Rockwell Pastures Site
Stanly County, North Carolina
Final Year 4 Annual Monitoring Report
Monitoring Year 2012

NCDENR EEP
1619 Mail Service Center
Raleigh, NC 27699-1619

Monitoring Year: 2012
Measurement Year 4
As-Built Date: 2009
NCEEP Project ID Number D-000624

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ROCKWELL PASTURES SITE
FINAL 2012 ANNUAL MONITORING REPORT

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I. EXECUTIVE SUMMARY/PROJECT ABSTRACT

The Rockwell Pastures Stream and Wetland Restoration Site includes the restoration and enhancement of 17,786 linear feet of stream on ten unnamed tributaries and 1.7 acres of wetland restoration within the parcels owned by Charles R. Dennis and his wife, Dennis Farms Inc., Deese Family LP, and Reece Vane Deese and his wife. The site is located six miles southeast of Albemarle in Stanly County. The project Site lies within the USGS hydrologic unit (HUC) 03040104010020 in the Yadkin River Basin.

This Annual Monitoring Report presents the data from two hydrology monitoring stations, 27 vegetation monitoring plots, three manual crest gauges, three auto crest gauges, a manual rain gauge, an auto-logging rain gauge, 24 stream cross sections, and photo reference locations, as required by the approved Restoration Plan for the site.

The 2012 vegetation monitoring for Rockwell Pastures utilized the Ecosystem Enhancement Program's (EEP) Carolina Vegetation Survey (CVS) protocol for recording vegetation. This report summarizes the vegetation observations. Planted-stem survival for Monitoring Year 4 for all 27 Vegetation Plots (VP) at Rockwell Pastures was above the interim success criterion of 320 trees per acre at the end of Monitoring Year 4. The average stem density (excluding live stakes) across all vegetation plots was 575 stems per acre. Few volunteer tree species were noted during Monitoring Year 4.

One vegetation problem area was noted during Monitoring Year 4. Invasive Chinese privet was observed along portions of UT 4 and UT 7. This problem area has continued to be observed during Monitoring Year 4 and should be managed and sprayed; however, they create no threat to achieving the vegetation success criteria. The Rockwell Pastures Site is on track to meet the vegetative success criteria as specified in the Restoration Plan.

Throughout the Year 4 monitoring season, the restored stream channel remained stable and continued to provide the intended habitat and hydrologic functions. All monitored cross sections show little adjustment in stream dimension, and the site remains on track to achieve the stream stability success criteria specified in the Restoration Plan. Two areas along the restoration stream channel are exhibiting minor erosion that presents no major concern to the overall stream stability.

In 2012, AW1 and AW2 hydrology monitoring gauges recorded hydroperiods of 7 and 9 percent of the growing season, meeting the success criteria of 7 percent of the growing season specified in the Restoration Plan. The two monitoring gauges at the reference site recorded hydroperiods from 0 to 7 percent of the growing season. Overall, the site was within the range of hydrologic conditions expected in undisturbed non-riparian wetland seeps.

II. PROJECT BACKGROUND

A. Project Goals and Objectives

The goal of this project is to provide functional uplift to the watershed by restoring or enhancing stream, wetland, and riparian areas within the watershed. The mitigation actions improve water quality, ecological function, and habitat, and include:

- Removing excess nutrients and sediment through the use of vegetative buffers,
- Increasing dissolved oxygen concentrations through the use of in-stream structures and the turbulence they produce in pools,
- Stabilizing the stream bank using natural channel design techniques,
- Improving substrate through the use of structures and the elimination of major sediment sources from the stream,
- Creating habitat diversity by introducing woody structures such as log vanes and/or root wads,
- Reducing temperature by restoring canopy in the buffer areas,
- Reconnecting streams to their adjacent floodplains and wetlands,
- Raising groundwater levels in adjacent streams by raising adjacent channel bed elevation,
- Removing/plugging ditches used to drain historic wetlands,
- Enhancing infiltration by re-grading and ripping wetlands,
- Breaking up soils historically compacted by cattle to allow the groundwater to come to the surface and wetland vegetation to flourish,
- Improving crossings by replacing pipes and/or stabilizing outfalls,
- Controlling the invasive exotics by removing them during construction,
- Preserving stable on-site streams, wetlands, and riparian buffers draining into the enhancement/restoration reaches,
- Excluding livestock with fencing, and
- Re-vegetating the stream banks, wetlands, and riparian areas to improve bio-diversity and Ecology.

B. Project Restoration Components

All ten stream reaches are located within the parcels owned by Charles R. Dennis and his wife, Dennis Farms Inc., Deese Family LP, and Reece Vane Deese and his wife six miles southeast of Albemarle in Stanly County. The existing stream channels had low sinuosity and varying levels of incision due to historic channelization.

UT 1 – Unnamed Tributary 1 is a second order stream that is located centrally within the project site. This channel had failing banks, and was moderately to severely incised for most of its length. Just below its confluence with UT 4, the area was primarily open with active pastures and a short stretch (375 feet) of sparse woody vegetation at the bottom of the project. The portion of UT 1 above the confluence with UT 4 was located within active agricultural fields. Almost the entire UT 1 stream reach was historically straightened and channelized.

In order to provide functional uplift to UT 1, it was divided into four types of treatment. The uppermost portion (Sta. 100+00 – 102+92) was treated using Enhancement Level II to establish stability. Most of the remaining length of UT 1 was treated using Priority I restoration since the stream was incised and was historically straightened. The priority 1 restoration technique was used to re-connect the stream with its historical floodplain, and to restore the functions of the riparian buffer. An exception was taken with the approach of the lowest portion (approximately 375 feet) that was not incised and had a thin wooded buffer. This area was treated using Enhancement Level II, which included some minor bank grading. The other exception was the reach along the upper portion just above the main farm road where property constraints will only allow the use of buffer planting, benches and grade control structures to provide an improved

cross section and bedform (profile) step/pool features. This concession to the landowners was necessary to secure the entire stream corridor. Enhancement Level I credit was proposed in this section. The UT1 sections with buffer widths less than 50 feet do not contribute to the stream mitigation unit yield and are included in the project only for continuity between restored sections.

UT 2 – UT 2 is a small first order perennial stream based on the USGS Topographic Map. This unnamed tributary had similar existing conditions as UT 1. This stream reach is fed by an existing farm pond and is a Bc channel. This stream does not appear to have been relocated, and has a fairly stable and natural morphology with a boulder substrate. UT 2 had a great amount of sedimentation and was heavily impacted by livestock. Aquatic life characteristics of a perennial stream exist within UT 2. Right-hand (gilled) snails, mayflies, bullfrog tadpoles, and minnows were found within this stream reach. Due to livestock access, the herbaceous stream buffer was severely degraded.

To provide functional uplift to UT 2, the Enhancement Level II approach was taken (Sta. 200+ 00 – 206 + 35). A fenced buffer has been provided to exclude livestock from the stream. The 50-foot stream buffer was planted with native forest vegetation.

UT 3 – UT 3 is a first order stream that has both perennial and intermittent portions. This stream reach was heavily impacted by livestock, and the buffer was primarily herbaceous vegetation. The short, upper portion of the stream is intermittent, and was an incised Rosgen E type channel. The lower portion of UT 3 was alternately incised and sedimented, and had failing banks. The entire perennial section of UT 3 appeared to be historically straightened.

The priority 1 restoration technique was used on UT 3 to provide functional uplift. UT 3 was re-connected with its historical floodplain, and a functional riparian buffer was planted. Additionally, livestock was excluded from the stream by fencing the easement.

UT 4 – UT 4 is a first order stream based on the 1:24,000 USGS Topographic Map. The upper portion of the stream is impounded by three small ponds that are fed by a perennial spring. Below the ponds, the upper portion of the stream is relatively stable; however, it is overgrown with invasive species such as Chinese privet (*Ligustrum sinense*) and multiflora rose (*Rosa multiflora*). This portion of the stream has an appropriate riffle-pool sequence. The middle portion of UT4 has been impacted by silviculture. Except for a section of approximately 200 feet, the stream is extremely over-wide (width-to-depth ratio of approximately 79) and braided in most areas. This has resulted in unstable banks, as the stream appears to frequently "wander" across the valley floor. It appeared to have been heavily altered, and the buffer had recently been removed. The area where a power line crosses the stream was excluded from the project site. Above this area is a small riparian wetland with mostly herbaceous vegetation. The lower portion of the stream had been straightened and altered based on topographic and visual observation. Most of the banks were severely unstable as a result of the redirection of the channel. A strong and unstable head-cut separated the lower portion and middle portions of UT4. It appeared to have been historically straightened. The buffers also had been cleared recently, leaving mostly sparse, new-growth vegetation. The geomorphic assessment of the lower portion of UT4 revealed that the stream was incised, and was unstable because of the straightening and other alterations.

The uppermost portion of UT 4 includes three small spring-fed ponds. The stream was restored through these ponds by partially removing the dam structure, and allowing the stream channel to

be re-established in the pond bottom. The approach was to establish the lowest, presumably flat, portions of the existing pond bottoms as the flood plain, and to create a channel with the appropriate dimension, pattern, and profile. This approach minimized sediment loss and rapidly re-established the stream and riparian corridor. Immediately below the ponds and for a short section just above and below the existing road, the stream channel was stable with undercut banks and an appropriate riffle/pool sequence. However, there were invasive species that were removed and replanted with native tree species. As such, this treatment was considered to be Enhancement Level II. Between the above reaches, there was a reach that had been impacted by the farmer on numerous occasions using earth-moving equipment. This reach has multiple threads in some locations and the main part of the stream switches channels, or forms new channels from time to time (i.e. the streams are laterally unstable). The reaches also had excessively wide width to depth ratios, and were overly shallow in areas with bedrock. This area received a combination of Restoration and Enhancement Level I treatment by blocking the multi-threaded areas, building benches using single or double wing deflectors, and adding appropriate bed-form features using log and rock vanes. The goal of this approach was to recreate a single thread channel with an appropriate width to depth ratio that is laterally stable and has better formed riffle-pool complexes. This will greatly improve habitat and reduce sedimentation. From station 436+37 to 449+26, the stream was incised and highly eroded; therefore, it was restored using Priority 1 stream restoration techniques. UT4 was also placed back into its natural valley as it enters the Reese property.

UT 5 and UT 6 – These small, intermittent streams are located in agricultural fields. Since these systems are relatively small, it was anticipated that they could be stabilized by re-establishing a woody riparian buffer. As such, Enhancement Level II was performed on these streams. Providing a riparian buffer to the intermittent portions of the above streams will protect the downstream areas by removing sedimentation sources, and by providing shading to reduce temperature. The stream banks along UT5 and UT6 were unstable due to agriculture and mowing down to the stream edges. A forested buffer will provide filtering for sediments, and shading to reduce temperatures.

UT 7 – This stream reach is bound by an agricultural field and cutover forest along most of its upper portion above the confluence with UT6. The banks were unstable due to the lack of vegetation, resulting in heavy sedimentation. UT 7 is also bounded by agricultural fields and open pasture to just below its confluence with UT6. Below the confluence, the stream becomes perennial based on a NCDWQ score of 33. The entire length of the stream appeared to have been straightened. The upper portion was incised with failing banks. The lower portion was heavily sedimented just before it entered the valley bottom. UT 7 was heavily impacted by livestock access and hoof shear.

Priority 1 restoration and Enhancement Level II were performed on UT 7 to provide biological uplift. Proper dimensions, pattern, and profile were restored on UT 7 because it had been historically straightened. A riparian buffer was planted to protect the downstream areas by removing sedimentation sources, and to provide shading to reduce temperature. The UT 7 stream reach was also fenced to exclude livestock.

UT 8 –This stream was determined to be an intermittent channel with a stream rating score of 29.75, and a drainage area of 0.02 square miles (13.9 acres). Approximately 83 feet of restoration

were added to tie the existing tributary into UT 1, and additional easement was added above the restoration to add approximately 402 feet of Enhancement Level II treatment.

UT 9 – This stream was determined to be a perennial channel with a stream rating score of 50.5, and a drainage area of 0.06 square miles (38.3 acres). The existing stream does not lie within the protective conservation easement; however, a restoration section of stream approximately 152 feet in length was added within the easement to tie UT 9 into the relocated UT 1.

UT 10 – This stream was determined to be a perennial channel with a stream rating score of 48.25, and a drainage area of 0.11 square miles (69.5 acres). This channel discharges directly from an existing farm pond. Approximately 24 feet of existing stream was located within the protective conservation easement, and a total of 103 feet of stream restoration was added within the easement to tie UT 10 into the relocated UT 1.

Additional details regarding the restoration components of the project are provided in **Table I**.

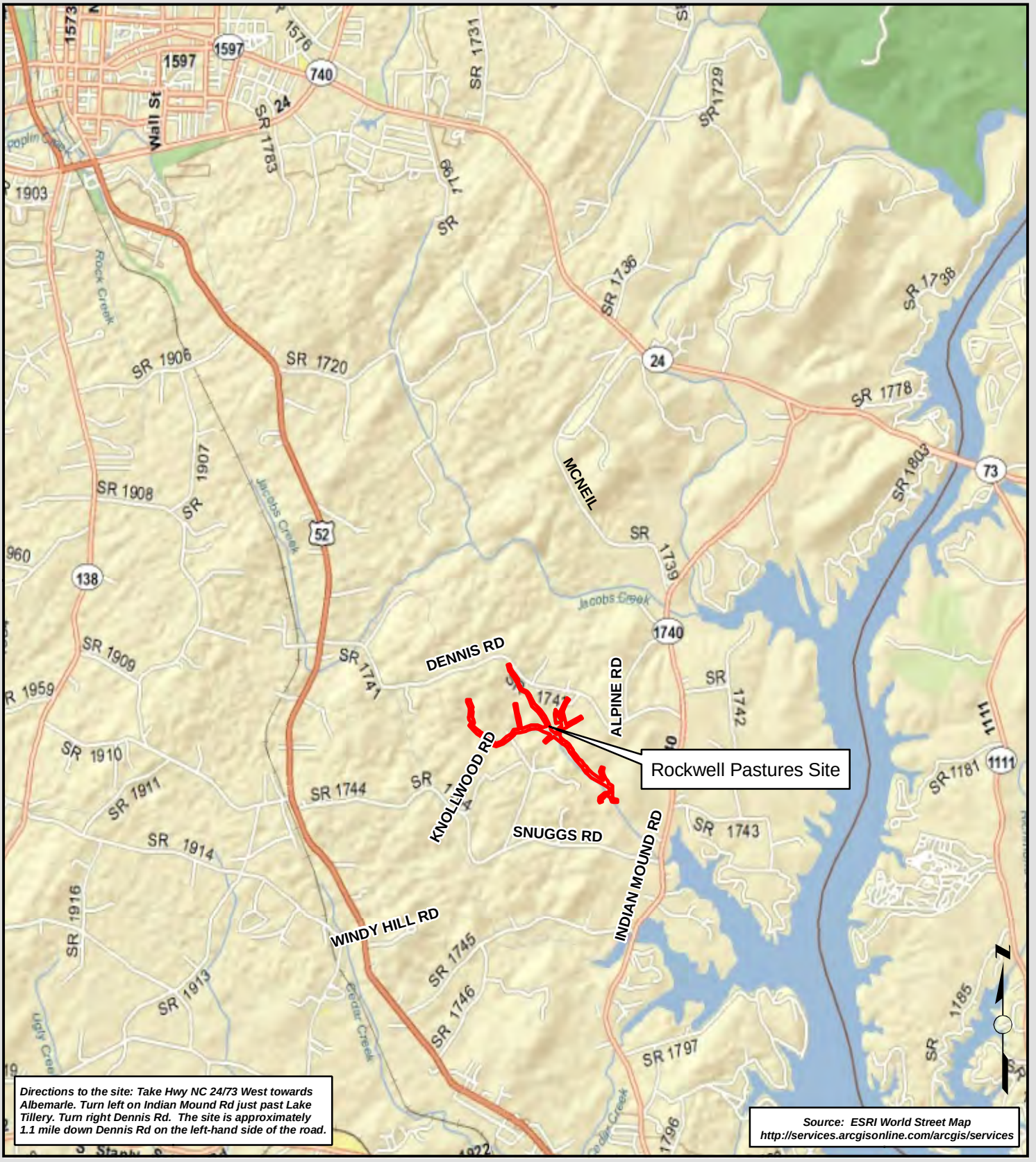
Table I. Project Restoration Components
Rockwell Pastures Site/Project No. D-000624

Project Stream	Existing Length (ft)	Constructed Length (ft)	Restoration (ft)	Enhancement Level I (ft)	Enhancement Level II (ft)	Wetland Restoration (acres)
UT 1	6,580	6,916	5,697	---	1,219	1.7
UT 2	635	635	---	---	635	---
UT 3	717	872	872	---	---	---
UT 4	3,952	4,934	3,357	982	596	---
UT 5	1,075	1,086	---	---	1,086	---
UT 6	1,174	1,184	---	---	1,184	---
UT 7	1,313	1,419	689	---	730	---
UT 8	485	485	83	---	402	---
UT 9	---[1]	152	152	---	---	---
UT 10	24	103	103	---	---	---
Total Site	15,955	17,786	10,953	982	5,852	1.7
Total SMUs	---	---	10,953	654	2,341	---
Total WMUs	---	---	---	---	---	1.7

[1]**UT 9 - Existing length lies outside of Project Easement**

C. Location and Setting

The Rockwell Pastures Stream and Wetland Restoration Site is located six miles southeast of Albemarle in Stanly County (**Figure 1**). Rockwell Pastures lies within the Yadkin Basin, North Carolina Division of Water Quality (DWQ) sub-basin 03-07-08, and is in local HUC 03040104010020. The project area is located in the Carolina Slate Belt sub-ecoregion of the Piedmont ecoregion. The site contains ten unnamed tributaries (UT1, UT2, UT3, UT4, UT5, UT6, UT7, UT8, UT9, and UT10) to David's Creek/Lake Tillery. Lake Tillery is listed as DWQ class Water Supply (WS-IV, CA) waters. The ten unnamed tributaries are considered to be WS-IV streams.



EBX

Figure 1.
Rockwell Pastures Site
Vicinity Map
Stanly County, NC

0 0.5 1 2
Miles
1 in = 1 mile

D. Project History and Background

Construction of the Rockwell Pastures Site was completed in May 2009. Following the completion of construction, the As-Built cross sections were installed and surveyed the same month. Year 1 monitoring took place in November 2009. Additional details regarding the timeline of the project are provided in **Table II** below.

The project was designed by Kimley-Horn and Associates, Inc. Construction was performed by RFG Construction, Inc. Monitoring activities for Years 1 2, and 3 were performed by WK Dickson and Co., Inc. Additional information regarding contractors is shown in **Table III**.

The site is bound by agricultural fields and pastureland. Additional information regarding this stream is included in **Table IVa** and **b**.

E. Monitoring Plan View

A series of monitoring devices have been installed on-site. Twenty-four individual cross-sections were located. Cross-sections were plotted from left to right facing downstream. Each cross-section is also a designated photographic point that is photographed annually. Twenty-seven vegetation-monitoring plots were randomly located within the riparian buffer of the Rockwell Pastures Stream Site. Two automatic HOBO groundwater gauges and two reference HOBO automatic groundwater gauges were installed to measure hydrology success of the wetland restoration area. One manual and one automatic rain gauge were installed to record rainfall onsite. Three manual crest gauges and three automatic crest gauges were installed to record bankfull events on stream reaches UT 1 and UT 4. The locations of all monitoring devices are shown on Figures 3a through 3m (Current Conditions Map).

Table II. Project Activity and Reporting History
Rockwell Pastures Site/Project No. D-000624

Activity or Report	Data Collection Complete	Actual Completion or Delivery
Restoration Plan	NA	August 2008
Final Design	NA	October 2008
Construction	NA	May 1st 2009
Mitigation Plan / As-built (Year 0 Monitoring – baseline)	May 2009	May 2009
Year 1 Monitoring	November 2009	November 2009
Year 2 Monitoring	July 2010	September 2010
Year 3 Monitoring	August 2011	October 2011
Year 4 Monitoring	October 2012	November 2012
Year 5 Monitoring		

Table III. Project Contacts Table Rockwell Pastures/Project No. D-000624	
Designer Project Manager:	Kimley-Horn and Associates, Inc. 3001 Weston Parkway Cary, NC 27513 Todd St. John, P.E., LEED AP (919) 677-2000
Construction and Seeding Contractor	RFG Construction, Inc 1907 Cambridge Dr Kinston, North Carolina 28504 (252) 523-2405 Robert Grady, President
Planting Contractor	Superior Wildlife Services 2105 Sparre Dr Kinston , North Carolina 28504 Robert Cato (252) 939-0465
Full Delivery Provider Project Manager:	Environmental Banc & Exchange 909 Capability Drive, Suite 3100 Raleigh, NC 27606 (919) 829-9909 Norton Webster, PWS
Monitoring Performers Project Manager:	WK Dickson and Co., Inc. 720 Corporate Center Drive Raleigh, NC 27607 (919) 782-0495 Daniel Ingram

Table IV. Project Background Table Rockwell Pastures/Project No. D-000624	
Physiographic Region	Piedmont
Ecoregion	Carolina Slate Belt
Cowardian Classification	R ¾ SB 3F
Dominant Soil Types	Tatum, Oakboro, Badin, Kirsey
Reference Site ID	On-Site Reference
USGS HUC for Project	3040104
USGS HUC for Reference	3040104
NCDWQ Sub-basin for Project	03-07-08
NCDWQ Sub-basin for Reference	03-07-08
NCDWQ Classification for Project	WS-IV
NCDWQ Classification for Reference	WS-IV
Any Portion of any project segment 303d listed?	No
Any portion of any project segment upstream of a 303d listed segment?	No
Reasons for 303d listing or stressor	NA
% of project easement fenced	~ 45%

Table IV b. Project Background Table Rockwell Pastures/Project No. D-000624														
Reach ID	**UT 1Upper**	**UT 1 Middle**	**UT 1 Lower**	**UT 2**	**UT 3**	**UT 4 Upper**	**UT 4 Middle**	**UT 4 Lower**	**UT 5**	**UT 6**	**UT 7**	**UT 8**	**UT 9**	**UT 10**
Stream Order	1	2	2	1	1	1	1	1	1	1	1	1	1	1
Drainage Area (mi²)	0.09	0.75	1.12	0.13	0.15	0.11	0.28	0.42	0.07	0.02	0.05	0.02	0.06	0.11
Entrenchment Ratio	---	3.9	4.9	3.1	2.4	2.7	---	10.7	3.6	2.6	2	NA	NA	NA
A_{bkf}	---	12.4	20.7	4.8	6.5	4.2	---	9.9	5	0.9	1	NA	NA	NA
W_{bkf}	---	8.9	18.2	8.3	6.3	7.3	---	7.4	5	2.5	2.8	NA	NA	NA
Width/Depth Ratio	12.7	6.4	16	14.3	6.1	12.6	---	5.5	5	6.6	8	NA	NA	NA
K	1.01	1.02	1.01	1	1.04	1.05	1.03	1.02	1	1	1.01	NA	NA	NA
Rosgen Classification of As-Built	B5	E5	C4	B4c	E4	C4	F4	E4b	E6	E4/E5	B5	NA	NA	NA
Dominant Soil Types	Tatum	Oakboro	Oakboro	Badin	Enon	Badin	Kirsey	Oakboro	Badin	Kirsey	Kirsey	Oakboro	Oakboro	Oakboro
NCDWQ Classification	WS-IV	WS-IV	WS-IV	WS-IV	WS-IV	WS-IV	WS-IV	WS-IV	WS-IV	WS-IV	WS-IV	NA	NA	NA

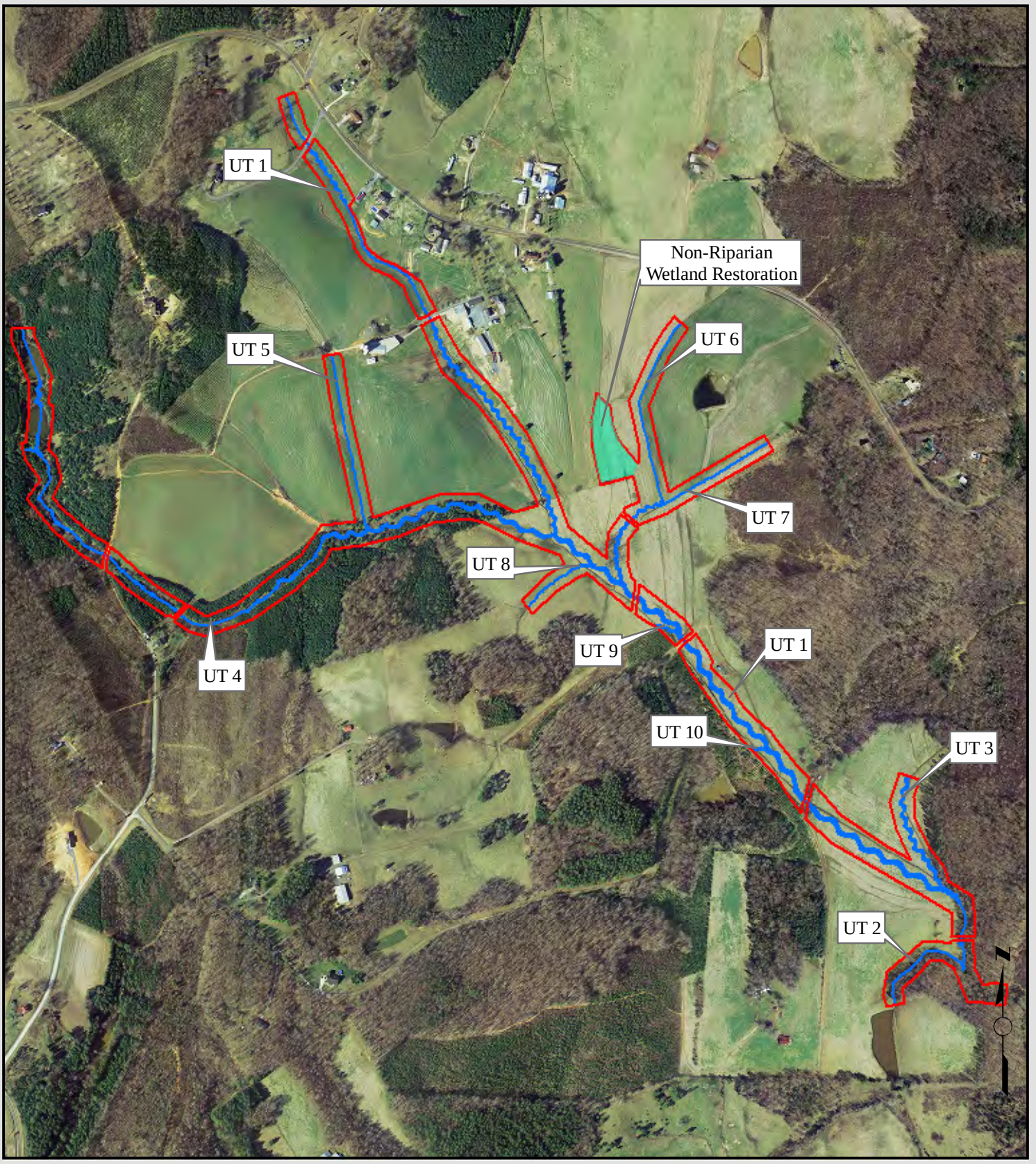


Figure 2.
Rockwell Pastures Site
Site Overview Map
Stanly County, NC

0 400 800 1,600
Feet
1 in = 800 feet

Legend

- Easement Boundary
- Restored Wetland
- Restored Streams

Figure 3. Current Conditions Plan View
(See Appendix B-1)

III. PROJECT CONDITION AND MONITORING RESULTS

Monitoring results are discussed below. Rockwell Pastures Site annual vegetation monitoring was conducted on October 16 and 17, 2012 by WK Dickson and Co., Inc personnel.

A. VEGETATION ASSESSMENT

Planted zones related to the stream restoration consist of the riparian buffer zone and the stream banks. The riparian buffer zone initiates at the top of the bank, and continues out perpendicular to the immediate channel following the general pattern of the meandering channel. The planted stream bank initiates at the normal base flow elevation, and extends to the top of bank or interface with the floodplain.

The success of riparian and vegetation planting will be gauged by stem counts of planted species. Stem counts of more than 320 trees per acre after three years, and 260 trees per acre after five years will be considered successful. Photos that are taken at established photos points should indicate maturation of the riparian vegetation community.

The "CVS-EEP Protocol for Recording Vegetation" was utilized during the As-Built (Baseline) and annual vegetation monitoring. A qualitative visual assessment of vegetation was also performed throughout the entire project area. Twenty-seven vegetation plots measuring 100 square meters were monitored. Vegetation observations were also recorded at cross sections, problem areas, and representative locations. Representative photographs of vegetation conditions were recorded throughout the project area (**Appendix A-3**).

1. Soil Data

The project area is located in the Carolina Slate Belt sub-ecoregion of the Piedmont ecoregion. This sub-region extends from southern Virginia, across the Carolinas, and into a small part of eastern Georgia. The mineral-rich metavolcanic and metasedimentary rocks with slatey cleavage tend to be finer-grained and less metamorphosed than other parts of the Piedmont, and are somewhat less resistant to erosion. In North Carolina, some parts of the region are more rugged and hilly. Trellised drainage patterns also occur in parts of the region. The volcanic-sedimentary rock formations include volcanic slates, basic and acid tuffs, breccias, and interbedded flows. The volcanic slates are deeply weathered in places, forming clay and shale, and the soils generally have high silt contents. Georgeville and Herndon soils (fine, kaolinitic, thermic Typic Hapludults) are common.

The NRCS soil survey for Stanly County maps the following soils within the site: Badin channery silt loam, Ewon very strong loam, Kirksey silt loam, Oakboro silt loam, Tatum gravelly loam, and Tatum channery silt clay.

2. Vegetative Problem Areas

Overall, the site appears to have good vegetation along the stream channel and floodplains. Few areas exposed banks and floodplains were observed during Monitoring Year 4. Two of the three vegetation problem areas noted during Monitoring Year 3 activities consisted of encroachment into the easement, herbicide overspray, and Chinese privet do not appear to be a problem in Monitoring Year 4. The Chinese privet (*Ligustrum sinense*) along UT4 and UT7 is still present.

Chinese privet was observed to be common or present along portions of UT 4 and UT 7. Along portions of UT 4, Chinese privet was observed to be common (VPA 17) with areas downstream along the right banks adjacent to the pine-forest. It is also present along UT 7 (VPA 25). EBX initiated invasive species control measures in March 2012, and will continue treatment as needed.

The vegetation problem areas are shown on the Current Conditions Plan View Maps, which are provided in **Appendix B, B-1.**

3. Stem Counts

Planted-stem survival for Monitoring Year 4 for all twenty-seven Vegetation Plots (VP) at Rockwell Pastures was above the interim success criteria of 320 trees per acre at the end of Monitoring Year 3. The plot density ranged from 364 stems per acre for VP #8 to 809 stems per acre in VP #26. The average stem density (excluding live stakes) across all vegetation plots was 575 stems per acre. Volunteer species were observed in only a few plots during Monitoring Year 4. Volunteer species observed include green ash (*Fraxinus pennsylvanica*), silky dogwood (*Cornus amomum*), and blackgum (*Nyssa sylvatica*). These volunteers pose no competition to the planted stems, but additional volunteer species should be expected in the future. The Rockwell Pastures site is on track to meet the interim and final success criteria specified in the Restoration Plan.

A few invasive species were observed, including tree of heaven (*Ailanthus altissima*), Johnson grass *(Sorghum halepense*), Chinese privet (*Ligustrum sinense*), multiflora rose (*Rosa multiflora*), tall fescue (*Schedonorus phoenix*), morning glory (*Ipomoea* spp.), Japanese clover (*Kummerowia striata*), and Japanese honeysuckle (*Lonicera japonica*). The Johnson grass and Chinese privet appears common in a few areas of the project. The other invasive species had a limited presence during this monitoring year.

4. Vegetation Plot Photos

Appendix A contains a vegetation photo log.

B. STREAM ASSESSMENT

WK Dickson and Co., Inc personnel performed annual monitoring activities at the Rockwell Pastures Site during September and October 2012. During the field visit, qualitative observations were recorded regarding the condition of the stream restoration project. Cross section and longitudinal surveys were also performed at the time of this visit. Twenty-four cross sections and approximately 4,400 linear feet of stream profile was surveyed. Profile on UT 1 was surveyed from station 121+02 to 144+75. Approximately 350 linear feet were surveyed on UT 3 from station 303+05 to 306+50. UT 4 profile survey was performed from station 433+00 to 447+00, and UT 7 was surveyed from 711+48 to 714+39. Photographs were taken at all permanent photo points. Banks were stable with no severe bank erosion. Stream problem areas are described in Appendix B, Table B.1. Problem areas should be monitored, and if they worsen over time, the reason for the problem should be assessed and potential repair options should be presented.

Hydrologic Assessment

The occurrence of bankfull events within the monitoring period is documented by the use of manual crest gauges and auto-recording crest gauges. The three crest gauges will record the highest watermark between site visits. Two crest gauges were installed on stream reach UT1 at the upper portion (Sta. 131+00) and on the lower portion (Sta. 164+20). The third crest gauge was installed on UT4 near station 438+20. The gauges were checked and downloaded every three months to document high flows. The auto-recording crest gauges are used to determine the date and time of each bankfull event. Digital images are used to document the occurrence of debris lines and sediment deposition on the floodplain during monitoring site visits.

During the 2012 monitoring season, three crest gauges were monitored to determine if there were any out-of-bank flow events on the Rockwell Pastures Site (**Table V**). Thirteen bankfull events were documented during the 2012 monitoring season on Crest Gauge 1. All three crest gauges experienced bankfull events during the month of March. The largest stream flow documented for Year 4 by the onsite crest gauges was recorded by Crest Gauges 1, which occurred on January 27 and was 0.85 feet above the bankfull stage. Crest Gauge 2 and 3 experienced their largest bankfull events during the same rain event, which was recorded at 0.3 feet above bankfull stage. Crest gauge data are presented in **Appendix C** along with the precipitation data.

1. Problem Areas Plan View

An assessment of the stability of the channel was performed in October 2012 by WK Dickson and Co., Inc. Four areas of concern were observed and documented. SPA 1, SPA2, and SPA4 are all areas with minor erosion. SPA 3 is a debris jam blocking a culvert. These problem areas are shown in **Appendix B, Section B-1**.

Table V. Verification of Bankfull Events
Rockwell Pastures Site/Project No. D-000624

Month Recorded	Crest Gauge 1		Crest Gauge 2		Crest Gauge 3*	
	Max Height (ft)	Number of Occurrences	Max Height (ft)	Number of Occurrences	Max Height (ft)	Number of Occurrences
January	0.85	3	---	---	---	---
February	0.52	3	---	---	---	---
March	0.63	1	0.3	1	0.3	1
April	---	---	---	---	---	---
May	0.22	2	---	---	---	---
June	---	---	---	---	---	---
July	0.57	1	---	---	---	---
August	0.41	1	---	---	---	---
September	0.77	2	0.50	1	---	---
October*	---	---	---	---	---	---
November	---	---	---	---	---	---
December	---	---	---	---	---	---
Total Occurrences		13		2		

*Data collection ended 15 October

2. Problem Areas Summary Table

The Problem Areas Table Summary is located in **Appendix B as Table B.1**.

3. Representative Stream Problem Areas Photos Section

Representative photos of each category of stream problem areas were taken and are shown in **Appendix B, Section B-3**.

4. Fixed Photo Station Photos

Photos from various photo stations were collected on October 15 and 16, 2012 during the annual stream walk. These photos are included in **Appendix B, Section B-4**.

5. Stability Assessment

A visual qualitative assessment was performed to inspect channel facets, meanders, bed, banks, and installed structures. This visual assessment was confirmed and enhanced with a quantitative assessment of the physical stream survey. The goal of this assessment is to provide a percentage of the features listed in **Table VI** that are stable.

Table VI. Categorical Stream Feature Visual Stability Assessment

Table VI. Categorical Stream Feature Visual Stability Assessment Rockwell Pastures Site/Project No. D-000624						
Reach UT 1 (6916 feet)						
Feature	**Initial**	**MY-01**	**MY-02**	**MY-03**	**MY-04**	**MY-05**
A. Riffles	100%	99%	100%	100%	100%	
B. Pools	100%	100%	98%	98%	98%	
C. Thalweg	100%	100%	100%	100%	100%	
D. Meanders	100%	100%	100%	100%	100%	
E. Bed General	100%	100%	100%	100%	100%	
F. Bank Condition	100%	100%	95%	95%	95%	
G. Rock/Log Vanes	100%	100%	100%	100%	100%	
H. Wads and Boulders	100%	100%	100%	100%	100%	
Reach UT 2 (635 feet)						
Feature	**Initial**	**MY-01**	**MY-02**	**MY-03**	**MY-04**	**MY-05**
A. Riffles	100%	100%	100%	100%	100%	
B. Pools	100%	100%	100%	100%	100%	
C. Thalweg	100%	100%	100%	100%	100%	
D. Meanders	100%	100%	100%	100%	100%	
E. Bed General	100%	100%	100%	100%	100%	
F. Bank Condition	100%	100%	100%	100%	100%	
G. Rock/Log Vanes	100%	100%	100%	100%	100%	
H. Wads and Boulders	100%	100%	100%	100%	100%	

Table VI (Cont). Categorical Stream Feature Visual Stability Assessment Rockwell Pastures Site/Project No. D-000624						
Reach UT 3 (872 feet)						
Feature	**Initial**	**MY-01**	**MY-02**	**MY-03**	**MY-04**	**MY-05**
A. Riffles	100%	100%	100%	100%	100%	
B. Pools	100%	100%	100%	100%	100%	
C. Thalweg	100%	100%	100%	100%	100%	
D. Meanders	100%	100%	100%	100%	100%	
E. Bed General	100%	100%	100%	100%	100%	
F. Bank Condition	100%	100%	100%	100%	100%	
G. Rock/Log Vanes	100%	100%	100%	100%	100%	
H. Wads and Boulders	100%	100%	100%	100%	100%	
Reach UT 4 (4934 feet)						
Feature	**Initial**	**MY-01**	**MY-02**	**MY-03**	**MY-04**	**MY-05**
A. Riffles	100%	100%	100%	100%	100%	
B. Pools	100%	100%	100%	100%	100%	
C. Thalweg	100%	100%	100%	100%	100%	
D. Meanders	100%	100%	100%	100%	99%	
E. Bed General	100%	100%	100%	100%	100%	
F. Bank Condition	100%	100%	93%	95%	93%	
G. Rock/Log Vanes	100%	100%	100%	100%	100%	
H. Wads and Boulders	100%	100%	100%	100%	100%	
Reach UT 5 (1086 feet)						
Feature	**Initial**	**MY-01**	**MY-02**	**MY-03**	**MY-04**	**MY-05**
A. Riffles	100%	100%	100%	100%	100%	
B. Pools	100%	100%	100%	100%	100%	
C. Thalweg	100%	100%	100%	100%	100%	
D. Meanders	100%	100%	100%	100%	100%	
E. Bed General	100%	100%	100%	100%	100%	
F. Bank Condition	100%	100%	100%	100%	100%	
G. Rock/Log Vanes	100%	100%	100%	100%	100%	
H. Wads and Boulders	100%	100%	100%	100%	100%	
Reach UT 6 (1184 feet)						
Feature	**Initial**	**MY-01**	**MY-02**	**MY-03**	**MY-04**	**MY-05**
A. Riffles	100%	100%	100%	100%	100%	
B. Pools	100%	100%	100%	100%	100%	
C. Thalweg	100%	100%	100%	100%	100%	
D. Meanders	100%	100%	100%	100%	100%	
E. Bed General	100%	100%	100%	100%	100%	
F. Bank Condition	100%	100%	100%	100%	100%	
G. Rock/Log Vanes	100%	100%	100%	100%	100%	
H. Wads and Boulders	100%	100%	100%	100%	100%	

Table VI (Cont). Categorical Stream Feature Visual Stability Assessment Rockwell Pastures Site/Project No. D-000624						
Reach UT 7 (1419 feet)						
Feature	**Initial**	**MY-01**	**MY-02**	**MY-03**	**MY-04**	**MY-05**
A. Riffles	100%	100%	100%	100%	100%	
B. Pools	100%	100%	100%	100%	100%	
C. Thalweg	100%	100%	100%	100%	100%	
D. Meanders	100%	100%	100%	100%	100%	
E. Bed General	100%	100%	100%	100%	100%	
F. Bank Condition	100%	100%	100%	100%	100%	
G. Rock/Log Vanes	100%	100%	100%	100%	100%	
H. Wads and Boulders	100%	100%	100%	100%	100%	
Reach UT 8 (83 feet)						
Feature	**Initial**	**MY-01**	**MY-02**	**MY-03**	**MY-04**	**MY-05**
A. Riffles	100%	100%	100%	100%	100%	
B. Pools	100%	100%	100%	100%	100%	
C. Thalweg	100%	100%	100%	100%	100%	
D. Meanders	100%	100%	100%	100%	100%	
E. Bed General	100%	100%	100%	100%	100%	
F. Bank Condition	100%	100%	100%	100%	100%	
G. Rock/Log Vanes	100%	100%	100%	100%	100%	
H. Wads and Boulders	100%	100%	100%	100%	100%	
Reach UT 9 (152 feet)						
Feature	**Initial**	**MY-01**	**MY-02**	**MY-03**	**MY-04**	**MY-05**
A. Riffles	100%	100%	100%	100%	100%	
B. Pools	100%	100%	100%	100%	100%	
C. Thalweg	100%	100%	100%	100%	100%	
D. Meanders	100%	100%	100%	100%	100%	
E. Bed General	100%	100%	100%	100%	100%	
F. Bank Condition	100%	100%	100%	100%	100%	
G. Rock/Log Vanes	100%	100%	100%	100%	100%	
H. Wads and Boulders	100%	100%	100%	100%	100%	
Reach UT 10 (103 feet)						
Feature	**Initial**	**MY-01**	**MY-02**	**MY-03**	**MY-04**	**MY-05**
A. Riffles	100%	100%	100%	100%	100%	
B. Pools	100%	100%	100%	100%	100%	
C. Thalweg	100%	100%	100%	100%	100%	
D. Meanders	100%	100%	100%	100%	100%	
E. Bed General	100%	100%	100%	100%	100%	
F. Bank Condition	100%	100%	100%	100%	100%	
G. Rock/Log Vanes	100%	100%	100%	100%	100%	
H. Wads and Boulders	100%	100%	100%	100%	100%	

6. Quantitative Morphology

The following tables (**Table VII** and **Table VIII**) summarize the quantitative data collected from the cross-sectional and longitudinal stream survey. These data were analyzed and summarized, and then compared with as-built data. The Quantitative Morphology Tables illustrate the degree of departure, if any, of the current channel from the baseline data. **Tables VII** and **VIII** were compiled from the cross-section and profile raw data and plots located in **Appendix B** of this report.

