

Dula Thoroughfare Stream and Wetland Restoration Project No. 65 2008 Monitoring Report (Final): Year 2 of 5



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EXECUTIVE SUMMARY

Executive Summary

The Dula Thoroughfare Stream and Wetland Restoration Project (Site) is located in Anson County, North Carolina, north of the Town of Wadesboro. The Site includes two of the three separate Ecosystem Enhancement Program (EEP) project sites located on the 200-acre Bishop Site (Dula Thoroughfare (DT) and Unnamed Tributary (UT) to Dula Thoroughfare), each confined within a North Carolina Department of Transportation (NCDOT)-owned conservation easement. Primary goals for the Site were to restore stable dimension, pattern, and profile for impacted on-site stream reaches and to restore adjacent riverine wetlands. Secondary Site restoration goals included stream channel and adjacent wetland enhancement and preservation.

The following restoration goals were established for the DT site.

1. Priority II stream restoration via excavation of approximately 2,730 linear feet of a designed E-type stream of Dula Thoroughfare (including an associated tributary), including adjacent floodplain excavation to achieve and entrenchment ratio characteristic of E-type streams.
2. Restoration of approximately 3.1 acres of riverine wetlands adjacent to Dula Thoroughfare via floodplain excavation in previously identified hydric soil areas, thereby re-establishing jurisdictional wetland hydrology.
3. Aquatic habitat creation via excavation of vernal pools within floodplain cut areas.
4. Re-establishment of the characteristic, pre-disturbance Piedmont Bottomland Forest (Schafale and Weakley 1990) community adjacent to restoration reaches using bare root seedling plantings.

The following restoration goals were established for the UT to DT site.

1. Level I enhancement of approximately 1,871 linear feet of stream via backfill of straightened and ditched portions of the existing watercourse, thereby re-establishing characteristic stream dimension and pattern by reintroducing flow into adjacent relic channel areas.
2. Level II enhancement of approximately 480 linear feet of stream via riparian plantings adjacent to the UT to Dula Thoroughfare stream banks.
3. Re-vegetation of open areas adjacent to the UT to Dula Thoroughfare via plantings of characteristic, pre-disturbance community types described by Schafale and Weakley (1990) using bare root seedling plantings.

The main reach of DT was restored by relocating approximately 2,730 lf of the existing channel and its tributary. DT (Reach 1) and its tributary (Reach 2) were designed as E-type streams by creating bankfull benches to re-establish floodplain connection. The UT to DT enhancement (Level 1) along Reach 3 was established via backfill of straightened and ditched portions of the existing watercourse, thereby re-establishing characteristic stream dimension and pattern by reintroducing flow into adjacent relic channel areas. Enhancement (Level 2) along Reach 4 was established through riparian plantings adjacent to the streambanks. The Site's riparian areas were planted to improve habitat and stabilize streambanks via planting bare root seedlings to recreate pre-disturbance vegetative communities within their appropriate landscape contexts. This report serves as the 2nd year of the 5 year monitoring plan for the Site.

The 2008 vegetation monitoring results indicated that the main reach of DT appears to be meeting vegetation success criteria. However, the UT to DT results indicate the site did not meet the 2008 vegetation success criteria. Vegetative monitoring success criteria as stated in the 2007 mitigation plan requires an average number of planted stems per acre exceeding 320 stems/acre after the third year of monitoring and 260 stems/acre after the fifth and final year of project monitoring. The DT and the UT to DT survival rate for the woody vegetation monitored for 2008 is 85% and 78%, respectively. The DT and the UT to DT site density are approximately 792 and 240 planted stems per acre, respectively. The DT exceeds the year 2 goal of 320 planted stems per acre. However the first year monitoring reported there were 842 planted stems per acre. Planted stem mortality within the plots is most likely due to the severe drought experienced during the 2007 growing season; however, based on visual assessment of the planted vegetation, it may also be due to wildlife grazing, insects, or vegetation competition from the high growth rate of non-planted vegetation. The UT to DT did not exceed the year 2 goal for 320 planted stems per acre, but with natural recruitment and re-planting of woody vegetation, the planted riparian area could improve and exceed the vegetation success criteria.

Results from the 2008 stream monitoring effort indicate the DT and UT DT appear stable, but are experiencing abnormal flow conditions. As a result, in-stream vegetation is developing throughout the channels. Overall, the site appears to be stable and could be functioning as intended in normal flow conditions. Areas with in-stream vegetation growth may potentially result in localized areas of aggradation, and lead to lateral and/or vertical shifts in the stream. These areas will continue to be monitored closely for significant adjustments in the bed features and the channel thalweg.

All gauges on Site achieved the wetland success criterion of soil saturation within the upper 12 inches for 31 consecutive days, which is 12.5 percent of the March 15 to November 18 (249 days) growing season. However, for this monitoring report hydrologic data is shown through September 30, 2008 due to site access restrictions administered by the landowner. The planted woody stem species throughout the wetland areas are meeting the required success criteria with the exception of plot 14. Missing woody stems were observed within this plot. It is suspected that the missing of planted stems may be due to high growth rate of non-planted species out competing planted species.

