Marston Mitigation Project
Jones County, North Carolina

Year 4 Monitoring Report

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1.0 SUMMARY

This Annual Report details the monitoring activities during the 2007 growing season on the Marston Mitigation Site. Construction of the site, including planting of trees, was completed in March 2004. The 2007 data represent results from Year 4 of hydrologic and vegetation monitoring for both wetlands and streams.

The design for the Marston property involved the restoration of a Coastal Plain small stream swamp as described by Schafale and Weakley (1990). After construction, it was determined that 6,416 feet of stream and 37.7 acres of wetland hydrology were restored. An additional 8.6 acres of wetlands were enhanced on the northern end of the project. The As-Built survey is included as Appendix A. This Annual Report presents the data from six hydrologic monitoring stations, eight vegetation monitoring stations, and stream monitoring, as required by the approved Mitigation Plan for the site.

Three of the hydrologic stations at the site are equipped with manual groundwater gauges and three stations are equipped with automated gauges and a manual calibration gauge. Additionally, the gauges are used as points from which photographs are taken over time. Based on field observations in 2007, three of the six hydrology monitoring gauges met the hydrologic success criteria of a hydroperiod of at least 7 % of the growing season. Two additional gauges recorded hydroperiods of at least 5 % of the growing season. The site reference wetland hydrology monitoring gauge documented a 2 % hydroperiod.

Weather station data from the Trenton Weather Station were used in conjunction with a manual rain gauge located on the site to document precipitation amounts. The manual gauge is used to validate observations made at the automated station. For the 2007 growing season rainfall was within normal limits early but dropped below normal for most of the latter part of the growing season. The summer of 2007 has experienced an extreme drought over most of North Carolina. Based on the groundwater gauge data at the project and reference sites over the first four years of the monitoring period, and the abnormal drought in 2007 conditions, it was concluded that the site remains on track to achieve the hydrologic success criteria specified in the Mitigation Plan for the site.

This Annual Report documents vegetation survivability based on eight vegetation-monitoring plots, as specified in the approved Mitigation Plan for the Marston site. Eight monitoring plots $1/10^{th}$ of an acre in size were used to document survivability of the woody vegetation planted on site.

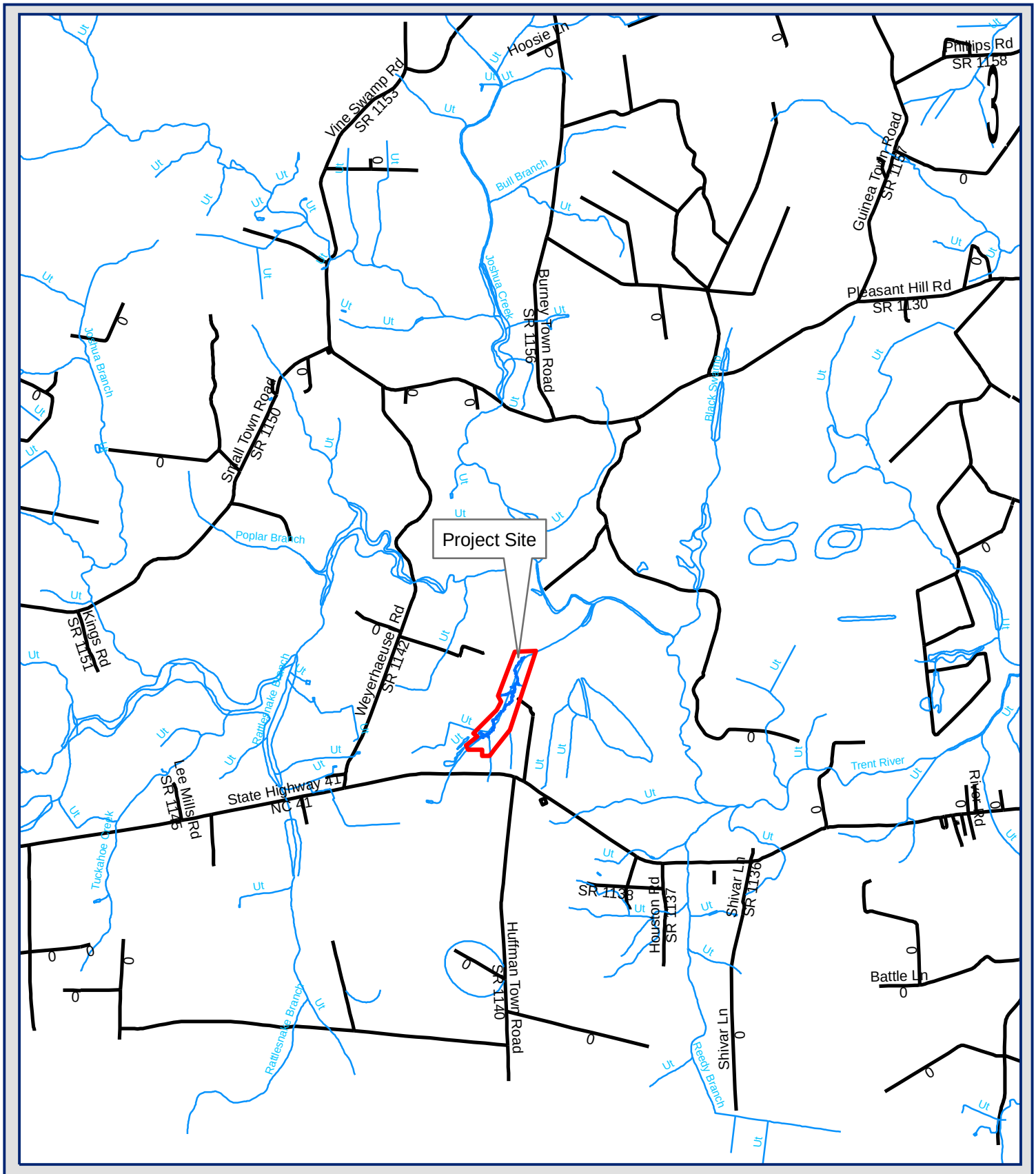
The vegetation monitoring documented survival rates between 290 and 650 stems per acre. The site has previously met the initial vegetation survival criteria of 320 stems per acre surviving after the third growing season, and it was concluded that the site remains on track to achieve the final vegetative success criteria specified in the Mitigation Plan for the site. An area of concern is the lespedeza in Plot 3 that has grown back since last year's treatment. Continued mowing and spraying herbicide on the 2 to 3 acre area will successfully manage this invasive species.

The restored stream channel has remained stable and is providing the intended habitat and hydrologic functions. Four bankfull events were recorded during the year. All monitored cross-sections show very little adjustment of stream dimension, and it was concluded that the site remains on track to achieve the stream success criteria specified in the Mitigation Plan.

2.0 INTRODUCTION

2.1 PROJECT

Located in Jones County, the Marston Mitigation Site encompasses approximately 176 acres. It is located approximately twelve miles west of the town of Trenton, North Carolina (**Figure 1** and **Figure 2**). This project provides compensatory mitigation for stream and wetland impacts associated within the resident hydrologic unit. The Marston Site is designed to restore a Coastal Plain small stream swamp as described by Schafale and Weakley (1990). The Coastal Plain small stream swamp communities exist as the floodplains of small blackwater streams in which separate fluvial features and associated vegetation are too small or poorly developed to distinguish. Construction at the site was completed in February 2004, with 58 acres of vegetation planted by March 2004. Groundwater, surface water, and rain gauges were functional beginning March 15, 2004. The 2007 monitoring season represents Year 4 of monitoring for the site.



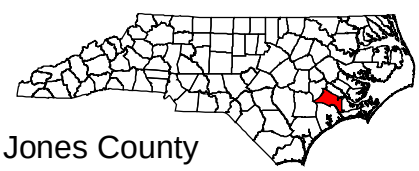
EBX

Marston
Vicinity Map
Jones County

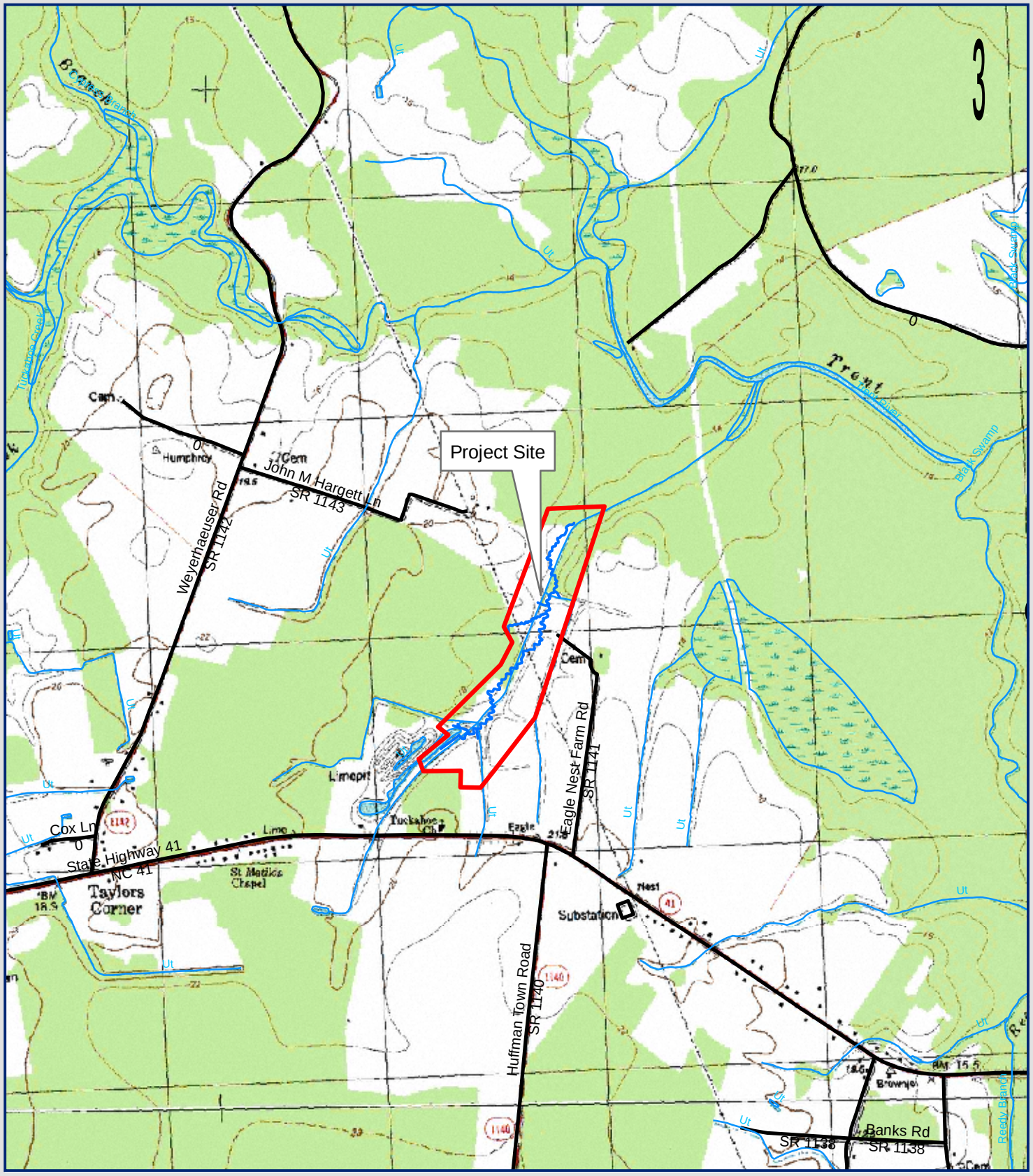
0 0.5 1 2 Miles

Legend

- Streams
- Roads
- Marston Site



Jones County
NTS



EBX

Figure 2
Marston
Jones County
USGS Map

0 500 1,000 2,000 3,000 4,000
Feet

Legend

- Streams
- Roads
- Marston Project Site

2.2 PROJECT PURPOSE

Monitoring of the Marston Site is required to demonstrate successful mitigation based on the criteria found in the Mitigation Plan for the site, the Neu-Con Umbrella Stream and Wetland Mitigation Bank Instrument, and through a comparison to reference site conditions. Hydrologic, vegetation, and stream monitoring are conducted on an annual basis. Success criteria must be met for five consecutive years. This Annual Monitoring Report details the results of the monitoring efforts for 2007 (Year 4) at the Marston Mitigation Site.

2.3 PROJECT HISTORY

Table 1. Project History and Schedule

Project History	
December 2003	Approved Mitigation Plan
March 2004	Construction Completed
March 2004	Post-restoration Monitoring Begins
November 2004	1st Annual Monitoring Report
November 2005	2nd Annual Monitoring Report
November 2006	3rd Annual Monitoring Report
November 2007	4th Annual Monitoring Report
November 2008 (scheduled)	5th Annual Monitoring Report

3.0 HYDROLOGY

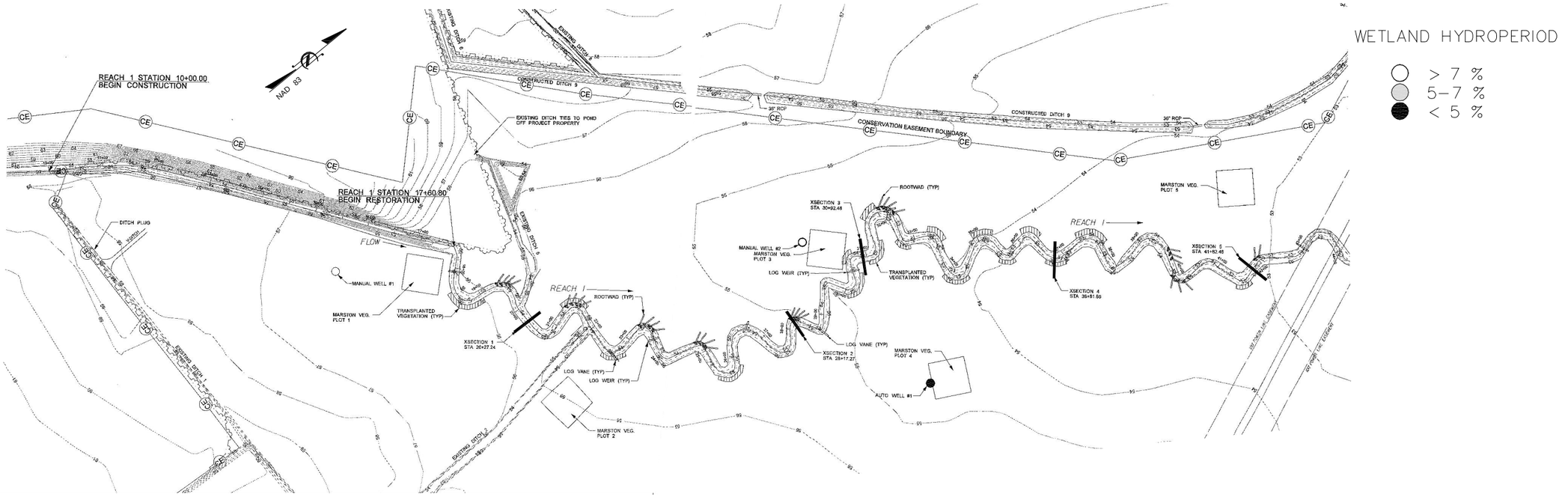
3.1 SUCCESS CRITERIA

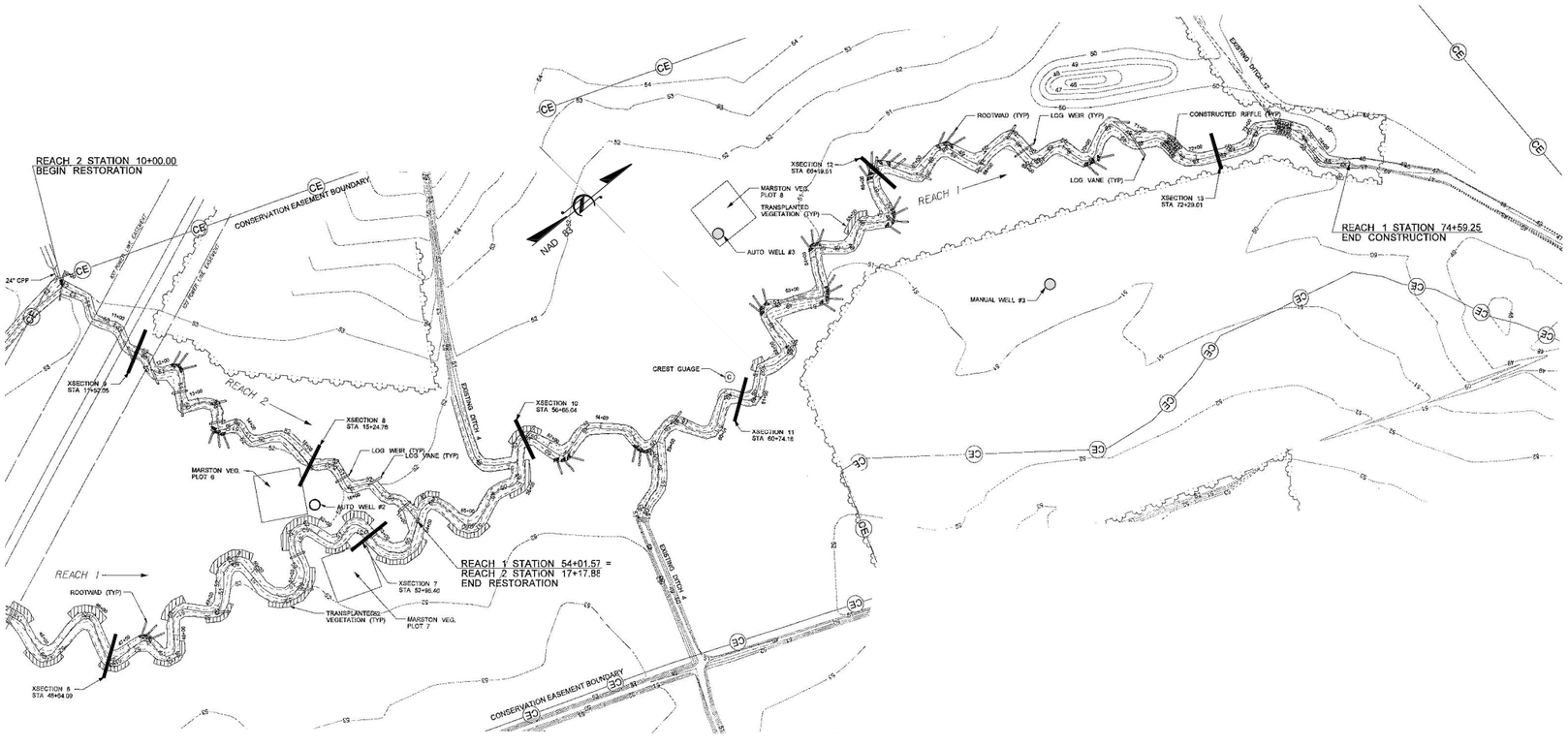
As stated in the approved Mitigation Plan, the hydrologic success criterion for the site is to restore the water table at the site so that it will remain within 12 inches of the soil surface for at least 7 % of the growing season continuously (approximately 16 days). The day counts are based on the growing season for Jones County, which is 232 days long, beginning on March 20 and ending November 7, as calculated from National Weather Service Wetlands Determination Tables (WETS) for Jones County. As specified in the approved Mitigation Plan, data are collected from three automated and three manual groundwater gauges.

The Mitigation Plan further specified that in order for the hydrologic data to be considered successful, it must demonstrate wetland conditions are present in normal or dryer than normal conditions.

3.2 DESCRIPTION OF HYDROLOGIC MONITORING EFFORTS

Three manual groundwater gauges, three automated groundwater gauges, and one rain gauge were installed prior to the beginning of the first growing season to monitor groundwater (**Figure 3**). An automated reference well was installed in April shortly after the growing season





Marston

Figure 3

100 50 0 100 200

SCALE (FT)

began. Groundwater gauges, both manual and automated, were installed to a minimum depth of at least 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 monthly basis. During monthly site visits, manual groundwater gauges are read and rainfall totals are collected from the on-site rain gauge. During the 2007 growing season, all of the automated loggers performed well and no periods of missing data were encountered.

Automated Gauges
Automated groundwater gauges record water table elevations twice daily at 08:00 and 20:00. These automatic gauges employ pressure sensors that record water elevation above the bottom of the sensor (with atmospheric pressure compensation). Immediately adjacent to each automatic gauge is a manual calibration gauge. The calibration water table depth is recorded at monthly 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 then used to determine wetland hydroperiods.

Manual Gauges
Water table depths are recorded monthly in manual groundwater gauges. To calculate wetland hydroperiods, interpolations are made between monthly readings by correlating twice daily automatic gauge readings. Each manual gauge is correlated to an automatic gauge based on proximity, landscape position, and the relationship of their groundwater depth readings (i.e. if their readings are separated by a consistent value). Once the appropriate automatic gauge has been selected, a correction factor is calculated for each monthly gauge reading. A daily rate of change between monthly correction factors is calculated to determine the daily correction factor. The daily correction factor is then applied to the automatic gauge readings to calculate an estimated daily water table depth for the manual gauge. These daily readings are used to determine wetland hydroperiods.

Data Interpretation
Wetland hydroperiods are calculated from twice 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 two consecutive readings (24 hours) then the hydroperiod ends at the last reading within -12 inches. If a gauge falls below -12 inches for only one reading then maintains a reading above -12 inches for a minimum of 24 hours then the hydroperiod is calculated continuously. This methodology accounts for minor technical malfunctions experienced by the automatic gauges.