Table VII. Baseline Morphology and Hydraulic Summary

Table VII. Baseline Morphology and Hydraulic Summary Rockwell Pastures Site/Project No. D-000624 Reach UT1 UPPER																		
Parameter	**USGS Gage Data**			**Regional Curve Interval**			**Pre-Existing Condition**			**Project Reference Stream**			**Design**			**As-Built**		
Dimension	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**
BF Width (ft)	*	*	*	*	*	4.2	*	*	*	*	*	7.3	*	*	6.3	*	*	6.3
BF Cross Sectional Area (ft2)	*	*	*	*	*	4.2	*	*	*	*	*	4.2	*	*	3.1	*	*	3.1
BF Mean Depth (ft)	*	*	*	*	*	0.7	*	*	*	*	*	0.6	*	*	0.5	*	*	0.5
BF Max Depth (ft)	*	*	*	*	*	*	*	*	*	*	*	1.1	*	*	0.8	*	*	0.8
Width/Depth Ratio	*	*	*	*	*	6.1	*	*	*	*	*	12.6	*	*	12.7	*	*	12.7
Entrenchment Ratio	*	*	*	*	*	*	*	*	*	*	*	2.7	*	*	17.6	*	*	17.6
Wetted Perimeter (ft)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Hydraulic Radius (ft)	*	*	*	*	*	*	*	*	0.59	*	*	*	*	*	*	*	*	*
Pattern																		
Channel Beltwidth (ft)	*	*	*	*	*	*	*	*	*	3.2	5.7	4.4	12.6	31.5	22.1	12.6	31.5	22.1
Radius of Curvature (ft)	*	*	*	*	*	*	*	*	*	5.3	12.6	9	15.8	18.9	17.3	15.8	18.9	17.3
Meander Wavelength (ft)	*	*	*	*	*	*	*	*	*	10.2	17	13.6	56.7	88.2	72.5	56.7	88.2	72.5
Meander Width Ratio	*	*	*	3	5	4	*	*	*	0.4	0.8	0.6	2	5	3.5	2	5	3.5
Profile																		
Riffle Length (ft)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Riffle Slope (ft)	*	*	*	*	*	*	*	*	*	0.006	0.049	0.0279	0.024	0.032	0.028	0.024	0.032	0.028
Pool Length (ft)	*	*	*	*	*	*	*	*	*			4.1			11.7			11.7
Pool -to-Pool Spacing (ft)	*	*	*	3	6	4.5	*	*	*	17.6	24.1	20.8	25.2	37.8	31.5	25.2	37.8	31.5
Substrate																		
d50 (mm)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
d84 (mm)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Additional Reach Parameters																		
Valley Length (ft)		*			*		*	*	*	*	*	*	*	*	*	*	*	*
Channel Length (ft)		*			*		*	*	3400	*	*	*	*	*	3077	*	*	3077
Sinuosity		*			*		1	1.05	1.01	*	*	1.05	1.02	1.14	1.08	1.02	1.14	1.08
Water Surface Slope (ft/ft)		*			*		*	*	0.017	*	*	0.0156	*	*	0.016	*	*	0.016
BF Slope (ft/ft)		*			*		*	*	*	*	*	*	*	*	*	*	*	0.017
Rosgen Classification		*			C/E			B5			C4			B5			B5	
*Habitat Index		*			*			*			*			*			*	
*Macrobenthos		*			*			*			*			*			*	
*Macorbenthos		*			*			*			*			*			*	

*Historical documents necessary to provide this information were unavailable at the time of the report submission
Note: As-Built data comes from the As-Built drawings and Mitigation Plan.

Table VII. Baseline Morphology and Hydraulic Summary
Rockwell Pastures Site/Project No. D-000624
Reach UT1 MIDDLE

Parameter	USGS Gage Data			Regional Curve Interval			Pre-Existing Condition			Project Reference Stream			Design			As-Built		
Dimension	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**
BF Width (ft)	*	*	*	*	*	10.5	*	*	8.9	*	*	7.3	*	*	15	*	*	15
BF Cross Sectional Area (ft2)	*	*	*	*	*	17.6	*	*	12.4	*	*	4.2	*	*	15.8	*	*	15.8
BF Mean Depth (ft)	*	*	*	*	*	1.4	*	*	1.4	*	*	0.6	*	*	1.1	*	*	1.1
BF Max Depth (ft)	*	*	*	*	*	*	*	*	1.8	*	*	1.1	*	*	1.5	*	*	1.5
Width/Depth Ratio	*	*	*	*	*	7.7	*	*	6.4	*	*	12.6	*	*	14.3	*	*	14.3
Entrenchment Ratio	*	*	*	*	*	*	*	*	3.9	*	*	2.7	*	*	10.5	*	*	10.5
Wetted Perimeter (ft)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Hydraulic Radius (ft)	*	*	*	*	*	*	*	*	1.18	*	*	*	*	*	*	*	*	*
Pattern																		
Channel Beltwidth (ft)	*	*	*	*	*	*	*	*	*	3.2	5.7	4.4	45	75	60	45	75	60
Radius of Curvature (ft)	*	*	*	*	*	*	*	*	*	5.3	12.6	9	37.5	45	41.3	37.5	45	41.3
Meander Wavelength (ft)	*	*	*	*	*	*	*	*	*	10.2	17	13.6	135	210	172.5	135	210	172.5
Meander Width Ratio	*	*	*	3	5	4	*	*	*	0.4	0.8	0.6	3	5	4	3	5	4
Profile																		
Riffle Length (ft)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Riffle Slope (ft)	*	*	*	*	*	*	*	*	*	0.006	0.049	0.0279	0.011	0.014	0.012	0.011	0.014	0.012
Pool Length (ft)	*	*	*	*	*	*	*	*	9.4	*	*	4.1	*	*	23.9	*	*	23.9
Pool -to-Pool Spacing (ft)	*	*	*	*	*	*	35.9	65.4	54.6	17.6	24.1	20.8	45	90	67.5	45	90	67.5
Substrate																		
d50 (mm)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
d84 (mm)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Additional Reach Parameters																		
Valley Length (ft)		*			*		*	*	*	*	*	*	*	*	*	*	*	*
Channel Length (ft)		*			*		*	*	1900	*	*	*	*	*	2050	*	*	2050
Sinuosity		*			*		1	1.09	1.02	*	*	1.05	1	1.15	1.09	1	1.15	1.09
Water Surface Slope (ft/ft)		*			*		*	*	0.009	*	*	0.0156	*	*	0.007	*	*	0.007
BF Slope (ft/ft)		*			*		*	*	*	*	*	*	*	*	*	*	*	*
Rosgen Classification		*			C/E			E5			C4			C4			C4	
*Habitat Index		*			*			*			*			*			*	
*Macrobenthos		*			*			*			*			*			*	
*Macorbenthos		*			*			*			*			*			*	

*Historical documents necessary to provide this information were unavailable at the time of the report submission
Note: As-Built data comes from the As-Built drawings and Mitigation Plan.

Table VII. Baseline Morphology and Hydraulic Summary
Rockwell Pastures Site/Project No. D-000624
Reach UT1 LOWER

Parameter	USGS Gage Data			Regional Curve Interval			Pre-Existing Condition			Project Reference Stream			Design			As-Built		
Dimension	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**
BF Width (ft)	*	*	*	*	*	11.4	*	*	18.2	*	*	7.3	*	*	16.6	*	*	16.6
BF Cross Sectional Area (ft2)	*	*	*	*	*	19.9	*	*	20.7	*	*	4.2	*	*	18.9	*	*	18.9
BF Mean Depth (ft)	*	*	*	*	*	1.5	*	*	1.1	*	*	0.6	*	*	1.1	*	*	1.1
BF Max Depth (ft)	*	*	*	*	*	*	*	*	2	*	*	1.1	*	*	1.6	*	*	1.6
Width/Depth Ratio	*	*	*	*	*	7.8	*	*	16	*	*	12.6	*	*	14.6	*	*	14.6
Entrenchment Ratio	*	*	*	*	*	*	*	*	4.9	*	*	2.7	*	*	12.4	*	*	12.4
Wetted Perimeter (ft)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Hydraulic Radius (ft)	*	*	*	*	*	*	*	*	1.09	*	*	*	*	*	*	*	*	*
Pattern																		
Channel Beltwidth (ft)	*	*	*	*	*	*	15.5	19.8	17.7	3.2	5.7	4.4	49.8	83	66.4	49.8	83	66.4
Radius of Curvature (ft)	*	*	*	*	*	*	41.1	130.5	121.3	5.3	12.6	9	41.5	49.8	45.7	41.5	49.8	45.7
Meander Wavelength (ft)	*	*	*	*	*	*	*	*	267	10.2	17	13.6	149.4	232.4	190.9	149.4	232.4	190.9
Meander Width Ratio	*	*	*	3	5	4	0.9	1.1	1	0.4	0.8	0.6	3	5	4	3	5	4
Profile																		
Riffle Length (ft)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Riffle Slope (ft)	*	*	*	*	*	*	0.012	0.063	0.037	0.006	0.049	0.0279	0.013	0.017	0.015	0.013	0.017	0.015
Pool Length (ft)	*	*	*	*	*	*	*	*	20.3	*	*	4.1	*	*	26.8	*	*	26.8
Pool -to-Pool Spacing (ft)	*	*	*	*	*	*	68.8	179.7	104.1	17.6	24.1	20.8	49.8	99.8	74.7	49.8	99.8	74.7
Substrate																		
d50 (mm)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
d84 (mm)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Additional Reach Parameters																		
Valley Length (ft)		*			*		*	*	*	*	*	*	*	*	*	*	*	*
Channel Length (ft)		*			*		*	*	1873	*	*	*	*	*	1530	*	*	1530
Sinuosity		*			*		1	1.02	1.01	*	*	1.05	*	*	1.08	*	*	1.08
Water Surface Slope (ft/ft)		*			*		*	*	0.009	*	*	0.0156	*	*	0.009	*	*	0.009
BF Slope (ft/ft)		*			*		*	*	*	*	*	*	*	*	*	*	*	*
Rosgen Classification		*			C/E			C4			C4			C4			C4	
*Habitat Index		*			*			*			*			*			*	
*Macrobenthos		*			*			*			*			*			*	
*Macorbenthos		*			*			*			*			*			*	

*Historical documents necessary to provide this information were unavailable at the time of the report submission
Note: As-Built data comes from the As-Built drawings and Mitigation Plan.

Table VII. Baseline Morphology and Hydraulic Summary Rockwell Pastures Site/Project No. D-000624 Reach UT2																		
Parameter	**USGS Gage Data**			**Regional Curve Interval**			**Pre-Existing Condition**			**Project Reference Stream**			**Design**			**As-Built**		
Dimension	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**
BF Width (ft)	*	*	*	*	*	4.9	*	*	8.3	*	*	7.3						
BF Cross Sectional Area (ft2)	*	*	*	*	*	5.4	*	*	4.8	*	*	4.2						
BF Mean Depth (ft)	*	*	*	*	*	0.8	*	*	0.6	*	*	0.6						
BF Max Depth (ft)	*	*	*	*	*	*	*	*	1.1	*	*	1.1						
Width/Depth Ratio	*	*	*	*	*	6.3	*	*	14.3	*	*	12.6						
Entrenchment Ratio	*	*	*	*	*	*	*	*	3.1	*	*	2.7						
Wetted Perimeter (ft)	*	*	*	*	*	*	*	*	*	*	*	*						
Hydraulic Radius (ft)	*	*	*	*	*	*	*	*	0.55	*	*	*						
Pattern																		
Channel Beltwidth (ft)	*	*	*	*	*	*	7.3	9.5	8.4	3.2	5.7	4.4						
Radius of Curvature (ft)	*	*	*	*	*	*	9.9	42.3	23.7	5.3	12.6	9						
Meander Wavelength (ft)	*	*	*	*	*	*	54.1	56.2	55.2	10.2	17	13.6						
Meander Width Ratio	*	*	*	3	5	4	0.9	1.1	1	0.4	0.8	0.6						
Profile																		
Riffle Length (ft)	*	*	*	*	*	*	*	*	*	*	*	*						
Riffle Slope (ft)	*	*	*	*	*	*	0.016	0.09	0.045	0.006	0.049	0.0279						
Pool Length (ft)	*	*	*	*	*	*	*	*	8	*	*	4.1						
Pool -to-Pool Spacing (ft)	*	*	*	*	*	*	10	41.5	24.6	17.6	24.1	20.8						
Substrate																		
d50 (mm)	*	*	*	*	*	*	*	*	*	*	*	*						
d84 (mm)	*	*	*	*	*	*	*	*	*	*	*	*						
Additional Reach Parameters																		
Valley Length (ft)		*			*		*	*	*	*	*	*						
Channel Length (ft)		*			*		*	*	634	*	*	*						
Sinuosity		*			*		*	*	1	*	*	1.05						
Water Surface Slope (ft/ft)		*			*		*	*	0.028	*	*	0.0156						
BF Slope (ft/ft)		*			*		*	*	*	*	*	*						
Rosgen Classification		*			C/E			B4c			C4							
*Habitat Index		*			*			*			*							
*Macrobenthos		*			*			*			*							
*Macorbenthos		*			*			*			*							

*Historical documents necessary to provide this information were unavailable at the time of the report submission

Table VII. Baseline Morphology and Hydraulic Summary
Rockwell Pastures Site/Project No. D-000624
Reach UT3

Parameter	USGS Gage Data			Regional Curve Interval			Pre-Existing Condition			Project Reference Stream			Design			As-Built		
Dimension	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**
BF Width (ft)	*	*	*	*	*	5.3	*	*	6.3	*	*	7.3	*	*	8.6	*	*	8.6
BF Cross Sectional Area (ft2)	*	*	*	*	*	5.9	*	*	6.5	*	*	4.2	*	*	5.8	*	*	5.8
BF Mean Depth (ft)	*	*	*	*	*	0.8	*	*	1	*	*	0.6	*	*	0.7	*	*	0.7
BF Max Depth (ft)	*	*	*	*	*	*	*	*	1.4	*	*	1.1	*	*	1.1	*	*	1.1
Width/Depth Ratio	*	*	*	*	*	6.4	*	*	6.1	*	*	12.6	*	*	12.7	*	*	12.7
Entrenchment Ratio	*	*	*	*	*	*	*	*	2.4	*	*	2.7	*	*	27.3	*	*	27.3
Wetted Perimeter (ft)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Hydraulic Radius (ft)	*	*	*	*	*	*	*	*	0.86	*	*	*	*	*	*	*	*	*
Pattern																		
Channel Beltwidth (ft)	*	*	*	*	*	*	5.3	6.4	5.8	3.2	5.7	4.4	25.8	43	34.4	25.8	43	34.4
Radius of Curvature (ft)	*	*	*	*	*	*	1.8	19.4	9.9	5.3	12.6	9	21.5	25.8	23.7	21.5	25.8	23.7
Meander Wavelength (ft)	*	*	*	*	*	*	33.7	47.4	40.5	10.2	17	13.6	77.4	120.4	98.9	77.4	120.4	98.9
Meander Width Ratio	*	*	*	3	5	4	0.8	1	0.9	0.4	0.8	0.6	3	5	4	3	5	4
Profile																		
Riffle Length (ft)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	`	*	*
Riffle Slope (ft)	*	*	*	*	*	*	*	*	0.15	0.006	0.049	0.0279	0.016	0.021	0.018	0.016	0.021	0.018
Pool Length (ft)	*	*	*	*	*	*	*	*	11.5	*	*	4.1	*	*	16.4	*	*	16.4
Pool -to-Pool Spacing (ft)	*	*	*	*	*	*	*	*	26	17.6	24.1	20.8	25.8	51.6	38.7	25.8	51.6	38.7
Substrate																		
d50 (mm)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
d84 (mm)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Additional Reach Parameters																		
Valley Length (ft)		*			*		*	*	*	*	*	*	*	*	*	*	*	*
Channel Length (ft)		*			*		*	*	716	*	*	*	*	*	872	*	*	872
Sinuosity		*			*		*	*	1.04	*	*	1.05	*	*	1.18	*	*	1.18
Water Surface Slope (ft/ft)		*			*		*	*	0.013	*	*	0.0156	*	*	0.01	*	*	0.01
BF Slope (ft/ft)		*			*		*	*	*	*	*	*	*	*	*	*	*	0.012
Rosgen Classification		*			C/E			E4			C4			C5			C5	
*Habitat Index		*			*			*			*			*			*	
*Macrobenthos		*			*			*			*			*			*	
*Macorbenthos		*			*			*			*			*			*	

*Historical documents necessary to provide this information were unavailable at the time of the report submission
Note: As-Built data comes from the As-Built drawings and Mitigation Plan.

Table VII. Baseline Morphology and Hydraulic Summary Rockwell Pastures Site/Project No. D-000624 Reach UT4 UPPER																		
Parameter	**USGS Gage Data**			**Regional Curve Interval**			**Pre-Existing Condition**			**Project Reference Stream**			**Design**			**As-Built**		
Dimension	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**
BF Width (ft)	*	*	*	*	*	4.5	*	*	7.3	*	*	7.3	*	*	7.4	*	*	7.4
BF Cross Sectional Area (ft2)	*	*	*	*	*	4.7	*	*	4.2	*	*	4.2	*	*	4.2	*	*	4.2
BF Mean Depth (ft)	*	*	*	*	*	0.7	*	*	0.6	*	*	0.6	*	*	0.6	*	*	0.6
BF Max Depth (ft)	*	*	*	*	*	*	*	*	1.1	*	*	1.1	*	*	0.9	*	*	0.9
Width/Depth Ratio	*	*	*	*	*	6.2	*	*	12.6	*	*	12.6	*	*	12.9	*	*	12.9
Entrenchment Ratio	*	*	*	*	*	*	*	*	2.7	*	*	2.7	*	*	5	*	*	5
Wetted Perimeter (ft)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Hydraulic Radius (ft)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Pattern																		
Channel Beltwidth (ft)	*	*	*	*	*	*	3.2	5.7	4.4	3.2	5.7	4.4	22.2	37	29.6	22.2	37	29.6
Radius of Curvature (ft)	*	*	*	*	*	*	5.3	12.6	9	5.3	12.6	9	18.5	22.2	20.4	18.5	22.2	20.4
Meander Wavelength (ft)	*	*	*	*	*	*	10.2	17	13.6	10.2	17	13.6	66.6	103.6	85.1	66.6	103.6	85.1
Meander Width Ratio	*	*	*	3	5	4	0.4	0.8	0.6	0.4	0.8	0.6	3	5	4	3	5	4
Profile																		
Riffle Length (ft)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Riffle Slope (ft)	*	*	*	*	*	*	0.006	0.049	0.028	0.006	0.049	0.0279	0.028	0.037	0.032	0.028	0.037	0.032
Pool Length (ft)	*	*	*	*	*	*	*	*	4.1	*	*	4.1	*	*	14	*	*	14
Pool -to-Pool Spacing (ft)	*	*	*	*	*	*	17.6	24.1	20.8	17.6	24.1	20.8	22.2	44.4	33.3	22.2	44.4	33.3
Substrate																		
d50 (mm)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
d84 (mm)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Additional Reach Parameters																		
Valley Length (ft)		*			*		*	*	*	*	*	*	*	*	*	*	*	*
Channel Length (ft)		*			*		*	*	*	*	*	*	*	*	1506	*	*	1506
Sinuosity		*			*		*	*	1.05	*	*	1.05	1.02	1.15	1.06	1.02	1.15	1.06
Water Surface Slope (ft/ft)		*			*		*	*	0.016	*	*	0.0156	*	*	0.019	*	*	0.019
BF Slope (ft/ft)		*			*		*	*	*	*	*	*	*	*	*	*	*	*
Rosgen Classification		*			C/E			C4			C4			C4			C4	
*Habitat Index		*			*			*			*			*			*	
*Macrobenthos		*			*			*			*			*			*	
*Macorbenthos		*			*			*			*			*			*	

*Historical documents necessary to provide this information were unavailable at the time of the report submission
Note: As-Built data comes from the As-Built drawings and Mitigation Plan.

Table VII. Baseline Morphology and Hydraulic Summary Rockwell Pastures Site/Project No. D-000624 Reach UT4 MIDDLE																		
Parameter	**USGS Gage Data**			**Regional Curve Interval**			**Pre-Existing Condition**			**Project Reference Stream**			**Design**			**As-Built**		
Dimension	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**
BF Width (ft)	*	*	*	*	*	6.9	*	*	*	*	*	7.3	*	*	10.7	*	*	10.7
BF Cross Sectional Area (ft2)	*	*	*	*	*	9.1	*	*	*	*	*	4.2	*	*	9.1	*	*	9.1
BF Mean Depth (ft)	*	*	*	*	*	1	*	*	*	*	*	0.6	*	*	0.9	*	*	0.9
BF Max Depth (ft)	*	*	*	*	*	*	*	*	*	*	*	1.1	*	*	1.4	*	*	1.4
Width/Depth Ratio	*	*	*	*	*	6.9	*	*	*	*	*	12.6	*	*	12.6	*	*	12.6
Entrenchment Ratio	*	*	*	*	*	*	*	*	*	*	*	2.7	*	*	9.1	*	*	9.1
Wetted Perimeter (ft)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Hydraulic Radius (ft)	*	*	*	*	*	*	*	*	0.33	*	*	*	*	*	*	*	*	*
Pattern																		
Channel Beltwidth (ft)	*	*	*	*	*	*	*	*	*	3.2	5.7	4.4	32.1	53.5	42.8	32.1	53.5	42.8
Radius of Curvature (ft)	*	*	*	*	*	*	*	*	*	5.3	12.6	9	26.8	32.1	29.4	26.8	32.1	29.4
Meander Wavelength (ft)	*	*	*	*	*	*	*	*	*	10.2	17	13.6	96.3	149.8	123.1	96.3	149.8	123.1
Meander Width Ratio	*	*	*	3	5	4	*	*	*	0.4	0.8	0.6	3	5	4	3	5	4
Profile																		
Riffle Length (ft)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Riffle Slope (ft)	*	*	*	*	*	*	*	*	*	0.006	0.049	0.0279	0.022	0.029	0.025	0.022	0.029	0.025
Pool Length (ft)	*	*	*	*	*	*	*	*	*	*	*	4.1	*	*	21.2	*	*	21.2
Pool -to-Pool Spacing (ft)	*	*	*	*	*	*	*	*	*	17.6	24.1	20.8	32.1	64.2	48.2	32.1	64.2	48.2
Substrate																		
d50 (mm)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
d84 (mm)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Additional Reach Parameters																		
Valley Length (ft)		*			*		*	*	*	*	*	*	*	*	*	*	*	*
Channel Length (ft)		*			*		*	*	2100	*	*	*	*	*	2131	*	*	2131
Sinuosity		*			*		*	*	1.03	*	*	1.05	1	1.12	1.04	1	1.12	1.04
Water Surface Slope (ft/ft)		*			*		*	*	0.015	*	*	0.0156	*	*	0.014	*	*	0.014
BF Slope (ft/ft)		*			*		*	*	*	*	*	*	*	*	*	*	*	*
Rosgen Classification		*			C/E			F4			C4			C4			C4	
*Habitat Index		*			*			*			*			*			*	
*Macrobenthos		*			*			*			*			*			*	
*Macorbenthos		*			*			*			*			*			*	

*Historical documents necessary to provide this information were unavailable at the time of the report submission
Note: As-Built data comes from the As-Built drawings and Mitigation Plan.

Table VII. Baseline Morphology and Hydraulic Summary
Rockwell Pastures Site/Project No. D-000624
Reach UT4 LOWER

Parameter	USGS Gage Data			Regional Curve Interval			Pre-Existing Condition			Project Reference Stream			Design			As-Built		
Dimension	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**
BF Width (ft)	*	*	*	*	*	8.2	*	*	7.4	*	*	7.3	*	*	12	*	*	12
BF Cross Sectional Area (ft2)	*	*	*	*	*	11.9	*	*	9.9	*	*	4.2	*	*	11.3	*	*	11.3
BF Mean Depth (ft)	*	*	*	*	*	1.1	*	*	1.3	*	*	0.6	*	*	0.9	*	*	0.9
BF Max Depth (ft)	*	*	*	*	*	*	*	*	1.7	*	*	1.1	*	*	1.5	*	*	1.5
Width/Depth Ratio	*	*	*	*	*	7.2	*	*	5.5	*	*	12.6	*	*	12.8	*	*	12.8
Entrenchment Ratio	*	*	*	*	*	*	*	*	10.7	*	*	2.7	*	*	13.6	*	*	13.6
Wetted Perimeter (ft)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Hydraulic Radius (ft)	*	*	*	*	*	*	*	*	1.11	*	*	*	*	*	*	*	*	*
Pattern																		
Channel Beltwidth (ft)	*	*	*	*	*	*	*	*	*	3.2	5.7	4.4	36	60	48	36	60	48
Radius of Curvature (ft)	*	*	*	*	*	*	*	*	*	5.3	12.6	9	30	36	33	30	36	33
Meander Wavelength (ft)	*	*	*	*	*	*	*	*	*	10.2	17	13.6	108	168	138	108	168	138
Meander Width Ratio	*	*	*	3	5	4	*	*	*	0.4	0.8	0.6	3	5	4	3	5	4
Profile																		
Riffle Length (ft)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Riffle Slope (ft)	*	*	*	*	*	*	*	*	*	0.006	0.049	0.0279	0.018	0.025	0.021	0.018	0.025	0.021
Pool Length (ft)	*	*	*	*	*	*	*	*	6.5	*	*	4.1	*	*	22.9	*	*	22.9
Pool -to-Pool Spacing (ft)	*	*	*	*	*	*	*	*	*	17.6	24.1	20.8	36	72	54	36	72	54
Substrate																		
d50 (mm)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
d84 (mm)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Additional Reach Parameters																		
Valley Length (ft)		*			*		*	*	*	*	*	*	*	*	*	*	*	*
Channel Length (ft)		*			*		*	*	1135	*	*	*	*	*	1306	*	*	1306
Sinuosity		*			*		1	1.04	1.02	*	*	1.05	1.09	1.2	1.1	1.09	1.2	1.1
Water Surface Slope (ft/ft)		*			*		*	*	0.012	*	*	0.0156	*	*	0.012	*	*	0.012
BF Slope (ft/ft)		*			*		*	*	*	*	*	*	*	*	*	*	*	*
Rosgen Classification		*			C/E			E4b			C4			C4			C4	
*Habitat Index		*			*			*			*			*			*	
*Macrobenthos		*			*			*			*			*			*	
*Macorbenthos		*			*			*			*			*			*	

*Historical documents necessary to provide this information were unavailable at the time of the report submission
Note: As-Built data comes from the As-Built drawings and Mitigation Plan.

Table VII. Baseline Morphology and Hydraulic Summary
Rockwell Pastures Site/Project No. D-000624
Reach UT5

Parameter	USGS Gage Data			Regional Curve Interval			Pre-Existing Condition			Project Reference Stream			Design			As-Built		
Dimension	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**
BF Width (ft)	*	*	*	*	*	3.8	*	*	5	*	*	7.3						
BF Cross Sectional Area (ft2)	*	*	*	*	*	3.5	*	*	5	*	*	4.2						
BF Mean Depth (ft)	*	*	*	*	*	0.6	*	*	1	*	*	0.6						
BF Max Depth (ft)	*	*	*	*	*	*	*	*	1.4	*	*	1.1						
Width/Depth Ratio	*	*	*	*	*	5.9	*	*	5	*	*	12.6						
Entrenchment Ratio	*	*	*	*	*	*	*	*	3.6	*	*	2.7						
Wetted Perimeter (ft)	*	*	*	*	*	*	*	*	*	*	*	*						
Hydraulic Radius (ft)	*	*	*	*	*	*	*	*	0.82	*	*	*						
Pattern																		
Channel Beltwidth (ft)	*	*	*	*	*	*	*	*	*	3.2	5.7	4.4						
Radius of Curvature (ft)	*	*	*	*	*	*	*	*	*	5.3	12.6	9						
Meander Wavelength (ft)	*	*	*	*	*	*	*	*	*	10.2	17	13.6						
Meander Width Ratio	*	*	*	3	5	4	*	*	*	0.4	0.8	0.6						
Profile																		
Riffle Length (ft)	*	*	*	*	*	*	*	*	*	*	*	*						
Riffle Slope (ft)	*	*	*	*	*	*	*	*	*	0.006	0.049	0.0279						
Pool Length (ft)	*	*	*	*	*	*	*	*	*	*	*	4.1						
Pool -to-Pool Spacing (ft)	*	*	*	*	*	*	*	*	*	17.6	24.1	20.8						
Substrate																		
d50 (mm)	*	*	*	*	*	*	*	*	*	*	*	*						
d84 (mm)	*	*	*	*	*	*	*	*	*	*	*	*						
Additional Reach Parameters																		
Valley Length (ft)		*			*		*	*	*	*	*	*						
Channel Length (ft)		*			*		*	*	1075	*	*	*						
Sinuosity		*			*		*	*	1	*	*	1.05						
Water Surface Slope (ft/ft)		*			*		*	*	0.019	*	*	0.0156						
BF Slope (ft/ft)		*			*		*	*	*	*	*	*						
Rosgen Classification		*			C/E			E6			C4							
*Habitat Index		*			*			*			*							
*Macrobenthos		*			*			*			*							
*Macorbenthos		*			*			*			*							

*Historical documents necessary to provide this information were unavailable at the time of the report submission

Table VII. Baseline Morphology and Hydraulic Summary
Rockwell Pastures Site/Project No. D-000624
Reach UT6

Parameter	USGS Gage Data			Regional Curve Interval			Pre-Existing Condition			Project Reference Stream			Design			As-Built		
Dimension	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**
BF Width (ft)	*	*	*	*	*	2.2	*	*	2.5	*	*	7.3						
BF Cross Sectional Area (ft2)	*	*	*	*	*	1.5	*	*	0.9	*	*	4.2						
BF Mean Depth (ft)	*	*	*	*	*	0.4	*	*	0.4	*	*	0.6						
BF Max Depth (ft)	*	*	*	*	*	*	*	*	0.6	*	*	1.1						
Width/Depth Ratio	*	*	*	*	*	5.2	*	*	6.6	*	*	12.6						
Entrenchment Ratio	*	*	*	*	*	*	*	*	2.6	*	*	2.7						
Wetted Perimeter (ft)	*	*	*	*	*	*	*	*	*	*	*	*						
Hydraulic Radius (ft)	*	*	*	*	*	*	*	*	0.34	*	*	*						
Pattern																		
Channel Beltwidth (ft)	*	*	*	*	*	*	*	*	*	3.2	5.7	4.4						
Radius of Curvature (ft)	*	*	*	*	*	*	*	*	*	5.3	12.6	9						
Meander Wavelength (ft)	*	*	*	*	*	*	*	*	*	10.2	17	13.6						
Meander Width Ratio	*	*	*	3	5	4	*	*	*	0.4	0.8	0.6						
Profile																		
Riffle Length (ft)	*	*	*	*	*	*	*	*	*	*	*	*						
Riffle Slope (ft)	*	*	*	*	*	*	*	*	*	0.006	0.049	0.0279						
Pool Length (ft)	*	*	*	*	*	*	*	*	*	*	*	4.1						
Pool -to-Pool Spacing (ft)	*	*	*	*	*	*	*	*	*	17.6	24.1	20.8						
Substrate																		
d50 (mm)	*	*	*	*	*	*	*	*	*	*	*	*						
d84 (mm)	*	*	*	*	*	*	*	*	*	*	*	*						
Additional Reach Parameters																		
Valley Length (ft)		*			*		*	*	*	*	*	*						
Channel Length (ft)		*			*		*	*	1174	*	*	*						
Sinuosity		*			*		*	*	1	*	*	1.05						
Water Surface Slope (ft/ft)		*			*		*	*	0.016	*	*	0.0156						
BF Slope (ft/ft)		*			*		*	*	*	*	*	*						
Rosgen Classification		*			C/E			E4/E5			C4							
*Habitat Index		*			*			*			*							
*Macrobenthos		*			*			*			*							
*Macorbenthos		*			*			*			*							

*Historical documents necessary to provide this information were unavailable at the time of the report submission

Table VII. Baseline Morphology and Hydraulic Summary Rockwell Pastures Site/Project No. D-000624 Reach UT7																		
Parameter	**USGS Gage Data**			**Regional Curve Interval**			**Pre-Existing Condition**			**Project Reference Stream**			**Design**			**As-Built**		
Dimension	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**
BF Width (ft)	*	*	*	*	*	3.3	*	*	2.8	*	*	7.3	*	*	6	*	*	6
BF Cross Sectional Area (ft2)	*	*	*	*	*	2.8	*	*	1	*	*	4.2	*	*	2.8	*	*	2.8
BF Mean Depth (ft)	*	*	*	*	*	0.6	*	*	0.4	*	*	0.6	*	*	0.5	*	*	0.5
BF Max Depth (ft)	*	*	*	*	*	*	*	*	0.7	*	*	1.1	*	*	0.8	*	*	0.8
Width/Depth Ratio	*	*	*	*	*	5.7	*	*	8	*	*	12.6	*	*	12.8	*	*	12.8
Entrenchment Ratio	*	*	*	*	*	*	*	*	2	*	*	2.7	*	*	7.5	*	*	7.5
Wetted Perimeter (ft)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Hydraulic Radius (ft)	*	*	*	*	*	*	*	*	0.29	*	*	*	*	*	*	*	*	*
Pattern																		
Channel Beltwidth (ft)	*	*	*	*	*	*	*	*	*	3.2	5.7	4.4	18	30	24	18	30	24
Radius of Curvature (ft)	*	*	*	*	*	*	*	*	*	5.3	12.6	9	15	18	16.5	15	18	16.5
Meander Wavelength (ft)	*	*	*	*	*	*	*	*	*	10.2	17	13.6	54	84	69	54	84	69
Meander Width Ratio	*	*	*	3	5	4	*	*	*	0.4	0.8	0.6	3	5	4	3	5	4
Profile																		
Riffle Length (ft)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Riffle Slope (ft)	*	*	*	*	*	*	*	*	*	0.006	0.049	0.0279	0.015	0.02	0.017	0.015	0.02	0.017
Pool Length (ft)	*	*	*	*	*	*	*	*	2.9	*	*	4.1	*	*	11.5	*	*	11.5
Pool -to-Pool Spacing (ft)	*	*	*	*	*	*	*	*	*	17.6	24.1	20.8	18	36	27	18	36	27
Substrate																		
d50 (mm)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
d84 (mm)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Additional Reach Parameters																		
Valley Length (ft)		*			*		*	*	*	*	*	*	*	*	*	*	*	*
Channel Length (ft)		*			*		*	*	1333	*	*	*	*	*	709	*	*	709
Sinuosity		*			*		*	*	1	*	*	1.05	1.07	1.15	1.13	1.07	1.15	1.13
Water Surface Slope (ft/ft)		*			*		*	*	0.018	*	*	0.0156	*	*	0.01	*	*	0.01
BF Slope (ft/ft)		*			*		*	*	*	*	*	*	*	*	*	*	*	0.011
Rosgen Classification		*			C/E			B			C4			C			C	
*Habitat Index		*			*			*			*			*			*	
*Macrobenthos		*			*			*			*			*			*	
*Macorbenthos		*			*			*			*			*			*	

*Historical documents necessary to provide this information were unavailable at the time of the report submission
Note: As-Built data comes from the As-Built drawings and Mitigation Plan.

Table VII. Baseline Morphology and Hydraulic Summary Rockwell Pastures Site/Project No. D-000624 Reach UT8																		
Parameter	**USGS Gage Data**			**Regional Curve Interval**			**Pre-Existing Condition**			**Project Reference Stream**			**Design**			**As-Built**		
Dimension	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**
BF Width (ft)	*	*	*	*	*	*	**	**	**	*	*	7.3	**	**	**	**	**	**
BF Cross Sectional Area (ft2)	*	*	*	*	*	*	**	**	**	*	*	4.2	**	**	**	**	**	**
BF Mean Depth (ft)	*	*	*	*	*	*	**	**	**	*	*	0.6	**	**	**	**	**	**
BF Max Depth (ft)	*	*	*	*	*	*	**	**	**	*	*	1.1	**	**	**	**	**	**
Width/Depth Ratio	*	*	*	*	*	*	**	**	**	*	*	12.6	**	**	**	**	**	**
Entrenchment Ratio	*	*	*	*	*	*	**	**	**	*	*	2.7	**	**	**	**	**	**
Wetted Perimeter (ft)	*	*	*	*	*	*	**	**	**	*	*	*	**	**	**	**	**	**
Hydraulic Radius (ft)	*	*	*	*	*	*	**	**	**	*	*	*	**	**	**	**	**	**
Pattern																		
Channel Beltwidth (ft)	*	*	*	*	*	*	**	**	**	3.2	5.7	4.4	**	**	**	**	**	**
Radius of Curvature (ft)	*	*	*	*	*	*	**	**	**	5.3	12.6	9	**	**	**	**	**	**
Meander Wavelength (ft)	*	*	*	*	*	*	**	**	**	10.2	17	13.6	**	**	**	**	**	**
Meander Width Ratio	*	*	*	*	*	*	**	**	**	0.4	0.8	0.6	**	**	**	**	**	**
Profile																		
Riffle Length (ft)	*	*	*	*	*	*	**	**	**	*	*	*	**	**	**	**	**	**
Riffle Slope (ft)	*	*	*	*	*	*	**	**	**	0.006	0.049	0.0279	**	**	**	**	**	**
Pool Length (ft)	*	*	*	*	*	*	**	**	**	*	*	4.1	**	**	**	**	**	**
Pool -to-Pool Spacing (ft)	*	*	*	*	*	*	**	**	**	17.6	24.1	20.8	**	**	**	**	**	**
Substrate																		
d50 (mm)	*	*	*	*	*	*	**	**	**	*	*	*	**	**	**	**	**	**
d84 (mm)	*	*	*	*	*	*	**	**	**	*	*	*	**	**	**	**	**	**
Additional Reach Parameters																		
Valley Length (ft)		*			*		**	**	**	*	*	*	**	**	**	**	**	**
Channel Length (ft)		*			*		**	**	**	*	*	*	**	**	83	**	**	83
Sinuosity		*			*		**	**	**	*	*	1.05	**	**	**	**	**	**
Water Surface Slope (ft/ft)		*			*		**	**	**	*	*	0.0156	**	**	0.036	**	**	0.036
BF Slope (ft/ft)		*			*		**	**	**	*	*	*	**	**	**	**	**	**
Rosgen Classification		*			C/E			**			C4			**			**	
*Habitat Index		*			*			**			*			**			**	
*Macrobenthos		*			*			**			*			**			**	
*Macorbenthos		*			*			**			*			**			**	

*Historical documents necessary to provide this information were unavailable at the time of the report submission

**UT8, UT9, and UT10 data documents needed to complete Table VII. were unavailable at the time of the report submission.

Note: As-Built data comes from the As-Built drawings and Mitigation Plan.

Table VII. Baseline Morphology and Hydraulic Summary Rockwell Pastures Site/Project No. D-000624 Reach UT9																		
Parameter	**USGS Gage Data**			**Regional Curve Interval**			**Pre-Existing Condition**			**Project Reference Stream**			**Design**			**As-Built**		
Dimension	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**
BF Width (ft)	*	*	*	*	*	*	**	**	**	*	*	7.3	**	**	**	**	**	**
BF Cross Sectional Area (ft2)	*	*	*	*	*	*	**	**	**	*	*	4.2	**	**	**	**	**	**
BF Mean Depth (ft)	*	*	*	*	*	*	**	**	**	*	*	0.6	**	**	**	**	**	**
BF Max Depth (ft)	*	*	*	*	*	*	**	**	**	*	*	1.1	**	**	**	**	**	**
Width/Depth Ratio	*	*	*	*	*	*	**	**	**	*	*	12.6	**	**	**	**	**	**
Entrenchment Ratio	*	*	*	*	*	*	**	**	**	*	*	2.7	**	**	**	**	**	**
Wetted Perimeter (ft)	*	*	*	*	*	*	**	**	**	*	*	*	**	**	**	**	**	**
Hydraulic Radius (ft)	*	*	*	*	*	*	**	**	**	*	*	*	**	**	**	**	**	**
Pattern																		
Channel Beltwidth (ft)	*	*	*	*	*	*	**	**	**	3.2	5.7	4.4	**	**	**	**	**	**
Radius of Curvature (ft)	*	*	*	*	*	*	**	**	**	5.3	12.6	9	**	**	**	**	**	**
Meander Wavelength (ft)	*	*	*	*	*	*	**	**	**	10.2	17	13.6	**	**	**	**	**	**
Meander Width Ratio	*	*	*	*	*	*	**	**	**	0.4	0.8	0.6	**	**	**	**	**	**
Profile																		
Riffle Length (ft)	*	*	*	*	*	*	**	**	**	*	*	*	**	**	**	**	**	**
Riffle Slope (ft)	*	*	*	*	*	*	**	**	**	0.006	0.049	0.0279	**	**	**	**	**	**
Pool Length (ft)	*	*	*	*	*	*	**	**	**	*	*	4.1	**	**	**	**	**	**
Pool -to-Pool Spacing (ft)	*	*	*	*	*	*	**	**	**	17.6	24.1	20.8	**	**	**	**	**	**
Substrate																		
d50 (mm)	*	*	*	*	*	*	**	**	**	*	*	*	**	**	**	**	**	**
d84 (mm)	*	*	*	*	*	*	**	**	**	*	*	*	**	**	**	**	**	**
Additional Reach Parameters																		
Valley Length (ft)		*			*		**	**	**	*	*	*	**	**	**	**	**	**
Channel Length (ft)		*			*		**	**	**	*	*	*	**	**	152	**	**	152
Sinuosity		*			*		**	**	**	*	*	1.05	**	**	**	**	**	**
Water Surface Slope (ft/ft)		*			*		**	**	**	*	*	0.0156	**	**	0.01	**	**	0.01
BF Slope (ft/ft)		*			*		**	**	**	*	*	*	**	**	**	**	**	**
Rosgen Classification		*			C/E			**			C4			**			**	
*Habitat Index		*			*			**			*			**			**	
*Macrobenthos		*			*			**			*			**			**	
*Macorbenthos		*			*			**			*			**			**	

*Historical documents necessary to provide this information were unavailable at the time of the report submission

**UT8, UT9, and UT10 data documents needed to complete Table VII. were unavailable at the time of the report submission.

Note: As-Built data comes from the As-Built drawings and Mitigation Plan.