Overall, the Site appears to be stable and has met stream and vegetation mitigation goals for monitoring year 2, with the exception of the UT to DT vegetation, which failed to meet the year 2 success criteria.



SECTION 1
PROJECT BACKGROUND



SECTION 1

PROJECT BACKGROUND

The background information provided in this report is referenced from the mitigation plan and previous monitoring reports prepared by EcoScience.

1.1 Location and Setting

The Site is located north of the Town of Wadesboro in Anson County, North Carolina (Figure 1.1). The Site is one of three separate Ecosystem Enhancement Program (EEP) project sites located within the North Carolina Department of Transportation (NCDOT) owned conservation easement on the 200-acre Bishop Site. Based on information provided by EEP, the Site consisted of restoring/enhancing 5,081 linear feet (lf) of streams using a Priority 2 restoration approach. There are also 12,918 lf of stream of preservation and 11.6 acres of restored/enhanced/preserved wetland areas within the 200-acre Bishop Property.

To access the site from Charlotte, take US 74 east towards the Town of Wadesboro. Approximately 7.6 miles after the Town of Polkton, turn left onto US-52 north. Follow US-52 north through Ansonville until you reach Pinkston River Road and turn right. Turn left onto Carpenter Road (1st gravel road on left) and continue to the first gravel road with a locked gate on the right. To access the UT to DT, follow the gated gravel road until you reach your next gravel road and turn right. Continue along this road until you cross the tributary at the downstream end of the restoration/enhancement project. To access DT, continue straight on the gated access gravel road to the bottom of the hill, where it crosses the stream restoration project. The stream restoration begins to the right of this gravel road.

1.2 Mitigation Structure and Objectives

The Site is located within the Piedmont eco-region and in the Yadkin River Basin (USGS Subbasin HUC 03040104 and 03040105). Prior to restoration, the Site was predominantly utilized for row cropping and recreational activities, such as hunting and wildlife viewing. Historically, drainage features and wetland areas were dredged, straightened, and filled in to provide land for agricultural purposes. These activities are thought to have inhibited stream channel stability and water quality; therefore, producing an incised, eroded stream. Primary goals for the site were to restore stable dimension, pattern, and profile for impacted on-site stream reaches. The following restoration goals were established for the Site.

Dula Thoroughfare

1. Priority II stream restoration via excavation of approximately 2,730 linear feet of a designed E-type stream of Dula Thoroughfare (including an associated tributary), including adjacent floodplain excavation to achieve and entrenchment ratio characteristic of E-type streams.

2. Restoration of approximately 3.1 acres of riverine wetlands adjacent to Dula Thoroughfare via floodplain excavation in previously identified hydric soil areas, thereby re-establishing jurisdictional wetland hydrology.
3. Aquatic habitat creation via excavation of vernal pools within floodplain cut areas.
4. Re-establishment of the characteristic, pre-disturbance Piedmont Bottomland Forest (Schafale and Weakley 1990) community adjacent to restoration reaches using bare root seedling plantings.

UT Dula Thoroughfare

1. Level I enhancement of approximately 1,871 linear feet of stream via backfill of straightened and ditched portions of the existing watercourse, thereby re-establishing characteristic stream dimension and pattern by reintroducing flow into adjacent relic channel areas.
2. Level II enhancement of approximately 480 linear feet of stream via riparian plantings adjacent to the UT to Dula Thoroughfare stream banks.
3. Re-vegetation of open areas adjacent to the UT to Dula Thoroughfare via plantings of characteristic, pre-disturbance community types described by Schafale and Weakley (1990) using bare root seedling plantings.

The main reach of DT was restored by relocating approximately 2,730 lf of the existing channel and its tributary (Table 1.1). DT (Reach 1) and its tributary (Reach 2) were designed as E-type streams by creating bankfull benches to re-establish floodplain connection. The UT to DT enhancement (Level 1) along Reach 3 was established via backfill of straightened and ditched portions of the existing watercourse, thereby re-establishing characteristic stream dimension and pattern by reintroducing flow into adjacent relic channel areas. Enhancement (Level 2) along Reach 4 was established through riparian plantings adjacent to the streambanks. The Site's riparian areas were planted to improve habitat and stabilize streambanks via planting bare root seedlings to recreate pre-disturbance vegetative communities within their appropriate landscape contexts. This report serves as the 2nd year of the 5 year monitoring plan for the Site.

