A	
	3. Apparent Rc within spec?	13	13	N/A	100	
	4. Sufficient floodplain access and relief?	13	13	N/A	100	**100%**
E. Bed General	1. General channel bed aggradation areas (bar formation)	N/A	N/A	0/0	100	
	2. Channel bed degradation - areas of increasing down-cutting or head cutting?	N/A	N/A	0/0	100	**100%**
F. Bank	1. Actively eroding, wasting, or slumping bank	N/A	N/A	0/0	100	**100%**
G. Vanes	1. Free of back or arm scour?	16	16	N/A	100	
	2. Height appropriate?	16	16	N/A	100	
	3. Angle and geometry appear appropriate?	16	16	N/A	100	
	4. Free of piping or other structural failures?	16	16	N/A	100	**100%**
H. Wads/ Boulders	1. Free of scour?	10	11	N/A	91	
	2. Footing stable?	11	11	N/A	100	**95%**

[1] 1 riffle was converted to a cross vane during Year 3 repair work. Initally there were 13 riffles and 12 vanes. Old total of 12 vanes was incorrect.

BCC Reach 4 (410 LF)

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

Table B2. Visual Morphological Stability Assessment
Big Cedar Creek Restoration Site: Project No. D06054-D

BCC Reach 6 (969 LF)

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	% Performing in Stable Condition	Feature Perfomance Mean or Total
A. Riffles	1. Present?	4	4	N/A	100	
	2. Armor stable (e.g. no displacement)?	4	4	N/A	100	
	3. Facet grades appears stable?	4	4	N/A	100	
	4. Minimal evidence of embedding/fining?	4	4	N/A	100	
	5. Length appropriate?	4	4	N/A	100	**100%**
B. Pools	1. Present? (e.g. not subject to severe aggradation or migration?)	4	4	N/A	100	
	2. Sufficiently deep (Max Pool D:Mean Bkf >1.6?)	4	4	N/A	100	
	3. Length appropriate?	4	4	N/A	100	**100%**
C. Thalweg	1. Upstream of meander bend (run/inflection) centering?	3	3	N/A	100	
	2. Downstream of meander (glide/inflection) centering?	3	3	N/A	100	**100%**
D. Meanders	1. Outer bend in state of limited/controlled erosion?	3	3	N/A	100	
	2. Of those eroding, # w/concomitant point bar formation?	N/A	N/A	N/A	N/A	
	3. Apparent Rc within spec?	N/A	N/A	N/A	N/A	
	4. Sufficient floodplain access and relief?	3	3	N/A	100	**100%**
E. Bed General	1. General channel bed aggradation areas (bar formation)	N/A	N/A	0/0	100	
	2. Channel bed degradation - areas of increasing down-cutting or head cutting?	N/A	N/A	0/0	100	**100%**
F. Bank	1. Actively eroding, wasting, or slumping bank	N/A	N/A	1/20	98	**98%**
G. Vanes	1. Free of back or arm scour?	2	2	N/A	100	
	2. Height appropriate?	2	2	N/A	100	
	3. Angle and geometry appear appropriate?	2	2	N/A	100	
	4. Free of piping or other structural failures?	2	2	N/A	100	**100%**
H. Wads/ Boulders	1. Free of scour?	N/A	N/A	N/A	N/A	**N/A**
	2. Footing stable?	N/A	N/A	N/A	N/A	**N/A**

UT1 Reach 1 (1247 LF)

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

Table B2. Visual Morphological Stability Assessment
Big Cedar Creek Restoration Site: Project No. D06054-D

UT1 Reach 2 (1016 LF)

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

UT1 Reach 3 (1885 LF)

Feature Category	Metric (per As-Built and reference baselines)	(# Stable) Number Performing as Intended	Total number per As-Built[1]	Total Number / feet in unstable state	% Performing in Stable Condition	Feature Perfomance Mean or Total
A. Riffles	1. Present?	17	17	N/A	100	
	2. Armor stable (e.g. no displacement)?	17	17	N/A	100	
	3. Facet grades appears stable?	17	17	N/A	100	
	4. Minimal evidence of embedding/fining?	17	17	N/A	100	
	5. Length appropriate?	17	17	N/A	100	**100%**
B. Pools	1. Present? (e.g. not subject to severe aggradation or migration?)	19	19	N/A	100	
	2. Sufficiently deep (Max Pool D:Mean Bkf >1.6?)	19	19	N/A	100	
	3. Length appropriate?	19	19	N/A	100	**100%**
C. Thalweg	1. Upstream of meander bend (run/inflection) centering?	19	19	N/A	100	
	2. Downstream of meander (glide/inflection) centering?	19	19	N/A	100	**100%**
D. Meanders	1. Outer bend in state of limited/controlled erosion?	19	19	N/A	100	
	2. Of those eroding, # w/concomitant point bar formation?	N/A	N/A	N/A	N/A	
	3. Apparent Rc within spec?	19	19	N/A	100	
	4. Sufficient floodplain access and relief?	19	19	N/A	100	**100%**
E. Bed General	1. General channel bed aggradation areas (bar formation)	N/A	N/A	0/0	100	
	2. Channel bed degradation - areas of increasing down-cutting or head cutting?	N/A	N/A	0/0	100	**100%**
F. Bank	1. Actively eroding, wasting, or slumping bank	N/A	N/A	0/0	100	**100%**
G. Vanes	1. Free of back or arm scour?	14	14	N/A	100	
	2. Height appropriate?	14	14	N/A	100	
	3. Angle and geometry appear appropriate?	14	14	N/A	100	
	4. Free of piping or other structural failures?	13	14	N/A	93	**98%**
H. Wads/ Boulders	1. Free of scour?	11	11	N/A	100	
	2. Footing stable?	11	11	N/A	100	**100%**

[1] 1 riffle was converted to into two cross vane during Year 3 repair work. Initally there were 18 riffles and 12 vanes.

Table B2. Visual Morphological Stability Assessment
Big Cedar Creek Restoration Site: Project No. D06054-D

UT1 Reach 4 (997 LF)

Feature Category	Metric (per As-Built and reference baselines)	(# Stable) Number Performing as Intended	Total number per As-Built[1]	Total Number / feet in unstable state	% Performing in Stable Condition	Feature Perfomance Mean or Total
A. Riffles	1. Present?	7	7	N/A	100	
	2. Armor stable (e.g. no displacement)?	7	7	N/A	100	
	3. Facet grades appears stable?	7	7	N/A	100	
	4. Minimal evidence of embedding/fining?	7	7	N/A	100	
	5. Length appropriate?	7	7	N/A	100	**100%**
B. Pools	1. Present? (e.g. not subject to severe aggradation or migration?)	7	7	N/A	100	
	2. Sufficiently deep (Max Pool D:Mean Bkf >1.6?)	7	7	N/A	100	
	3. Length appropriate?	7	7	N/A	100	**100%**
C. Thalweg	1. Upstream of meander bend (run/inflection) centering?	7	7	N/A	100	
	2. Downstream of meander (glide/inflection) centering?	7	7	N/A	100	**100%**
D. Meanders	1. Outer bend in state of limited/controlled erosion?	7	7	N/A	100	
	2. Of those eroding, # w/concomitant point bar formation?	N/A	N/A	N/A	N/A	
	3. Apparent Rc within spec?	7	7	N/A	100	
	4. Sufficient floodplain access and relief?	7	7	N/A	100	**100%**
E. Bed General	1. General channel bed aggradation areas (bar formation)	N/A	N/A	0/0	100	
	2. Channel bed degradation - areas of increasing down-cutting or head cutting?	N/A	N/A	0/0	100	**100%**
F. Bank	1. Actively eroding, wasting, or slumping bank	N/A	N/A	0/0	100	**100%**
G. Vanes	1. Free of back or arm scour?	4	4	N/A	100	
	2. Height appropriate?	4	4	N/A	100	
	3. Angle and geometry appear appropriate?	4	4	N/A	100	
	4. Free of piping or other structural failures?	4	4	N/A	100	**100%**
H. Wads/ Boulders	1. Free of scour?	5	5	N/A	100	
	2. Footing stable?	5	5	N/A	100	**100%**

[1] A total of 3 cross vanes were added during Year 3 repair work. 2 existing riffles were converted into cross vanes. Initally there were 9 riffles and 1 vane.

UT1A (85 LF)

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

Table B2. Visual Morphological Stability Assessment
Big Cedar Creek Restoration Site: Project No. D06054-D

UT1B (34 LF)

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

UT1C (78 LF)

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

Table B2. Visual Morphological Stability Assessment
Big Cedar Creek Restoration Site: Project No. D06054-D

UT2 (609 LF)

Feature Category	Metric (per As-Built and reference baselines)	(# Stable) Number Performing as Intended	Total number per As-Built[1]	Total Number / feet in unstable state	% Performing in Stable Condition	Feature Perfomance Mean or Total
A. Riffles	1. Present?	8	8	N/A	100	
	2. Armor stable (e.g. no displacement)?	8	8	N/A	100	
	3. Facet grades appears stable?	8	8	N/A	100	
	4. Minimal evidence of embedding/fining?	8	8	N/A	100	
	5. Length appropriate?	8	8	N/A	100	**100%**
B. Pools	1. Present? (e.g. not subject to severe aggradation or migration?)	8	8	N/A	100	
	2. Sufficiently deep (Max Pool D:Mean Bkf >1.6?)	8	8	N/A	100	
	3. Length appropriate?	8	8	N/A	100	**100%**
C. Thalweg	1. Upstream of meander bend (run/inflection) centering?	7	7	N/A	100	
	2. Downstream of meander (glide/inflection) centering?	7	7	N/A	100	**100%**
D. Meanders	1. Outer bend in state of limited/controlled erosion?	7	7	N/A	100	
	2. Of those eroding, # w/concomitant point bar formation?	N/A	N/A	N/A	N/A	
	3. Apparent Rc within spec?	7	7	N/A	100	
	4. Sufficient floodplain access and relief?	7	7	N/A	100	**100%**
E. Bed General	1. General channel bed aggradation areas (bar formation)	N/A	N/A	0/0	100	
	2. Channel bed degradation - areas of increasing down-cutting or head cutting?	N/A	N/A	0/0	100	**100%**
F. Bank	1. Actively eroding, wasting, or slumping bank	N/A	N/A	0/0	100	**100%**
G. Vanes	1. Free of back or arm scour?	8	8	N/A	100	
	2. Height appropriate?	8	8	N/A	100	
	3. Angle and geometry appear appropriate?	8	8	N/A	100	
	4. Free of piping or other structural failures?	8	8	N/A	100	**100%**
H. Wads/ Boulders	1. Free of scour?	4	4	N/A	100	
	2. Footing stable?	4	4	N/A	100	**100%**

[1] 1 cross vane was added during Year 3 repairs. Initally there were 7 vanes.

UT3 (73 LF within easement)

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

Figure B1: Stream Problem Areas
BCC (Station 27+00 to 39+00)

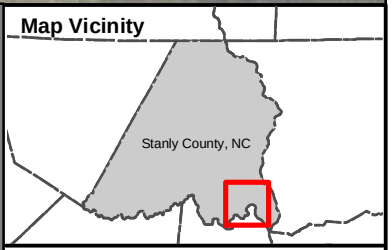
Big Cedar Creek Stream Restoration Project
Annual Monitoring Plan - Year 3
Stanly County, NC

0 50 100 200 Feet

LEGEND

- Fallen Tree
- Conservation Easement
- Asbuilt Alignment

Map Vicinity



EEP Project No. : D06054-D
March 2012

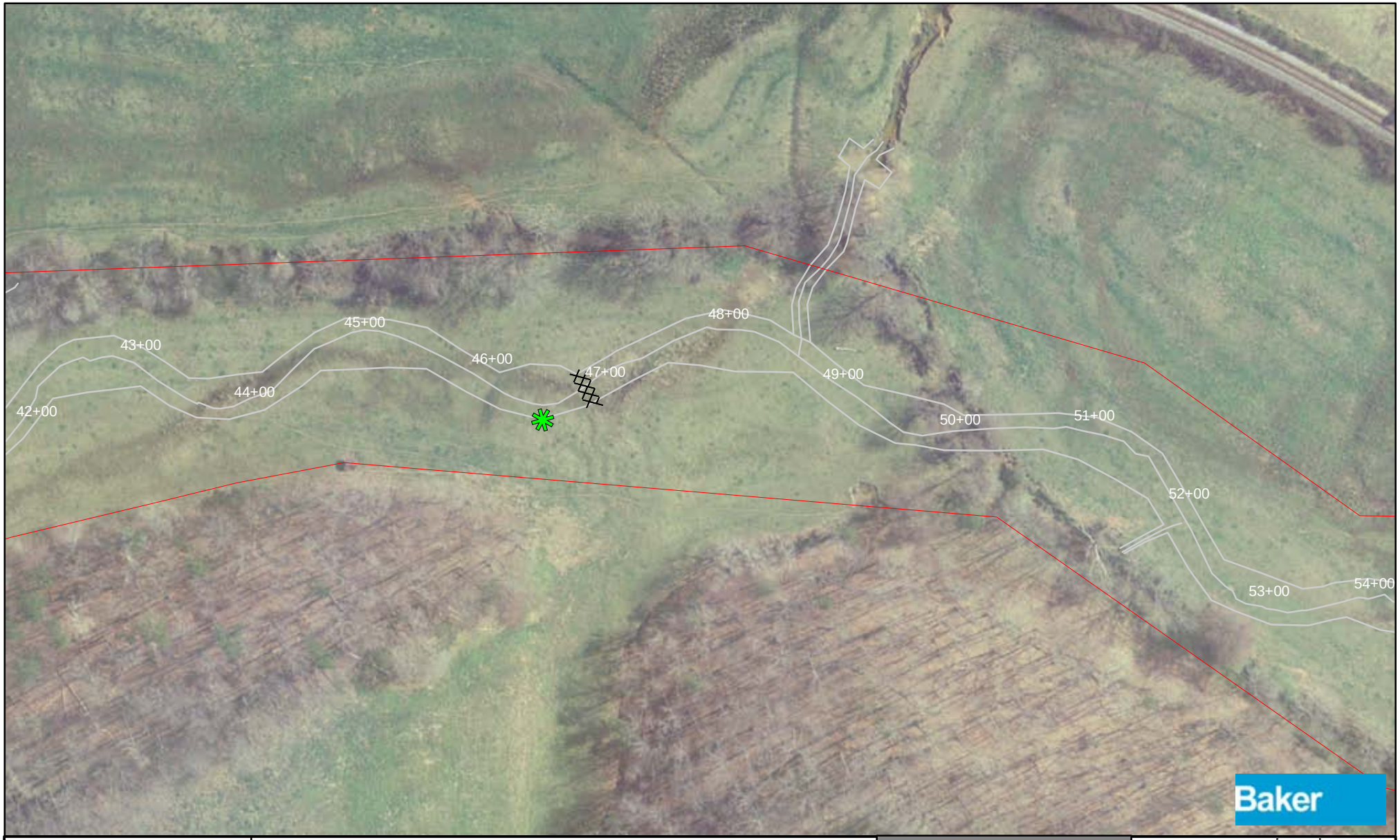


Figure B2: Stream Problem Areas
BCC (Station 42+00 to 54+00)

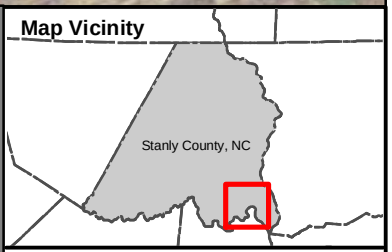
Big Cedar Creek Stream Restoration Project
Annual Monitoring Plan - Year 3
Stanly County, NC

0 50 100 200 Feet

LEGEND

- Bank Scour
- Beaver Dam
- Conservation Easement
- Asbuilt Alignment

Map Vicinity



EEP Project No. : D06054-D
March 2012

Ecosystem Enhancement Program

Figure B3: Stream Problem Areas
BCC (Station 72+00 to 78+00)

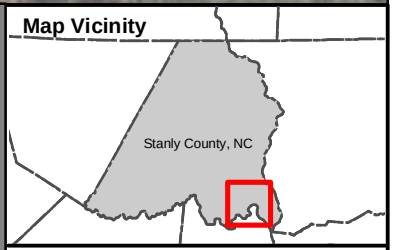
Big Cedar Creek Stream Restoration Project
Annual Monitoring Plan - Year 3
Stanly County, NC

0 50 100 200 Feet

LEGEND

- Fallen Tree
- Conservation Easement
- Asbuilt Alignment

Map Vicinity



EEP Project No. : D06054-D
March 2012

Figure B4: Stream Problem Areas
UT1 (Station 36+00 to 43+00)

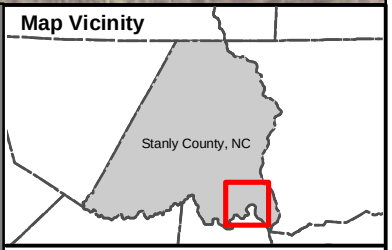
Big Cedar Creek Stream Restoration Project
Annual Monitoring Plan - Year 3
Stanly County, NC

0 50 100 200 Feet

LEGEND

- Boulder Sill Scour
- Conservation Easement
- Asbuilt Alignment

Map Vicinity



EEP Project No. : D06054-D
March 2012

Representative Stream Problem Area Photos

SPA 1 – Conservation easement damage caused by fallen tree

SPA 2 – Conservation easement damage caused by fallen tree

SPA 3 – Bank scour near abandoned beaver lodge

SPA 4 – Abandoned beaver dam

SPA 5 – Uprooted tree along streambank

SPA 6 – Streamflow beneath bolder sill

Appendix C

Vegetation Data

Vegetation Data

Tables C.1 through C.7

Vegetation Monitoring Plot Photos

Vegetation Problem Areas Figure C1

Vegetation Problem Area Photos

ɹt (continued): 92532-01-0001

ID	Species	map char	source	X (m)	Y (m)	Last Year's Data ddh (mm)	Height (cm)	DBH (cm)	THIS YEAR'S DATA ddh (mm)	Height (cm)	DBH (cm)	Re-sprout	Vigor*	Damage*	Notes

Plot 92532-01-0001

Please fill in any missing data and fix incorrect data. **Vegetation Monitoring Data (VMD) Datasheet**

VMD Year (1-5): 3 Date: 12/7/11 - / /

Party: KS, DM Role:

Notes on plot:

Taxonomic Standard:

Taxonomic Standard DATE:

Latitude or UTM-N: (dec.deg. or m) 1662971.957 Datum: NAD83/WGS84

Longitude or UTM-E: 532586.8988 UTM Zone:

Coordinate Accuracy (m): X-Axis bearing (deg): 35.208

Plot Dimensions: X: 10 Y: 10 ☐ Plot has reverse orientation for X and Y axis (Y is 90 degrees to the right of X

ID	Species Name	Map char	Source*	X 0.1m	Y 0.1m	Last Year's Data ddh 1 mm	Height 1cm*	DBH 1 cm	THIS YEAR'S DATA ddh 1mm	Height 1cm*	DBH 1 cm	Re-sprout	Vigor*	Damage*	Notes
1	Viburnum dentatum ✓	E!	R			4	43.0		8	68		☐	2		
	yr1: 1-1 | yr2: 1-1														
2	Platanus occidentalis ✓	E!	R			18	157.0	5.0	30	219	12	☐	3		
	yr1: 1-2 | yr2: 1-2														
3	Betula nigra	E!	R									☐	0		
	yr1: 1-3 | yr2: 1-3														
4	Platanus occidentalis	E!	R									☐	0		
	yr1: 1-4 | yr2: 1-4														
5	Carpinus caroliniana	E!	R									☐	0		
	yr1: 1-5 | yr2: 1-5														
6	Betula nigra	E!	R									☐	0		
	yr1: 1-6 | yr2: 1-6														
7	Platanus occidentalis ✓	E!	R			10	73.0		12	86.5		☐	2		
	yr1: 1-7 | yr2: 1-7														
8	Carpinus caroliniana	E!	R									☐	0		
	yr1: 1-8 | yr2: 1-8														
9	Cornus amomum ✓	E!	R			6	57.0		9	75		☐	3		
	yr1: 1-9 | yr2: 1-9														
10	Carpinus caroliniana ✓	E!	R			*Missing*			12	146	3	☐	3		
	yr1: 1-10 | yr2: 1-10														
14	Platanus occidentalis ✓	E!	R			6	60.0		7	60		☐	1		
	yr1: 1-14 | yr2: 1-14														
15	Betula nigra ✓	E!	R			7	70.0		11	73		☐	3		
	yr1: 1-15 | yr2: 1-15														
16	Platanus occidentalis ✓	E!	R			14	135.0	3.0	35	270	20	☐	4		
	yr1: 1-16 | yr2: 1-16														
17	Lindera benzoin ✓	E!	R			4	43.0		9	51		☐	2		
	yr1: 1-17 | yr2: 1-17														
18	Cornus amomum ✓	E!	R			6	57.0		10	275		☐	1		
	yr1: 1-18 | yr2: 1-18														
20	Lindera benzoin ✓	E!	R			3	33.0		5	31		☐	1		
	yr1: 1-20 | yr2: 1-20														

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Plot (continued): 92532-01-0001

ID	Species	map char	source	X (m)	Y (m)	Last Year's Data ddh (mm)	Height (cm)	DBH (cm)	THIS YEAR'S DATA ddh (mm)	Height (cm)	DBH (cm)	Re-sprout	Vigor*	Damage*	Notes
21	Viburnum dentatum ✓	E	R			4	75.0		11	122	3	☐	4		
yr1: 1-21 | yr2: 1-21															
22	Platanus occidentalis ✓	E	R			13	140.0	5.0	30	176	7	☐	3		BROKEN STEM
yr1: 1-22 | yr2: 1-22															
23	Carpinus caroliniana ✓	E	R			3	46.0		7	55		☐	3		
yr1: 1-23 | yr2: 1-23															
24	Platanus occidentalis ✓	E	R			7	69.0		15	120	3	☐	4		
yr1: 1-24 | yr2: 1-24															
25	Cornus amomum ✓	E	R			5	49.0		7	49		☐	2		
yr1: 1-25 | yr2: 1-25															

 # stems: 21

New Stems, not included last year, but are obviously planted. If more space needed, use blank PWS (Planted Woody Stems) Form:

Species Name	Source*	X (m)	Y (m)	ddh 1 mm	Height 1 cm*	DBH 1 cm	Vigor*	Damage*	Notes

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Plot 92532-01-0002

Please fill in any missing data and fix incorrect data.

Vegetation Monitoring Data (VMD) Datasheet

VMD Year (1-5): 3 Date: 12/7/11 - / /

Party: KS, DN Role:

Notes on plot: NEEDS INVASIVE TREATMENT

Taxonomic Standard:

Taxonomic Standard DATE:

Latitude or UTM-N: (dec.deg. or m) 1662752.543 Datum: NAD83/WGS84

Longitude or UTM-E: 532550.122 UTM Zone:

Coordinate Accuracy (m): X-Axis bearing (deg): 35.208

Plot Dimensions: X: 10 Y: 10 ☐ Plot has reverse orientation for X and Y axis (Y is 90 degrees to the right of X

ID	Species Name	Map char	Source*	X 0.1m	Y 0.1m	Last Year's Data ddh 1 mm	Height 1cm*	DBH 1 cm	THIS YEAR'S DATA ddh 1mm	Height 1cm*	DBH 1 cm	Re-sprout	Vigor*	Damage*	Notes
26	Platanus occidentalis ✓	E!	R			12	130.0	DBH?	20	259	9	☐	3		
yr1: 2-1 | yr2: 2-1															
27	Cornus amomum ✓	E!	R			5	52.0		7	48		☐	1		BROKEN STEM
yr1: 2-2 | yr2: 2-2															
28	Viburnum dentatum ✓	E!	R			3	58.0		8	82		☐	3		
yr1: 2-3 | yr2: 2-3															
29	Betula nigra ✓	E!	R			7	78.0		13	125	2	☐	3		
yr1: 2-4 | yr2: 2-4															
30	Carpinus caroliniana ✓	E!	R			4	42.0		10	76		☐	2		
yr1: 2-5 | yr2: 2-5															
31	Platanus occidentalis ✓	E!	R			12	114.0	DBH?	16	151	5	☐	3		
yr1: 2-6 | yr2: 2-6															
32	Carpinus caroliniana ✓	E!	R			5	79.0		9	101		☐	3		
yr1: 2-7 | yr2: 2-7															
33	Betula nigra ✓	E!	R			4	33.0		8	67		☐	3		
yr1: 2-8 | yr2: 2-8 (New Growth)															
34	Betula nigra ✓	E!	R			4	29.0		4	31		☐	1		
yr1: 2-9 | yr2: 2-9															
35	Platanus occidentalis ✓	E!	R			17	162.0	6.0	27	214	12	☐	3		
yr1: 2-10 | yr2: 2-10															
36	Platanus occidentalis ✓	E!	R			13	129.0	DBH?	20	179	7	☐	3		
yr1: 2-11 | yr2: 2-11															
37	Cornus amomum ✓	E!	R			6	67.0		9	69		☐	4		
yr1: 2-12 | yr2: 2-12 (New Growth)															
38	Quercus rubra ✓	E!	R			4	49.0		9	60		☐	3		
yr1: 2-13 | yr2: 2-13															
39	Betula nigra ✓	E!	R			3	44.0		5	57.5		☐	2		
yr1: 2-14 | yr2: 2-14															
40	Platanus occidentalis ✓	E!	R			14	130.0	DBH?	24	218	11	☐	4		
yr1: 2-15 | yr2: 2-15															
41	Fraxinus pennsylvanica ✓	E!	R			15	162.0	7.0	29	<270	15	☐	4		
yr1: 2-16 | yr2: 2-16															
42	Lindera benzoin	E!	R			4	41.0		7	68		☐	2		BROKEN STEM
yr1: 2-17 | yr2: 2-17															
1499	Lindera benzoin	E!	R			2	21.0		5	24		☐	1		BROKEN STEM
2-18 (New Growth)															

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

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Plot (continued): 92532-01-0002

ID	Species	map char	source	X (m)	Y (m)	Last Year's Data ddh (mm)	Last Year's Data Height (cm)	Last Year's Data DBH (cm)	THIS YEAR'S DATA ddh (mm)	Height (cm)	DBH (cm)	Re-sprout	Vigor*	Damage*	Notes
44	Carpinus caroliniana ✓	E	R			5	63.0		10	127	3	☐	3		
yr1: 2-19 | yr2: 2-19															
45	Cornus amomum ✓	E	R			7	60.0		8	65		☐	2		
yr1: 2-20 | yr2: 2-20															
46	Platanus occidentalis ✓	E	R				403.0	35.0	96	470	67	☐	4		
yr1: 2-21 | yr2: 2-21															
47	Betula nigra ✓	E	R			7	107.0	*DBH?*	13	218	6	☐	4		
yr1: 2-22 | yr2: 2-22															
48	Viburnum dentatum ✓	E	R			8	102.0	*DBH?* 13	15	166	5	☐	4		
yr1: 2-23 | yr2: 2-23															
49	Cornus amomum ✓	E	R			5	64.0		5	54		☐	1		
yr1: 2-24 | yr2: 2-24															

 # stems: 24

New Stems, not included last year, but are obviously planted. If more space needed, use blank PWS (Planted Woody Stems) Form:

Species Name	Source*	X (m)	Y (m)	ddh 1 mm	Height 1 cm*	DBH 1 cm	Vigor*	Damage*	Notes

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Plot 92532-01-0003

Please fill in any missing data and fix incorrect data.