3.3 RESULTS OF HYDROLOGY MONITORING

The following hydroperiod statistics were calculated for each monitoring station during the growing season: 1) most consecutive days that the water table was within twelve inches of the surface; 2) cumulative number of days that the water table was within twelve inches of the soil surface; and 3) number of times that the water table rose to within twelve inches of the soil surface (**Table 2**). Depth to groundwater for each of the monitoring gauges is shown in a graph with precipitation (**Figure 4**). This graph demonstrates the reaction at each monitoring location of the groundwater level to specific rainfall events. Raw hydrograph data collected from the monitoring gauges is provided in **Appendix C**.

The site was designed to function as a riparian wetland system with associated wet flats. Hydrology in the riparian areas is driven primarily by groundwater discharge and over bank

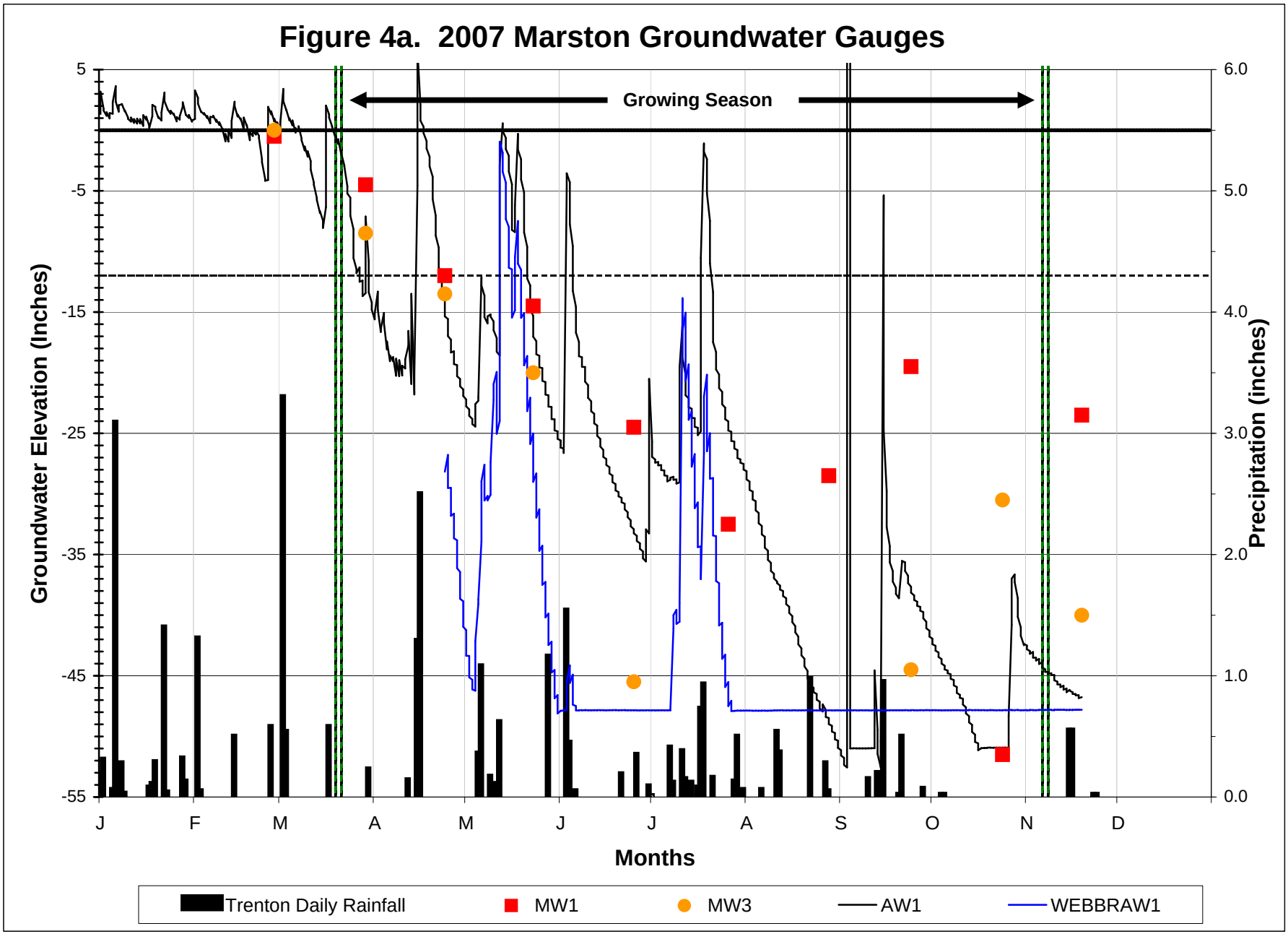


Figure 4a. 2007 Marston Groundwater Gauges
Growing Season
Groundwater Elevation (Inches)
Precipitation (inches)
5
-5
-15
-25
-35
-45
-55
6.0
5.0
4.0
3.0
2.0
1.0
0.0
J
F
M
A
M
J
J
A
S
O
N
D
Months
Trenton Daily Rainfall
MW1
MW3
AW1
WEBBRAW1

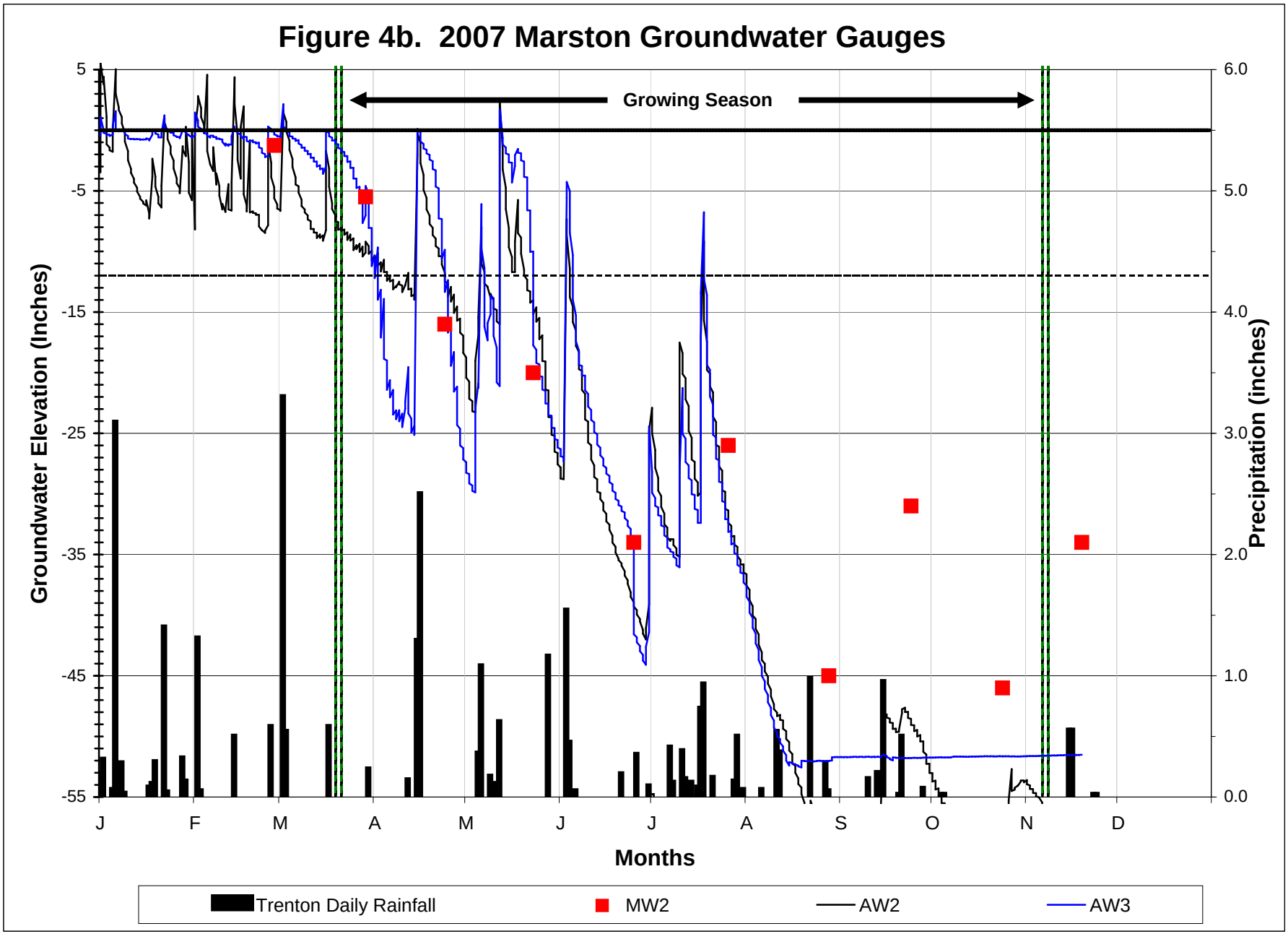


Figure 4b. 2007 Marston Groundwater Gauges
Growing Season
Groundwater Elevation (Inches)
Precipitation (inches)
5
-5
-15
-25
-35
-45
-55
6.0
5.0
4.0
3.0
2.0
1.0
0.0
J
F
M
A
M
J
J
A
S
O
N
D
Months
Trenton Daily Rainfall
MW2
AW2
AW3

flooding, while precipitation is the primary hydrologic influence in wet flat areas. Model simulations performed during the design phase of the project indicate that the entire site would range from slightly higher than the minimum wetland criteria of 5 % to more saturated areas that would exceed 12.5 %. The data collected for 2007 growing season for this site indicate it is performing as described in the Mitigation Plan, with varying degrees of wetness documented.

Table 2. Hydrologic Monitoring Results

2007 Max Hydroperiod (Growing Season 20-Mar through 7-Nov, 232 days)					
Gauge	Consecutive		Cumulative		Occurrences
	Days	Percent of growing Season	Days	Percent of growing Season	
AW1	9	4	31	13	7
AW2	16	7	35	15	5
AW3	13	6	36	16	5
MW1	18	8	45	19	8
MW2	16	7	35	15	7
MW3	11	5	27	12	3
Webb Reference	4	2	6	3	2

Because of the severe drought during the summer of 2007 the monitoring data shows the site has remained dry for extended periods. Three gauges met the specified criteria of a hydroperiod of at least 7 % of the growing season. Two gauges recorded hyrdoperiods of at least 5 % of the growing season. The gauge at the reference site documented a hydroperiod of 2 %. The reference gauge was installed in April 2007 after the start of the growing season and after the target hydrology was recorded for many of the on-site gauges. The longest cumulative saturation during 2007 was 18 days compared to 50 days recorded in 2006.

3.3.1 Reference Data

The approved Mitigation Plan provides that if the rainfall data for any given year during the monitoring period is not normal, the reference wetland data can be accessed to determine if there is a positive correlation between the performance of the restoration site and the natural hydrology of the reference site.

The incomplete data from the Webb reference wetland groundwater gauge recorded a hydroperiod of 2% of the 2007 growing season (**Figure 4**). The groundwater gauge data is found in **Appendix C**.

3.3.2 Climate Data

Comparisons of the 2007 monthly rainfall totals to historical precipitation for Jones County are shown in **Figure 5** and **Table 3**. Observed precipitation data were collected from an automated weather station in Trenton and an on-site manual rain gauge. For the 2007 growing season on-site rainfall measurements correlate well with the Trenton gauge data but were generally below the weather station data. The Trenton monthly rainfall amounts were lower than normal for the months of July through October; within normal limits for March through June; and exceeded normal limits in January. Monthly rainfall for data for November and December 2007 were not available at the time this report was compiled.

Table 3. Comparison of Normal Rainfall to Observed Rainfall for Jones County

Month	Average	Normal Limits		Trenton Precipitation	On-Site Precipitation	Accumulated Average Rainfall Deficit
		30 Percent	70 Percent			
January	4.77	3.74	5.72	6.34	---	1.57
February	3.57	2.24	4.14	2.44	10.69	0.44
March	4.41	3.27	5.06	4.65	1.78	0.92
April	3.47	1.91	4.45	3.93	2.55	1.67
May	4.12	2.87	4.82	3.52	3.90	1.07
June	4.89	3.4	5.9	2.67	1.75	-1.15
July	6.22	4.55	7.41	3.79	5.45	-3.58
August	6.12	4.28	7.08	2.28	1.84	-7.42
September	5.51	2.99	6.74	1.89	2.60	-11.04
October	3.34	1.69	4.79	0.04	0.33	-14.34
November	2.93	2.17	3.74	1.14	2.84	-16.13
December	3.64	2.34	4.43	---	---	---
Total	37.57	26.26	44.58	---	---	---

The entire state of North Carolina experienced increasingly severe drought conditions throughout 2007, with some areas experiencing the lowest average stream flows on record. The first signs of drought began in February in the western part of the state. By early spring, abnormally dry conditions had spread across the state, and the western edge of the state began to see "moderate" drought conditions. From late spring through the summer, conditions steadily worsened. By August, 98% of North Carolina's land area was designated as being in either "severe", "extreme", or "exceptional" drought. Additionally, lowest-ever average stream flows were recorded at 13 monitoring stations in August, including 9 in central North Carolina, 2 in the mountains, and 2 on the coastal plain. Nearly the entire state was categorized as experiencing "extreme" drought in September, with the southwest portion of the state categorized as experiencing "exceptional" drought. **Figure 6** depicts the increasing severity of the drought throughout the year.

The Marston restoration site experienced drought conditions consistent with state-wide trends. The Trenton monitoring station, near the Marston site, received normal or above-normal precipitation from January through May (**Figure 5** and **Table 3**). From June through September, precipitation levels fell below the normal range, varying from 2.22 to 3.84 inches below average. The accumulated rainfall deficit - the difference between the long-term average and the observed monthly precipitation levels, aggregated monthly – began to develop in the summer months, and from June through September, the deficit increased rapidly from -1.15 inches to -11.04 inches. Persistent and worsening drought conditions severely impacted the wetland hydroperiods at the Marston restoration site.

Figure 5. 2007 Precipitation for Marston Site

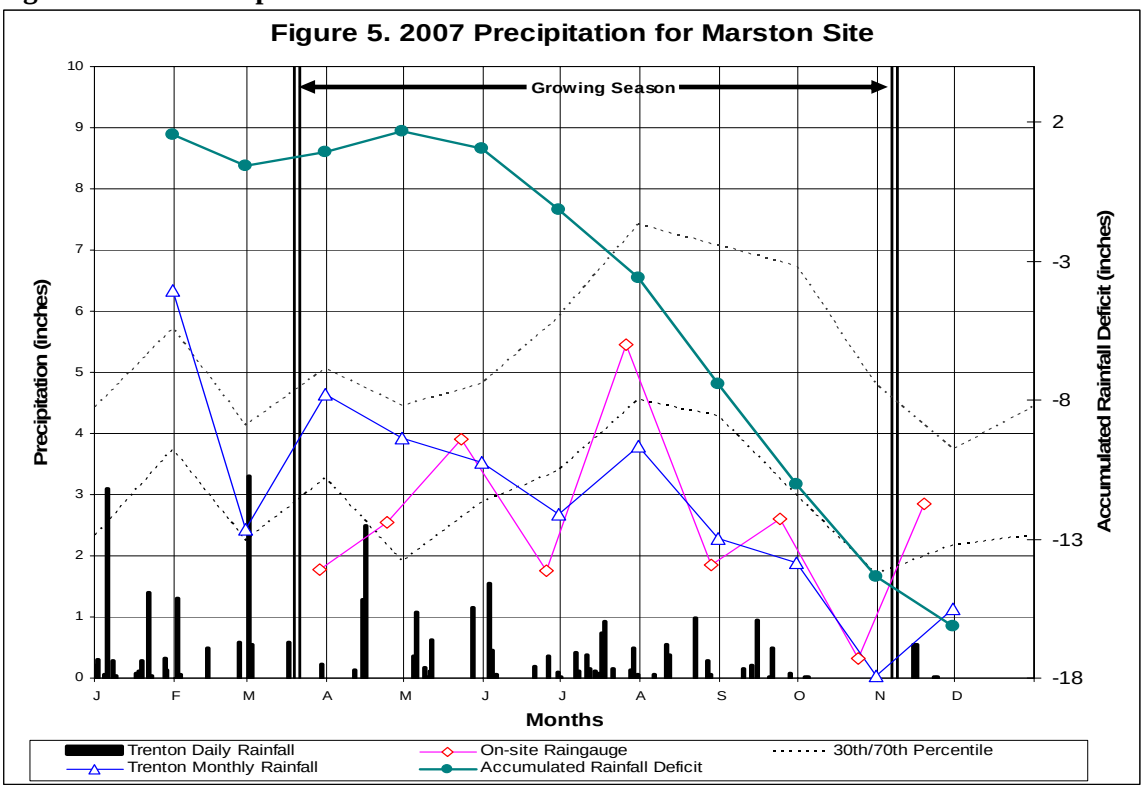
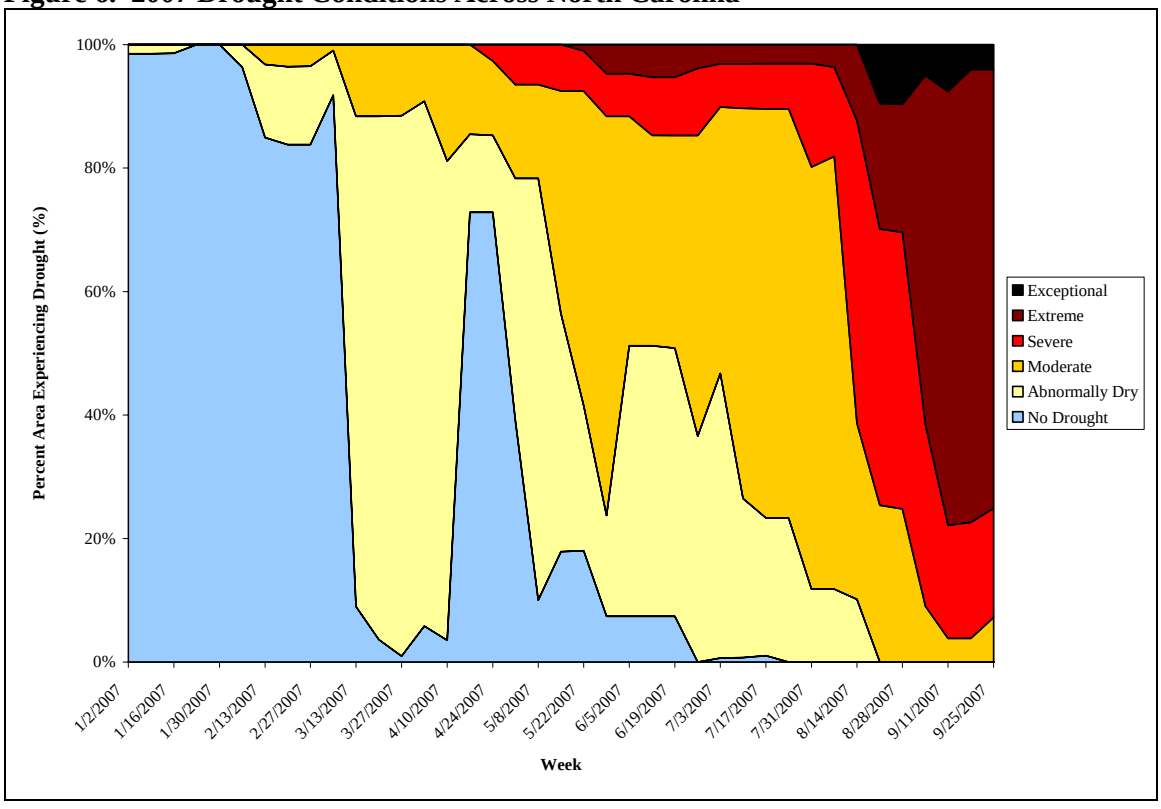


Figure 6. 2007 Drought Conditions Across North Carolina



3.4 HYDROLOGIC CONCLUSIONS

Data collected from the groundwater monitoring gauges on the Marston Mitigation Site in 2007 indicate that three of the hydrology monitoring stations recorded hydroperiods of at least 7 % of the growing season. Two additional gauges recorded hydroperiods of at least 5 % percent of the growing season. The site reference wetland hydrology monitoring gauge recorded a hydroperiod of 2 %. In monitoring Years 1 through 3, the gauges at the site recorded hydroperiods above 7% of the growing season.

Trenton weather station rainfall data indicates that the 2007 growing season rainfall amounts dropped below normal for most of the latter part of the growing season while the on-site rainfall was normal to below normal except for January. The state climate office shows the Marston site to be within a zone of extreme drought for portions of the growing season. Based on groundwater gauge data at the project site and the reference site over the last four growing seasons and on the drought conditions experienced in 2007, it was concluded that the site remains on track to achieve the success criteria specified in the Mitigation Plan for the site.

4.0 VEGETATION

4.1 VEGETATION SUCCESS CRITERIA

The interim measure of vegetative success for the Marston Mitigation Plan will be survival of at least 320 planted trees per acre at the end of Year 3 of the monitoring period. The mitigation site was successful in meeting the interim success criteria. At the end of the Year 3 monitoring period 475 stems per acre were recorded. The final vegetative success criteria will be the survival of 260 planted trees per acre at the end of Year 5 of the monitoring period.