Table 1.1
Project Mitigation Structure and Objectives
Dula Thoroughfare/Project No. 65

| Segment/Reach | Mitigation Type | Approach | Linear Footage or Acres | Stationing (ft) | Comments | |
|-------------------------------|-----------------|--------------|-------------------------|-----------------|-----------------------------------|------------|
| Reach 1-DT Main Channel | R | P2 | 2,025 lf | 0+00 – 20+25 | | |
| Reach 2-DT Tributary | R | P2 | 705 lf | 0+00 – 7+05 | | |
| Reach 3-UT to DT | E1 | N/A | 1,871 lf | N/A* | Enhancement reaches not stationed | |
| Reach 4-UT to DT | E2 | N/A | 480 lf | N/A* | Enhancement reaches not stationed | |
| Stream Preservation ** | P | N/A | 6,355 lf | N/A | | |
| Riparian Wetland Restoration | R | N/A | 3.1 ac | N/A | | |
| Riparian Wetland Enhancement | WE | N/A | 1.0 ac | N/A | | |
| Riparian Wetland Preservation | P | N/A | 2.3 ac | N/A | | |
| Component Summations | | | | | | |
| Restoration Level | Stream (lf) | Wetland (ac) | | Upland (ac) | Buffer (ac) | BMP |
| | | Riparian | Non-Riparian | | | |
| Restoration (R) | 2,730 | 3.1 | N/A | N/A | N/A | N/A |
| Enhancement (E) | N/A | 1.0 | N/A | N/A | N/A | N/A |
| Enhancement I (E) | 1,871 | N/A | N/A | N/A | N/A | N/A |
| Enhancement II (E) | 480 | N/A | N/A | N/A | N/A | N/A |
| Creation (C) | N/A | N/A | N/A | N/A | N/A | N/A |
| Preservation (P) | 6,355 | 2.3 | N/A | N/A | N/A | N/A |
| HQ Preservation (P) | N/A | N/A | N/A | N/A | N/A | N/A |
| Totals | 11,436 | 6.4 | N/A | N/A | N/A | N/A |

*Stationing was not provided for the enhancement and preservation reach.

1.3 Project History and Background

The stream preservation/enhancement/restoration plan was designed by EcoScience Corporation and constructed by Vaughn Construction, Inc. Construction and planting activities were completed in February 2007. As-built surveys for the Site were performed in May 2007. The first annual monitoring activities were conducted in October 2007. This report serves as the 2nd year of the 5 year monitoring plan for the DT project. Tables 1.2 and 1.3 provide detailed project activity, history and contact information for this project. Table 1.4 provides more in-depth watershed/site background for the project.

Table 1.2
Project Activity and Reporting History
Dula Thoroughfare/Project No. 65

| Activity or Report | Data Collection Completed | Actual Completion or Delivery |
|---|----------------------------|-------------------------------|
| Restoration Plan | August 2004 | September 2004 |
| Final Design (90%) | March 2005 | June 2005 |
| Construction | N/A* | February 2007 |
| Temporary S&E mix applied to entire project area* | N/A | Throughout construction |
| Permanent seed mix applied to reach/segments | N/A | October 2006 |
| Bare Root Seedling Installation | N/A | February 2007 |
| Mitigation Plan | June 2007 | October 2007 |
| Final Report | June 2007 | October 2007 |
| Year 1 Monitoring | October 2007 /December2007 | October 2007 /December2007 |
| Year 2 Monitoring | May 2008/September 2008 | October 2008 |

*Seed and mulch is added as each section of construction is completed.

Table 1.3
Project Contacts
Dula Thoroughfare/Project No. 65

| | |
|-----------------------------------|---|
| Designer | EcoScience Corporation 1101 Haynes Street, Suite 101 Raleigh, NC 27604 |
| Construction | Vaughn Construction, Inc. Tommy Vaughn and Spencer Walker (Foremen) P.O. Box 796 Wadesboro, NC 28170 |
| Planting Contractor | Kiker Forestry and Realty P.O. Box 933 Wadesboro, NC 28170 |
| Seeding Contractor | N/A |
| Monitoring Performers | |
| Year 1 | EcoScience Corporation 1101 Haynes Street, Suite 101 Raleigh, NC 27604 919- 828-3433 |
| Year 2-present | Jordan, Jones, & Goulding 9101 Southern Pine Blvd., Suite 160 Charlotte, NC 28273 |
| Stream Monitoring, POC | Kirsten Young, 704-527-4106 ext.246 |
| Vegetation Monitoring, POC | |
| Wetland Monitoring, POC | |