Vegetation Monitoring Data (VMD) Datasheet

VMD Year (1-5): 3 Date: 12/6/11 - / /

Party: PL, DB, DN Role:

Notes on plot:

Taxonomic Standard:

Taxonomic Standard DATE:

Latitude or UTM-N: (dec.deg. or m) 1662939.109 Datum: NAD83/W

Longitude or UTM-E: 532159.1657 UTM Zone:

Coordinate Accuracy (m): X-Axis bearing (deg): 35.207

Plot Dimensions: X: 10 Y: 10 ☐ Plot has reverse orientation for X and Y axis (Y is 90 degrees to the right of X

ID	Species Name	Map char	Source*	X 0.1m	Y 0.1m	Last Year's Data ddh 1 mm	Height 1cm*	DBH 1 cm	THIS YEAR'S DATA ddh 1mm	Height 1cm*	DBH 1 cm	Re-sprout	Vigor*	Damage*	Notes
50	Platanus occidentalis ✓	E	R			9	81.0		15	116		☐	4		
yr1: 3-1 | yr2: 3-1															
51	Viburnum dentatum ✓	E	R			9	82.0		13	137	4	☐	4		
yr1: 3-2 | yr2: 3-2															
53	Betula nigra ✓	E	R			11	113.0	DBH?	29	212	10	☐	4		
yr1: 3-4 | yr2: 3-4															
54	Cornus amomum ✓	E	R			6	55.0		12	75		☐	4		
yr1: 3-5 | yr2: 3-5															
55	Platanus occidentalis ✓	E	R			12	125.0	DBH?	20	190	8	☐	4		
yr1: 3-6 | yr2: 3-6															
56	Platanus occidentalis ✓	E	R			15	167.0	8.0	37	<270	20	☐	4		
yr1: 3-7 | yr2: 3-7															
57	Quercus rubra ✓	E	R			3	31.0		9	70		☐	4		
yr1: 3-8 | yr2: 3-8															
58	Betula nigra ✓	E	R			5	69.0		12	128	2	☐	4		
yr1: 3-9 | yr2: 3-9															
59	Platanus occidentalis ✓	E	R			18	185.0	8.0	36	<270	17	☐	4		
yr1: 3-10 | yr2: 3-10															
60	Viburnum dentatum ✓	E	R			5	81.0		19	104		☐	4		
yr1: 3-11 | yr2: 3-11															
61	Platanus occidentalis ✓	E	R			13	128.0	DBH?	20	180	9	☐	4		
yr1: 3-12 | yr2: 3-12															
62	Platanus occidentalis ✓	E	R			15	150.0	6.0	23	210	9	☐	4		
yr1: 3-13 | yr2: 3-13															
63	Quercus phellos ✓	E	R			3	36.0		9	51		☐	4		
yr1: 3-14 | yr2: 3-14															
64	Lindera benzoin	E	R			3	36.0					☐	0		
yr1: 3-15 | yr2: 3-15															
65	Platanus occidentalis ✓	E	R			6	66.0		10	77		☐	4		
yr1: 3-16 | yr2: 3-16															
66	Betula nigra ✓	E	R			8	97.0		15	142	3	☐	4		
yr1: 3-17 | yr2: 3-17															
67	Platanus occidentalis ✓	E	R			20	203.0	8.0	34	<270	17	☐	4		
yr1: 3-18 | yr2: 3-18															
68	Platanus occidentalis ✓	E	R			18	139.0	4.0	30	196	10	☐	4		
yr1: 3-19 | yr2: 3-19															

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

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Plot (continued): 92532-01-0003

ID	Species		map char	source	X (m)	Y (m)	Last Year's Data ddh (mm)	Height (cm)	DBH (cm)	THIS YEAR'S DATA ddh (mm)	Height (cm)	DBH (cm)	Re-sprout	Vigor*	Damage*	Notes
69	Betula nigra	✓	E!	R			13	105.0	*DBH?*	25	189	6	☐	4		
yr1: 3-20 | yr2: 3-20																
70	Lindera benzoin	✓	E!	R			3	44.0		4	42		☐	1		
yr1: 3-21 | yr2: 3-21																
71	Lindera benzoin		E!	R			3	34.0					☐	D		
yr1: 3-22 | yr2: 3-22																
72	Fraxinus pennsylvanica		E!	R			13	132.0	*DBH?*	23	172	6	☐	4		
yr1: 3-23 | yr2: 3-23																
73	Quercus phellos	✓	E!	R			5	73.0		10	124	2	☐	4		
yr1: 3-24 | yr2: 3-24																

 # stems: 23

New Stems, not included last year, but are obviously planted. If more space needed, use blank PWS (Planted Woody Stems) Form:

Species Name	Source*	X (m)	Y (m)	ddh 1 mm	Height 1 cm*	DBH 1 cm	Vigor*	Damage*	Notes

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Plot 92532-01-0004 — Please fill in any missing data and fix incorrect data. — **Vegetation Monitoring Data (VMD) Datasheet**

VMD Year (1-5): 3 Date: 12/6/11 - / /

Party: PL, DB, DN Role: Notes on plot:

Taxonomic Standard:

Taxonomic Standard DATE:

Latitude or UTM-N: (dec.deg. or m) 1663101.313 Datum: NAD83/W

Longitude or UTM-E: 531863.5707 UTM Zone:

Coordinate Accuracy (m): X-Axis bearing (deg): 35.206

Plot Dimensions: X: 10 Y: 10 ☐ Plot has reverse orientation for X and Y axis (Y is 90 degrees to the right of X

ID	Species Name	Map char	Source*	X 0.1m	Y 0.1m	Last Year's Data: ddh 1 mm	Height 1cm*	DBH 1 cm	THIS YEAR'S DATA: ddh 1mm	Height 1cm*	DBH 1 cm	Re-sprout	Vigor*	Damage*	Notes
74	Quercus phellos ✓	E!	R			5	71.0		17	244	10	☐	4		
yr1: 4-1 | yr2: 4-1															
75	Quercus phellos ✓	E!	R			12	151.0	3.0	33	<270	18	☐	4		
yr1: 4-2 | yr2: 4-2															
76	Quercus michauxii ✓	E!	R			14	138.0	3.0	35	255	15	☐	4		
yr1: 4-3 | yr2: 4-3															
77	Platanus occidentalis ✓	E!	R			11	104.0	*DBH?*	21	174	7	☐	4		
yr1: 4-4 | yr2: 4-4															
78	Betula nigra ✓	E!	R			10	143.0	2.0	30	<270	21	☐	4		
yr1: 4-5 | yr2: 4-5															
79	Platanus occidentalis ✓	E!	R			30	270.0	15.0	76	<270	50	☐	4		
yr1: 4-6 | yr2: 4-6															
80	Platanus occidentalis ✓	E!	R			8	98.0		20	194	7	☐	4		
yr1: 4-7 | yr2: 4-7															
81	Platanus occidentalis ✓	E!	R			21	179.0	6.0	43	<270	25	☐	4		
yr1: 4-8 | yr2: 4-8															
82	Betula nigra ✓	E!	R			9	128.0	*DBH?*	22	250	11	☐	4		
yr1: 4-10 | yr2: 4-10															
83	Carpinus caroliniana ✓	E!	R			3	84.0		12	124	3	☐	4		
yr1: 4-11 | yr2: 4-11															
85	Cornus amomum ✓	E!	R			8	100.0		14	141	4	☐	4		
yr1: 4-13 | yr2: 4-13															
86	Ilex verticillata ✓	E!	R			5	42.0		5	55		☐	2		
yr1: 4-14 | yr2: 4-14															
87	Platanus occidentalis ✓	E!	R			33	380.0	17.0	75	<270	46	☐	4		
yr1: 4-15 | yr2: 4-15															
88	Platanus occidentalis ✓	E!	R			10	104.0	*DBH?*	15	148	4	☐	4		
yr1: 4-16 | yr2: 4-16															
89	Betula nigra ✓	E!	R			11	156.0	3.0	37	<270	17	☐	4		
yr1: 4-17 | yr2: 4-17															
90	Platanus occidentalis ✓	E!	R			9	98.0		22	212	9	☐	4		
yr1: 4-18 | yr2: 4-18															
91	Betula nigra ✓	E!	R			6	101.0	*DBH?*	21	182	6	☐	4		
yr1: 4-19 | yr2: 4-19															

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

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Plot (continued): 92532-01-0004

ID	Species	map char	source	X (m)	Y (m)	Last Year's Data ddh (mm)	Height (cm)	DBH (cm)	THIS YEAR'S DATA ddh (mm)	Height (cm)	DBH (cm)	Re-sprout	Vigor*	Damage*	Notes

 # stems: 17

New Stems, not included last year, but are obviously planted. If more space needed, use blank PWS (Planted Woody Stems) Form:

Species Name	Source*	X (m)	Y (m)	ddh 1 mm	Height 1 cm*	DBH 1 cm	Vigor*	Damage*	Notes

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Plot 92532-01-0005 — Please fill in any missing data and fix incorrect data. — **Vegetation Monitoring Data (VMD) Datasheet**

VMD Year (1-5): 3 Date: 12/6/11 - 1 1

Taxonomic Standard:

Taxonomic Standard DATE:

Latitude or UTM-N: (dec.deg. or m) 1663007.647 Datum: NAD83/W

Longitude or UTM-E: 531726.1593 UTM Zone:

Coordinate Accuracy (m): X-Axis bearing (deg): 35.206

Plot Dimensions: X: 10 Y: 10 ☐ Plot has reverse orientation for X and Y axis (Y is 90 degrees to the right of X

Party:	Role:
PL	
DB	
DM	

Notes on plot:

ID	Species Name	Map char	Source*	X 0.1m	Y 0.1m	Last Year's Data ddh 1 mm	Height 1cm*	DBH 1 cm	THIS YEAR'S DATA ddh 1mm	Height 1cm*	DBH 1 cm	Re-sprout	Vigor*	Damage*	Notes
93	Cornus amomum ✓	E	R			10	129.0	*DBH?*	20	247	9	☐	4		
yr1: 5-1 | yr2: 5-1															
94	Quercus phellos ✓	E	R			5	48.0		8	48		☐	3		
yr1: 5-2 | yr2: 5-2 (Broken Stem)															
96	Platanus occidentalis ✓	E	R			14	188.0	5.0	37	<270	21	☐	4		
yr1: 5-4 | yr2: 5-4															
97	Cornus amomum ✓	E	R			7	66.0		12	99		☐	4		
yr1: 5-5 | yr2: 5-5															
98	Betula nigra ✓	E	R			3	31.0		8	80		☐	4		
yr1: 5-6 | yr2: 5-6 (Broken Stem & New Growth)															
99	Quercus phellos ✓	E	R			4	63.0		12	132	2	☐	4		
yr1: 5-7 | yr2: 5-7															
100	Viburnum dentatum ✓	E	R			5	92.0		14	145	4	☐	4		
yr1: 5-8 | yr2: 5-8															
101	Cornus amomum ✓	E	R			11	90.0		13	135	3	☐	4		
yr1: 5-9 | yr2: 5-9															
102	Cornus amomum ✓	E	R			10	149.0	3.0	22	253	12	☐	4		
yr1: 5-10 | yr2: 5-10															
104	Quercus rubra ✓	E	R			6	98.0		16	207	7	☐	4		
yr1: 5-11 | yr2: 5-11															
105	Betula nigra ✓	E	R			17	142.0	2.0	36	<270	15	☐	4		
yr1: 5-12 | yr2: 5-12															
107	Quercus phellos ✓	E	R			8	131.0	*DBH?*	19	194	10	☐	4		
yr1: 5-14 | yr2: 5-14 (New Growth)															
108	Platanus occidentalis ✓	E	R			16	162.0	6.0	35	<270	18	☐	4		
yr1: 5-15 | yr2: 5-15 (New Growth)															
109	Betula nigra ✓	E	R			15	192.0	5.0	38	<270	24	☐	4		
yr1: 5-16 | yr2: 5-16															
110	Quercus phellos ✓	E	R			9	123.0	*DBH?*	17	222	11	☐	4		
yr1: 5-17 | yr2: 5-17 (Renamed from Quercus nigra to Quercus phellos)															
111	Cornus amomum ✓	E	R			7	62.0		15	125	4	☐	4		
yr1: 5-18 | yr2: 5-18															
112	Cornus amomum ✓	E	R			5	54.0		10	97		☐	4		
yr1: 5-19 | yr2: 5-19 (Broken Stem & New Growth)															
113	Betula nigra ✓	E	R			23	230.0	10.0	42	<270	23	☐	4		
yr1: 5-20 | yr2: 5-20															

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Plot (continued): 92532-01-0005

ID	Species	map char	source	X (m)	Y (m)	Last Year's Data ddh (mm)	Height (cm)	DBH (cm)	THIS YEAR'S DATA ddh (mm)	Height (cm)	DBH (cm)	Re-sprout	Vigor*	Damage*	Notes
114	Quercus phellos ✓	(E)	R			12	137.0	2.0	20	242	8	☐	4		

yr1: 5-21 | yr2: 5-21

 # stems: *19*

New Stems, not included last year, but are obviously planted. If more space needed, use blank PWS (Planted Woody Stems) Form:

Species Name	Source*	X (m)	Y (m)	ddh 1 mm	Height 1 cm*	DBH 1 cm	Vigor*	Damage*	Notes

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Plot 92532-01-0006 — Please fill in any missing data and fix incorrect data. — **Vegetation Monitoring Data (VMD) Datasheet**

VMD Year (1-5): 3 Date: 12/6/11 - / /

Taxonomic Standard:

Taxonomic Standard DATE:

Latitude or UTM-N: (dec.deg. or m) 1663145.752 Datum:

Longitude or UTM-E: 531306.6951 UTM Zone:

Coordinate Accuracy (m): X-Axis bearing (deg): 35.205

Plot Dimensions: X: 10 Y: 10 ☐ Plot has reverse orientation for X and Y axis (Y is 90 degrees to the right of X

Party:	Role:
PL	
DB	
DN	

Notes on plot:

ID	Species Name	Map char	Source*	X 0.1m	Y 0.1m	Last Year's Data ddh 1 mm	Height 1cm*	DBH 1 cm	THIS YEAR'S DATA ddh 1mm	Height 1cm*	DBH 1 cm	Re-sprout	Vigor*	Damage*	Notes
116	Cornus amomum ✓	E	R			8	127.0	DBH?	13	203	5	☐	4		
yr1: 6-1 | yr2: 6-1															
117	Viburnum dentatum ✓	E	R			6	82.0		8	113		☐	4		
yr1: 6-2 | yr2: 6-2															
118	Cornus amomum ✓	E	R			6	63.0		10	105		☐	4		
yr1: 6-3 | yr2: 6-3															
119	Viburnum dentatum ✓	E	R			3	54.0		10	143	4	☐	4		
yr1: 6-4 | yr2: 6-4															
120	Platanus occidentalis ✓	E	R			16	199.0	7.0	40	<270	20	☐	4		
yr1: 6-5 | yr2: 6-5															
121	Quercus phellos ✓	E	R			9	124.0	DBH?	26	<270	14	☐	4		
yr1: 6-6 | yr2: 6-6															
123	Platanus occidentalis ✓	E	R			21	215.0	10.0	52	<270	39	☐	4		
yr1: 6-8 | yr2: 6-8															
124	Fraxinus pennsylvanica ✓	E	R			13	179.0	4.0	27	266	15	☐	4		
yr1: 6-9 | yr2: 6-9															
125	Quercus michauxii ✓	E	R			10	95.0		18	208	10	☐	4		
yr1: 6-10 | yr2: 6-10															
126	Platanus occidentalis ✓	E	R			18	208.0	7.0	30	<270	20	☐	4		
yr1: 6-11 | yr2: 6-11															
127	Cornus amomum ✓	E	R			8	116.0	DBH?	14	188	5	☐	4		
yr1: 6-12 | yr2: 6-12															
129	Fraxinus pennsylvanica ✓	E	R			17	169.0	6.0	32	267	16	☐	4		
yr1: 6-14 | yr2: 6-14															
130	Quercus michauxii ✓	E	R			4	101.0	DBH?	13	212	9	☐	4		
yr1: 6-15 | yr2: 6-15															
131	Quercus rubra ✓	E	R			8	93.0		23	202	6	☐	4		
yr1: 6-16 | yr2: 6-16															
133	Platanus occidentalis ✓	E	R			18	205.0	9.0	44	<270	27	☐	4		
yr1: 6-18 | yr2: 6-18															
134	Cornus amomum ✓	E	R			9	110.0	DBH?	13	157	4	☐	4		
yr1: 6-19 | yr2: 6-19															
136	Cornus amomum ✓	E	R			11	116.0	DBH?	16	192	7	☐	4		
yr1: 6-21 | yr2: 6-21															
137	Fraxinus pennsylvanica ✓	E	R			21	210.0	7.0	35	<270	16	☐	4		
yr1: 6-22 | yr2: 6-22															

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Plot (continued): 92532-01-0006

ID	Species	map char	source	X (m)	Y (m)	Last Year's Data ddh (mm)	Height (cm)	DBH (cm)	THIS YEAR'S DATA ddh (mm)	Height (cm)	DBH (cm)	Re-sprout	Vigor*	Damage*	Notes
138	Quercus michauxii	E!	R			6	78.0		18	158	5	☐	4		
yr1: 6-23 | yr2: 6-23															
139	Fraxinus pennsylvanica	E!	R			11	161.0	4.0	17	225	10	☐	4		
yr1: 6-24 | yr2: 6-24															

 # stems: 20

New Stems, not included last year, but are obviously planted. If more space needed, use blank PWS (Planted Woody Stems) Form:

Species Name	Source*	X (m)	Y (m)	ddh 1 mm	Height 1 cm*	DBH 1 cm	Vigor*	Damage*	Notes

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Plot 92532-01-0007

Please fill in any missing data and fix incorrect data.

Vegetation Monitoring Data (VMD) Datasheet

VMD Year (1-5): 3 Date: 12 / 6 / 11 - / /

Party: PL, DB, DN Role:

Notes on plot:

Taxonomic Standard:

Taxonomic Standard DATE:

Latitude or UTM-N: (dec.deg. or m) 1663511.583 Datum: NAD83/W

Longitude or UTM-E: 530651.8484 UTM Zone:

Coordinate Accuracy (m): X-Axis bearing (deg): 35.203

Plot Dimensions: X: 10 Y: 10 ☐ Plot has reverse orientation for X and Y axis (Y is 90 degrees to the right of X

ID	Species Name	Map char	Source*	X 0.1m	Y 0.1m	Last Year's Data ddh 1 mm	Height 1cm*	DBH 1 cm	THIS YEAR'S DATA ddh 1mm	Height 1cm*	DBH 1 cm	Re-sprout	Vigor*	Damage*	Notes
141	Betula nigra ✓	E!	R			10	137.0	1.0	26	<270	13	☐	4		
yr1: 7-1 | yr2: 7-1															
142	Fraxinus pennsylvanica ✓	E!	R			35	279.0	12.0	65	<270	28	☐	4		
yr1: 7-2 | yr2: 7-2															
143	Carpinus caroliniana ✓	E!	R			13	183.0	5.0	28	<270	18	☐	4		
yr1: 7-3 | yr2: 7-3															
144	Quercus michauxii	E!	R			8	59.0					☐	0		
yr1: 7-4 | yr2: 7-4															
145	Platanus occidentalis ✓	E!	R			12	134.0	*DBH?*	29	<270	19	☐	4		
yr1: 7-5 | yr2: 7-5															
146	Cornus amomum ✓	E!	R			17	247.0	6.0	25	<270	17	☐	4		
yr1: 7-6 | yr2: 7-6															
147	Quercus michauxii	E!	R			4	43.0					☐	0		
yr1: 7-7 | yr2: 7-7 (Broken Stem)															
148	Cornus amomum ✓	E!	R			14	173.0	3.0	18	<270	11	☐	4		
yr1: 7-8 | yr2: 7-8															
149	Acer rubrum ✓	E!	R			20	173.0	4.0	46	<270	25	☐	4		
yr1: 7-9 | yr2: 7-9															
150	Quercus phellos ✓	E!	R			8	89.0		15	192	6	☐	4		
yr1: 7-10 | yr2: 7-10															
151	Quercus michauxii ✓	E!	R			7	125.0	*DBH?*	16	<270	9	☐	4		
yr1: 7-11 | yr2: 7-11															
152	Betula nigra	E!	R			4	23.0					☐	0		
yr1: 7-12 | yr2: 7-12 (Broken Stem)															
153	Cornus amomum ✓	E!	R			15	173.0	4.0	21	<270	12	☐	4		
yr1: 7-13 | yr2: 7-13															
155	Platanus occidentalis ✓	E!	R			33	317.0	21.0	90	<270	53	☐	4		
yr1: 7-15 | yr2: 7-15															
156	Platanus occidentalis ✓	E!	R			34	318.0	21.0	90	<270	70	☐	4		
yr1: 7-16 | yr2: 7-16															
158	Quercus michauxii	E!	R			4	30.0					☐	0		
yr1: 7-18 | yr2: 7-18 (Broken Stem)															
160	Platanus occidentalis ✓	E!	R			34	273.0	16.0	68	<270	48	☐	4		
yr1: 7-20 | yr2: 7-20															
161	Betula nigra ✓	E!	R			22	251.0	13.0	71	<270	51	☐	4		
yr1: 7-21 | yr2: 7-21															

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Plot (continued): 92532-01-0007

ID	Species	map char	source	X (m)	Y (m)	Last Year's Data ddh (mm)	Last Year's Data Height (cm)	Last Year's Data DBH (cm)	THIS YEAR'S DATA ddh (mm)	Height (cm)	DBH (cm)	Re-sprout	Vigor*	Damage*	Notes
162	Quercus nigra ✓	E	R			3	27.0		5	42.5		☐	2		
yr1: 7-22 | yr2: 7-22															
164	Platanus occidentalis ✓	E	R			26	254.0	13.0	66	270	45	☐	4		
yr1: 7-24 | yr2: 7-24															
166	Cornus amomum ✓	E	R			13	209.0	5.0	23	258	13	☐	4		
yr1: 7-26 | yr2: 7-26															

 # stems: 21

New Stems, not included last year, but are obviously planted. If more space needed, use blank PWS (Planted Woody Stems) Form:

Species Name	Source*	X (m)	Y (m)	ddh 1 mm	Height 1 cm*	DBH 1 cm	Vigor*	Damage*	Notes

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Plot 92532-01-0008 — Please fill in any missing data and fix incorrect data. — **Vegetation Monitoring Data (VMD) Datasheet**

VMD Year (1-5): 3 Date: 12/5/11 - / /

Taxonomic Standard:

Taxonomic Standard DATE:

Latitude or UTM-N: (dec.deg. or m) 1663750.576 Datum: NAD83/W

Longitude or UTM-E: 530390.7873 UTM Zone:

Coordinate Accuracy (m): X-Axis bearing (deg): 35.202

Plot Dimensions: X: 10 Y: 10 ☐ Plot has reverse orientation for X and Y axis (Y is 90 degrees to the right of X

Party:	Role:
PL	
DB	
DN	

Notes on plot:

ID	Species Name	Map char	Source*	X 0.1m	Y 0.1m	Last Year's Data ddh 1 mm	Height 1cm*	DBH 1 cm	THIS YEAR'S DATA ddh 1mm	Height 1cm*	DBH 1 cm	Re-sprout	Vigor*	Damage*	Notes
167	Corylus americana ✓	E!	R			7	79.0		9	89		☐	3		
yr1: 8-1 | yr2: 8-1															
168	Lindera benzoin	E!	R			4	36.0					☐	0		
yr1: 8-2 | yr2: 8-2															
169	Fraxinus pennsylvanica ✓	E!	R			10	95.0		18	143	4	☐	4		
yr1: 8-3 | yr2: 8-3 (Misnamed as Viburnum dentatum)															
170	Platanus occidentalis ✓	E!	R			15	167.0	7.0	50	<270	33	☐	4		
yr1: 8-4 | yr2: 8-4															
172	Cornus amomum ✓	E!	R			11	134.0	*DBH?*	22	240	11	☐	4		
yr1: 8-6 | yr2: 8-6															
173	Lindera benzoin ✓	E!	R			3	50.0		6	52		☐	3		
yr1: 8-7 | yr2: 8-7															
175	Platanus occidentalis ✓	E!	R			16	159.0	5.0	50	<270	30	☐	4		
yr1: 8-9 | yr2: 8-9															
176	Viburnum dentatum ✓	E!	R			5	87.0		13	212	8	☐	4		
yr1: 8-10 | yr2: 8-10															
177	Platanus occidentalis ✓	E!	R			16	176.0	8.0	49	<270	30	☐	4		
yr1: 8-11 | yr2: 8-11															
179	Corylus americana ✓	E!	R			7	72.0		13	140	4	☐	4		
yr1: 8-13 | yr2: 8-13															
181	Corylus americana ✓	E!	R			5	69.0		5	68		☑	1		
yr1: 8-15 | yr2: 8-15															
182	Viburnum dentatum ✓	E!	R			6	92.0		13	169	5	☐	4		
yr1: 8-16 | yr2: 8-16															
183	Cornus amomum ✓	E!	R			12	107.0	*DBH?*	20	229	13	☐	4		
yr1: 8-17 | yr2: 8-17															
184	Fraxinus pennsylvanica ✓	E!	R			7	88.0		7	87		☐	3		
yr1: 8-18 | yr2: 8-18															
186	Corylus americana ✓	E!	R			6	91.0		13	167	6	☐	4		
yr1: 8-20 | yr2: 8-20															
187	Calycanthus floridus ✓	E!	R			3	47.0		4	32.5		☐	2		
yr1: 8-21 | yr2: 8-21															
188	Cornus amomum ✓	E!	R			11	163.0	3.0	20	270	13	☐	4		
yr1: 8-22 | yr2: 8-22															
189	Cornus amomum ✓	E!	R			11	141.0	3.0	22	234	8	☐	4		
yr1: 8-23 | yr2: 8-23															

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Plot (continued): 92532-01-0008

ID	Species	map char	source	X (m)	Y (m)	Last Year's Data ddh (mm)	Height (cm)	DBH (cm)	THIS YEAR'S DATA ddh (mm)	Height (cm)	DBH (cm)	Re-sprout	Vigor*	Damage*	Notes
190	Platanus occidentalis ✓	E	R			19	197.0	9.0	45	<270	27	☐	4		

yr1: 8-24 | yr2: 8-24

 # stems: 19

New Stems, not included last year, but are obviously planted. If more space needed, use blank PWS (Planted Woody Stems) Form:

Species Name	Source*	X (m)	Y (m)	ddh 1 mm	Height 1 cm*	DBH 1 cm	Vigor*	Damage*	Notes

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Plot 92532-01-0009 — **Please fill in any missing data and fix incorrect data.** — **Vegetation Monitoring Data (VMD) Datasheet**