Up to 20 % of the site species composition may be comprised of volunteers. Remedial action may be required should these (i.e. loblolly pine (*Pinus taeda*), red maple(*Acer rubrum*), sweet gum (*Liquidambar styraciflua*), etc.) present a problem and exceed 20 % composition.

4.2 DESCRIPTION OF SPECIES AND VEGETATION MONITORING

Eight plots were established on the Marston Mitigation Site, to monitor approximately 2 % of the site. The vegetation monitoring plots were designed to be $1/10^{th}$ of an acre in size. The plots were randomly located and randomly oriented within the wetland restoration area.
Six tree species were planted in the Wetland Restoration Area (**Table 4**).

Table 4. Planted Tree Species

Common Name	Scientific Name	FAC Status
Swamp Tupelo	*Nyssa biflora*	OBL
Blackgum	*Nyssa sylvatica*	FAC
Overcup Oak	*Quercus lyrata*	OBL
Swamp Chestnut Oak	*Quercus michauxii*	FACW-
Coastal Willow Oak	*Quercus phellos*	FACW-
Bald Cypress	*Taxodium distichum*	OBL

All of the planted stems inside the plot were flagged with orange flagging and marked with a three-foot tall piece of half inch PVC to mark them as the planted stems and to help in locating

them in the future. Each stem is tagged with a numbered aluminum tag, though some tags have been damaged by meadow voles.

4.3 RESULTS OF VEGETATION MONITORING

Trees within each plot are flagged in the field on a quarterly basis before the flags degrade. Flags are utilized because they will not interfere with the growth of the tree. Volunteers are also flagged during this process. The following tables present stem counts for each of the monitoring stations.

Table 5. 2007 Vegetation Monitoring Plot Species Composition

	Plot							
Species	**M1**	**M2**	**M3**	**M4**	**M5**	**M6**	**M7**	**M8**
Swamp Tupelo	0	0	0	26	0	0	0	16
Blackgum	5	44	13	0	12	2	3	0
Overcup Oak	3	6	4	1	11	3	9	0
Swamp Chestnut Oak	12	1	8	1	7	11	25	5
Coastal Willow Oak	19	1	3	2	1	14	5	2
Bald Cypress	26	4	1	24	1	2	0	22
Total	65	56	29	54	32	32	42	45
Stems/Acre	650	560	290	540	320	320	420	450

Average Stems/Acre: 444
Range of Stems/Acre: 290-650

Volunteer species will also be monitored throughout the five-year monitoring period.

Volunteer woody species were observed in most of the vegetation plots, but were deemed too small to tally. Three woody volunteer species were found within in the Wetland Restoration Area (**Table 6**). If these volunteers persist into next growing season, they will be flagged and added to the overall stems per acre assessment of the site. Sweetgum (*Liquidambar styraciflua*) is the most common volunteer, though Red Maple (*Acer rubrum*) and Persimmon (*Diospyros virginiana*) were also observed.

Table 6. Volunteer Tree Species

Common Name	Scientific Name	FAC Status
Sweetgum	*Liquidambar styraciflua*	FAC+
Red Maple	*Acer rubrum*	FAC
Persimmon	*Diospyros virginiana*	FAC

4.4 GENERAL VEGETATION OBSERVATIONS

Hydrophytic herbaceous vegetation is abundant onsite. Rush (*Juncus effusus*), spike-rush (*Eleocharis obtusa*), climbing hempweed (*Mikania scandens*), tearthumb (*Polygonum sagittatum*), boxseed (*Ludwigia* sp.), cat-tails (*Typha* sp.), and sedge (*Carex* sp.), all hydrophytic herbaceous plants, are observed across the site, particularly in areas of periodic inundation. The presence of these herbaceous wetland plants helps to confirm the presence of wetland hydrology on the site.

There are weedy species occurring on the site, though few seem to be posing any widespread problems for the woody or herbaceous hydrophytic vegetation. The kudzu near Plots 7 and 8 no longer poses a threat to the survival of the hydrophytic vegetation due to the mechanical removal and herbicide application. The area around Plot 3 that had been invaded by Lespedeza was mown and received an herbicide application. Invasives across the site will continue to be monitored and treated if necessary.

Other than the aforementioned area, the other species are weedy annuals and pose very little threat to survivability on site. Commonly seen weedy vegetation includes ragweed (*Ambrosia artemisiifolia*), wild dill (*Foeniculum vulgare*), and morning glory (*Ipomoea* spp.). The kudzu (*Pueraria montana*), lespedeza (*Lespedeza cuneata*), and any other threatening weedy vegetation found in the future will be monitored.

It was observed that beaver activity in the upper reach has resulted in the loss of a number of planted cypress trees. This continued activity will significantly impact survival of planted trees within this area. Additionally, beaver activity could spread beyond this area and affect other portions of the project.

4.5 VEGETATION CONCLUSIONS

The site was planted in nonriverine hardwoods and coastal plain swamp species in March 2004. There were eight 1/10th acre vegetation-monitoring plots established throughout the planting areas. The site has met the minimum interim success criteria of 320 trees per acre by the end of year three and is on tract to meet the final success criteria of 260 trees per acre by the end of year five. Continued active management will be required within the area having sericea lespedeza to achieve the final success criteria.

A supplemental planting area, which is approximated at 1.5 to 2.0 acres, was closely monitored throughout this year. Plot 3, which is located within this area, was replanted entirely in 2006 with two year old trees. They have had an acceptable survival rate. In fall 2007, the Lespedeza was treated by mechanical mowing and an herbicide application that affects legume species (Transline). The result of these combined treatments will be apparent in the spring of 2008, and continued treatment may be necessary.

There are other small pockets of lespedeza that should be treated through out the site so that there is not a repeat of the actions needed around Plot 3. The treatment on the off-site kudzu performed throughout this year seems to have been successful at suppressing this invasive plant. Monitoring of its presence will be continued.

5.0 STREAM MONITORING

5.1 SUCCESS CRITERIA

As stated in the approved Mitigation Plan, the stream restoration success criteria for the site includes the following:

- Bankfull Events: Two bankfull flow events must be documented within the five-year monitoring period.
- Cross-Sections: There should be little change in as-built cross sections. Cross sections shall be classified using the Rosgen stream classification method and all monitored cross-sections should fall within the quantitative parameters defined for "E" or "C" type channels.

- Longitudinal Profiles: The longitudinal profiles should show that the bedform features are remaining stable, e.g. they are not aggrading or degrading. Bedforms observed should be consistent with those observed in "E" and "C" type channels.
- 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.
- Benthic Macroinvertebrates: Sampling of benthic macroinvertebrates within the restored stream channel shall be conducted for the first three years of post-restoration monitoring.

5.2 STREAM MORPHOLOGY MONITORING PLAN

To document the stated success criteria, the following monitoring program was instituted following construction completion on the Marston Site:

Bankfull Events: A crest gauge was installed on the site to document bankfull events. The gauge is checked each month, and records the highest out-of-bank flow event that occurred during the past month. The gauge is located near stream station 60+50 (**Figure 3**).

Cross Sections: Two permanent cross sections were installed per 1,000 linear feet of stream restoration work, with one (1) of the locations being a riffle cross section and one (1) location being a pool cross section. A total of 13 permanent cross sections were established across the mitigation site. Each cross section was marked on both banks with permanent pins to establish the exact transect used. Permanent cross section pins were surveyed and located relative to a common benchmark to facilitate easy comparison of year-to-year data. The annual cross-section surveys include points measured at all breaks in slope, including top of bank, bankfull, inner berm, edge of water, and thalweg. Riffle cross-sections are classified using the Rosgen stream classification system. Permanent cross sections for 2007 (Year 4) were surveyed in August 2007.

Longitudinal Profiles: A longitudinal profile will be completed in Years 1, 3, and 5. The profile will be conducted for a length of restored channel at least 3,000 feet in length. Measurements will include thalweg, water surface, inner berm, bankfull, and top of low bank. Each of these measurements will be taken at the head of each feature, e.g. riffle, run, pool, and glide, and the max pool depth. A common benchmark will be used each year to facilitate comparison of year-to-year data.

Photo Reference Stations: Photographs are used to visually document restoration success. Nine reference photo stations have been established across the Marston Site. Reference stations are marked with wooden stakes and GPS coordinates have been determined for each location. Reference photos are taken at least once per year. Reference photos are taken at each permanent cross section from both stream banks. The survey tape is centered in the photographs of the bank, and the water line is located in the lower edge of the frame with as much of the bank as possible included in each photo. Structure photos of each grade control structure are also taken. A photo log of the Marston site is included as **Appendix D**.

5.3 STREAM MORPHOLOGY MONITORING RESULTS

Photographs were taken throughout the monitoring season to document the evolution of the restored stream channel (see **Appendix D**). Herbaceous vegetation is moderately dense along the restored stream. The channel was dry during the latter part of the growing season, making it difficult to take photographs of the stream channel itself. Pools have maintained a variety of depths and habitat qualities, depending on the location and type of scour features (logs, root wads, transplants, etc.). During the early portion of the growing season a consistent stream flow was

present during the monthly site visits. Submerged aquatic vegetation and abundant fish were observed in the channel.

5.3.1 Cross Sections

Year 4 cross-section monitoring data for stream stability were collected during August 2007 and compared to baseline data collected in March 2004 (**Appendix B**). All monitored cross sections fell within the quantitative parameters defined for "E" or "C" type channels.

In-stream structures installed within the restored stream included constructed riffles, log vanes, log weirs, and root wads. Visual observations of structures throughout the past growing season have indicated that nearly all structures are functioning as designed. Two constructed riffles were installed on the lower end of the project to step the restored stream down to the elevation of the existing channel at the outlet of the project. Small localized areas of erosion were present but do not present a problem to stream stability.

5.3.2 Longitudinal Profile

A longitudinal profile survey was not conducted in Year 4. The previous profile indicated there has been very little adjustment to the stream profile or dimension since construction.

A stream walk was performed on March 29, 2007 and pictures were taken throughout the reach at various stations and structures. No major problems were observed at that time. Marston is in the fourth year of monitoring, therefore the stream banks are well vegetated and the stream is stable. The stream flow was low and algae had begun to grow in several pools that had little water movement. This is likely due to low rainfall in the early growing season.

A second stream walk was performed on August 13, 2007 and pictures were taken throughout the reach at various stations and structures. Two small areas of concern were observed (**Table 7**). One log-vane located at station 28+75 has been undercut and a small beaver dam has been constructed near station 26+ 60 (**Figure 7**). These don't pose immediate problems but should be observed in the future. No major problems were observed. Marston is in the fourth year of monitoring, therefore the stream banks are well vegetated and the stream is stable. The stream flow was absent during this late summer stream walk, but the upper reaches contained standing water.

Table 7. Stream Areas Requiring Observation

Feature Issue	Station Numbers	Suspected Cause	Photo Number
Log-vane undercut	26+ 60	Unknown	1
Small beaver dam	28+75	Beaver activity	2

5.3.3 Hydrology

Four bankfull events were documented during site visits through the use of the on-site crest gauge and visual evidence of out-of-bank flow (**Table 8**). The largest stream flow for Year 4 documented by the on-site crest gauge was a flow that occurred during June and was 1.6 feet above the bankfull stage.

Table 8. Crest Gauge Data

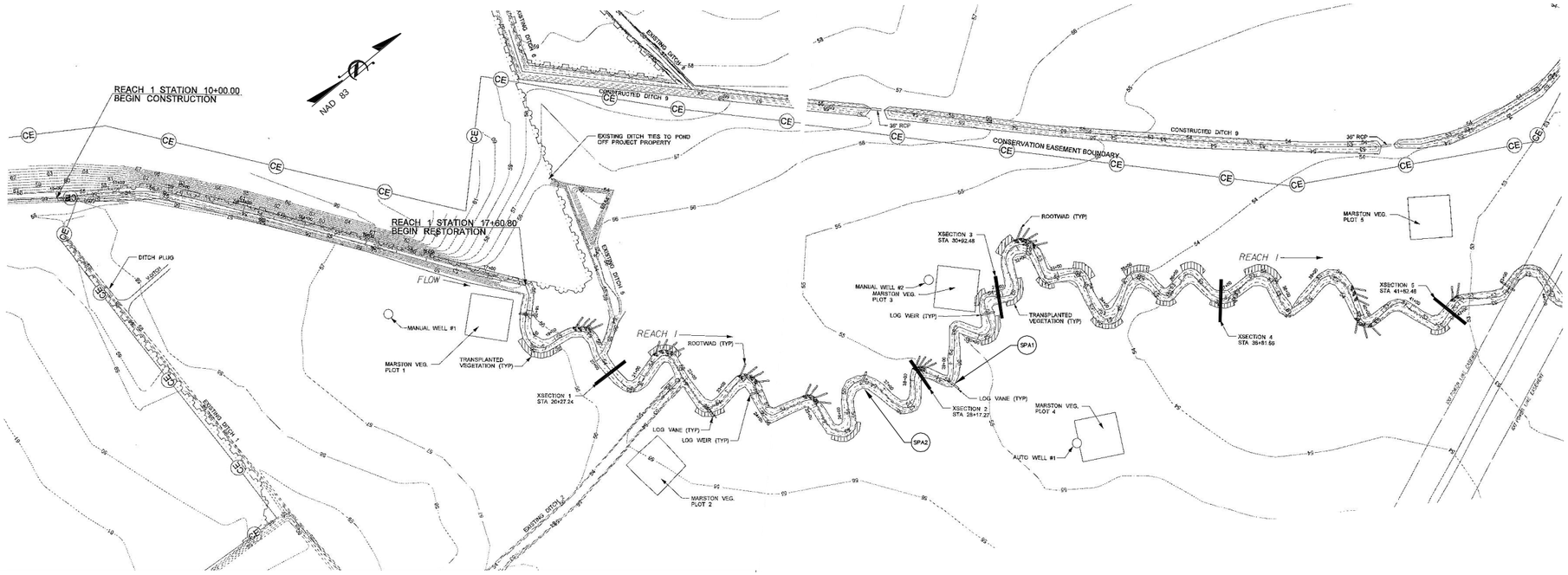
Month Recorded	Crest Gauge
January	---
February	2.50
March	0.25
April	0.00
May	0.85
June	1.60
July	0.00
August	0.00
September	0.00
October	---
November	---
December	---

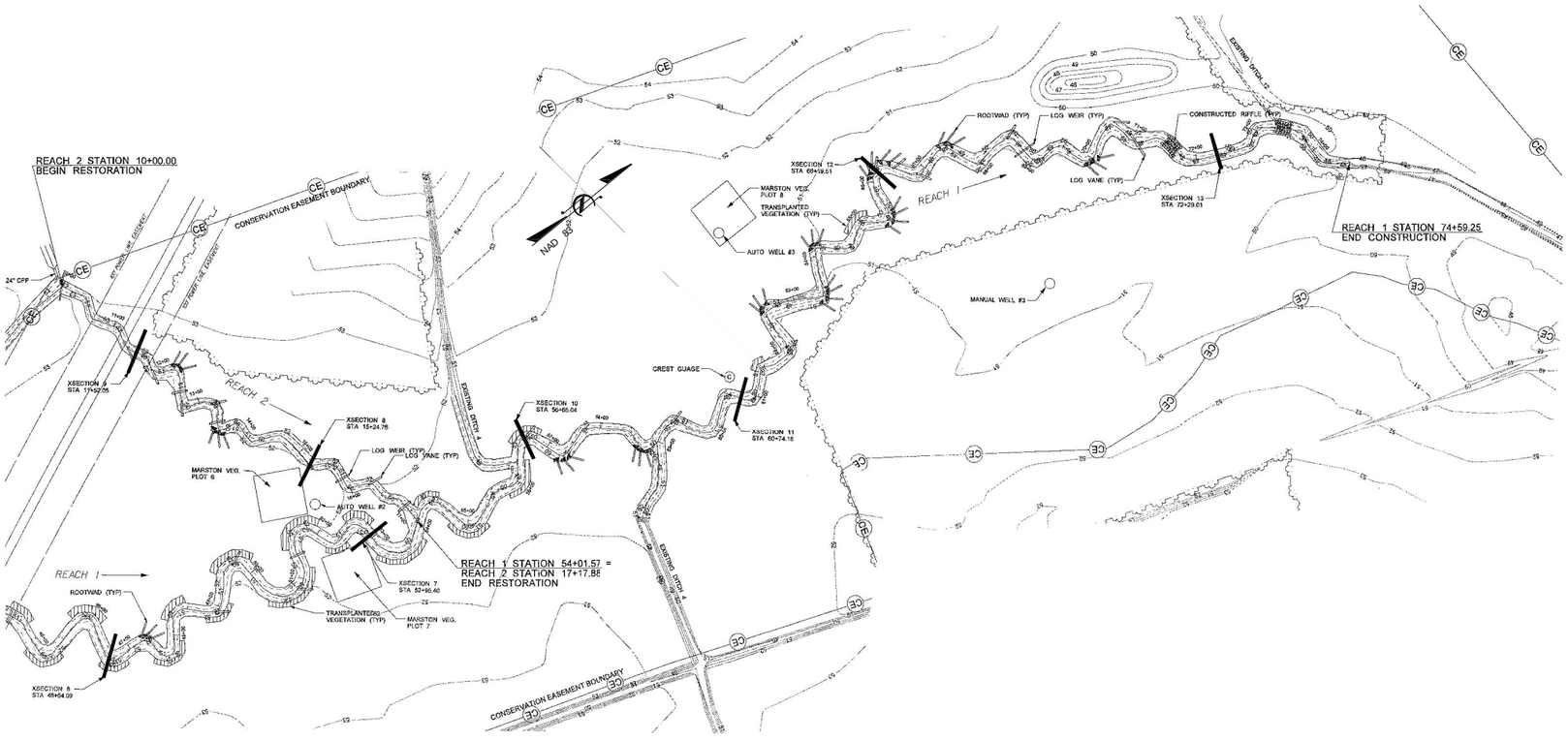
5.4 BENTHIC MACROINVERTEBRATE SURVEY RESULTS

Benthic macroinvertebrate sampling results were not available at the time this report was prepared. They will be provided at a later date.

5.5 STREAM CONCLUSIONS

The channel was dry during the latter part of the growing season, making it difficult to take photographs of the stream channel itself. All potential problem areas are minor and localized. No corrective actions are recommended at this time as the channel appears to be moving toward stability. All monitored cross sections fell within the quantitative parameters defined for "E" or "C" type channels. Two small areas of concern were observed. One log-vane located at station 28+75 has been undercut and a small beaver dam has been constructed near station 26 + 60 (**Figure 6**). These don't pose immediate problems but should be observed in the future. Four bankfull events were documented during site visits through the use of the on site crest gauge and visual evidence of out-of-bank flow. It was concluded that the site remains on track to achieve the stream success criteria specified in the Mitigation Plan for the site.





Marston

Figure 7

100 50 0 100 200

SCALE (FT)

6.0 OVERALL CONCLUSIONS AND RECOMMENDATIONS

- In 2007, three of the groundwater monitoring gauges recorded hydroperiods of at least 7% of the growing season. Two other gauges recorded hydroperiods of at least 5% of the growing season. The site reference wetland gauge recorded a hydroperiod of 2%. Based on the results of monitoring Years 1 through 4 and the abnormal drought conditions experienced in 2007, the site appears to be on track to achieve the hydrologic success criteria specified in the Mitigation Plan for the site.

- The restored stream channel has remained stable and is providing the intended habitat and hydrologic functions. All monitored cross sections for 2007 show very little adjustment in stream dimension and the site remains on track to achieve the stream criteria specified in the Mitigation Plan for the site.

- Vegetation Plot 3 was replanted in 2006 with two-year-old trees. The replanted trees have had an acceptable survival rate. Lespedeza had been treated by mechanical mowing and an herbicide application. The herbicide treatment performed on the kudzu seems to have been successful. Monitoring of lespedeza and kudzu will be continued. The average number of surviving planted stems per acre on site is 444 and the site remains on track to achieve the vegetative criteria of 260 stems per acre at the end of Year 5 as specified in the Mitigation Plan for the site.

- Monitoring of vegetation, stream stability, and hydrology will continue through 2008.