Table 1.4
Project Background
Dula Thoroughfare/Project No. 65

| | |
|---|---|
| Project County | Anson County, North Carolina |
| Drainage Areas: DT UT to DT | 0.36 square miles 0.23 square miles |
| Impervious cover estimate (%) | <1 percent for all streams |
| Stream Orders (per USGS) DT and UT to DT | 1 st |
| Physiographic Region | Piedmont |
| Ecoregion (Griffith and Omernik) | Triassic Basins |
| Rosgen Classifications of As-built: Dula Thoroughfare UT to Dula Thoroughfare | E5 E/D5 |
| Cowardin Classification | Streams: R2UB12/R4SB23 Wetlands: PFO1 |
| Dominant soil types | Badin Channery Silt Loam (BaB, BaC) Badin-Goldston Complex (BgD) McQueen (MrB) Shellbluff (ShA) Tetotum (ToA) Chewacla (ChA) |
| Reference Site ID | N/A* (reference areas established on-Site) |
| USGS HUCs for Project and Reference | 03040104 and 03040105 |
| NCDWQ Sub-basins for Project and Reference | 03-07-10 |
| NCDWQ classification for Project and Reference | C |
| Any portion of any project segment 303d listed? | No |
| Any portion of any project segment upstream of a 303d listed segment? | No |
| Reasons for 303d listing or stressor | N/A |
| Percent of project easement fenced | No fencing along easement |

1.4 Monitoring Plan View

The monitoring plan view map (Figure 1.2) illustrates the location of the longitudinal profile stations, cross-section stations, vegetation plots, photo points, and gauges for DT. A total of three cross-sections were established within DT and three cross-sections were established within the UT to DT by EcoScience in MY-2007. Approximately 2,700 lf of longitudinal profile were monitored along the main channel and its tributary. Eight previously established vegetative plots in the riparian zone adjacent to DT and UT to DT were identified and monitored. Photographs were taken upstream and downstream at each cross-section, vegetation plot, photo point, and current condition area.



SECTION 2
PROJECT CONDITION AND MONITORING RESULTS

SECTION 2

PROJECT CONDITION AND MONITORING RESULTS

The following monitoring results are from the 2008 (year 2 of 5) survey.

2.1 Vegetation Assessment

2.1.1 Soil Data

The Site is underlain by the Carolina Slate Belt geologic formation, immediately adjacent to the Chatham Group of the Triassic Basin geologic formation, within the Piedmont physiographic province of North Carolina. The hydrophysiographic region is characterized by dissected irregular plains, some hills, linear ridges, and isolated monadnocks (*Griffith, 2002* in *EcoScience, 2007*). This region is characterized by moderate rainfall with precipitation averaging approximately 47 inches per year (*NRCS, 2000* in *EcoScience, 2004*).

Site soils have been mapped by the NRCS and include the Badin – Goldston complex (BgD), as well as the McQueen (MrB), Shellbluff (ShA), Tetotum (ToA), and Chewacla series (ChA) (*NRCS 2000* in *EcoScience, 2004*). A general description of each soil and its hydric/non-hydric status is included below.

Badin-Goldston Complex BgD: This series shares many characteristics with the Badin Channery Silt Loam described above; however, the addition of Goldston in the complex produces additional ranges for some values. These soils are also found in the Piedmont on slopes of 15 to 25 percent. Depths can range from shallow to moderately deep, and permeability can be moderate to moderately rapid, though typically well-drained. Depth to the seasonal high water table is greater than 6.0 feet, and depth to bedrock varies from 10 to 20 inches and 20 to 40 inches to soft bedrock. Depth to hard bedrock is between 10 to 20 inches and greater than 40 inches.

McQueen MrB: This series, found in the Piedmont, Upper Coastal Plain, and Sandhills along major streams and rivers, is very deep and well-drained. Permeability is slow, and the seasonal high water table through the months of January through March is at a depth of 4 to 6 feet. Depth to bedrock is greater than 60 inches.

Shellbluff (ShA): This soil series is also found in floodplains of the Piedmont, Upper Coastal Plain, and Sandhills landscapes. Shellbluff soils are typically very deep and well drained with moderate permeability. Slopes are quite flat, ranging between 0 and 2 percent. From December to March the seasonal high water table can vary between 3 and 5 feet, and depth to bedrock is more than 60 inches. Shellbluff soils occur in crowned agricultural fields within the Rocky River floodplain.

Tetotum (ToA): These soils are located on low stream terraces in the Piedmont, Upper Coastal Plain, and Sandhills landscapes. Tetotum soils are classified as very deep and moderately well-drained with moderate permeability. These soils are found in low slope areas with slopes ranging from 0 to 3 percent. Seasonal high water tables in the months of December to April are between 1.5 and 2.5 feet. Bedrock can be found at depths greater than 60 inches.

Chewacla ChA: These frequently flooded soils can be found in floodplains of the Piedmont, Upper Coastal Plains, and Sandhills. Soils are very deep and somewhat poorly-drained with moderate permeability. During the months of November through April the seasonal high water table can be at a depth of 0.5 to 1.5 feet. Depth to bedrock is more than 60 inches. Chewacla soils occur in low elevation depressions within the Rocky River floodplain.

2.1.2 Vegetative Current Condition

Herbaceous seeding appears to provide adequate soil cover along the streambanks; however, areas along the floodplain have barren areas of little to no vegetative cover. Please refer to Appendix 1.1 and 1.2 for more details on vegetative current conditions and photos.