VMD Year (1-5): 3 Date: 12/5/11 - / /

Taxonomic Standard:

Taxonomic Standard DATE:

Latitude or UTM-N: (dec.deg. or m) 1663875.647 Datum: NAD83/WGS84

Longitude or UTM-E: 530195.5613 UTM Zone:

Coordinate Accuracy (m): X-Axis bearing (deg): 35.202

Plot Dimensions: X: 10 Y: 10 ☐ Plot has reverse orientation for X and Y axis (Y is 90 degrees to the right of X

Party:	Role:
PL	
DB	
DN	

Notes on plot:

ID	Species Name	Map char	Source*	X 0.1m	Y 0.1m	Last Year's Data ddh 1 mm	Height 1cm*	DBH 1 cm	THIS YEAR'S DATA ddh 1mm	Height 1cm*	DBH 1 cm	Re-sprout	Vigor*	Damage*	Notes
193	Betula nigra ✓	E	R			26	290.0	19.0	53	<270	41		4		
yr1: 9-1 | yr2: 9-1															
194	Platanus occidentalis ✓	E	R			37	310.0	27.0	72	<270	54		4		
yr1: 9-2 | yr2: 9-2															
195	Quercus phellos ✓	E	R			10	200.0	6.0	90	<270	11		4		
yr1: 9-3 | yr2: 9-3															
196	Betula nigra ✓	E	R			32	372.0	21.0	74	<270	53		4		
yr1: 9-4 | yr2: 9-4															
197	Betula nigra ✓	E	R			26	281.0	20.0	64	<270	44		4		
yr1: 9-5 | yr2: 9-5															
198	Platanus occidentalis ✓	E	R			37	352.0	30.0	81	<270	68		4		
yr1: 9-6 | yr2: 9-6															
199	Platanus occidentalis ✓	E	R			43	360.0	30.0	82	<270	69		4		
yr1: 9-7 | yr2: 9-7															
200	Cornus amomum ✓	E	R			10	163.0	4.0	17	<270	11		4		
yr1: 9-8 | yr2: 9-8															
201	Platanus occidentalis ✓	E	R			34	295.0	19.0	73	<270	48		4		
yr1: 9-9 | yr2: 9-9															
202	Carpinus caroliniana ✓	E	R			12	163.0	3.0	24	<270	17		4		
yr1: 9-10 | yr2: 9-10															
203	Quercus phellos ✓	E	R			10	186.0	4.0	19	<270	12		4		
yr1: 9-11 | yr2: 9-11															
204	Quercus phellos ✓	E	R			13	207.0	8.0	21	<270	18		4		
yr1: 9-12 | yr2: 9-12															
205	Platanus occidentalis ✓	E	R			42	265.0	27.0	105	<270	66		4		
yr1: 9-13 | yr2: 9-13															
206	Symphoricarpos orbiculatus ✓	E	R			8	93.0		12	122	1		4		
yr1: 9-14 | yr2: 9-14															
207	Viburnum dilatatum ✓	E	R			7	137.0	3.0	12	214	6		4		
yr1: 9-15 | yr2: 9-15															
208	Viburnum dilatatum ✓	E	R				*Missing*		15	182	5		4		
yr1: 9-16 | yr2: 9-16															
209	Betula nigra ✓	E	R			15	243.0	8.0	30	<270	23		4		
yr1: 9-17 | yr2: 9-17															
210	Fraxinus pennsylvanica ✓	E	R			30	231.0	14.0	45	<270	25		4		
yr1: 9-18 | yr2: 9-18															

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Plot (continued): 92532-01-0009

ID	Species	map char	source	X (m)	Y (m)	Last Year's Data ddh (mm)	Last Year's Data Height (cm)	Last Year's Data DBH (cm)	THIS YEAR'S DATA ddh (mm)	Height (cm)	DBH (cm)	Re-sprout	Vigor*	Damage*	Notes
211	Carpinus caroliniana ✓	E!	R			16	230.0	8.0	28	<270	22	☐	4		
yr1: 9-19 | yr2: 9-19															
212	Quercus michauxii ✓	E!	R			5	67.0		6	59		☐	1		
yr1: 9-20 | yr2: 9-20 (New Growth)															
213	Quercus michauxii ✓	E!	R			9	146.0	4.0	20	254	11	☐	4		
yr1: 9-21 | yr2: 9-21															
214	Lindera benzoin ✓	E!	R				*Missing*		10	87		☐	4		
yr1: 9-22 | yr2: 9-22															
215	Betula nigra ✓	E!	R			8	253.0	7.0	13	<270	28	☐	4		
yr1: 9-23 | yr2: 9-23															
216	Platanus occidentalis ✓	E!	R			38	395.0	25.0	85	<270	58	☐	4		
yr1: 9-24 | yr2: 9-24															
218	Viburnum dentatum	E!	R			10	193.0	7.0	24	<270	16	☐	4		
yr1: 9-26 | yr2: 9-26															
219	Quercus phellos ✓	E!	R			6	126.0	*DBH?*	10	138	4	☐	4		
yr1: 9-27 | yr2: 9-27															

 # stems: 26

New Stems, not included last year, but are obviously planted. If more space needed, use blank PWS (Planted Woody Stems) Form:

Species Name	Source*	X (m)	Y (m)	ddh 1 mm	Height 1 cm*	DBH 1 cm	Vigor*	Damage*	Notes

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Plot 92532-01-0010 — Please fill in any missing data and fix incorrect data. — **Vegetation Monitoring Data (VMD) Datasheet**

VMD Year (1-5): 3 Date: 12/5/11 - / /

Party: PL, DB, DN Role: Notes on plot:

Taxonomic Standard:

Taxonomic Standard DATE:

Latitude or UTM-N: (dec.deg. or m) 1664004.035 Datum: NAD83/WGS84

Longitude or UTM-E: 529868.3227 UTM Zone:

Coordinate Accuracy (m): X-Axis bearing (deg): 35.201

Plot Dimensions: X: 10 Y: 10 ☐ Plot has reverse orientation for X and Y axis (Y is 90 degrees to the right of X

ID	Species Name	Map char	Source*	X 0.1m	Y 0.1m	Last Year's Data ddh 1 mm	Height 1cm*	DBH 1 cm	THIS YEAR'S DATA ddh 1mm	Height 1cm*	DBH 1 cm	Re-sprout	Vigor*	Damage*	Notes
220	Cornus amomum ✓	EI	R			7	69.0		11	110		☐	4		
yr1: 10-1 | yr2: 10-1															
221	Betula nigra ✓	EI	R			19	160.0	12.0	72	<270	53	☐	4		
yr1: 10-2 | yr2: 10-2															
222	Cornus amomum ✓	EI	R			7	82.0		11	82		☐	4		
yr1: 10-3 | yr2: 10-3															
223	Platanus occidentalis ✓	EI	R			18	157.0	6.0	52	<270	32	☐	4		
yr1: 10-4 | yr2: 10-4															
224	Platanus occidentalis ✓	EI	R			14	139.0	5.0	22	218	11	☐	4		
yr1: 10-5 | yr2: 10-5															
225	Betula nigra ✓	EI	R			22	252.0	11.0	46	<270	43	☐	4		
yr1: 10-6 | yr2: 10-6															
226	Fraxinus pennsylvanica ✓	EI	R			26	190.0	8.0	57	<270	28	☐	4		
yr1: 10-7 | yr2: 10-7															
227	Lindera benzoin ✓	EI	R			4	59.0		5	33		☑	1		
yr1: 10-8 | yr2: 10-8															
228	Quercus michauxii ✓	EI	R			3	34.0		5	88		☐	3		
yr1: 10-9 | yr2: 10-9 (New Growth)															
229	Platanus occidentalis ✓	EI	R			37	285.0	22.0	95	<270	65	☐	4		
yr1: 10-10 | yr2: 10-10															
230	Cornus amomum ✓	EI	R			22	222.0	6.0	34	257	13	☐	4		
yr1: 10-11 | yr2: 10-11															
232	Fraxinus pennsylvanica ✓	EI	R			13	100.0		18	189	10	☐	4		
yr1: 10-13 | yr2: 10-13															
233	Platanus occidentalis ✓	EI	R			45	360.0	25.0	87	<270	71	☐	4		
yr1: 10-14 | yr2: 10-14															
235	Platanus occidentalis ✓	EI	R			7	86.0		9	103		☐	2		
yr1: 10-16 | yr2: 10-16															
236	Fraxinus pennsylvanica ✓	EI	R			5	54.0		6	40		☑	1		
yr1: 10-17 | yr2: 10-17 (New Growth) — BROKE OFF															
237	Platanus occidentalis ✓	EI	R			43	320.0	31.0	104	<270	81	☐	4		
yr1: 10-18 | yr2: 10-18															
238	Symphoricarpos orbiculatus ✓	EI	R			5	129.0	DBH?	12	122	1	☐	4		
yr1: 10-19 | yr2: 10-19															
239	Platanus occidentalis ✓	EI	R			10	121.0	DBH?	18	183	7	☐	4		
yr1: 10-20 | yr2: 10-20															

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Plot (continued): 92532-01-0010

ID	Species	map char	source	X (m)	Y (m)	Last Year's Data ddh (mm)	Height (cm)	DBH (cm)	THIS YEAR'S DATA ddh (mm)	Height (cm)	DBH (cm)	Re-sprout	Vigor*	Damage*	Notes
240	Platanus occidentalis ✓	E!	R			19	172.0	7.0	31	260	14	☐	4		
yr1: 10-21 | yr2: 10-21															
243	Platanus occidentalis ✓	E!	R			29	247.0	14.0	99	<270	60	☐	4		
yr1: 10-24 | yr2: 10-24															
244	Lindera benzoin	E!	R			2	19.0					☐	0		
yr1: 10-25 | yr2: 10-25 (New Growth)															
246	Fraxinus pennsylvanica ✓	E!	R			22	169.0	10.0	39	<270	19	☐	4		
yr1: 10-27 | yr2: 10-27															

 # stems: 22

New Stems, not included last year, but are obviously planted. If more space needed, use blank PWS (Planted Woody Stems) Form:

Species Name	Source*	X (m)	Y (m)	ddh 1 mm	Height 1 cm*	DBH 1 cm	Vigor*	Damage*	Notes

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Plot 92532-01-0011 — Please fill in any missing data and fix incorrect data. — **Vegetation Monitoring Data (VMD) Datasheet**

VMD Year (1-5): 3 Date: 12/5/11 - / /

Party: PL, DB, DN Role:

Notes on plot:

Taxonomic Standard:

Taxonomic Standard DATE:

Latitude or UTM-N: (dec.deg. or m) 1663942.254 Datum: NAD83/WGS84

Longitude or UTM-E: 529509.9583 UTM Zone:

Coordinate Accuracy (m): X-Axis bearing (deg): 35.2

Plot Dimensions: X: 10 Y: 10 ☐ Plot has reverse orientation for X and Y axis (Y is 90 degrees to the right of X

ID	Species Name	Map char	Source*	X 0.1m	Y 0.1m	Last Year's Data ddh 1 mm	Height 1cm*	DBH 1 cm	THIS YEAR'S DATA ddh 1mm	Height 1cm*	DBH 1 cm	Re-sprout	Vigor*	Damage*	Notes
247	Cornus amomum ✓	E	R			5	76.0		12	114		☐	4		
yr1: 11-1 | yr2: 11-1															
248	Platanus occidentalis ✓	E	R			19	211.0	10.0	59	<270	36	☐	4		
yr1: 11-2 | yr2: 11-2															
249	Platanus occidentalis ✓	E	R			22	207.0	10.0	55	<270	33	☐	4		
yr1: 11-3 | yr2: 11-3															
250	Cornus amomum ✓	E	R			13	142.0	3.0	14	200	7	☐	4		
yr1: 11-4 | yr2: 11-4															
251	Cornus amomum ✓	E	R			11	160.0	6.0	15	218	9	☐	4		
yr1: 11-5 | yr2: 11-5															
254	Symphoricarpos orbiculatus ✓	E	R			9	79.0		10	110		☐	4		
yr1: 11-8 | yr2: 11-8															
255	Platanus occidentalis ✓	E	R			19	200.0	11.0	52	<270	32	☐	4		
yr1: 11-9 | yr2: 11-9															
256	Fraxinus pennsylvanica ✓	E	R			10	129.0	*DBH?*	16	161	5	☐	4		
yr1: 11-10 | yr2: 11-10															
257	Ilex verticillata ✓	E	R			6	49.0		10	74		☐	3		
yr1: 11-11 | yr2: 11-11															
258	Ilex verticillata ✓	E	R			5	55.0		7	55		☐	2		
yr1: 11-12 | yr2: 11-12															
259	Corylus americana ✓	E	R			7	119.0	*DBH?*	16	177	6	☐	4		
yr1: 11-13 | yr2: 11-13															
260	Cornus amomum ✓	E	R			9	111.0	*DBH?*	19	200	5	☐	4		
yr1: 11-14 | yr2: 11-14															
261	Cornus amomum ✓	E	R			5	73.0		10	80		☐	3		
yr1: 11-15 | yr2: 11-15															
263	Cornus amomum ✓	E	R			11	177.0	3.0	18	238	6	☐	4		
yr1: 11-17 | yr2: 11-17															
264	Corylus americana ✓	E	R			8	109.0	*DBH?*	17	129	6	☐	4		
yr1: 11-18 | yr2: 11-18															
265	Cornus amomum ✓	E	R			10	92.0		13	116		☐	4		
yr1: 11-19 | yr2: 11-19															
266	Platanus occidentalis ✓	E	R			16	180.0	7.0	30	<270	18	☐	4		
yr1: 11-20 | yr2: 11-20															
267	Platanus occidentalis ✓	E	R			20	192.0	8.0	37	<270	21	☐	4		
yr1: 11-21 | yr2: 11-21															

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Plot (continued): 92532-01-0011

ID	Species	map char	source	X (m)	Y (m)	Last Year's Data ddh (mm)	Height (cm)	DBH (cm)		THIS YEAR'S DATA ddh (mm)	Height (cm)	DBH (cm)	Re-sprout	Vigor*	Damage*	Notes

 # stems: 18

New Stems, not included last year, but are obviously planted. If more space needed, use blank PWS (Planted Woody Stems) Form:

Species Name	Source*	X (m)	Y (m)	ddh 1 mm	Height 1 cm*	DBH 1 cm	Vigor*	Damage*	Notes

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Plot 92532-01-0012

Please fill in any missing data and fix incorrect data.

Vegetation Monitoring Data (VMD) Datasheet

VMD Year (1-5): 3 Date: 12/5/11 - 1/1/

Taxonomic Standard:

Taxonomic Standard DATE:

Latitude or UTM-N: (dec.deg. or m) 1664077.426 Datum: NAD83/WGS84

Longitude or UTM-E: 529194.0351 UTM Zone:

Coordinate Accuracy (m): X-Axis bearing (deg): 35.199

Plot Dimensions: X: 10 Y: 10 ☐ Plot has reverse orientation for X and Y axis (Y is 90 degrees to the right of X

Party:	Role:
PL	
DB	
DN	

Notes on plot:

ID	Species Name	Map char	Source*	X 0.1m	Y 0.1m	Last Year's Data ddh 1 mm	Last Year's Data Height 1cm*	Last Year's Data DBH 1 cm		THIS YEAR'S DATA ddh 1mm	Height 1cm*	DBH 1 cm	Re-sprout	Vigor*	Damage*	Notes
268	Viburnum dentatum ✓	E!	R			6	65.0			13	138	5	☐	4		
yr1: 12-1 | yr2: 12-1																
270	Viburnum dentatum ✓	E!	R			4	38.0			7	57.5		☐	3		
yr1: 12-3 | yr2: 12-3																
271	Viburnum dentatum ✓	E!	R			7	49.0			12	67		☐	3		
yr1: 12-4 | yr2: 12-4																
272	Fraxinus pennsylvanica ✓	E!	R			9	64.0			13	64		☐	3		
yr1: 12-5 | yr2: 12-5																
273	Platanus occidentalis ✓	E!	R			10	116.0	*DBH?*		22	188	8	☐	4		
yr1: 12-6 | yr2: 12-6																
274	Fraxinus pennsylvanica ✓	E!	R			10	66.0			13	64		☐	2		
yr1: 12-7 | yr2: 12-7																
275	Corylus americana ✓	E!	R			8	70.0			11	68		☐	3		
yr1: 12-8 | yr2: 12-8																
276	Platanus occidentalis ✓	E!	R			8	68.0			11	79		☐	3		
yr1: 12-9 | yr2: 12-9																
278	Platanus occidentalis ✓	E!	R			6	74.0			14	89		☐	3		
yr1: 12-11 | yr2: 12-11																
279	Cornus amomum ✓	E!	R			5	56.0			8	55		☐	3		
yr1: 12-12 | yr2: 12-12																
280	Symphoricarpos orbiculatus ✓	E!	R			2	13.0						☐	0		
yr1: 12-13 | yr2: 12-13																
281	Platanus occidentalis ✓	E!	R			5	55.0			12	62.5		☐	3		
yr1: 12-14 | yr2: 12-14																
282	Platanus occidentalis ✓	E!	R			7	77.0			11	88		☐	3		
yr1: 12-15 | yr2: 12-15																
283	Cornus amomum ✓	E!	R			7	61.0			9	75		☐	3		
yr1: 12-16 | yr2: 12-16																
284	Platanus occidentalis ✓	E!	R			5	64.0			9	78		☐	2		
yr1: 12-17 | yr2: 12-17																
285	Betula nigra ✓	E!	R			11	71.0			26	110		☐	4		
yr1: 12-18 | yr2: 12-18																
286	Platanus occidentalis ✓	E!	R			6	70.0			7	75		☐	2		
yr1: 12-19 | yr2: 12-19																
287	Calycanthus floridus ✓	E!	R			3	35.0			6	37		☐	2		
yr1: 12-20 | yr2: 12-20																

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

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Plot (continued): 92532-01-0012

ID	Species	map char	source	X (m)	Y (m)	Last Year's Data ddh (mm)	Last Year's Data Height (cm)	Last Year's Data DBH (cm)	THIS YEAR'S DATA ddh (mm)	Height (cm)	DBH (cm)	Re-sprout	Vigor*	Damage*	Notes
288	Ilex verticillata ✓	E	R			6	59.0		8	66		☐	2		
yr1: 12-21 | yr2: 12-21															
289	Cornus amomum ✓	E	R			3	44.0		6	53		☐	3		
yr1: 12-22 | yr2: 12-22															

 # stems: 20

New Stems, not included last year, but are obviously planted. If more space needed, use blank PWS (Planted Woody Stems) Form:

Species Name	Source*	X (m)	Y (m)	ddh 1 mm	Height 1 cm*	DBH 1 cm	Vigor*	Damage*	Notes

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Plot 92532-01-0013 — Please fill in any missing data and fix incorrect data. — **Vegetation Monitoring Data (VMD) Datasheet**

VMD Year (1-5): 3 Date: 12/2/11 - / /

Taxonomic Standard:

Taxonomic Standard DATE:

Latitude or UTM-N: (dec.deg. or m) 1664410.412 Datum: NAD83/W

Longitude or UTM-E: 528159.748 UTM Zone:

Coordinate Accuracy (m): X-Axis bearing (deg): 35.196

Plot Dimensions: X: 10 Y: 10 ☐ Plot has reverse orientation for X and Y axis (Y is 90 degrees to the right of X

Party: PL, DB, DM — Role: — Notes on plot:

ID	Species Name	Map char	Source*	X 0.1m	Y 0.1m	Last Year's Data: ddh 1 mm	Height 1cm*	DBH 1 cm	THIS YEAR'S DATA: ddh 1mm	Height 1cm*	DBH 1 cm	Re-sprout	Vigor*	Damage*	Notes
290	Betula nigra ✓	E	R			3	39.0		6	96		☐	4		
yr1: 13-1 | yr2: 13-1															
291	Cornus amomum ✓	E	R			15	140.0	3.0	19	208	7	☐	4		
yr1: 13-2 | yr2: 13-2															
292	Cornus amomum ✓	E	R			9	93.0		15	134	3	☐	4		
yr1: 13-3 | yr2: 13-3															
293	Carpinus caroliniana ✓	E	R			8	133.0	DBH?	21	<270	9	☐	4		
yr1: 13-4 | yr2: 13-4															
294	Carpinus caroliniana ✓	E	R			6	98.0		15	195	5	☐	4		
yr1: 13-5 | yr2: 13-5															
295	Cornus amomum ✓	E	R			11	164.0	4.0	22	<270	11	☐	4		
yr1: 13-6 | yr2: 13-6															
296	Carpinus caroliniana ✓	E	R			10	145.0	2.0	21	259	13	☐	4		
yr1: 13-7 | yr2: 13-7															
297	Betula nigra ✓	E	R			6	97.0		13	228	7	☐	4		
yr1: 13-8 | yr2: 13-8															
298	Betula nigra ✓	E	R			9	141.0	2.0	41	<270	21	☐	4		
yr1: 13-9 | yr2: 13-9															
299	Cornus amomum ✓	E	R			15	160.0	5.0	22	<270	14	☐	4		
yr1: 13-10 | yr2: 13-10															
300	Betula nigra ✓	E	R			16	167.0	4.0	47	<270	21	☐	4		
yr1: 13-11 | yr2: 13-11															
301	Cornus amomum ✓	E	R			9	134.0	DBH?	14	180	5	☐	4		
yr1: 13-12 | yr2: 13-12															
302	Carpinus caroliniana ✓	E	R			11	157.0	3.0	27	267	12	☐	4		
yr1: 13-13 | yr2: 13-13															
303	Viburnum dentatum ✓	E	R			10	109.0	DBH?	14	225	7	☐	4		
yr1: 13-14 | yr2: 13-14															
304	Carpinus caroliniana	E	R			3	41.0		10	135	2	☐	4		
yr1: 13-15 | yr2: 13-15	MISLABELED BN ✓														
305	Carpinus caroliniana ✓	E	R			2	38.0		18	170	5	☐	4		
yr1: 13-16 | yr2: 13-16															
307	Carpinus caroliniana ✓	E	R			8	140.0	2.0	21	<270	11	☐	4		
yr1: 13-18 | yr2: 13-18															
309	Viburnum dentatum ✓	E	R			7	73.0		15	182	7	☐	4		
yr1: 13-20 | yr2: 13-20															

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

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Plot (continued): 92532-01-0013

ID	Species	map char	source	X (m)	Y (m)	Last Year's Data ddh (mm)	Last Year's Data Height (cm)	Last Year's Data DBH (cm)	THIS YEAR'S DATA ddh (mm)	Height (cm)	DBH (cm)	Re-sprout	Vigor*	Damage*	Notes
310	Cornus amomum ✓	(E)	R			7	118.0	*DBH?*	17	191	6	☐	4		

yr1: 13-21 | yr2: 13-21

 # stems: 19

New Stems, not included last year, but are obviously planted. If more space needed, use blank PWS (Planted Woody Stems) Form:

Species Name	Source*	X (m)	Y (m)	ddh 1 mm	Height 1 cm*	DBH 1 cm	Vigor*	Damage*	Notes

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Plot 92532-01-0014 — Please fill in any missing data and fix incorrect data. — **Vegetation Monitoring Data (VMD) Datasheet**

VMD Year (1-5): 3 Date: 12/31/11 - / /

Party: JE, DB, DN Role:

Notes on plot:

Taxonomic Standard:

Taxonomic Standard DATE:

Latitude or UTM-N: (dec.deg. or m) 1664553.140 Datum: NAD83/W

Longitude or UTM-E: 527679.835 UTM Zone:

Coordinate Accuracy (m): X-Axis bearing (deg): 35.195

Plot Dimensions: X: 10 Y: 10 ☐ Plot has reverse orientation for X and Y axis (Y is 90 degrees to the right of X

ID	Species Name	Map char	Source*	X 0.1m	Y 0.1m	Last Year's Data ddh 1 mm	Height 1cm*	DBH 1 cm	THIS YEAR'S DATA ddh 1mm	Height 1cm*	DBH 1 cm	Re-sprout	Vigor*	Damage*	Notes
312	Betula nigra ✓	E	R			9	144.0	2.0	20	194	5	☐	4		
yr1: 14-2 | yr2: 14-2 (Mislabeled as Ilex verticillata)															
313	Cornus amomum ✓	E	R			14	163.0	3.0	24	245	10	☐	4		
yr1: 14-3 | yr2: 14-3															
314	Carpinus caroliniana ✓	E	R			3	36.0		8	81		☐	2		
yr1: 14-4 | yr2: 14-4															
315	Viburnum dentatum ✓	E	R			5	63.0		7	132	3	☐	4		
yr1: 14-5 | yr2: 14-5															
316	Betula nigra ✓	E	R			6	101.0	*DBH?*	15	150	4	☐	4		
yr1: 14-6 | yr2: 14-6															
317	Cornus amomum ✓	E	R			10	155.0	3.0	17	205	5	☐	4		
yr1: 14-7 | yr2: 14-7															
318	Betula nigra ✓	E	R			7	74.0		9	46		☐	2	BS	
yr1: 14-8 | yr2: 14-8 (Mislabeled as Ilex verticillata)															
319	Carpinus caroliniana ✓	E	R			5	95.0		16	189	5	☐	4		
yr1: 14-9 | yr2: 14-9															
320	Viburnum dentatum ✓	E	R			3	69.0		10	140	4	☐	4		
yr1: 14-10 | yr2: 14-10															
321	Carpinus caroliniana ✓	E	R			4	64.0		11	140	3	☐	3		
yr1: 14-11 | yr2: 14-11															
322	Betula nigra ✓	E	R			12	99.0		15	173	3	☐	4		
yr1: 14-12 | yr2: 14-12															
323	Ilex verticillata	E	R			9	139.0	3.0	24	172	5	☐	4		
yr1: 14-13 | yr2: 14-13 (Mislabeled as Betula nigra) – IS A BN ✓															
325	Platanus occidentalis	E	R			13	142.0	5.0	41	<270	17	☐	4		
yr1: 14-15 | yr2: 14-15 (Mislabeled as Betula nigra) – IS A BN ✓															
326	Cornus amomum ✓	E	R			11	200.0	5.0	17	232	10	☐	4		
yr1: 14-16 | yr2: 14-16															
328	Betula nigra ✓	E	R			6	55.0		14	183	5	☐	4		
yr1: 14-18 | yr2: 14-18															
330	Platanus occidentalis	E	R			9	137.0	1.0	31	<270	20	☐	4		
yr1: 14-20 | yr2: 14-20 (Mislabeled as Betula nigra)															

IT IS A BN ✓

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

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Plot (continued): 92532-01-0014

ID	Species	map char	source	X (m)	Y (m)	Last Year's Data ddh (mm)	Height (cm)	DBH (cm)	THIS YEAR'S DATA ddh (mm)	Height (cm)	DBH (cm)	Re-sprout	Vigor*	Damage*	Notes

 # stems: 16

New Stems, not included last year, but are obviously planted. If more space needed, use blank PWS (Planted Woody Stems) Form:

Species Name	Source*	X (m)	Y (m)	ddh 1 mm	Height 1 cm*	DBH 1 cm	Vigor*	Damage*	Notes