APPENDIX A

As-Built Survey

PROJECT: 070 MARSTON

WETLAND AND STREAM RESTORATION PROJECT
ENVIRONMENTAL BANC AND EXCHANGE, LLC
MARSTON SITE

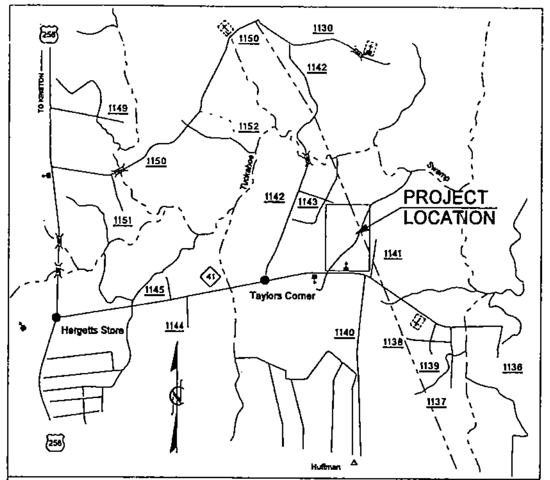
JONES COUNTY

LOCATION: OFF NCSR 41 NEAR TAYLORS CORNER

TYPE OF WORK: AS-BUILT DRAWING FOR WETLAND AND STREAM MITIGATION

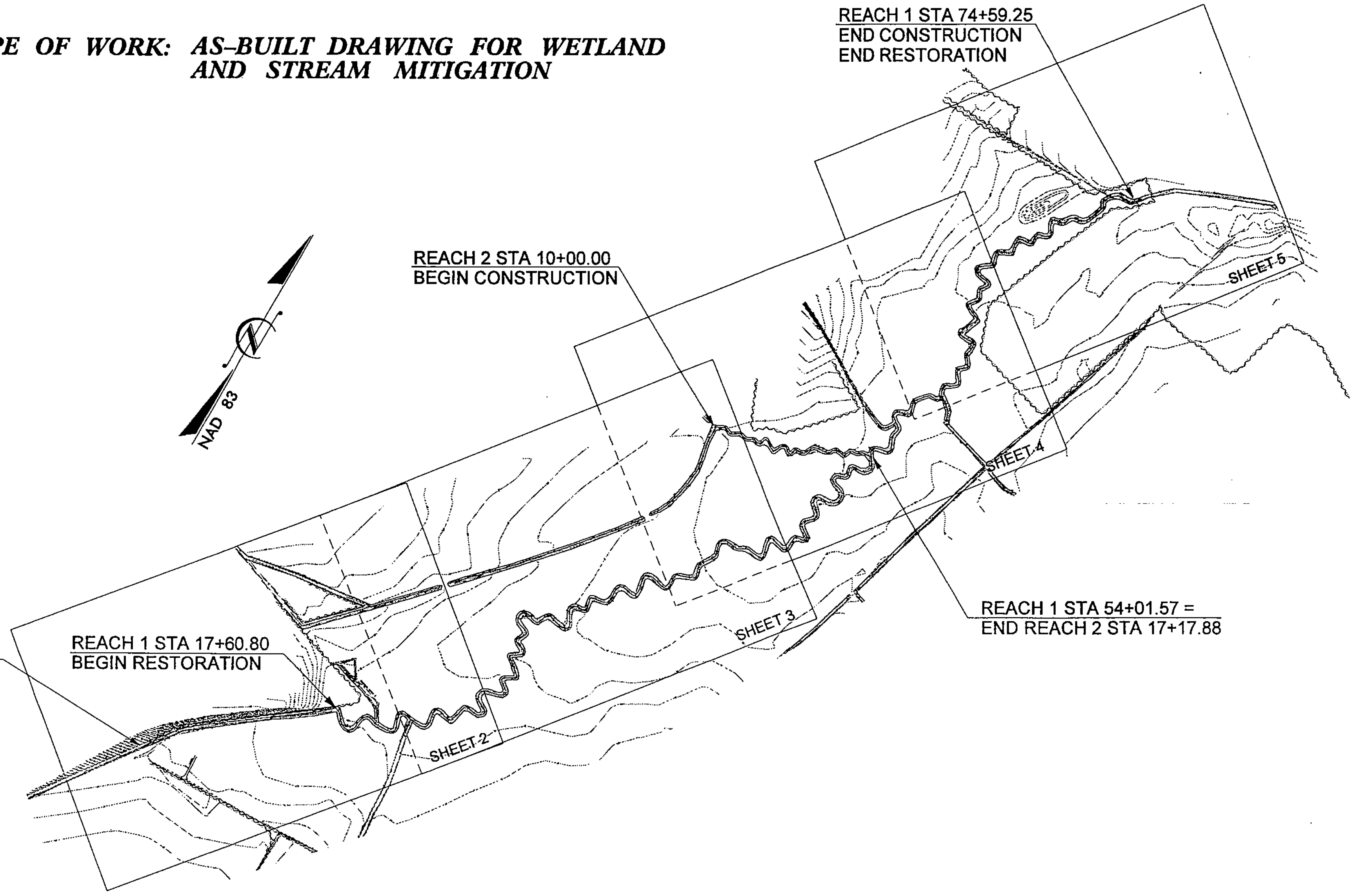
STATE	BUCK PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	070	1	6

NO.	DATE	CHECKED BY	APPROVED BY
1	5-4-04		KEVIN TWEEDY



VICINITY MAP

INDEX OF SHEETS:



GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

5 0 5 10
PROFILE (VERTICAL)

PROJECT SUMMARY

AS-BUILT DESIGN REACH 1 LENGTH = 5698 FEET
AS-BUILT DESIGN REACH 2 LENGTH = 718 FEET
AS-BUILT DESIGN STREAM LENGTH = 6416 FEET

PROPOSED WETLAND RESTORATION AREA = 37.7 ACRES
PROPOSED WETLAND ENHANCEMENT AREA = 8.7 ACRES

PREPARED FOR THE OFFICE OF:

ENVIRONMENTAL BANC AND EXCHANGE, LLC
10055 RED RUN BOULEVARD, SUITE 130
OWING MILLS, MD 21117

EBX

EBX CONTACT:
GEORGE KELLY
PROJECT MANAGER

PREPARED IN THE OFFICE OF:

BUCK ENGINEERING
8000 Regency Parkway, Suite 200
Cary, North Carolina 27511
Phone: 919-463-5488
Fax: 919-463-5490

MARCH 2004
CONSTRUCTION COMPLETED:

KEVIN L. TWEEDY, PE
PROJECT ENGINEER

PROJECT ENGINEER

Figure 2a

As-Built Drawing for the Marston Mitigation Site.

SIGNATURE: P.E.

PROJECT REFERENCE NO.	SHEET NO.
070	3

EBX MARSTON - ASBUILT

PLAN VIEW

PROJECT ENGINEER

Figure 2c

As-Built Drawing for the Marston Mitigation Site.

BUCK ENGINEERING
8000 Regency Parkway, Suite 200
Cary, North Carolina 27511
Phone: 919-463-5488
Fax: 919-463-5490

NAD 83

36" RCP

CONSERVATION EASEMENT BOUNDARY

CONSTRUCTED DITCH 9

36" RCP

ROOTWAD (TYP)

XSECTION 3
STA 30+92.48

MARSTON VEG.
PLOT 5

REACH 1

MANUAL WELL #2

MARSTON VEG.
PLOT 3

LOG WEIR (TYP)

TRANSPLANTED
VEGETATION (TYP)

XSECTION 4
STA 36+81.56

XSECTION 5
STA 41+82.48

MATCHLINE SHEET 2

LOG VANE (TYP)

XSECTION 2
STA 28+17.27

MARSTON VEG.
PLOT 4

AUTO WELL #1

100' POWER LINE EASEMENT

100' POWER LINE EASEMENT

MATCHLINE SHEET 4

NOTE:
AS-BUILT CONTOURS ARE BASED ON GRADED ELEVATIONS DURING CONSTRUCTION. ACTUAL ELEVATIONS MAY VARY BY +/- 0.5 FT DUE TO SCARIFICATION OF SOIL.

AS-BUILT DRAWING

50 25 0 50 100
SCALE (FT)

PROJECT REFERENCE NO.	SHEET NO.
070	2

EBX MARSTON - ASBUILT

PLAN VIEW

PROJECT ENGINEER

Figure 2b

As-Built Drawing for the Marston Mitigation Site.

BUCK ENGINEERING
8000 Regency Parkway, Suite 200
Cary, North Carolina 27511
Phone: 919-463-5488
Fax: 919-463-5490

NAD 83

REACH 1 STATION 10+00.00
BEGIN CONSTRUCTION

REACH 1 STATION 17+60.80
BEGIN RESTORATION

EXISTING DITCH 6

EXISTING DITCH 8

CONSTRUCTED DITCH 9

EXISTING DITCH TIES TO POND
OFF PROJECT PROPERTY

EXISTING DITCH 5

DITCH PLUG

V-DITCH

FLOW

EXISTING DITCH 1

EXISTING DITCH 2

MANUAL WELL #1

MARSTON VEG.
PLOT 1

TRANSPLANTED
VEGETATION (TYP)

XSECTION 1
STA 20+27.24

REACH 1

ROOTWAD (TYP)

LOG VANE (TYP)

LOG WEIR (TYP)

MARSTON VEG.
PLOT 2

MATCHLINE SHEET 3

NOTE:
AS-BUILT CONTOURS ARE BASED ON GRADED ELEVATIONS DURING CONSTRUCTION. ACTUAL ELEVATIONS MAY VARY BY +/- 0.5 FT DUE TO SCARIFICATION OF SOIL.

AS-BUILT DRAWING

50 25 0 50 100
SCALE (FT)

PROJECT REFERENCE NO.	SHEET NO.
070	4
EBX MARSTON - ASBUILT	
PLAN VIEW	
PROJECT ENGINEER	

Figure 2d

As-Built Drawing for the Marston Mitigation Site.

BUCK ENGINEERING
8000 Regency Parkway, Suite 200
Cary, North Carolina 27511
Phone: 919-463-5488
Fax: 919-463-5490

REACH 2 STATION 10+00.00
BEGIN RESTORATION

NAD 83

24" CPP

CONSERVATION EASEMENT BOUNDARY

100' POWER LINE EASEMENT

XSECTION 9
STA 11+52.05

REACH 2

XSECTION 8
STA 15+24.76

LOG WEIR (TYP)

LOG VANE (TYP)

MARSTON VEG. PLOT 6

AUTO WELL #2

EXISTING DITCH 4

XSECTION 10
STA 56+65.04

CREST GUAGE

XSECTION 11
STA 60+74.18

MATCHLINE SHEET 5

REACH 1

ROOTWAD (TYP)

XSECTION 7
STA 52+95.40

TRANSPLANTED VEGETATION (TYP)

MARSTON VEG. PLOT 7

REACH 1 STATION 54+01.57 =
REACH 2 STATION 17+17.88
END RESTORATION

MATCHLINE SHEET 3

XSECTION 6
STA 46+64.09

RAIN GUAGE

NOTE:
AS-BUILT CONTOURS ARE BASED ON GRADED ELEVATIONS DURING CONSTRUCTION. ACTUAL ELEVATIONS MAY VARY BY +/- 0.5 FT DUE TO SCARIFICATION OF SOIL.

AS-BUILT DRAWING

50 25 0 50 100
SCALE (FT)

PROJECT REFERENCE NO.	SHEET NO.
070	5
EBX MARSTON - ASBUILT	
PLAN VIEW	

PROJECT ENGINEER

Figure 2e

As-Built Drawing for the Marston Mitigation Site.

BUCK ENGINEERING
8000 Regency Parkway, Suite 200
Cary, North Carolina 27511
Phone: 919-463-5488
Fax: 919-463-5490

NAD 83

ROOTWAD (TYP)

LOG WEIR (TYP)

CONSTRUCTED RIFFLE (TYP)

EXISTING DITCH 12

XSECTION 12
STA 66+19.51

LOG VANE (TYP)

XSECTION 13
STA 72+29.01

REACH 1

MARSTON VEG. PLOT 8

TRANSPLANTED VEGETATION (TYP)

AUTO WELL #3

MANUAL WELL #3

REACH 1 STATION 74+59.25
END CONSTRUCTION

MATCHLINE SHEET 6

NOTE:
AS-BUILT CONTOURS ARE BASED ON GRADED ELEVATIONS DURING CONSTRUCTION. ACTUAL ELEVATIONS MAY VARY BY +/- 0.5 FT DUE TO SCARIFICATION OF SOIL.

PLAN VIEW

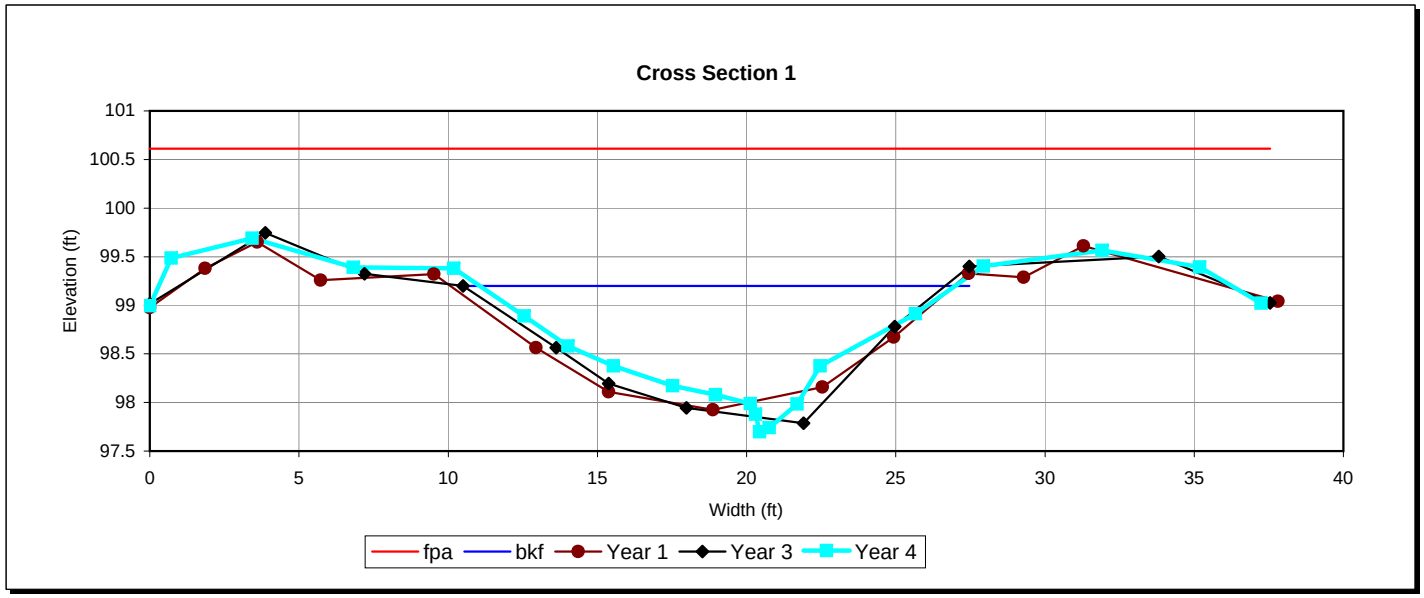
50 25 0 50 100
SCALE (FT)

APPENDIX B

Cross Section Data

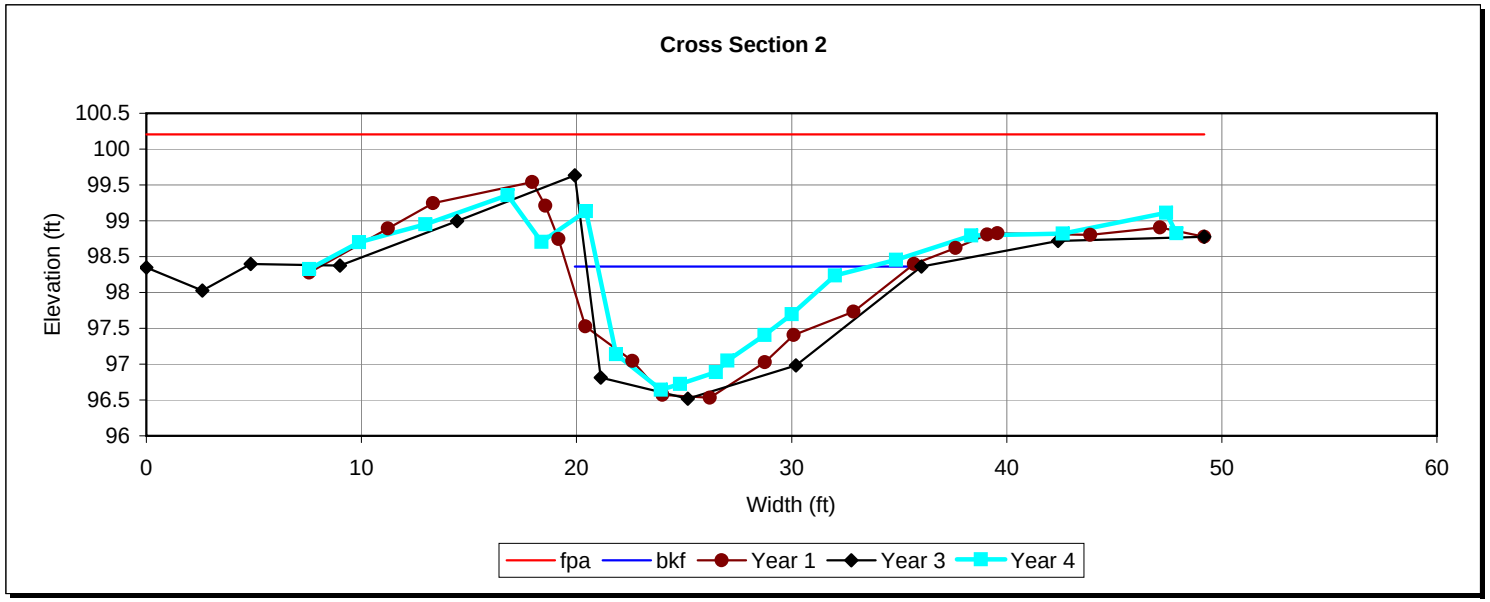
Looking at Left Bank.

Looking at Right Bank.



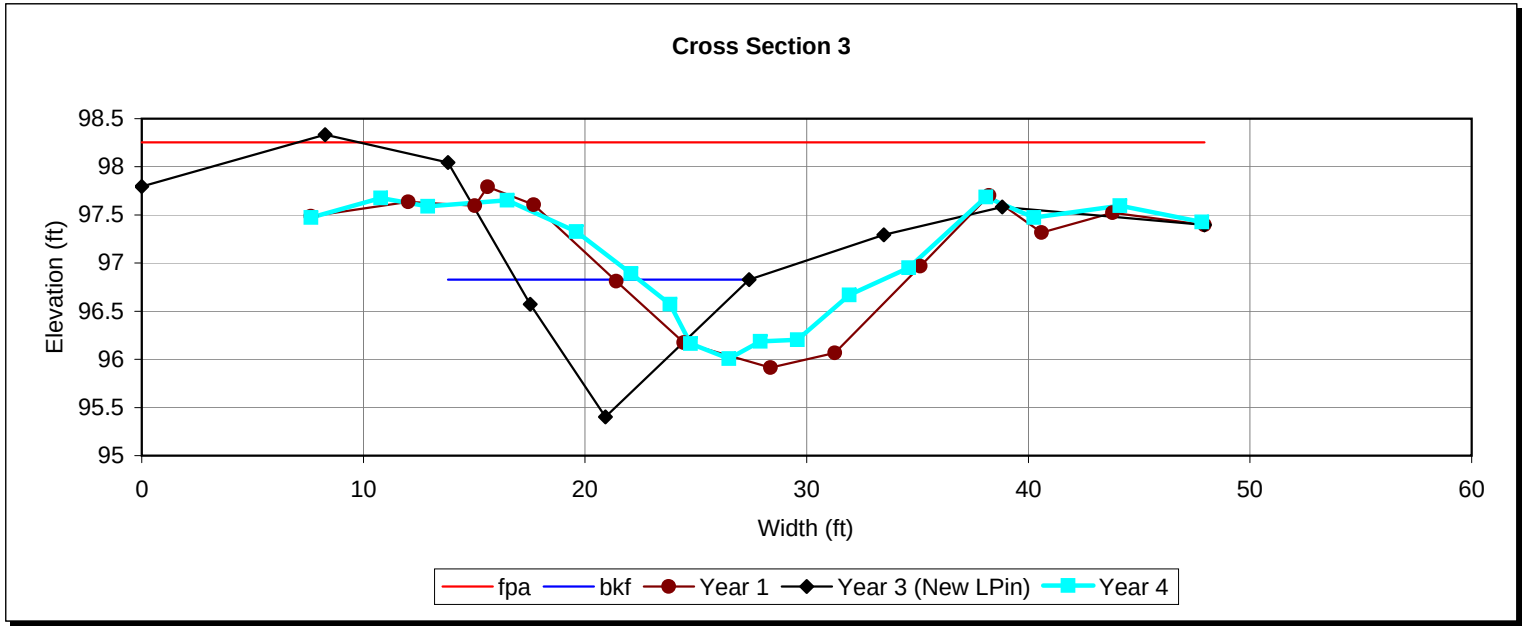
Looking at Left Bank.

Looking at Right Bank.