2.1.3 Vegetative Current Condition Plan View

Please refer to Appendix 4 for location of vegetative current conditions onsite and Appendix 1.2 for representative vegetation current condition photos.

2.1.4 Stem Counts

The UT to DT did not exceed the year 2 goal of 320 planted stems per acre, but with natural recruitment occurring the planted riparian area could potentially improve and exceed the vegetation success criteria.

JJG conducted the 2008 (year 2 of 5) vegetative assessment and vegetative plot analysis in September 2008 per the 2006 CVS-EEP Level 2 protocol (Lee et al., 2006). The eight vegetation plots previously established in the design phase were selected randomly and represent the riparian buffer zone (DT has five vegetation plots and UT to DT has 3 vegetation plots). Vegetative monitoring success criteria as stated in the 2007 mitigation plan requires an average number of planted stems per acre exceeding 320 stems/acre after the third year of monitoring and 260 stems/acre after the fifth and final year of project monitoring. Please refer to the DT and UT to DT vegetation summary below and to Appendix 1.1 for a summary of stem counts.

Dula Thoroughfare

The survival rate for the woody vegetation monitored for 2008 is 85%. The monitoring data recorded an average of 20 planted live stems per plot. The site density is approximately 792 planted stems per acre, which exceeds the year 3 goal of 320 planted stems per acre. The site density was calculated by dividing the average number of stems by the plot size (0.025 ac). However, the first year monitoring reported 842 planted stems per acre. Planted stem mortality within the plots is most likely due to the severe drought experienced during the 2007 growing

season; however, based on visual assessment of the planted vegetation, it may also be due to wildlife grazing or vegetation competition from the high growth rate of non-planted vegetation.

UT to Dula Thoroughfare

The survival rate for the woody vegetation monitored for 2008 is 78%. The monitoring data recorded an average of 6 planted live stems per plot. The site density is approximately 240 planted stems per acre, which does not exceed the year 3 goal of 320 planted stems per acre. The site density was calculated by dividing the average number of stems by the plot size (0.025 ac). The 2008 site density is also lower than the first year monitoring results (310 planted stems per acre). Two of the three vegetation plots met the vegetation success criteria (Plot 13 and 15). Plot 14 did not meet the success criteria, but with natural recruitment and re-planting of woody vegetation, the planted riparian area could improve by year 5 and exceed the vegetation success criteria. Planted stem mortality within the plots is most likely due to the severe drought experienced during the 2007 growing season; however, based on visual assessment of the planted vegetation, it may also be due to wildlife grazing or vegetation competition from the high growth rate of non-planted vegetation.

In conclusion, the 2008 vegetation monitoring results indicated that the main reach of DT has met the year 2 vegetation success criteria. However, the UT to DT did not meet the year 2 vegetation success criteria. Although the UT to DT did not exceed the year 2 goal for 320 planted stems per acre, with natural recruitment and re-planting of woody vegetation, the planted riparian area could potentially improve by year 5 and exceed the vegetation success criteria.

2.1.5 Vegetation Plot Photos

Please refer to Appendix 1.3 for photographs of the monitoring plots.

2.2 Stream Assessment

The entire restored stream length (main channel and its tributary) of DT was assessed from the project at the gravel road to the downstream end of the restoration project where the preservation reach begins. The UT to DT was assessed from the beginning of the project approximately 300 feet upstream from the first cross vane triplet to the downstream end of the restoration project where the preservation reach begins. Please refer to Table 2.1 for a summary of the visual stability assessment, Table 2.2 for the as-built morphology and hydraulic summary, Table 2.3 for monitoring years 2007-2008 morphology and hydraulic summary, Table 2.4 for hydrologic criteria, and Appendix 2 for more detailed stream data tables and plots.

2.2.1 Stream Current Condition Plan View

Please refer to Appendix 4 for location of stream current condition onsite.

2.2.2 Stream Current Condition Table

Please refer to Appendix 2.1 for the stream current condition table.

2.2.3 Numbered Issues Photo Section

Please refer to Appendix 2.2 for representative stream current condition photos.

2.2.4 Fixed Photo Station Photos

Please refer to Appendix 2.3 for stream photo station photos and Appendix 2.4 for stream cross-section photos.

2.2.5 Stability Assessment

Due to the recent completion of this project, the observed project conditions appear to reflect the as-built drawings. The following general observations were noted.

Dula Thoroughfare

- The pattern, profile, and dimension of the restored main channel and its tributary appear stable.
- During JIG's observations, the main channel and its tributary had abnormal flow conditions, resulting in dry riffles and runs with sporadic pocket pools.