Table VII. Baseline Morphology and Hydraulic Summary Rockwell Pastures Site/Project No. D-000624 Reach UT10																		
Parameter	**USGS Gage Data**			**Regional Curve Interval**			**Pre-Existing Condition**			**Project Reference Stream**			**Design**			**As-Built**		
Dimension	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**	**Min**	**Max**	**Med**
BF Width (ft)	*	*	*	*	*	*	**	**	**	*	*	7.3	**	**	**	**	**	**
BF Cross Sectional Area (ft2)	*	*	*	*	*	*	**	**	**	*	*	4.2	**	**	**	**	**	**
BF Mean Depth (ft)	*	*	*	*	*	*	**	**	**	*	*	0.6	**	**	**	**	**	**
BF Max Depth (ft)	*	*	*	*	*	*	**	**	**	*	*	1.1	**	**	**	**	**	**
Width/Depth Ratio	*	*	*	*	*	*	**	**	**	*	*	12.6	**	**	**	**	**	**
Entrenchment Ratio	*	*	*	*	*	*	**	**	**	*	*	2.7	**	**	**	**	**	**
Wetted Perimeter (ft)	*	*	*	*	*	*	**	**	**	*	*	*	**	**	**	**	**	**
Hydraulic Radius (ft)	*	*	*	*	*	*	**	**	**	*	*	*	**	**	**	**	**	**
Pattern																		
Channel Beltwidth (ft)	*	*	*	*	*	*	**	**	**	3.2	5.7	4.4	**	**	**	**	**	**
Radius of Curvature (ft)	*	*	*	*	*	*	**	**	**	5.3	12.6	9	**	**	**	**	**	**
Meander Wavelength (ft)	*	*	*	*	*	*	**	**	**	10.2	17	13.6	**	**	**	**	**	**
Meander Width Ratio	*	*	*	*	*	*	**	**	**	0.4	0.8	0.6	**	**	**	**	**	**
Profile																		
Riffle Length (ft)	*	*	*	*	*	*	**	**	**	*	*	*	**	**	**	**	**	**
Riffle Slope (ft)	*	*	*	*	*	*	**	**	**	0.006	0.049	0.0279	**	**	**	**	**	**
Pool Length (ft)	*	*	*	*	*	*	**	**	**	*	*	4.1	**	**	**	**	**	**
Pool -to-Pool Spacing (ft)	*	*	*	*	*	*	**	**	**	17.6	24.1	20.8	**	**	**	**	**	**
Substrate																		
d50 (mm)	*	*	*	*	*	*	**	**	**	*	*	*	**	**	**	**	**	**
d84 (mm)	*	*	*	*	*	*	**	**	**	*	*	*	**	**	**	**	**	**
Additional Reach Parameters																		
Valley Length (ft)		*			*		**	**	**	*	*	*	**	**	**	**	**	**
Channel Length (ft)		*			*		**	**	**	*	*	*	**	**	103	**	**	103
Sinuosity		*			*		**	**	**	*	*	1.05	**	**	**	**	**	**
Water Surface Slope (ft/ft)		*			*		**	**	**	*	*	0.0156	**	**	0.005	**	**	0.005
BF Slope (ft/ft)		*			*		**	**	**	*	*	*	**	**	**	**	**	**
Rosgen Classification		*			C/E			**			C4			**			**	
*Habitat Index		*			*			**			*			**			**	
*Macrobenthos		*			*			**			*			**			**	
*Macorbenthos		*			*			**			*			**			**	

*Historical documents necessary to provide this information were unavailable at the time of the report submission

**UT8, UT9, and UT10 data documents needed to complete Table VII. were unavailable at the time of the report submission.

Note: As-Built data comes from the As-Built drawings and Mitigation Plan.

Table VIII. Morphology and Hydraulic Monitoring Summary
Rockwell Pastures Site/Project No. D-000624

Parameter	Cross-Section 1						Cross-Section 2						Cross-Section 3						Cross-Section 4						Cross-Section 5						Cross-Section 6					
	106+33 Riffle						106+78 Pool						120+45 Riffle						121+02 Pool						130+05 Riffle						130+64 Pool					
Dimension	MY0	MY1	MY2	MY3	MY4	MY5	MY0	MY1	MY2	MY3	MY4	MY5	MY0	MY1	MY2	MY3	MY4	MY5	MY0	MY1	MY2	MY3	MY4	MY5	MY0	MY1	MY2	MY3	MY4	MY5	MY0	MY1	MY2	MY3	MY4	MY5
BF Width (ft)	4.4	3.1	4.2	3.4	3.9		9.1	6.9	5.8	5.9	7.3		5.4	5.8	4.5	4.6	4.7		7.9	6.8	6.3	6.1	9.4		7	7.1	9.7	7.6	6.3		22	17.3	16.8	20.3	16.4	
Floodprone Width (ft)	10.9	7.1	10.2	8.3	8.2		19.2	16.1	12.2	14.3	14.2		36.8	37	39.9	39.5	42.4		64.8	56.1	62.4	50.1	54.9		63.8	83.9	84.6	84.5	84.5		80.2	79.9	80.3	80.1	80	
BF Cross Sectional Area (ft2)	1.8	1.1	1.9	1.3	1.7		7.6	5.5	3.7	4.5	4.7		1.5	1.4	1.3	1.4	1.5		8.6	8.2	8.8	8	6		2.6	3.3	4.2	3.6	2.6		10.5	8.9	9	10.3	8.4	
BF Mean Depth (ft)	0.4	0.3	0.5	0.4	0.4		0.8	0.8	0.6	0.8	0.6		0.3	0.2	0.3	0.3	0.3		0.7	0.7	0.6	0.6	0.6		0.4	0.5	0.4	0.5	0.4		0.5	0.5	0.5	0.5	0.5	
BF Max Depth (ft)	0.8	0.6	0.8	0.7	0.7		1.6	1.4	1.1	1.1	1.1		0.5	0.6	0.6	0.6	0.6		1.8	1.6	1.7	1.5	1.5		0.8	1.2	1.3	1.3	1.2		2.1	1.6	1.6	1.5	1.5	
Width/Depth Ratio	10.5	8.8	9.1	8.5	9.0		10.9	8.6	9.1	7.6	11.3		20.3	23.2	15.9	15.3	14.8		19.8	15.5	25.6	18.6	14.9		19.2	15.1	22.3	15.6	14.9		46.3	33.4	31.5	39.7	31.9	
Entrenchment Ratio	2.9	2.3	2.4	3.0	2.1		2.1	2.3	2.1	2.4	2		6.8	6.4	8.8	8.5	9.1		5	5	4.2	4.7	5.8		9.1	11.8	8.7	11.12	13.5		3.6	4.6	4.8	3.9	4.9	
Wetted Perimeter (ft)	4.9	3.4	4.6	3.7	4.3		9.9	7.4	6.3	6.2	7.7		5.6	6.0	4.7	5.1	4.9		14.1	12.5	16.2	11.7	10.4		7.3	7.6	10.3	8.8	6.9		23	18.3	17.4	21	17.2	
Hydraulic Radius (ft)	0.4	0.3	0.4	0.4	0.4		0.8	0.7	0.6	0.7	0.6		0.3	0.2	0.3	0.3	0.3		0.6	0.7	0.5	0.5	0.6		0.4	0.4	0.4	0.4	0.4		0.5	0.5	0.5	0.5	0.5	
Substrate																																				
d50 (mm)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
d84 (mm)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Reach UT1-Upper																																				
Parameter	MY-00 (2009) As-Built						MY-01 (2009)						MY-02 (2010)						MY-03 (2011)						MY-04 (2012)						MY-05 (2013)					
Pattern	Min	Max	Med				Min	Max	Med				Min	Max	Med				Min	Max	Med				Min	Max	Med				Min	Max	Med			
Channel Beltwidth (ft)	12.6	31.5	22.1				13.0	34.0	25.0				13.5	34.4	24.6				13.5	34.4	24.6				13.5	34.4	24.6									
Radius of Curvature (ft)	15.8	18.9	17.3				8.7	21.5	12.3				3.5	34.8	14.4				3.5	34.8	14.4				3.5	34.8	14.4									
Meander Wavelength (ft)	56.7	88.2	72.5				51.1	73.8	62.7				52.2	79.6	64.7				52.2	79.6	64.7				52.2	79.6	64.7									
Meander Width Ratio	2.0	5.0	3.5				2.0	3.0	2.5				1.9	4.9	3.5				1.9	4.9	3.5				1.9	4.9	3.5									
Profile																																				
Riffle Length (ft)	*	*	*				8.0	32.0	20.2				8.1	33.1	20.3				6.0	39.4	18.3				7.6	30.5	18.6									
Riffle Slope (ft)	0.024	0.032	0.028				0.006	0.050	0.023				0.010	0.053	0.035				0.007	0.052	0.031				0.008	0.054	0.032									
Pool Length (ft)	*	*	*				9.9	21.5	15.7				4.2	29.1	17.1				6.9	33.1	18.2				9.7	30.5	17.7									
Pool -to-Pool Spacing (ft)	25.2	37.8	31.5				25.1	44.4	34.7				23.7	49.5	36.8				21.7	51.6	36.5				25.4	50.1	37.2									
Additional Reach Parameters																																				
Valley Length (ft)	*						1141.67						1136						1116						1120											
Channel Length (ft)	*						1320.04						1325						1319						1320											
Sinuosity	1.08						1.16						1.16						1.20						1.18											
Water Surface Slope (ft/ft)	0.0159						0.0108						NA						NA						NA											
BF Slope (ft/ft)	0.0172						0.01						0.01023						0.01						0.012											
Rosgen Classification	B5						B5						B5						B5						B5											
*Habitat Index																																				
*Macrobenthos																																				

*Historical documents necessary to provide this information were unavailable at the time of the report submission
**Typically a flood prone width and entrenchment ratio are not calculated for a pool cross section.

Table VIII. Morphology and Hydraulic Monitoring Summary
Rockwell Pastures Site/Project No. D-000624

Reach UT1-Lower

Parameter	**MY-00 (2009) As-Built**						**MY-01 (2009)**						**MY-02 (2010)**						**MY-03 (2011)**						**MY-04 (2012)**						**MY-05 (2013)**					
Pattern	Min	Max	Med				Min	Max	Med				Min	Max	Med				Min	Max	Med				Min	Max	Med				Min	Max	Med			
Channel Beltwidth (ft)	47.4	79.0	63.2				32.0	62.0	48.0				36.0	61.0	47.4				36.0	61.0	47.4				36.0	61.0	47.4									
Radius of Curvature (ft)	39.5	47.4	43.5				18.8	45.9	29.9				18.5	49.7	30.2				18.5	49.7	30.2				18.5	49.7	30.2									
Meander Wavelength (ft)	142.2	221.2	181.7				122.4	147.9	134.2				112.9	145.4	133.6				112.9	145.4	133.6				112.9	145.4	133.6									
Meander Width Ratio	3.0	5.0	4.0										2.4	4.1	3.2				2.4	4.1	3.2				2.4	4.1	3.2									
Profile																																				
Riffle Length (ft)	*	*	*				*	*	*				31.3	55.1	42.4				18.1	50.4	33.9				7.0	48.9	28.9									
Riffle Slope (ft)	0.012	0.016	0.014				0.012	0.016	0.014				0.006	0.045	0.025				0.015	0.063	0.032				0.017	0.052	0.035									
Pool Length (ft)	*	*	*				*	*	*				20.1	41.7	31.6				24.4	54.6	37.6				26.8	69.3	47.5									
Pool -to-Pool Spacing (ft)	47.4	94.8	71.1				47.4	94.8	71.1				57.9	85.9	73.1				41.1	89.7	69.5				52.3	98.7	77.6									
Additional Reach Parameters																																				
Valley Length (ft)	*						995.5						995						968.4						969.6											
Channel Length (ft)	*						1106.8						1092						1091.2						1115											
Sinuosity	1.09						1.11						1.09						1.10						1.10											
Water Surface Slope (ft/ft)	0.0078						0.0079						NA						NA						0.0072											
BF Slope (ft/ft)	0.0085						0.0084						0.0070						0.0082						0.0710											
Rosgen Classification	C4						C4						C4						C4						C4											
*Habitat Index																																				
*Macrobenthos																																				

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**Typically a flood prone width and entrenchment ratio are not calculated for a pool cross section.

Table VIII. Morphology and Hydraulic Monitoring Summary
Rockwell Pastures Site/Project No. D-000624

Parameter	Cross-Section 7 143+32 Riffle						Cross-Section 8 143+73 Pool						Cross-Section 9 152+52 Riffle						Cross-Section 10 153+01 Pool						Cross-Section 11 163+83 Riffle						Cross-Section 12 164+28 Pool					
Dimension	MY0	MY1	MY2	MY3	MY4	MY5	MY0	MY1	MY2	MY3	MY4	MY5	MY0	MY1	MY2	MY3	MY4	MY5	MY0	MY1	MY2	MY3	MY4	MY5	MY0	MY1	MY2	MY3	MY4	MY5	MY0	MY1	MY2	MY3	MY4	MY5
BF Width (ft)	14.9	18	14.8	16.1	17.7		23.5	30.5	23.8	22	24.9		15.3	14.9	14.8	15.2	17.2		20.2	19.9	21.7	22.4	20.4		16.9	17.3	17.4	17.1	16.8		20.7	22.2	25.1	27.9	25.1	
Floodprone Width (ft)	56.1	56.1	56.2	55.8	56.5		58.5	58.6	58.7	58.8	58.4		57.8	57.8	57.9	58	57.6		57.6	57.7	57.7	57.7	57.7		58.7	58.4	58.6	56.7	57.6		61.8	61.9	61.8	61	62	
BF Cross Sectional Area (ft2)	15.2	15.9	14.7	15.7	15.4		31.3	35.6	33.1	28.6	26.1		14.3	17.7	19.7	21.8	20.2		26.5	26.4	27.3	23.6	21.1		20.8	20.8	21.1	21.8	19.8		27.2	26.7	28.6	28.9	25.6	
BF Mean Depth (ft)	1.0	0.9	1.0	1.0	0.9		1.3	1.2	1.4	1.3	1		0.9	1.2	1.3	1.3	1.2		1.3	1.3	1.3	1.1	1		1.2	1.2	1.2	1.3	1.2		1.3	1.2	1.1	1	1	
BF Max Depth (ft)	1.6	1.7	1.8	1.8	1.8		3.3	3	3.3	3.1	3.1		1.5	2.1	2.4	2.6	2.4		3	3.1	3.2	2.8	2.8		2	2.2	2.1	2.1	2.1		3.2	2.8	2.8	2.9	2.7	
Width/Depth Ratio	14.7	20.3	15.0	16.6	20.4		17.7	26.2	17.1	23.5	23.7		16.4	12.5	11.1	13.3	14.7		15.4	14.9	17.2	21.2	19.6		13.8	14.3	14.3	13.5	14.3		15.7	18.5	22.1	27	24.6	
Entrenchment Ratio	3.8	3.1	3.8	3.5	3.2		2.5	1.9	2.5	2.7	2.3		3.8	3.9	3.9	3.8	3.3		2.8	2.9	2.7	2.6	2.8		3.5	3.4	3.4	3.3	3.4		3	2.8	2.5	2.2	2.5	
Wetted Perimeter (ft)	15.4	18.5	15.4	16.9	18.5		24.7	31.8	25	23.5	27.6		15.7	15.9	16.1	18.2	18.4		21.4	21.3	23.5	24.3	21.9		17.5	18.1	18	17.9	17.5		21.9	23.5	26.1	29	26.4	
Hydraulic Radius (ft)	1.0	0.9	1.0	0.9	0.8		1.3	1.1	1.3	1.2	0.9		0.9	1.1	1.2	1.2	1.1		1.2	1.2	1.2	1	1		1.2	1.1	1.2	1.2	1.1		1.2	1.1	1.1	1	1	
Substrate																																				
d50 (mm)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
d84 (mm)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Reach UT3																																				
Parameter	**MY-00 (2009) As-Built**						**MY-01 (2009)**						**MY-02 (2010)**						**MY-03 (2011)**						**MY-04 (2012)**						**MY-05 (2013)**					
Pattern	Min	Max	Med				Min	Max	Med				Min	Max	Med				Min	Max	Med				Min	Max	Med				Min	Max	Med			
Channel Beltwidth (ft)	25.8	43.0	34.4				24.5	33.0	30.0				27.2	33.5	30.4				26.3	33.3	30.3				26.3	33.3	30.3									
Radius of Curvature (ft)	21.5	25.8	23.7				12.7	18.1	14.9				12.0	19.4	15.5				12.4	18.7	15.8				12.4	18.7	15.8									
Meander Wavelength (ft)	77.4	120.4	98.9				68.8	78.3	72.4				70.0	78.9	72.7				70.2	78.4	72.5				70.2	78.4	72.5									
Meander Width Ratio	3.0	5.0	4.0				2.3	2.6	2.4				3.0	3.6	3.3				3.3	4.2	3.8				3.3	4.2	3.8									
Profile																																				
Riffle Length (ft)	*	*	*				17.8	30.0	23.6				13.0	36.3	22.1				17.2	25.8	20.8				13.2	35.1	20.9									
Riffle Slope (ft)	0.016	0.021	0.018				0.009	0.068	0.038				0.008	0.040	0.025				0.009	0.052	0.029				0.008	0.053	0.027									
Pool Length (ft)	*	*	*				14.3	22.4	18.5				9.3	25.7	19.1				17.6	38.6	23.9				14.8	29.5	21.5									
Pool -to-Pool Spacing (ft)	25.8	51.6	38.7				35.0	50.6	40.9				32.4	53.3	40.5				28.0	52.5	40.3				34.7	54.0	41.3									
Additional Reach Parameters																																				
Valley Length (ft)	*						399.1						295.0						286..8						288.0											
Channel Length (ft)	*						451.6						329.0						335.2						334.0											
Sinuosity	1.18						1.13						1.12						1.20						1.20											
Water Surface Slope (ft/ft)	0.0103						0.0132						NA						NA						NA											
BF Slope (ft/ft)	0.0122						0.0128						0.0107						0.0119						0.0118											
Rosgen Classification	C5						C5						C5						C5						C5											
*Habitat Index																																				
*Macrobenthos																																				

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Table VIII. Morphology and Hydraulic Monitoring Summary
Rockwell Pastures Site/Project No. D-000624

Parameter	Cross-Section 13 404+41 Riffle						Cross-Section 14 405+00 Pool						Cross-Section 15 414+43 Pool						Cross-Section 16 414+65 Riffle						Cross-Section 17 428+98 Riffle						Cross-Section 18 429+80 Pool					
Dimension	MY0	MY1	MY2	MY3	MY4	MY5	MY0	MY1	MY2	MY3	MY4	MY5	MY0	MY1	MY2	MY3	MY4	MY5	MY0	MY1	MY2	MY3	MY4	MY5	MY0	MY1	MY2	MY3	MY4	MY5	MY0	MY1	MY2	MY3	MY4	MY5
BF Width (ft)	7.2	5.4	5.7	6.7	6.7		11.2	9.6	9.1	9.3	11.2		8.3	9	7.3	7	8.5		9.9	9.9	9.9	10.7	13.5		9.6	10.1	9.7	9.4	9.8		20.4	19.7	22.6	19.1	22.5	
Floodprone Width (ft)	39.8	40	40.1	38.5	40.1		49	50	48.3	48.7	48.3		45.1	45.2	45.1	39.1	45		51.4	51.4	51.4	51.6	51.8		57.8	60.5	64.3	61	61		61	59	52	52.9	60.9	
BF Cross Sectional Area (ft2)	2.7	2.7	2.7	2.8	2.4		10.4	14	8.1	10.2	9.8		8.4	7.3	6.9	6.4	6.9		7.8	7.8	7.9	7.8	7.1		8.4	7.5	9	7.1	8.3		17.9	17.5	16.6	15.6	15.2	
BF Mean Depth (ft)	0.4	0.5	0.5	0.4	0.4		0.9	0.8	0.9	0.9	0.9		1.0	0.8	0.9	0.9	0.8		0.6	0.6	0.6	0.7	0.5		0.6	0.7	0.7	0.8	0.8		0.9	0.9	0.7	0.8	0.7	
BF Max Depth (ft)	0.9	0.9	0.9	0.9	0.8		2.2	2.3	2.1	2	2		1.8	1.6	1.4	1.3	1.2		1.4	1.5	1.5	1.5	1.3		1.5	1.8	1.9	1.7	1.8		2.3	2.1	1.9	1.8	1.7	
Width/Depth Ratio	19.3	10.8	12.1	15.9	18.9		12	21.2	9.5	13.3	12.8		8.1	11.1	7.7	7.6	10.5		21.6	24.5	25.2	17.1	25.7		20.7	13.6	16.5	12.5	11.6		23.3	22.1	30.8	23.5	33.4	
Entrenchment Ratio	5.5	7.4	7.1	5.7	6.0		4.4	2.9	5.5	4.2	4.3		5.5	5	6.2	5.6	5.3		4	3.7	3.7	4.4	3.8		4.4	6	5.3	6.5	6.2		3	3	2.3	2.8	2.7	
Wetted Perimeter (ft)	7.6	5.8	6.0	7.1	6.9		12.6	18.5	10.2	12.8	12.3		9.7	10.3	8.0	8.3	9.1		13.3	14.4	14.6	12.6	13.9		13.7	11.1	13.1	10.6	11.3		21.5	20.4	23.3	19.6	23.1	
Hydraulic Radius (ft)	0.4	0.5	0.4	0.4	0.3		0.8	0.8	0.8	0.8	0.8		0.9	0.7	0.9	0.8	0.8		0.6	0.5	0.5	0.6	0.5		0.6	0.7	0.7	0.7	0.7		0.8	0.9	0.7	0.8	0.7	
Substrate																																				
d50 (mm)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
d84 (mm)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Reach UT4																																				
Parameter	**MY-00 (2009) As-Built**						**MY-01 (2009)**						**MY-02 (2010)**						**MY-03 (2011)**						**MY-04 (2012)**						**MY-05 (2013)**					
Pattern	Min	Max	Med				Min	Max	Med				Min	Max	Med				Min	Max	Med				Min	Max	Med				Min	Max	Med			
Channel Beltwidth (ft)	36.0	60.0	48.0				37.0	52.0	40.0				43.2	54.0	47.0				43.2	54.0	47.0				43.2	54.0	47.0									
Radius of Curvature (ft)	30.0	36.0	33.0				13.8	40.7	23.2				17.8	53.9	28.5				17.8	53.9	28.5				17.8	53.9	28.5									
Meander Wavelength (ft)	108.0	168.0	138.0				101.3	125.3	114.1				98.3	173.9	115.4				98.3	173.9	115.4				98.3	173.9	115.4									
Meander Width Ratio	3.0	5.0	4.0				2.5	3.1	2.9				3.5	4.4	3.9				3.5	4.4	3.9				3.5	4.4	3.9									
Profile																																				
Riffle Length (ft)	*	*	*				26.6	55.7	39.7				17.3	57.3	33.6				27.4	63.5	27.0				14.3	51.3	27.7									
Riffle Slope (ft)	0.018	0.025	0.021				0.011	0.049	0.027				0.005	0.067	0.025				0.007	0.058	0.029				0.010	0.060	0.032									
Pool Length (ft)	*	*	*				15.3	37.7	24.1				21.6	44.5	31.1				11.1	51.9	25.0				20.6	49.0	33.0									
Pool -to-Pool Spacing (ft)	36.0	72.0	54.0				50.9	77.9	62.8				47.6	77.9	61.9				19.5	88.6	53.0				48.3	85.2	55.7									
Additional Reach Parameters																																				
Valley Length (ft)	*						1247						1249						1196.5						1185											
Channel Length (ft)	*						1421						1425						1461.3						1411											
Sinuosity	1.10						1.14						1.14						1.20						1.20											
Water Surface Slope (ft/ft)	0.01						0.01						0.01						NA						0.01											
BF Slope (ft/ft)	1.36						0.0134						0.013						0.014						0.013											
Rosgen Classification	C						C						C						C						C											
*Habitat Index																																				
*Macrobenthos																																				

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Table VIII. Morphology and Hydraulic Monitoring Summary
Rockwell Pastures Site/Project No. D-000624

Parameter	Cross-Section 19						Cross-Section 20						Cross-Section 21						Cross-Section 22						Cross-Section 23						Cross-Section 24					
	437+73 Riffle						438+12 Pool						711+05 Riffle						711+48 Pool						300+94 Riffle						301+12 Pool					
Dimension	MY0	MY1	MY2	MY3	MY4	MY5	MY0	MY1	MY2	MY3	MY4	MY5	MY0	MY1	MY2	MY3	MY4	MY5	MY0	MY1	MY2	MY3	MY4	MY5	MY0	MY1	MY2	MY3	MY4	MY5	MY0	MY1	MY2	MY3	MY4	MY5
BF Width (ft)	13.6	14	13.1	13.5	13.7		7.9	7.5	6.7	6.9	15.7		7.2	6.3	6.7	7	7.1		10.9	8	9.2	7.9	9.2		9.4	9.4	9.2	9.3	8.4		10.5	9.8	10.6	11.2	10.6	
Floodprone Width (ft)	59.4	59.3	59.5	58.9	59.5		62.2	62.3	57.5	54.5	55.2		74	74	74.2	73.8	73.9		61.5	61.4	61.8	61.5	61.5		43.8	43.5	44	43.7	43.6		43.3	41	40.1	38.9	36.7	
BF Cross Sectional Area (ft2)	13.3	13.4	11.3	12.6	10.4		22.4	22.7	12.9	12.2	11.9		2.8	2.6	2.7	3.3	2.7		5.8	5.6	7.3	6.6	6.6		6.7	6.4	6.3	5	5.4		11.5	9.7	12.6	8.4	8.2	
BF Mean Depth (ft)	1.0	1.0	0.9	0.7	0.8		0.8	0.8	0.8	0.5	0.8		0.4	0.4	0.4	0.4	0.4		0.5	0.7	0.6	0.7	0.7		0.7	0.7	0.7	0.6	0.7		0.9	0.7	0.7	0.8	0.8	
BF Max Depth (ft)	1.7	1.7	1.5	1.6	1.4		2.5	2.6	1.8	1.6	1.5		0.7	0.7	0.7	0.8	0.8		1.7	1.7	1.8	1.7	1.6		1.2	1.3	1.3	1.1	1.2		2.7	2.1	2	1.6	1.5	
Width/Depth Ratio	13.8	14.6	15.2	14.9	18.1		37.7	37	22.7	43	20.6		18.5	14.8	16.6	16.2	18.6		20.6	11	21.9	14.2	13		13.2	13.9	13.4	13.6	12.8		14.4	21.2	27.1	14.8	13.8	
Entrenchment Ratio	4.4	4.2	4.5	4.4	4.3		2.1	2.1	3.4	7.9	3.5		10.2	11.9	11.0	10.5	10.4		5.6	7.8	4.9	6.3	6.6		4.6	4.6	4.8	4.7	4.1		3.4	2.9	2.2	3.5	3.4	
Wetted Perimeter (ft)	14.1	14.5	13.5	14.0	14.1		30.2	30.1	18.1	24.7	16.6		7.5	6.4	6.9	7.5	7.3		12	9.2	13.8	12.1	10.3		9.8	10.1	9.6	9.7	8.9		14.5	15.6	19.8	12.1	11.5	
Hydraulic Radius (ft)	0.9	0.9	0.8	0.7	0.7		0.7	0.8	0.7	0.5	0.7		0.4	0.4	0.4	0.4	0.4		0.5	0.6	0.5	0.5	0.6		0.7	0.6	0.7	0.4	0.6		0.8	0.6	0.6	0.7	0.7	
Substrate																																				
d50 (mm)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
d84 (mm)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Reach UT7																																				
Parameter	**MY-00 (2009) As-Built**						**MY-01 (2009)**						**MY-02 (2010)**						**MY-03 (2011)**						**MY-04 (2012)**						**MY-05 (2013)**					
Pattern	Min	Max	Med				Min	Max	Med				Min	Max	Med				Min	Max	Med				Min	Max	Med				Min	Max	Med			
Channel Beltwidth (ft)	18.0	30.0	24.0				16.0	27.0	22.0				19.5	24.0	21.3				19.5	24.0	21.3				19.5	24.0	21.3									
Radius of Curvature (ft)	15.0	18.0	16.5				7.5	21.4	13.1				9.3	21.1	13.5				9.3	21.1	13.5				9.3	21.1	13.5									
Meander Wavelength (ft)	54.0	84.0	69.0				43.4	53.7	50.6				44.9	72.7	53.3				44.9	72.7	53.3				44.9	72.7	53.3									
Meander Width Ratio	2.3	3.5	2.9				2.0	2.4	2.3				2.9	3.6	3.2				2.9	3.6	3.2				2.9	3.6	3.2									
Profile																																				
Riffle Length (ft)	*	*	*				13.2	28.4	18.0				5.9	23.5	14.0				3.3	14.4	9.8				3.6	35.5	11.0									
Riffle Slope (ft)	0.015	0.020	0.017				0.030	0.061	0.049				0.011	0.045	0.024				0.024	0.058	0.032				0.020	0.063	0.034									
Pool Length (ft)	*	*	*				8.9	16.8	12.9				11.6	20.6	15.7				9.0	21.1	15.0				10.8	24.1	17.2									
Pool -to-Pool Spacing (ft)	18.0	36.0	27.0				17.0	31.5	27.2				20.2	33.4	27.7				16.1	34.3	24.7				17.2	34.5	28.7									
Additional Reach Parameters																																				
Valley Length (ft)	*						250						246						241.5						241											
Channel Length (ft)	*						275						287						247.4						277											
Sinuosity	1.13						1.10						1.16						1.10						1.10											
Water Surface Slope (ft/ft)	0.0099						0.0113						NA						NA						NA											
BF Slope (ft/ft)	0.0112						0.013						0.0114						0.0154						0.0146											
Rosgen Classification	C						C						C						C						C											
*Habitat Index																																				
*Macrobenthos																																				

*Historical documents necessary to provide this information was unavailable at the time of the report submission.
**Typically a flood prone width and entrenchment ratio are not calculated for a pool cross section

C. WETLAND ASSESSMENT

The non-riparian wetland restoration consists of 1.7 acres of non-riparian wetlands. The plan targets the restoration of a non-riparian low elevation seep. Based on the location of the restoration site, the main source of hydrology is from seepage and overland flow. The wetland restoration area at this site was designed to be a combination of piedmont/mountain bottomland forest, piedmont/mountain levee forest, and piedmont/low mountain alluvial forest communities.

As stated in the Restoration Plan, the hydrology success criterion for the site is to restore wetland hydrology at the site so that the water table will remain within 12 inches of the soil surface for at least 7 percent of the growing season continuously (approximately 16 days). The growing season is from March 27 to November 5. Based on a daily minimum temperature greater than 28 degrees Fahrenheit occurring in five of ten years, the growing season for Stanly County is 222 days long. On-site gauge data will be compared to gauge data from a reference wetland in growing seasons with less than normal rainfall. In periods of low rainfall, if a restoration gauge hydroperiod exceeds the reference gauge hydroperiods, and both exceed 5 percent of the growing season, then the gauge will be deemed successful.

Two automated HOBO groundwater gauges, one tipping bucket rain gauge, and one funnel rain gauge were installed prior to the beginning of the first growing season. Two additional automated groundwater gauges were installed in a reference wetland. Groundwater gauges are installed to a minimum depth of 40 inches below the ground surface. The monitoring protocol for the site specifies that automated monitoring stations will be downloaded and checked for malfunctions on a quarterly basis. During quarterly site visits, manual groundwater gauges are read, crest gauge readings are taken, and cumulative rainfall totals are collected from the on-site rain gauges.

Both automated HOBO groundwater gauges have met the success criteria for the 2012 growing season (**Table IX**). AW1 and AW2 met the 7 percent hydrology success criteria by recording hydroperiods of 7 and 9 percent of the growing season respectfully. Precipitation data for Albemarle, North Carolina and the on-site rain gauge are provided in the groundwater gauge data tables in Appendix C. Albemarle precipitation data was provided by the State Climate Office.

Table IX. Wetland Criteria Attainment
Rockwell Pastures Site/Project No. D-000624

Tract	Gauge ID	Gauge Hydrology Threshold Met?	Tract Mean	Vegetation Plot ID	Vegetation Survival Threshold Met?	Tract Mean
1	AW1	Y	100%	27	Y	100%
	AW2	Y		27	Y	

IV. METHODOLOGY

A. VEGETATION METHODOLOGY

The following methodology was used for stem count and vegetation monitoring. Twenty-seven vegetation plots were marked out to measure ten meters by ten meters or five meters by twenty meters (100 square meters), depending on the buffer width. Each planted stem in the plots are marked with flagging tape and a PVC marker pole. Photo documentation of each plot was recorded. All vegetation plot data and inventories were conducted per the 2006 CVS-EEP Level II Protocol for Recording Vegetation (EEP 2006).

B. STREAM METHODOLOGY

The stream monitoring activities included longitudinal survey, cross-sectional surveys, detailed stream walk analysis, problem area identification, hydrology monitoring and photo documentation.

Longitudinal Profile
A longitudinal profile will be measured annually throughout the five-year monitoring period. The profile will be measured along a representative length of restored channel. Measurements will include thalweg, water surface, bankfull, and top of low bank. Each of these measurements will be taken at the head of each feature, for example, shallow, pool, and the max pool depth. The survey will be tied to a permanent benchmark.

Cross Sections
Two permanent cross sections will be installed per 1,000 linear feet of stream restoration work, with one located at a riffle and one located at a pool. Each cross section will be marked on both banks with permanent pins to establish the exact transect used. A common benchmark will be used for cross sections to facilitate easy comparison of year-to-year data. The annual cross-section survey will include points measured at all breaks in slope, including top of bank, bankfull, inner berm, edge of water, and thalweg, if the features are present. Riffle cross sections will be classified using the Rosgen stream classification system.

Hydrology
The occurrence of bankfull events within the monitoring period will be documented by the use of manual crest gauges, auto-logging crest gauges, and photographs. The three crest gauges will record the highest watermark between site visits, and the gauges will be checked quarterly to document high flows. Digital images will be used to document the occurrence of debris lines and sediment deposition on the floodplain during monitoring site visits.

Photo Reference Stations
Photographs will be used to subjectively evaluate channel aggradation or degradation, bank erosion, success of riparian vegetation and effectiveness of erosion control measures.

C. WETLAND METHODOLOGY

Two automated HOBO groundwater gauges, one tipping bucket rain gauge, and one funnel rain gauge were installed prior to the beginning of the first growing season. Two additional automated groundwater gauges were installed in a reference wetland. Groundwater gauges are installed to a minimum depth of 40 inches below the ground surface. The monitoring protocol for the site specifies that automated monitoring stations will be downloaded and checked for malfunctions on a quarterly basis. During quarterly site visits, manual groundwater gauges are read, crest gauge readings are taken, and cumulative rainfall totals are collected from the on-site rain gauges. During the 2012 growing seasons, neither the automated rain gauge nor the manual rain guage performed well, only during the month of March respectively. A new manual rain gauge was installed in September to replace the cracked one.

Automated Gauges

HOBO automatic groundwater gauges record water table elevations four times daily at 06:00, 12:00, 18:00, and 24:00. These automatic gauges employ pressure sensors that record water elevation above the bottom of the sensor (with atmospheric pressure compensation). The calibration water table depth is recorded at quarterly downloads. To determine wetland hydroperiods, the automatically recorded data are compared to the calibration data to determine a standard correction factor between the calibration gauge and the automatic gauge for each location. The standard correction factor is applied to correct daily readings. The corrected daily readings are used to determine wetland hydroperiods.

Data Interpretation
Wetland hydroperiods are calculated for four daily water table depth elevations. A hydroperiod is calculated if the water table is equal to or less than 12 inches below ground surface for at least 24 hours. If a gauge falls below -12 inches for four consecutive readings (24 hours) then the hydroperiod ends at the last reading within 12 inches of the ground surface. If a gauge falls below -12 inches for only three readings then maintains a reading above -12 inches for a minimum of 24 hours, the hydroperiod is calculated continuously. This methodology accounts for minor technical malfunctions experienced by the automatic gauges.

RECOMMENDATIONS AND CONCLUSIONS

The Rockwell Pastures Site remained stable through Monitoring Year 4. Three stream problem areas were recorded on UT1, including one culvert blocked by debris and two areas of minor bank erosion. One problem area of minor bank erosion at station 437+00 was recorded on UT 4. Both minor erosion areas will be re-seeded to establish bank vegetation and the culvert blockage will be removed. These problems do not create a stability issue; however, the conditions will continue to be observed during Year 5 Monitoring. All structures and banks appeared to be stable and in good condition. The Rockwell Pastures Site is on track to meet the stream stability success criteria as specified in the Restoration Plan.

High planted-stem densities were found for all the vegetation plots at the Rockwell Pastures Site. Stem densities were well above the interim success criteria of 320 stems per acre at the end of Monitoring Year 4. The average stem density (excluding live stakes) across all vegetation plots was 575 stems per acre. Few volunteer tree species were noted during Monitoring Year 4. Invasive Chinese privet was observed along portions of UT 4 and UT 7. Remedial action will be taken to control and eliminate invasive species from taking over the desired species. This problem area will continue to be observed during Monitoring Year 5; however, it creates no threat to achieving the vegetation success criteria. The Rockwell Pastures Site is on track to meet the vegetative success criteria as specified in the Restoration Plan.

Both automated HOBO groundwater gauges met the success criteria for the 2012 growing season. AW1 and AW2 met the seven percent hydrology success criteria with 7 and 9 percent of the growing season displaying jurisdictional wetland hydrology (saturation within 12 inches of the soil surface), respectively. The Rockwell Pastures Site is on track to meet the wetland success criteria as specified in the Restoration Plan.

REFERENCES:

Lee, Michaeal T., Peet, Robert K., Roberts, Steven D., Wentworth, Thomas R. (2006). CVS-EEP Protocol for Recording Vegetation Version 4.0. Retrieved October 30, 2006, from: http://www.nceep.net/business/monitoring/veg/datasheets.htm

North Carolina Ecosystem Enhancement Program. November 2006. *Content, Format and Data Requirements for EEP Monitoring Reports*

Radford, A.E., H.E. Ahles and F.R. Bell. 1968. *Manual of the Vascular Flora of the Carolinas.* The University of North Carolina Press, Chapel Hill, North Carolina.

APPENDIX A

1. Vegetation Survey Data Tables

Table A.1 CVS Entrytool Metadata

Report Prepared By	Ashley Steele									
Date Prepared	11/6/2012 9:24									
database name	Year 4 Rockwell_cvs-eep-entrytool-v2.2.6.mdb									
database location	I:\Projects\EBX\2009000800RA\Documents\Monitoring Reports\2012\Vegetation									
computer name	WKD1728									
file size	35262464									
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	624									
project Name	Rockwell Pasture									
Description	Project is full delivery site provided to EEP by EBX. Site consist of stream restoration and wetland restoration in Stanly County									
River Basin	Cape Fear									
length(ft)										
stream-to-edge width (ft)										
area (sq m)										
Required Plots (calculated)										
Sampled Plots	0									

Table A.2 Vigor by Species – Rockwell Pastures (Year 4 Monitoring)

	Species	4	3	2	1	0	Missing	Unknown
	Asimina triloba		1		3		1	
	Betula nigra	11	13	8			3	
	Carya ovata			6	4		7	
	Cephalanthus occidentalis	3	4	1				
	Cornus amomum			1				
	Cornus florida	4	8	11	2		3	
	Diospyros virginiana	11	1	4	2		1	
	Fraxinus pennsylvanica	2	20	26	20		4	
	Nyssa sylvatica			1			1	
	Quercus falcata	8	20	43	1		8	
	Quercus nigra	1	5	19	3		1	
	Quercus palustris	1	2	1				
	Quercus phellos	22	26	19	3		7	
	Sambucus canadensis	1	4				2	
	Quercus			1				
	Platanus occidentalis	22	11	4				
TOT:	**16**	**86**	**115**	**145**	**38**		**38**	

Table A.3 Damage by Plot – Rockwell Pastures (Year 4 Monitoring)

Damage	Count	Percent Of Stems
(no damage)	375	88.2
Mowing	13	3.1
Unknown	11	2.6
Deer	11	2.6
Insects	9	2.1
Vine Strangulation	6	1.4

Table A.4 Damage by Species - Rockwell Pastures (Year 4 Monitoring)

	Species	All Damage Categories	(no damage)	Deer	Insects	Mowing	Unknown	Vine Strangulation		
	Asimina triloba	5	5							
	Betula nigra	35	32		2	1				
	Carya ovata	18	14			4				
	Cephalanthus occidentalis	8	7	1						
	Cornus amomum	1	1							
	Cornus florida	28	22	4			2			
	Diospyros virginiana	20	18					2		
	Fraxinus pennsylvanica	72	65	2			4	1		
	Nyssa sylvatica	2	1					1		
	Platanus occidentalis	37	34		3					
	Quercus	1	1							
	Quercus falcata	80	67	2	4	4	3			
	Quercus nigra	30	27	2		1				
	Quercus palustris	4	4							
	Quercus phellos	77	72			2	1	2		
	Sambucus canadensis	7	5			1	1			
TOT:	**16**	**425**	**375**	**11**	**9**	**13**	**11**	**6**		

Table A.5 Stem Count by Plot and Species – Rockwell Pastures (Year 4 Monitoring)

	Species	Total Planted Stems	# plots	avg# stems	plot 000624-01-0001-year:4	plot 000624-01-0002-year:4	plot 000624-01-0003-year:4	plot 000624-01-0004-year:4	plot 000624-01-0005-year:4	plot 000624-01-0006-year:4	plot 000624-01-0007-year:4	plot 000624-01-0008-year:4	plot 000624-01-0009-year:4	plot 000624-01-0010-year:4	plot 000624-01-0011-year:4	plot 000624-01-0012-year:4	plot 000624-01-0013-year:4	plot 000624-01-0014-year:4	plot 000624-01-0015-year:4	plot 000624-01-0016-year:4	plot 000624-01-0017-year:4	plot 000624-01-0018-year:4	plot 000624-01-0019-year:4	plot 000624-01-0020-year:4	plot 000624-01-0021-year:4	plot 000624-01-0022-year:4	plot 000624-01-0023-year:4	plot 000624-01-0024-year:4	plot 000624-01-0025-year:4	plot 000624-01-0026-year:4	plot 000624-01-0027-year:4	
	Asimina triloba	4	2	2												2						2									
	Betula nigra	32	13	2.46	2	3		4		2	4			1		1			1		1						2	3	3		5	
	Carya ovata	10	4	2.5		5	2		1																	2					
	Cephalanthus occidentalis	8	4	2	2												3	1													2	
	Cornus amomum	1	1	1																		1										
	Cornus florida	25	10	2.5	2					2	2		5	2	2							2	3	4		1						
	Diospyros virginiana	18	8	2.25				4		1					4				2	1	2			3		1						
	Fraxinus pennsylvanica	68	18	3.78	3		2		6	3	3	6			1	7			2		3	1	1		7		1	3	5	10	4	
	Nyssa sylvatica	1	1	1															1													
	Platanus occidentalis	37	12	3.08		2	2	1			4		1					3	5				1	2			4	6	6			
	Quercus	1	1	1																		1										
	Quercus falcata	72	20	3.6		2	2	1	3	3	2	2	5	2	3	7	7			6	4	8	5		3	2	4			1		
	Quercus nigra	28	11	2.55		1				2		1	3	6	2		3			1				5		2			2			
	Quercus palustris	4	4	1		1														1						1			1			
	Quercus phellos	70	20	3.5	1		7	2	2	2			3	1	4	1	1	11	3	1	4				7	3	4	1		7	5	
	Sambucus canadensis	5	4	1.25	1			1																			1			2		
TOT	**16**	**384**	**16**		**11**	**14**	**15**	**13**	**12**	**15**	**15**	**9**	**17**	**12**	**16**	**16**	**13**	**17**	**15**	**10**	**14**	**15**	**10**	**14**	**17**	**12**	**16**	**13**	**17**	**20**	**16**	Average Stems per Acre
	Stems Per Acre				**445**	**567**	**607**	**526**	**486**	**607**	**607**	**364**	**688**	**486**	**647**	**647**	**526**	**688**	**607**	**405**	**567**	**607**	**405**	**567**	**688**	**486**	**647**	**526**	**688**	**809**	**647**	**575**

Table A.6. Vegetation Problem Areas Summary

Rockwell Pastures Site/Project No. D-000624			
Feature Issue	**Location**	**Suspected Cause**	**Photo Number**
Presence of invasive species	UT 4 and UT 7	Chinese privet (*Ligustrum sinense*) present and common	VPA 1and VPA 2

APPENDIX A

2. Vegetation Problem Area Photos

VPA1. Invasive species present and common along UT4 and UT7.