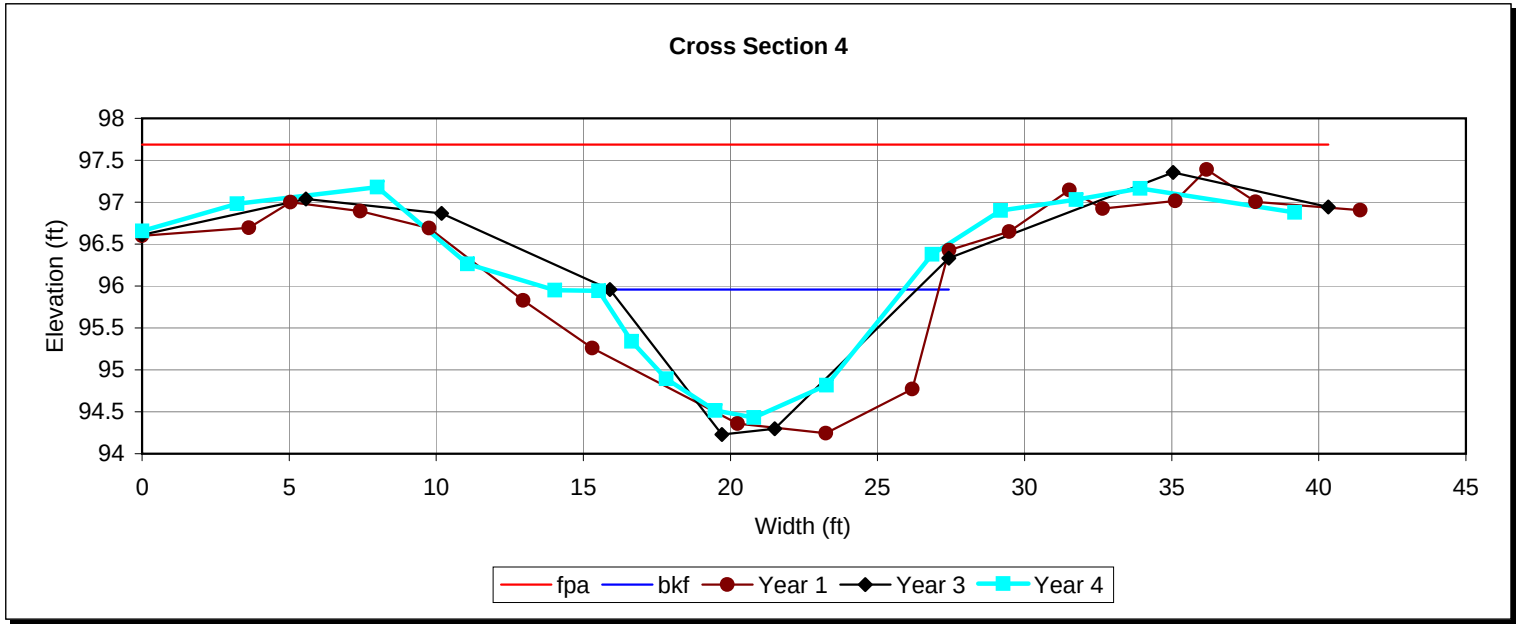
Looking at Left Bank.

Looking at Right Bank.



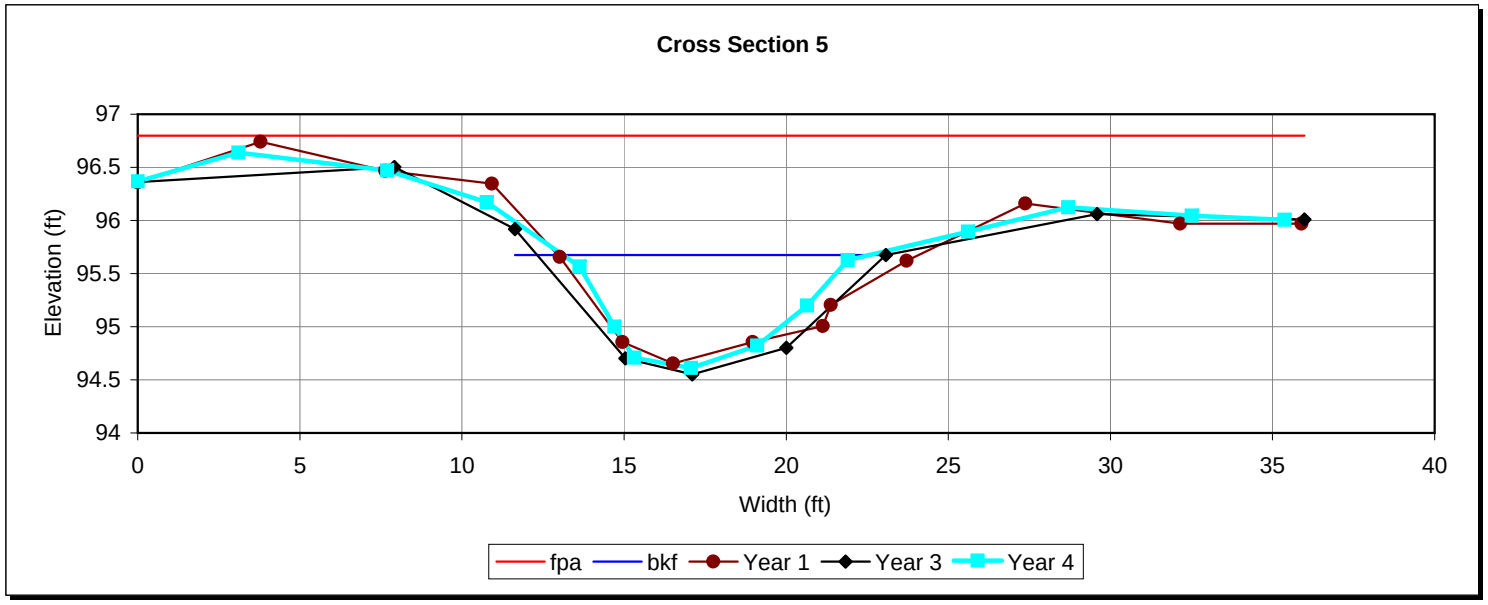
Looking at Left Bank.

Looking at Right Bank.



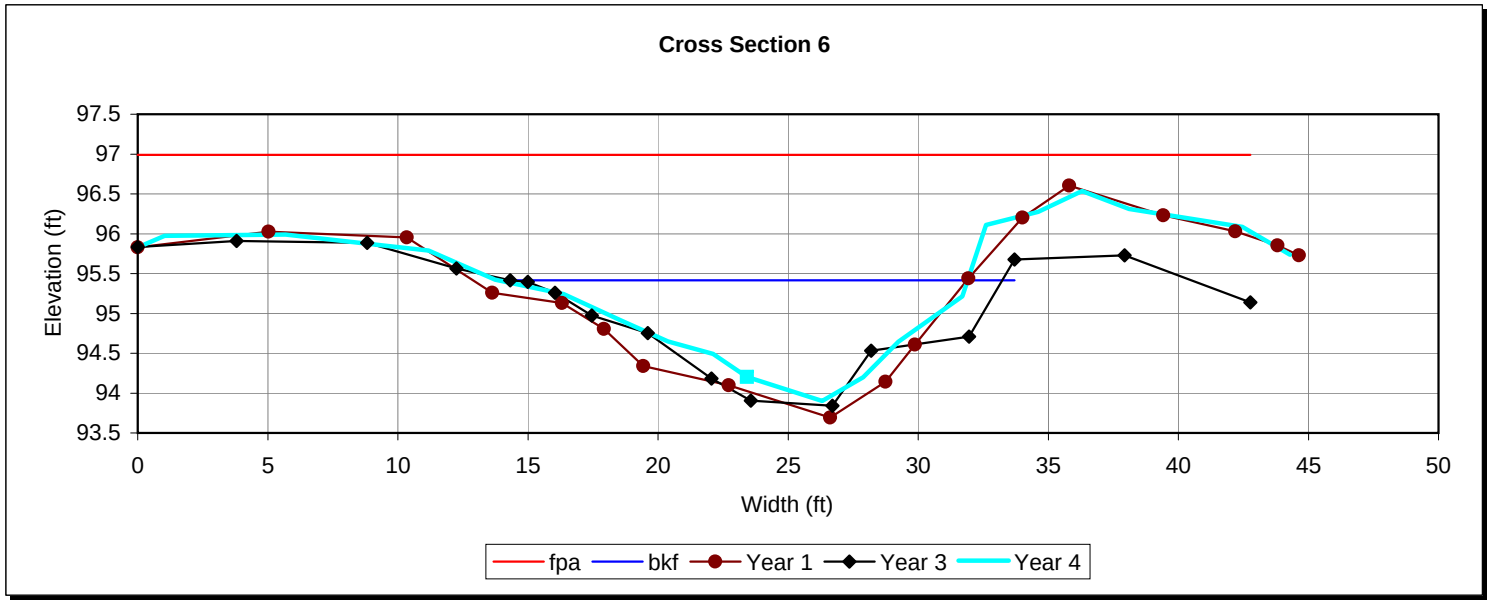
Looking at Left Bank.

Looking at Right Bank.



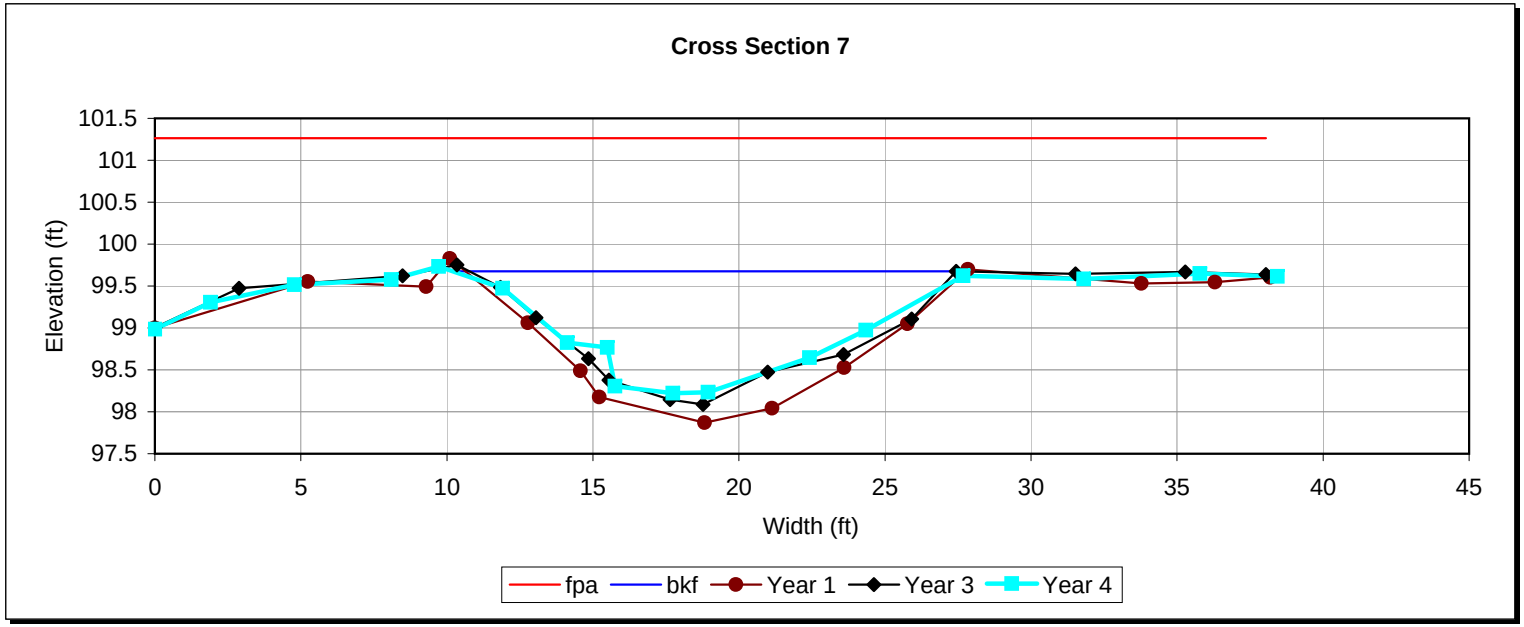
Looking at Left Bank.

Looking at Right Bank.



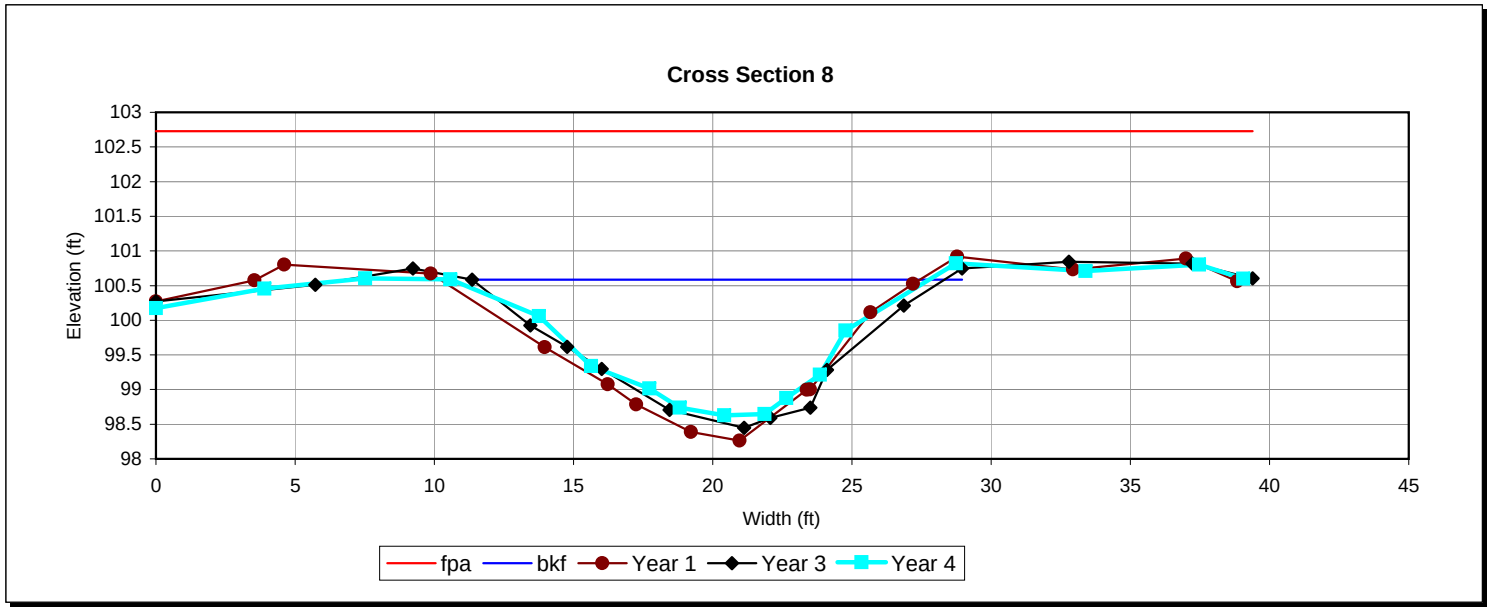
Looking at Left Bank.

Looking at Right Bank.



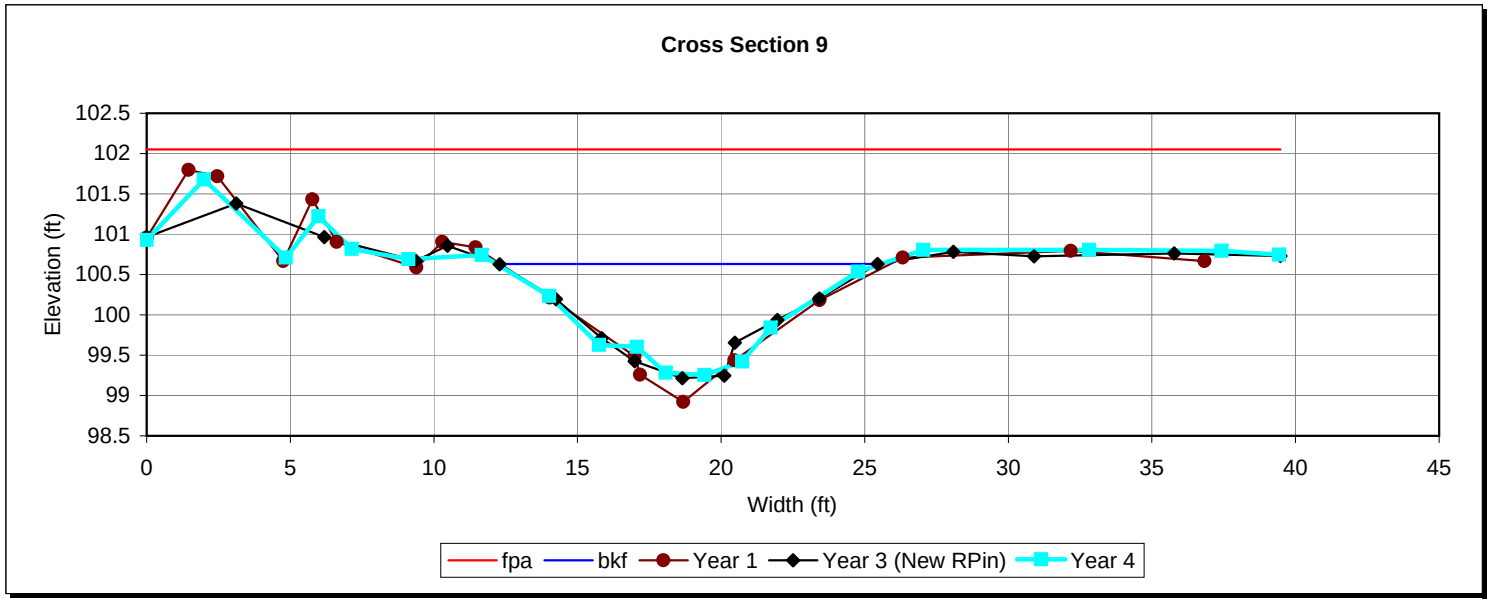
Looking at Left Bank.

Looking at Right Bank.



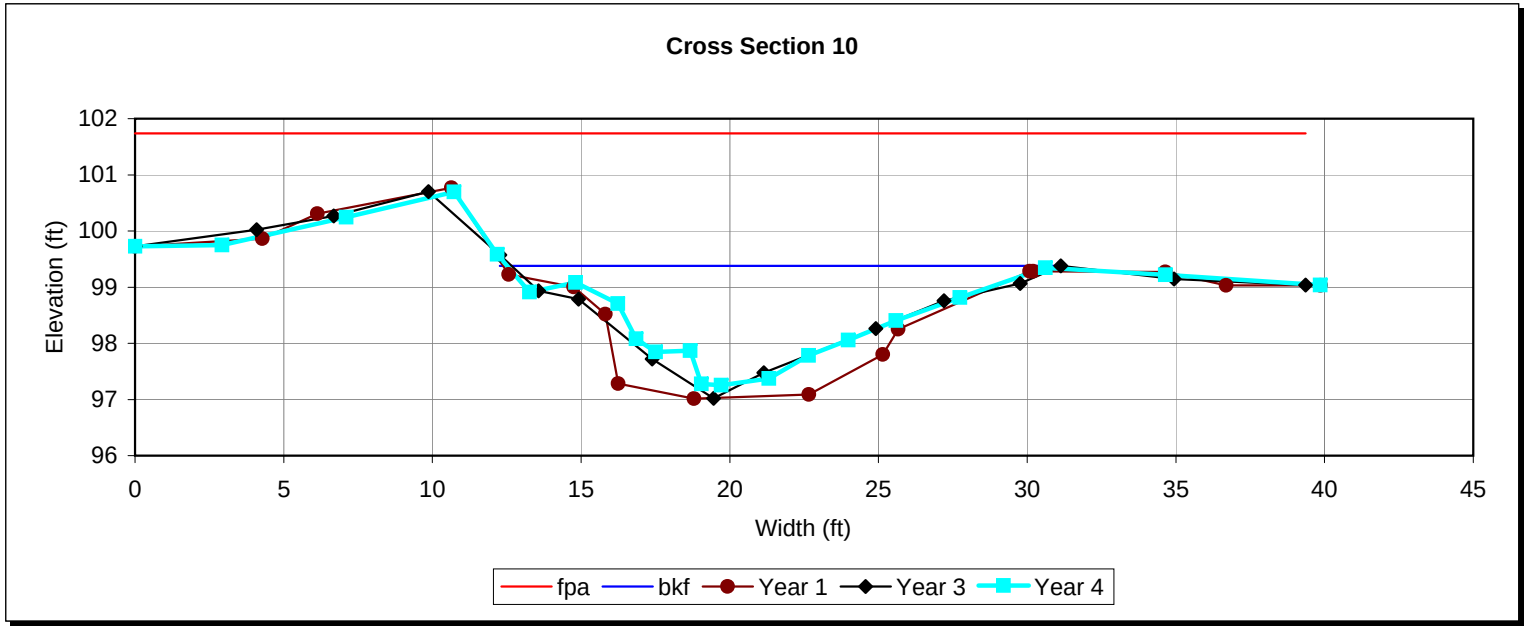
Looking at Left Bank.

Looking at Right Bank.