Main Channel

Overall, the present stream dimensions in DT (main channel) appear stable. The average bankfull width (11.7 ft) of the surveyed cross-sections is higher than the proposed 6.0 ft. Cross-section 1 appears to have some minor changes along the left bank, which increased the bankfull width. The average water surface slope was not calculated for the 2008 monitoring year due to inconsistent water levels along the channel's profile; however, the reach appears to be maintaining vertical and lateral stability with minimal bank erosion. The average bankfull slope for the 2008 monitoring year was calculated as 0.0013 ft/ft, which is similar to the design slope (0.0010 ft/ft). Slopes were not provided in the previous monitoring report (year 1 of 5). Areas with in-stream vegetation growth could potentially result in localized areas of aggradation, and lead to lateral and/or vertical shifts in the stream. These areas will continue to be monitored closely for significant adjustments in the bed features and the channel thalweg.

Tributary

Based on current monitoring data and the visual inspection, the channel appears to be functioning properly and maintaining stability. No erosion failure was observed along this reach. In-stream vegetation and poor streambank vegetation cover was observed and noted in the Current Condition Plan View (CCPV).

UT to Dula Thoroughfare

The following general observations were noted.

- During JGG's assessment, the channel had abnormal flow conditions, resulting in a dry channel bed, with sporadic pocket pools. Typically, the upstream reach consisted of dry riffles and runs with pocket pools. The downstream reach had more flow within the channel, but flow was not consistent.
- All cross vane triplets appear to be stable, showing no signs of erosion or piping.

Both DT and UT to DT appear stable, but are experiencing abnormal flow conditions. As a result, in-stream vegetation is developing throughout the channels. Overall, the site appears to be stable and could function as intended in normal flow conditions.

Table 2.1
Categorical Stream Feature Visual Stability Assessment
Dula Thoroughfare/Project No. 65

| Feature | Initial-2006 | MY1-2007 | MY2-2008 | MY3-2009 | MY4-2010 | MY5-2011 |
|-------------------|--------------|----------|----------|----------|----------|----------|
| A. Riffles | N/A | N/A | N/A | | | |
| B. Pools | N/A | N/A | N/A | | | |
| C. Thalweg | 100% | 100% | N/A | | | |
| D. Meanders | 100% | 100% | 100% | | | |
| E. Bed General | 100% | 100% | 94% | | | |
| F. Bank | N/A | N/A | 100% | | | |
| G. Vanes | N/A | N/A | N/A | | | |
| H. Wads/ Boulders | * | * | N/A | | | |

Cells noted with a (*), data was not provided.

2.2.6 Quantitative Measures Tables

Tables 2.2 and 2.3 display morphological summary data for baseline as-built conditions and from the 2007 and 2008 monitoring year. Please refer to Appendix 2 for morphological plots and raw data tables.

**Table 2.2
Baseline Morphology and Hydraulic As-Built Summary
Dula Thoroughfare/Project No. 65
DT Main Channel and Tributary**