VPA2. Invasive species present and common along UT4 and UT7.

APPENDIX A

3. Vegetation Monitoring Plot Photos

Vegetation Plot # 1

Vegetation Plot # 2

Vegetation Plot # 3

Vegetation Plot # 4

Vegetation Plot # 5

Vegetation Plot # 6

Vegetation Plot # 7

Vegetation Plot # 8

Vegetation Plot # 9

Vegetation Plot # 10

Vegetation Plot # 11

Vegetation Plot # 12

Vegetation Plot # 13

Vegetation Plot # 14

Vegetation Plot # 15

Vegetation Plot # 16

Vegetation Plot # 17

Vegetation Plot # 18

Vegetation Plot # 19

Vegetation Plot # 20

Vegetation Plot # 21

Vegetation Plot # 22

Vegetation Plot # 23

Vegetation Plot # 24

Vegetation Plot # 25

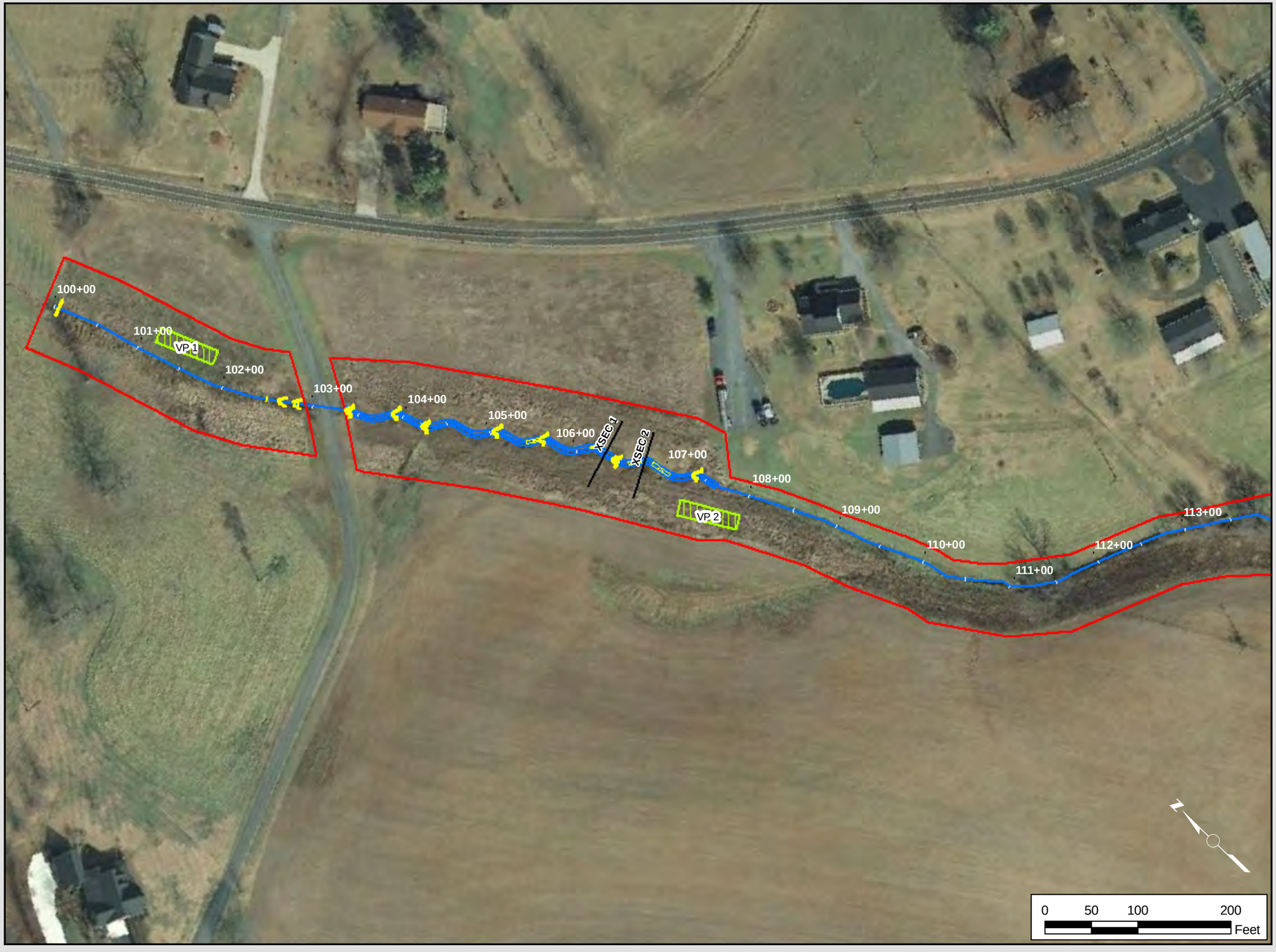
Vegetation Plot # 26

Vegetation Plot # 27

APPENDIX B

1. Current Conditions Plan View

Figure B-1a.
Rockwell Pastures Site
Current Conditions Map
Reach: UT 1
Stanly County, NC



Legend

- Well & CG Locations
- Cross-Sections
- Restored Streams
- Easement Boundary
- Restored Wetland
- Veg Plots

Stream Structures

- Wing Deflector
- RockCross Vane With Valley Blocks
- Constructed Riffle
- Rock Cross Vane
- Log Cross Vane
- Rock A Vane
- Boulder Sill

Structure Conditions

- Stable and Functional
- Stable and Not Functional
- Unstable and Functional
- Unstable and Not Functional

Riparian Buffer Conditions

Invasive Species	Target Community: Present	Target Community: Marginal	Target Community: Absent
Absent	No Fill		
Present			
Common			

Figure B-1b.
Rockwell Pastures Site
Current Conditions Map
Reach: UT 1
Stanly County, NC

EBX

AW1

VP 27

117+00

VP 3

118+00

119+00

120+00

XSEC 3

XSEC 4

121+00

122+00

123+00

VP 4

124+00

125+00

126+00

127+00

128+00

129+00

VP 5

130+00

XSEC 5

XSEC 6

ACG1

MCG1

131+00

132+00

0 50 100 200 Feet

Legend

- Well & CG Locations
- Cross-Sections
- Restored Streams
- Veg Plots
- Restored Wetland
- Easement Boundary

Stream Structures

- Wing Deflector
- RockCross Vane With Valley Blocks
- Constructed Riffle
- Rock Cross Vane
- Log Cross Vane
- Rock A Vane
- Boulder Sill

Structure Conditions

- Stable and Functional
- Stable and Not Functional
- Unstable and Functional
- Unstable and Not Functional

Riparian Buffer Conditions

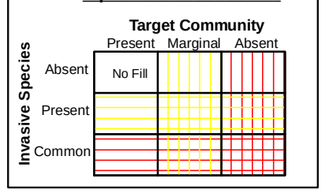


Figure B-1c.
Rockwell Pastures Site
Current Conditions Map
Reach: UT 1
Stanly County, NC

EBX

Legend

- Well & CG Locations
- Cross-Sections
- Restored Streams
- Easement Boundary
- Restored Wetland
- Veg Plots

Stream Structures

- Wing Deflector
- RockCross Vane With Valley Blocks
- Constructed Riffle
- Rock Cross Vane
- Log Cross Vane
- Rock A Vane
- Boulder Sill

Structure Conditions

- Stable and Functional
- Stable and Not Functional
- Unstable and Functional
- Unstable and Not Functional

Riparian Buffer Conditions

Invasive Species	Target Community: Present	Marginal	Absent
Absent	No Fill		
Present			
Common			

0 50 100 200 Feet

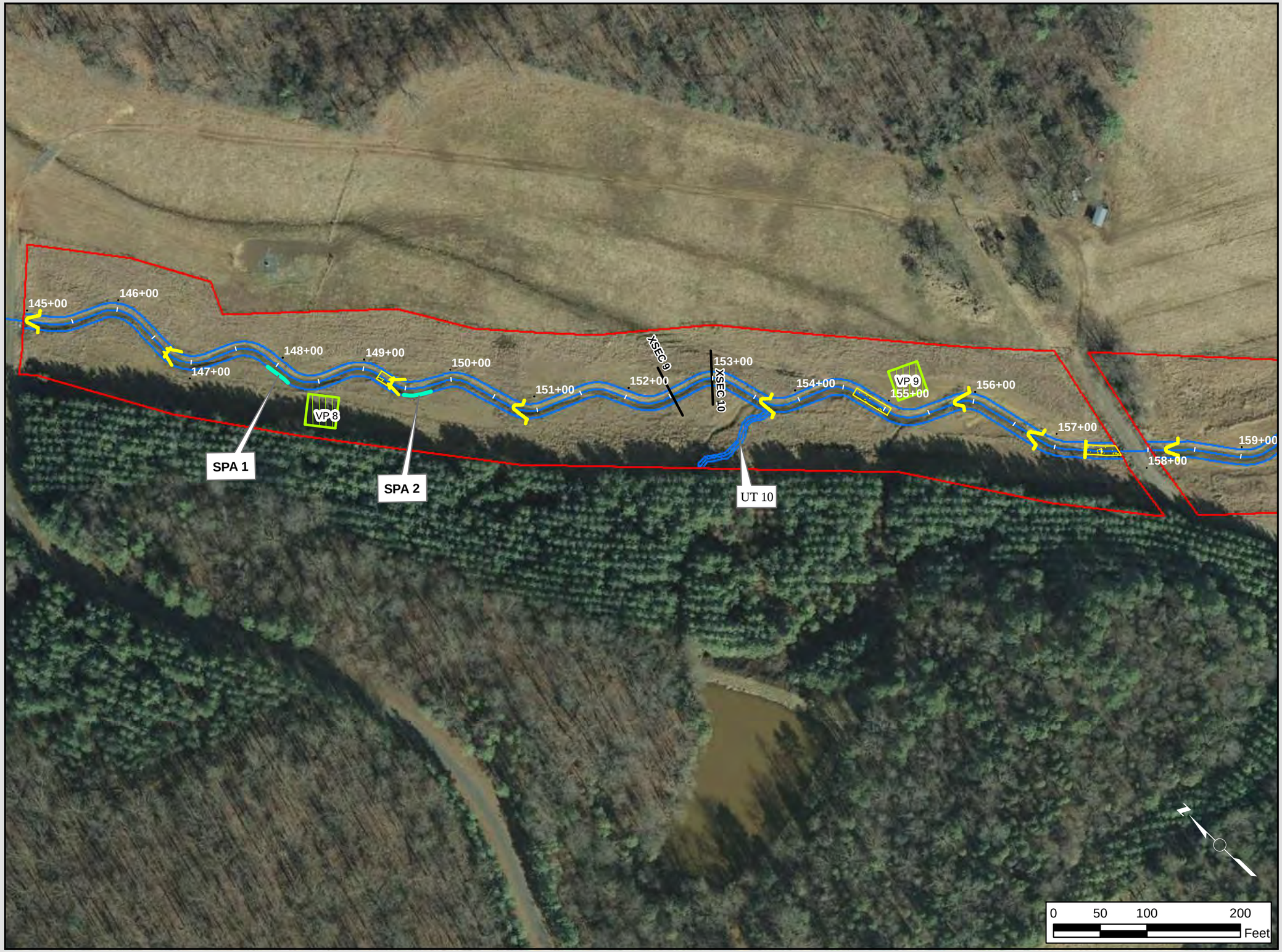


Figure B-1d.
Rockwell Pastures Site
Current Conditions Map
Reach: UT 1 / UT 10
Stanly County, NC

Legend

- Well & CG Locations
- Cross-Sections
- Restored Streams
- Easement Boundary
- Restored Wetland
- Veg Plots

Stream Structures

- Wing Deflector
- RockCross Vane With Valley Blocks
- Constructed Riffle
- Rock Cross Vane
- Log Cross Vane
- Rock A Vane
- Boulder Sill

Structure Conditions

- Stable and Functional
- Stable and Not Functional
- Unstable and Functional
- Unstable and Not Functional

Riparian Buffer Conditions

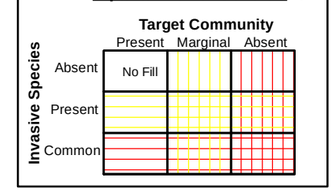


Figure B-1e.
Rockwell Pastures Site
Current Conditions Map
Reach: UT 1
Stanly County, NC

303+00
304+00
305+00
306+00
307+00
308+00
308+71
169+00
170+00
171+00
172+00
173+00
174+00
174+00.42
206+00
206+34.58
205+00
204+00
203+00
202+00
201+00
200+00
169+00
168+00
167+00
166+00
165+00
164+00
163+00
162+00
161+00
160+00
VP 13
VP 11
VP 10
VP 12
XSEC 11
XSEC 12
ACG3
SPA 3

0 50 100 200 Feet

Legend

- Well & CG Locations
- Cross-Sections
- Restored Streams
- Easement Boundary
- Restored Wetland
- Veg Plots

Stream Structures

- Wing Deflector
- RockCross Vane With Valley Blocks
- Constructed Riffle
- Rock Cross Vane
- Log Cross Vane
- Rock A Vane
- Boulder Sill

Structure Conditions

- Stable and Functional
- Stable and Not Functional
- Unstable and Functional
- Unstable and Not Functional

Riparian Buffer Conditions

Invasive Species	Target Community: Present	Marginal	Absent
Absent	No Fill		
Present			
Common			

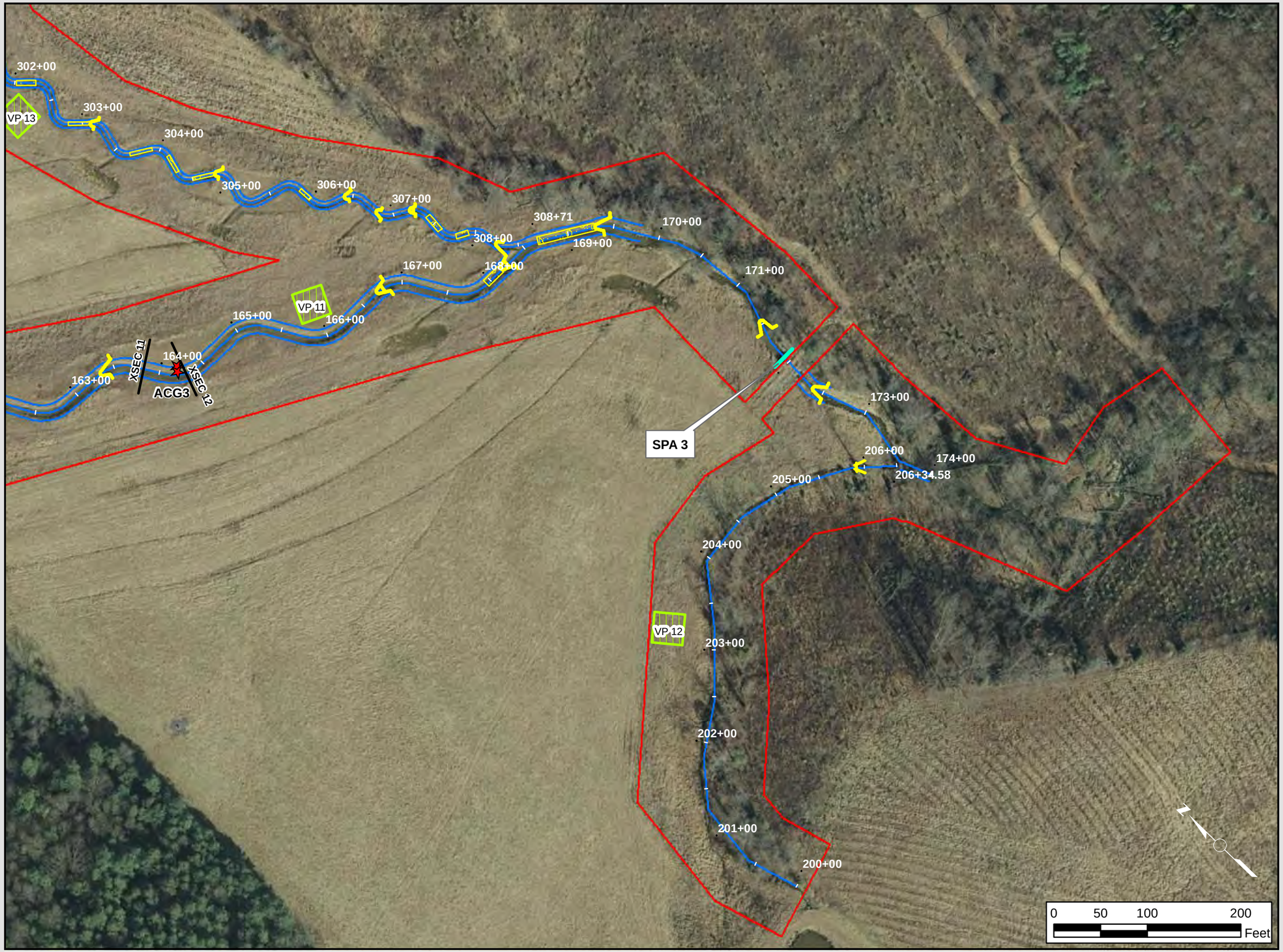


Figure B-1f.
Rockwell Pastures Site
Current Conditions Map
Reach: UT 1 / UT 2
Stanly County, NC

Legend

- Well & CG Locations
- Cross-Sections
- Restored Streams
- Easement Boundary
- Restored Wetland
- Veg Plots

Stream Structures

- Wing Deflector
- RockCross Vane With Valley Blocks
- Constructed Riffle
- Rock Cross Vane
- Log Cross Vane
- Rock A Vane
- Boulder Sill

Structure Conditions

- Stable and Functional
- Stable and Not Functional
- Unstable and Functional
- Unstable and Not Functional

Riparian Buffer Conditions

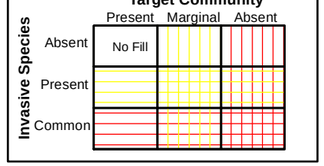


Figure B-1g.
Rockwell Pastures Site
Current Conditions Map
Reach: UT 3
Stanly County, NC

RAW2

RAW1

300+00

XSEC 23

XSEC 24

301+00

302+00

303+00

304+00

305+00

306+00

307+00

308+00

308+71

169+00

168+00

167+00

166+00

165+00

170+00

171+00

VP 13

VP 11

MCG3

ACG3

164+00

XSEC 11

XSEC 12

0 50 100 200 Feet

Legend

- Well & CG Locations
- Restored Streams
- Cross-Sections
- Easement Boundary
- Restored Wetland
- Veg Plots

Stream Structures

- Wing Deflector
- RockCross Vane With Valley Blocks
- Constructed Riffle
- Rock Cross Vane
- Log Cross Vane
- Rock A Vane
- Boulder Sill

Structure Conditions

- Stable and Functional
- Stable and Not Functional
- Unstable and Functional
- Unstable and Not Functional

Riparian Buffer Conditions

Invasive Species	Target Community: Present	Marginal	Absent
Absent	No Fill		
Present			
Common			

Figure B-1h.
Rockwell Pastures Site
Current Conditions Map
Reach: UT 4
Stanly County, NC

400+00
401+00
402+00
VP 14
403+00
404+00
XSEC 13
405+00
XSEC 14
406+00
407+00
408+00
480+72.33
409+00
480+00
410+00
VP 15
411+00
412+00
413+00
414+00
XSEC 15
XSEC 16
415+00
416+00

0 50 100 200 Feet

Legend

- Well & CG Locations
- Cross-Sections
- Restored Streams
- Easement Boundary
- Veg Plots
- Restored Wetland

Stream Structures

- Wing Deflector
- RockCross Vane With Valley Blocks
- Constructed Riffle
- Rock Cross Vane
- Log Cross Vane
- Rock A Vane
- Boulder Sill

Structure Conditions

- Stable and Functional
- Stable and Not Functional
- Unstable and Functional
- Unstable and Not Functional

Riparian Buffer Conditions

Invasive Species	Target Community: Present	Marginal	Absent
Absent	No Fill		
Present			
Common			

Figure B-1i.
Rockwell Pastures Site
Current Conditions Map
Reach: UT 4
Stanly County, NC

434+00
433+00
432+00
VP 18
431+00
430+00
XSEC 18
XSEC 17
429+00
428+00
427+00
426+00
VP 17
425+00
VPA 1
424+00
423+00
422+00
421+00
420+00
419+00
418+00
VP 16
417+00

0 50 100 200 Feet

Legend

- Well & CG Locations
- Cross-Sections
- Restored Streams
- Veg Plots
- Restored Wetland
- Easement Boundary

Stream Structures

- Wing Deflector
- RockCross Vane With Valley Blocks
- Constructed Riffle
- Rock Cross Vane
- Log Cross Vane
- Rock A Vane
- Boulder Sill

Structure Conditions

- Stable and Functional
- Stable and Not Functional
- Unstable and Functional
- Unstable and Not Functional

Riparian Buffer Conditions

Invasive Species	Target Community: Present	Marginal	Absent
Absent	No Fill		
Present			
Common			

Figure B-1j.
Rockwell Pastures Site
Current Conditions Map
Reach: UT 4
Stanly County, NC

EBX

505+00
506+00
507+00
508+00
509+00
510+00
510+86.83
434+00
435+00
436+00
437+00
439+00
440+00
441+00
442+00
443+00
444+00
445+00
446+00
447+00
448+00
449+00
449+26
128+00
129+00
130+00
131+00
132+00
133+00
VP 22
VP 19
VP 20
VP 5
XSEC 19
XSEC 20
XSEC 5
XSEC 6
ACG1
MCG1
SPA 4
N
0 50 100 200
Feet

Legend

- Well & CG Locations
- Cross-Sections
- Restored Streams
- Veg Plots
- Restored Wetland
- Easement Boundary

Stream Structures

- Wing Deflector
- RockCross Vane With Valley Blocks
- Constructed Riffle
- Rock Cross Vane
- Log Cross Vane
- Rock A Vane
- Boulder Sill

Structure Conditions

- Stable and Functional
- Stable and Not Functional
- Unstable and Functional
- Unstable and Not Functional

Riparian Buffer Conditions

Invasive Species	Target Community: Present	Marginal	Absent
Absent	No Fill		
Present			
Common			

Figure B-1k.
Rockwell Pastures Site
Current Conditions Map
Reach: UT 5
Stanly County, NC

EBX

Legend

- Well & CG Locations
- Cross-Sections
- Restored Streams
- Veg Plots
- Restored Wetland
- Easement Boundary

Stream Structures

- Wing Deflector
- RockCross Vane With Valley Blocks
- Constructed Riffle
- Rock Cross Vane
- Log Cross Vane
- Rock A Vane
- Boulder Sill

Structure Conditions

- Stable and Functional
- Stable and Not Functional
- Unstable and Functional
- Unstable and Not Functional

Riparian Buffer Conditions

Invasive Species	Target Community: Present	Marginal	Absent
Absent	No Fill		
Present			
Common			

441+00
440+00
SPA 4
439+00
XSEC 20
XSEC 19
VP 19
437+00
510+86.83
436+00
435+00
434+00
433+00
432+00
VP 18
431+00
510+00
509+00
508+00
507+00
506+00
505+00
504+00
503+00
VP 21
502+00
501+00
500+00
VP 22

0 50 100 200 Feet

Figure B-1l.
Rockwell Pastures Site
Current Conditions Map
Reach: UT 6 / UT 7
Stanly County, NC

600+00
601+00
602+00
VP 23
603+00
604+00
605+00
606+00
607+00
608+00
609+00
610+00
611+00
611+84
700+00
701+00
702+00
703+00
VP 25
704+00
705+00
706+00
707+00
708+00
709+00
VPA 1
VP 24
AW1
AW2
ARG
VP 27

0 50 100 200 Feet

Legend

- Well & CG Locations
- Cross-Sections
- Restored Streams
- Veg Plots
- Restored Wetland
- Easement Boundary

Stream Structures

- Wing Deflector
- RockCross Vane With Valley Blocks
- Constructed Riffle
- Rock Cross Vane
- Log Cross Vane
- Rock A Vane
- Boulder Sill

Structure Conditions

- Stable and Functional
- Stable and Not Functional
- Unstable and Functional
- Unstable and Not Functional

Riparian Buffer Conditions

Invasive Species	Target Community: Present	Marginal	Absent
Absent	No Fill		
Present			
Common			

Figure B-1m.
Rockwell Pastures Site
Current Conditions Map
Reach: UT 7 / UT 8/ UT 9
Stanly County, NC

EBX

Legend

- Well & CG Locations
- Cross-Sections
- Restored Streams
- Veg Plots
- Restored Wetland
- Easement Boundary

Stream Structures

- Wing Deflector
- RockCross Vane With Valley Blocks
- Constructed Riffle
- Rock Cross Vane
- Log Cross Vane
- Rock A Vane
- Boulder Sill

Structure Conditions

- Stable and Functional
- Stable and Not Functional
- Unstable and Functional
- Unstable and Not Functional

Riparian Buffer Conditions

Invasive Species	Target Community: Present	Marginal	Absent
Absent	No Fill		
Present			
Common			

0 50 100 200 Feet

APPENDIX B

2. Stream Problem Area Table

Table B.1. Stream Problem Areas Summary Rockwell Pastures Site/Project No. D-000624			
Feature Issue	**Station Numbers**	**Suspected Cause**	**Photo Number**
Right Bank Erosion (25 ft)	148+00	Lacking bank vegetation	SPA1
Right Bank Erosion (25 ft)	149+50	Lacking bank vegetation	SPA2
Culvert blocked by debris jam	172+00	High bankfull flow events	SPA3
Right Bank Erosion (250 ft)	437+00	High bankfull flow events/sparse vegetation	SPA4

APPENDIX B

3. Stream Problem Area Photos

SPA # 1. Minor right bank erosion at Sta. 148+00.

SPA # 2. Minor right bank erosion at Sta. 149+50.

SPA # 3. Culvert blocked by debris at Sta. 172+00.

SPA # 4. Right bank erosion at Sta. 437+00.

APPENDIX B

4. Stream Monitoring Photos

Stream Photo # 1 Downstream from Sta. 101+00

Stream Photo # 2 Looking Downstream from Road Crossing at Sta. 116+75

Stream Photo # 3 Rock Cross Vane Looking Upstream at Sta. 118+15

Stream Photo # 4 Rock Cross Vane Looking Upstream at Sta. 125+48

Stream Photo # 5 Log Cross Vane Looking Downstream at Sta. 129+70

Stream Photo # 6 Rock Cross Vane Looking Downstream at Sta. 155+79

Stream Photo # 7 Riffle Looking Downstream at Sta. 140+75

Stream Photo # 8 Log Vane Looking Downstream at Sta. 149+33

Stream Photo # 9 Rock Cross Vane Looking Downstream at Sta. 161+57

Stream Photo # 10 Looking Upstream at Riffle on UT-2 at Sta. 204+00

Stream Photo # 11 Downstream from Sta. 201+50

Stream Photo # 12 Looking Upstream at Sta. 206+00

Stream Photo # 13 Rock Cross Vane Looking Upstream at Sta. 300+07

Stream Photo # 14 Constructed Riffle Looking Upstream at Sta.303+10

Stream Photo # 15 Rock Cross Vane Looking Upstream at Sta. 304+74

Stream Photo # 16 Downstream at Sta. 400+27

Stream Photo # 17 Log Cross Vane Looking Downstream at Sta. 410+95

Stream Photo # 18 Downstream at Sta. 416+35

Stream Photo # 19 Log Cross Vane Looking Upstream at Sta. 426+45

Stream Photo # 20 Rock Cross Vane Looking Upstream at Sta. 436+00

Stream Photo # 21 Confluence of Ut-4 and Ut-5

Stream Photo # 22 Looking Upstream at Cross-Section 19 Sta. 437+73

Stream Photo # 23 Typical Pool on Ut4 Looking Downstream at Sta. 443+75

Stream Photo # 24 Rock Cross Vane Looking Upstream at Sta. 445+68

Stream Photo # 25 Looking Downstream on Ut-6 from Sta. 600+00

Stream Photo # 26 Looking Downstream on Ut-6 from Sta. 606+00

Stream Photo # 27 Confluence of Ut-6 and Ut-7 at Sta. 611+84

Stream Photo # 28 Looking Upstream on Ut-7 at Sta. 701+00

Stream Photo # 29 Looking Downstream at Culvert Crossing at Sta. 709+63

Stream Photo # 30 Looking Upstream at Sta. 710+51

Stream Photo # 31 Rock Cross Vane Looking Downstream at Sta. 714+03

Stream Photo # 32 Confluence of Ut-7 and Ut-1

APPENDIX B

5. Table B.2 Qualitative Visual Stability Assessment

Table B.2a. Visual Morphological Stability Assessment Rockwell Pastures Site/Project No. D-000624 Reach UT 1 (6,916 feet)						
Feature Category	Metric (per As-built and reference baselines)	(# Stable) Number Performing as Intended	Total number per As-built	Total Number / feet in unstable state[1]	% Perform in Stable Condition[2]	Feature Perform. Mean or Total[3]
A. Riffles	1. Present?*	113	113	NA	100%	
	2. Armor stable (e.g. no displacement)?	113	113	NA	100%	
	3. Facet grade appears stable?	113	113	NA	100%	
	4. Minimal evidence of embedding/fining?	113	113	NA	100%	
	5. Length appropriate?	113	113	NA	100%	**100%**
B. Pools	1. Present? (e.g. not subject to sever aggrad.or migrat?)[4]	114	114	NA	100%	
	2. Sufficiently deep (Max Pool D:Mean Bkf>1.6?	114	114	NA	100%	
	3. Length appropriate?	112	114	NA	98%	**98%**
C. Thalweg	1. Upstream of meander bend (run/inflection) centering?[5]	57	57	NA	100%	
	2. Downstream of meander (glide/inflection) centering?[5]	56	56	NA	100%	**100%**
D. Meanders	1. Outer bend in state of limited/controlled erosion?	112	113	NA	99%	
	2. Of those eroding, # w/concomitant point bar formation?	1	113	NA	1%	
	3. Apparent Rc within spec?	112	113	NA	99%	
	4. Sufficient floodplain access and relief?	113	113	NA	100%	**100%**
E. Bed General	1. General channel bed aggradation areas (bar formation)	2	NA	15	100%	
	2. Channel bed degradation - areas of increasing down-cutting or head cutting?	1	NA	10	100%	**100%**
F. Bank[6]	1. Actively eroding, wasting or slumping bank	NA	NA	NA	100%	**95%**
G. Vanes	1. Free of back or arm scour?	49	49	NA	100%	
	2. Height appropriate?	49	49	NA	100%	
	3. Angle and geometry appear appropriate?	49	49	NA	100%	
	4. Free of piping or other structural failures?	49	49	NA	100%	**100%**
H. Wads/ Boulers	1. Free of scour?	NA	NA.	NA	100%	
	2. Footing stable?	NA	NA	NA	100%	**100%**

Table B.2b. Visual Morphological Stability Assessment Rockwell Pastures Site/Project No. D-000624 Reach UT 3 (872 feet)						
Feature Category	Metric (per As-built and reference baselines)	(# Stable) Number Performing as Intended	Total number per As-built	Total Number / feet in unstable state[1]	% Perform in Stable Condition[2]	Feature Perform. Mean or Total[3]
A. Riffles	1. Present?[4]	20	20	NA	100%	
	2. Armor stable (e.g. no displacement)?	20	20	NA	100%	
	3. Facet grade appears stable?	20	20	NA	100%	
	4. Minimal evidence of embedding/fining?	20	20	NA	100%	
	5. Length appropriate?	20	20	NA	100%	**100%**
B. Pools	1. Present? (e.g. not subject to sever aggrad.or migrat?)[4]	20	20	NA	100%	
	2. Sufficiently deep (Max Pool D:Mean Bkf>1.6?	20	20	NA	100%	
	3. Length appropriate?	20	20	NA	100%	**100%**
C. Thalweg	1. Upstream of meander bend (run/inflection) centering?[5]	10	10	NA	100%	
	2. Downstream of meander (glide/inflection) centering?[5]	10	10	NA	100%	**100%**
D. Meanders	1. Outer bend in state of limited/controlled erosion?	20	20	NA	100%	
	2. Of those eroding, # w/concomitant point bar formation?	0	20	NA	0%	
	3. Apparent Rc within spec?	20	20	NA	100%	
	4. Sufficient floodplain access and relief?	20	20	NA	100%	**100%**
E. Bed General	1. General channel bed aggradation areas (bar formation)	NA	NA	NA	100%	
	2. Channel bed degradation - areas of increasing down-cutting or head cutting?	NA	NA	NA	100%	**100%**
F. Bank[6]	1. Actively eroding, wasting or slumping bank	NA	NA	NA	100%	**100%**
G. Vanes	1. Free of back or arm scour?	8	8	NA	100%	
	2. Height appropriate?	8	8	NA	100%	
	3. Angle and geometry appear appropriate?	8	8	NA	100%	
	4. Free of piping or other structural failures?	8	8	NA	100%	**100%**
H. Wads/ Boulers	1. Free of scour?	NA	NA.	NA	100%	
	2. Footing stable?	NA	NA	NA	100%	**100%**

Table B.2c. Visual Morphological Stability Assessment Rockwell Pastures Site/Project No. D-000624 Reach UT 4 (4934 feet)						
Feature Category	Metric (per As-built and reference baselines)	(# Stable) Number Performing as Intended	Total number per As-built	Total Number / feet in unstable state[1]	% Perform in Stable Condition[2]	Feature Perform. Mean or Total[3]
A. Riffles	1. Present?[4]	49	49	NA	100%	
	2. Armor stable (e.g. no displacement)?	49	49	NA	100%	
	3. Facet grade appears stable?	49	49	NA	100%	
	4. Minimal evidence of embedding/fining?	49	49	NA	100%	
	5. Length appropriate?	49	49	NA	100%	**100%**
B. Pools	1. Present? (e.g. not subject to sever aggrad.or migrat?)[4]	69	69	NA	100%	
	2. Sufficiently deep (Max Pool D:Mean Bkf>1.6?	69	69	NA	100%	
	3. Length appropriate?	69	69	NA	100%	**100%**
C. Thalweg	1. Upstream of meander bend (run/inflection) centering?[5]	25	25	NA	100%	
	2. Downstream of meander (glide/inflection) centering?[5]	24	24	NA	100%	**100%**
D. Meanders	1. Outer bend in state of limited/controlled erosion?	47	49	NA	96%	
	2. Of those eroding, # w/concomitant point bar formation?	NA	NA	NA	100%	
	3. Apparent Rc within spec?	49	49	NA	100%	
	4. Sufficient floodplain access and relief?	49	49	NA	100%	**99%**
E. Bed General	1. General channel bed aggradation areas (bar formation)	NA	NA	NA	100%	
	2. Channel bed degradation - areas of increasing down-cutting or head cutting?	NA	NA	NA	100%	**100%**
F. Bank[6]	1. Actively eroding, wasting or slumping bank	NA	NA	NA	100%	**93%**
G. Vanes	1. Free of back or arm scour?	52	52	NA	100%	
	2. Height appropriate?	52	52	NA	100%	
	3. Angle and geometry appear appropriate?	52	52	NA	100%	
	4. Free of piping or other structural failures?	52	52	NA	100%	**100%**
H. Wads/ Boulers	1. Free of scour?	NA	NA.	NA	100%	
	2. Footing stable?	NA	NA	NA	100%	**100%**

Table B.2d. Visual Morphological Stability Assessment Rockwell Pastures Site/Project No. D-000624 Reach UT 7 (1419 feet)						
Feature	Metric (per As-built and reference baselines)	(# Stable)	Total	Total	%	Feature
A. Riffles	1. Present?[4]	23	23	NA	100%	
	2. Armor stable (e.g. no displacement)?	23	23	NA	100%	
	3. Facet grade appears stable?	23	23	NA	100%	
	4. Minimal evidence of embedding/fining?	23	23	NA	100%	
	5. Length appropriate?	23	23	NA	100%	**100%**
B. Pools	1. Present? (e.g. not subject to sever aggrad.or migrat?)[4]	25	25	NA	100%	
	2. Sufficiently deep (Max Pool D:Mean Bkf>1.6?	25	25	NA	100%	
	3. Length appropriate?	25	25	NA	100%	**100%**
C. Thalweg	1. Upstream of meander bend (run/inflection) centering?[5]	11	11	NA	100%	
	2. Downstream of meander (glide/inflection) centering?[5]	12	12	NA	100%	**100%**
D. Meanders	1. Outer bend in state of limited/controlled erosion?	23	23	NA	100%	
	2. Of those eroding, # w/concomitant point bar formation?	NA	NA	NA	100%	
	3. Apparent Rc within spec?	23	23	NA	100%	
	4. Sufficient floodplain access and relief?	23	23	NA	100%	**100%**
E. Bed General	1. General channel bed aggradation areas (bar formation)	NA	NA	NA	100%	
	2. Channel bed degradation - areas of increasing down-cutting or head cutting?	NA	NA	NA	100%	**100%**
F. Bank[6]	1. Actively eroding, wasting or slumping bank	NA	NA	NA	100%	**100%**
G. Vanes	1. Free of back or arm scour?	8	8	NA	100%	
	2. Height appropriate?	8	8	NA	100%	
	3. Angle and geometry appear appropriate?	8	8	NA	100%	
	4. Free of piping or other structural failures?	8	8	NA	100%	**100%**
H. Wads/ Boulers	1. Free of scour?	NA	NA.	NA	100%	
	2. Footing stable?	NA	NA	NA	100%	**100%**

Table B.2e. Visual Morphological Stability Assessment Rockwell Pastures Site/Project No. D-000624 Reach UT 8 (83 feet)						
Feature Category	Metric (per As-built and reference baselines)	(# Stable) Number Performing as Intended	Total number per As-built	Total Number / feet in unstable state[1]	% Perform in Stable Condition[2]	Feature Perform. Mean or Total[3]
A. Riffles	1. Present?[4]	5	5	NA	100%	
	2. Armor stable (e.g. no displacement)?	5	5	NA	100%	
	3. Facet grade appears stable?	5	5	NA	100%	
	4. Minimal evidence of embedding/fining?	5	5	NA	100%	
	5. Length appropriate?	5	5	NA	100%	**100%**
B. Pools	1. Present? (e.g. not subject to sever aggrad.or migrat?)[4]	4	4	NA	100%	
	2. Sufficiently deep (Max Pool D:Mean Bkf>1.6?	4	4	NA	100%	
	3. Length appropriate?	4	4	NA	100%	**100%**
C. Thalweg	1. Upstream of meander bend (run/inflection) centering?[5]	3	3	NA	100%	
	2. Downstream of meander (glide/inflection) centering?[5]	2	2	NA	100%	**100%**
D. Meanders	1. Outer bend in state of limited/controlled erosion?	5	5	NA	100%	
	2. Of those eroding, # w/concomitant point bar formation?	NA	NA	NA	100%	
	3. Apparent Rc within spec?	5	5	NA	100%	
	4. Sufficient floodplain access and relief?	5	5	NA	100%	**100%**
E. Bed General	1. General channel bed aggradation areas (bar formation)	NA	NA	NA	100%	
	2. Channel bed degradation - areas of increasing down-cutting or head cutting?	NA	NA	NA	100%	**100%**
F. Bank[6]	1. Actively eroding, wasting or slumping bank	NA	NA	NA	100%	**100%**
G. Vanes	1. Free of back or arm scour?	NA	NA	NA	100%	
	2. Height appropriate?	NA	NA	NA	100%	
	3. Angle and geometry appear appropriate?	NA	NA	NA	100%	
	4. Free of piping or other structural failures?	NA	NA	NA	100%	**100%**
H. Wads/ Boulers	1. Free of scour?	NA	NA.	NA	100%	
	2. Footing stable?	NA	NA	NA	100%	**100%**