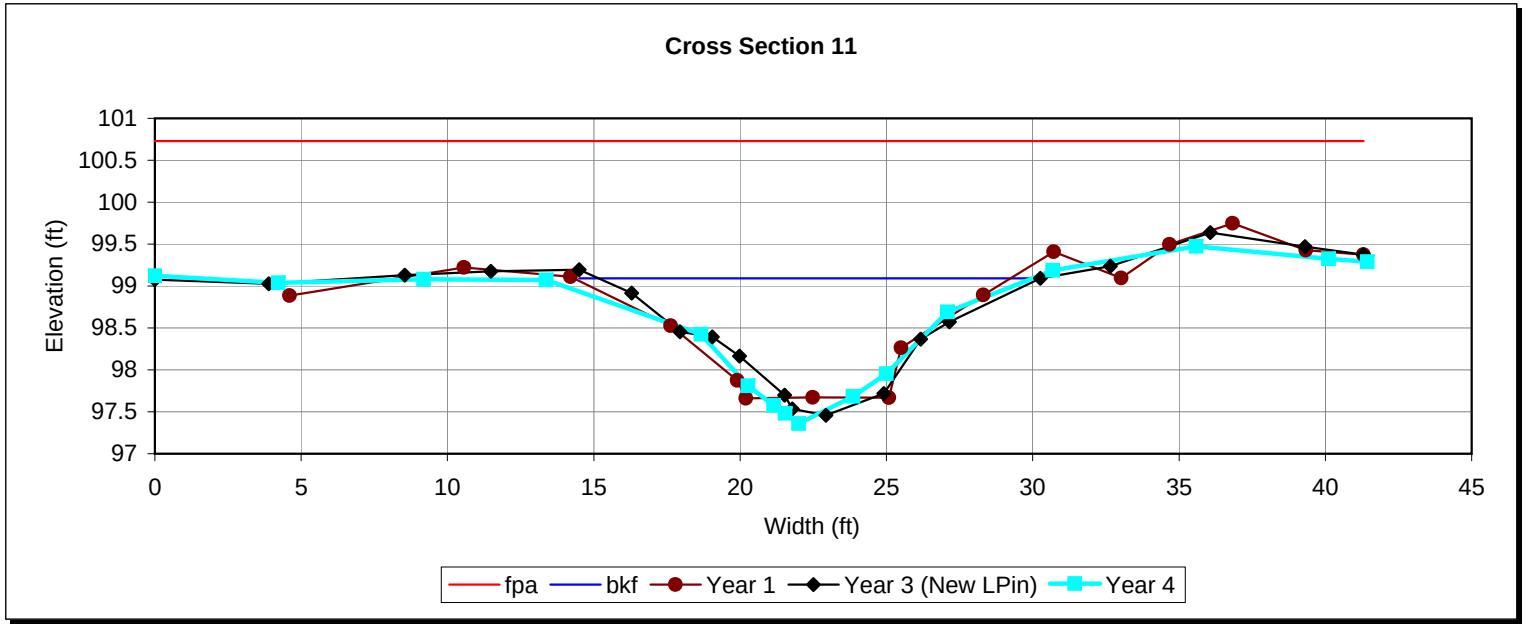
Looking at Left Bank.

Looking at Right Bank.



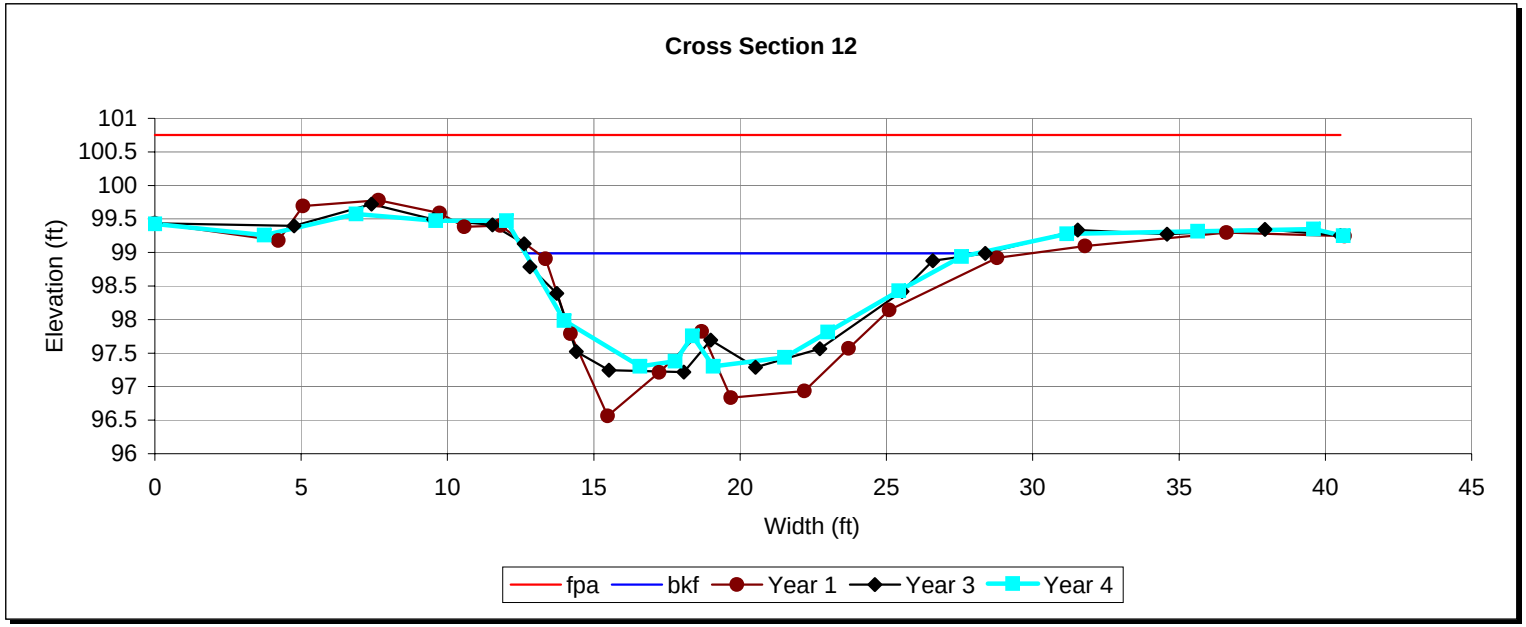
Looking at Left Bank.

Looking at Right Bank.



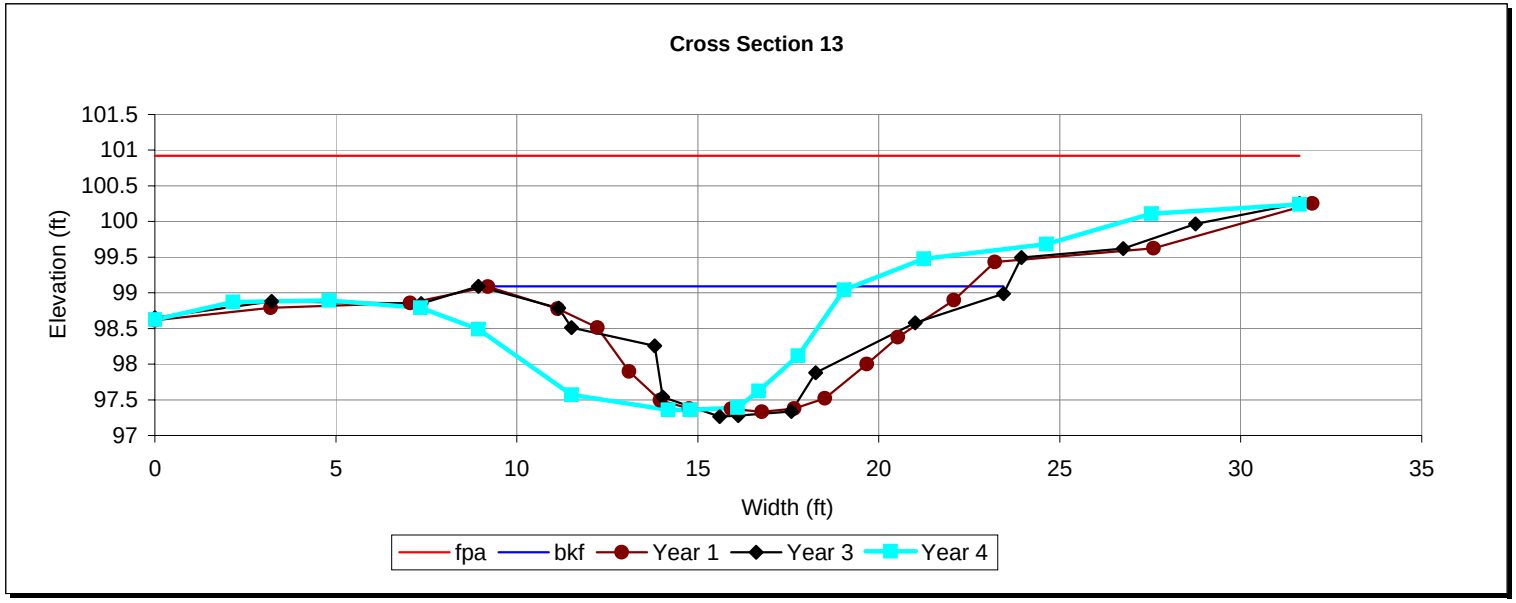
Looking at Left Bank.

Looking at Right Bank.



Looking at Left Bank.

Looking at Right Bank.



APPENDIX C

Gauge Data

									Weatherstation Rainfall Data	
Date	**Water Level (inches)**									
dd-mmm-yyyy	**AW1**	**AW2**	**AW3**	**WEBBRAW1**	**MW1**	**MW2**	**MW3**	**On-site Raingauge**	**Trenton Daily Rainfall**	**Trenton Monthly Rainfall**
1-Jan-2007	1.34	-3.48	-0.45							
1-Jan-2007	3.18	5.54	1.08						0.2	
2-Jan-2007	1.78	3.79	0.02							
2-Jan-2007	1.62	4.42	-0.22						0.31	
3-Jan-2007	1.19	1.08	-0.30							
3-Jan-2007	1.48	-1.16	-0.36						0	
4-Jan-2007	0.97	-1.43	-0.38							
4-Jan-2007	1.42	-1.65	-0.47						0	
5-Jan-2007	1.36	-1.78	-0.36							
5-Jan-2007	2.31	-0.08	0.37						0.06	
6-Jan-2007	3.64	5.03	1.57							
6-Jan-2007	2.36	3.01	0.04						3.09	
7-Jan-2007	1.53	1.89	-0.10							
7-Jan-2007	2.06	1.68	0.03						0	
8-Jan-2007	2.14	1.08	0.03							
8-Jan-2007	2.16	0.55	-0.01						0.28	
9-Jan-2007	1.55	-0.21	-0.15							
9-Jan-2007	1.63	-0.93	-0.33						0.03	
10-Jan-2007	1.05	-1.72	-0.47							
10-Jan-2007	0.94	-2.47	-0.68						0	
11-Jan-2007	0.71	-3.19	-0.74							
11-Jan-2007	1.04	-3.51	-0.72						0	
12-Jan-2007	0.61	-4.02	-0.72							
12-Jan-2007	0.92	-4.32	-0.76						0	
13-Jan-2007	0.55	-4.74	-0.72							
13-Jan-2007	0.95	-5.06	-0.75						0	
14-Jan-2007	0.56	-5.49	-0.74							
14-Jan-2007	0.92	-5.65	-0.79						0	
15-Jan-2007	0.36	-5.91	-0.76							
15-Jan-2007	1.24	-6.04	-0.77						0	
16-Jan-2007	0.87	-6.21	-0.76							
16-Jan-2007	1.11	-5.78	-0.68						0	
17-Jan-2007	0.37	-6.88	-0.74							
17-Jan-2007	0.17	-7.29	-0.85						0.08	
18-Jan-2007	1.16	-3.83	-0.37							

									Weatherstation Rainfall Data	
Date	**Water Level (inches)**									
dd-mmm-yyyy	**AW1**	**AW2**	**AW3**	**WEBBRAW1**	**MW1**	**MW2**	**MW3**	**On-site Raingauge**	**Trenton Daily Rainfall**	**Trenton Monthly Rainfall**
18-Jan-2007	2.09	-2.35	0.01						0.11	
19-Jan-2007	1.93	-3.82	-0.13							
19-Jan-2007	1.73	-4.65	-0.27						0.29	
20-Jan-2007	1.02	-5.48	-0.37							
20-Jan-2007	1.1	-6.03	-0.59						0	
21-Jan-2007	0.8	-6.37	-0.60							
21-Jan-2007	1.45	-4.57	-0.31						0	
22-Jan-2007	3.11	0.98	1.22							
22-Jan-2007	2.4	0.66	0.29						1.4	
23-Jan-2007	1.74	-0.15	0.05							
23-Jan-2007	1.71	-0.74	-0.08						0.04	
24-Jan-2007	1.36	-1.34	-0.15							
24-Jan-2007	1.61	-1.92	-0.21						0	
25-Jan-2007	1.29	-2.50	-0.23							
25-Jan-2007	1.37	-3.16	-0.42						0	
26-Jan-2007	0.73	-3.96	-0.52							
26-Jan-2007	1.08	-4.38	-0.57						0	
27-Jan-2007	0.87	-4.77	-0.56							
27-Jan-2007	1.15	-5.20	-0.67						0	
28-Jan-2007	1.95	-1.32	0.02							
28-Jan-2007	2.3	-1.59	0.01						0.32	
29-Jan-2007	1.27	-2.14	-0.18							
29-Jan-2007	1.26	0.28	-0.27						0.13	
30-Jan-2007	1.02	-2.63	-0.39							
30-Jan-2007	1.26	-5.15	-0.44						0	
31-Jan-2007	0.71	-5.77	-0.57							
31-Jan-2007	0.81	-0.14	-0.63						0	6.34
1-Feb-2007	0.92	-8.19	-0.40							
1-Feb-2007	3.28	0.11	1.45						0	
2-Feb-2007	2.67	2.18	0.81							
2-Feb-2007	2.19	2.82	0.30						1.31	
3-Feb-2007	1.5	1.83	0.11							
3-Feb-2007	1.54	1.08	-0.03						0.05	
4-Feb-2007	1.3	0.42	-0.07							
4-Feb-2007	1.41	-0.25	-0.21						0	

									Weatherstation Rainfall Data	
Date	**Water Level (inches)**									
dd-mmm-yyyy	**AW1**	**AW2**	**AW3**	**WEBBRAW1**	**MW1**	**MW2**	**MW3**	**On-site Raingauge**	**Trenton Daily Rainfall**	**Trenton Monthly Rainfall**
5-Feb-2007	1.01	4.57	-0.34							
5-Feb-2007	1.17	-1.71	-0.46						0	
6-Feb-2007	0.58	-2.84	-0.61							
6-Feb-2007	1.1	-2.82	-0.46						0	
7-Feb-2007	1.07	-3.37	-0.46							
7-Feb-2007	1.2	-1.40	-0.57						0	
8-Feb-2007	0.69	-4.48	-0.57							
8-Feb-2007	0.86	-3.57	-0.71						0	
9-Feb-2007	0.43	-4.61	-0.69							
9-Feb-2007	0.65	-5.38	-0.73						0	
10-Feb-2007	0.1	-6.53	-0.77							
10-Feb-2007	0.1	-6.07	-0.97						0	
11-Feb-2007	-0.92	-6.74	-1.28							
11-Feb-2007	-0.31	-6.52	-1.10						0	
12-Feb-2007	-0.94	-4.44	-1.29							
12-Feb-2007	0.04	-6.53	-1.17						0	
13-Feb-2007	-0.64	-6.63	-1.19							
13-Feb-2007	0.77	-4.31	-0.50						0	
14-Feb-2007	2.35	4.37	0.28							
14-Feb-2007	2	2.14	-0.01						0.5	
15-Feb-2007	1.13	-0.50	-0.13							
15-Feb-2007	1.29	-2.43	-0.26						0	
16-Feb-2007	0.86	-3.99	-0.36							
16-Feb-2007	0.97	0.26	-0.49						0	
17-Feb-2007	0.06	1.97	-0.71							
17-Feb-2007	1.04	-5.29	-0.53						0	
18-Feb-2007	0.37	-6.21	-0.57							
18-Feb-2007	0.44	-6.70	-0.88						0	
19-Feb-2007	-0.82	-0.82	-0.99							
19-Feb-2007	-0.17	-6.78	-0.89						0	
20-Feb-2007	-0.48	-6.69	-0.85							
20-Feb-2007	-0.08	-6.81	-0.99						0	
21-Feb-2007	-0.36	-6.86	-1.00							
21-Feb-2007	0	-6.97	-1.09						0	
22-Feb-2007	-0.46	-6.97	-1.03							

									Weatherstation Rainfall Data	
Date	**Water Level (inches)**									
dd-mmm-yyyy	**AW1**	**AW2**	**AW3**	**WEBBRAW1**	**MW1**	**MW2**	**MW3**	**On-site Raingauge**	**Trenton Daily Rainfall**	**Trenton Monthly Rainfall**
22-Feb-2007	-0.66	-7.93	-1.42						0	
23-Feb-2007	-2.39	-8.26	-1.51							
23-Feb-2007	-2.63	-8.24	-1.88						0	
24-Feb-2007	-4	-8.47	-1.97							
24-Feb-2007	-4.17	-8.28	-2.22						0	
25-Feb-2007	-4.1	-7.84	-2.11							
25-Feb-2007	1.93	-1.10	0.30						0	
26-Feb-2007	1.31	-2.68	0.09							
26-Feb-2007	1.56	-3.88	-0.10						0.58	
27-Feb-2007	0.73	-4.71	-0.12		-0.50	-1.25	0.00			
27-Feb-2007	0.96	-5.62	-0.35						0	
28-Feb-2007	0.37	-6.12	-0.44							
28-Feb-2007	0.64	-6.47	-0.52						0	2.44
1-Mar-2007	-0.14	-6.59	-0.51							
1-Mar-2007	0.65	-6.66	-0.60						0	
2-Mar-2007	3.41	1.67	2.15							
2-Mar-2007	2.39	1.46	0.30						3.3	
3-Mar-2007	1.65	0.69	0.09							
3-Mar-2007	1.67	-0.11	-0.13						0.54	
4-Mar-2007	0.81	-0.86	-0.17							
4-Mar-2007	0.98	-1.61	-0.49						0	
5-Mar-2007	0.4	-2.37	-0.53							
5-Mar-2007	0.81	-3.03	-0.68						0	
6-Mar-2007	-0.2	-3.89	-0.71							
6-Mar-2007	0.17	-4.47	-0.88						0	
7-Mar-2007	-0.08	-4.63	-0.82							
7-Mar-2007	0.33	-5.15	-1.10						0	
8-Mar-2007	-0.68	-5.73	-1.23							
8-Mar-2007	-0.83	-6.26	-1.45						0	
9-Mar-2007	-1.67	-6.53	-1.44							
9-Mar-2007	-1.34	-6.77	-1.70						0	
10-Mar-2007	-2.19	-7.03	-1.71							
10-Mar-2007	-1.74	-7.36	-1.98						0	
11-Mar-2007	-2.55	-7.50	-1.95							
11-Mar-2007	-3.26	-8.14	-2.28						0	

									Weatherstation Rainfall Data	
Date	**Water Level (inches)**									
dd-mmm-yyyy	**AW1**	**AW2**	**AW3**	**WEBBRAW1**	**MW1**	**MW2**	**MW3**	**On-site Raingauge**	**Trenton Daily Rainfall**	**Trenton Monthly Rainfall**
12-Mar-2007	-4.31	-8.14	-2.27							
12-Mar-2007	-4.49	-8.44	-2.59						0	
13-Mar-2007	-5.59	-8.45	-2.59							
13-Mar-2007	-5.75	-8.89	-3.00						0	
14-Mar-2007	-6.83	-8.59	-2.90							
14-Mar-2007	-6.69	-8.88	-3.22						0	
15-Mar-2007	-7.45	-8.68	-3.15							
15-Mar-2007	-8.06	-9.12	-3.60						0	
16-Mar-2007	-6.33	-8.24	-3.01							
16-Mar-2007	2.04	-1.71	-0.09						0	
17-Mar-2007	1.3	-3.14	-0.22							
17-Mar-2007	1.04	-4.65	-0.49						0.58	
18-Mar-2007	0.33	-6.02	-0.63							
18-Mar-2007	0.28	-6.50	-0.86						0	
19-Mar-2007	-0.56	-6.99	-0.84							
19-Mar-2007	-0.38	-7.51	-1.12						0	
20-Mar-2007	-1.12	-7.58	-1.17							
20-Mar-2007	-0.75	-8.21	-1.47						0	
21-Mar-2007	-1.99	-8.10	-1.56							
21-Mar-2007	-1.89	-8.29	-1.73						0	
22-Mar-2007	-2.91	-8.19	-1.81							
22-Mar-2007	-2.98	-8.62	-2.13						0	
23-Mar-2007	-4.61	-8.42	-2.13							
23-Mar-2007	-5.22	-9.05	-2.62						0	
24-Mar-2007	-5.56	-8.60	-2.57							
24-Mar-2007	-7.06	-9.11	-3.12						0	
25-Mar-2007	-8.16	-8.92	-3.11							
25-Mar-2007	-10.55	-9.89	-3.99						0	
26-Mar-2007	-11.44	-9.48	-3.99							
26-Mar-2007	-11.79	-9.81	-4.76						0	
27-Mar-2007	-11.31	-9.36	-4.67							
27-Mar-2007	-12.5	-10.03	-6.04						0	
28-Mar-2007	-12.4	-9.60	-5.78							
28-Mar-2007	-13.68	-10.41	-7.66						0	
29-Mar-2007	-13.44	-10.09	-7.02		-4.50	-5.50	-8.50			