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Plot 92532-01-0015 — Please fill in any missing data and fix incorrect data. — **Vegetation Monitoring Data (VMD) Datasheet**

VMD Year (1-5): 3 Date: 12/2/11 - / /

Party: PL, DB, DH Role:

Notes on plot:

Taxonomic Standard:

Taxonomic Standard DATE:

Latitude or UTM-N: (dec.deg. or m) 1659965.842 Datum: NAD83/WGS84

Longitude or UTM-E: 526547.6359 UTM Zone:

Coordinate Accuracy (m): X-Axis bearing (deg): 35.191

Plot Dimensions: X: 10 Y: 10 ☐ Plot has reverse orientation for X and Y axis (Y is 90 degrees to the right of X

ID	Species Name	Map char	Source*	X 0.1m	Y 0.1m	Last Year's Data ddh 1 mm	Height 1cm*	DBH 1 cm	THIS YEAR'S DATA ddh 1mm	Height 1cm*	DBH 1 cm	Re-sprout	Vigor*	Damage*	Notes
333	Platanus occidentalis ✓	E!	R			10	85.0		23	142	5	☐	4		
yr1: 15-3 | yr2: 15-3															
334	Betula nigra ✓	E!	R			5	72.0		12	87		☐	4		
yr1: 15-4 | yr2: 15-4															
335	Cornus amomum ✓	E!	R			5	75.0		10	110		☐	4		
yr1: 15-5 | yr2: 15-5															
342	Quercus phellos ✓	E!	R			7	60.0		20	140	5	☐	4		
yr1: 15-12 | yr2: 15-12															
344	Quercus phellos ✓	E!	R			4	59.0		6	44		☐	2		
yr1: 15-14 | yr2: 15-14															
345	Quercus nigra ✓	E!	R			5	60.0		5	60		☐	2		
yr1: 15-15 | yr2: 15-15															
346	Quercus phellos ✓	E!	R			4	70.0		7	72		☐	4		
yr1: 15-16 | yr2: 15-16															

 # stems: 7

New Stems, not included last year, but are obviously planted. If more space needed, use blank PWS (Planted Woody Stems) Form:

Species Name	Source*	X (m)	Y (m)	ddh 1 mm	Height 1 cm*	DBH 1 cm	Vigor*	Damage*	Notes

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Printed in the CVS-EEP Entry Tool ver. 2.2.7

Plot 92532-01-0016 — Please fill in any missing data and fix incorrect data. — **Vegetation Monitoring Data (VMD) Datasheet**

VMD Year (1-5): 3 Date: 12/2/11 - 1 1

Taxonomic Standard:

Taxonomic Standard DATE:

Latitude or UTM-N: (dec.deg. or m) 1660031.749 Datum: NAD83/W

Longitude or UTM-E: 526637.7563 UTM Zone:

Coordinate Accuracy (m): X-Axis bearing (deg): 35.192

Plot Dimensions: X: 10 Y: 10 ☐ Plot has reverse orientation for X and Y axis (Y is 90 degrees to the right of X

Party:	Role:
PL	
DB	
DR	

Notes on plot:

ID	Species Name	Map char	Source*	X 0.1m	Y 0.1m	Last Year's Data ddh 1 mm	Height 1cm*	DBH 1 cm	THIS YEAR'S DATA ddh 1mm	Height 1cm*	DBH 1 cm	Re-sprout	Vigor*	Damage*	Notes
347	Cornus amomum ✓	ED	R			6	61.0		9	60		☐	4		
yr1: 16-1 | yr2: 16-1															
348	Platanus occidentalis ✓	ED	R			19	166.0	7.0	39	270	25	☐	4		
yr1: 16-2 | yr2: 16-2															
350	Carpinus caroliniana ✓	ED	R			10	100.0		20	192	5	☐	4		
yr1: 16-4 | yr2: 16-4															
351	Betula nigra ✓	ED	R			10	109.0	DBH?	33	224	12	☐	4		
yr1: 16-5 | yr2: 16-5															
352	Ilex verticillata ✓	ED	R			4	51.0		7	54		☐	2		
yr1: 16-6 | yr2: 16-6															
355	Quercus nigra ✓	ED	R			11	145.0	2.0	28	234	18	☐	4		
yr1: 16-9 | yr2: 16-9															
356	Quercus nigra ✓	ED	R			9	142.0	3.0	21	207	11	☐	4		
yr1: 16-10 | yr2: 16-10															
357	Platanus occidentalis ✓	ED	R			17	170.0	6.0	47	270	26	☐	4		
yr1: 16-11 | yr2: 16-11															
358	Betula nigra	ED	R			4	41.0		[illegible]			☐	0		
yr1: 16-12 | yr2: 16-12															
359	Cornus amomum ✓	ED	R			7	56.0		11	74		☐	4		
yr1: 16-13 | yr2: 16-13															
360	Betula nigra ✓	ED	R			12	163.0	4.0	31	270	16	☐	4		
yr1: 16-14 | yr2: 16-14															
361	Betula nigra ✓	ED	R			4	71.0		15	158	6	☐	4		
yr1: 16-15 | yr2: 16-15															
362	Cornus amomum ✓	ED	R			9	101.0	DBH?	20	211		☐	4		
yr1: 16-16 | yr2: 16-16															
363	Fraxinus pennsylvanica ✓	ED	R			9	90.0		16	87		☐	3		
yr1: 16-17 | yr2: 16-17															
364	Platanus occidentalis ✓	ED	R			22	143.0	5.0	33	253	19	☐	4		
yr1: 16-18 | yr2: 16-18															
365	Viburnum dentatum ✓	ED	R			11	106.0	DBH?	18	140	4	☐	4		
yr1: 16-19 | yr2: 16-19															
366	Platanus occidentalis ✓	ED	R			18	165.0	7.0	48	270	26	☐	4		
yr1: 16-20 | yr2: 16-20															
367	Cornus amomum ✓	ED	R			7	107.0	DBH?	16	195	6	☐	4		
yr1: 16-21 | yr2: 16-21															

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

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#9105423 1

Plot (continued): 92532-01-0016

ID	Species	map char	source	X (m)	Y (m)	Last Year's Data ddh (mm)	Height (cm)	DBH (cm)		THIS YEAR'S DATA ddh (mm)	Height (cm)	DBH (cm)	Re-sprout	Vigor*	Damage*	Notes

 # stems: 18

New Stems, not included last year, but are obviously planted. If more space needed, use blank PWS (Planted Woody Stems) Form:

Species Name	Source*	X (m)	Y (m)	ddh 1 mm	Height 1 cm*	DBH 1 cm	Vigor*	Damage*	Notes

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Plot 92532-01-0017 — Please fill in any missing data and fix incorrect data. — **Vegetation Monitoring Data (VMD) Datasheet**

VMD Year (1-5): 3 Date: 12/2/11 - / /

Taxonomic Standard:

Taxonomic Standard DATE:

Latitude or UTM-N: (dec.deg. or m) 1660252.663 Datum: NAD83/W

Longitude or UTM-E: 526651.9064 UTM Zone:

Coordinate Accuracy (m): X-Axis bearing (deg): 35.192

Plot Dimensions: X: 10 Y: 10 ☐ Plot has reverse orientation for X and Y axis (Y is 90 degrees to the right of X

Party:	Role:
PL	
DB	
DH	

Notes on plot:

ID	Species Name	Map char	Source*	X 0.1m	Y 0.1m	Last Year's Data ddh 1 mm	Last Year's Data Height 1cm*	Last Year's Data DBH 1 cm	THIS YEAR'S DATA ddh 1mm	Height 1cm*	DBH 1 cm	Re-sprout	Vigor*	Damage*	Notes
368	Platanus occidentalis ✓	E	R			7	79.0		9	98		☐	3		
yr1: 17-1 | yr2: 17-1															
369	Ilex verticillata ✓	E	R			5	45.0		6	55		☐	2		
yr1: 17-2 | yr2: 17-2															
370	Betula nigra	E	R			3	60.0					☐	0		
yr1: 17-3 | yr2: 17-3															
371	Cornus amomum ✓	E	R			6	77.0		7	90		☐	4		
yr1: 17-4 | yr2: 17-4															
372	Platanus occidentalis ✓	E	R			7	67.0		9	74		☐	3		
yr1: 17-5 | yr2: 17-5															
373	Quercus nigra ✓	E	R			4	43.0		8	54		☐	2		
yr1: 17-6 | yr2: 17-6															
374	Platanus occidentalis ✓	E	R			5	58.0		7	71		☐	3		
yr1: 17-7 | yr2: 17-7															
375	Quercus nigra ✓	E	R			6	61.0		11	98		☐	4		
yr1: 17-8 | yr2: 17-8															
376	Carpinus caroliniana ✓	E	R			3	27.0		11	71		☐	4		
yr1: 17-9 | yr2: 17-9															
377	Carpinus caroliniana ✓	E	R			5	45.0		13	104		☐	4		
yr1: 17-10 | yr2: 17-10															
378	Platanus occidentalis ✓	E	R			5	53.0		8	55		☐	2		
yr1: 17-11 | yr2: 17-11															
379	Platanus occidentalis ✓	E	R			10	68.0		10	73		☐	3		
yr1: 17-12 | yr2: 17-12															
380	Platanus occidentalis ✓	E	R			10	97.0		13	128	4	☐	4		
yr1: 17-13 | yr2: 17-13															
381	Carpinus caroliniana ✓	E	R			7	62.0		9	78		☐	4		
yr1: 17-14 | yr2: 17-14															
382	Platanus occidentalis ✓	E	R			6	68.0		9	73		☐	3		
yr1: 17-15 | yr2: 17-15															
383	Platanus occidentalis ✓	E	R			6	59.0		7	68.5		☐	2		
yr1: 17-16 | yr2: 17-16															
384	Quercus nigra ✓	E	R			7	70.0		12	98		☐	4		
yr1: 17-17 | yr2: 17-17															
385	Betula nigra	E	R			6	58.0					☐	0		
yr1: 17-18 | yr2: 17-18															

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Plot (continued): 92532-01-0017

ID	Species	map char	source	X (m)	Y (m)	Last Year's Data ddh (mm)	Last Year's Data Height (cm)	Last Year's Data DBH (cm)	THIS YEAR'S DATA ddh (mm)	Height (cm)	DBH (cm)	Re-sprout	Vigor*	Damage*	Notes
386	Calycanthus floridus ✓	E	R			9	56.0		13	65		☐	4		
yr1: 17-19 | yr2: 17-19															
387	Platanus occidentalis ✓	E	R			3	37.0		5	43		☐	2		
yr1: 17-20 | yr2: 17-20															
388	Quercus rubra ✓	E	R			5	40.0		9	58		☐	4		
yr1: 17-21 | yr2: 17-21															
389	Platanus occidentalis ✓	E	R			4	60.0		9	74		☐	4		
yr1: 17-22 | yr2: 17-22															

 # stems: 22

New Stems, not included last year, but are obviously planted. If more space needed, use blank PWS (Planted Woody Stems) Form:

Species Name	Source*	X (m)	Y (m)	ddh 1 mm	Height 1 cm*	DBH 1 cm	Vigor*	Damage*	Notes

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Plot 92532-01-0018

Please fill in any missing data and fix incorrect data.

Vegetation Monitoring Data (VMD) Datasheet

VMD Year (1-5): 3 Date: 12/2/11 - / /

Party: PL, DB, DN Role:

Notes on plot:

Taxonomic Standard:

Taxonomic Standard DATE:

Latitude or UTM-N: (dec.deg. or m) 1661007.457 Datum: NAD83/W

Longitude or UTM-E: 527015.0198 UTM Zone:

Coordinate Accuracy (m): X-Axis bearing (deg): 35.193

Plot Dimensions: X: 10 Y: 10 ☐ Plot has reverse orientation for X and Y axis (Y is 90 degrees to the right of X

ID	Species Name	Map char	Source*	X 0.1m	Y 0.1m	Last Year's Data ddh 1 mm	Height 1cm*	DBH 1 cm	THIS YEAR'S DATA ddh 1mm	Height 1cm*	DBH 1 cm	Re-sprout	Vigor*	Damage*	Notes
390	Quercus phellos ✓	E!	R			3	28.0		7	36		☐	4		
yr1: 18-1 | yr2: 18-1															
392	Quercus nigra ✓	E!	R			4	56.0		11	126	4	☐	4		
yr1: 18-3 | yr2: 18-3															
393	Betula nigra ✓	E!	R			8	81.0		12	106		☐	4		
yr1: 18-4 | yr2: 18-4															
394	Cornus amomum ✓	E!	R			6	60.0		6	58.5		☐	3		
yr1: 18-5 | yr2: 18-5															
395	Cornus amomum ✓	E!	R			5	54.0		7	52		☐	3		
yr1: 18-6 | yr2: 18-6															
397	Cornus amomum ✓	E!	R			6	77.0		8	93		☐	4		
yr1: 18-8 | yr2: 18-8															
399	Quercus phellos ✓	E!	R			4	46.0		5	32.5		☑	4		
yr1: 18-10 | yr2: 18-10															
400	Quercus phellos ✓	E!	R			5	54.0		10	70		☐	4		
yr1: 18-11 | yr2: 18-11															
402	Quercus phellos ✓	E!	R			4	32.0		6	53		☐	4		
yr1: 18-13 | yr2: 18-13															
403	Betula nigra ✓	E!	R			3	13.0		3	23		☑	2		
yr1: 18-14 | yr2: 18-14															
404	Betula nigra ✓	E!	R			7	86.0		13	137	3	☐	4		
yr1: 18-15 | yr2: 18-15															
405	Quercus phellos ✓	E!	R			5	46.0		16	116		☐	4		
yr1: 18-16 | yr2: 18-16															
406	Platanus occidentalis	E!	R			7	67.0		16	156	5	☐	4		
yr1: 18-17 | yr2: 18-17	MISLABELED QP ✓														
408	Platanus occidentalis	E!	R			8	63.0					☐	0		
yr1: 18-19 | yr2: 18-19															

 # stems: 14

New Stems, not included last year, but are obviously planted. If more space needed, use blank PWS (Planted Woody Stems) Form:

Species Name	Source*	X (m)	Y (m)	ddh 1 mm	Height 1 cm*	DBH 1 cm	Vigor*	Damage*	Notes

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

6 5 2 M
11 10 4 1
14 13 8 3
18 16 15
19 17

Plot 92532-01-0019 — Please fill in any missing data and fix incorrect data. — **Vegetation Monitoring Data (VMD) Datasheet**

VMD Year (1-5): 3 Date: 12/1/11 - / /

Party: DB/DAI Role:

Notes on plot:

Taxonomic Standard:

Taxonomic Standard DATE:

Latitude or UTM-N: (dec.deg. or m) 1661620.441 Datum: NAD83/W

Longitude or UTM-E: 527433.5076 UTM Zone:

Coordinate Accuracy (m): X-Axis bearing (deg): 35.194

Plot Dimensions: X: 10 Y: 10 ☐ Plot has reverse orientation for X and Y axis (Y is 90 degrees to the right of X

ID	Species Name	Map char	Source*	X 0.1m	Y 0.1m	Last Year's Data ddh 1 mm	Height 1cm*	DBH 1 cm	THIS YEAR'S DATA ddh 1mm	Height 1cm*	DBH 1 cm	Re-sprout	Vigor*	Damage*	Notes
410	Platanus occidentalis ✓	E	R			22	217.0	10.0	74	<270	47	☐	4		
yr1: 19-1 | yr2: 19-1															
412	Betula nigra ✓	E	R			17	209.0	9.0	33	<270	21	☐	4		
yr1: 19-3 | yr2: 19-3															
414	Platanus occidentalis ✓	E	R			14	137.0	7.0	55	<270	31	☐	4		
yr1: 19-5 | yr2: 19-5															
415	Cornus amomum ✓	E	R			6	106.0	*DBH?*	9	125	4	☐	4		
yr1: 19-6 | yr2: 19-6															
416	Carpinus caroliniana ✓	E	R			8	149.0	1.0	17	251	10	☐	4		
yr1: 19-7 | yr2: 19-7															
417	Fraxinus pennsylvanica ✓	E	R			6	97.0		21	211	7	☐	4		
yr1: 19-8 | yr2: 19-8															
418	Platanus occidentalis ✓	E	R			29	300.0	13.0	84	<270	54	☐	4		
yr1: 19-9 | yr2: 19-9															
419	Betula nigra ✓	E	R			26	205.0	6.0	65	<270	29	☐	4		
yr1: 19-10 | yr2: 19-10															
421	Platanus occidentalis ✓	E	R			20	213.0	11.0	68	<270	48	☐	4		
yr1: 19-12 | yr2: 19-12															
422	Carpinus caroliniana ✓	E	R			5	54.0		16	158	2	☐	4		
yr1: 19-13 | yr2: 19-13															
423	Fraxinus pennsylvanica ✓	E	R			12	140.0	5.0	34	174	11	☐	4		
yr1: 19-14 | yr2: 19-14															
424	Platanus occidentalis ✓	E	R			22	175.0	10.0	34	<270	18	☐	4		
yr1: 19-15 | yr2: 19-15															
425	Betula nigra ✓	E	R			3	59.0		14	156	4	☐	4		
yr1: 19-16 | yr2: 19-16 (Mislabeled as Platanus occientalis)															
427	Carpinus caroliniana ✓	E	R			5	79.0		10	120	3	☐	4		
yr1: 19-18 | yr2: 19-18															
428	Platanus occidentalis ✓	E	R			19	179.0	5.0	36	<270	18	☐	4		
yr1: 19-19 | yr2: 19-19															
429	Betula nigra ✓	E	R			12	163.0	3.0	26	<270	12	☐	4		
yr1: 19-20 | yr2: 19-20															
430	Quercus phellos ✓	E	R			12	153.0	3.0	32	253	12	☐	4		
yr1: 19-21 | yr2: 19-21															
									10	74			3		

19-11 IV

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Plot (continued): 92532-01-0019

ID	Species	map char	source	X (m)	Y (m)	Last Year's Data ddh (mm)	Height (cm)	DBH (cm)	THIS YEAR'S DATA ddh (mm)	Height (cm)	DBH (cm)	Re-sprout	Vigor*	Damage*	Notes

 # stems: 17

New Stems, not included last year, but are obviously planted. If more space needed, use blank PWS (Planted Woody Stems) Form:

Species Name	Source*	X (m)	Y (m)	ddh 1 mm	Height 1 cm*	DBH 1 cm	Vigor*	Damage*	Notes

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Plot 92532-01-0020 — Please fill in any missing data and fix incorrect data. — **Vegetation Monitoring Data (VMD) Datasheet**

VMD Year (1-5): 3 Date: 12/1/11 - / /

Taxonomic Standard:

Taxonomic Standard DATE:

Latitude or UTM-N: (dec.deg. or m) 1662045.131 Datum: NAD83/WGS84

Longitude or UTM-E: 527430.2246 UTM Zone:

Coordinate Accuracy (m): X-Axis bearing (deg): 35.194

Plot Dimensions: X: 10 Y: 10 ☐ Plot has reverse orientation for X and Y axis (Y is 90 degrees to the right of X

Party:	Role:
DB / DM	

Notes on plot:

ID	Species Name	Map char	Source*	X 0.1m	Y 0.1m	Last Year's Data ddh 1 mm	Height 1cm*	DBH 1 cm		THIS YEAR'S DATA ddh 1mm	Height 1cm*	DBH 1 cm	Re-sprout	Vigor*	Damage*	Notes
431	Platanus occidentalis ✓	E!	R			6	69.0			18	150	7	☐	4		
yr1: 20-1 | yr2: 20-1																
432	Quercus phellos ✓	E!	R			4	80.0			20	201	9	☐	4		
yr1: 20-2 | yr2: 20-2																
433	Quercus phellos ✓	E!	R			8	104.0	DBH?		35	250	12	☐	4		
yr1: 20-3 | yr2: 20-3																
434	Quercus phellos ✓	E!	R			8	67.0			16	143	3	☐	4		
yr1: 20-4 | yr2: 20-4																
436	Carpinus caroliniana ✓	E!	R			6	87.0			19	198	9	☐	4		
yr1: 20-6 | yr2: 20-6																
437	Betula nigra ✓	E!	R			8	89.0			25	204	9	☐	4		
yr1: 20-7 | yr2: 20-7																
438	Quercus phellos ✓	E!	R			5	62.0			16	150	5	☐	4		
yr1: 20-8 | yr2: 20-8																
439	Betula nigra ✓	E!	R			7	70.0			20	162	6	☐	4		
yr1: 20-9 | yr2: 20-9																
440	Betula nigra ✓	E!	R			13	150.0	3.0		51	<270	28	☐	4		
yr1: 20-10 | yr2: 20-10																
441	Carpinus caroliniana ✓	E!	R			5	81.0			16	210	7	☐	4		
yr1: 20-11 | yr2: 20-11																
442	Platanus occidentalis ✓	E!	R			8	71.0			21	160	7	☐	4		
yr1: 20-12 | yr2: 20-12																
443	Quercus phellos ✓	E!	R			17	209.0	10.0		44	<270	28	☐	4		
yr1: 20-13 | yr2: 20-13																
447	Quercus phellos ✓	E!	R			10	108.0	DBH?		35	224	15	☐	4		
yr1: 20-17 | yr2: 20-17																

 # stems: 13

New Stems, not included last year, but are obviously planted. If more space needed, use blank PWS (Planted Woody Stems) Form:

Species Name	Source*	X (m)	Y (m)	ddh 1 mm	Height 1 cm*	DBH 1 cm	Vigor*	Damage*	Notes

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Plot 92532-01-0021 — Please fill in any missing data and fix incorrect data. — **Vegetation Monitoring Data (VMD) Datasheet**

VMD Year (1-5): 3 Date: 12/1/11 - / /

Party: DB/DM Role:

Notes on plot:

Taxonomic Standard:

Taxonomic Standard DATE:

Latitude or UTM-N: (dec.deg. or m) 1662756.461 Datum: NAD83/WGS84

Longitude or UTM-E: 527798.7472 UTM Zone:

Coordinate Accuracy (m): X-Axis bearing (deg): 35.195

Plot Dimensions: X: 10 Y: 10 ☐ Plot has reverse orientation for X and Y axis (Y is 90 degrees to the right of X

ID	Species Name	Map char	Source*	X 0.1m	Y 0.1m	Last Year's Data ddh 1 mm	Height 1cm*	DBH 1 cm	THIS YEAR'S DATA ddh 1mm	Height 1cm*	DBH 1 cm	Re-sprout	Vigor*	Damage*	Notes
448	Lindera benzoin ✓	ED	R			5	39.0		5	69		✓	3		
yr1: 21-1 | yr2: 21-1															
449	Viburnum dentatum ✓	ED	R			6	102.0	DBH?	13	122	4		4		
yr1: 21-2 | yr2: 21-2															
450	Quercus nigra ✓	ED	R			7	52.0		15	137	5		4		
yr1: 21-3 | yr2: 21-3															
451	Quercus nigra	ED	R			4	35.0						0	MOVED TAG TO WEED	
yr1: 21-4 | yr2: 21-4															
452	Fraxinus pennsylvanica ✓	ED	R			30	238.0	10.0	50	<270	21		4		
yr1: 21-5 | yr2: 21-5 (Mislabeled as Platanus occidentalis)															
453	Cornus amomum ✓	ED	R			10	119.0	DBH?	22	202	5		4		
yr1: 21-6 | yr2: 21-6															
455	Quercus phellos ✓	ED	R			10	90.0		22	181	5		4		
yr1: 21-8 | yr2: 21-8															
456	Cornus amomum ✓	ED	R			4	47.0		11	74			4		
yr1: 21-9 | yr2: 21-9															
457	Ilex verticillata ✓	ED	R			8	72.0		11	104			3		BROKEN BRANCH
yr1: 21-10 | yr2: 21-10															
458	Quercus phellos ✓	ED	R			11	131.0	DBH?	31	<270	21		4		
yr1: 21-11 | yr2: 21-11															
459	Viburnum dentatum ✓	ED	R			5	76.0		13	89			4		
yr1: 21-12 | yr2: 21-12															
461	Fraxinus pennsylvanica ✓	ED	R			18	235.0	2.0	43	<270	24		4		
yr1: 21-14 | yr2: 21-14															
462	Lindera benzoin	ED	R			3	28.0						M		
yr1: 21-15 | yr2: 21-15 (New Growth0															
463	Ilex verticillata ✓	ED	R			5	57.0		10	69			3		
yr1: 21-16 | yr2: 21-16															
464	Viburnum dentatum ✓	ED	R			6	106.0	DBH?	20	160	5		4		
yr1: 21-17 | yr2: 21-17															
465	Viburnum dentatum ✓	ED	R			8	124.0	DBH?	25	182	5		4		
yr1: 21-18 | yr2: 21-18															
466	Cornus amomum ✓	ED	R			11	163.0	3.0	16	223	5		4		
yr1: 21-19 | yr2: 21-19															
467	Fraxinus pennsylvanica ✓	ED	R			21	213.0	6.0	40	<270	20		4		
yr1: 21-20 | yr2: 21-20															

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

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Plot (continued): 92532-01-0021

ID	Species	map char	source	X (m)	Y (m)	Last Year's Data ddh (mm)	Height (cm)	DBH (cm)	THIS YEAR'S DATA ddh (mm)	Height (cm)	DBH (cm)	Re-sprout	Vigor*	Damage*	Notes
468	Cornus amomum	E!	R			12	184.0	5.0	26	<270	15	☐	4		

yr1: 21-21 | yr2: 21-21

 # stems: 19

New Stems, not included last year, but are obviously planted. If more space needed, use blank PWS (Planted Woody Stems) Form:

Species Name	Source*	X (m)	Y (m)	ddh 1 mm	Height 1 cm*	DBH 1 cm	Vigor*	Damage*	Notes

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Plot 92532-01-0022 — Please fill in any missing data and fix incorrect data. — **Vegetation Monitoring Data (VMD) Datasheet**

VMD Year (1-5): 3 Date: 12/1/11 - / /

Party: DB/DN Role:

Taxonomic Standard:

Taxonomic Standard DATE:

Latitude or UTM-N: (dec.deg. or m) 1663364.256 Datum: NAD83/WGS84

Longitude or UTM-E: 527856.6138 UTM Zone:

Coordinate Accuracy (m): X-Axis bearing (deg): 35.195

Plot Dimensions: X: 10 Y: 10 ☐ Plot has reverse orientation for X and Y axis (Y is 90 degrees to the right of X

Notes on plot:

ID	Species Name	Map char	Source*	X 0.1m	Y 0.1m	Last Year's Data ddh 1 mm	Height 1cm*	DBH 1 cm	THIS YEAR'S DATA ddh 1mm	Height 1cm*	DBH 1 cm	Re-sprout	Vigor*	Damage*	Notes
470	Betula nigra ✓	E	R			7	71.0		36	195	7	☐	4		
yr1: 22-1 | yr2: 22-1															
472	Betula nigra ✓	E	R			3	45.0		16	147	3	☐	4		
yr1: 22-3 | yr2: 22-3 (New Growth)															
473	Platanus occidentalis ✓	E	R			12	116.0	DBH?	25	188	10	☐	4		
yr1: 22-4 | yr2: 22-4															
474	Ilex verticillata ✓	E	R			6	77.0		10	75		☐	3		
yr1: 22-5 | yr2: 22-5															
476	Ilex verticillata ✓	E	R			6	66.0		10	74		☐	3		
yr1: 22-7 | yr2: 22-7															
477	Quercus phellos ✓	E	R			7	66.0		20	163	5	☐	4		
yr1: 22-8 | yr2: 22-8															
478	Lindera benzoin	E	R			5	59.0					☐	0		
yr1: 22-9 | yr2: 22-9															
479	Viburnum dentatum	E	R			5	27.0					☐	0		
yr1: 22-10 | yr2: 22-10															
481	Ilex verticillata ✓	E	R			4	49.0		6	59		☐	2		
yr1: 22-12 | yr2: 22-12															
482	Fraxinus pennsylvanica ✓	E	R			10	103.0	DBH?	24	224	10	☐	4		
yr1: 22-13 | yr2: 22-13															
483	Cornus amomum ✓	E	R			7	83.0		14	214	4	☐	4		
yr1: 22-14 | yr2: 22-14															
484	Betula nigra ✓	E	R			6	91.0		26	228	11	☐	4		
yr1: 22-15 | yr2: 22-15															
485	Ilex verticillata ✓	E	R			5	52.0		7	61		☐	3		
yr1: 22-16 | yr2: 22-16															
486	Quercus michauxii ✓	E	R			11	127.0	DBH?	32	234	13	☐	4		
yr1: 22-17 | yr2: 22-17															
487	Quercus phellos ✓	E	R			4	43.0		5	56		☐	2		
yr1: 22-18 | yr2: 22-18															
488	Cornus amomum ✓	E	R			9	73.0		14	134	4	☐	4		
yr1: 22-19 | yr2: 22-19															
489	Viburnum dentatum ✓	E	R			5	82.0		10	140	3	☐	4		
yr1: 22-20 | yr2: 22-20															

5 14 ✓ 2

22-2 PO

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Plot (continued): 92532-01-0022

ID	Species	map char	source	X (m)	Y (m)	Last Year's Data ddh (mm)	Height (cm)	DBH (cm)	THIS YEAR'S DATA ddh (mm)	Height (cm)	DBH (cm)	Re-sprout	Vigor*	Damage*	Notes

 # stems: 17

New Stems, not included last year, but are obviously planted. If more space needed, use blank PWS (Planted Woody Stems) Form:

Species Name	Source*	X (m)	Y (m)	ddh 1 mm	Height 1 cm*	DBH 1 cm	Vigor*	Damage*	Notes

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Plot 92532-01-0023 — Please fill in any missing data and fix incorrect data. — **Vegetation Monitoring Data (VMD) Datasheet**

VMD Year (1-5): 3 Date: 12/2/11 - 1/1

Party: PL, DB, DM Role:

Notes on plot:

Taxonomic Standard:

Taxonomic Standard DATE:

Latitude or UTM-N: (dec.deg. or m) 1664007.916 Datum: NAD83/W

Longitude or UTM-E: 528249.907 UTM Zone:

Coordinate Accuracy (m): X-Axis bearing (deg): 35.196

Plot Dimensions: X: 10 Y: 10 ☐ Plot has reverse orientation for X and Y axis (Y is 90 degrees to the right of X

ID	Species Name	Map char	Source*	X 0.1m	Y 0.1m	Last Year's Data ddh 1 mm	Height 1cm*	DBH 1 cm	THIS YEAR'S DATA ddh 1mm	Height 1cm*	DBH 1 cm	Re-sprout	Vigor*	Damage*	Notes
491	Lindera benzoin ✓	E	R			4	67.0		10	146	5	☐	4		
yr1: 23-1 | yr2: 23-1															
492	Cornus amomum ✓	E	R			6	80.0		17	188	5	☐	4		
yr1: 23-2 | yr2: 23-2 (Mislabeled as Ilex verticillata)															
493	Lindera benzoin ✓	E	R			7	77.0		19	163	4	☐	4		
yr1: 23-3 | yr2: 23-3															
494	Betula nigra ✓	E	R			7	93.0		32	<270	18	☐	4		
yr1: 23-4 | yr2: 23-4															
495	Betula nigra ✓	E	R			6	104.0	DBH?	25	254	15	☐	4		
yr1: 23-5 | yr2: 23-5															
496	Betula nigra ✓	E	R			13	157.0	4.0	39	<270	26	☐	4		
yr1: 23-6 | yr2: 23-6															
497	Viburnum dentatum ✓	E	R			10	143.0	4.0	23	250	12	☐	4		
yr1: 23-7 | yr2: 23-7															
498	Quercus michauxii ✓	E	R			8	97.0		17	<270	12	☐	4		
yr1: 23-8 | yr2: 23-8															
499	Viburnum dentatum ✓	E	R			10	121.0	DBH?	23	121	6	☐	4		
yr1: 23-9 | yr2: 23-9															
500	Quercus phellos ✓	E	R			11	137.0	3.0	31	<270	18	☐	4		
yr1: 23-10 | yr2: 23-10															
502	Betula nigra ✓	E	R			17	242.0	9.0	51	<270	38	☐	4		
yr1: 23-12 | yr2: 23-12															
503	Quercus nigra ✓	E	R			12	200.0	15.0	30	<270	22	☐	4		
yr1: 23-13 | yr2: 23-13															
504	Quercus michauxii ✓	E	R			14	173.0	4.0	20	163	6	☐	4		
yr1: 23-14 | yr2: 23-14															
505	Carpinus caroliniana ✓	E	R			11	133.0	DBH?	35	<270	24	☐	4		
yr1: 23-15 | yr2: 23-15															
506	Quercus michauxii ✓	E	R			7	53.0		13	121	4	☐	3		
yr1: 23-16 | yr2: 23-16															
507	Betula nigra ✓	E	R			25	273.0	14.0	66	<270	40	☐	4		
yr1: 23-17 | yr2: 23-17															
508	Cornus amomum ✓	E	R			18	220.0	8.0	33	<270	24	☐	4		
yr1: 23-18 | yr2: 23-18															
509	Fraxinus pennsylvanica ✓	E	R			20	208.0	11.0	52	<270	33	☐	4		
yr1: 23-19 | yr2: 23-19															

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

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Plot (continued): 92532-01-0023

ID	Species	map char	source	X (m)	Y (m)	Last Year's Data ddh (mm)	Last Year's Data Height (cm)	Last Year's Data DBH (cm)	THIS YEAR'S DATA ddh (mm)	THIS YEAR'S DATA Height (cm)	THIS YEAR'S DATA DBH (cm)	THIS YEAR'S DATA Re-sprout	Vigor*	Damage*	Notes
514	Lindera benzoin ✓	E!	R			3	22.0		9	155	4	☑	3		

yr1: 23-24 | yr2: 23-24 (Broken Stem)

 # stems: 19

New Stems, not included last year, but are obviously planted. If more space needed, use blank PWS (Planted Woody Stems) Form:

Species Name	Source*	X (m)	Y (m)	ddh 1 mm	Height 1 cm*	DBH 1 cm	Vigor*	Damage*	Notes

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Table C.1. Vegetation Metadata

Big Cedar Creek Restoration Site: Project No. D06054-D	
Report Prepared By	Kristi Suggs
Date Prepared	12/14/2011 11:54
Revised/Edited	2/10/2012 14:54
database name	cvs-eep-entrytool-v2.2.7.mdb
database location	C:
computer name	CHABWKSUGGS2
file size	47611904
DESCRIPTION OF WORKSHEETS IN THIS DOCUMENT----------	
Metadata	Description of database file, the report worksheets, and a summary of project(s) and project data.
Proj, planted	Each project is listed with its PLANTED stems per acre, for each year. This excludes live stakes.
Proj, total stems	Each project is listed with its TOTAL stems per acre, for each year. This includes live stakes, all planted stems, and all natural/volunteer stems.
Plots	List of plots surveyed with location and summary data (live stems, dead stems, missing, etc.).
Vigor	Frequency distribution of vigor classes for stems for all plots.
Vigor by Spp	Frequency distribution of vigor classes listed by species.
Damage	List of most frequent damage classes with number of occurrences and percent of total stems impacted by each.
Damage by Spp	Damage values tallied by type for each species.
Damage by Plot	Damage values tallied by type for each plot.
Planted Stems by Plot and Spp	A matrix of the count of PLANTED living stems of each species for each plot; dead and missing stems are excluded.
PROJECT SUMMARY----------	
Project Code	92532
project Name	Big Cedar Creek
Description	Restoration Project
River Basin	Yadkin-Pee Dee
length(ft)	11661
stream-to-edge width (ft)	70
area (sq m)	151652.58
Required Plots (calculated)	23
Sampled Plots	23

Table C.2. Vegetation Vigor by Species

Big Cedar Creek Restoration Site: Project No. D06054-D									
	Species	**CommonName**	**4**	**3**	**2**	**1**	**0**	**Missing**	**Unknown**
	Betula nigra	river birch	56	3	3	1	6		
	Cornus amomum	silky dogwood	57	7	2	3			
	Corylus americana	American hazelnut	4	2		1			
	Fraxinus pennsylvanica	green ash	20	3	1	1			
	Ilex verticillata	common winterberry		7	6				
	Quercus michauxii	swamp chestnut oak	9	2		1	3		
	Quercus nigra	water oak	7		3		1		
	Quercus phellos	willow oak	33	1	2				
	Symphoricarpos orbiculatus	coralberry	3				1		
	Viburnum dentatum	southern arrowwood	25	3	1		1		
	Carpinus caroliniana	American hornbeam	21	5	2		2		
	Calycanthus floridus	eastern sweetshrub	1		2				
	Quercus rubra	northern red oak	4	1					
	Lindera benzoin	northern spicebush	3	3	2	4	5	1	
	Platanus occidentalis	American sycamore	71	15	8	1	2		
	Acer rubrum	red maple	1						
TOT:	**16**	**16**	**315**	**52**	**32**	**12**	**21**	**1**	**0**

Table C.3. Vegetation Damage by Species

Big Cedar Creek Restoration Site: Project No. D06054-D							
	Species	CommonName	Count of Damage Categories	No damage	(Other damage)	Unknown	
	Acer rubrum	red maple	0	1			
	Betula nigra	river birch	1	68	1		
	Calycanthus floridus	eastern sweetshrub	0	3			
	Carpinus caroliniana	American hornbeam	0	30			
	Cornus amomum	silky dogwood	1	68	1		
	Corylus americana	American hazelnut	0	7			
	Fraxinus pennsylvanica	green ash	0	25			
	Ilex verticillata	common winterberry	1	12	1		
	Lindera benzoin	northern spicebush	2	16	2		
	Platanus occidentalis	American sycamore	1	96	1		
	Quercus michauxii	swamp chestnut oak	0	15			
	Quercus nigra	water oak	0	11			
	Quercus phellos	willow oak	0	36			
	Quercus rubra	northern red oak	0	5			
	Symphoricarpos orbiculatus	coralberry	0	4			
	Viburnum dentatum	southern arrowwood	0	30			
TOT:	**16**	**16**	**6**	**427**	**6**	**0**	

Table C.4. Vegetation Damage by Plot

Big Cedar Creek Restoration Site: Project No. D06054-D						
	Plot	Count of Damage Categories	No damage	(Other damage)	Unknown	
	92532-01-0001-year:3	1	20	1		
	92532-01-0002-year:3	3	21	3		
	92532-01-0003-year:3	0	23			
	92532-01-0004-year:3	0	17			
	92532-01-0005-year:3	0	19			
	92532-01-0006-year:3	0	20			
	92532-01-0007-year:3	0	21			
	92532-01-0008-year:3	0	19			
	92532-01-0009-year:3	0	26			
	92532-01-0010-year:3	0	22			
	92532-01-0011-year:3	0	18			
	92532-01-0012-year:3	0	20			
	92532-01-0013-year:3	0	19			
	92532-01-0014-year:3	1	15	1		
	92532-01-0015-year:3	0	7			
	92532-01-0016-year:3	0	18			
	92532-01-0017-year:3	0	22			
	92532-01-0018-year:3	0	14			
	92532-01-0019-year:3	0	18			
	92532-01-0020-year:3	0	13			
	92532-01-0021-year:3	1	18	1		
	92532-01-0022-year:3	0	18			
	92532-01-0023-year:3	0	19			
TOT:	**23**	**6**	**427**	**6**	**0**	

Table C.5. Planted Stems by Plot and Species

Big Cedar Creek Restoration Site: Project No. D06054-D

Comment	Species	CommonName	Total Planted Stems	# plots	avg# stems	plot 92532-01-0001-year:3	plot 92532-01-0002-year:3	plot 92532-01-0003-year:3	plot 92532-01-0004-year:3	plot 92532-01-0005-year:3	plot 92532-01-0006-year:3	plot 92532-01-0007-year:3	plot 92532-01-0008-year:3	plot 92532-01-0009-year:3	plot 92532-01-0010-year:3	plot 92532-01-0011-year:3	plot 92532-01-0012-year:3	plot 92532-01-0013-year:3	plot 92532-01-0014-year:3	plot 92532-01-0015-year:3	plot 92532-01-0016-year:3	plot 92532-01-0017-year:3	plot 92532-01-0018-year:3	plot 92532-01-0019-year:3	plot 92532-01-0020-year:3	plot 92532-01-0021-year:3	plot 92532-01-0022-year:3	plot 92532-01-0023-year:3
	Acer rubrum	red maple	1	1	1						1																	
	Betula nigra	river birch	63	18	3.5	1	5	4	4	4		2		5	2		1	5	8	1	3		3	4	3		3	5	
	Calycanthus floridus	eastern sweetshrub	3	3	1								1				1					1						
	Carpinus caroliniana	American hornbeam	28	12	2.33	2	3		1			1		2				6	3		1	3		3	2			1	
	Cornus amomum	silky dogwood	69	22	3.14	3	4	1	1	6	5	4	4	1	3	7	3	6	3	1	4	1	3	1		4	2	2	
	Corylus americana	American hazelnut	7	3	2.33								4			2	1												
	Fraxinus pennsylvanica	green ash	25	14	1.79		1	1			4	1	2	1	4	1	2				1			2		3	1	1	
	Ilex verticillata	common winterberry	13	8	1.62				1							2	1				1	1		1		2	4		
	Lindera benzoin	northern spicebush	12	8	1.5	2	2	1					1	1	1												1		3	
	Platanus occidentalis	American sycamore	95	18	5.28	6	6	9	7	2	4	5	4	6	9	5	7			1	4	10		6	2		2		
	Quercus michauxii	swamp chestnut oak	12	7	1.71				1		3	1		2	1												1	3	
	Quercus nigra	water oak	10	7	1.43							1								1	2	3	1			1		1	
	Quercus phellos	willow oak	36	13	2.77			2	2	5	1	1		4						3			6	1	6	2	2	1	
	Quercus rubra	northern red oak	5	5	1		1	1		1	1											1							
	Symphoricarpos orbiculatu	coralberry	3	3	1									1	1	1													
	Viburnum dentatum	southern arrowwood	29	14	2.07	2	2	2		1	2		2	3			3	2	2		1					4	1	2	
TOT:	**16**	**16**	**411**	**16**		**16**	**24**	**21**	**17**	**19**	**20**	**17**	**18**	**26**	**21**	**18**	**19**	**19**	**16**	**7**	**17**	**20**	**13**	**18**	**13**	**17**	**16**	**19**	

Table C.6. Vegetative Problem Areas

Big Cedar Creek Restoration Site: Project No. D06054-D			
BCC			
Feature/Issue	Station # / Range	Probable Cause	Photo #
Invasive/Exotic Populations	68+00 - 78+00, Right Bank	Ligustrum sinese persisting after construction.	VPA 1
UT1			
Feature/Issue	Station # / Range	Probable Cause	Photo #
Invasive/Exotic Populations	59+00 - 63+50, Right Bank	Ligustrum sinese persisting after construction.	VPA 2

Table C.7. Plot Species and Densities

Big Cedar Creek Restoration Site Contract No. D06054-D																										
Tree Species	**Plots**																							**Year 1 Totals**	**Year 2 Totals**	**Year 3 Totals**	**Average**
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
Acer rubrum							1																	1	1	1	
Betula nigra	1	5	4	4	4		2		5	2		1	5	8	1	3		3	4	3		3	5	64	65	63	
Calycanthus floridus								1				1					1							3	3	3	
Carpinus caroliniana	2	3		1			1		2				6	3		1	3		3	2			1	32	30	28	
Cornus amomum	3	4	1	1	6	5	4	4	1	3	7	3	6	3	1	4	1	3	1		4	2	2	69	69	69	
Corylus americana								4			2	1												7	7	7	
Fraxinus pennsylvanica		1	1			4	1	2	1	4	1	2				1			2		3	1	1	25	25	25	
Ilex verticillata				1							2	1				1	1		1		2	4		20	13	13	
Lindera benzoin	2	2	1					1	1	1											1		3	27	17	12	
Platanus occidentalis	6	6	9	7	2	4	5	4	6	9	5	7			1	4	10		6	2		2		108	99	95	
Quercus michauxii				1		3	1		2	1												1	3	17	15	12	
Quercus nigra							1								1	2	3	1			1		1	13	11	10	
Quercus phellos			2	2	5	1	1		4						3			6	1	6	2	2	1	40	35	36	
Quercus rubra		1	1		1	1											1							5	5	5	
Symphoricarpos obiculatus									1	1	1													4	4	3	
Viburnum dentatum	2	2	2		1	2		2	3			3	2	2		1					4	1	2	32	28	29	
Stems/plot	16	24	21	17	19	20	17	18	26	21	18	19	19	16	7	17	20	13	18	13	17	16	19	467	427	411	
Stems/acre Year 3	640	960	840	680	760	800	680	720	1040	840	720	760	760	640	280	680	800	520	720	520	680	640	760	N/A	N/A	N/A	715
Stems/acre Initial	1000	960	960	760	880	1000	1040	1040	1080	1080	840	880	840	800	640	840	880	800	840	680	880	840	960				892

Vegetation Monitoring Plot Photos

Veg Plot 1

Veg Plot 2

Veg Plot 3

Veg Plot 4

Veg Plot 5

Veg Plot 6

Veg Plot 7

Veg Plot 8

Veg Plot 9

Veg Plot 10

Veg Plot 11

Veg Plot 12

Veg Plot 13

Veg Plot 14

Veg Plot 15

Veg Plot 16

Veg Plot 17

Veg Plot 18

Veg Plot 19

Veg Plot 20

Veg Plot 21

Veg Plot 22

Veg Plot 23

Figure C1: Vegetation Problem Areas
BCC (Station 68+00 to 78+00) and
UT1 (Station 59+00 to 63+50)

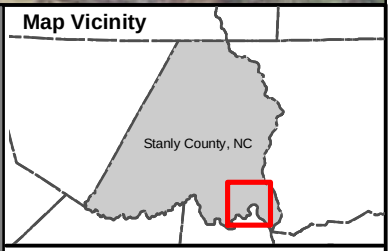
Big Cedar Creek Stream Restoration Project
Annual Monitoring Plan - Year 3
Stanly County, NC

0 75 150 300 Feet

LEGEND

- Invasives
- Conservation Easement
- Asbuilt Alignment
- Vegetation Plots

Map Vicinity



EEP Project No. : D06054-D
March 2012

Representative Vegetation Problem Area Photos

VPA 1 – Invasive species on right bank (BCC)

VPA 2 – Invasive species on left bank (UT1)

Appendix D

As-Built Plan Sheets

BIG CEDAR CREEK STREAM RESTORATION AS-BUILT PLANS

PROJECT REFERENCE NO.	SHEET NO.
109261	T1

PROJECT MANAGER
CDM
APPROVED BY
KLT
DATE
02/15/08

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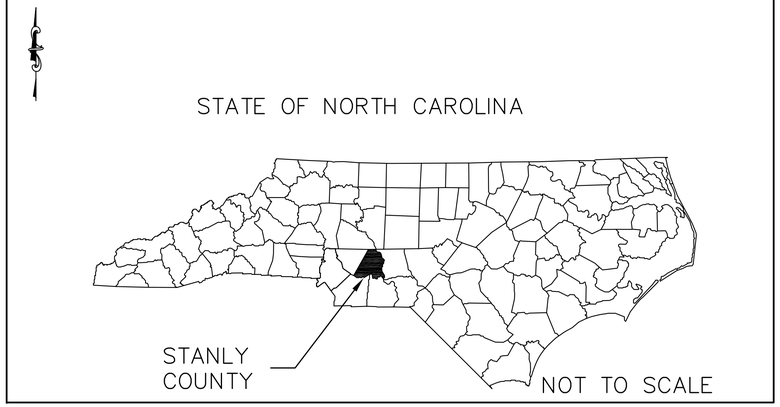
VICINITY MAP – NTS



EEP PROJECT # D06054-D
EEP REVIEW COORDINATOR-TIM BAUMGARTNER

MICHAEL BAKER ENGINEERING CONTACT-CHRISTINE MILLER
PH# 704-334-4454

INDEX OF SHEETS

STA. 10+00 BIG CEDAR CREEK
LAT 35.20977595
LONG -80.12770448

BIG CEDAR
PRE-PROJECT STREAM LENGTH = 6700 LF
AS-BUILT STREAM LENGTH = 6736 LF

UT1
PRE-PROJECT STREAM LENGTH = 5314 LF
AS-BUILT STREAM LENGTH = 5396 LF

UT2
PRE-PROJECT STREAM LENGTH = 591 LF
AS-BUILT STREAM LENGTH = 597 LF

BIG CEDAR CREEK

TITLE SHEET

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PROJECT REFERENCE NO.	SHEET NO.
109261	R2

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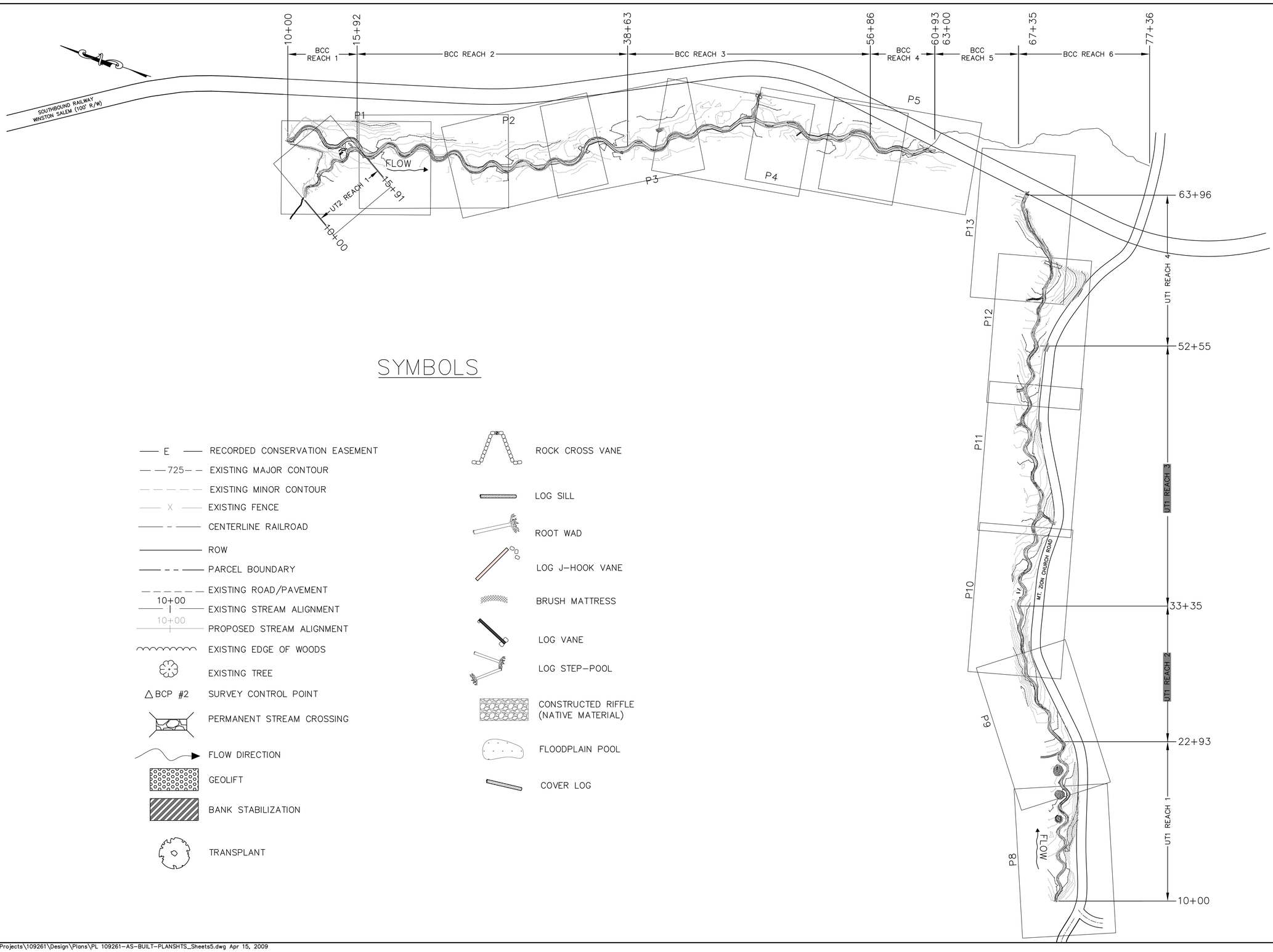

SYMBOLS

- E — RECORDED CONSERVATION EASEMENT
- 725 — EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- X — EXISTING FENCE
- CENTERLINE RAILROAD
- ROW
- PARCEL BOUNDARY
- EXISTING ROAD/PAVEMENT
- 10+00 EXISTING STREAM ALIGNMENT
- 10+00 PROPOSED STREAM ALIGNMENT
- EXISTING EDGE OF WOODS
- EXISTING TREE
- △BCP #2 SURVEY CONTROL POINT
- PERMANENT STREAM CROSSING
- FLOW DIRECTION
- GEOLIFT
- BANK STABILIZATION
- TRANSPLANT

- ROCK CROSS VANE
- LOG SILL
- ROOT WAD
- LOG J-HOOK VANE
- BRUSH MATTRESS
- LOG VANE
- LOG STEP-POOL
- CONSTRUCTED RIFFLE (NATIVE MATERIAL)
- FLOODPLAIN POOL
- COVER LOG

400 0 400 800
SCALE (FT)