Table B.2f. Visual Morphological Stability Assessment Rockwell Pastures Site/Project No. D-000624 Reach UT 9 (152 feet)						
Feature Category	Metric (per As-built and reference baselines)	(# Stable) Number Performing as Intended	Total number per As-built	Total Number / feet in unstable state[1]	% Perform in Stable Condition[2]	Feature Perform. Mean or Total[3]
A. Riffles	1. Present?[4]	6	6	NA	100%	
	2. Armor stable (e.g. no displacement)?	6	6	NA	100%	
	3. Facet grade appears stable?	6	6	NA	100%	
	4. Minimal evidence of embedding/fining?	6	6	NA	100%	
	5. Length appropriate?	6	6	NA	100%	**100%**
B. Pools	1. Present? (e.g. not subject to sever aggrad.or migrat?)[4]	5	5	NA	100%	
	2. Sufficiently deep (Max Pool D:Mean Bkf>1.6?	5	5	NA	100%	
	3. Length appropriate?	5	5	NA	100%	**100%**
C. Thalweg	1. Upstream of meander bend (run/inflection) centering?[5]	3	3	NA	100%	
	2. Downstream of meander (glide/inflection) centering?[5]	3	3	NA	100%	**100%**
D. Meanders	1. Outer bend in state of limited/controlled erosion?	6	6	NA	100%	
	2. Of those eroding, # w/concomitant point bar formation?	NA	NA	NA	100%	
	3. Apparent Rc within spec?	6	6	NA	100%	
	4. Sufficient floodplain access and relief?	6	6	NA	100%	**100%**
E. Bed General	1. General channel bed aggradation areas (bar formation)	NA	NA	NA	100%	
	2. Channel bed degradation - areas of increasing down-cutting or head cutting?	NA	NA	NA	100%	**100%**
F. Bank[6]	1. Actively eroding, wasting or slumping bank	NA	NA	NA	100%	**100%**
G. Vanes	1. Free of back or arm scour?	NA	NA	NA	100%	
	2. Height appropriate?	NA	NA	NA	100%	
	3. Angle and geometry appear appropriate?	NA	NA	NA	100%	
	4. Free of piping or other structural failures?	NA	NA	NA	100%	**100%**
H. Wads/ Boulers	1. Free of scour?	NA	NA.	NA	100%	
	2. Footing stable?	NA	NA	NA	100%	**100%**

Table B.2g. Visual Morphological Stability Assessment Rockwell Pastures Site/Project No. D-000624 Reach UT 10 (103 feet)						
Feature Category	Metric (per As-built and reference baselines)	(# Stable) Number Performing as Intended	Total number per As-built	Total Number / feet in unstable state[1]	% Perform in Stable Condition[2]	Feature Perform. Mean or Total[3]
A. Riffles	1. Present?[4]	6	6	NA	100%	
	2. Armor stable (e.g. no displacement)?	6	6	NA	100%	
	3. Facet grade appears stable?	6	6	NA	100%	
	4. Minimal evidence of embedding/fining?	6	6	NA	100%	
	5. Length appropriate?	6	6	NA	100%	**100%**
B. Pools	1. Present? (e.g. not subject to sever aggrad.or migrat?)[4]	5	5	NA	100%	
	2. Sufficiently deep (Max Pool D:Mean Bkf>1.6?	5	5	NA	100%	
	3. Length appropriate?	5	5	NA	100%	**100%**
C. Thalweg	1. Upstream of meander bend (run/inflection) centering?[5]	3	3	NA	100%	
	2. Downstream of meander (glide/inflection) centering?[5]	3	3	NA	100%	**100%**
D. Meanders	1. Outer bend in state of limited/controlled erosion?	6	6	NA	100%	
	2. Of those eroding, # w/concomitant point bar formation?	NA	NA	NA	100%	
	3. Apparent Rc within spec?	6	6	NA	100%	
	4. Sufficient floodplain access and relief?	6	6	NA	100%	**100%**
E. Bed General	1. General channel bed aggradation areas (bar formation)	NA	NA	NA	100%	
	2. Channel bed degradation - areas of increasing down-cutting or head cutting?	NA	NA	NA	100%	**100%**
F. Bank[6]	1. Actively eroding, wasting or slumping bank	NA	NA	NA	100%	**100%**
G. Vanes	1. Free of back or arm scour?	NA	NA	NA	100%	
	2. Height appropriate?	NA	NA	NA	100%	
	3. Angle and geometry appear appropriate?	NA	NA	NA	100%	
	4. Free of piping or other structural failures?	NA	NA	NA	100%	**100%**
H. Wads/ Boulers	1. Free of scour?	NA	NA.	NA	100%	
	2. Footing stable?	NA	NA	NA	100%	**100%**

Footnotes:

The above table should be completed using the visual assessment data form for each project reach/segment. It is recognized that the various metrics

1. Metrics that are spatial estimates that are continous variables should be entered as:

Table B.2g. Visual Morphological Stability Assessment Rockwell Pastures Site/Project No. D-000624 Reach UT 10 (103 feet)						
Feature Category	Metric (per As-built and reference baselines)	(# Stable) Number Performing as Intended	Total number per As-built	Total Number / feet in unstable state[1]	% Perform in Stable Condition[2]	Feature Perform. Mean or Total[3]
A. Riffles	1. Present?[4]	6	6	NA	100%	
	2. Armor stable (e.g. no displacement)?	6	6	NA	100%	
	3. Facet grade appears stable?	6	6	NA	100%	
	4. Minimal evidence of embedding/fining?	6	6	NA	100%	
	5. Length appropriate?	6	6	NA	100%	**100%**
B. Pools	1. Present? (e.g. not subject to sever aggrad.or migrat?)[4]	5	5	NA	100%	
	2. Sufficiently deep (Max Pool D:Mean Bkf>1.6?	5	5	NA	100%	
	3. Length appropriate?	5	5	NA	100%	**100%**
C. Thalweg	1. Upstream of meander bend (run/inflection) centering?[5]	3	3	NA	100%	
	2. Downstream of meander (glide/inflection) centering?[5]	3	3	NA	100%	**100%**
D. Meanders	1. Outer bend in state of limited/controlled erosion?	6	6	NA	100%	
	2. Of those eroding, # w/concomitant point bar formation?	NA	NA	NA	100%	
	3. Apparent Rc within spec?	6	6	NA	100%	
	4. Sufficient floodplain access and relief?	6	6	NA	100%	**100%**
E. Bed General	1. General channel bed aggradation areas (bar formation)	NA	NA	NA	100%	
	2. Channel bed degradation - areas of increasing down-cutting or head cutting?	NA	NA	NA	100%	**100%**
F. Bank[6]	1. Actively eroding, wasting or slumping bank	NA	NA	NA	100%	**100%**
G. Vanes	1. Free of back or arm scour?	NA	NA	NA	100%	
	2. Height appropriate?	NA	NA	NA	100%	
	3. Angle and geometry appear appropriate?	NA	NA	NA	100%	
	4. Free of piping or other structural failures?	NA	NA	NA	100%	**100%**
H. Wads/ Boulers	1. Free of scour?	NA	NA.	NA	100%	
	2. Footing stable?	NA	NA	NA	100%	**100%**

Footnotes:

The above table should be completed using the visual assessment data form for each project reach/segment. It is recognized that the various metrics

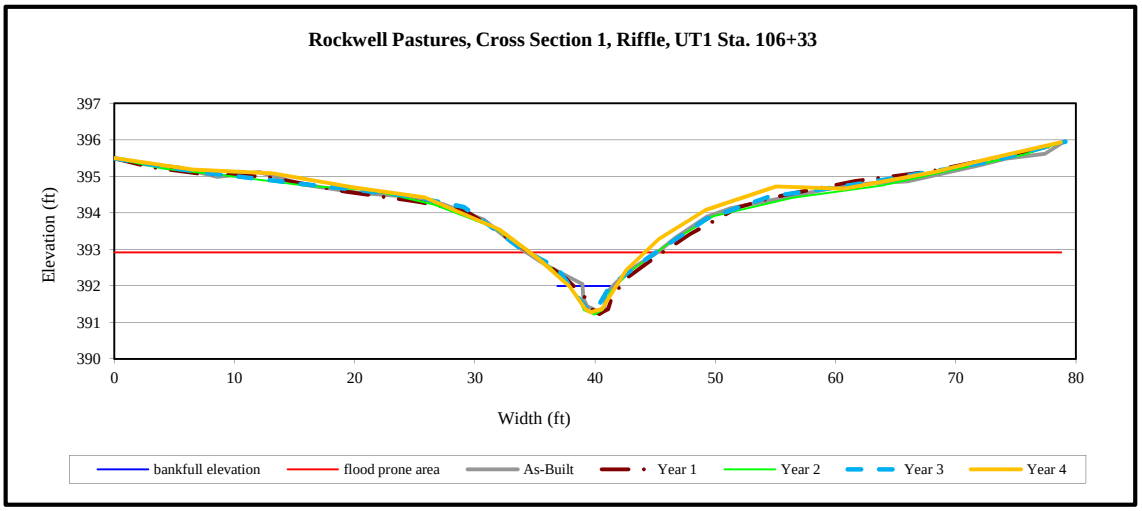
1. Metrics that are spatial estimates that are continous variables should be entered as:

APPENDIX B

6. Annual Overlays of Cross Section Plots

Left bank

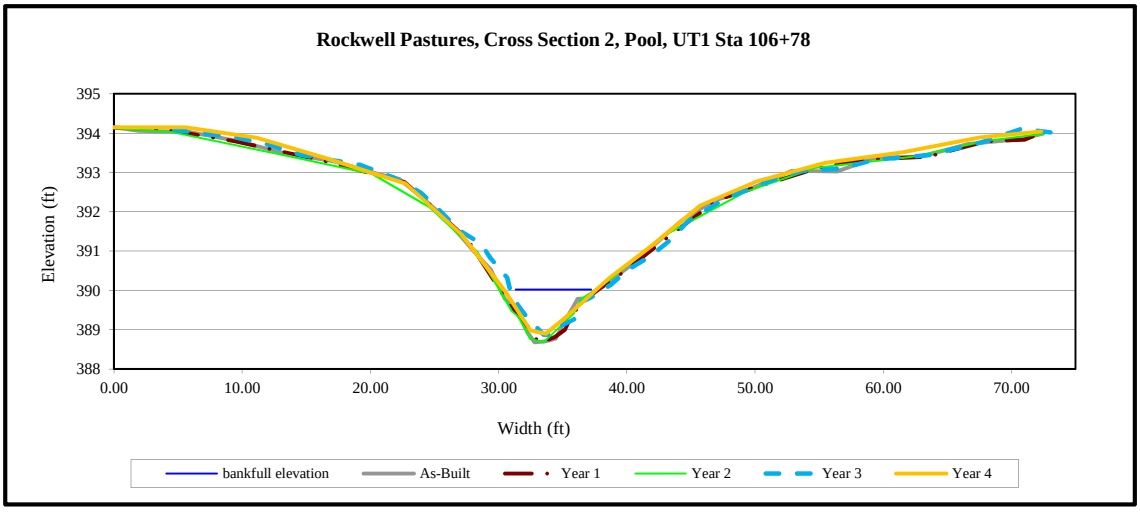
Right bank



Reach ID	UT 1
Cross Sectional Area	1.7
Bankfull Width	3.9
Mean Depth	0.4
Wetted Perimeter	4.3
Hydraulic Radius	0.4
Width:Depth Ratio	9.0

Left bank

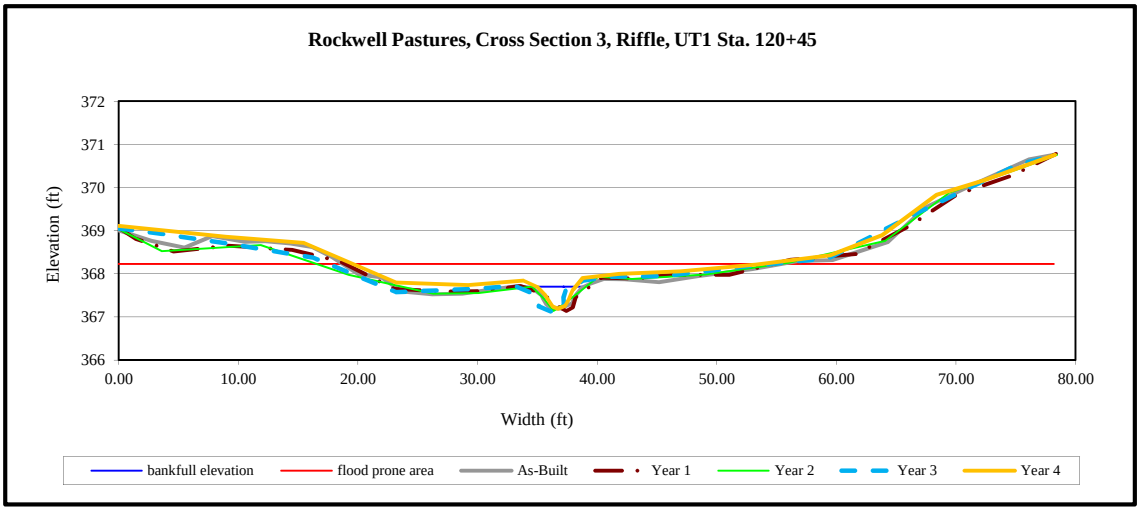
Right bank



Reach ID	UT 1
Cross Sectional Area	4.7
Bankfull Width	7.3
Mean Depth	0.6
Wetted Perimeter	7.7
Hydraulic Radius	0.6
Width:Depth Ratio	11.3

Left bank

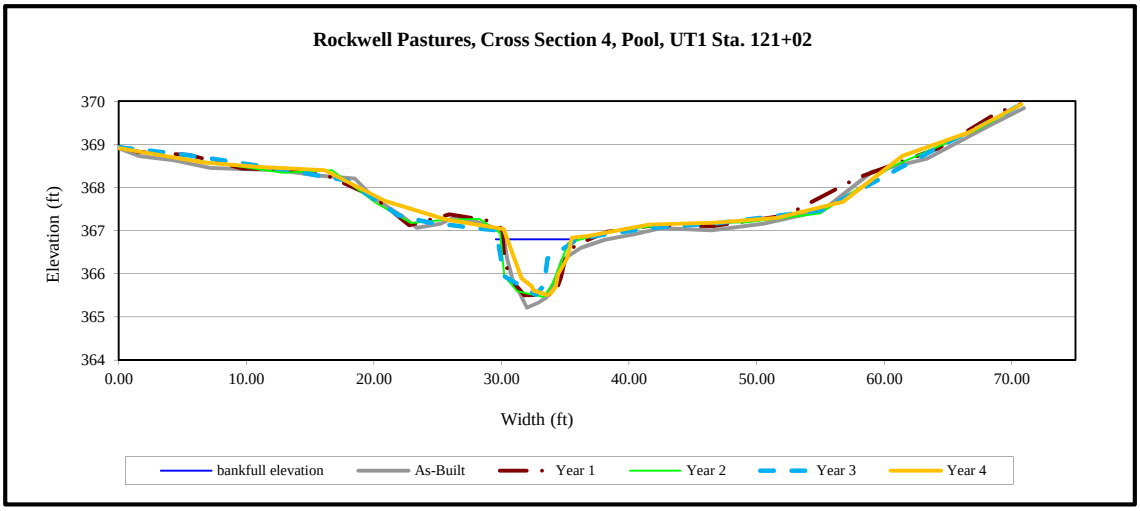
Right bank



Reach ID	UT 1
Cross Sectional Area	1.5
Bankfull Width	4.7
Mean Depth	0.3
Wetted Perimeter	4.9
Hydraulic Radius	0.3
Width:Depth Ratio	14.8

Left bank

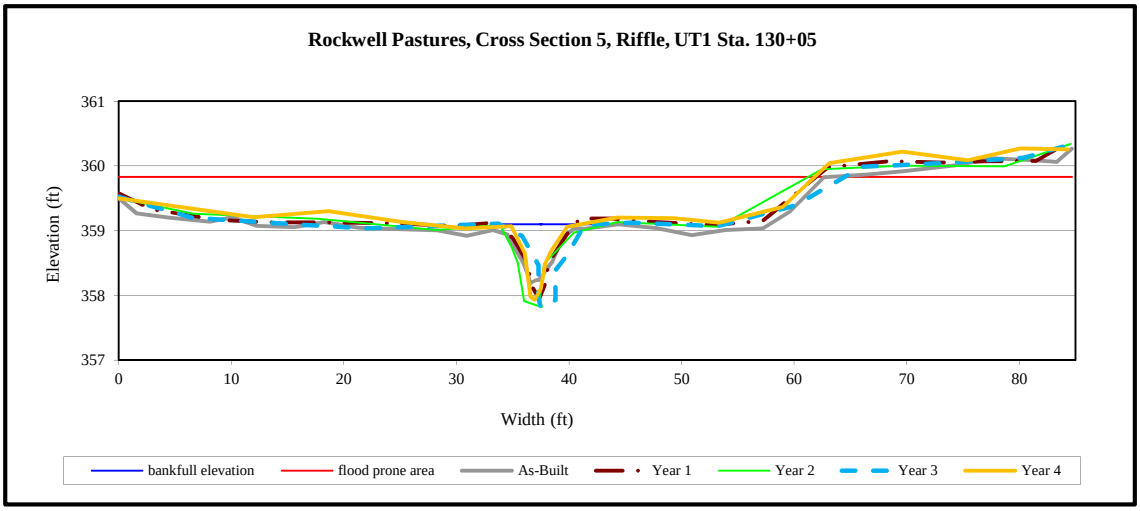
Right bank



Reach ID	UT 1
Cross Sectional Area	6.0
Bankfull Width	9.4
Mean Depth	0.6
Wetted Perimeter	10.4
Hydraulic Radius	0.6
Width:Depth Ratio	14.9

Left bank

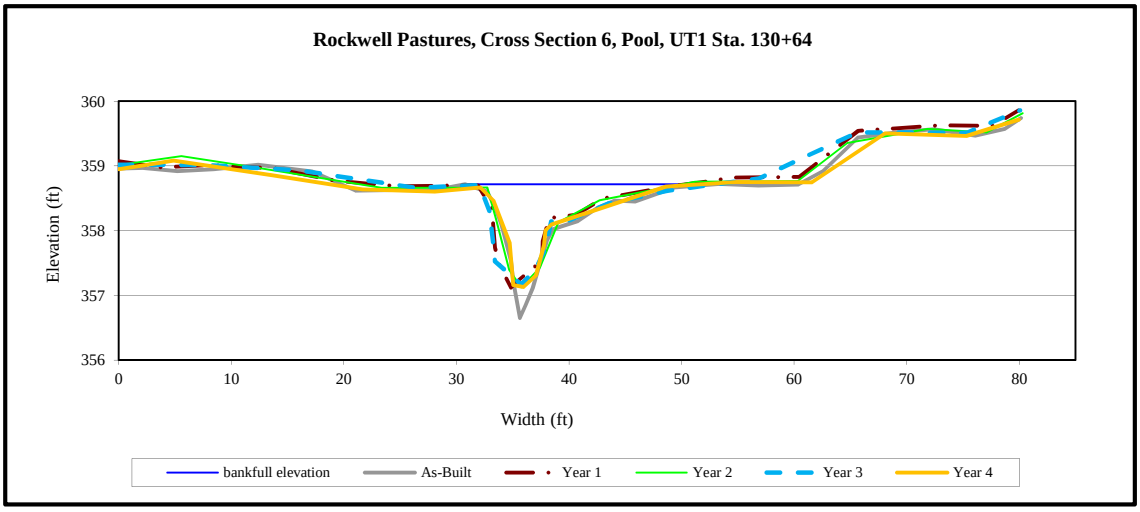
Right bank



Reach ID	UT 1
Cross Sectional Area	2.6
Bankfull Width	6.3
Mean Depth	0.4
Wetted Perimeter	6.9
Hydraulic Radius	0.4
Width:Depth Ratio	14.9

Left bank

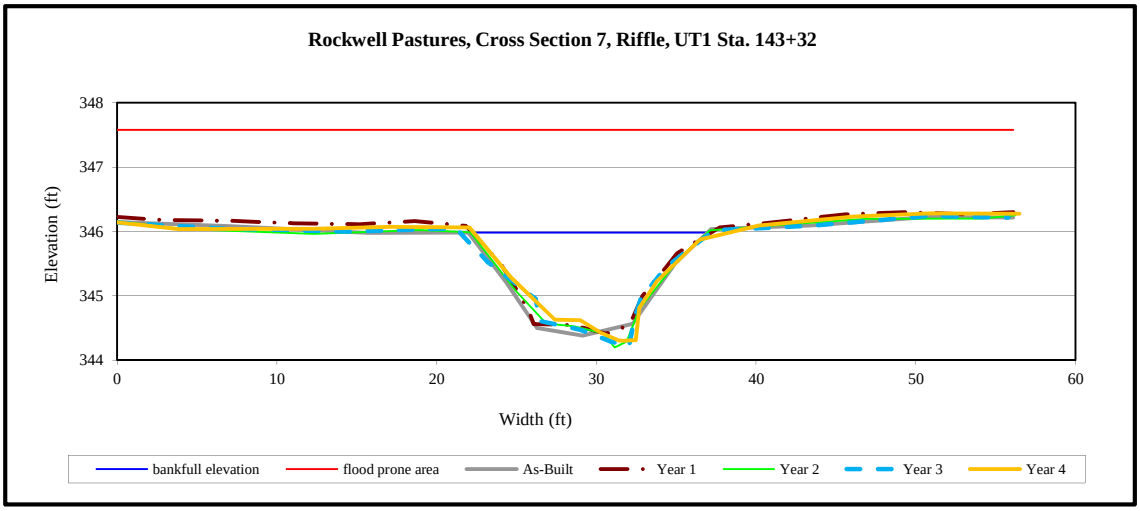
Right bank



Reach ID	UT 1
Cross Sectional Area	8.4
Bankfull Width	16.4
Mean Depth	0.5
Wetted Perimeter	17.2
Hydraulic Radius	0.5
Width:Depth Ratio	31.9

Left bank

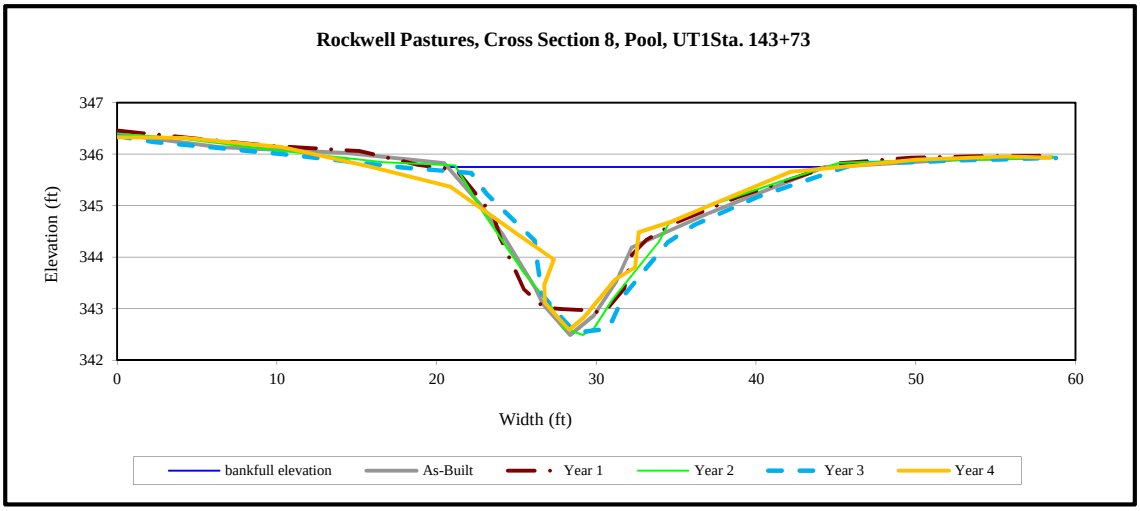
Right bank



Reach ID	UT 1
Cross Sectional Area	15.4
Bankfull Width	17.7
Mean Depth	0.9
Wetted Perimeter	18.5
Hydraulic Radius	0.8
Width:Depth Ratio	20.4

Left bank

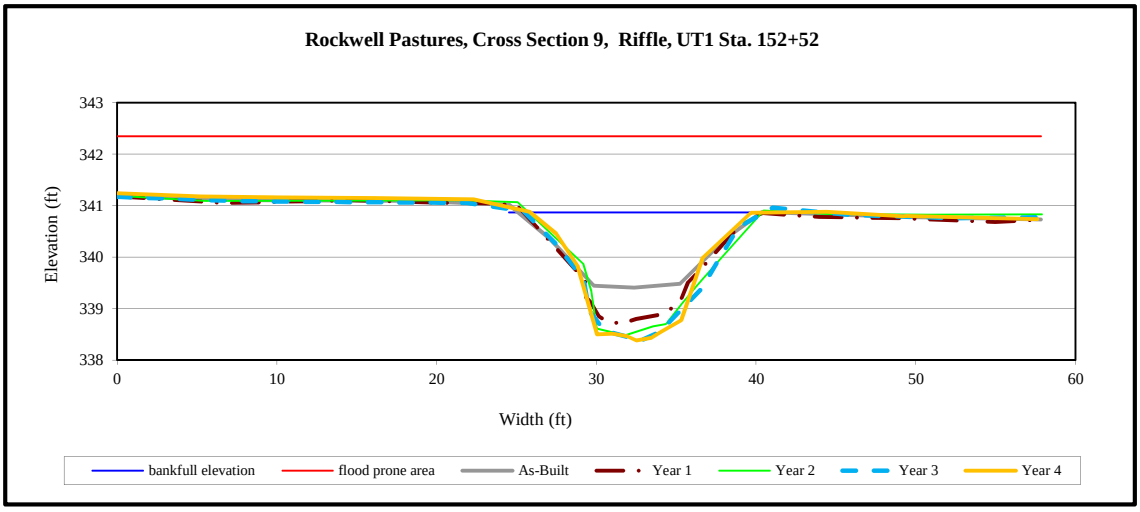
Right bank



Reach ID	UT 1
Cross Sectional Area	26.1
Bankfull Width	24.9
Mean Depth	1.0
Wetted Perimeter	27.6
Hydraulic Radius	0.9
Width:Depth Ratio	23.7

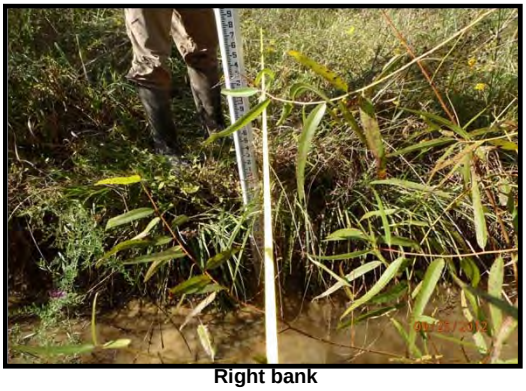
Left bank

Right bank

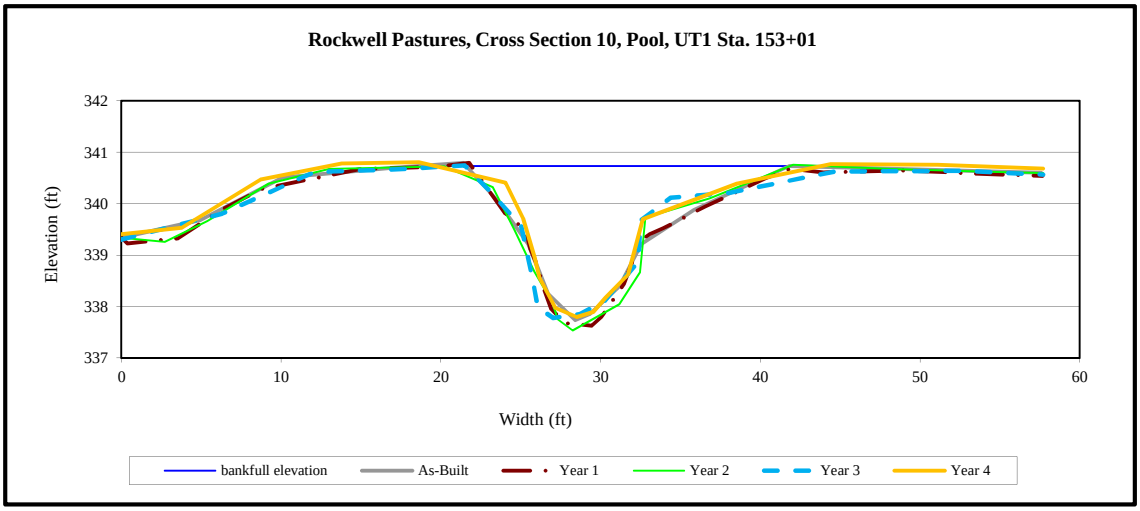


Reach ID	UT 1
Cross Sectional Area	20.2
Bankfull Width	17.2
Mean Depth	1.2
Wetted Perimeter	18.4
Hydraulic Radius	1.1
Width:Depth Ratio	14.7

Left bank



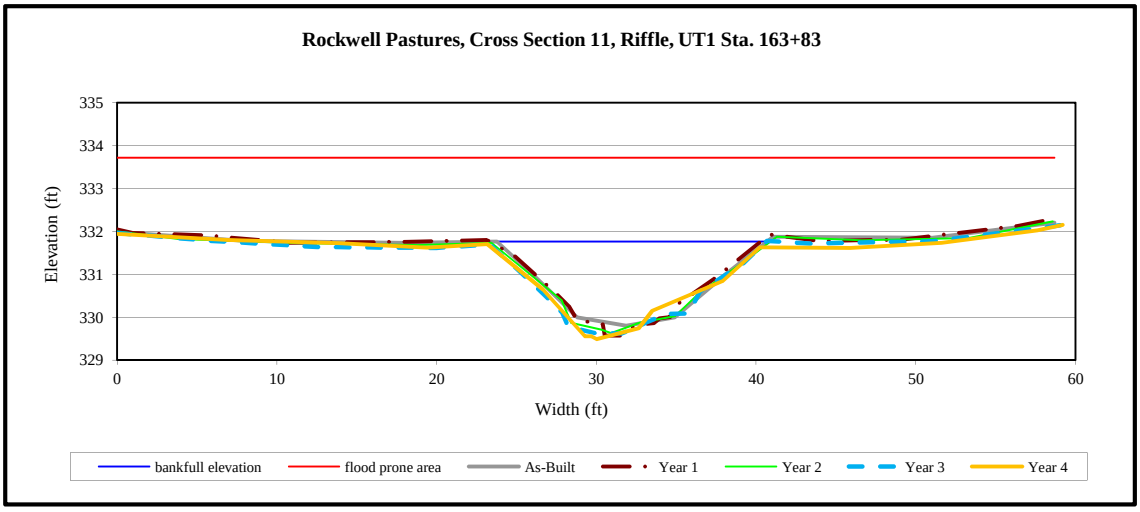
Right bank



Reach ID	UT 1
Cross Sectional Area	21.1
Bankfull Width	20.4
Mean Depth	1.0
Wetted Perimeter	21.9
Hydraulic Radius	1.0
Width:Depth Ratio	19.6

Left bank

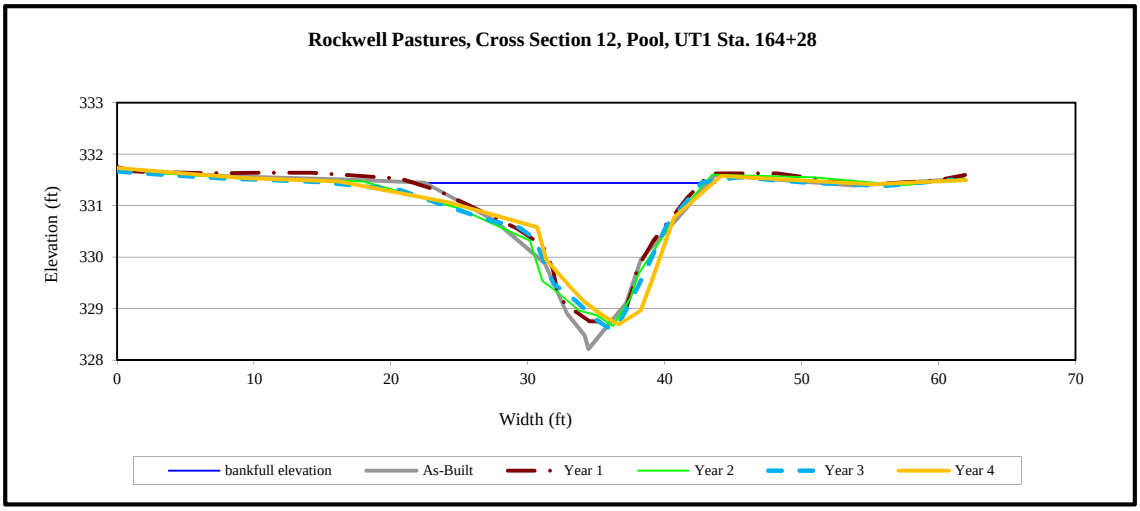
Right bank



Reach ID	UT 1
Cross Sectional Area	19.8
Bankfull Width	16.8
Mean Depth	1.2
Wetted Perimeter	17.5
Hydraulic Radius	1.1
Width:Depth Ratio	14.3

Left bank

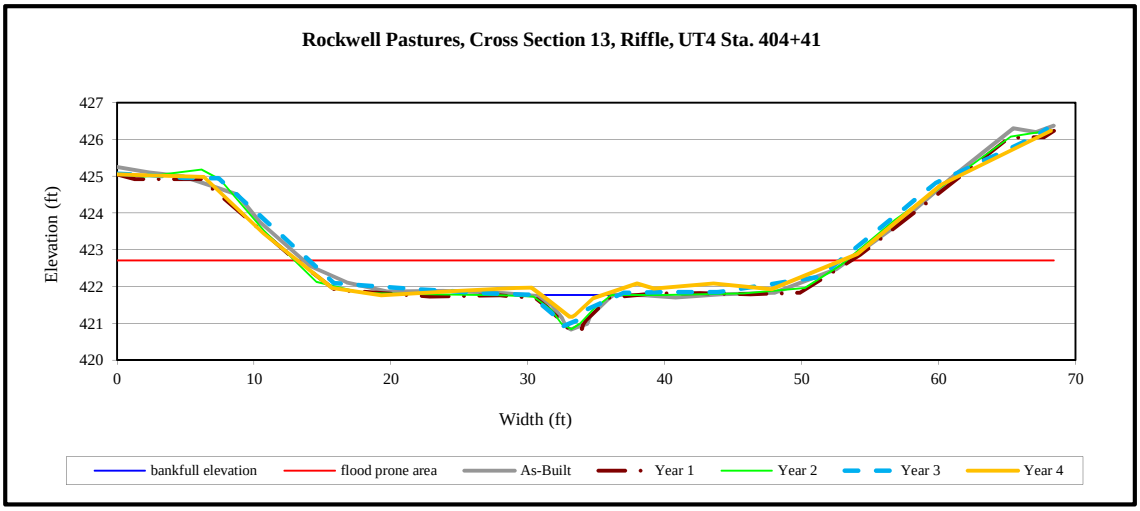
Right bank



Reach ID	UT 1
Cross Sectional Area	25.6
Bankfull Width	25.1
Mean Depth	1.0
Wetted Perimeter	26.4
Hydraulic Radius	1.0
Width:Depth Ratio	24.6

Left bank

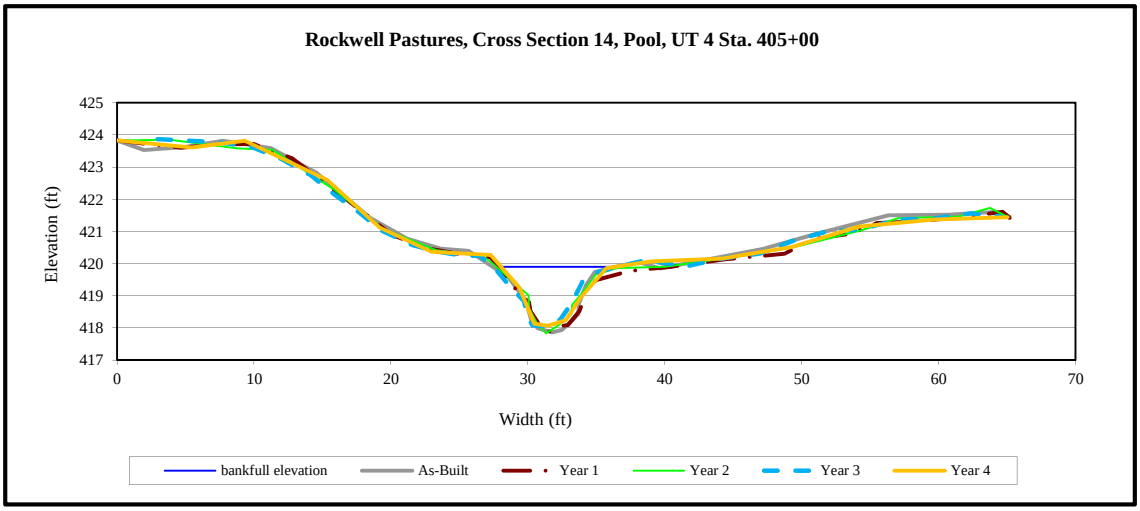
Right bank



Reach ID	UT 4
Cross Sectional Area	2.4
Bankfull Width	6.7
Mean Depth	0.4
Wetted Perimeter	6.9
Hydraulic Radius	0.3
Width:Depth Ratio	18.9

Left bank

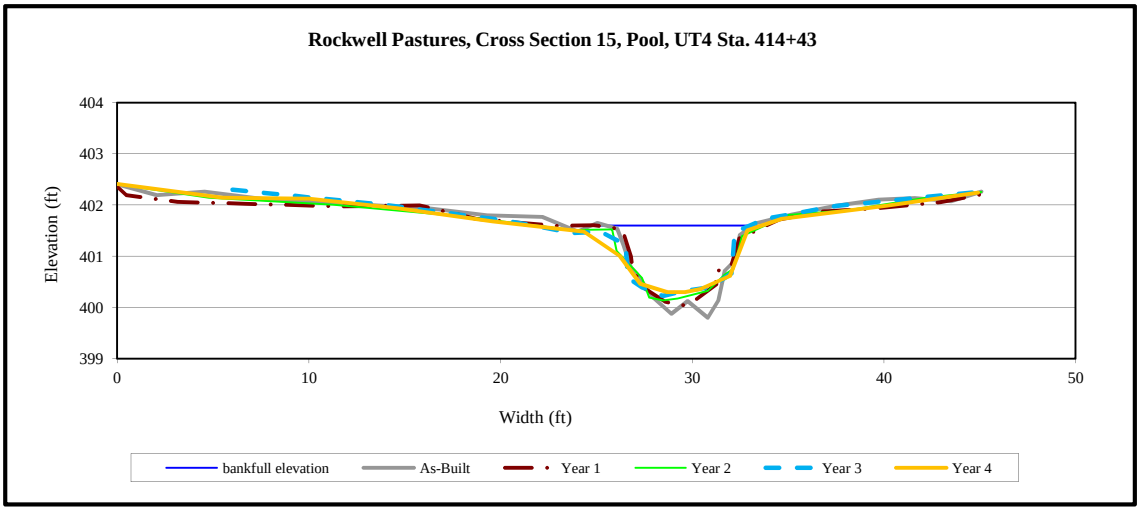
Right bank



Reach ID	UT 4
Cross Sectional Area	9.8
Bankfull Width	11.2
Mean Depth	0.9
Wetted Perimeter	12.3
Hydraulic Radius	0.8
Width:Depth Ratio	12.8

Left bank

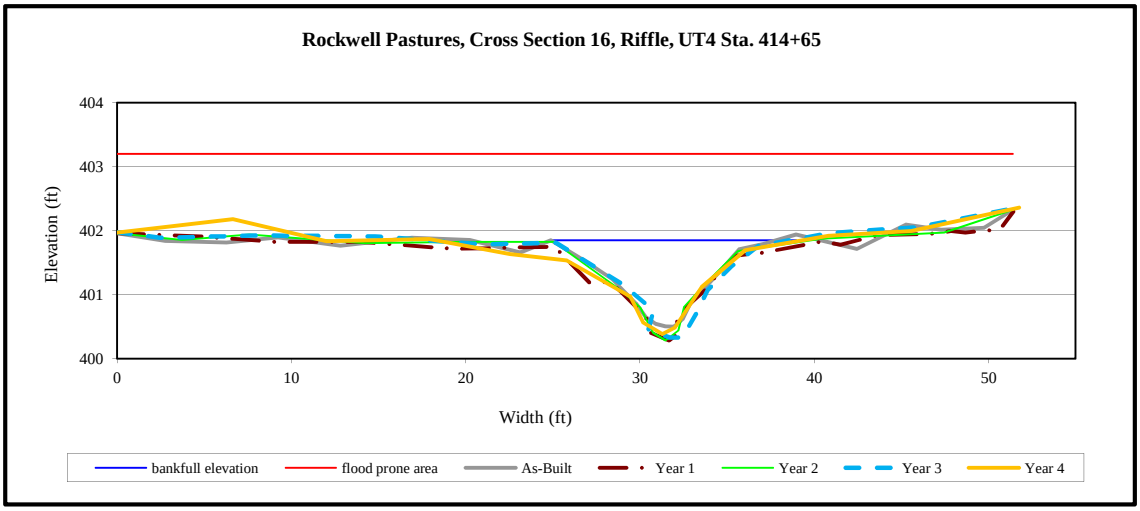
Right bank



Reach ID	UT 4
Cross Sectional Area	6.9
Bankfull Width	8.5
Mean Depth	0.8
Wetted Perimeter	9.1
Hydraulic Radius	0.8
Width:Depth Ratio	10.5