									Weatherstation Rainfall Data	
Date	**Water Level (inches)**								**Trenton Daily Rainfall**	**Trenton Monthly Rainfall**
dd-mmm-yyyy	**AW1**	**AW2**	**AW3**	**WEBBRAW1**	**MW1**	**MW2**	**MW3**	**On-site Raingauge**		
29-Mar-2007	-7.12	-9.19	-4.60					1.78	0	
30-Mar-2007	-10.79	-9.55	-5.25							
30-Mar-2007	-13.37	-10.19	-8.06						0.23	
31-Mar-2007	-14.2	-9.94	-8.07							
31-Mar-2007	-14.8	-10.75	-11.21						0	4.65
1-Apr-2007	-15.6	-10.33	-10.36							
1-Apr-2007	-15.11	-10.82	-12.20						0	
2-Apr-2007	-13.31	-10.14	-9.67							
2-Apr-2007	-14.83	-11.17	-13.98						0	
3-Apr-2007	-16.64	-10.89	-13.16							
3-Apr-2007	-16.38	-11.65	-17.10						0	
4-Apr-2007	-15.07	-10.68	-13.92							
4-Apr-2007	-15.93	-11.70	-18.86						0	
5-Apr-2007	-18.09	-11.69	-19.00							
5-Apr-2007	-17.42	-12.41	-21.42						0	
6-Apr-2007	-19.05	-12.10	-20.62							
6-Apr-2007	-18.58	-12.47	-22.04						0	
7-Apr-2007	-19.05	-12.35	-21.43							
7-Apr-2007	-18.71	-13.12	-23.46						0	
8-Apr-2007	-20.25	-12.84	-23.11							
8-Apr-2007	-18.84	-12.95	-23.84						0	
9-Apr-2007	-20.29	-12.49	-23.10							
9-Apr-2007	-18.97	-12.71	-24.01						0	
10-Apr-2007	-20.23	-12.81	-23.38							
10-Apr-2007	-19.42	-13.35	-24.49						0	
11-Apr-2007	-19.65	-12.79	-22.96							
11-Apr-2007	-18.9	-12.78	-22.40						0	
12-Apr-2007	-17.77	-11.77	-19.54							
12-Apr-2007	-16.55	-13.13	-23.35						0.14	
13-Apr-2007	-20.93	-13.06	-23.80							
13-Apr-2007	-13.49	-13.68	-24.94						0	
14-Apr-2007	-21.8	-13.57	-24.39							
14-Apr-2007	-20.16	-13.98	-25.14						0	
15-Apr-2007	-4.56	-2.05	-0.83							
15-Apr-2007	6.58	-0.25	0.11						1.29	

									Weatherstation Rainfall Data	
Date	**Water Level (inches)**								**Trenton Daily Rainfall**	**Trenton Monthly Rainfall**
dd-mmm-yyyy	**AW1**	**AW2**	**AW3**	**WEBBRAW1**	**MW1**	**MW2**	**MW3**	**On-site Raingauge**		
16-Apr-2007	2.06	-1.06	-0.22							
16-Apr-2007	0.79	-2.71	-0.93						2.5	
17-Apr-2007	0.28	-3.68	-1.14							
17-Apr-2007	-0.24	-4.93	-1.51						0	
18-Apr-2007	-0.89	-5.58	-1.62							
18-Apr-2007	-1.51	-6.53	-1.91						0	
19-Apr-2007	-2.19	-7.05	-2.04							
19-Apr-2007	-2.98	-7.72	-2.42						0	
20-Apr-2007	-3.84	-8.05	-2.56							
20-Apr-2007	-5.71	-8.65	-3.21						0	
21-Apr-2007	-7.04	-8.94	-3.32							
21-Apr-2007	-8.7	-9.55	-4.65						0	
22-Apr-2007	-9.67	-9.75	-4.80							
22-Apr-2007	-11.29	-10.38	-7.28						0	
23-Apr-2007	-12.08	-10.39	-7.33							
23-Apr-2007	-13.48	-11.08	-10.61						0	
24-Apr-2007	-13.81	-11.75	-9.86		-12.00	-16.00	-13.50			
24-Apr-2007	-15.35	-12.48	-13.34	-28.17				2.55	0	
25-Apr-2007	-15.57	-12.62	-12.37	-26.79						
25-Apr-2007	-16.98	-13.70	-16.69	-29.51					0	
26-Apr-2007	-17.28	-12.92	-15.86	-29.50						
26-Apr-2007	-18.34	-14.13	-19.44	-31.81					0	
27-Apr-2007	-18.23	-13.56	-18.29	-31.63						
27-Apr-2007	-19.29	-15.06	-21.56	-33.66					0	
28-Apr-2007	-19.38	-14.54	-21.15	-33.83						
28-Apr-2007	-20.29	-15.71	-24.32	-36.13					0	
29-Apr-2007	-20.52	-15.53	-24.63	-36.44						
29-Apr-2007	-21.12	-16.69	-26.00	-38.65					0	
30-Apr-2007	-21.38	-16.94	-26.22	-38.85						
30-Apr-2007	-21.92	-18.36	-27.16	-40.96					0	3.93
1-May-2007	-22.21	-18.74	-27.39	-41.24						
1-May-2007	-22.78	-20.41	-28.26	-43.35					0	
2-May-2007	-23.03	-20.74	-28.36	-43.36						
2-May-2007	-23.56	-22.15	-29.13	-45.13					0	
3-May-2007	-23.82	-22.35	-29.31	-45.34						

									Weatherstation Rainfall Data	
Date	**Water Level (inches)**									
dd-mmm-yyyy	**AW1**	**AW2**	**AW3**	**WEBBRAW1**	**MW1**	**MW2**	**MW3**	**On-site Raingauge**	**Trenton Daily Rainfall**	**Trenton Monthly Rainfall**
3-May-2007	-24.24	-23.18	-29.75	-46.13					0	
4-May-2007	-24.45	-23.26	-29.87	-46.23						
4-May-2007	-22.59	-19.01	-22.97	-42.15					0	
5-May-2007	-22.31	-16.93	-20.90	-39.07						
5-May-2007	-22.03	-15.44	-21.27	-38.71					0.36	
6-May-2007	-12.12	-8.01	-6.10	-33.92						
6-May-2007	-12.81	-11.00	-9.78	-28.96					1.08	
7-May-2007	-13.65	-11.66	-11.39	-27.60						
7-May-2007	-15.42	-12.64	-16.21	-30.55					0	
8-May-2007	-15.93	-12.91	-17.34	-30.17						
8-May-2007	-15.35	-12.96	-15.92	-30.54					0	
9-May-2007	-15.19	-13.82	-15.18	-30.07						
9-May-2007	-15.38	-13.50	-13.65	-27.38					0.17	
10-May-2007	-15.77	-14.05	-13.86	-22.22						
10-May-2007	-16.5	-14.69	-16.97	-20.94					0.02	
11-May-2007	-17.14	-14.83	-17.94	-19.94						
11-May-2007	-18.27	-15.76	-20.80	-25.04					0.11	
12-May-2007	-18.58	-16.00	-21.10	-23.98						
12-May-2007	-2.89	2.43	1.69	-0.95					0.62	
13-May-2007	0.57	-1.56	-0.64	-1.87						
13-May-2007	-0.07	-3.24	-1.18	-3.44					0	
14-May-2007	-0.63	-4.75	-1.44	-4.32						
14-May-2007	-1.56	-6.50	-1.91	-7.34					0	
15-May-2007	-2.11	-8.06	-2.01	-7.98						
15-May-2007	-3.41	-9.65	-2.65	-11.34					0	
16-May-2007	-4.47	-10.46	-2.69	-11.49						
16-May-2007	-8.23	-11.70	-4.33	-15.46					0	
17-May-2007	-8.4	-11.70	-2.95	-14.86						
17-May-2007	-6.18	-9.19	-2.07	-10.47					0	
18-May-2007	-0.3	-5.75	-1.54	-7.49						
18-May-2007	-1.62	-8.49	-1.86	-11.02					0	
19-May-2007	-2.4	-8.86	-1.90	-11.51						
19-May-2007	-4.08	-10.18	-2.49	-15.48					0	
20-May-2007	-5.13	-11.50	-2.59	-15.09						
20-May-2007	-8.42	-11.96	-3.85	-19.40					0	

									Weatherstation Rainfall Data	
Date	**Water Level (inches)**								**Trenton Daily Rainfall**	**Trenton Monthly Rainfall**
dd-mmm-yyyy	**AW1**	**AW2**	**AW3**	**WEBBRAW1**	**MW1**	**MW2**	**MW3**	**On-site Raingauge**		
21-May-2007	-9.61	-12.34	-3.90	-18.63						
21-May-2007	-12.23	-13.20	-6.60	-23.17					0	
22-May-2007	-12.81	-13.30	-6.62	-22.07						
22-May-2007	-14.72	-14.23	-10.04	-25.88					0	
23-May-2007	-15.32	-14.02	-10.01	-25.01	-14.50	-20.00	-20.00			
23-May-2007	-17.03	-15.16	-17.75	-29.01				3.9	0	
24-May-2007	-17.4	-14.61	-18.12	-28.31						
24-May-2007	-18.48	-15.79	-19.20	-31.95					0	
25-May-2007	-18.6	-15.47	-19.32	-31.27						
25-May-2007	-19.56	-17.24	-20.28	-34.70					0	
26-May-2007	-19.62	-16.91	-20.34	-34.28						
26-May-2007	-20.67	-19.04	-21.39	-37.50					0	
27-May-2007	-20.78	-19.07	-21.50	-37.26						
27-May-2007	-21.81	-21.39	-22.53	-40.19					0	
28-May-2007	-21.86	-21.46	-22.58	-39.87						
28-May-2007	-22.8	-23.65	-23.52	-42.47					1.16	
29-May-2007	-22.83	-23.68	-23.55	-42.19						
29-May-2007	-23.83	-25.12	-24.55	-44.74					0	
30-May-2007	-23.85	-25.20	-24.57	-44.53						
30-May-2007	-24.76	-26.51	-25.48	-46.86					0	
31-May-2007	-24.84	-26.62	-25.56	-46.60						
31-May-2007	-25.46	-27.55	-26.18	-48.11					0	3.52
1-Jun-2007	-25.59	-27.82	-26.31	-47.89						
1-Jun-2007	-26.18	-28.73	-26.90	-47.89					0	
2-Jun-2007	-26.26	-28.78	-26.98	-47.87						
2-Jun-2007	-26.62	-28.59	-27.34	-47.83					0	
3-Jun-2007	-4.87	-7.33	-5.59	-47.84						
3-Jun-2007	-3.55	-8.63	-4.27	-45.51					1.54	
4-Jun-2007	-4.3	-11.42	-5.02	-44.15						
4-Jun-2007	-7.75	-13.77	-8.47	-45.59					0.45	
5-Jun-2007	-9.57	-14.56	-10.29	-44.91						
5-Jun-2007	-13.26	-15.83	-13.98	-47.39					0	
6-Jun-2007	-14.57	-16.54	-15.29	-47.50						
6-Jun-2007	-16.7	-17.79	-17.42	-47.85					0.05	
7-Jun-2007	-17.46	-18.30	-18.18	-47.86						

									Weatherstation Rainfall Data	
Date	**Water Level (inches)**									
dd-mmm-yyyy	**AW1**	**AW2**	**AW3**	**WEBBRAW1**	**MW1**	**MW2**	**MW3**	**On-site Raingauge**	**Trenton Daily Rainfall**	**Trenton Monthly Rainfall**
7-Jun-2007	-18.64	-19.71	-19.36	-47.84					0	
8-Jun-2007	-18.73	-19.85	-19.45	-47.83						
8-Jun-2007	-19.52	-21.42	-20.24	-47.85					0	
9-Jun-2007	-19.53	-21.75	-20.25	-47.83						
9-Jun-2007	-20.74	-23.85	-21.46	-47.83					0	
10-Jun-2007	-21.03	-24.03	-21.75	-47.84						
10-Jun-2007	-22.07	-25.76	-22.79	-47.84					0	
11-Jun-2007	-22.37	-25.99	-23.09	-47.84						
11-Jun-2007	-23.18	-27.16	-23.90	-47.84					0	
12-Jun-2007	-23.39	-27.64	-24.11	-47.84						
12-Jun-2007	-24.18	-28.60	-24.90	-47.83					0	
13-Jun-2007	-24.36	-28.80	-25.08	-47.85						
13-Jun-2007	-25.21	-29.81	-25.93	-47.83					0	
14-Jun-2007	-25.47	-29.92	-26.19	-47.83						
14-Jun-2007	-26.09	-30.42	-26.81	-47.84					0	
15-Jun-2007	-26.37	-30.74	-27.09	-47.83						
15-Jun-2007	-26.94	-31.34	-27.66	-47.84					0	
16-Jun-2007	-27.13	-31.64	-27.85	-47.85						
16-Jun-2007	-27.61	-32.26	-28.33	-47.84					0	
17-Jun-2007	-27.8	-32.54	-28.52	-47.84						
17-Jun-2007	-28.32	-32.96	-29.04	-47.83					0	
18-Jun-2007	-28.48	-33.44	-29.20	-47.84						
18-Jun-2007	-29.02	-34.02	-29.74	-47.83					0	
19-Jun-2007	-29.19	-34.36	-29.91	-47.83						
19-Jun-2007	-29.71	-34.84	-30.43	-47.83					0	
20-Jun-2007	-29.85	-35.34	-30.57	-47.84						
20-Jun-2007	-30.2	-35.46	-30.92	-47.84					0	
21-Jun-2007	-30.33	-35.72	-31.05	-47.83						
21-Jun-2007	-30.68	-35.91	-31.40	-47.84					0.19	
22-Jun-2007	-30.81	-36.37	-31.53	-47.83						
22-Jun-2007	-31.27	-36.73	-31.99	-47.83					0	
23-Jun-2007	-31.51	-37.12	-32.23	-47.85						
23-Jun-2007	-31.92	-37.41	-32.64	-47.84					0	
24-Jun-2007	-32.18	-38.11	-32.90	-47.84						
24-Jun-2007	-32.66	-38.49	-33.38	-47.84					0	

									Weatherstation Rainfall Data	
Date	**Water Level (inches)**									
dd-mmm-yyyy	**AW1**	**AW2**	**AW3**	**WEBBRAW1**	**MW1**	**MW2**	**MW3**	**On-site Raingauge**	**Trenton Daily Rainfall**	**Trenton Monthly Rainfall**
25-Jun-2007	-32.91	-38.93	-33.63	-47.84	-24.50	-34.00	-45.50			
25-Jun-2007	-33.25	-39.29	-41.58	-47.84				1.75	0	
26-Jun-2007	-33.46	-39.58	-41.83	-47.84						
26-Jun-2007	-33.88	-39.94	-42.24	-47.85					0.35	
27-Jun-2007	-34.08	-40.32	-42.54	-47.86						
27-Jun-2007	-34.53	-40.52	-42.97	-47.85					0	
28-Jun-2007	-34.74	-41.21	-43.28	-47.84						
28-Jun-2007	-35.31	-41.52	-43.74	-47.85					0	
29-Jun-2007	-35.57	-42.00	-44.10	-47.85						
29-Jun-2007	-32.92	-41.07	-42.61	-47.84					0	
30-Jun-2007	-33.26	-39.13	-41.40	-47.84						
30-Jun-2007	-20.51	-24.78	-24.43	-47.85					0.09	2.67
1-Jul-2007	-25.69	-22.89	-28.19	-47.85						
1-Jul-2007	-26.94	-24.99	-29.90	-47.84					0.01	
2-Jul-2007	-27.16	-26.37	-30.34	-47.85						
2-Jul-2007	-27.42	-27.84	-30.98	-47.85					0	
3-Jul-2007	-27.36	-28.68	-31.12	-47.84						
3-Jul-2007	-27.64	-29.73	-31.76	-47.85					0	
4-Jul-2007	-27.62	-30.17	-31.83	-47.84						
4-Jul-2007	-28.03	-31.07	-32.60	-47.84					0	
5-Jul-2007	-28.07	-31.61	-32.71	-47.84						
5-Jul-2007	-28.47	-32.49	-33.42	-47.85					0	
6-Jul-2007	-28.52	-32.79	-33.60	-47.84						
6-Jul-2007	-28.97	-33.59	-34.41	-47.84					0	
7-Jul-2007	-28.83	-33.87	-34.57	-47.84						
7-Jul-2007	-28.67	-33.72	-34.74	-47.85					0.41	
8-Jul-2007	-28.58	-33.74	-34.83	-41.13						
8-Jul-2007	-28.83	-34.22	-35.18	-40.01					0.12	
9-Jul-2007	-28.8	-34.49	-35.35	-39.56						
9-Jul-2007	-29.15	-35.02	-35.89	-40.72					0	
10-Jul-2007	-29.05	-35.20	-36.05	-40.54						
10-Jul-2007	-19.55	-17.51	-28.20	-39.03					0	
11-Jul-2007	-15.93	-18.39	-21.27	-13.86						
11-Jul-2007	-18.83	-20.11	-25.06	-16.49					0.38	
12-Jul-2007	-20.16	-20.45	-25.45	-15.05						

									Weatherstation Rainfall Data	
Date	**Water Level (inches)**								**Trenton Daily Rainfall**	**Trenton Monthly Rainfall**
dd-mmm-yyyy	**AW1**	**AW2**	**AW3**	**WEBBRAW1**	**MW1**	**MW2**	**MW3**	**On-site Raingauge**		
12-Jul-2007	-21.86	-22.20	-27.37	-20.71					0.15	
13-Jul-2007	-22.12	-22.75	-27.65	-19.32						
13-Jul-2007	-22.84	-24.81	-28.69	-23.89					0	
14-Jul-2007	-22.98	-25.37	-28.88	-23.19						
14-Jul-2007	-23.72	-27.16	-30.03	-27.76					0.12	
15-Jul-2007	-23.75	-27.36	-30.08	-26.72						
15-Jul-2007	-24.47	-28.74	-31.24	-31.18					0.01	
16-Jul-2007	-24.54	-29.05	-31.33	-30.70						
16-Jul-2007	-25.15	-30.15	-32.39	-34.39					0.08	
17-Jul-2007	-24.84	-29.89	-32.39	-34.33						
17-Jul-2007	-10.55	-16.99	-13.41	-37.03					0.73	
18-Jul-2007	-1.09	-9.15	-6.77	-26.64						
18-Jul-2007	-1.79	-15.68	-12.27	-21.97					0.93	
19-Jul-2007	-2.39	-17.46	-13.59	-20.17						
19-Jul-2007	-5.2	-19.77	-19.37	-26.49					0	
20-Jul-2007	-7.48	-20.08	-19.77	-24.99						
20-Jul-2007	-10.98	-21.12	-21.95	-28.75					0	
21-Jul-2007	-13.35	-21.63	-22.67	-28.69						
21-Jul-2007	-17.49	-23.62	-25.13	-33.43					0.16	
22-Jul-2007	-18.3	-24.07	-25.36	-33.49						
22-Jul-2007	-19.74	-25.95	-27.09	-37.19					0	
23-Jul-2007	-20.15	-26.10	-27.23	-37.37						
23-Jul-2007	-21.27	-27.72	-29.00	-40.86					0	
24-Jul-2007	-21.59	-28.09	-29.07	-40.63						
24-Jul-2007	-22.61	-29.71	-30.60	-43.60					0	
25-Jul-2007	-22.88	-29.82	-30.70	-43.26						
25-Jul-2007	-23.84	-31.22	-32.09	-45.93					0	
26-Jul-2007	-24.02	-31.37	-32.10	-45.52	-32.50	-26.00	-64.00			
26-Jul-2007	-24.77	-32.38	-33.13	-47.50				5.45	0	
27-Jul-2007	-24.88	-32.63	-33.06	-47.06						
27-Jul-2007	-25.63	-33.52	-34.16	-47.91					0	
28-Jul-2007	-25.68	-33.46	-34.05	-47.90						
28-Jul-2007	-26.25	-34.18	-34.88	-47.89					0.13	
29-Jul-2007	-26.38	-34.37	-35.02	-47.88						
29-Jul-2007	-27.04	-35.12	-35.85	-47.87					0.5	

									Weatherstation Rainfall Data	
Date	**Water Level (inches)**									
dd-mmm-yyyy	**AW1**	**AW2**	**AW3**	**WEBBRAW1**	**MW1**	**MW2**	**MW3**	**On-site Raingauge**	**Trenton Daily Rainfall**	**Trenton Monthly Rainfall**
30-Jul-2007	-27.15	-35.45	-36.02	-47.88						
30-Jul-2007	-27.43	-35.83	-36.49	-47.88					0	
31-Jul-2007	-27.53	-35.81	-36.59	-47.87						
31-Jul-2007	-27.99	-36.47	-37.30	-47.88					0.06	3.79
1-Aug-2007	-28.13	-36.63	-37.58	-47.87						
1-Aug-2007	-28.8	-37.56	-38.49	-47.87					0	
2-Aug-2007	-28.98	-37.91	-38.90	-47.88						
2-Aug-2007	-29.67	-38.74	-39.80	-47.87					0	
3-Aug-2007	-29.8	-39.26	-40.23	-47.88						
3-Aug-2007	-30.46	-40.02	-41.05	-47.89					0	
4-Aug-2007	-30.6	-40.32	-41.51	-47.88						
4-Aug-2007	-31.36	-41.13	-42.33	-47.88					0	
5-Aug-2007	-31.57	-41.58	-42.86	-47.89						
5-Aug-2007	-32.42	-42.42	-43.70	-47.88					0	
6-Aug-2007	-32.65	-43.07	-44.30	-47.89						
6-Aug-2007	-33.34	-43.70	-45.00	-47.87					0.06	
7-Aug-2007	-33.53	-44.01	-45.47	-47.88						
7-Aug-2007	-34.44	-44.64	-46.10	-47.88					0	
8-Aug-2007	-34.69	-45.06	-46.59	-47.89						
8-Aug-2007	-35.44	-45.65	-47.20	-47.88					0	
9-Aug-2007	-35.69	-46.15	-47.64	-47.87						
9-Aug-2007	-36.35	-46.69	-48.25	-47.89					0	
10-Aug-2007	-36.58	-47.35	-48.70	-47.85						
10-Aug-2007	-36.95	-47.74	-49.29	-47.85					0	
11-Aug-2007	-37.23	-48.04	-49.66	-47.86						
11-Aug-2007	-37.35	-48.32	-50.00	-47.85					0.54	
12-Aug-2007	-37.56	-48.22	-50.22	-47.85						
12-Aug-2007	-37.89	-48.63	-50.52	-47.84					0.37	
13-Aug-2007	-38.01	-48.68	-50.83	-47.84						
13-Aug-2007	-38.42	-49.37	-51.18	-47.86					0	
14-Aug-2007	-38.6	-49.56	-51.55	-47.85						
14-Aug-2007	-39.09	-50.21	-52.00	-47.85					0	
15-Aug-2007	-39.31	-50.47	-52.41	-47.84						
15-Aug-2007	-39.81	-51.17	-52.12	-47.86					0	
16-Aug-2007	-40.08	-51.45	-52.19	-47.86						