BIG CEDAR CREEK

REFERENCE SHEET

PROJECT REFERENCE NO.	SHEET NO.
109261	5A

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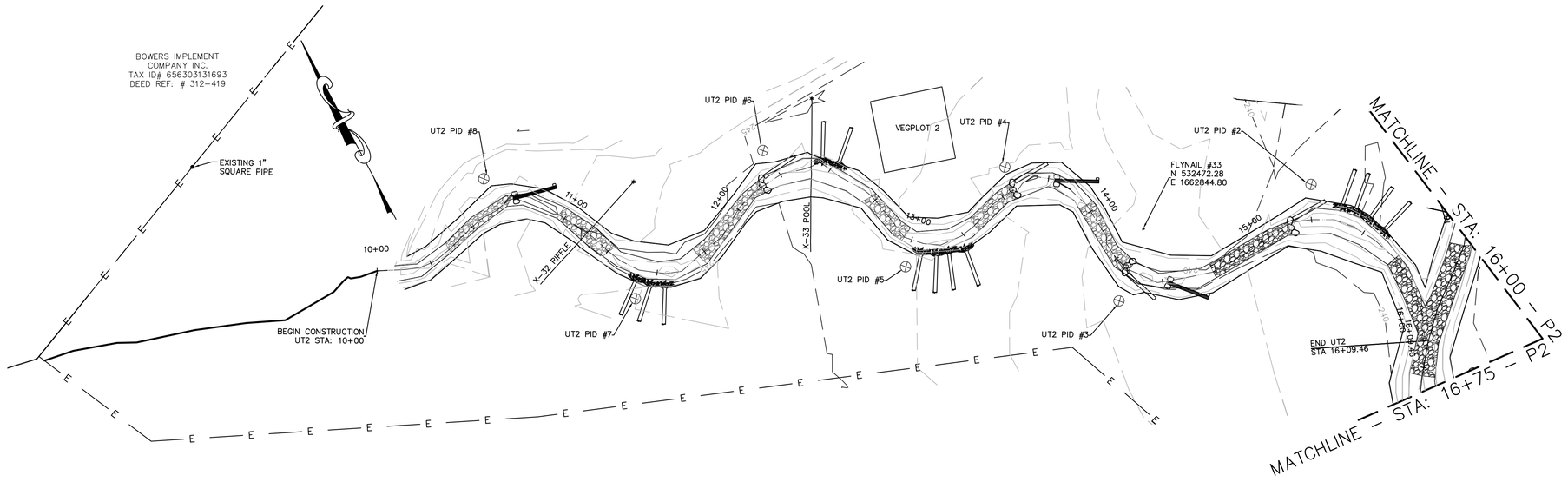

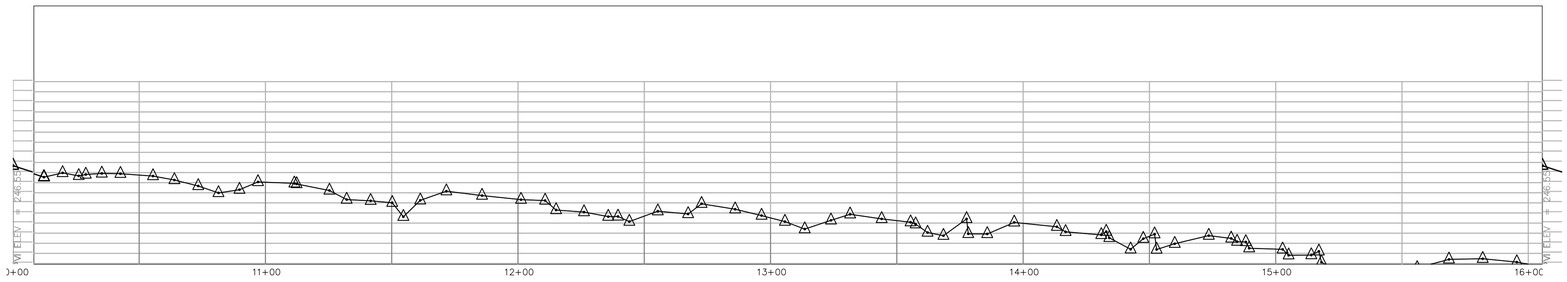

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BIG CEDAR CREEK

UT2 SITE PLAN

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PROJECT REFERENCE NO.	SHEET NO.
109261	5B

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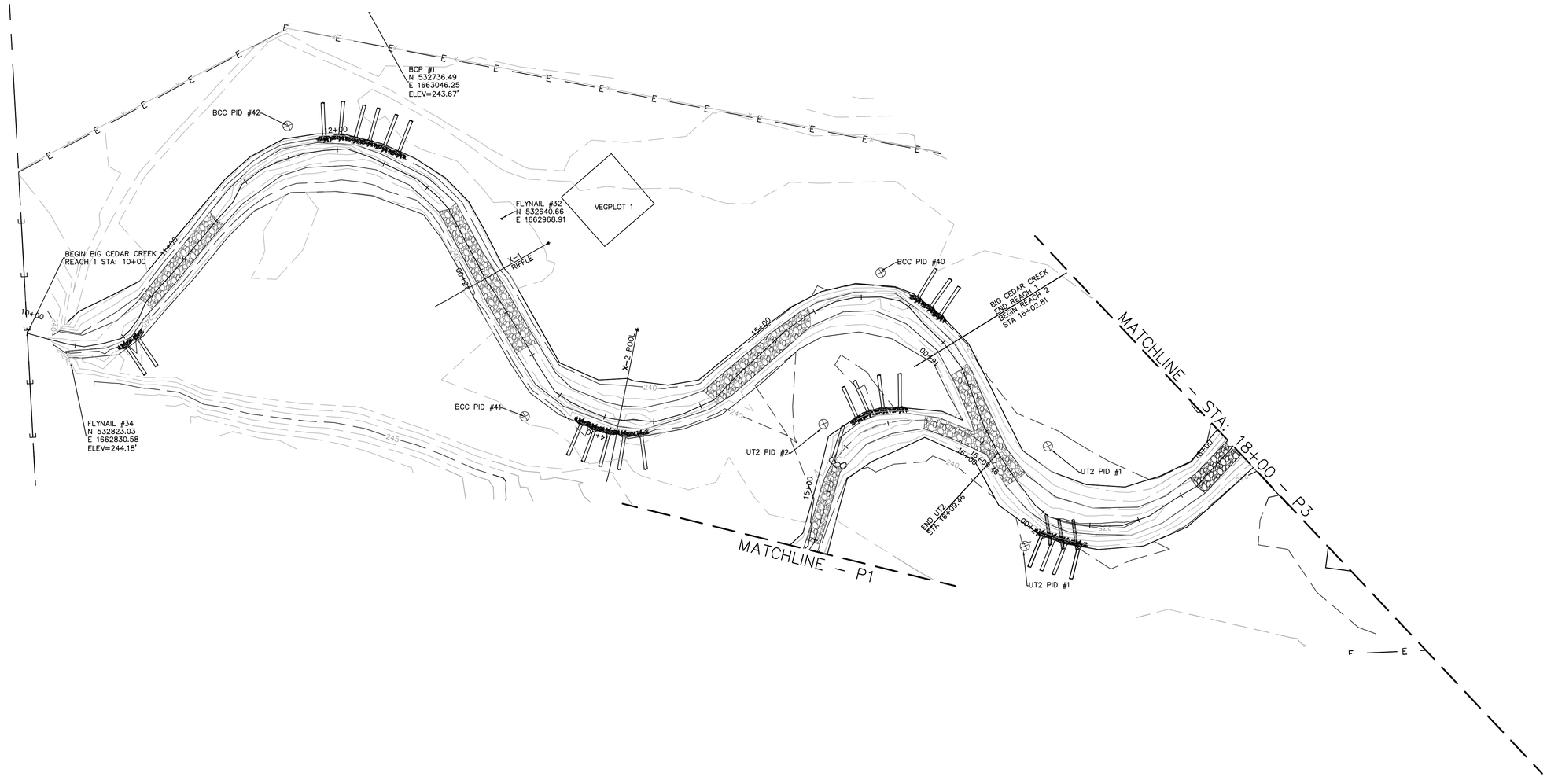

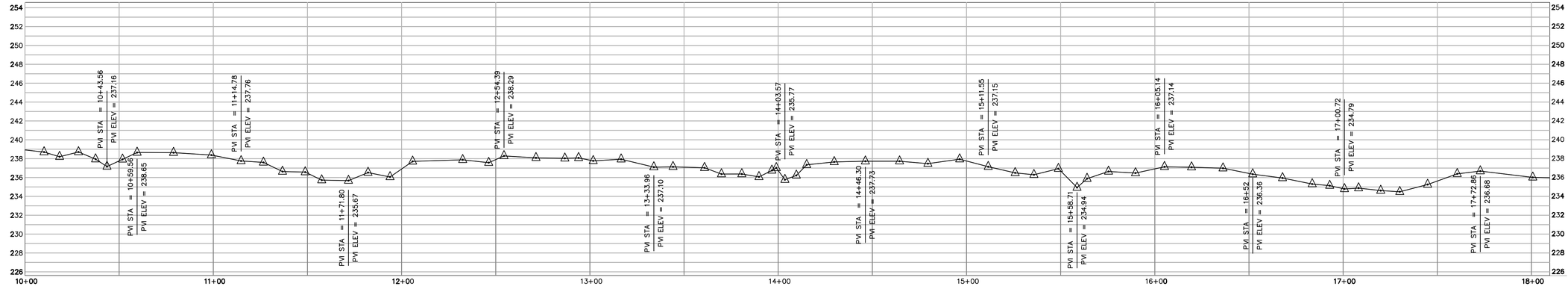

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BIG CEDAR CREEK

BIG CEDAR CREEK SITE PLAN

PROJECT REFERENCE NO.	SHEET NO.
109261	5C

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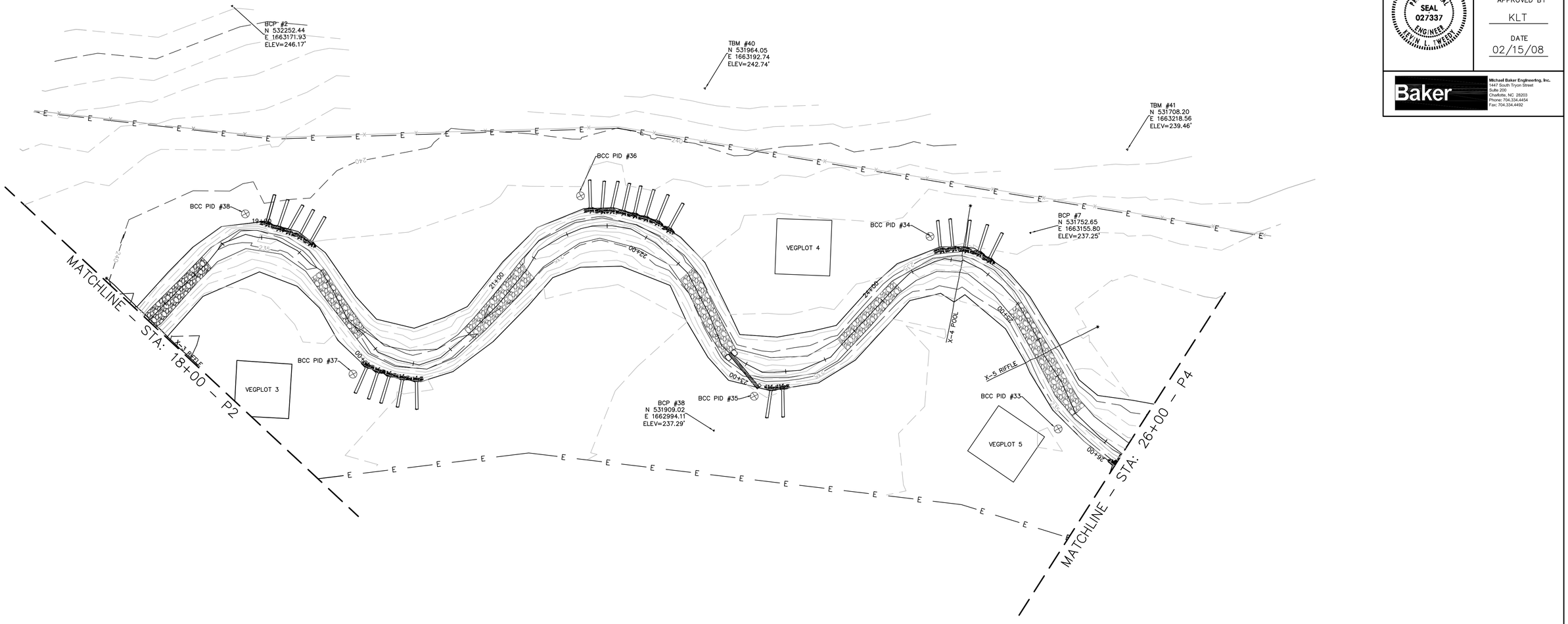

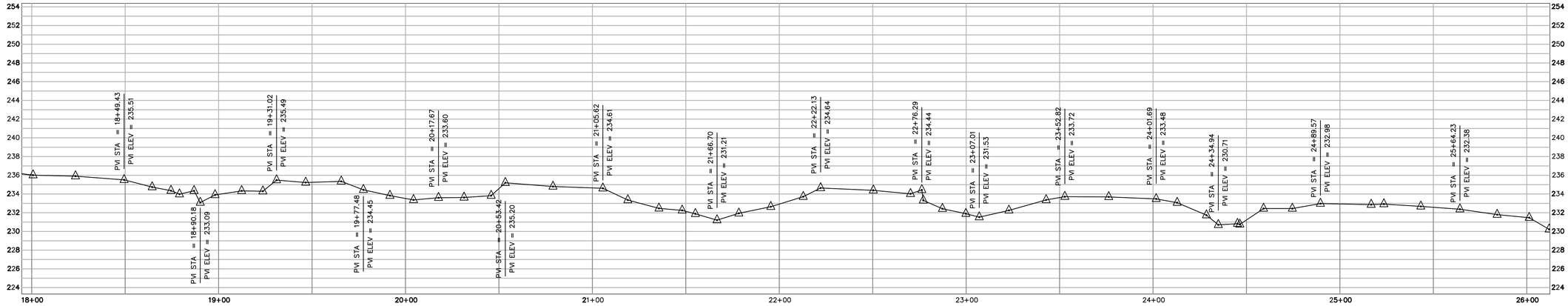

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BIG CEDAR CREEK

BIG CEDAR CREEK SITE PLAN

PROJECT REFERENCE NO.	SHEET NO.
109261	5D

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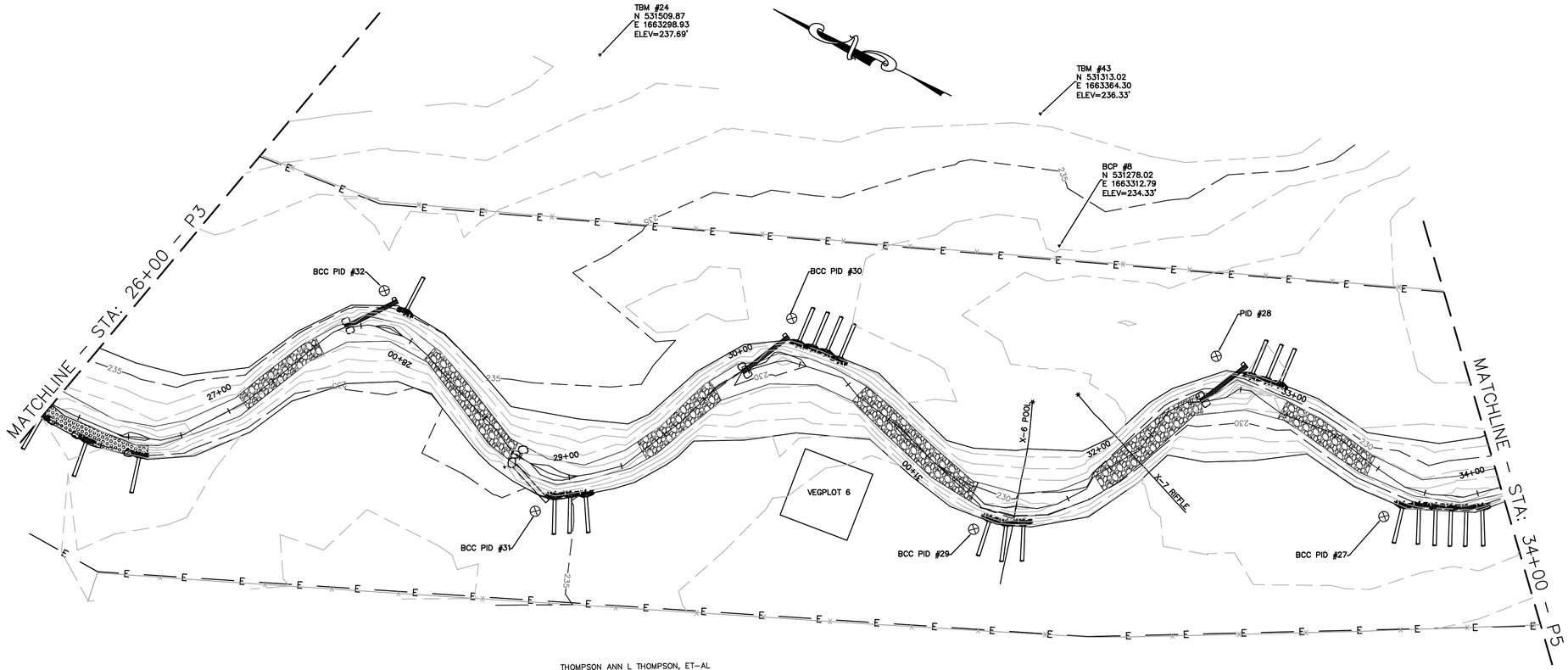

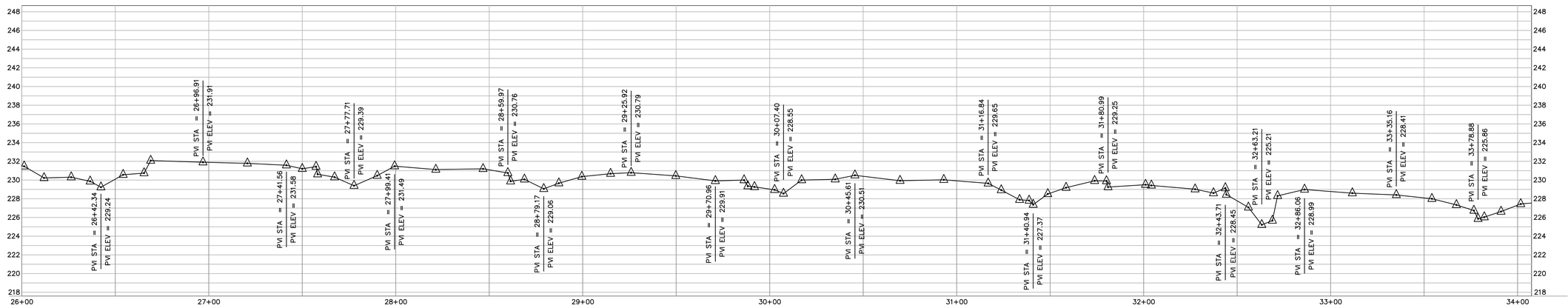

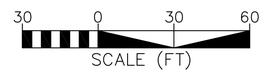

BIG CEDAR CREEK

BIG CEDAR CREEK SITE PLAN

PROJECT REFERENCE NO.	SHEET NO.
109261	5E

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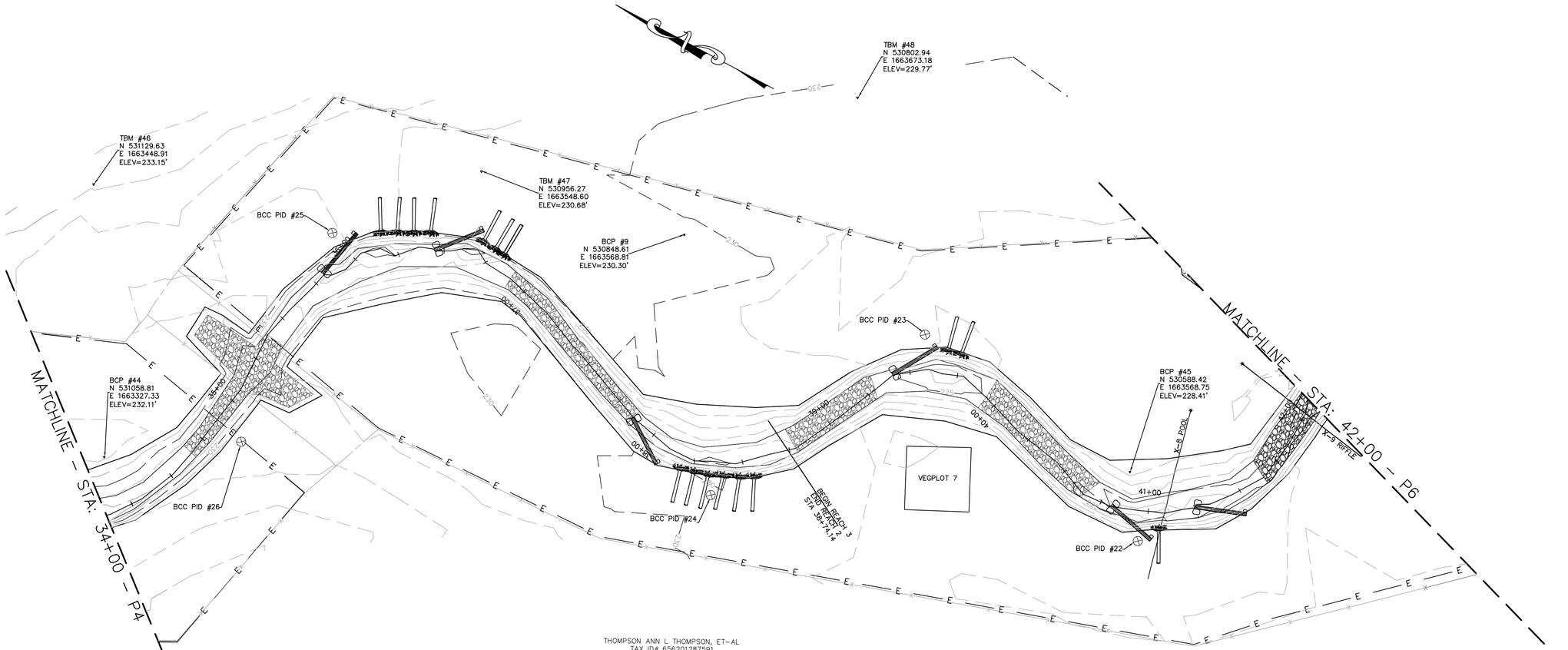

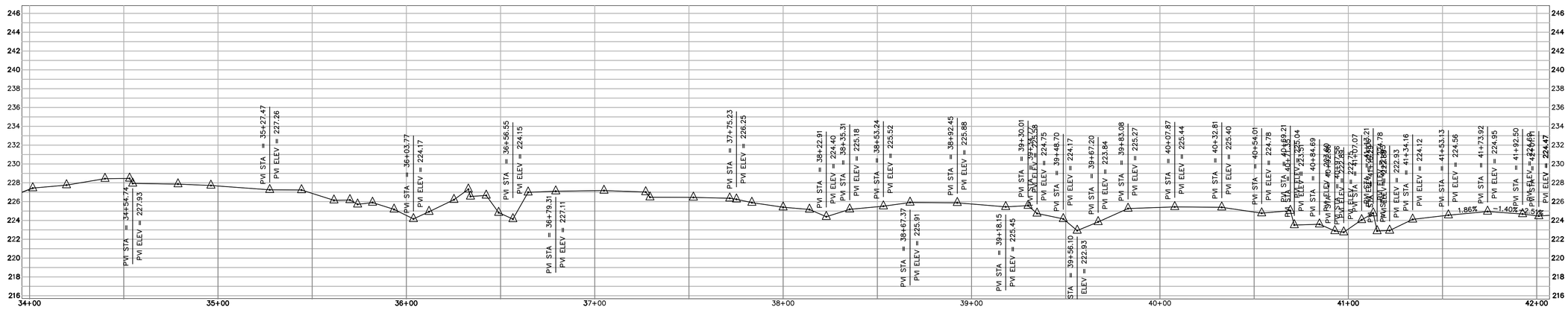

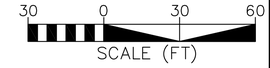

BIG CEDAR CREEK

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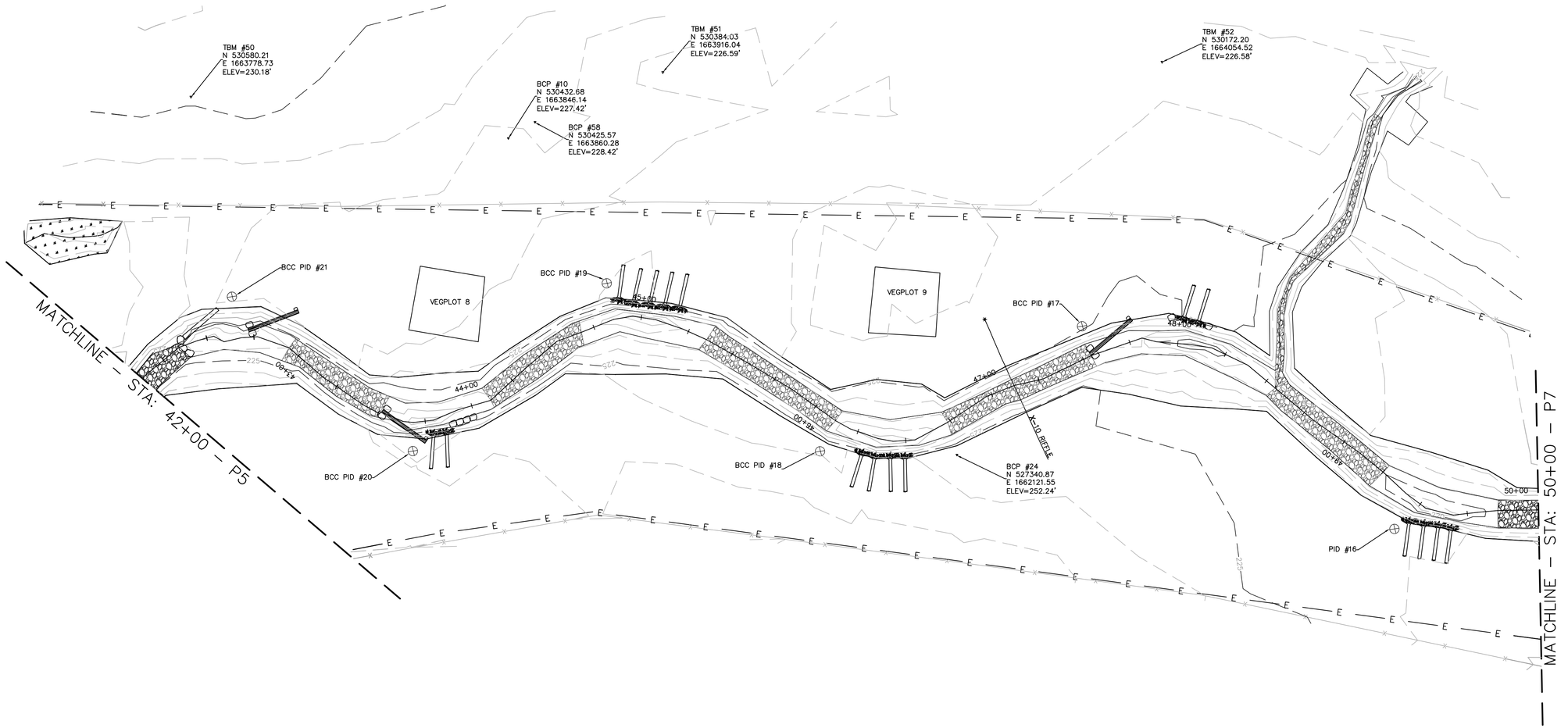