Left bank

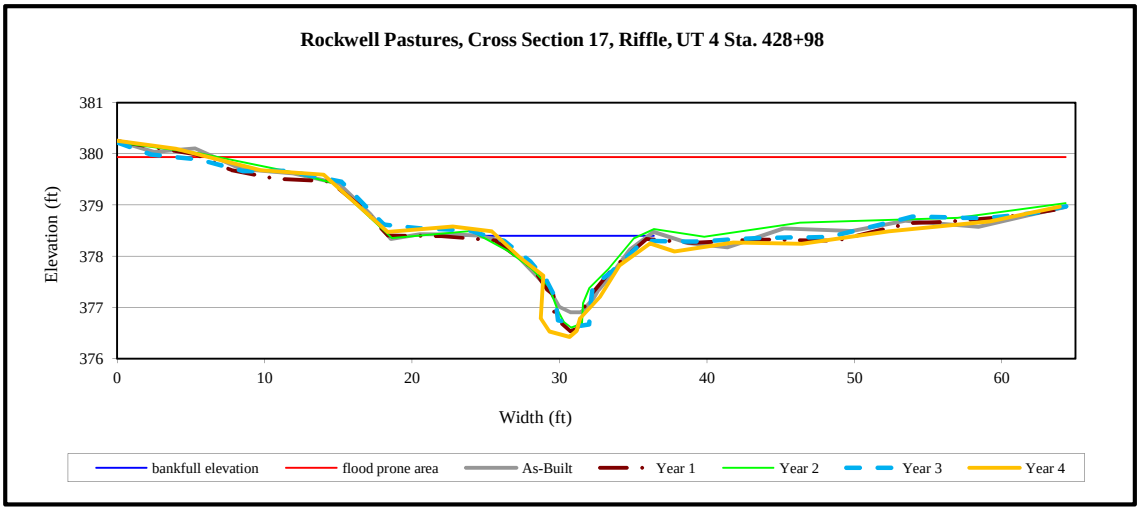
Right bank



Reach ID	UT 4
Cross Sectional Area	7.1
Bankfull Width	13.5
Mean Depth	0.5
Wetted Perimeter	13.9
Hydraulic Radius	0.5
Width:Depth Ratio	25.7

Left bank

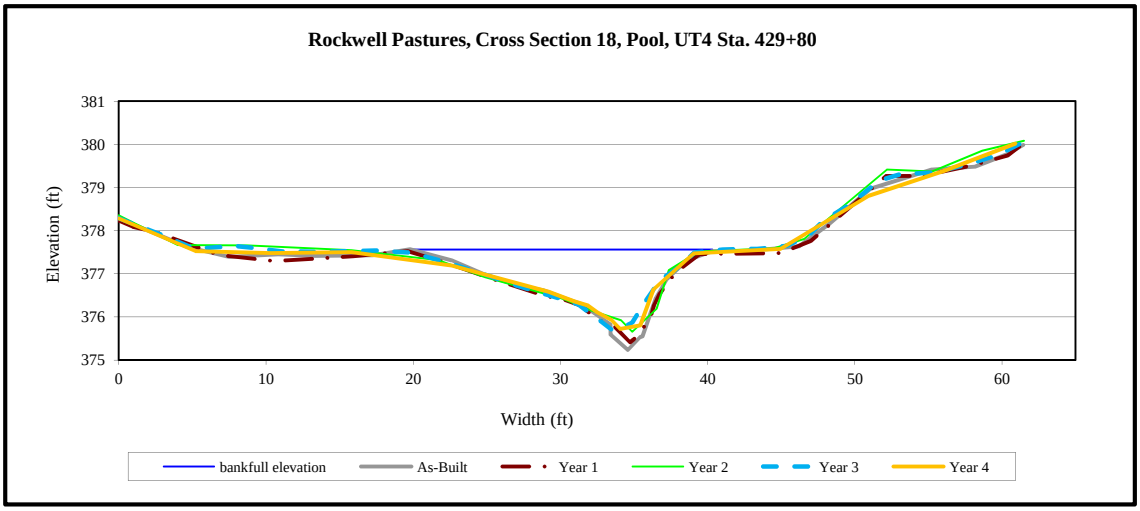
Right bank



Reach ID	UT 4
Cross Sectional Area	8.3
Bankfull Width	9.8
Mean Depth	0.8
Wetted Perimeter	11.3
Hydraulic Radius	0.7
Width:Depth Ratio	11.6

Left bank

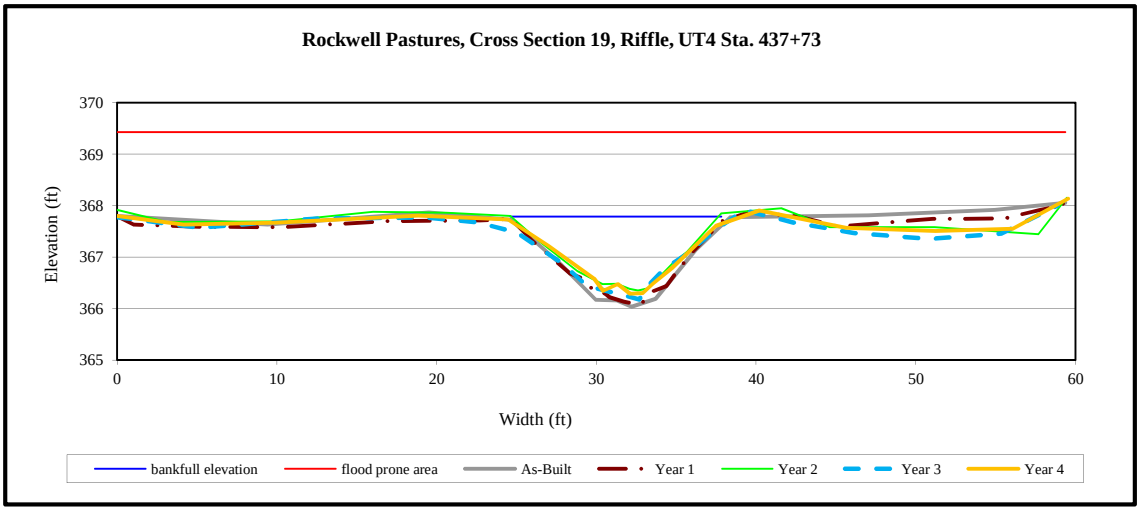
Right bank



Reach ID	UT 4
Cross Sectional Area	15.2
Bankfull Width	22.5
Mean Depth	0.7
Wetted Perimeter	23.1
Hydraulic Radius	0.7
Width:Depth Ratio	33.4

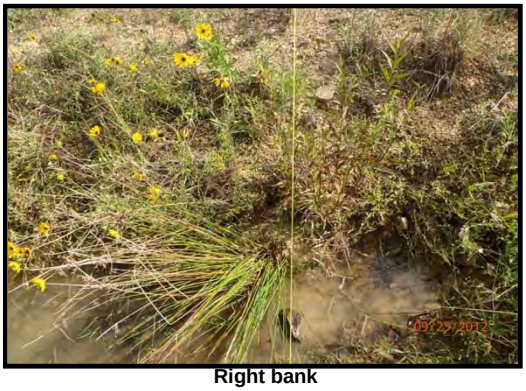
Left bank

Right bank

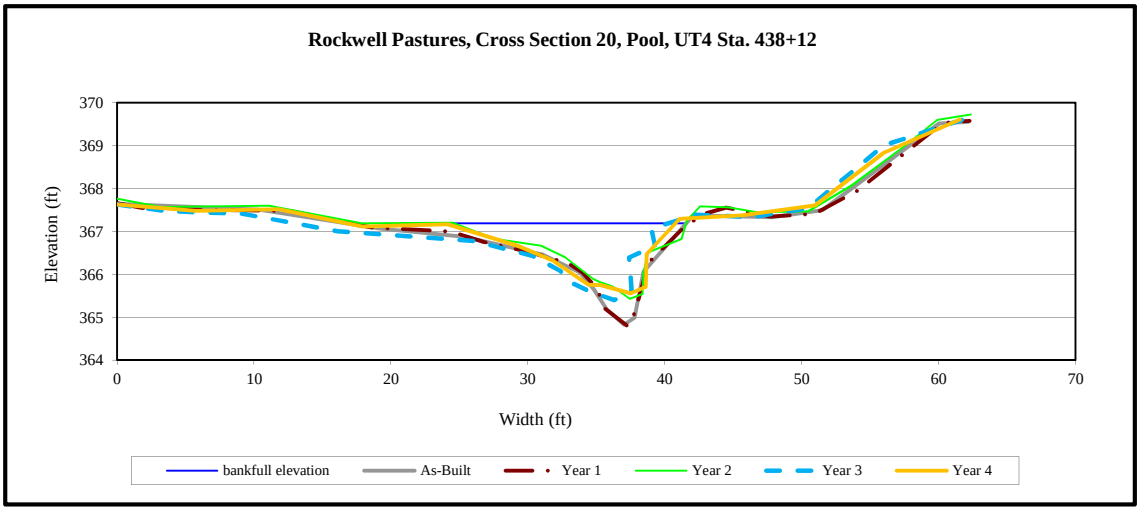


Reach ID	UT 4
Cross Sectional Area	10.4
Bankfull Width	13.7
Mean Depth	0.8
Wetted Perimeter	14.1
Hydraulic Radius	0.7
Width:Depth Ratio	18.1

Left bank



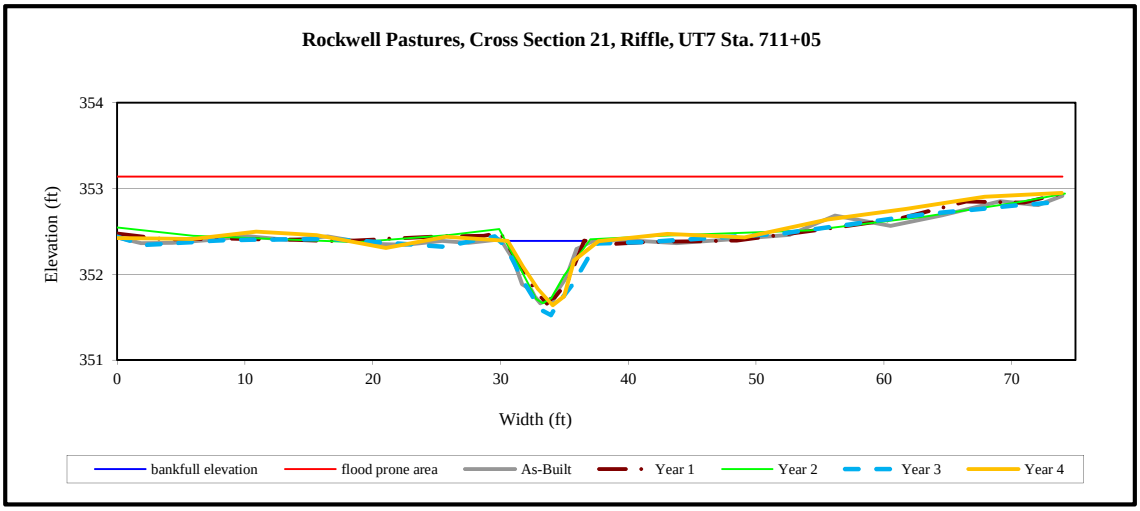
Right bank



Reach ID	UT 4
Cross Sectional Area	11.9
Bankfull Width	15.7
Mean Depth	0.8
Wetted Perimeter	16.6
Hydraulic Radius	0.7
Width:Depth Ratio	20.6

Left bank

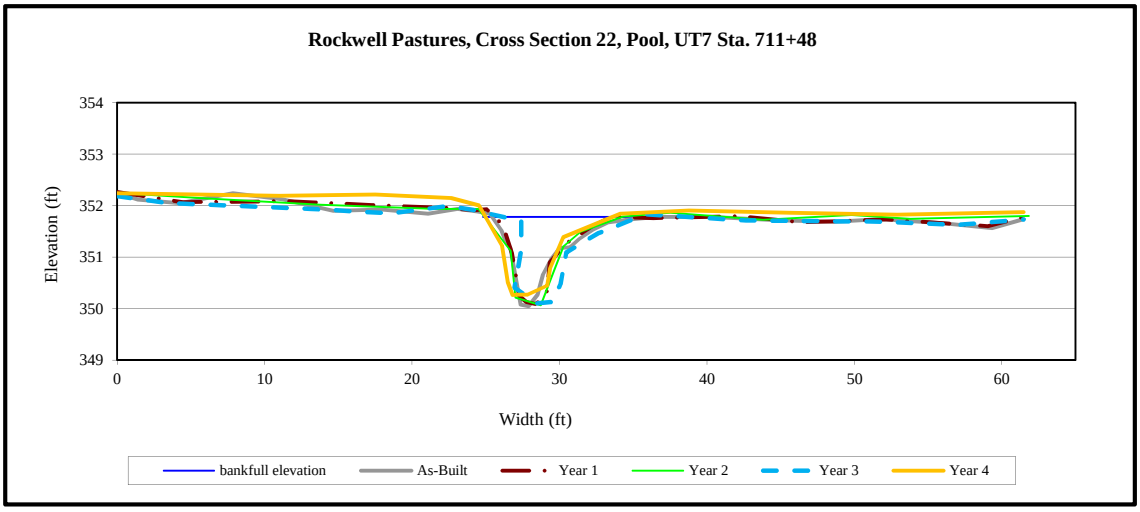
Right bank



Reach ID	UT 7
Cross Sectional Area	2.7
Bankfull Width	7.1
Mean Depth	0.4
Wetted Perimeter	7.3
Hydraulic Radius	0.4
Width:Depth Ratio	18.6

Left bank

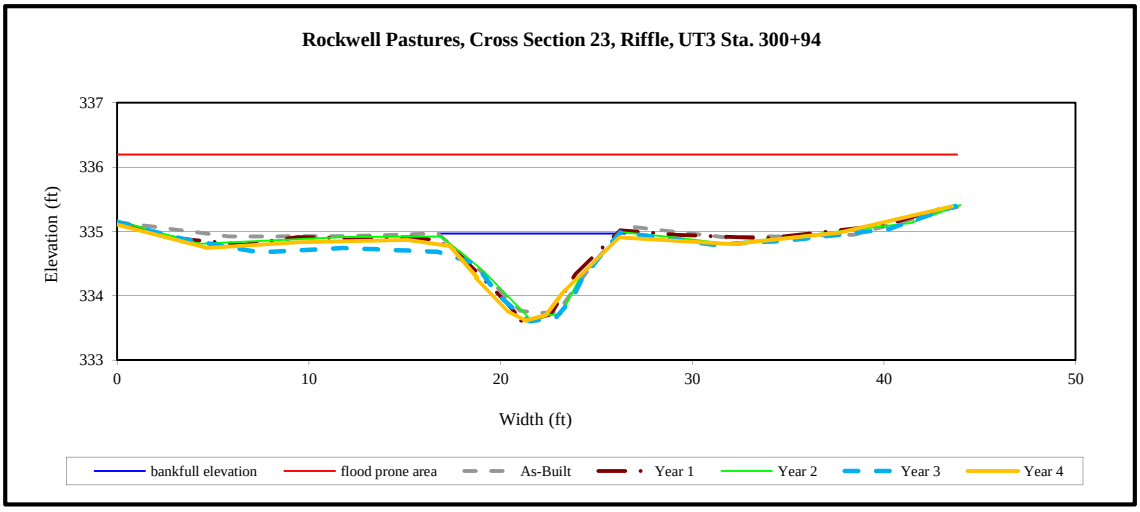
Right bank



Reach ID	UT 7
Cross Sectional Area	6.6
Bankfull Width	9.2
Mean Depth	0.7
Wetted Perimeter	10.3
Hydraulic Radius	0.6
Width:Depth Ratio	13.0

Left bank

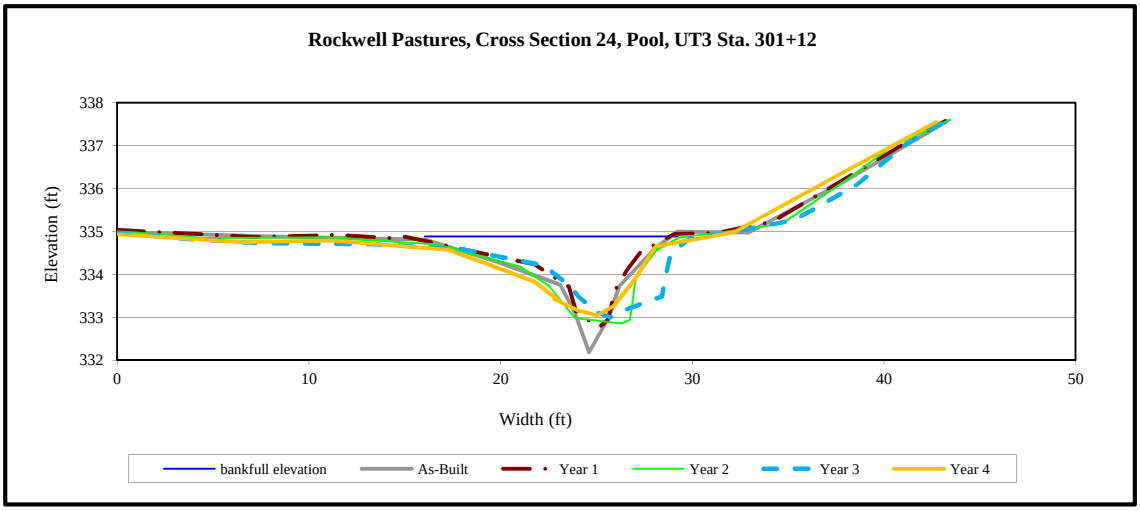
Right bank



Reach ID	UT 4
Cross Sectional Area	5.4
Bankfull Width	8.4
Mean Depth	0.7
Wetted Perimeter	8.9
Hydraulic Radius	0.6
Width:Depth Ratio	12.8

Left bank

Right bank

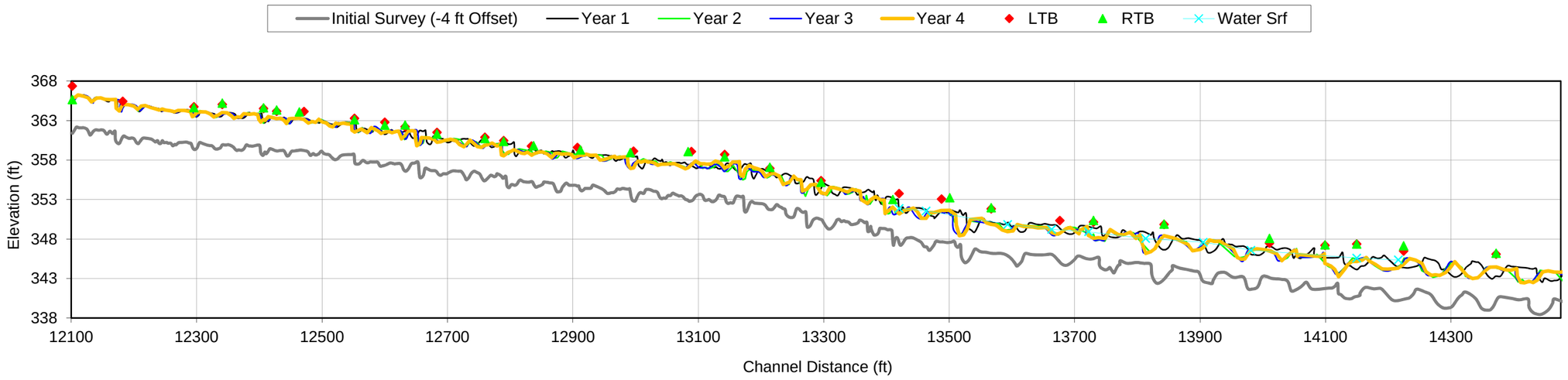


Reach ID	UT 3
Cross Sectional Area	8.2
Bankfull Width	10.6
Mean Depth	0.8
Wetted Perimeter	11.5
Hydraulic Radius	0.7
Width:Depth Ratio	13.8

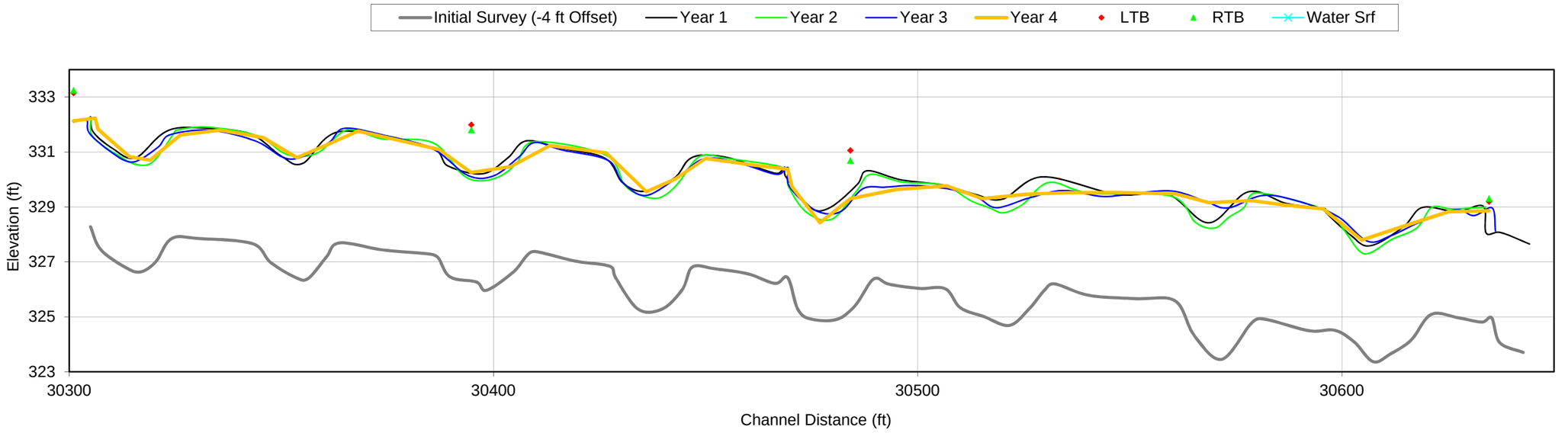
APPENDIX B

7. Annual Overlays of Longitudinal Plots

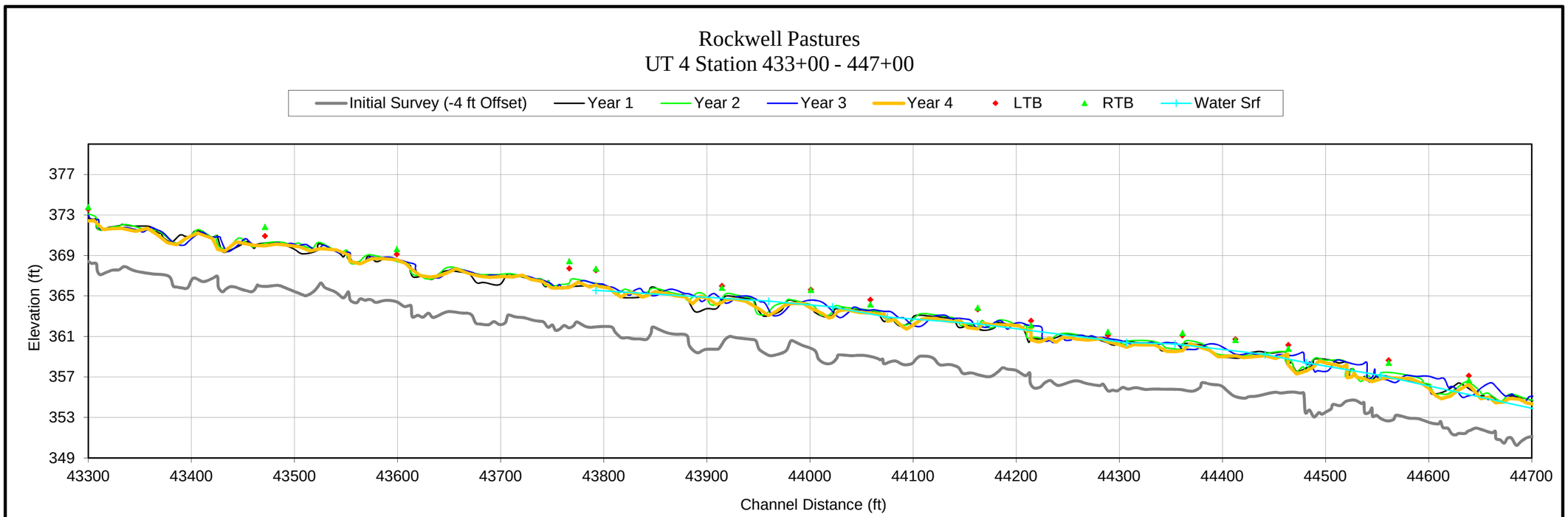
Rockwell Pastures
UT-1 Station 121+02 - 144+75



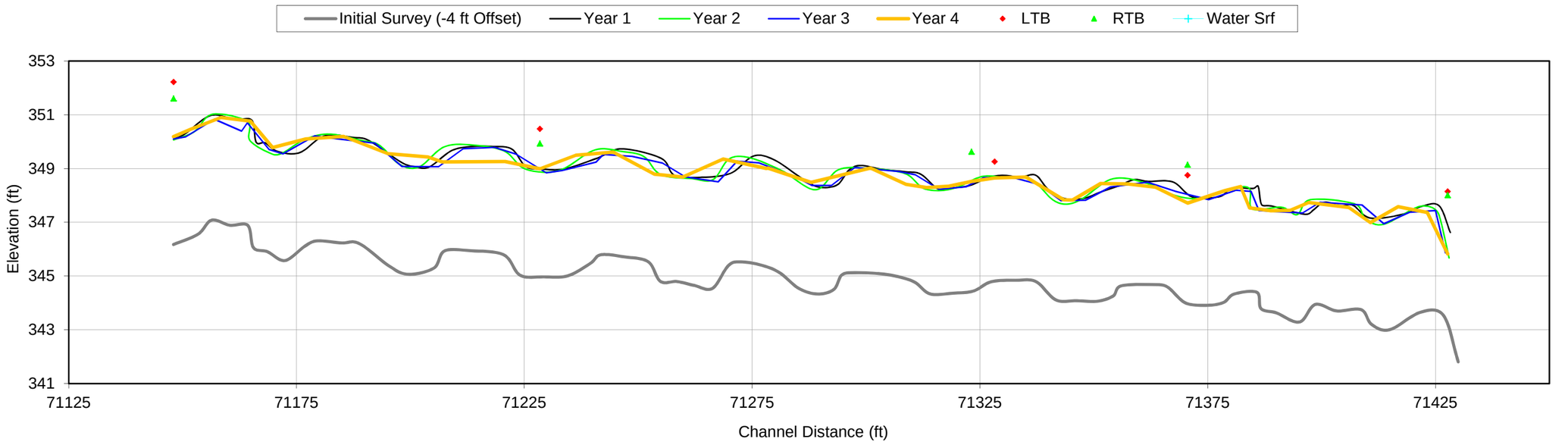
Rockwell Pastures
UT 3 Station 303+05 - 306+50



Rockwell Pastures
UT 4 Station 433+00 - 447+00



Rockwell Pastures
UT 7 Station 711+48 - 714+39



APPENDIX C

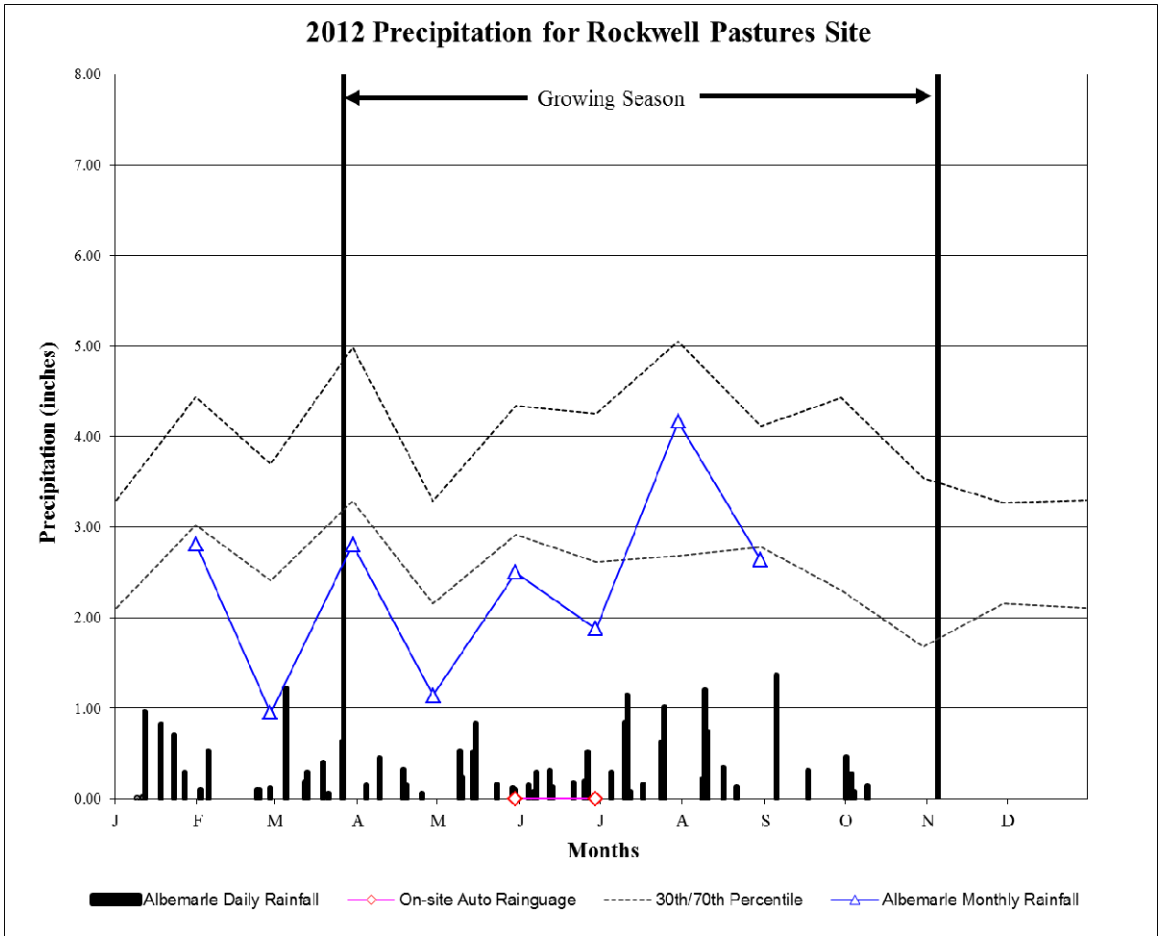
1. Precipitation Data Table

Table C.1 Precipitation Data Table

Month	Average	Normal Limits		Albemarle Precipitation
		30 Percent	70 Percent	
January	4.44	3.03	5.60	2.82
February	3.70	2.41	4.59	0.95
March	4.98	3.29	5.97	2.81
April	3.29	2.16	4.43	1.14
May	4.34	2.92	5.21	2.50
June	4.25	2.62	6.14	1.88
July	5.05	2.68	5.73	4.17
August	4.12	2.78	5.34	2.64
September	4.43	2.30	6.34	1.69
October	3.54	1.68	4.03	0.96
November	3.27	2.16	4.13	
December	3.30	2.11	3.93	
Total	48.71	30.14	61.44	21.56

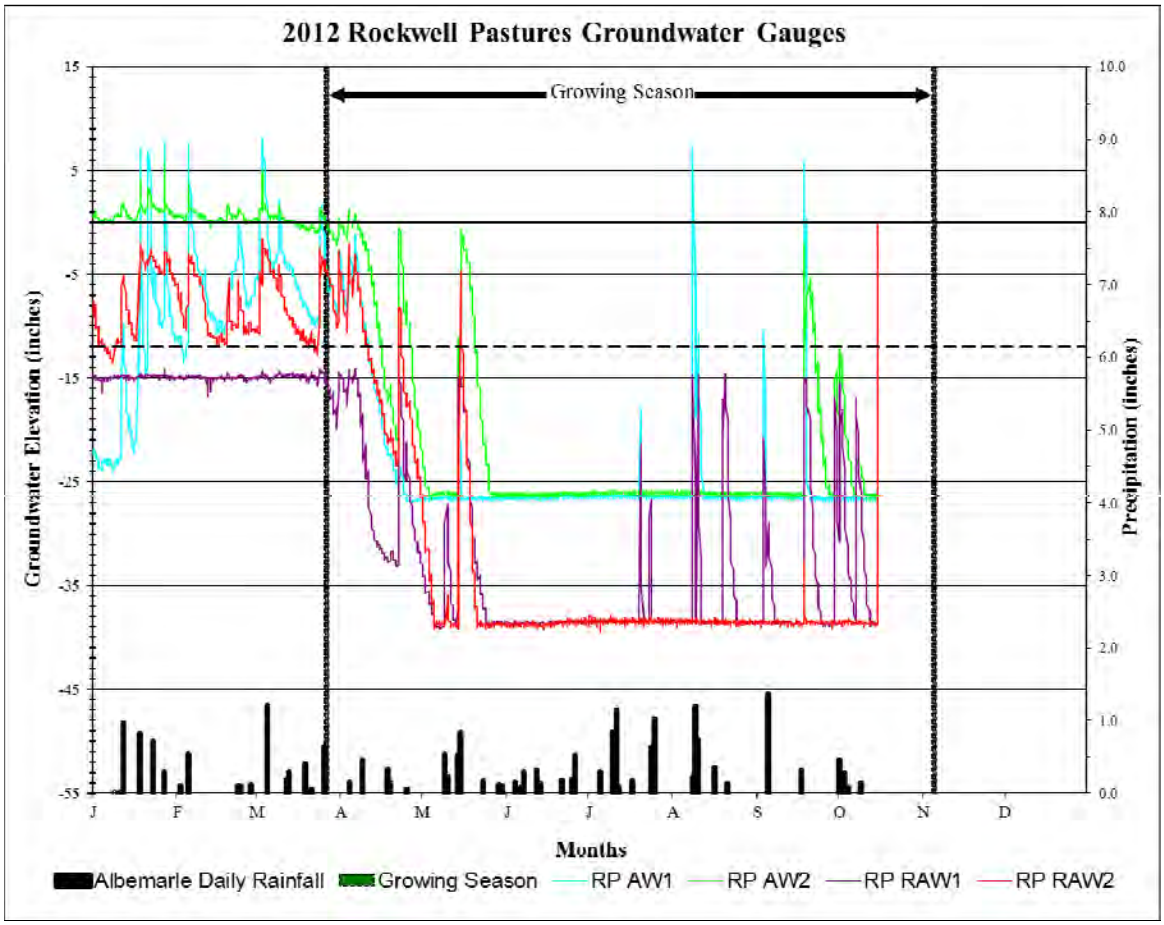
APPENDIX C

2. 2012 Precipitation for Rockwell Pastures Site


2012 Precipitation for Rockwell Pastures Site
Growing Season
Precipitation (inches)
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
J
F
M
A
M
J
J
A
S
O
N
D
Months
Albemarle Daily Rainfall
On-site Auto Rainguage
30th/70th Percentile
Albemarle Monthly Rainfall

APPENDIX C

3. Wetland Hydrographs


2012 Rockwell Pastures Groundwater Gauges
Growing Season
Groundwater Elevation (inches)
Precipitation (inches)
15
5
-5
-15
-25
-35
-45
-55
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
J
F
M
A
M
J
J
A
S
O
N
D
Months
Albemarle Daily Rainfall
Growing Season
RP AW1
RP AW2
RP RAW1
RP RAW2

APPENDIX C

4. Table C.2 Hydrologic Monitoring Results

Table C.2 Hydrologic Monitoring Results

2012 Max Hydroperiod (Growing Season 27-Mar through 5-Nov, 222 days) Well Data for 27-Mar through 15-October Success Criterion 7% = 15 Consecutive Days					
	Consecutive		Cumulative		
Gauge	Days	Percent of growing Season	Days	Percent of growing Season	Occurrences
AW1	16	7	18	8	5
AW2	21	9	35	16	4
RAW1	0	0	0	0	0
RAW2	16	7	18	8	3

Table C.3 Annual Summary of Hydrologic Monitoring Results

Rockwell Pastures Project Summary Well Data Max Hydroperiod (Growing Season 27-Mar through 5-Nov, 222 days) Success Criterion 7% = 15 Consecutive Days					
Gauge	Max Consecutive Hydroperiod (percent of growing season)				
	2009	2010	2011	2012	2013
AW1	12	9	15	7	
AW2	14	14	10	9	
RAW1	5	13	11	0	
RAW2	2	5	8	7	

APPENDIX C

5. Raw Well and Crest Gauge Data

												Weatherstation Rainfall Data	
Date	Time	Water Level (inches)							On-site Manual Raingauge	On-site Auto Rainguage	On-site Monthly Total	Albemarle Daily Rainfall	Albemarle Monthly Rainfall
dd-mmm-yyyy	hh:mm:ss	RP AW1	RP AW2	RP RAW1	RP RAW2	CG1	CG2	CG3					
1-Jan-2012	06:00:00	-22.27	0.67	-14.82	-7.54								
1-Jan-2012	12:00:00	-22.41	0.72	-14.83	-8.40								
1-Jan-2012	18:00:00	-22.48	0.51	-15.07	-8.36								
1-Jan-2012	24:00:00	-21.86	0.53	-14.95	-9.17								
2-Jan-2012	06:00:00	-22.34	1.09	-14.72	-7.87								
2-Jan-2012	12:00:00	-22.75	0.79	-14.84	-9.30								
2-Jan-2012	18:00:00	-22.87	0.51	-15.20	-9.23								
2-Jan-2012	24:00:00	-22.38	0.57	-14.99	-10.30								
3-Jan-2012	06:00:00	-22.96	0.47	-15.00	-10.08								
3-Jan-2012	12:00:00	-23.13	0.48	-15.14	-10.73								
3-Jan-2012	18:00:00	-23.74	0.17	-15.20	-10.78								
3-Jan-2012	24:00:00	-23.50	0.22	-15.02	-11.68								
4-Jan-2012	06:00:00	-24.02	0.11	-15.52	-11.29								
4-Jan-2012	12:00:00	-23.85	-0.20	-16.40	-11.87								
4-Jan-2012	18:00:00	-24.02	0.25	-15.02	-11.44								
4-Jan-2012	24:00:00	-22.98	0.25	-15.02	-12.07								
5-Jan-2012	06:00:00	-22.77	0.16	-15.28	-11.70								
5-Jan-2012	12:00:00	-22.84	0.09	-15.11	-12.24								
5-Jan-2012	18:00:00	-23.29	0.07	-15.14	-11.94								
5-Jan-2012	24:00:00	-22.89	0.41	-14.86	-12.34								
6-Jan-2012	06:00:00	-23.29	0.23	-15.07	-12.08								
6-Jan-2012	12:00:00	-23.19	0.11	-15.05	-12.65								
6-Jan-2012	18:00:00	-23.41	0.04	-15.30	-12.53								
6-Jan-2012	24:00:00	-22.83	0.25	-14.95	-12.61								
7-Jan-2012	06:00:00	-22.84	0.30	-14.90	-12.42								
7-Jan-2012	12:00:00	-23.07	0.31	-14.87	-12.91								
7-Jan-2012	18:00:00	-23.43	-0.01	-15.22	-12.83								
7-Jan-2012	24:00:00	-23.08	0.16	-14.98	-13.13								
8-Jan-2012	06:00:00	-23.48	0.15	-15.01	-13.18								
8-Jan-2012	12:00:00	-23.84	0.17	-14.95	-13.61								
8-Jan-2012	18:00:00	-24.20	-0.14	-15.18	-13.37								
8-Jan-2012	24:00:00	-23.94	0.12	-15.00	-13.58								
9-Jan-2012	06:00:00	-23.86	0.71	-14.76	-11.88							0.01	
9-Jan-2012	12:00:00	-23.65	0.64	-14.88	-12.22								
9-Jan-2012	18:00:00	-23.61	0.55	-14.94	-11.94								
9-Jan-2012	24:00:00	-23.05	0.61	-14.87	-12.34								
10-Jan-2012	06:00:00	-22.98	0.84	-14.84	-11.22								
10-Jan-2012	12:00:00	-22.84	0.90	-14.80	-11.51								
10-Jan-2012	18:00:00	-23.32	0.55	-15.11	-11.47								
10-Jan-2012	24:00:00	-22.71	0.66	-14.77	-11.63								
11-Jan-2012	06:00:00	-22.81	0.61	-14.88	-11.40							0.02	
11-Jan-2012	12:00:00	-22.39	0.76	-14.77	-11.76								
11-Jan-2012	18:00:00	-22.27	0.97	-14.77	-10.42								
11-Jan-2012	24:00:00	-14.64	1.56	-14.76	-6.02								
12-Jan-2012	06:00:00	-9.80	1.79	-14.69	-5.23							0.96	
12-Jan-2012	12:00:00	-10.71	1.48	-14.72	-5.71								
12-Jan-2012	18:00:00	-12.92	1.15	-15.10	-5.78								
12-Jan-2012	24:00:00	-13.68	1.19	-14.87	-6.02								
13-Jan-2012	06:00:00	-14.53	1.21	-14.74	-6.66								
13-Jan-2012	12:00:00	-16.33	1.05	-14.87	-6.66								