| Parameter | USGS Gage Data | | | Regional Curve Interval | | | Pre-Existing Condition | | | Project Reference Stream | | | Design | | | As-built/Year-1 | | |
|------------------------------------|----------------|-----|-----|-------------------------|------|-----|------------------------|-------|--------|--------------------------|-----|-----|--------|-------|-------|-----------------|-------|-------|
| | Min | Med | Max | Min | Med | Max | Min | Med | Max | Min | Med | Max | Min | Med | Max | Min | Med | Max |
| Dimension | | | | | | | | | | | | | | | | | | |
| Bankfull Width (ft) | N/A | N/A | N/A | N/A | 8.8 | N/A | 12.3 | 14.1 | 15.9 | NA | NA | NA | 6.0 | 6.0 | 6.0 | 4.9 | 7.4 | 9.6 |
| Floodprone Width (ft) | N/A | N/A | N/A | N/A | N/A | N/A | 35.0+ | 78.3+ | 150.0+ | NA | NA | NA | 90.0 | 120.0 | 150.0 | 84.0 | 120.0 | 125.0 |
| Bankfull Cross-sectional Area | N/A | N/A | N/A | N/A | 10.7 | N/A | 5.7 | 6.6 | 8.4 | NA | NA | NA | 4.0 | 4.0 | 4.0 | 2.4 | 5.8 | 8.9 |
| Bankfull Mean Depth | N/A | N/A | N/A | N/A | 1.1 | N/A | 0.4 | 0.5 | 0.6 | NA | NA | NA | 0.7 | 0.7 | 0.7 | 0.5 | 0.7 | 0.9 |
| Bankfull Max Depth | N/A | N/A | N/A | N/A | N/A | N/A | 0.8 | 0.8 | 0.9 | NA | NA | NA | 1.0 | 1.0 | 1.0 | 0.6 | 1.1 | 1.5 |
| Width/Depth Ratio | N/A | N/A | N/A | N/A | 8.0 | N/A | 23.0 | NA | 40.0 | NA | NA | NA | 8.6 | 8.6 | 8.6 | 9.7 | 10.3 | 10.8 |
| Entrenchment Ratio | N/A | N/A | N/A | N/A | N/A | N/A | 23.5 | 28.2 | 35.3 | NA | NA | NA | 15.0 | 20.0 | 25.0 | >12.9 | >14.5 | 17.1 |
| Wetted Perimeter (ft) | N/A | N/A | N/A | N/A | 11.0 | N/A | 14.9 | 15.1 | 15.3 | NA | NA | NA | 7.4 | 7.4 | 7.4 | 8.4 | 8.8 | 9.2 |
| Hydraulic Radius (ft) | N/A | N/A | N/A | N/A | 1.0 | N/A | 0.4 | 0.4 | 0.4 | NA | NA | NA | 0.8 | 0.8 | 0.8 | 0.6 | 0.7 | 0.7 |
| Bank Height Ratio | | | | | | | | | | | | | | | | | | |
| Pattern | | | | | | | | | | | | | | | | | | |
| Channel Beltwidth (ft) | N/A | N/A | N/A | N/A | N/A | N/A | NA | NA | NA | NA | NA | NA | 80.0 | 100.0 | 140.0 | 80.0 | 100.0 | 140.0 |
| Radius of Curvature (ft) | N/A | N/A | N/A | N/A | N/A | N/A | NA | NA | NA | NA | NA | NA | 19.6 | 36.6 | 80.0 | 19.6 | 36.6 | 80.0 |
| Meander Wave Length (ft) | N/A | N/A | N/A | N/A | N/A | N/A | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Meander Width Ratio | N/A | N/A | N/A | N/A | N/A | N/A | NA | NA | NA | NA | NA | NA | 13.3 | 16.7 | 23.3 | 10.8 | 13.5 | 18.9 |
| Profile | | | | | | | | | | | | | | | | | | |
| Riffle Length (ft) | N/A | N/A | N/A | N/A | N/A | N/A | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA ² | NA | NA |
| Riffle Slope (ft/ft) | N/A | N/A | N/A | N/A | N/A | N/A | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Pool Length (ft) | N/A | N/A | N/A | N/A | N/A | N/A | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Pool to Pool Spacing (ft) | N/A | N/A | N/A | N/A | N/A | N/A | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Substrate | | | | | | | | | | | | | | | | | | |
| D50 (mm) | N/A | N/A | N/A | N/A | N/A | N/A | silt | sand | sand | NA | NA | NA | silt | sand | sand | 0.09 | 0.09 | 0.09 |
| D84 (mm) | N/A | N/A | N/A | N/A | N/A | N/A | silt | sand | sand | NA | NA | NA | silt | sand | sand | 0.11 | 0.11 | 0.11 |
| Additional Reach Parameters | | | | | | | | | | | | | | | | | | |
| Valley Length (ft) | N/A | | | N/A | | | NA | | | NA | | | 2,300 | | | 2,275 | | |
| Channel Length (ft) | N/A | | | N/A | | | NA | | | NA | | | 2,790 | | | 2,730 | | |
| Sinuosity | N/A | | | N/A | | | 1.01 | | | NA | | | 1.2 | | | 1.2 | | |
| Water Surface Slope (ft/ft) | N/A | | | N/A | | | 0.0019 | | | NA | | | N/A | | | NA | | |
| Bankfull Slope (ft/ft) | N/A | | | N/A | | | 0.0019 | | | NA | | | 0.001 | | | NA | | |
| Rosgen Classification | N/A | | | N/A | | | C5/6 | | | NA | | | E5/6 | | | E5/6 | | |

N/A: Not applicable (data was not provided in previous reports)