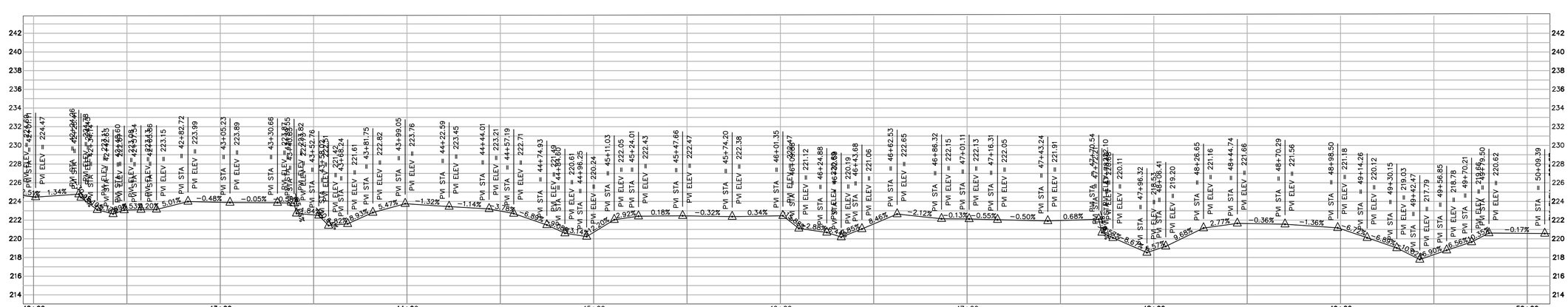

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BIG CEDAR CREEK

BIG CEDAR CREEK SITE PLAN

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PROJECT REFERENCE NO.	SHEET NO.
109261	5G

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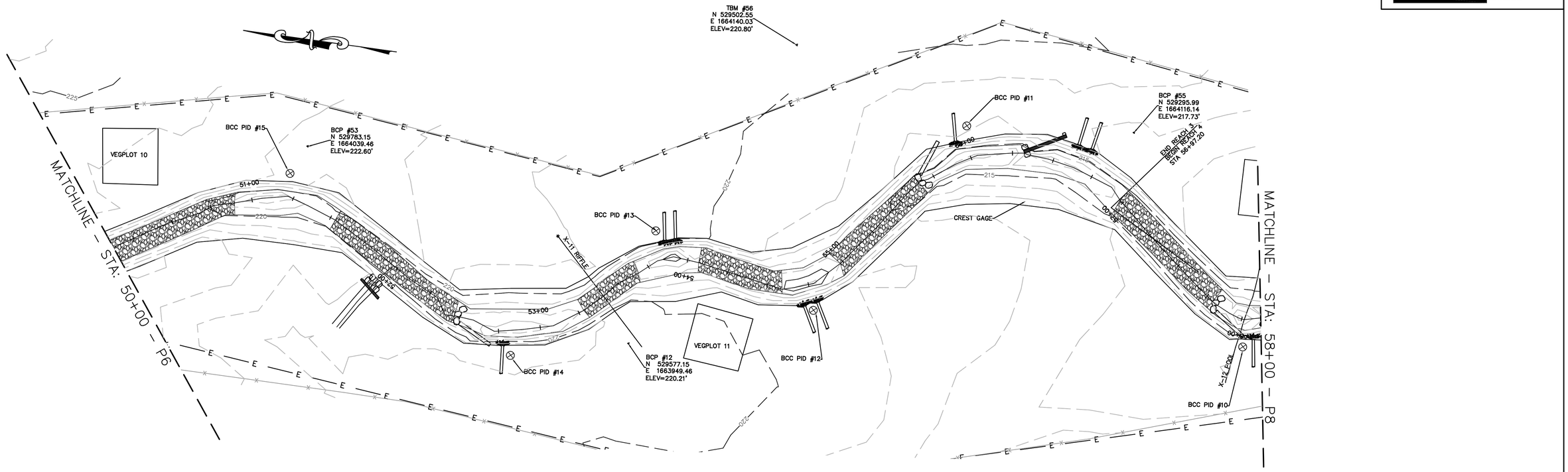

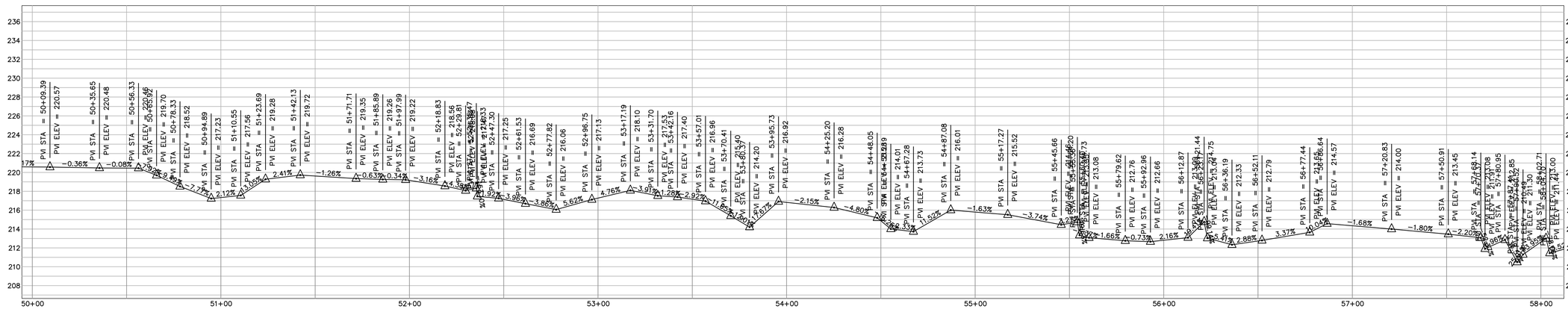

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BIG CEDAR CREEK

BIG CEDAR CREEK SITE PLAN

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PROJECT REFERENCE NO.	SHEET NO.
109261	5H

NORTH CAROLINA PROFESSIONAL SEAL 027337 ENGINEER KEVIN L. NEED

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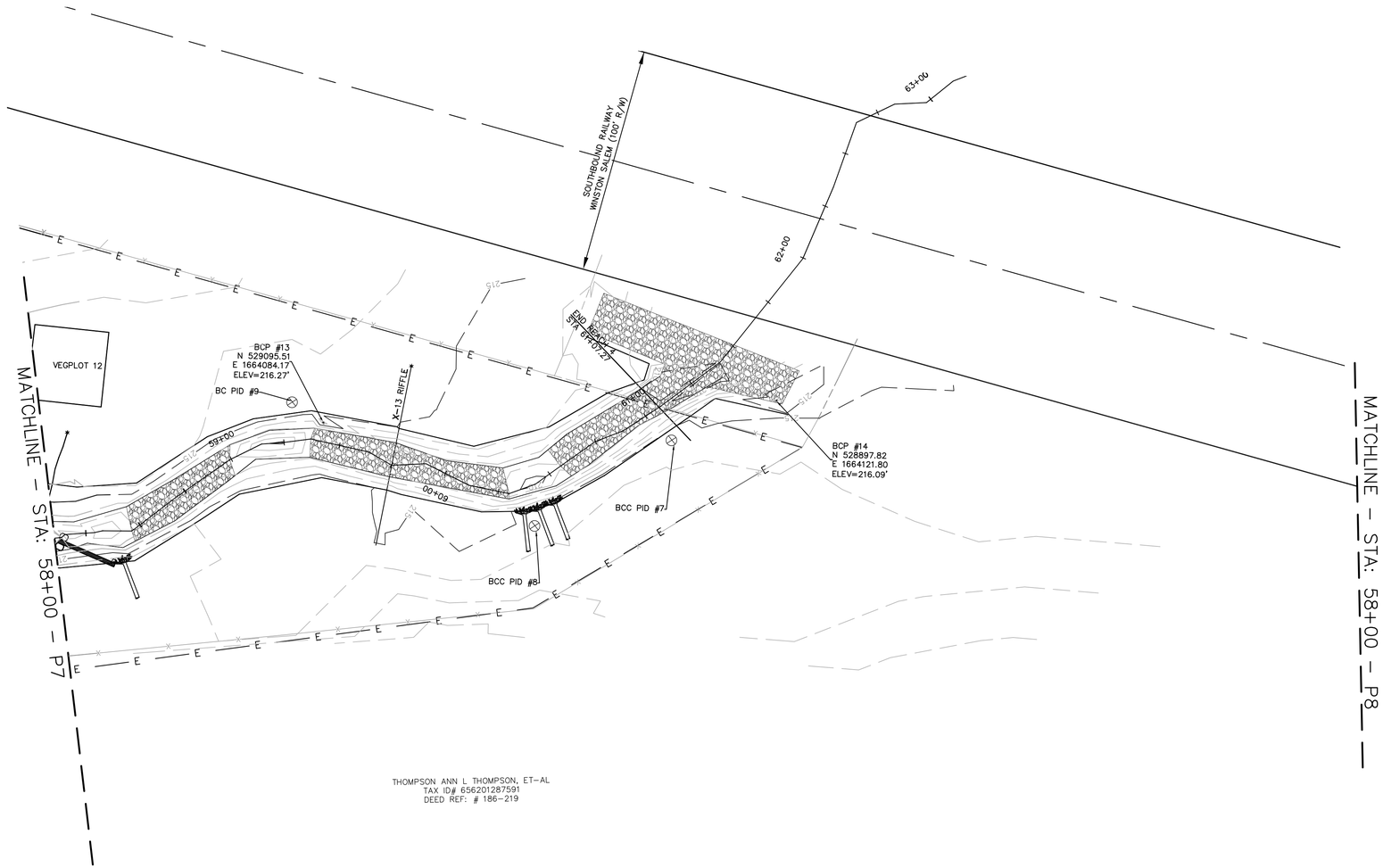

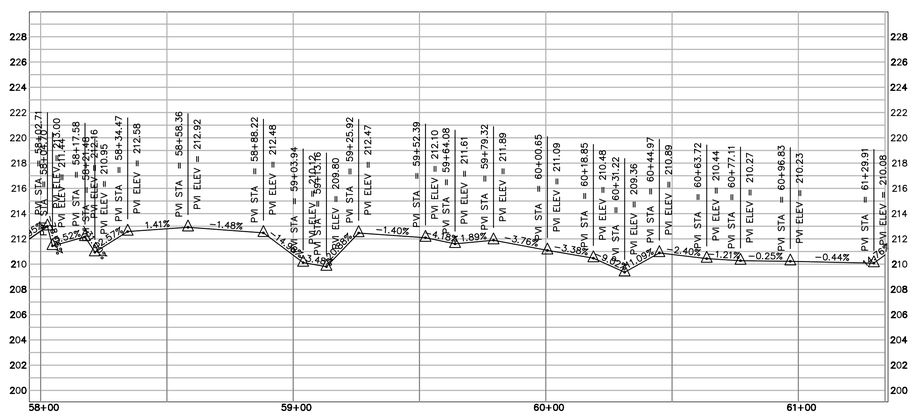

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SCALE (FT)

BIG CEDAR CREEK

BIG CEDAR CREEK SITE PLAN

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PROJECT REFERENCE NO.	SHEET NO.
109261	5J

NORTH CAROLINA PROFESSIONAL SEAL 027337 ENGINEER KEVIN L. WEEDY

PROJECT MANAGER
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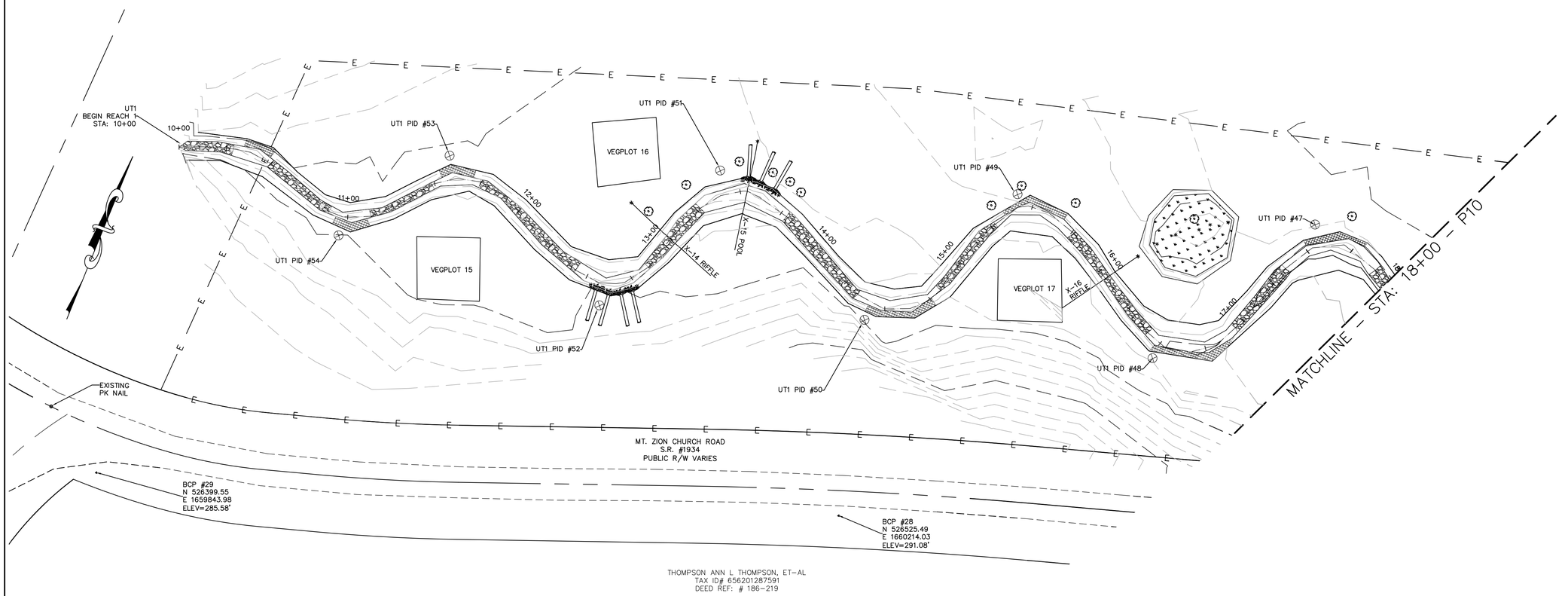

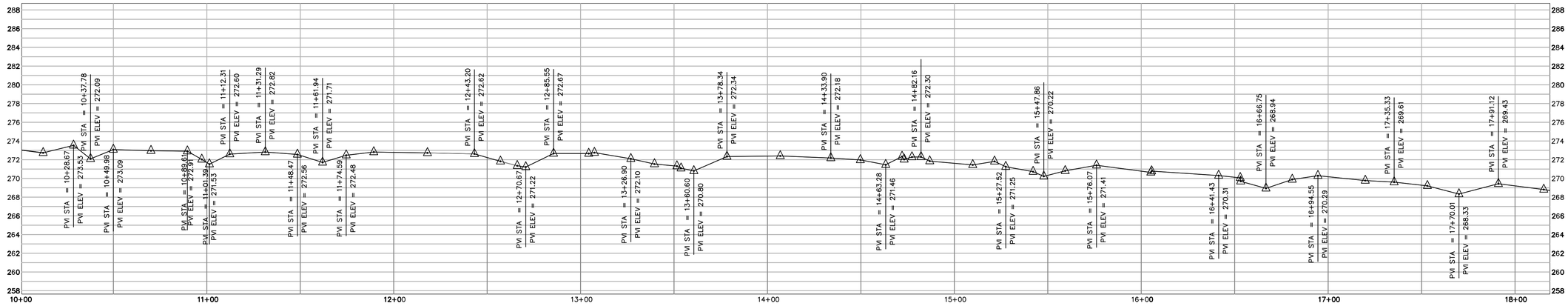

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SCALE (FT)

BIG CEDAR CREEK

UT1
SITE PLAN

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PROJECT REFERENCE NO.	SHEET NO.
109261	5K

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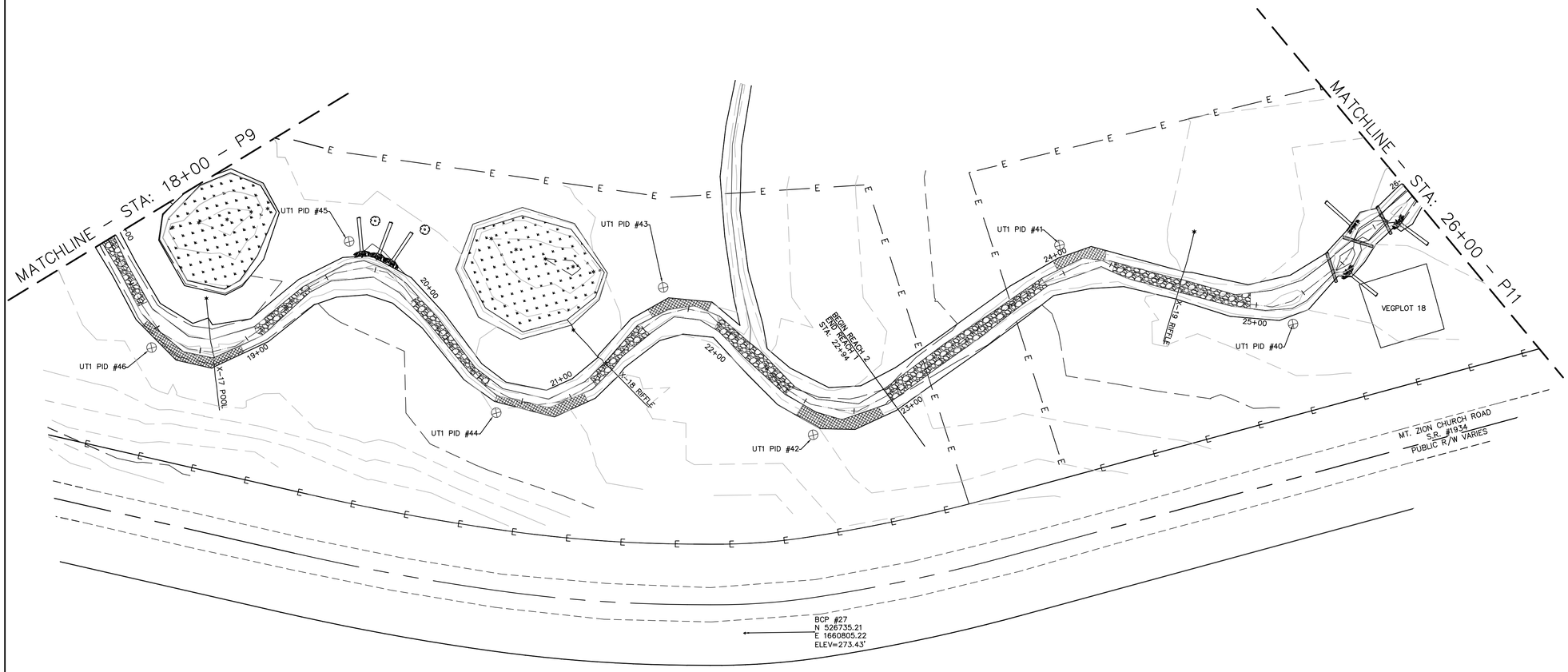

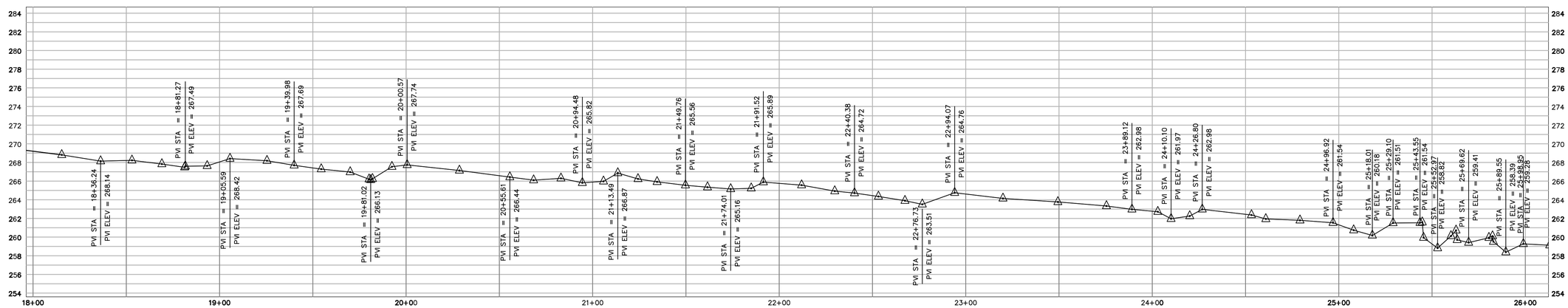

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VERTICAL SCALE (FT)

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HORIZONTAL SCALE (FT)

BIG CEDAR CREEK

UT1 SITE PLAN

PROJECT REFERENCE NO.	SHEET NO.
109261	5L

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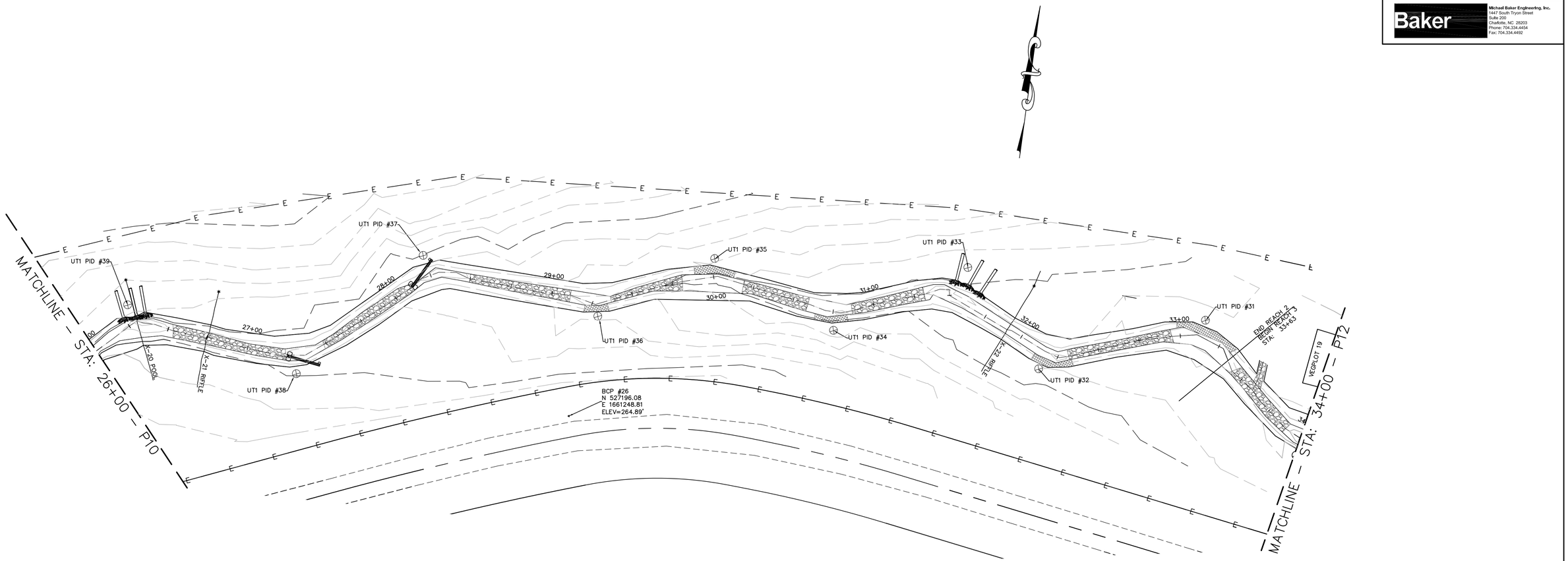

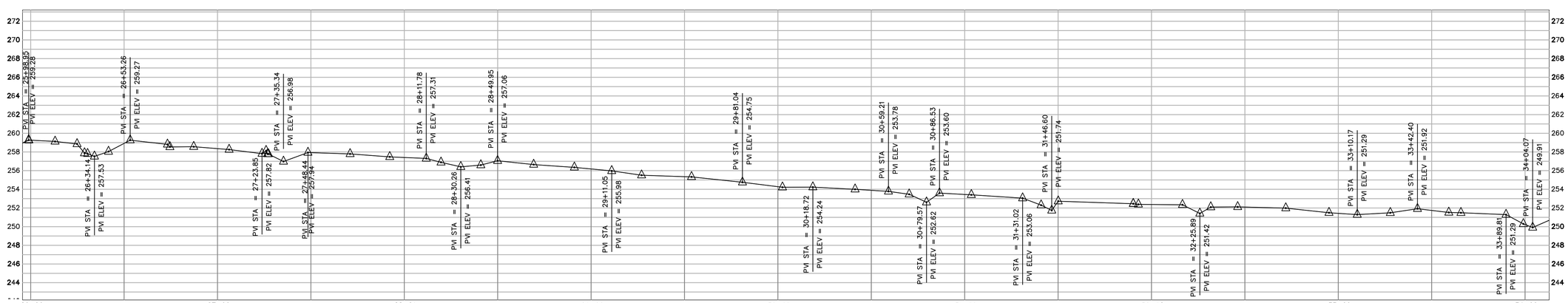

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SCALE (FT)

BIG CEDAR CREEK

UT1
SITE PLAN

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PROJECT REFERENCE NO.	SHEET NO.
109261	5N

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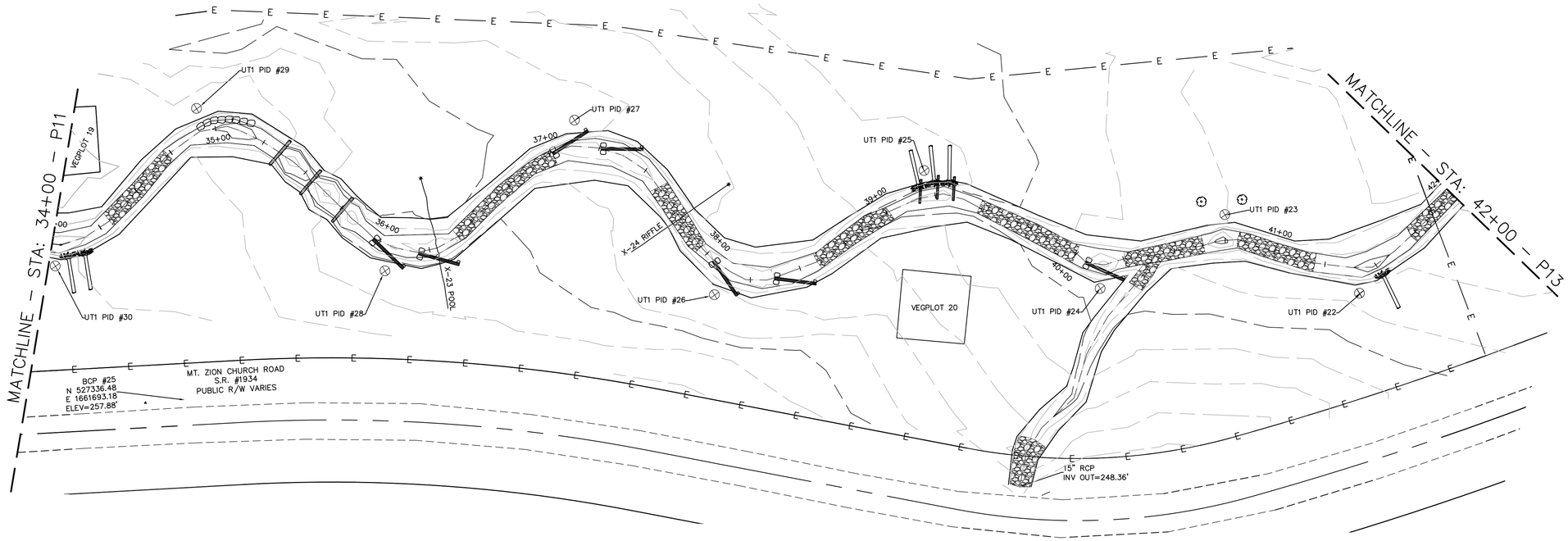