												Weatherstation Rainfall Data	
Date	Time	Water Level (inches)							On-site Manual Raingauge	On-site Auto Rainguage	On-site Monthly Total	Albemarle Daily Rainfall	Albemarle Monthly Rainfall
dd-mmm-yyyy	hh:mm:ss	RP AW1	RP AW2	RP RAW1	RP RAW2	CG1	CG2	CG3					
13-Jan-2012	18:00:00	-17.62	0.63	-15.24	-7.43								
13-Jan-2012	24:00:00	-18.13	0.76	-14.84	-8.41								
14-Jan-2012	06:00:00	-18.85	0.69	-14.81	-8.46								
14-Jan-2012	12:00:00	-19.52	0.54	-15.19	-9.26								
14-Jan-2012	18:00:00	-20.12	0.37	-15.07	-9.06								
14-Jan-2012	24:00:00	-19.77	0.51	-14.98	-9.79								
15-Jan-2012	06:00:00	-20.04	0.45	-14.96	-9.62								
15-Jan-2012	12:00:00	-20.43	0.33	-15.13	-10.46								
15-Jan-2012	18:00:00	-21.68	0.22	-15.02	-10.28								
15-Jan-2012	24:00:00	-21.68	0.27	-14.92	-10.87								
16-Jan-2012	06:00:00	-22.12	0.18	-15.07	-10.78								
16-Jan-2012	12:00:00	-22.24	0.09	-15.32	-11.18								
16-Jan-2012	18:00:00	-22.22	-0.05	-15.10	-11.32								
16-Jan-2012	24:00:00	-21.26	0.33	-14.95	-11.08								
17-Jan-2012	06:00:00	-21.15	0.23	-14.95	-11.10								
17-Jan-2012	12:00:00	-20.62	0.29	-14.88	-11.41								
17-Jan-2012	18:00:00	-20.61	0.22	-15.10	-11.08								
17-Jan-2012	24:00:00	-19.98	0.33	-14.98	-11.06								
18-Jan-2012	06:00:00	-7.03	1.65	-14.71	-3.35							0.82	
18-Jan-2012	12:00:00	7.18	4.19	-14.48	-3.05								
18-Jan-2012	18:00:00	0.87	2.03	-14.95	-2.12								
18-Jan-2012	24:00:00	-3.25	1.73	-14.74	-2.80								
19-Jan-2012	06:00:00	-7.26	1.43	-14.84	-2.68								
19-Jan-2012	12:00:00	-9.44	1.37	-14.81	-2.98								
19-Jan-2012	18:00:00	-11.28	1.08	-15.05	-3.13								
19-Jan-2012	24:00:00	-11.84	1.05	-14.95	-3.74								
20-Jan-2012	06:00:00	-12.70	1.13	-14.84	-3.92								
20-Jan-2012	12:00:00	-13.45	1.01	-14.94	-4.27								
20-Jan-2012	18:00:00	-14.38	0.85	-15.02	-4.49								
20-Jan-2012	24:00:00	-14.83	1.42	-14.65	-3.96								
21-Jan-2012	06:00:00	-13.94	1.53	-14.72	-3.61								
21-Jan-2012	12:00:00	-8.38	1.75	-14.78	-3.70								
21-Jan-2012	18:00:00	-5.97	1.54	-14.86	-4.20								
21-Jan-2012	24:00:00	6.86	3.39	-14.66	-3.91								
22-Jan-2012	06:00:00	4.29	2.49	-14.77	-3.06								
22-Jan-2012	12:00:00	0.21	1.81	-14.82	-2.50								
22-Jan-2012	18:00:00	-3.37	1.51	-14.77	-2.65								
22-Jan-2012	24:00:00	-5.29	1.43	-14.86	-3.23								
23-Jan-2012	06:00:00	-6.75	1.49	-14.82	-3.36							0.71	
23-Jan-2012	12:00:00	-7.29	1.44	-14.80	-3.77								
23-Jan-2012	18:00:00	-5.77	1.87	-14.62	-3.26								
23-Jan-2012	24:00:00	-4.42	1.68	-14.75	-3.80								
24-Jan-2012	06:00:00	-5.05	1.53	-14.80	-3.58								
24-Jan-2012	12:00:00	-5.77	1.42	-14.75	-3.84								
24-Jan-2012	18:00:00	-7.08	1.33	-14.89	-3.71								
24-Jan-2012	24:00:00	-7.63	1.26	-14.83	-4.37								
25-Jan-2012	06:00:00	-8.46	1.33	-14.83	-4.27								
25-Jan-2012	12:00:00	-9.00	1.27	-14.70	-4.45								
25-Jan-2012	18:00:00	-9.96	0.96	-15.19	-4.22								
25-Jan-2012	24:00:00	-9.55	1.20	-14.76	-4.84								

												Weatherstation Rainfall Data	
Date	Time	Water Level (inches)							On-site Manual Raingauge	On-site Auto Rainguage	On-site Monthly Total	Albemarle Daily Rainfall	Albemarle Monthly Rainfall
dd-mmm-yyyy	hh:mm:ss	RP AW1	RP AW2	RP RAW1	RP RAW2	CG1	CG2	CG3					
26-Jan-2012	06:00:00	-9.97	1.03	-14.76	-4.72								
26-Jan-2012	12:00:00	-10.10	1.09	-14.84	-4.90								
26-Jan-2012	18:00:00	-10.20	0.89	-14.99	-4.60								
26-Jan-2012	24:00:00	-9.57	1.03	-14.82	-4.98								
27-Jan-2012	06:00:00	-9.26	1.06	-14.84	-5.15							0.30	
27-Jan-2012	12:00:00	7.56	5.55	-14.23	-2.76								
27-Jan-2012	18:00:00	4.22	2.37	-14.89	-3.17								
27-Jan-2012	24:00:00	1.36	1.75	-14.81	-2.75								
28-Jan-2012	06:00:00	-1.02	1.67	-14.74	-2.87								
28-Jan-2012	12:00:00	-3.06	1.51	-14.77	-3.55								
28-Jan-2012	18:00:00	-4.93	1.17	-15.10	-3.38								
28-Jan-2012	24:00:00	-5.62	1.33	-14.89	-3.85								
29-Jan-2012	06:00:00	-7.24	1.25	-14.82	-3.43								
29-Jan-2012	12:00:00	-8.11	1.12	-14.86	-4.00								
29-Jan-2012	18:00:00	-9.14	0.78	-15.20	-4.12								
29-Jan-2012	24:00:00	-8.71	0.90	-14.94	-4.79								
30-Jan-2012	06:00:00	-9.22	0.95	-14.83	-4.94								
30-Jan-2012	12:00:00	-9.88	0.82	-14.98	-5.42								
30-Jan-2012	18:00:00	-10.78	0.55	-15.18	-4.93								
30-Jan-2012	24:00:00	-10.47	0.64	-15.06	-5.57								
31-Jan-2012	06:00:00	-10.86	0.70	-14.98	-5.41								
31-Jan-2012	12:00:00	-10.93	0.60	-14.93	-5.57								
31-Jan-2012	18:00:00	-11.43	0.40	-15.24	-5.56								
31-Jan-2012	24:00:00	-10.87	0.54	-14.94	-6.08								2.82
1-Feb-2012	06:00:00	-11.28	0.60	-14.96	-5.89								
1-Feb-2012	12:00:00	-11.30	0.55	-14.92	-6.48								
1-Feb-2012	18:00:00	-11.50	0.51	-15.08	-6.77								
1-Feb-2012	24:00:00	-10.99	0.61	-14.89	-7.37								
2-Feb-2012	06:00:00	-11.02	0.67	-14.81	-7.70							0.10	
2-Feb-2012	12:00:00	-10.84	0.77	-14.81	-6.82								
2-Feb-2012	18:00:00	-11.83	0.55	-15.10	-7.75								
2-Feb-2012	24:00:00	-11.92	0.51	-15.07	-8.75								
3-Feb-2012	06:00:00	-12.84	0.55	-14.95	-9.02								
3-Feb-2012	12:00:00	-13.08	0.46	-14.87	-9.50								
3-Feb-2012	18:00:00	-13.62	0.07	-15.19	-9.78								
3-Feb-2012	24:00:00	-12.90	0.23	-15.07	-10.16								
4-Feb-2012	06:00:00	-12.94	0.23	-15.02	-9.97								
4-Feb-2012	12:00:00	-12.74	0.22	-15.02	-10.39								
4-Feb-2012	18:00:00	-12.66	0.84	-14.75	-9.85								
4-Feb-2012	24:00:00	-11.82	0.65	-15.07	-8.27								
5-Feb-2012	06:00:00	-11.67	1.00	-14.84	-7.92							0.53	
5-Feb-2012	12:00:00	7.59	3.69	-14.74	-3.10								
5-Feb-2012	18:00:00	5.80	1.92	-14.84	-3.17								
5-Feb-2012	24:00:00	4.12	1.56	-14.90	-3.95								
6-Feb-2012	06:00:00	2.54	1.48	-14.90	-3.46								
6-Feb-2012	12:00:00	1.24	1.38	-14.83	-3.52								
6-Feb-2012	18:00:00	0.12	1.19	-15.00	-3.28								
6-Feb-2012	24:00:00	-0.31	1.12	-14.92	-3.92								
7-Feb-2012	06:00:00	-0.91	1.27	-14.80	-3.86								
7-Feb-2012	12:00:00	-1.60	1.17	-14.83	-4.37								

												Weatherstation Rainfall Data	
Date	Time	Water Level (inches)							On-site Manual Raingauge	On-site Auto Rainguage	On-site Monthly Total	Albemarle Daily Rainfall	Albemarle Monthly Rainfall
dd-mmm-yyyy	hh:mm:ss	RP AW1	RP AW2	RP RAW1	RP RAW2	CG1	CG2	CG3					
7-Feb-2012	18:00:00	-2.53	0.88	-15.07	-4.56								
7-Feb-2012	24:00:00	-2.78	0.96	-14.89	-5.18								
8-Feb-2012	06:00:00	-3.40	0.89	-14.83	-4.99								
8-Feb-2012	12:00:00	-3.63	0.84	-14.77	-5.03								
8-Feb-2012	18:00:00	-4.47	0.65	-14.99	-5.09								
8-Feb-2012	24:00:00	-4.38	0.84	-14.84	-5.30								
9-Feb-2012	06:00:00	-4.92	0.88	-14.76	-5.24								
9-Feb-2012	12:00:00	-5.54	0.66	-14.86	-5.59								
9-Feb-2012	18:00:00	-6.25	0.39	-15.17	-5.62								
9-Feb-2012	24:00:00	-5.70	0.61	-14.94	-6.01								
10-Feb-2012	06:00:00	-6.06	0.55	-14.89	-6.14								
10-Feb-2012	12:00:00	-5.90	0.53	-14.90	-6.64								
10-Feb-2012	18:00:00	-6.08	0.37	-15.05	-6.91								
10-Feb-2012	24:00:00	-5.20	0.54	-14.99	-7.22								
11-Feb-2012	06:00:00	-4.92	0.57	-14.90	-7.69								
11-Feb-2012	12:00:00	-4.44	0.58	-14.93	-8.24								
11-Feb-2012	18:00:00	-5.18	0.51	-15.08	-8.34								
11-Feb-2012	24:00:00	-6.50	0.36	-15.11	-9.37								
12-Feb-2012	06:00:00	-7.62	0.18	-15.74	-9.67								
12-Feb-2012	12:00:00	-8.13	-0.09	-16.80	-10.22								
12-Feb-2012	18:00:00	-8.84	0.11	-14.94	-10.25								
12-Feb-2012	24:00:00	-8.24	0.09	-15.07	-10.92								
13-Feb-2012	06:00:00	-8.79	0.15	-15.23	-10.63								
13-Feb-2012	12:00:00	-9.06	-0.32	-16.22	-10.73								
13-Feb-2012	18:00:00	-9.27	0.24	-14.95	-10.63								
13-Feb-2012	24:00:00	-8.70	0.10	-15.12	-11.03								
14-Feb-2012	06:00:00	-8.85	0.17	-15.01	-10.98								
14-Feb-2012	12:00:00	-8.67	0.25	-14.99	-11.16								
14-Feb-2012	18:00:00	-9.44	-0.08	-15.36	-10.88								
14-Feb-2012	24:00:00	-9.06	0.09	-15.07	-11.21								
15-Feb-2012	06:00:00	-9.56	0.16	-14.96	-11.16								
15-Feb-2012	12:00:00	-9.99	0.10	-14.98	-11.38								
15-Feb-2012	18:00:00	-10.68	-0.08	-15.26	-11.29								
15-Feb-2012	24:00:00	-10.27	0.06	-15.13	-11.71								
16-Feb-2012	06:00:00	-10.44	0.15	-14.95	-11.34								
16-Feb-2012	12:00:00	-10.62	0.05	-15.00	-11.83								
16-Feb-2012	18:00:00	-10.00	0.37	-14.88	-11.74								
16-Feb-2012	24:00:00	-9.38	0.37	-14.94	-11.09								
17-Feb-2012	06:00:00	-9.57	0.47	-14.88	-10.70								
17-Feb-2012	12:00:00	-9.72	0.49	-14.84	-11.20								
17-Feb-2012	18:00:00	-10.52	0.24	-15.16	-11.27								
17-Feb-2012	24:00:00	-10.12	0.27	-15.11	-11.56								
18-Feb-2012	06:00:00	-10.34	0.21	-15.02	-11.24								
18-Feb-2012	12:00:00	-10.48	0.28	-14.92	-11.77								
18-Feb-2012	18:00:00	-10.74	-0.09	-15.31	-11.66								
18-Feb-2012	24:00:00	-9.99	0.09	-15.12	-11.75								
19-Feb-2012	06:00:00	-9.87	0.24	-14.98	-11.50								
19-Feb-2012	12:00:00	-9.46	0.27	-14.89	-11.70								
19-Feb-2012	18:00:00	-9.57	0.85	-14.66	-10.80								
19-Feb-2012	24:00:00	-8.73	1.59	-14.50	-8.36								

												Weatherstation Rainfall Data	
Date	Time	Water Level (inches)							On-site Manual Raingauge	On-site Auto Rainguage	On-site Monthly Total	Albemarle Daily Rainfall	Albemarle Monthly Rainfall
dd-mmm-yyyy	hh:mm:ss	RP AW1	RP AW2	RP RAW1	RP RAW2	CG1	CG2	CG3					
20-Feb-2012	06:00:00	-5.77	1.59	-14.78	-5.39								
20-Feb-2012	12:00:00	-5.54	1.39	-14.77	-7.27								
20-Feb-2012	18:00:00	-6.43	0.90	-15.11	-8.51								
20-Feb-2012	24:00:00	-6.04	0.84	-15.04	-9.43								
21-Feb-2012	06:00:00	-6.40	0.82	-14.92	-9.58								
21-Feb-2012	12:00:00	-6.06	0.72	-15.00	-10.38								
21-Feb-2012	18:00:00	-6.14	0.36	-15.22	-9.78								
21-Feb-2012	24:00:00	-4.66	0.63	-15.02	-9.95								
22-Feb-2012	06:00:00	-4.78	0.65	-14.90	-9.86								
22-Feb-2012	12:00:00	-4.60	0.63	-14.89	-10.18								
22-Feb-2012	18:00:00	-4.69	0.37	-15.11	-10.09								
22-Feb-2012	24:00:00	-3.82	0.51	-15.08	-10.01								
23-Feb-2012	06:00:00	-3.54	0.55	-14.88	-10.09							0.10	
23-Feb-2012	12:00:00	-0.13	1.50	-14.71	-5.56								
23-Feb-2012	18:00:00	-0.40	1.13	-15.01	-6.43								
23-Feb-2012	24:00:00	-0.40	1.03	-14.99	-7.20								
24-Feb-2012	06:00:00	-0.55	1.12	-14.69	-7.22							0.10	
24-Feb-2012	12:00:00	-1.06	1.03	-14.83	-7.66								
24-Feb-2012	18:00:00	-1.52	0.93	-14.90	-7.15								
24-Feb-2012	24:00:00	-1.88	0.99	-14.63	-8.34								
25-Feb-2012	06:00:00	-3.96	0.67	-14.92	-8.65								
25-Feb-2012	12:00:00	-4.69	0.66	-14.84	-9.29								
25-Feb-2012	18:00:00	-5.58	0.13	-15.32	-9.64								
25-Feb-2012	24:00:00	-5.86	0.16	-15.28	-10.69								
26-Feb-2012	06:00:00	-6.84	0.37	-15.04	-10.00								
26-Feb-2012	12:00:00	-7.71	0.07	-15.18	-10.78								
26-Feb-2012	18:00:00	-8.20	-0.15	-15.41	-10.44								
26-Feb-2012	24:00:00	-7.78	-0.01	-15.43	-10.60								
27-Feb-2012	06:00:00	-7.78	-0.01	-15.12	-10.26								
27-Feb-2012	12:00:00	-8.23	-0.12	-15.23	-10.80								
27-Feb-2012	18:00:00	-8.30	0.07	-14.96	-10.48								
27-Feb-2012	24:00:00	-7.62	0.16	-15.01	-9.61								
28-Feb-2012	06:00:00	-7.66	0.21	-15.05	-9.50							0.12	
28-Feb-2012	12:00:00	-7.59	0.22	-15.05	-10.24								
28-Feb-2012	18:00:00	-8.05	0.09	-15.24	-10.08								
28-Feb-2012	24:00:00	-7.15	0.27	-15.10	-10.50								0.95
29-Feb-2012	06:00:00	-7.00	0.37	-14.89	-10.21								
29-Feb-2012	12:00:00	-6.75	0.13	-15.01	-10.56								
29-Feb-2012	18:00:00	-6.22	0.17	-15.02	-10.56								
29-Feb-2012	24:00:00	-5.47	0.28	-14.99	-10.61								
1-Mar-2012	06:00:00	-5.30	0.48	-14.86	-10.18								
1-Mar-2012	12:00:00	-5.01	0.42	-14.83	-10.13								
1-Mar-2012	18:00:00	-5.42	0.25	-15.19	-9.98								
1-Mar-2012	24:00:00	-5.07	0.25	-15.20	-10.67								
2-Mar-2012	06:00:00	-5.89	0.27	-14.89	-10.66								
2-Mar-2012	12:00:00	-6.25	0.19	-14.99	-10.81								
2-Mar-2012	18:00:00	-1.81	1.39	-14.75	-4.74								
2-Mar-2012	24:00:00	1.25	1.30	-14.81	-5.00								
3-Mar-2012	06:00:00	1.26	1.08	-14.86	-6.10								
3-Mar-2012	12:00:00	8.08	4.91	-14.32	-2.84								

												Weatherstation Rainfall Data	
Date	Time	Water Level (inches)							On-site Manual Raingauge	On-site Auto Rainguage	On-site Monthly Total	Albemarle Daily Rainfall	Albemarle Monthly Rainfall
dd-mmm-yyyy	hh:mm:ss	RP AW1	RP AW2	RP RAW1	RP RAW2	CG1	CG2	CG3					
3-Mar-2012	18:00:00	7.92	2.75	-14.53	-1.49								
3-Mar-2012	24:00:00	6.44	1.77	-14.80	-2.50								
4-Mar-2012	06:00:00	5.63	1.74	-14.69	-2.56								
4-Mar-2012	12:00:00	5.34	1.65	-14.64	-3.10								
4-Mar-2012	18:00:00	3.96	1.41	-15.04	-2.74								
4-Mar-2012	24:00:00	2.67	1.25	-14.89	-3.11								
5-Mar-2012	06:00:00	1.53	1.21	-14.78	-2.58							1.22	
5-Mar-2012	12:00:00	1.14	1.09	-14.92	-2.83								
5-Mar-2012	18:00:00	-0.52	0.71	-15.25	-3.47								
5-Mar-2012	24:00:00	-1.64	0.78	-15.20	-3.52								
6-Mar-2012	06:00:00	-2.80	0.64	-15.06	-3.89								
6-Mar-2012	12:00:00	-3.42	0.53	-15.06	-4.38								
6-Mar-2012	18:00:00	-4.15	0.27	-15.48	-4.32								
6-Mar-2012	24:00:00	-3.80	0.59	-15.30	-4.82								
7-Mar-2012	06:00:00	-4.35	0.58	-15.04	-4.56	0.85	0.00	0.30					
7-Mar-2012	12:00:00	-4.29	0.46	-15.00	-5.21								
7-Mar-2012	18:00:00	-4.50	0.29	-15.10	-5.09								
7-Mar-2012	24:00:00	-3.85	0.51	-14.86	-5.36								
8-Mar-2012	06:00:00	-3.61	0.66	-14.60	-5.36								
8-Mar-2012	12:00:00	-3.84	0.45	-14.69	-5.71								
8-Mar-2012	18:00:00	-3.73	0.30	-14.94	-5.83								
8-Mar-2012	24:00:00	-3.12	0.47	-14.80	-6.30								
9-Mar-2012	06:00:00	-2.98	0.59	-14.60	-6.67								
9-Mar-2012	12:00:00	0.24	1.62	-14.33	-4.06								
9-Mar-2012	18:00:00	2.15	1.33	-14.60	-4.10								
9-Mar-2012	24:00:00	1.18	1.06	-14.53	-5.16								
10-Mar-2012	06:00:00	-0.06	0.95	-14.50	-5.22								
10-Mar-2012	12:00:00	-1.29	0.81	-14.56	-6.20								
10-Mar-2012	18:00:00	-2.42	0.42	-14.96	-6.36								
10-Mar-2012	24:00:00	-2.65	0.39	-14.93	-7.01								
11-Mar-2012	06:00:00	-3.20	0.42	-14.62	-7.30								
11-Mar-2012	12:00:00	-3.62	0.41	-14.62	-7.93								
11-Mar-2012	18:00:00	-4.21	0.06	-15.01	-8.06								
11-Mar-2012	24:00:00	-3.86	0.12	-15.01	-8.53								
12-Mar-2012	06:00:00	-3.94	0.28	-14.68	-8.32							0.19	
12-Mar-2012	12:00:00	-4.03	0.19	-14.59	-8.53								
12-Mar-2012	18:00:00	-4.44	-0.01	-15.00	-8.58								
12-Mar-2012	24:00:00	-4.00	0.07	-14.78	-8.99								
13-Mar-2012	06:00:00	-3.98	0.27	-14.54	-8.93							0.30	
13-Mar-2012	12:00:00	-4.10	0.21	-14.53	-9.19								
13-Mar-2012	18:00:00	-4.50	-0.02	-14.81	-9.08								
13-Mar-2012	24:00:00	-4.12	0.21	-14.82	-9.36								
14-Mar-2012	06:00:00	-4.47	0.28	-14.48	-9.17								
14-Mar-2012	12:00:00	-4.59	0.21	-14.56	-9.85								
14-Mar-2012	18:00:00	-5.23	-0.11	-14.88	-9.58								
14-Mar-2012	24:00:00	-5.11	-0.03	-14.89	-10.01								
15-Mar-2012	06:00:00	-5.38	0.15	-14.66	-9.79								
15-Mar-2012	12:00:00	-5.71	-0.03	-14.71	-10.24								
15-Mar-2012	18:00:00	-6.18	-0.35	-15.01	-10.13								
15-Mar-2012	24:00:00	-5.89	-0.15	-14.83	-10.78								

												Weatherstation Rainfall Data	
Date	Time	Water Level (inches)							On-site Manual Raingauge	On-site Auto Rainguage	On-site Monthly Total	Albemarle Daily Rainfall	Albemarle Monthly Rainfall
dd-mmm-yyyy	hh:mm:ss	RP AW1	RP AW2	RP RAW1	RP RAW2	CG1	CG2	CG3					
16-Mar-2012	06:00:00	-5.91	0.00	-14.53	-10.16								
16-Mar-2012	12:00:00	-6.01	-0.11	-14.54	-10.43								
16-Mar-2012	18:00:00	-6.51	-0.39	-14.95	-10.42								
16-Mar-2012	24:00:00	-6.20	-0.25	-14.88	-10.72								
17-Mar-2012	06:00:00	-6.78	-0.11	-14.74	-10.43								
17-Mar-2012	12:00:00	-6.82	-0.19	-14.66	-10.96								
17-Mar-2012	18:00:00	-7.48	-0.68	-15.24	-10.88								
17-Mar-2012	24:00:00	-7.15	-0.43	-15.06	-11.38								
18-Mar-2012	06:00:00	-7.64	-0.24	-14.58	-10.40								
18-Mar-2012	12:00:00	-7.74	-0.43	-14.77	-11.11								
18-Mar-2012	18:00:00	-8.23	-0.48	-14.86	-10.87								
18-Mar-2012	24:00:00	-7.66	-0.51	-14.92	-11.41								
19-Mar-2012	06:00:00	-7.76	-0.32	-14.75	-11.09							0.40	
19-Mar-2012	12:00:00	-7.92	-0.36	-14.63	-11.46								
19-Mar-2012	18:00:00	-8.26	-0.68	-15.12	-11.21								
19-Mar-2012	24:00:00	-8.02	-0.75	-15.34	-11.69								
20-Mar-2012	06:00:00	-8.35	-0.49	-14.95	-11.30								
20-Mar-2012	12:00:00	-8.68	-0.55	-14.89	-11.81								
20-Mar-2012	18:00:00	-9.16	-0.95	-15.49	-11.52								
20-Mar-2012	24:00:00	-8.64	-0.81	-15.47	-12.14								
21-Mar-2012	06:00:00	-9.39	-0.08	-14.45	-10.49							0.06	
21-Mar-2012	12:00:00	-9.25	-0.23	-14.41	-10.93								
21-Mar-2012	18:00:00	-9.79	-0.53	-14.84	-11.10								
21-Mar-2012	24:00:00	-9.12	-0.55	-14.93	-11.62								
22-Mar-2012	06:00:00	-9.57	-0.53	-14.71	-11.33								
22-Mar-2012	12:00:00	-9.61	-0.60	-14.75	-11.90								
22-Mar-2012	18:00:00	-9.85	-0.79	-15.05	-11.77								
22-Mar-2012	24:00:00	-9.43	-0.91	-15.25	-12.47								
23-Mar-2012	06:00:00	-9.46	-0.66	-14.98	-11.98								
23-Mar-2012	12:00:00	-9.52	-0.75	-14.92	-12.29								
23-Mar-2012	18:00:00	-9.78	-1.14	-15.56	-12.19								
23-Mar-2012	24:00:00	-9.18	-1.14	-15.78	-12.73								
24-Mar-2012	06:00:00	-9.18	-0.44	-14.53	-9.43								
24-Mar-2012	12:00:00	-1.62	1.48	-14.12	-2.45								
24-Mar-2012	18:00:00	0.23	1.14	-14.48	-3.16								
24-Mar-2012	24:00:00	-0.27	0.95	-14.45	-5.24								
25-Mar-2012	06:00:00	-0.60	0.89	-14.28	-4.06								
25-Mar-2012	12:00:00	1.64	1.30	-14.28	-3.30								
25-Mar-2012	18:00:00	0.95	0.93	-14.46	-3.52								
25-Mar-2012	24:00:00	-0.39	0.61	-14.58	-4.14								
26-Mar-2012	06:00:00	-1.26	0.61	-14.40	-3.50							0.64	
26-Mar-2012	12:00:00	-2.04	0.54	-14.40	-3.73								
26-Mar-2012	18:00:00	-3.34	-0.14	-15.13	-3.74								
26-Mar-2012	24:00:00	-3.74	-0.08	-15.40	-4.68								
27-Mar-2012	06:00:00	-4.87	-0.03	-15.20	-4.55								
27-Mar-2012	12:00:00	-5.77	-0.20	-15.25	-4.70								
27-Mar-2012	18:00:00	-6.69	-0.78	-16.24	-4.67								
27-Mar-2012	24:00:00	-6.46	-0.72	-16.58	-5.27								
28-Mar-2012	06:00:00	-6.69	-0.66	-16.26	-5.38								
28-Mar-2012	12:00:00	-6.74	-0.72	-16.09	-5.75								

												Weatherstation Rainfall Data	
Date	Time	Water Level (inches)							On-site Manual Raingauge	On-site Auto Rainguage	On-site Monthly Total	Albemarle Daily Rainfall	Albemarle Monthly Rainfall
dd-mmm-yyyy	hh:mm:ss	RP AW1	RP AW2	RP RAW1	RP RAW2	CG1	CG2	CG3					
28-Mar-2012	18:00:00	-6.62	-1.02	-16.50	-5.38								
28-Mar-2012	24:00:00	-5.74	-1.03	-17.11	-6.10								
29-Mar-2012	06:00:00	-6.18	-0.92	-16.49	-6.18								
29-Mar-2012	12:00:00	-6.52	-0.98	-16.30	-6.70								
29-Mar-2012	18:00:00	-7.33	-1.52	-17.65	-6.94								
29-Mar-2012	24:00:00	-7.33	-1.69	-18.50	-8.38								
30-Mar-2012	06:00:00	-7.99	-1.44	-18.00	-8.88								
30-Mar-2012	12:00:00	-8.46	-1.50	-17.77	-9.77								
30-Mar-2012	18:00:00	-8.95	-2.18	-19.08	-9.65								
30-Mar-2012	24:00:00	-8.62	-2.24	-20.03	-10.32								2.81
31-Mar-2012	06:00:00	-8.78	-1.31	-16.22	-9.52								
31-Mar-2012	12:00:00	-8.72	0.03	-14.35	-7.70								
31-Mar-2012	18:00:00	-2.56	0.53	-14.69	-2.68								
31-Mar-2012	24:00:00	-2.71	0.04	-14.78	-4.55								
1-Apr-2012	06:00:00	-3.62	0.09	-14.60	-4.98								
1-Apr-2012	12:00:00	-4.51	-0.05	-14.62	-5.78								
1-Apr-2012	18:00:00	-5.37	-0.50	-15.16	-5.64								
1-Apr-2012	24:00:00	-5.20	-0.44	-15.08	-6.66								
2-Apr-2012	06:00:00	-5.10	-0.31	-15.05	-6.52								
2-Apr-2012	12:00:00	-5.35	-0.49	-15.10	-7.46								
2-Apr-2012	18:00:00	-6.37	-0.91	-15.43	-7.15								
2-Apr-2012	24:00:00	-7.09	-1.17	-16.33	-8.63								
3-Apr-2012	06:00:00	-8.08	-0.98	-16.10	-9.19								
3-Apr-2012	12:00:00	-8.56	-1.20	-16.20	-9.66								
3-Apr-2012	18:00:00	-9.01	-1.58	-17.17	-9.59								
3-Apr-2012	24:00:00	-8.86	-1.67	-17.68	-10.62								
4-Apr-2012	06:00:00	-5.95	1.31	-14.18	-2.00							0.15	
4-Apr-2012	12:00:00	-1.98	0.57	-14.44	-3.71								
4-Apr-2012	18:00:00	-2.65	-0.09	-14.98	-4.56								
4-Apr-2012	24:00:00	-3.26	-0.09	-15.11	-5.88								
5-Apr-2012	06:00:00	-4.23	0.10	-14.90	-5.47								
5-Apr-2012	12:00:00	-4.53	-0.05	-14.92	-5.88								
5-Apr-2012	18:00:00	-5.88	-0.48	-15.46	-5.93								
5-Apr-2012	24:00:00	-6.44	-0.35	-15.52	-7.22								
6-Apr-2012	06:00:00	-3.90	0.58	-14.42	-3.41								
6-Apr-2012	12:00:00	-4.11	0.82	-14.17	-4.52								
6-Apr-2012	18:00:00	-1.22	0.41	-14.80	-3.08								
6-Apr-2012	24:00:00	-2.54	0.10	-15.11	-4.79								
7-Apr-2012	06:00:00	-3.98	0.17	-15.05	-4.82								
7-Apr-2012	12:00:00	-4.81	-0.02	-15.20	-5.32								
7-Apr-2012	18:00:00	-5.76	-0.60	-15.97	-5.23								
7-Apr-2012	24:00:00	-6.13	-0.69	-16.79	-6.52								
8-Apr-2012	06:00:00	-6.33	-0.41	-16.42	-6.38								
8-Apr-2012	12:00:00	-6.43	-0.50	-16.60	-6.78								
8-Apr-2012	18:00:00	-6.96	-1.15	-17.83	-6.68								
8-Apr-2012	24:00:00	-7.50	-1.33	-19.68	-8.12								
9-Apr-2012	06:00:00	-7.76	-0.97	-18.40	-8.32							0.45	
9-Apr-2012	12:00:00	-8.47	-1.15	-18.47	-8.83								
9-Apr-2012	18:00:00	-9.10	-1.85	-20.32	-9.05								
9-Apr-2012	24:00:00	-9.38	-2.13	-23.09	-10.46								

												Weatherstation Rainfall Data	
Date	Time	Water Level (inches)							On-site Manual Raingauge	On-site Auto Rainguage	On-site Monthly Total	Albemarle Daily Rainfall	Albemarle Monthly Rainfall
dd-mmm-yyyy	hh:mm:ss	RP AW1	RP AW2	RP RAW1	RP RAW2	CG1	CG2	CG3					
10-Apr-2012	06:00:00	-9.85	-1.83	-21.94	-10.43								
10-Apr-2012	12:00:00	-10.23	-1.91	-21.42	-10.67								
10-Apr-2012	18:00:00	-10.70	-2.76	-23.14	-10.98								
10-Apr-2012	24:00:00	-11.05	-2.81	-24.76	-11.71								
11-Apr-2012	06:00:00	-11.38	-2.51	-23.95	-11.80								
11-Apr-2012	12:00:00	-12.06	-2.72	-24.25	-11.88								
11-Apr-2012	18:00:00	-12.69	-3.81	-25.74	-12.16								
11-Apr-2012	24:00:00	-13.41	-4.68	-27.43	-13.33								
12-Apr-2012	06:00:00	-13.86	-4.28	-28.25	-13.13								
12-Apr-2012	12:00:00	-14.12	-4.41	-28.61	-13.73								
12-Apr-2012	18:00:00	-14.50	-5.34	-29.06	-13.66								
12-Apr-2012	24:00:00	-14.68	-6.19	-29.50	-14.45								
13-Apr-2012	06:00:00	-14.88	-5.66	-29.65	-14.18								
13-Apr-2012	12:00:00	-14.90	-5.87	-29.88	-14.53								
13-Apr-2012	18:00:00	-15.55	-7.08	-30.26	-14.38								
13-Apr-2012	24:00:00	-16.18	-8.10	-30.50	-15.47								
14-Apr-2012	06:00:00	-16.30	-7.51	-30.60	-15.16								
14-Apr-2012	12:00:00	-16.41	-7.77	-30.91	-15.47								
14-Apr-2012	18:00:00	-16.98	-9.01	-31.30	-15.59								
14-Apr-2012	24:00:00	-17.18	-10.26	-30.97	-16.63								
15-Apr-2012	06:00:00	-17.34	-9.59	-31.06	-16.15								
15-Apr-2012	12:00:00	-17.12	-9.73	-31.24	-16.43								
15-Apr-2012	18:00:00	-17.76	-10.55	-31.50	-16.15								
15-Apr-2012	24:00:00	-18.25	-11.69	-31.24	-17.41								
16-Apr-2012	06:00:00	-18.43	-11.30	-31.43	-17.04								
16-Apr-2012	12:00:00	-18.46	-11.46	-31.42	-17.32								
16-Apr-2012	18:00:00	-19.12	-12.66	-31.90	-17.41								
16-Apr-2012	24:00:00	-19.99	-14.01	-31.85	-18.70								
17-Apr-2012	06:00:00	-20.06	-14.00	-31.76	-18.43								
17-Apr-2012	12:00:00	-20.04	-14.23	-32.02	-18.92								
17-Apr-2012	18:00:00	-20.67	-15.02	-32.51	-19.10								
17-Apr-2012	24:00:00	-21.42	-16.15	-32.22	-20.21								
18-Apr-2012	06:00:00	-21.90	-16.26	-32.32	-20.48							0.33	
18-Apr-2012	12:00:00	-21.64	-16.39	-32.21	-20.47								
18-Apr-2012	18:00:00	-22.12	-16.91	-32.59	-20.54								
18-Apr-2012	24:00:00	-22.41	-17.33	-32.68	-21.36								
19-Apr-2012	06:00:00	-22.41	-15.97	-32.54	-20.69							0.15	
19-Apr-2012	12:00:00	-22.35	-15.62	-32.30	-20.50								
19-Apr-2012	18:00:00	-22.56	-16.53	-32.28	-20.03								
19-Apr-2012	24:00:00	-22.78	-17.65	-31.74	-21.14								
20-Apr-2012	06:00:00	-22.80	-17.79	-31.57	-20.78								
20-Apr-2012	12:00:00	-22.76	-18.31	-31.91	-21.24								
20-Apr-2012	18:00:00	-23.23	-18.71	-32.45	-21.25								
20-Apr-2012	24:00:00	-24.00	-19.38	-32.56	-22.31								
21-Apr-2012	06:00:00	-24.00	-19.58	-32.50	-22.18								
21-Apr-2012	12:00:00	-23.82	-19.94	-32.57	-22.08								
21-Apr-2012	18:00:00	-24.34	-20.37	-33.05	-22.22								
21-Apr-2012	24:00:00	-25.12	-20.94	-33.08	-23.51								
22-Apr-2012	06:00:00	-25.36	-21.11	-32.98	-23.00								
22-Apr-2012	12:00:00	-24.97	-11.88	-31.03	-20.84								

												Weatherstation Rainfall Data	
Date	Time	Water Level (inches)							On-site Manual Raingauge	On-site Auto Rainguage	On-site Monthly Total	Albemarle Daily Rainfall	Albemarle Monthly Rainfall
dd-mmm-yyyy	hh:mm:ss	RP AW1	RP AW2	RP RAW1	RP RAW2	CG1	CG2	CG3					
22-Apr-2012	18:00:00	-24.74	-5.05	-21.54	-14.23								
22-Apr-2012	24:00:00	-24.43	-0.49	-15.17	-8.20								
23-Apr-2012	06:00:00	-24.31	-0.97	-15.73	-8.44								
23-Apr-2012	12:00:00	-23.64	-1.81	-16.22	-10.18								
23-Apr-2012	18:00:00	-23.98	-2.77	-17.22	-11.30								
23-Apr-2012	24:00:00	-24.52	-3.77	-18.65	-12.85								
24-Apr-2012	06:00:00	-24.57	-4.53	-19.18	-13.22								
24-Apr-2012	12:00:00	-24.46	-5.28	-19.69	-13.93								
24-Apr-2012	18:00:00	-25.32	-7.01	-21.22	-14.76								
24-Apr-2012	24:00:00	-26.17	-8.75	-24.19	-16.31								
25-Apr-2012	06:00:00	-26.30	-8.82	-24.90	-16.51							0.06	
25-Apr-2012	12:00:00	-26.47	-8.04	-22.91	-16.98								
25-Apr-2012	18:00:00	-26.60	-7.55	-21.23	-16.44								
25-Apr-2012	24:00:00	-26.85	-9.78	-24.04	-17.82								
26-Apr-2012	06:00:00	-26.68	-9.53	-24.77	-17.27								
26-Apr-2012	12:00:00	-26.41	-9.84	-25.12	-17.63								
26-Apr-2012	18:00:00	-26.80	-10.79	-25.60	-18.02								
26-Apr-2012	24:00:00	-26.90	-11.88	-26.93	-18.80								
27-Apr-2012	06:00:00	-26.88	-12.13	-27.25	-18.97								
27-Apr-2012	12:00:00	-26.77	-12.56	-27.38	-19.33								
27-Apr-2012	18:00:00	-26.90	-13.80	-28.24	-19.93								
27-Apr-2012	24:00:00	-26.86	-15.30	-29.06	-21.54								
28-Apr-2012	06:00:00	-26.74	-15.85	-29.46	-21.55								
28-Apr-2012	12:00:00	-26.66	-16.38	-29.80	-22.40								
28-Apr-2012	18:00:00	-26.82	-17.06	-30.36	-22.49								
28-Apr-2012	24:00:00	-26.72	-17.79	-30.71	-23.06								
29-Apr-2012	06:00:00	-26.58	-18.26	-30.79	-23.29								
29-Apr-2012	12:00:00	-26.61	-18.50	-31.13	-23.21								
29-Apr-2012	18:00:00	-26.86	-19.05	-31.37	-22.85								
29-Apr-2012	24:00:00	-26.80	-19.83	-31.68	-24.65								1.14
30-Apr-2012	06:00:00	-26.60	-20.27	-31.68	-24.44								
30-Apr-2012	12:00:00	-26.72	-20.69	-31.96	-24.98								
30-Apr-2012	18:00:00	-26.83	-21.17	-32.52	-24.71								
30-Apr-2012	24:00:00	-26.71	-21.75	-32.75	-26.44								
1-May-2012	06:00:00	-26.56	-22.07	-32.83	-26.23								
1-May-2012	12:00:00	-26.55	-22.27	-32.93	-26.71								
1-May-2012	18:00:00	-26.83	-22.93	-33.71	-27.25								
1-May-2012	24:00:00	-26.71	-23.60	-34.13	-29.00								
2-May-2012	06:00:00	-26.43	-23.66	-34.01	-28.80								
2-May-2012	12:00:00	-26.48	-24.17	-34.32	-29.26								
2-May-2012	18:00:00	-26.78	-24.75	-35.12	-29.95								
2-May-2012	24:00:00	-26.71	-25.39	-35.68	-31.69								
3-May-2012	06:00:00	-26.50	-25.53	-35.50	-31.40								
3-May-2012	12:00:00	-26.52	-25.69	-35.60	-31.79								
3-May-2012	18:00:00	-26.82	-26.39	-36.35	-32.46								
3-May-2012	24:00:00	-26.54	-26.39	-36.84	-34.54								
4-May-2012	06:00:00	-26.41	-26.33	-36.60	-33.86								
4-May-2012	12:00:00	-26.47	-26.37	-36.61	-34.03								
4-May-2012	18:00:00	-26.71	-26.59	-37.37	-34.40								
4-May-2012	24:00:00	-26.56	-26.36	-37.82	-36.77								