									Weatherstation Rainfall Data	
Date	**Water Level (inches)**								**Trenton Daily Rainfall**	**Trenton Monthly Rainfall**
dd-mmm-yyyy	**AW1**	**AW2**	**AW3**	**WEBBRAW1**	**MW1**	**MW2**	**MW3**	**On-site Raingauge**		
16-Aug-2007	-40.58	-52.23	-52.26	-47.84					0	
17-Aug-2007	-40.91	-52.42	-52.30	-47.84						
17-Aug-2007	-41.42	-53.00	-52.33	-47.85					0	
18-Aug-2007	-41.77	-53.46	-52.41	-47.86						
18-Aug-2007	-42.4	-53.93	-52.48	-47.84						
19-Aug-2007	-42.74	-54.22	-52.56	-47.86						
19-Aug-2007	-43.31	-54.75	-52.01	-47.84					0	
20-Aug-2007	-43.6	-55.46	-52.02	-47.85						
20-Aug-2007	-44.22	-56.11	-52.05	-47.84					0	
21-Aug-2007	-44.6	-56.50	-52.04	-47.84						
21-Aug-2007	-45.24	-57.11	-52.04	-47.84					0	
22-Aug-2007	-45.26	-57.10	-52.05	-47.85						
22-Aug-2007	-45.8	-55.30	-52.04	-47.85					0.98	
23-Aug-2007	-45.99	-56.04	-52.08	-47.85						
23-Aug-2007	-46.34	-56.86	-52.06	-47.86					0	
24-Aug-2007	-46.51	-57.43	-52.05	-47.85						
24-Aug-2007	-46.97	-56.05	-52.03	-47.86					0	
25-Aug-2007	-47.14	-56.05	-52.00	-47.86						
25-Aug-2007	-47.7	-56.05	-52.02	-47.86					0	
26-Aug-2007	-47.95	-56.05	-52.03	-47.85						
26-Aug-2007	-47.35	-56.05	-52.03	-47.85					0	
27-Aug-2007	-47.82	-56.05	-52.04	-47.86						
27-Aug-2007	-48.4	-56.06	-52.04	-47.85					0.28	
28-Aug-2007	-48.48	-56.06	-52.02	-47.85	-28.50	-45.00	-71.00			
28-Aug-2007	-48.98	-56.05	-52.02	-47.84				1.84	0.05	
29-Aug-2007	-49.13	-56.05	-51.99	-47.85						
29-Aug-2007	-49.6	-56.05	-51.72	-47.86					0	
30-Aug-2007	-49.72	-56.05	-51.71	-47.85						
30-Aug-2007	-50.24	-56.05	-51.70	-47.85					0	
31-Aug-2007	-50.35	-56.06	-51.70	-47.84						
31-Aug-2007	-50.95	-56.05	-51.71	-47.85					0	2.28
1-Sep-2007	-51.13	-56.05	-51.70	-47.85						
1-Sep-2007	-51.58	-56.05	-51.70	-47.86					0	
2-Sep-2007	-51.77	-56.05	-51.72	-47.84						
2-Sep-2007	-52.36	-56.05	-51.70	-47.85					0	

									Weatherstation Rainfall Data	
Date	**Water Level (inches)**									
dd-mmm-yyyy	**AW1**	**AW2**	**AW3**	**WEBBRAW1**	**MW1**	**MW2**	**MW3**	**On-site Raingauge**	**Trenton Daily Rainfall**	**Trenton Monthly Rainfall**
3-Sep-2007	-52.56	-56.05	-51.70	-47.85						
3-Sep-2007	125.17	-56.05	-51.72	-47.85					0	
4-Sep-2007	125.17	-56.04	-51.70	-47.84						
4-Sep-2007	-51	-56.05	-51.70	-47.85					0	
5-Sep-2007	-50.99	-56.04	-51.70	-47.85						
5-Sep-2007	-50.98	-56.05	-51.69	-47.84					0	
6-Sep-2007	-50.99	-56.05	-51.69	-47.84						
6-Sep-2007	-50.99	-56.05	-51.70	-47.85					0	
7-Sep-2007	-50.99	-56.05	-51.70	-47.86						
7-Sep-2007	-50.99	-56.05	-51.69	-47.84					0	
8-Sep-2007	-50.99	-56.04	-51.69	-47.84						
8-Sep-2007	-50.99	-56.05	-51.70	-47.85					0	
9-Sep-2007	-50.99	-56.06	-51.70	-47.85						
9-Sep-2007	-50.99	-56.04	-51.69	-47.84					0	
10-Sep-2007	-50.99	-56.04	-51.69	-47.85						
10-Sep-2007	-50.98	-56.03	-51.69	-47.85					0.15	
11-Sep-2007	-50.99	-56.04	-51.70	-47.86						
11-Sep-2007	-50.97	-56.04	-51.70	-47.85					0	
12-Sep-2007	-50.98	-56.03	-51.68	-47.84						
12-Sep-2007	-44.55	-55.65	-51.71	-47.84					0	
13-Sep-2007	-49.47	-56.04	-51.69	-47.85						
13-Sep-2007	-51.44	-56.04	-51.69	-47.85					0.2	
14-Sep-2007	-52.53	-56.02	-51.70	-47.85						
14-Sep-2007	-50.41	-56.27	-51.70	-47.84					0	
15-Sep-2007	-5.37	-49.24	-51.50	-47.85						
15-Sep-2007	-24.76	-48.35	-51.55	-47.85					0.95	
16-Sep-2007	-29.78	-48.18	-51.62	-47.84						
16-Sep-2007	-32.74	-48.44	-51.71	-47.85					0	
17-Sep-2007	-34.29	-48.53	-51.81	-47.85						
17-Sep-2007	-35.65	-48.85	-51.89	-47.84					0	
18-Sep-2007	-36.36	-48.90	-51.98	-47.84						
18-Sep-2007	-37.23	-49.38	-51.73	-47.84					0	
19-Sep-2007	-37.75	-49.35	-51.75	-47.84						
19-Sep-2007	-38.25	-49.64	-51.77	-47.84					0	
20-Sep-2007	-38.6	-49.62	-51.77	-47.84						

									Weatherstation Rainfall Data	
Date	**Water Level (inches)**								**Trenton Daily Rainfall**	**Trenton Monthly Rainfall**
dd-mmm-yyyy	**AW1**	**AW2**	**AW3**	**WEBBRAW1**	**MW1**	**MW2**	**MW3**	**On-site Raingauge**		
20-Sep-2007	-38.56	-49.50	-51.78	-47.84					0.02	
21-Sep-2007	-35.71	-48.10	-51.79	-47.84						
21-Sep-2007	-35.52	-47.76	-51.79	-47.84					0.5	
22-Sep-2007	-35.64	-47.63	-51.80	-47.84						
22-Sep-2007	-36.35	-47.99	-51.78	-47.83					0	
23-Sep-2007	-36.74	-47.97	-51.79	-47.84						
23-Sep-2007	-37.35	-48.48	-51.79	-47.85					0	
24-Sep-2007	-37.66	-48.55	-51.78	-47.85	-19.50	-31.00	-44.50			
24-Sep-2007	-38.15	-49.06	-51.79	-47.83				2.6	0	
25-Sep-2007	-38.37	-49.08	-51.76	-47.83						
25-Sep-2007	-38.75	-49.56	-51.77	-47.85					0	
26-Sep-2007	-38.89	-49.47	-51.77	-47.84						
26-Sep-2007	-39.23	-50.00	-51.78	-47.85					0	
27-Sep-2007	-39.32	-49.89	-51.77	-47.84						
27-Sep-2007	-39.63	-50.41	-51.77	-47.83					0	
28-Sep-2007	-39.75	-50.40	-51.76	-47.84						
28-Sep-2007	-40.26	-51.27	-51.75	-47.84					0.07	
29-Sep-2007	-40.55	-51.49	-51.75	-47.83						
29-Sep-2007	-41.08	-52.26	-51.75	-47.83					0	
30-Sep-2007	-41.28	-52.25	-51.75	-47.83						
30-Sep-2007	-41.77	-53.01	-51.75	-47.85					0	1.89
1-Oct-2007	-41.94	-53.02	-51.75	-47.83						
1-Oct-2007	-42.4	-53.72	-51.75	-47.84					0	
2-Oct-2007	-42.53	-53.64	-51.75	-47.83						
2-Oct-2007	-42.93	-54.38	-51.73	-47.84					0	
3-Oct-2007	-43.07	-54.28	-51.74	-47.84						
3-Oct-2007	-43.45	-54.95	-51.73	-47.84					0	
4-Oct-2007	-43.63	-54.95	-51.71	-47.84						
4-Oct-2007	-43.99	-55.50	-51.74	-47.86					0.02	
5-Oct-2007	-44.17	-55.51	-51.73	-47.84						
5-Oct-2007	-44.48	-55.88	-51.74	-47.84					0.02	
6-Oct-2007	-44.57	-55.88	-51.73	-47.84						
6-Oct-2007	-44.79	-56.25	-51.73	-47.84					0	
7-Oct-2007	-44.88	-56.19	-51.74	-47.84						
7-Oct-2007	-45.25	-55.95	-51.73	-47.84					0	

									Weatherstation Rainfall Data	
Date	**Water Level (inches)**								**Trenton Daily Rainfall**	**Trenton Monthly Rainfall**
dd-mmm-yyyy	**AW1**	**AW2**	**AW3**	**WEBBRAW1**	**MW1**	**MW2**	**MW3**	**On-site Raingauge**		
8-Oct-2007	-45.35	-56.32	-51.67	-47.83						
8-Oct-2007	-45.79	-56.01	-51.67	-47.84					0	
9-Oct-2007	-45.92	-56.01	-51.67	-47.84						
9-Oct-2007	-46.41	-56.02	-51.68	-47.83					0	
10-Oct-2007	-46.57	-56.01	-51.67	-47.84						
10-Oct-2007	-46.82	-56.00	-51.67	-47.84					0	
11-Oct-2007	-46.89	-56.01	-51.68	-47.85						
11-Oct-2007	-47.37	-56.02	-51.68	-47.84					0	
12-Oct-2007	-47.6	-56.01	-51.68	-47.86						
12-Oct-2007	-48.1	-56.00	-51.69	-47.84					0	
13-Oct-2007	-48.33	-56.01	-51.69	-47.84						
13-Oct-2007	-48.84	-55.82	-51.67	-47.82					0	
14-Oct-2007	-49.04	-56.00	-51.68	-47.83						
14-Oct-2007	-49.63	-56.00	-51.66	-47.84					0	
15-Oct-2007	-49.85	-56.01	-51.67	-47.83						
15-Oct-2007	-50.45	-55.98	-51.67	-47.83					0	
16-Oct-2007	-50.58	-55.98	-51.66	-47.83						
16-Oct-2007	-51.14	-55.98	-51.66	-47.83					0	
17-Oct-2007	-50.99	-55.98	-51.65	-47.84						
17-Oct-2007	-50.97	-55.71	-51.66	-47.83					0	
18-Oct-2007	-50.96	-55.98	-51.65	-47.83						
18-Oct-2007	-50.96	-55.97	-51.64	-47.84					0	
19-Oct-2007	-50.95	-55.98	-51.64	-47.84						
19-Oct-2007	-50.93	-55.99	-51.65	-47.84					0	
20-Oct-2007	-50.92	-55.97	-51.65	-47.83						
20-Oct-2007	-50.93	-55.97	-51.64	-47.83					0	
21-Oct-2007	-50.94	-55.97	-51.65	-47.83						
21-Oct-2007	-50.93	-55.98	-51.65	-47.84					0	
22-Oct-2007	-50.93	-55.96	-51.66	-47.84						
22-Oct-2007	-50.93	-55.97	-51.65	-47.85					0	
23-Oct-2007	-50.93	-55.97	-51.64	-47.83						
23-Oct-2007	-50.93	-55.97	-51.64	-47.84					0	
24-Oct-2007	-50.93	-55.96	-51.65	-47.85						
24-Oct-2007	-50.93	-55.96	-51.65	-47.83	-51.50	-46.00	-30.50	0.33	0	
25-Oct-2007	-50.92	-55.95	-51.64	-47.83						

									Weatherstation Rainfall Data	
Date	**Water Level (inches)**									
dd-mmm-yyyy	**AW1**	**AW2**	**AW3**	**WEBBRAW1**	**MW1**	**MW2**	**MW3**	**On-site Raingauge**	**Trenton Daily Rainfall**	**Trenton Monthly Rainfall**
25-Oct-2007	-50.93	-55.97	-51.65	-47.83					0	
26-Oct-2007	-50.93	-55.96	-51.64	-47.84						
26-Oct-2007	-48.31	-55.28	-51.65	-47.83					0	
27-Oct-2007	-40.8	-52.69	-51.66	-47.82						
27-Oct-2007	-36.98	-54.50	-51.65	-47.84					0	
28-Oct-2007	-36.64	-54.39	-51.65	-47.83						
28-Oct-2007	-37.27	-54.24	-51.66	-47.84					0	
29-Oct-2007	-38.6	-54.05	-51.66	-47.82						
29-Oct-2007	-40.14	-54.07	-51.66	-47.83					0	
30-Oct-2007	-41.01	-53.72	-51.66	-47.84						
30-Oct-2007	-41.7	-53.63	-51.65	-47.84					0	
31-Oct-2007	-42.47	-53.63	-51.65	-47.84						
31-Oct-2007	-42.37	-53.79	-51.64	-47.83					0	0.04
1-Nov-2007	-42.5	-53.60	-51.65	-47.83						
1-Nov-2007	-42.82	-53.95	-51.63	-47.85					0	
2-Nov-2007	-42.96	-54.03	-51.63	-47.84						
2-Nov-2007	-43.19	-54.33	-51.63	-47.82					0	
3-Nov-2007	-43.04	-54.35	-51.63	-47.83						
3-Nov-2007	-43.5	-54.66	-51.63	-47.83					0	
4-Nov-2007	-43.51	-54.67	-51.63	-47.84						
4-Nov-2007	-43.74	-54.94	-51.63	-47.83					0	
5-Nov-2007	-43.61	-55.03	-51.62	-47.83						
5-Nov-2007	-44.03	-55.04	-51.61	-47.82					0	
6-Nov-2007	-43.88	-55.45	-51.60	-47.82						
6-Nov-2007	-44.32	-55.70	-51.59	-47.82					0	
7-Nov-2007	-44.47	-55.84	-51.60	-47.83						
7-Nov-2007	-44.68	-55.77	-51.59	-47.82					0	
8-Nov-2007	-44.69	-56.87	-51.59	-47.82						
8-Nov-2007	-44.84	-56.28	-51.59	-47.81					0	
9-Nov-2007	-44.79	-56.26	-51.59	-47.81						
9-Nov-2007	-44.94	-55.88	-51.58	-47.83					0	
10-Nov-2007	-44.93	-56.02	-51.57	-47.84						
10-Nov-2007	-45.37	-55.92	-51.58	-47.80					0	
11-Nov-2007	-45.49	-55.98	-51.58	-47.82						
11-Nov-2007	-45.71	-55.87	-51.56	-47.82					0	

									Weatherstation Rainfall Data	
Date	**Water Level (inches)**								**Trenton Daily Rainfall**	**Trenton Monthly Rainfall**
dd-mmm-yyyy	**AW1**	**AW2**	**AW3**	**WEBBRAW1**	**MW1**	**MW2**	**MW3**	**On-site Raingauge**		
12-Nov-2007	-45.72	-55.86	-51.56	-47.81						
12-Nov-2007	-45.93	-55.68	-51.56	-47.82					0	
13-Nov-2007	-45.82	-55.86	-51.56	-47.81						
13-Nov-2007	-46.14	-55.84	-51.54	-47.81					0	
14-Nov-2007	-46.05	-55.86	-51.54	-47.83						
14-Nov-2007	-46.35	-55.86	-51.54	-47.82					0	
15-Nov-2007	-46.16	-55.84	-51.53	-47.83						
15-Nov-2007	-46.22	-55.83	-51.53	-47.81					0.55	
16-Nov-2007	-46.36	-55.82	-51.53	-47.83						
16-Nov-2007	-46.5	-55.83	-51.53	-47.81					0.55	
17-Nov-2007	-46.51	-55.82	-51.53	-47.82						
17-Nov-2007	-46.61	-55.82	-51.53	-47.82					0	
18-Nov-2007	-46.6	-55.81	-51.53	-47.80						
18-Nov-2007	-46.84	-55.83	-51.53	-47.82					0	
19-Nov-2007	-46.76	-55.80	-51.51	-47.81	-23.50	-34.00	-40.00	2.84		
19-Nov-2007									0	
20-Nov-2007										
20-Nov-2007									0	
21-Nov-2007										
21-Nov-2007									0	
22-Nov-2007										
22-Nov-2007									0	
23-Nov-2007										
23-Nov-2007									0.02	
24-Nov-2007										
24-Nov-2007									0.02	
25-Nov-2007										
25-Nov-2007									0	
26-Nov-2007										
26-Nov-2007										
27-Nov-2007										
27-Nov-2007										
28-Nov-2007										
28-Nov-2007										
29-Nov-2007										

									Weatherstation Rainfall Data	
Date	**Water Level (inches)**									
dd-mmm-yyyy	**AW1**	**AW2**	**AW3**	**WEBBRAW1**	**MW1**	**MW2**	**MW3**	**On-site Raingauge**	**Trenton Daily Rainfall**	**Trenton Monthly Rainfall**
29-Nov-2007										
30-Nov-2007										
30-Nov-2007										1.14
1-Dec-2007										
1-Dec-2007										
2-Dec-2007										
2-Dec-2007										
3-Dec-2007										
3-Dec-2007										
4-Dec-2007										
4-Dec-2007										
5-Dec-2007										
5-Dec-2007										
6-Dec-2007										
6-Dec-2007										
7-Dec-2007										
7-Dec-2007										
8-Dec-2007										
8-Dec-2007										
9-Dec-2007										
9-Dec-2007										
10-Dec-2007										
10-Dec-2007										
11-Dec-2007										
11-Dec-2007										
12-Dec-2007										
12-Dec-2007										
13-Dec-2007										
13-Dec-2007										
14-Dec-2007										
14-Dec-2007										
15-Dec-2007										
15-Dec-2007										
16-Dec-2007										
16-Dec-2007										

									Weatherstation Rainfall Data	
Date	**Water Level (inches)**									
dd-mmm-yyyy	**AW1**	**AW2**	**AW3**	**WEBBRAW1**	**MW1**	**MW2**	**MW3**	**On-site Raingauge**	**Trenton Daily Rainfall**	**Trenton Monthly Rainfall**
17-Dec-2007										
17-Dec-2007										
18-Dec-2007										
18-Dec-2007										
19-Dec-2007										
19-Dec-2007										
20-Dec-2007										
20-Dec-2007										
21-Dec-2007										
21-Dec-2007										
22-Dec-2007										
22-Dec-2007										
23-Dec-2007										
23-Dec-2007										
24-Dec-2007										
24-Dec-2007										
25-Dec-2007										
25-Dec-2007										
26-Dec-2007										
26-Dec-2007										
27-Dec-2007										
27-Dec-2007										
28-Dec-2007										
28-Dec-2007										
29-Dec-2007										
29-Dec-2007										
30-Dec-2007										
30-Dec-2007										
31-Dec-2007										
31-Dec-2007										

APPENDIX D

2007 Site Photos

APPENDIX D – PHOTO LOG

Photo 1 Station 28+75 Reach 1 upstream. Problem area-undercut log vane.

Photo 2 Station 26+60 Reach 1 downstream. Problem area-Beaverdam.

APPENDIX D – PHOTO LOG

Photo 3 Station 72+29 Reach 1 upstream. Cross section #13-dry channel.

Photo 4 Station 71+60 Reach 1 upstream. Constructed Riffle.

APPENDIX D – PHOTO LOG

Photo 5 Station 66+00 Reach 1 left bank. Root wad.

Photo 6 Station 66+19 Reach 1 upstream. Cross section #12.

APPENDIX D – PHOTO LOG

Photo 7 Station 59+50 Reach 1 upstream. Log vane.

Photo 8 Station 39+74 Reach 1 left bank. Root wad.

APPENDIX D – PHOTO LOG

Photo 9Station 15+24 Reach 2 upstream.

Photo 10 Station 13+75 Reach 2 right bank. Root wad.

APPENDIX D – PHOTO LOG

Vegetation Plot 1

Vegetation Plot 2

APPENDIX D – PHOTO LOG

Vegetation Plot 3

Vegetation Plot 4

APPENDIX D – PHOTO LOG

Vegetation Plot 5

Vegetation Plot 6

APPENDIX D – PHOTO LOG

Vegetation Plot 7

Vegetation Plot 8