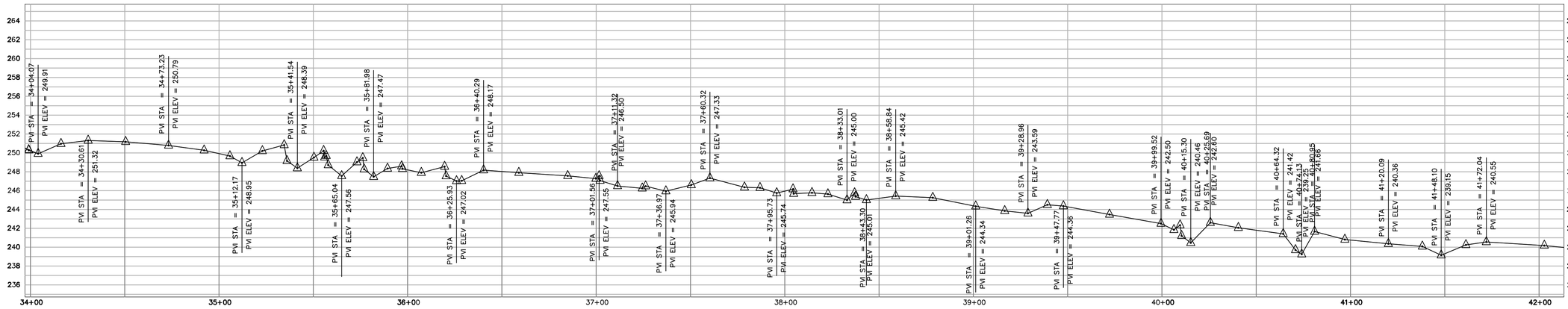

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SCALE (FT)

BIG CEDAR CREEK

UT1
SITE PLAN

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PROJECT REFERENCE NO.	SHEET NO.
109261	5N

NORTH CAROLINA PROFESSIONAL SEAL 027337 ENGINEER KEVIN L. NEED

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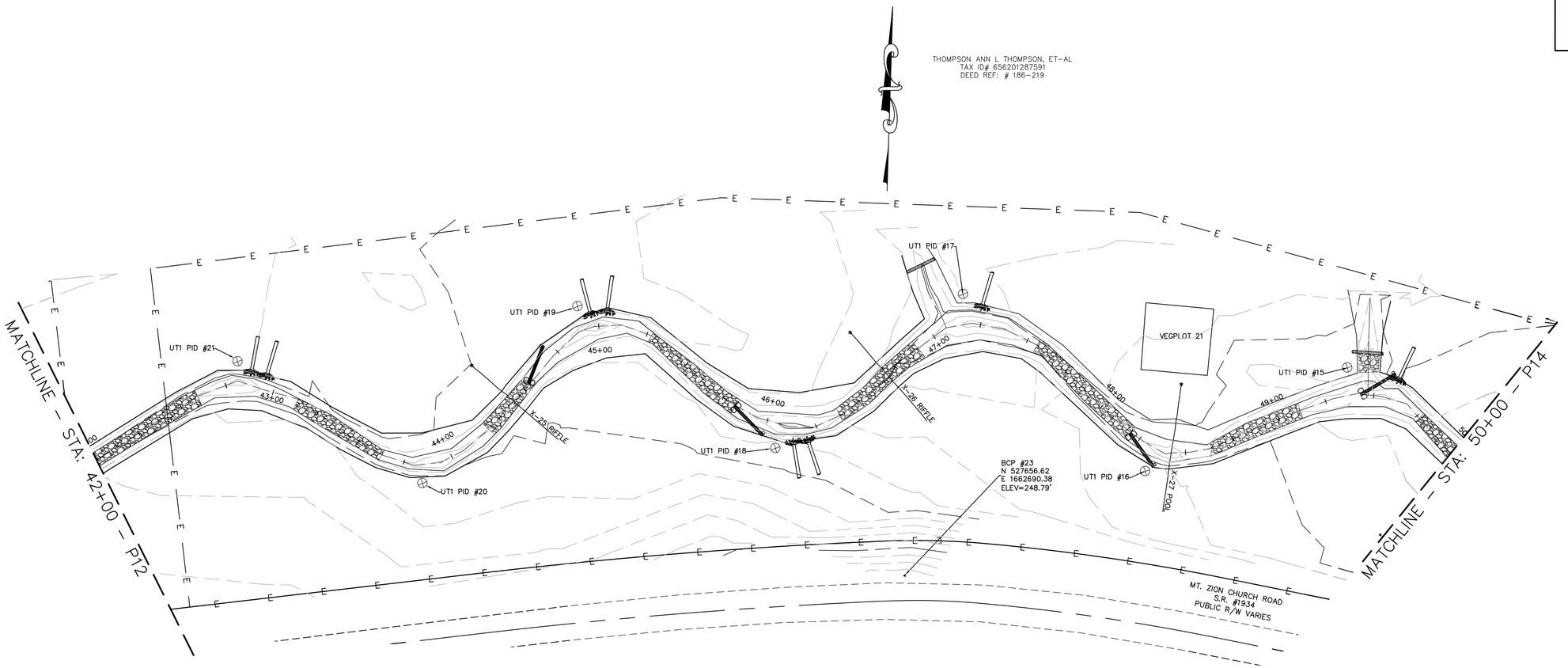

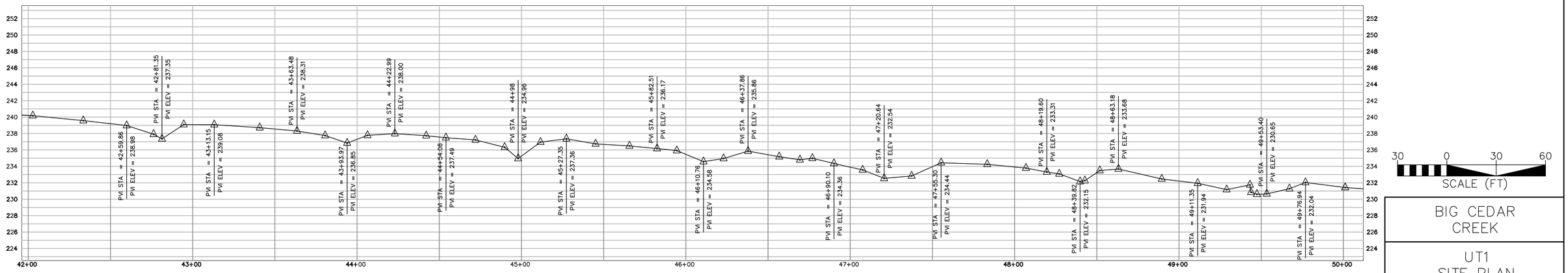

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SCALE (FT)

BIG CEDAR CREEK

UT1
SITE PLAN

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PROJECT REFERENCE NO.	SHEET NO.
109261	50

NORTH CAROLINA PROFESSIONAL SEAL 027337 ENGINEER KEVIN L. WEEDY

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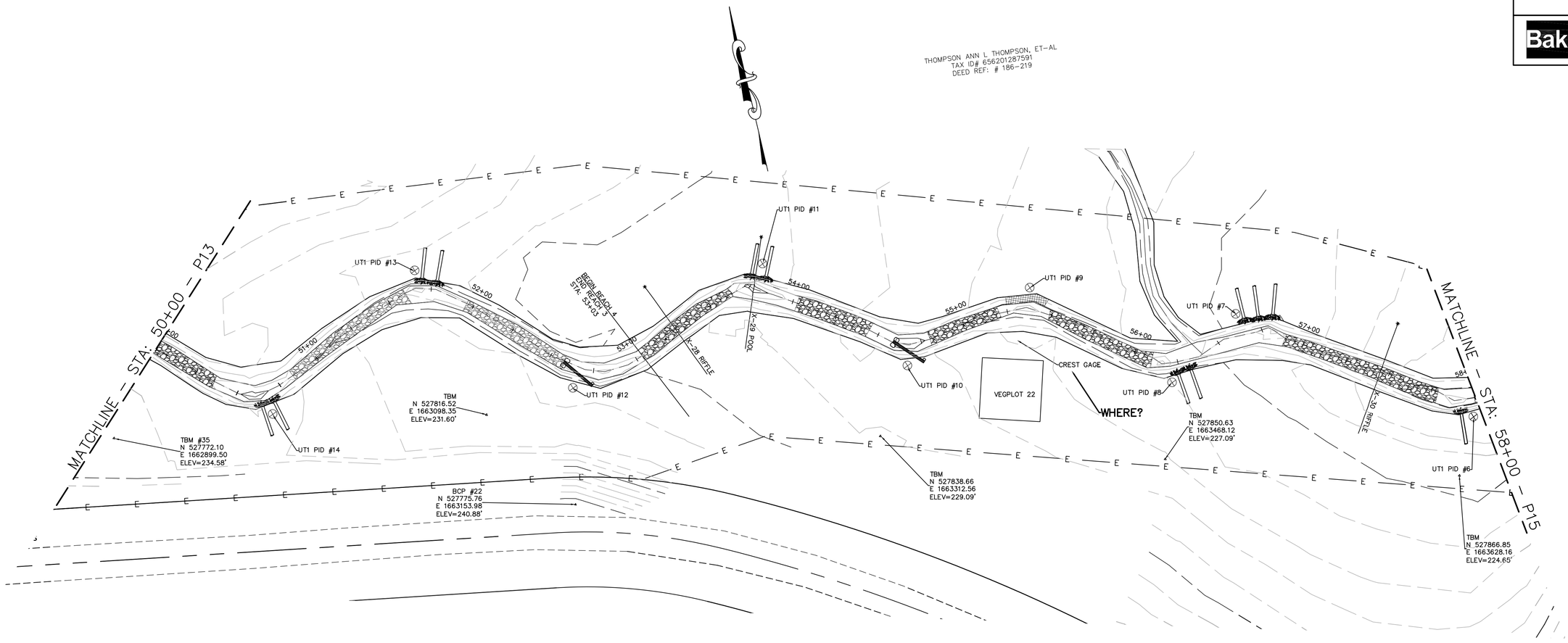

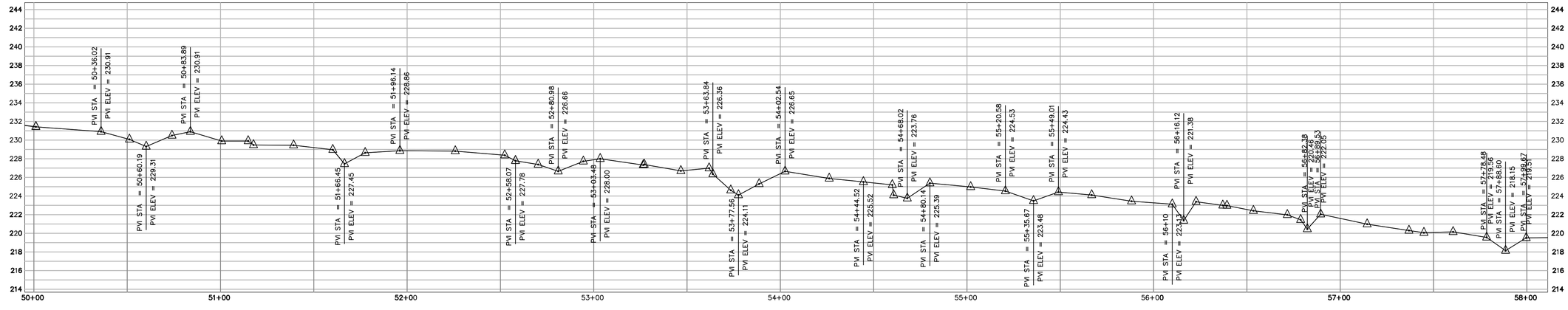

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SCALE (FT)

BIG CEDAR CREEK

UT1
SITE PLAN

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PROJECT REFERENCE NO.	SHEET NO.
109261	5P

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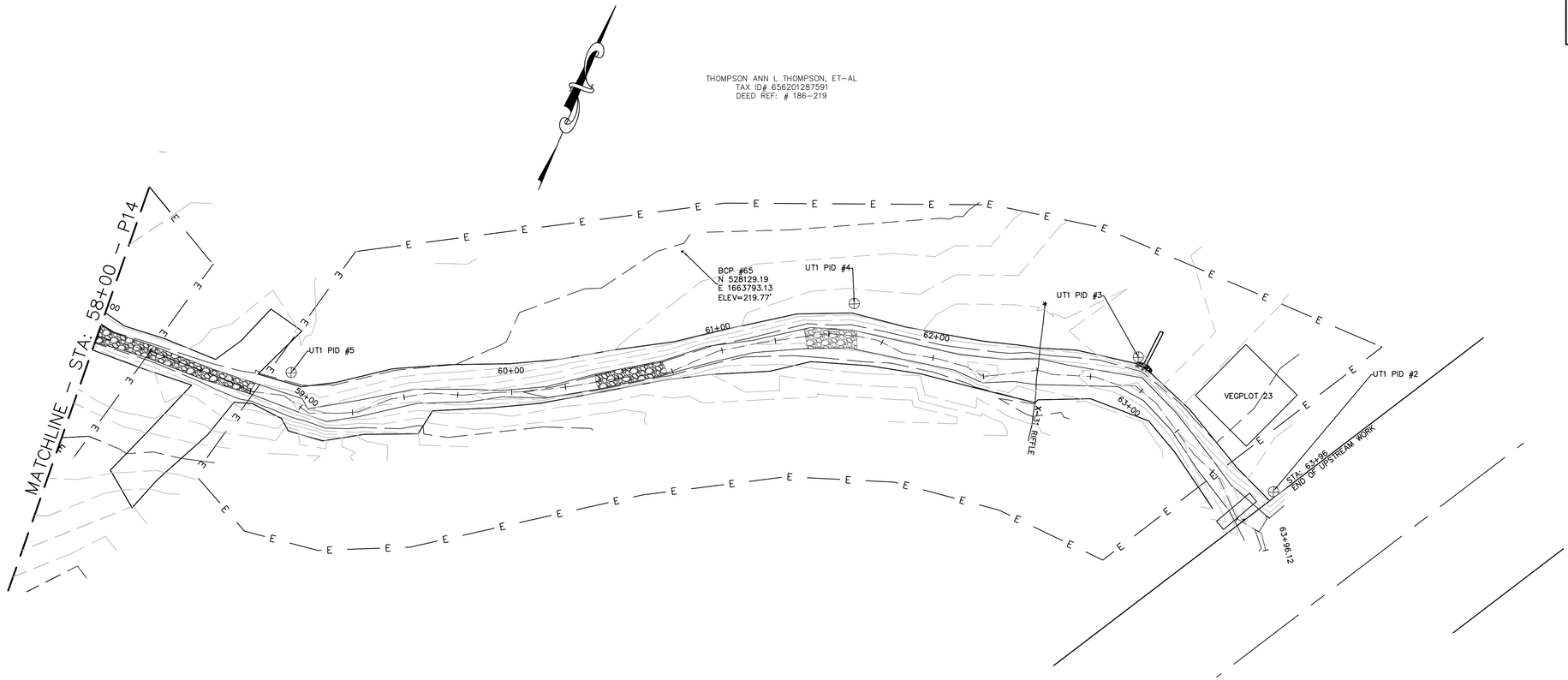

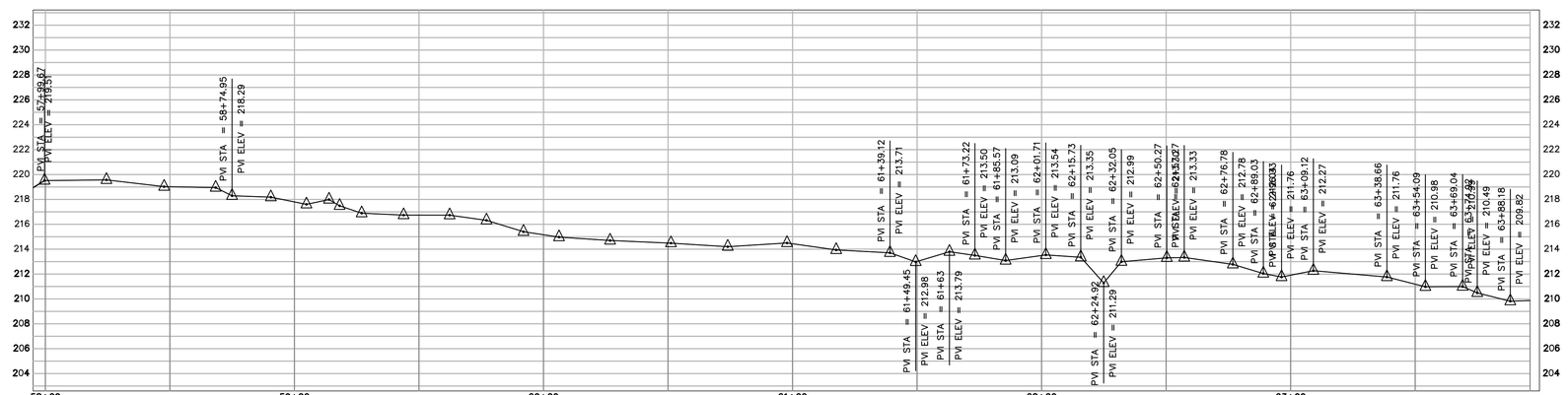

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SCALE (FT)

BIG CEDAR CREEK

UT1
SITE PLAN

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Appendix E

Photo ID Log

1. Big Cedar Creek (BCC)
2. Unnamed Tributary 1 (UT1)
3. Unnamed Tributary 2 (UT2)
4. Crest Gauge Photos

APPENDIX E:
PHOTO ID LOG

Big Cedar Creek Photos

BCC PID 1– Cross Vane, BCC Reach 6 End

BCC PID 2 – Re-graded Riffle, BCC Reach 6

BCC PID 3 –Existing Riffle, BCC Reach 6

BCC PID 4 – Re-graded Riffle, BCC Reach 6

BCC PID 5 – Re-graded Riffle, BCC Reach 6

BCC PID 6 – Log Vane in distance, BCC Reach 6 Start

BCC PID 7 – Constructed Riffle, BCC Reach 4 End

BCC PID 8 – Constructed Riffle, BCC Reach 4

BCC PID 9 – Constructed Riffle, BCC Reach 4

BCC PID 10 – Constructed Riffle, BCC Reach 4 Start

BCC PID 11 – Log J-Hook & Constructed Riffle, BCC Reach 3 End

BCC PID 12 – Log J-Hook Step Pool, BCC Reach 3

BCC PID 13 – Log J-Hook &
Constructed Riffle, BCC Reach 3

BCC PID 14 – Constructed Riffle, BCC Reach 3

BCC PID 15 – Constructed Riffle, BCC Reach 3

BCC PID 16 – Constructed Riffle, BCC Reach 3

BCC PID 17 – Constructed Riffle, UT1 Reach 3

BCC PID 18 – Constructed Riffle, BCC Reach 3

BCC PID 19 – Constructed Riffle, BCC Reach 3

BCC PID 20 – Constructed Riffle, BCC Reach 3

BCC PID 21 – Constructed Riffle, BCC Reach 3

BCC PID 22 – Constructed Riffle, BCC Reach 3

BCC PID 23 – Constructed Riffle, BCC Reach 3 Start

BCC PID 24 – Constructed Riffle, BCC Reach 2 End

BCC PID 25 – Riffle Crossing, BCC Reach 2

BCC PID 26 – Constructed Riffle, BCC Reach 2

BCC PID 27 – Constructed Riffle, BCC Reach 2

BCC PID 28 – Log J-Hook & Constructed Riffle, BCC Reach 2

BCC PID 29 – Log J-Hook & Constructed Riffle, BCC Reach 2

BCC PID 30 – Constructed Riffle, BCC Reach 2

BCC PID 31 – Constructed Riffle, BCC Reach 2

BCC PID 32 – Constructed Riffle, BCC Reach 2

BCC PID 33 – Constructed Riffle, BCC Reach 2

BCC PID 34 – Constructed Riffle, BCC Reach 2

BCC PID 35 – Constructed Riffle, BCC Reach 2

BCC PID 36 – Constructed Riffle, BCC Reach 2

BCC PID 37 – Constructed Riffle, BCC Reach 2

BCC PID 38 – Constructed Riffle, BCC Reach 2

BCC PID 39 – Constructed Riffle, BCC Reach 2 Start

BCC PID 40 – Constructed Riffle, BCC Reach 1 End

BCC PID 41 – Constructed Riffle, BCC Reach 1

BCC PID 42 – Constructed Riffle, BCC Reach 1 Start

UT1 Photos

UT1 PID 1 – Constructed Riffle, UT1 Reach 4 End

UT1 PID 2 –Constructed Riffle, UT1 Reach 4

UT1 PID 3 – Constructed Riffle, UT1 Reach 4

UT1 PID 4 – Constructed Riffle, UT1 Reach 4

UT1 PID 5 – Riffle Crossing, UT1 Reach 4

UT1 PID 6 – Constructed Riffle, UT1 Reach 4

UT1 PID 7 – Constructed Riffle, UT1 Reach 4

UT1 PID 8 – Constructed Riffle, UT1 Reach 4

UT1 PID 9 – Constructed Riffle, UT1 Reach 4

UT1 PID 10 – Constructed Riffle, UT1 Reach 4

UT1 PID 11 – Constructed Riffle, UT1 Reach 4 Start

UT1 PID 12 – Constructed Riffle, UT1 Reach 3 End

UT1 PID 13 – Constructed Riffle, UT1 Reach 3

UT1 PID 14 – Constructed Riffle, UT1 Reach 3

UT1 PID 15 – Constructed Riffle, UT1 Reach 3

UT1 PID 16 – Constructed Riffle, UT1 Reach 3

UT1 PID 17 – Constructed Riffle, UT1 Reach 3

UT1 PID 18 – Constructed Riffle, UT1 Reach 3

UT1 PID 19 – Constructed Riffle, UT1 Reach 3

UT1 PID 20 – Constructed Riffle, UT1 Reach 3

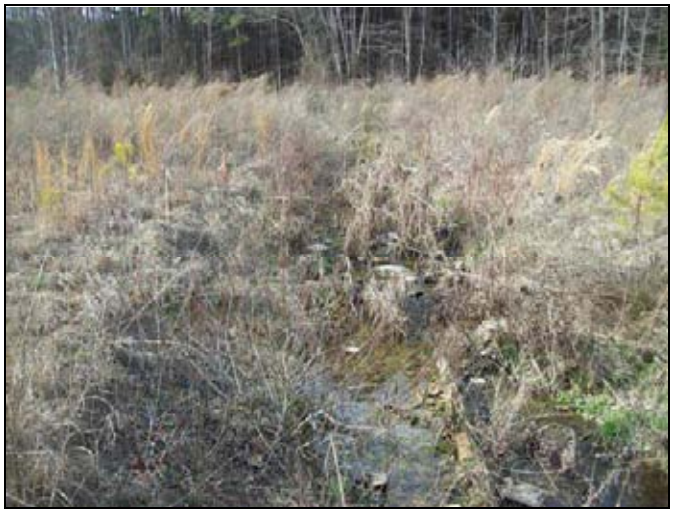
UT1 PID 21 – Constructed Riffle, UT1 Reach 3

UT1 PID 22 – Constructed Riffle, UT1 Reach 3

UT1 PID 23 – Constructed Riffle, UT1 Reach 3

UT1 PID 24 – Constructed Riffle, UT1 Reach 3

UT1 PID 25 – Constructed Riffle, UT1 Reach 3



UT1 PID 26 – Constructed Riffle, UT1 Reach 3

UT1 PID 27 – Constructed Riffle, UT1 Reach 3

UT1 PID 28 – Log sill step pools (3), UT1 Reach 3

UT1 PID 29 – Constructed Riffle, UT1 Reach 3

UT1 PID 30– Constructed Riffle, UT1 Reach 3 Start

UT1 PID 31 – Constructed Riffle, UT1 Reach 2 End

UT1 PID 32 – Constructed Riffle, UT1 Reach 2

UT1 PID 33 – Constructed Riffle, UT1 Reach 2

UT1 PID 34– Constructed Riffle, UT1 Reach 2

UT1 PID 35 – Constructed Riffle, UT1 Reach 2

UT1 PID 36 – Constructed Riffle, UT1 Reach 2

UT1 PID 37 – Constructed Riffle, UT1 Reach 2

UT1 PID 38 – Constructed Riffle, UT1 Reach 2

UT1 PID 39 – Rock and roll structures (3), UT1 Reach 3

UT1 PID 40 – Constructed Riffle, UT1 Reach 2

UT1 PID 41 – Riffle crossing, UT1 Reach 2 Start

UT1 PID 42 – Constructed Riffle, UT1 Reach 1 End

UT1 PID 43 – Constructed Riffle, UT1 Reach 1

UT1 PID 44 – Constructed Riffle, UT1 Reach 1

UT1 PID 45 – Constructed Riffle, UT1 Reach 1

UT1 PID 46 – Constructed Riffle, UT1 Reach 1

UT1 PID 47 – Constructed Riffle, UT1 Reach 1

UT1 PID 48 – Constructed Riffle, UT1 Reach 1

UT1 PID 49 – Constructed Riffle, UT1 Reach 1

UT1 PID 50 – Constructed Riffle, UT1 Reach 1

UT1 PID 51 – Constructed Riffle, UT1 Reach 1

UT1 PID 52 – Constructed Riffle, UT1 Reach 1

UT1 PID 53 – Constructed Riffle, UT1 Reach 1

UT1 PID 54 – Constructed Riffle, UT1 Reach 1 Start

UT2 Photos

UT2 PID 1 – Constructed Riffle, UT2 End

UT2 PID 2 – Constructed Riffle

UT2 PID 3 – Constructed Riffle

UT2 PID 4 – Constructed Riffle

UT2 PID 5 – Constructed Riffle

UT2 PID 6 – Constructed Riffle

UT2 PID 7 – Constructed Riffle

UT2 PID 8 – Constructed Riffle, UT2 Start

Crest Gauge Photos

UT1 Crest Gauge – 2/22/12

BCC Crest Gauge – 2/22/12