												Weatherstation Rainfall Data	
Date	Time	Water Level (inches)							On-site Manual Raingauge	On-site Auto Rainguage	On-site Monthly Total	Albemarle Daily Rainfall	Albemarle Monthly Rainfall
dd-mmm-yyyy	hh:mm:ss	RP AW1	RP AW2	RP RAW1	RP RAW2	CG1	CG2	CG3					
5-May-2012	06:00:00	-26.48	-26.21	-37.48	-36.36								
5-May-2012	12:00:00	-26.41	-26.22	-37.48	-36.37								
5-May-2012	18:00:00	-26.71	-26.39	-38.17	-37.07								
5-May-2012	24:00:00	-26.64	-26.23	-38.74	-39.17								
6-May-2012	06:00:00	-26.49	-26.21	-38.57	-38.57								
6-May-2012	12:00:00	-26.53	-26.17	-38.65	-38.82								
6-May-2012	18:00:00	-26.48	-26.21	-38.95	-38.38								
6-May-2012	24:00:00	-26.56	-26.19	-39.10	-38.81								
7-May-2012	06:00:00	-26.38	-25.99	-38.90	-38.42								
7-May-2012	12:00:00	-26.54	-26.11	-39.05	-38.89								
7-May-2012	18:00:00	-26.67	-26.31	-39.18	-38.69								
7-May-2012	24:00:00	-26.58	-26.22	-39.12	-38.95								
8-May-2012	06:00:00	-26.46	-26.04	-39.05	-38.44								
8-May-2012	12:00:00	-26.46	-26.03	-38.96	-38.62								
8-May-2012	18:00:00	-26.68	-26.28	-38.99	-38.52								
8-May-2012	24:00:00	-26.59	-26.21	-38.98	-38.64								
9-May-2012	06:00:00	-26.44	-26.11	-38.86	-38.59							0.53	
9-May-2012	12:00:00	-26.43	-26.09	-37.36	-38.82								
9-May-2012	18:00:00	-26.54	-26.28	-36.64	-38.48								
9-May-2012	24:00:00	-26.47	-26.10	-28.94	-38.96								
10-May-2012	06:00:00	-26.32	-25.91	-27.22	-36.60	0.00	0.00	0.00				0.24	
10-May-2012	12:00:00	-26.50	-26.04	-28.73	-35.84								
10-May-2012	18:00:00	-26.72	-26.25	-31.06	-36.06								
10-May-2012	24:00:00	-26.67	-26.18	-32.77	-38.32								
11-May-2012	06:00:00	-26.38	-25.99	-33.55	-38.48								
11-May-2012	12:00:00	-26.53	-26.07	-34.44	-38.65								
11-May-2012	18:00:00	-26.76	-26.30	-35.78	-39.07								
11-May-2012	24:00:00	-26.77	-26.33	-36.73	-38.65								
12-May-2012	06:00:00	-26.55	-26.15	-36.83	-38.82								
12-May-2012	12:00:00	-26.52	-26.12	-37.10	-38.60								
12-May-2012	18:00:00	-26.77	-26.42	-37.92	-38.93								
12-May-2012	24:00:00	-26.55	-26.22	-38.32	-38.53								
13-May-2012	06:00:00	-26.47	-26.15	-38.21	-38.88								
13-May-2012	12:00:00	-26.49	-26.12	-38.30	-38.62								
13-May-2012	18:00:00	-26.68	-26.34	-38.72	-38.84								
13-May-2012	24:00:00	-26.59	-26.27	-38.84	-38.68								
14-May-2012	06:00:00	-26.58	-26.22	-37.27	-39.14							0.52	
14-May-2012	12:00:00	-26.54	-26.29	-34.42	-38.71								
14-May-2012	18:00:00	-26.68	-14.63	-14.92	-24.56								
14-May-2012	24:00:00	-26.65	-11.34	-16.64	-22.38								
15-May-2012	06:00:00	-26.58	-11.25	-14.96	-4.58							0.83	
15-May-2012	12:00:00	-21.06	-0.56	-14.86	-6.80								
15-May-2012	18:00:00	-25.53	-1.40	-15.43	-11.36								
15-May-2012	24:00:00	-26.67	-1.77	-15.91	-11.71								
16-May-2012	06:00:00	-26.53	-1.28	-15.94	-12.83								
16-May-2012	12:00:00	-26.50	-1.40	-16.19	-14.52								
16-May-2012	18:00:00	-26.70	-2.34	-17.24	-17.45								
16-May-2012	24:00:00	-26.70	-2.73	-18.25	-17.60								
17-May-2012	06:00:00	-26.53	-2.41	-18.28	-18.34								
17-May-2012	12:00:00	-26.53	-2.71	-18.80	-19.32								

												Weatherstation Rainfall Data	
Date	Time	Water Level (inches)							On-site Manual Raingauge	On-site Auto Rainguage	On-site Monthly Total	Albemarle Daily Rainfall	Albemarle Monthly Rainfall
dd-mmm-yyyy	hh:mm:ss	RP AW1	RP AW2	RP RAW1	RP RAW2	CG1	CG2	CG3					
17-May-2012	18:00:00	-26.67	-3.81	-20.46	-22.38								
17-May-2012	24:00:00	-26.43	-3.83	-22.64	-23.34								
18-May-2012	06:00:00	-26.56	-3.85	-23.24	-23.96								
18-May-2012	12:00:00	-26.53	-3.95	-23.78	-25.25								
18-May-2012	18:00:00	-26.62	-5.37	-25.40	-28.54								
18-May-2012	24:00:00	-26.59	-6.56	-26.75	-28.96								
19-May-2012	06:00:00	-26.43	-6.24	-27.44	-29.39								
19-May-2012	12:00:00	-26.48	-6.24	-28.15	-30.95								
19-May-2012	18:00:00	-26.71	-8.00	-29.38	-33.70								
19-May-2012	24:00:00	-26.60	-9.08	-30.24	-33.35								
20-May-2012	06:00:00	-26.43	-8.95	-30.40	-33.60								
20-May-2012	12:00:00	-26.50	-9.21	-30.76	-34.79								
20-May-2012	18:00:00	-26.72	-10.88	-31.87	-37.27								
20-May-2012	24:00:00	-26.66	-12.53	-32.87	-36.89								
21-May-2012	06:00:00	-26.55	-12.31	-32.50	-37.03								
21-May-2012	12:00:00	-26.55	-12.81	-32.81	-38.12								
21-May-2012	18:00:00	-26.65	-14.12	-33.55	-39.06								
21-May-2012	24:00:00	-26.55	-15.66	-34.45	-38.44								
22-May-2012	06:00:00	-26.31	-15.97	-34.04	-38.89								
22-May-2012	12:00:00	-26.46	-16.35	-33.94	-38.64								
22-May-2012	18:00:00	-26.64	-17.71	-35.05	-38.99								
22-May-2012	24:00:00	-26.56	-18.90	-35.80	-38.34								
23-May-2012	06:00:00	-26.49	-19.21	-35.82	-38.94							0.16	
23-May-2012	12:00:00	-26.46	-19.51	-35.77	-38.84								
23-May-2012	18:00:00	-26.73	-20.37	-36.47	-38.99								
23-May-2012	24:00:00	-26.62	-21.41	-37.22	-38.58								
24-May-2012	06:00:00	-26.47	-21.26	-37.10	-38.98								
24-May-2012	12:00:00	-26.49	-21.60	-37.38	-38.65								
24-May-2012	18:00:00	-26.68	-22.27	-37.87	-39.17								
24-May-2012	24:00:00	-26.62	-23.30	-38.60	-38.52								
25-May-2012	06:00:00	-26.43	-23.33	-38.51	-38.81								
25-May-2012	12:00:00	-26.42	-23.84	-38.58	-38.69								
25-May-2012	18:00:00	-26.71	-24.84	-39.05	-39.10								
25-May-2012	24:00:00	-26.70	-26.03	-39.07	-38.71								
26-May-2012	06:00:00	-26.53	-26.07	-38.83	-38.75								
26-May-2012	12:00:00	-26.52	-26.33	-38.78	-38.77								
26-May-2012	18:00:00	-26.77	-26.40	-38.90	-39.04								
26-May-2012	24:00:00	-26.59	-26.40	-38.75	-38.50								
27-May-2012	06:00:00	-26.37	-26.09	-38.41	-38.83								
27-May-2012	12:00:00	-26.44	-26.19	-38.52	-38.75								
27-May-2012	18:00:00	-26.76	-26.37	-38.80	-39.10								
27-May-2012	24:00:00	-26.68	-26.41	-38.74	-38.65								
28-May-2012	06:00:00	-26.41	-26.12	-38.46	-38.83								
28-May-2012	12:00:00	-26.52	-26.29	-38.56	-38.59								
28-May-2012	18:00:00	-26.59	-26.37	-38.68	-38.81								
28-May-2012	24:00:00	-26.43	-26.19	-38.50	-38.44								
29-May-2012	06:00:00	-26.37	-26.07	-38.39	-38.77							0.12	
29-May-2012	12:00:00	-26.48	-26.27	-38.48	-38.71								
29-May-2012	18:00:00	-26.71	-26.42	-38.63	-38.58								
29-May-2012	24:00:00	-26.42	-26.16	-38.42	-38.46								

												Weatherstation Rainfall Data	
Date	Time	Water Level (inches)							On-site Manual Raingauge	On-site Auto Rainguage	On-site Monthly Total	Albemarle Daily Rainfall	Albemarle Monthly Rainfall
dd-mmm-yyyy	hh:mm:ss	RP AW1	RP AW2	RP RAW1	RP RAW2	CG1	CG2	CG3					
30-May-2012	06:00:00	-26.44	-26.13	-38.50	-38.82							0.10	
30-May-2012	12:00:00	-26.52	-26.23	-38.54	-38.77								
30-May-2012	18:00:00	-26.74	-26.37	-38.83	-39.00								
30-May-2012	24:00:00	-26.62	-26.42	-38.70	-38.59						0.00		2.50
31-May-2012	06:00:00	-26.40	-26.16	-38.48	-38.82								
31-May-2012	12:00:00	-26.49	-26.24	-38.50	-38.76								
31-May-2012	18:00:00	-26.67	-26.43	-38.66	-38.92								
31-May-2012	24:00:00	-26.60	-26.33	-38.64	-38.70								
1-Jun-2012	06:00:00	-26.36	-26.11	-38.45	-39.07								
1-Jun-2012	12:00:00	-26.43	-26.22	-38.51	-38.58								
1-Jun-2012	18:00:00	-26.61	-26.35	-38.64	-38.88								
1-Jun-2012	24:00:00	-26.47	-26.30	-38.59	-38.48								
2-Jun-2012	06:00:00	-26.37	-26.15	-38.59	-38.92								
2-Jun-2012	12:00:00	-26.47	-26.23	-38.53	-38.56								
2-Jun-2012	18:00:00	-26.64	-26.39	-38.71	-39.02								
2-Jun-2012	24:00:00	-26.54	-26.39	-38.66	-38.63								
3-Jun-2012	06:00:00	-26.40	-26.11	-38.53	-38.89								
3-Jun-2012	12:00:00	-26.54	-26.33	-38.65	-39.10								
3-Jun-2012	18:00:00	-26.66	-26.42	-38.77	-39.00								
3-Jun-2012	24:00:00	-26.56	-26.31	-38.69	-38.71								
4-Jun-2012	06:00:00	-26.24	-26.04	-38.34	-38.65							0.15	
4-Jun-2012	12:00:00	-26.47	-26.21	-38.54	-38.74								
4-Jun-2012	18:00:00	-26.67	-26.42	-38.71	-38.93								
4-Jun-2012	24:00:00	-26.58	-26.27	-38.63	-38.44								
5-Jun-2012	06:00:00	-26.46	-26.22	-38.59	-38.76								
5-Jun-2012	12:00:00	-26.47	-26.19	-38.63	-38.80								
5-Jun-2012	18:00:00	-26.76	-26.39	-38.77	-38.89								
5-Jun-2012	24:00:00	-26.55	-26.30	-38.69	-38.45								
6-Jun-2012	06:00:00	-26.43	-26.21	-38.54	-38.96							0.08	
6-Jun-2012	12:00:00	-26.37	-26.13	-38.51	-38.80								
6-Jun-2012	18:00:00	-26.59	-26.22	-38.60	-39.00								
6-Jun-2012	24:00:00	-26.54	-26.34	-38.65	-38.63								
7-Jun-2012	06:00:00	-26.42	-26.10	-38.46	-38.74							0.30	
7-Jun-2012	12:00:00	-26.47	-26.25	-38.52	-38.82								
7-Jun-2012	18:00:00	-26.70	-26.37	-38.81	-39.05								
7-Jun-2012	24:00:00	-26.65	-26.45	-38.75	-38.59								
8-Jun-2012	06:00:00	-26.43	-26.23	-38.54	-38.80								
8-Jun-2012	12:00:00	-26.46	-26.24	-38.52	-38.80								
8-Jun-2012	18:00:00	-26.74	-26.46	-38.82	-38.96								
8-Jun-2012	24:00:00	-26.43	-26.24	-38.65	-38.40								
9-Jun-2012	06:00:00	-26.37	-26.15	-38.41	-38.72								
9-Jun-2012	12:00:00	-26.42	-26.21	-38.54	-38.70								
9-Jun-2012	18:00:00	-26.62	-26.37	-38.74	-38.90								
9-Jun-2012	24:00:00	-26.50	-26.31	-38.59	-38.53								
10-Jun-2012	06:00:00	-26.37	-26.17	-38.57	-38.88								
10-Jun-2012	12:00:00	-26.44	-26.29	-38.56	-38.72								
10-Jun-2012	18:00:00	-26.59	-26.43	-38.78	-38.75								
10-Jun-2012	24:00:00	-26.46	-26.27	-38.59	-38.28								
11-Jun-2012	06:00:00	-26.46	-26.15	-38.52	-39.00								
11-Jun-2012	12:00:00	-26.50	-26.24	-38.60	-38.59								

												Weatherstation Rainfall Data	
Date	Time	Water Level (inches)							On-site Manual Raingauge	On-site Auto Rainguage	On-site Monthly Total	Albemarle Daily Rainfall	Albemarle Monthly Rainfall
dd-mmm-yyyy	hh:mm:ss	RP AW1	RP AW2	RP RAW1	RP RAW2	CG1	CG2	CG3					
11-Jun-2012	18:00:00	-26.67	-26.41	-38.69	-38.96								
11-Jun-2012	24:00:00	-26.49	-26.28	-38.60	-38.44								
12-Jun-2012	06:00:00	-26.38	-26.21	-38.48	-38.77							0.32	
12-Jun-2012	12:00:00	-26.58	-26.31	-38.63	-38.88								
12-Jun-2012	18:00:00	-26.62	-26.35	-38.72	-39.18								
12-Jun-2012	24:00:00	-26.71	-26.33	-38.82	-38.86								
13-Jun-2012	06:00:00	-26.62	-26.23	-38.71	-38.82							0.13	
13-Jun-2012	12:00:00	-26.48	-26.19	-38.60	-39.00								
13-Jun-2012	18:00:00	-26.80	-26.52	-38.87	-38.86								
13-Jun-2012	24:00:00	-26.50	-26.33	-38.59	-38.72								
14-Jun-2012	06:00:00	-26.40	-26.12	-38.48	-39.02								
14-Jun-2012	12:00:00	-26.43	-26.17	-38.52	-38.84								
14-Jun-2012	18:00:00	-26.77	-26.46	-38.83	-39.26								
14-Jun-2012	24:00:00	-26.67	-26.37	-38.72	-38.57								
15-Jun-2012	06:00:00	-26.52	-26.23	-38.54	-38.86								
15-Jun-2012	12:00:00	-26.44	-26.21	-38.53	-38.54								
15-Jun-2012	18:00:00	-26.66	-26.46	-38.82	-38.94								
15-Jun-2012	24:00:00	-26.56	-26.41	-38.69	-38.56								
16-Jun-2012	06:00:00	-26.41	-26.13	-38.46	-38.63								
16-Jun-2012	12:00:00	-26.36	-26.10	-38.53	-38.75								
16-Jun-2012	18:00:00	-26.70	-26.41	-38.69	-38.92								
16-Jun-2012	24:00:00	-26.54	-26.35	-38.66	-38.56								
17-Jun-2012	06:00:00	-26.32	-26.10	-38.36	-38.74								
17-Jun-2012	12:00:00	-26.40	-26.23	-38.54	-38.68								
17-Jun-2012	18:00:00	-26.62	-26.36	-38.69	-39.05								
17-Jun-2012	24:00:00	-26.53	-26.30	-38.60	-38.53								
18-Jun-2012	06:00:00	-26.34	-26.10	-38.46	-38.82								
18-Jun-2012	12:00:00	-26.47	-26.23	-38.51	-38.74								
18-Jun-2012	18:00:00	-26.76	-26.54	-38.75	-38.96								
18-Jun-2012	24:00:00	-26.60	-26.37	-38.57	-38.50								
19-Jun-2012	06:00:00	-26.42	-26.19	-38.46	-38.59								
19-Jun-2012	12:00:00	-26.38	-26.12	-38.44	-38.66								
19-Jun-2012	18:00:00	-26.59	-26.40	-38.74	-38.82								
19-Jun-2012	24:00:00	-26.54	-26.25	-38.59	-38.50								
20-Jun-2012	06:00:00	-26.30	-26.16	-38.36	-38.72								
20-Jun-2012	12:00:00	-26.46	-26.23	-38.59	-38.59								
20-Jun-2012	18:00:00	-26.65	-26.42	-38.74	-38.68								
20-Jun-2012	24:00:00	-26.22	-26.07	-38.34	-38.42								
21-Jun-2012	06:00:00	-26.31	-26.13	-38.36	-38.59							0.18	
21-Jun-2012	12:00:00	-26.34	-26.06	-38.45	-38.65								
21-Jun-2012	18:00:00	-26.68	-26.39	-38.74	-38.99								
21-Jun-2012	24:00:00	-26.47	-26.24	-38.57	-38.38								
22-Jun-2012	06:00:00	-26.30	-25.97	-38.44	-38.56								
22-Jun-2012	12:00:00	-26.23	-25.97	-38.35	-38.63								
22-Jun-2012	18:00:00	-26.54	-26.24	-38.64	-38.66								
22-Jun-2012	24:00:00	-26.37	-26.12	-38.47	-38.40								
23-Jun-2012	06:00:00	-26.22	-26.06	-38.48	-38.63								
23-Jun-2012	12:00:00	-26.35	-26.04	-38.46	-38.58								
23-Jun-2012	18:00:00	-26.49	-26.17	-38.68	-38.90								
23-Jun-2012	24:00:00	-26.44	-26.27	-38.60	-38.14								

												Weatherstation Rainfall Data	
Date	Time	Water Level (inches)							On-site Manual Raingauge	On-site Auto Rainguage	On-site Monthly Total	Albemarle Daily Rainfall	Albemarle Monthly Rainfall
dd-mmm-yyyy	hh:mm:ss	RP AW1	RP AW2	RP RAW1	RP RAW2	CG1	CG2	CG3					
24-Jun-2012	06:00:00	-26.24	-26.04	-38.38	-38.62								
24-Jun-2012	12:00:00	-26.29	-26.07	-38.45	-38.40								
24-Jun-2012	18:00:00	-26.52	-26.34	-38.65	-38.26								
24-Jun-2012	24:00:00	-26.25	-26.13	-38.39	-38.17								
25-Jun-2012	06:00:00	-26.34	-26.11	-38.39	-38.57							0.20	
25-Jun-2012	12:00:00	-26.34	-26.06	-38.30	-38.53								
25-Jun-2012	18:00:00	-26.56	-26.30	-38.62	-38.76								
25-Jun-2012	24:00:00	-26.40	-26.23	-38.51	-38.58								
26-Jun-2012	06:00:00	-26.26	-25.97	-38.32	-38.57							0.52	
26-Jun-2012	12:00:00	-26.31	-26.07	-38.41	-38.20								
26-Jun-2012	18:00:00	-26.53	-26.31	-38.66	-38.87								
26-Jun-2012	24:00:00	-26.44	-26.25	-38.56	-38.44								
27-Jun-2012	06:00:00	-26.36	-26.16	-38.50	-38.64								
27-Jun-2012	12:00:00	-26.32	-26.15	-38.46	-38.53								
27-Jun-2012	18:00:00	-26.60	-26.43	-38.64	-38.82								
27-Jun-2012	24:00:00	-26.54	-26.43	-38.59	-38.24								
28-Jun-2012	06:00:00	-26.32	-26.12	-38.40	-38.63								
28-Jun-2012	12:00:00	-26.41	-26.10	-38.50	-38.63								
28-Jun-2012	18:00:00	-26.55	-26.33	-38.70	-38.70								
28-Jun-2012	24:00:00	-26.53	-26.37	-38.63	-38.26								
29-Jun-2012	06:00:00	-26.26	-26.10	-38.44	-38.59								
29-Jun-2012	12:00:00	-26.37	-26.05	-38.44	-38.60								
29-Jun-2012	18:00:00	-26.62	-26.43	-38.77	-38.58								
29-Jun-2012	24:00:00	-26.42	-26.16	-38.52	-38.09						0.00		1.88
30-Jun-2012	06:00:00	-26.37	-26.10	-38.50	-38.29								
30-Jun-2012	12:00:00	-26.35	-26.13	-38.42	-38.47								
30-Jun-2012	18:00:00	-26.53	-26.35	-38.71	-38.87								
30-Jun-2012	24:00:00	-26.38	-26.11	-38.48	-38.18								
1-Jul-2012	06:00:00	-26.23	-25.99	-38.24	-38.52								
1-Jul-2012	12:00:00	-26.30	-26.01	-38.23	-38.59								
1-Jul-2012	18:00:00	-26.50	-26.17	-38.52	-38.86								
1-Jul-2012	24:00:00	-26.41	-26.04	-38.39	-37.91								
2-Jul-2012	06:00:00	-26.30	-26.06	-38.44	-37.99								
2-Jul-2012	12:00:00	-26.25	-25.97	-38.27	-38.22								
2-Jul-2012	18:00:00	-26.47	-26.25	-38.58	-38.74								
2-Jul-2012	24:00:00	-26.48	-26.16	-38.53	-38.22								
3-Jul-2012	06:00:00	-26.31	-25.94	-38.32	-38.51								
3-Jul-2012	12:00:00	-26.37	-25.92	-38.36	-38.36								
3-Jul-2012	18:00:00	-26.56	-26.27	-38.54	-38.64								
3-Jul-2012	24:00:00	-26.38	-26.11	-38.44	-38.04								
4-Jul-2012	06:00:00	-26.24	-25.99	-38.34	-38.53								
4-Jul-2012	12:00:00	-26.25	-25.99	-38.38	-38.41								
4-Jul-2012	18:00:00	-26.53	-26.24	-38.54	-38.94								
4-Jul-2012	24:00:00	-26.43	-26.09	-38.39	-38.28								
5-Jul-2012	06:00:00	-26.24	-25.99	-38.24	-38.44							0.30	
5-Jul-2012	12:00:00	-26.26	-26.01	-38.38	-38.29								
5-Jul-2012	18:00:00	-26.52	-26.15	-38.50	-39.46								
5-Jul-2012	24:00:00	-26.37	-26.07	-38.50	-38.26								
6-Jul-2012	06:00:00	-26.34	-26.00	-38.34	-38.44								
6-Jul-2012	12:00:00	-26.26	-26.04	-38.33	-38.57								

												Weatherstation Rainfall Data	
Date	Time	Water Level (inches)							On-site Manual Raingauge	On-site Auto Rainguage	On-site Monthly Total	Albemarle Daily Rainfall	Albemarle Monthly Rainfall
dd-mmm-yyyy	hh:mm:ss	RP AW1	RP AW2	RP RAW1	RP RAW2	CG1	CG2	CG3					
6-Jul-2012	18:00:00	-26.53	-26.35	-38.58	-38.84								
6-Jul-2012	24:00:00	-26.49	-26.19	-38.50	-38.26								
7-Jul-2012	06:00:00	-26.26	-26.00	-38.36	-38.32								
7-Jul-2012	12:00:00	-26.30	-26.03	-38.40	-38.33								
7-Jul-2012	18:00:00	-26.56	-26.29	-38.57	-38.68								
7-Jul-2012	24:00:00	-26.40	-26.10	-38.48	-38.29								
8-Jul-2012	06:00:00	-26.29	-26.03	-38.34	-38.56								
8-Jul-2012	12:00:00	-26.40	-26.04	-38.47	-38.53								
8-Jul-2012	18:00:00	-26.56	-26.25	-38.62	-38.33								
8-Jul-2012	24:00:00	-26.38	-26.06	-38.42	-38.26								
9-Jul-2012	06:00:00	-26.19	-25.86	-38.28	-38.46								
9-Jul-2012	12:00:00	-26.30	-26.00	-38.33	-38.32								
9-Jul-2012	18:00:00	-26.35	-26.18	-38.53	-37.86								
9-Jul-2012	24:00:00	-26.17	-25.87	-38.39	-37.94								
10-Jul-2012	06:00:00	-26.29	-25.97	-38.32	-38.52							0.84	
10-Jul-2012	12:00:00	-26.26	-25.98	-38.30	-38.05								
10-Jul-2012	18:00:00	-26.50	-26.18	-38.57	-38.39								
10-Jul-2012	24:00:00	-26.28	-25.93	-38.30	-38.11								
11-Jul-2012	06:00:00	-26.34	-26.05	-38.44	-38.77							1.14	
11-Jul-2012	12:00:00	-26.29	-26.04	-38.40	-38.30								
11-Jul-2012	18:00:00	-26.55	-26.18	-38.52	-38.66								
11-Jul-2012	24:00:00	-26.30	-26.06	-38.36	-38.23								
12-Jul-2012	06:00:00	-26.34	-26.03	-38.36	-38.54							0.08	
12-Jul-2012	12:00:00	-26.36	-26.07	-38.32	-38.46								
12-Jul-2012	18:00:00	-26.49	-26.13	-38.51	-38.68								
12-Jul-2012	24:00:00	-26.52	-26.15	-38.50	-38.22								
13-Jul-2012	06:00:00	-26.32	-25.97	-38.28	-38.48								
13-Jul-2012	12:00:00	-26.35	-25.99	-38.38	-38.38								
13-Jul-2012	18:00:00	-26.58	-26.27	-38.65	-38.59								
13-Jul-2012	24:00:00	-26.31	-26.01	-38.32	-38.23								
14-Jul-2012	06:00:00	-26.34	-25.99	-38.36	-38.76								
14-Jul-2012	12:00:00	-26.46	-26.19	-38.45	-38.28								
14-Jul-2012	18:00:00	-26.42	-26.15	-38.46	-38.93								
14-Jul-2012	24:00:00	-26.47	-26.10	-38.54	-38.09								
15-Jul-2012	06:00:00	-26.26	-26.03	-38.39	-38.66								
15-Jul-2012	12:00:00	-26.35	-25.99	-38.36	-38.29								
15-Jul-2012	18:00:00	-26.53	-26.28	-38.60	-38.77								
15-Jul-2012	24:00:00	-26.28	-26.09	-38.45	-38.14								
16-Jul-2012	06:00:00	-26.28	-26.04	-38.34	-38.54								
16-Jul-2012	12:00:00	-26.23	-25.95	-38.32	-38.22								
16-Jul-2012	18:00:00	-26.55	-26.27	-38.57	-38.47								
16-Jul-2012	24:00:00	-26.38	-26.15	-38.38	-38.24								
17-Jul-2012	06:00:00	-26.32	-26.03	-38.35	-38.52							0.16	
17-Jul-2012	12:00:00	-26.31	-26.00	-38.34	-38.45								
17-Jul-2012	18:00:00	-26.50	-26.25	-38.54	-38.51								
17-Jul-2012	24:00:00	-26.28	-26.01	-38.42	-38.04								
18-Jul-2012	06:00:00	-26.26	-25.87	-38.28	-38.56								
18-Jul-2012	12:00:00	-26.32	-26.16	-38.42	-38.56								
18-Jul-2012	18:00:00	-26.61	-26.36	-38.68	-38.89								
18-Jul-2012	24:00:00	-26.38	-26.07	-38.50	-38.45								

												Weatherstation Rainfall Data	
Date	Time	Water Level (inches)							On-site Manual Raingauge	On-site Auto Rainguage	On-site Monthly Total	Albemarle Daily Rainfall	Albemarle Monthly Rainfall
dd-mmm-yyyy	hh:mm:ss	RP AW1	RP AW2	RP RAW1	RP RAW2	CG1	CG2	CG3					
19-Jul-2012	06:00:00	-26.32	-26.04	-38.44	-38.51								
19-Jul-2012	12:00:00	-26.26	-26.01	-38.36	-38.28								
19-Jul-2012	18:00:00	-26.50	-26.25	-38.64	-38.68								
19-Jul-2012	24:00:00	-26.14	-25.92	-38.29	-38.14								
20-Jul-2012	06:00:00	-17.85	-26.01	-21.36	-38.62								
20-Jul-2012	12:00:00	-23.20	-26.12	-27.41	-38.53								
20-Jul-2012	18:00:00	-26.62	-26.34	-32.06	-38.58								
20-Jul-2012	24:00:00	-26.25	-25.85	-35.18	-38.16								
21-Jul-2012	06:00:00	-26.25	-25.98	-37.99	-38.59								
21-Jul-2012	12:00:00	-26.36	-26.06	-38.68	-38.45								
21-Jul-2012	18:00:00	-26.46	-26.21	-38.69	-38.87								
21-Jul-2012	24:00:00	-26.24	-26.03	-38.47	-38.17								
22-Jul-2012	06:00:00	-26.29	-25.94	-38.41	-38.28								
22-Jul-2012	12:00:00	-26.28	-25.93	-38.41	-38.40								
22-Jul-2012	18:00:00	-26.65	-26.29	-38.69	-38.70								
22-Jul-2012	24:00:00	-26.37	-26.01	-38.48	-38.33								
23-Jul-2012	06:00:00	-26.32	-26.06	-38.41	-38.50								
23-Jul-2012	12:00:00	-26.32	-26.07	-38.47	-38.45								
23-Jul-2012	18:00:00	-26.61	-26.34	-38.70	-37.99								
23-Jul-2012	24:00:00	-26.38	-26.01	-28.33	-38.05								
24-Jul-2012	06:00:00	-26.30	-26.04	-26.57	-38.32							0.63	
24-Jul-2012	12:00:00	-26.18	-25.93	-31.30	-38.48								
24-Jul-2012	18:00:00	-26.55	-26.35	-35.48	-37.93								
24-Jul-2012	24:00:00	-26.40	-26.22	-38.56	-38.53								
25-Jul-2012	06:00:00	-26.34	-25.99	-38.40	-38.64							1.02	
25-Jul-2012	12:00:00	-26.34	-26.04	-38.44	-38.56								
25-Jul-2012	18:00:00	-26.59	-26.31	-38.63	-38.52								
25-Jul-2012	24:00:00	-26.41	-26.11	-38.48	-38.22								
26-Jul-2012	06:00:00	-26.36	-25.97	-38.39	-38.53								
26-Jul-2012	12:00:00	-26.36	-25.98	-38.30	-38.22								
26-Jul-2012	18:00:00	-26.58	-26.22	-38.52	-38.38								
26-Jul-2012	24:00:00	-26.42	-26.10	-38.47	-38.08								
27-Jul-2012	06:00:00	-26.25	-26.04	-38.36	-38.18								
27-Jul-2012	12:00:00	-26.19	-25.95	-38.26	-38.39								
27-Jul-2012	18:00:00	-26.58	-26.34	-38.59	-38.65								
27-Jul-2012	24:00:00	-26.40	-26.06	-38.46	-38.28								
28-Jul-2012	06:00:00	-26.28	-26.07	-38.29	-38.32								
28-Jul-2012	12:00:00	-26.30	-26.09	-38.34	-38.26								
28-Jul-2012	18:00:00	-26.55	-26.22	-38.47	-38.90								
28-Jul-2012	24:00:00	-26.42	-26.15	-38.51	-38.10								
29-Jul-2012	06:00:00	-26.24	-25.95	-38.21	-38.71								
29-Jul-2012	12:00:00	-26.32	-25.94	-38.23	-38.33								
29-Jul-2012	18:00:00	-26.53	-26.19	-38.53	-38.80								
29-Jul-2012	24:00:00	-26.42	-26.10	-38.40	-38.16								
30-Jul-2012	06:00:00	-26.29	-25.99	-38.32	-38.45								
30-Jul-2012	12:00:00	-26.37	-26.09	-38.29	-38.29								
30-Jul-2012	18:00:00	-26.55	-26.23	-38.51	-38.64								
30-Jul-2012	24:00:00	-26.35	-26.00	-38.38	-38.22								4.17
31-Jul-2012	06:00:00	-26.29	-25.93	-38.36	-38.76								
31-Jul-2012	12:00:00	-26.46	-26.15	-38.48	-38.57								

												Weatherstation Rainfall Data	
Date	Time	Water Level (inches)							On-site Manual Raingauge	On-site Auto Rainguage	On-site Monthly Total	Albemarle Daily Rainfall	Albemarle Monthly Rainfall
dd-mmm-yyyy	hh:mm:ss	RP AW1	RP AW2	RP RAW1	RP RAW2	CG1	CG2	CG3					
31-Jul-2012	18:00:00	-26.59	-26.24	-38.53	-38.56								
31-Jul-2012	24:00:00	-26.47	-26.07	-38.45	-38.17								
1-Aug-2012	06:00:00	-26.32	-25.95	-38.35	-38.48								
1-Aug-2012	12:00:00	-26.46	-26.05	-38.40	-38.48								
1-Aug-2012	18:00:00	-26.58	-26.18	-38.57	-38.72								
1-Aug-2012	24:00:00	-26.48	-26.25	-38.53	-38.24								
2-Aug-2012	06:00:00	-26.31	-26.06	-38.44	-38.47								
2-Aug-2012	12:00:00	-26.28	-25.87	-38.26	-38.40								
2-Aug-2012	18:00:00	-26.52	-26.23	-38.50	-39.07								
2-Aug-2012	24:00:00	-26.40	-26.00	-38.41	-38.18								
3-Aug-2012	06:00:00	-26.29	-26.05	-38.33	-38.39								
3-Aug-2012	12:00:00	-26.17	-25.98	-38.24	-38.30								
3-Aug-2012	18:00:00	-26.64	-26.24	-38.56	-38.64								
3-Aug-2012	24:00:00	-26.37	-26.12	-38.29	-38.17								
4-Aug-2012	06:00:00	-26.14	-25.82	-38.20	-38.59								
4-Aug-2012	12:00:00	-26.35	-26.13	-38.40	-38.35								
4-Aug-2012	18:00:00	-26.58	-26.34	-38.54	-38.68								
4-Aug-2012	24:00:00	-26.42	-26.10	-38.38	-38.27								
5-Aug-2012	06:00:00	-26.32	-26.03	-38.30	-38.53								
5-Aug-2012	12:00:00	-26.31	-25.97	-38.27	-38.28								
5-Aug-2012	18:00:00	-26.58	-26.23	-38.53	-38.63								
5-Aug-2012	24:00:00	-26.37	-26.05	-38.39	-38.24								
6-Aug-2012	06:00:00	-26.22	-25.91	-38.24	-38.50								
6-Aug-2012	12:00:00	-26.41	-26.07	-38.40	-38.47								
6-Aug-2012	18:00:00	-26.62	-26.25	-38.48	-38.75								
6-Aug-2012	24:00:00	-26.29	-26.04	-38.34	-38.28								
7-Aug-2012	06:00:00	-26.37	-26.06	-38.34	-38.65								
7-Aug-2012	12:00:00	-26.43	-26.00	-38.36	-38.41								
7-Aug-2012	18:00:00	-26.53	-26.23	-38.53	-38.72								
7-Aug-2012	24:00:00	-26.41	-26.03	-38.36	-38.22								
8-Aug-2012	06:00:00	-26.36	-25.98	-38.33	-38.69							0.22	
8-Aug-2012	12:00:00	-26.47	-26.09	-38.42	-38.35								
8-Aug-2012	18:00:00	-26.60	-26.18	-38.47	-38.33								
8-Aug-2012	24:00:00	7.41	-26.03	-14.72	-38.16								
9-Aug-2012	06:00:00	-7.33	-26.00	-24.85	-38.60							1.20	
9-Aug-2012	12:00:00	-12.46	-25.95	-31.48	-38.50								
9-Aug-2012	18:00:00	-15.85	-26.29	-36.67	-38.71								
9-Aug-2012	24:00:00	-18.79	-26.17	-38.40	-38.02								
10-Aug-2012	06:00:00	-12.79	-26.03	-14.66	-38.64							0.74	
10-Aug-2012	12:00:00	-10.68	-26.06	-19.42	-38.36								
10-Aug-2012	18:00:00	-14.01	-26.23	-24.36	-38.52								
10-Aug-2012	24:00:00	-16.68	-26.19	-28.91	-38.53								
11-Aug-2012	06:00:00	-18.50	-25.95	-32.14	-38.52								
11-Aug-2012	12:00:00	-20.19	-26.03	-34.87	-38.32								
11-Aug-2012	18:00:00	-22.06	-26.15	-36.98	-38.81								
11-Aug-2012	24:00:00	-24.09	-26.12	-38.40	-38.35								
12-Aug-2012	06:00:00	-25.48	-25.99	-38.39	-38.47								
12-Aug-2012	12:00:00	-26.31	-26.04	-38.36	-38.50								
12-Aug-2012	18:00:00	-26.59	-26.24	-38.57	-38.71								
12-Aug-2012	24:00:00	-26.47	-26.18	-38.47	-38.20								
13-Aug-2012	06:00:00	-26.38	-26.11	-38.39	-38.64								
13-Aug-2012	12:00:00	-26.35	-26.11	-38.35	-38.54								

												Weatherstation Rainfall Data	
Date	Time	Water Level (inches)							On-site Manual Raingauge	On-site Auto Rainguage	On-site Monthly Total	Albemarle Daily Rainfall	Albemarle Monthly Rainfall
dd-mmm-yyyy	hh:mm:ss	RP AW1	RP AW2	RP RAW1	RP RAW2	CG1	CG2	CG3					
13-Aug-2012	18:00:00	-26.56	-26.25	-38.64	-38.75								
13-Aug-2012	24:00:00	-26.54	-26.17	-38.53	-38.44								
14-Aug-2012	06:00:00	-26.31	-25.95	-38.32	-38.41								
14-Aug-2012	12:00:00	-26.40	-26.11	-38.39	-38.48								
14-Aug-2012	18:00:00	-26.70	-26.27	-38.69	-38.69								
14-Aug-2012	24:00:00	-26.48	-26.15	-38.52	-38.26								
15-Aug-2012	06:00:00	-26.26	-26.04	-38.30	-38.75								
15-Aug-2012	12:00:00	-26.30	-26.10	-38.39	-38.56								
15-Aug-2012	18:00:00	-26.59	-26.31	-38.60	-38.90								
15-Aug-2012	24:00:00	-26.53	-26.19	-38.54	-38.30								
16-Aug-2012	06:00:00	-26.38	-26.16	-38.46	-38.70							0.35	
16-Aug-2012	12:00:00	-26.44	-26.04	-38.46	-38.58								
16-Aug-2012	18:00:00	-26.59	-26.34	-38.64	-38.76								
16-Aug-2012	24:00:00	-26.43	-26.18	-38.52	-38.09								
17-Aug-2012	06:00:00	-26.35	-26.24	-38.36	-38.77								
17-Aug-2012	12:00:00	-26.47	-26.17	-38.46	-38.57								
17-Aug-2012	18:00:00	-26.68	-26.37	-38.77	-38.29								
17-Aug-2012	24:00:00	-26.37	-26.13	-38.35	-38.18								
18-Aug-2012	06:00:00	-26.41	-26.10	-38.40	-38.69								
18-Aug-2012	12:00:00	-26.38	-26.23	-38.41	-38.35								
18-Aug-2012	18:00:00	-26.70	-26.35	-38.69	-38.68								
18-Aug-2012	24:00:00	-26.50	-26.30	-38.57	-38.28								
19-Aug-2012	06:00:00	-26.41	-26.07	-38.45	-38.57								
19-Aug-2012	12:00:00	-26.41	-26.11	-38.40	-38.42								
19-Aug-2012	18:00:00	-26.53	-26.35	-17.04	-38.71								
19-Aug-2012	24:00:00	-26.49	-26.17	-21.04	-38.33								
20-Aug-2012	06:00:00	-26.44	-26.11	-15.42	-38.77								
20-Aug-2012	12:00:00	-26.42	-26.07	-14.57	-38.24								
20-Aug-2012	18:00:00	-26.53	-26.30	-16.18	-38.74								
20-Aug-2012	24:00:00	-26.44	-26.11	-17.66	-38.34								
21-Aug-2012	06:00:00	-26.46	-26.10	-19.06	-38.78							0.13	
21-Aug-2012	12:00:00	-26.38	-26.18	-20.32	-38.56								
21-Aug-2012	18:00:00	-26.68	-26.41	-22.80	-38.58								
21-Aug-2012	24:00:00	-26.44	-26.18	-26.47	-38.29								
22-Aug-2012	06:00:00	-26.26	-25.98	-28.51	-38.63								
22-Aug-2012	12:00:00	-26.35	-26.03	-30.05	-38.40								
22-Aug-2012	18:00:00	-26.54	-26.36	-31.61	-38.86								
22-Aug-2012	24:00:00	-26.53	-26.27	-32.66	-38.59								
23-Aug-2012	06:00:00	-26.47	-26.19	-33.49	-38.58								
23-Aug-2012	12:00:00	-26.37	-26.11	-34.15	-38.60								
23-Aug-2012	18:00:00	-26.65	-26.35	-35.26	-38.60								
23-Aug-2012	24:00:00	-26.49	-26.17	-35.96	-38.29								
24-Aug-2012	06:00:00	-26.34	-26.00	-36.38	-38.68								
24-Aug-2012	12:00:00	-26.37	-26.00	-36.95	-38.50								
24-Aug-2012	18:00:00	-26.74	-26.42	-37.64	-38.92								
24-Aug-2012	24:00:00	-26.55	-26.23	-38.20	-38.47								
25-Aug-2012	06:00:00	-26.36	-26.03	-38.47	-38.75								
25-Aug-2012	12:00:00	-26.43	-26.13	-38.47	-38.62								
25-Aug-2012	18:00:00	-26.71	-26.34	-38.76	-38.89								
25-Aug-2012	24:00:00	-26.59	-26.27	-38.63	-38.32								
26-Aug-2012	06:00:00	-26.32	-26.05	-38.41	-38.76								
26-Aug-2012	12:00:00	-26.47	-26.16	-38.56	-38.53								

												Weatherstation Rainfall Data	
Date	Time	Water Level (inches)							On-site Manual Raingauge	On-site Auto Rainguage	On-site Monthly Total	Albemarle Daily Rainfall	Albemarle Monthly Rainfall
dd-mmm-yyyy	hh:mm:ss	RP AW1	RP AW2	RP RAW1	RP RAW2	CG1	CG2	CG3					
26-Aug-2012	18:00:00	-26.78	-26.42	-38.84	-38.75								
26-Aug-2012	24:00:00	-26.50	-26.17	-38.58	-38.18								
27-Aug-2012	06:00:00	-26.34	-26.00	-38.42	-38.59								
27-Aug-2012	12:00:00	-26.47	-26.09	-38.54	-38.34								
27-Aug-2012	18:00:00	-26.74	-26.34	-38.80	-38.77								
27-Aug-2012	24:00:00	-26.47	-26.21	-38.57	-38.32								
28-Aug-2012	06:00:00	-26.28	-26.04	-38.50	-38.71								
28-Aug-2012	12:00:00	-26.52	-26.13	-38.52	-38.41								
28-Aug-2012	18:00:00	-26.59	-26.27	-38.74	-38.71								
28-Aug-2012	24:00:00	-26.53	-26.22	-38.54	-38.53								
29-Aug-2012	06:00:00	-26.47	-26.07	-38.50	-38.70								
29-Aug-2012	12:00:00	-26.47	-26.07	-38.45	-38.47								