**Table 2.3
Morphology and Hydraulic Monitoring Summary
Dula Thoroughfare/Project No. 65
DT Main Channel and Tributary**

| PARAMETER | Cross-Section 1-Pool | | | | | Cross-Section 2-Run | | | | | Cross-Section 3-Pool | | | | | Cross-Section 4 Run | | | | |
|------------------------------------|----------------------|-----------------|-----------------|-----------------|-----------------|---------------------|-----------------|------------|------------|-----------------|----------------------|------------|-----------------|------------|------------|---------------------|----------|----------|----------|----------|
| | MY1-2007 | MY2-2008 | MY3-2009 | MY4-2010 | MY5-2011 | MY1-2007 | MY2-2008 | MY3-2009 | MY4-2010 | MY5-2011 | MY1-2007 | MY2-2008 | MY3-2009 | MY4-2010 | MY5-2011 | MY1-2007 | MY2-2008 | MY3-2009 | MY4-2010 | MY5-2011 |
| DIMENSION | | | | | | | | | | | | | | | | | | | | |
| Bankfull Width (ft) | 9.6 | 27.0 | | | | 8.7 | 8.0 | | | | 6.5 | 7.4 | | | | 4.9 | 4.6 | | | |
| Floodprone Width (ft) | >125.0 | 125.0 | | | | 127.0 | 152.0 | | | | 95.0 | 116.6 | | | | 84.0 | 82.3 | | | |
| Bankfull Cross-sectional Area | 8.9 | 9.7 | | | | 8.2 | 6.9 | | | | 3.8 | 4.6 | | | | 2.4 | 2.2 | | | |
| Bankfull Mean Depth | 0.9 | 0.4 | | | | 0.9 | 0.9 | | | | 0.6 | 0.6 | | | | 0.5 | 0.5 | | | |
| Bankfull Max Depth | 1.5 | 1.5 | | | | 1.4 | 3.1 | | | | 0.8 | 1.0 | | | | 0.6 | 0.7 | | | |
| Width/Depth Ratio | 10.6 | 75.0 | | | | 9.7 | 9.3 | | | | 10.8 | 11.7 | | | | 10.3 | 9.5 | | | |
| Entrenchment Ratio | >13.0 | 4.6 | | | | 14.5 | 19.0 | | | | 14.6 | 15.8 | | | | 17.1 | 18.0 | | | |
| Wetted Perimeter (ft) | 11.4 | 27.6 | | | | 10.5 | 8.7 | | | | 7.7 | 7.8 | | | | 5.9 | 4.9 | | | |
| Hydraulic Radius (ft) | 0.8 | 0.4 | | | | 0.8 | 0.8 | | | | 0.5 | 0.6 | | | | 0.4 | 0.5 | | | |
| Bank Height Ratio | * | 1.0 | | | | * | 1.0 | | | | * | 1.0 | | | | * | 1.0 | | | |
| SUBSTRATE (Reachwide) | MY1-2007 | MY2-2008 | MY3-2009 | MY4-2010 | MY5-2011 | | | | | | | | | | | | | | | |
| D50 (mm) | 0.09 | 0.04 | | | | | | | | | | | | | | | | | | |
| D84 (mm) | 0.11 | 0.07 | | | | | | | | | | | | | | | | | | |
| PROFILE | MY1-2007 | | | MY2-2008 | | | MY3-2009 | | | MY4-2010 | | | MY5-2011 | | | | | | | |
| | Min | Max | Med | Min | Max | Med | Min | Max | Med | Min | Max | Med | Min | Max | Med | | | | | |
| Riffle Length (ft) | N/A | N/A | N/A | | | | | | | | | | | | | | | | | |
| Riffle Slope (ft/ft) | N/A | N/A | N/A | | | | | | | | | | | | | | | | | |
| Pool Length (ft) | N/A | N/A | N/A | | | | | | | | | | | | | | | | | |
| Pool to Pool Spacing (ft) | N/A | N/A | N/A | | | | | | | | | | | | | | | | | |
| ADDITIONAL REACH PARAMETERS | | | | | | | | | | | | | | | | | | | | |
| Valley Length (ft) | 2,275 | | | 2,275 | | | | | | | | | | | | | | | | |
| Channel Length (ft) | 2,730 | | | 2,730 | | | | | | | | | | | | | | | | |
| Sinuosity | 1.2 | | | 1.2 | | | | | | | | | | | | | | | | |
| Water Surface Slope (ft/ft) | N/A | | | N/A | | | | | | | | | | | | | | | | |
| Bankfull Slope (ft/ft) | N/A | | | 0.0013 | | | | | | | | | | | | | | | | |
| Rosgen Classification | E5/6 | | | E5/6 | | | | | | | | | | | | | | | | |

* Data was not provided

** Water elevations were not consistent along the channel and any calculations would misrepresent profile conditions.

Table 2.3 cont.
Morphology and Hydraulic Monitoring Summary
Dula Thoroughfare/Project No. 65
UT to DT

| PARAMETER | Cross-Section 5-Riffle | | | | | Cross-Section 6-Pool | | | | | Cross-Section 7-Riffle | | | | |
|-------------------------------|------------------------|-----------------|-----------------|-----------------|-----------------|----------------------|-----------------|-----------------|-----------------|-----------------|------------------------|-----------------|-----------------|-----------------|-----------------|
| | MY1-2007 | MY2-2008 | MY3-2009 | MY4-2010 | MY5-2011 | MY1-2007 | MY2-2008 | MY3-2009 | MY4-2010 | MY5-2011 | MY1-2007 | MY2-2008 | MY3-2009 | MY4-2010 | MY5-2011 |
| Bankfull Width (ft) | 11.1 | 12.1 | | | | 16.2 | 17.4 | | | | 7.1 | 11.7 | | | |
| Floodprone Width (ft) | >27.0 | 53.1 | | | | >70.0 | 85.8 | | | | >62 | 60.9 | | | |
| Bankfull Cross-sectional Area | 8.6 | 8.8 | | | | 4.3 | 4.5 | | | | 2.6 | 3.0 | | | |
| Bankfull Mean Depth | 0.8 | 0.7 | | | | 0.3 | 0.3 | | | | 0.4 | 0.3 | | | |
| Bankfull Max Depth | 1.3 | 1.3 | | | | 0.7 | 1.3 | | | | 0.6 | 0.6 | | | |
| Width/Depth Ratio | 14.3 | 16.6 | | | | 54 | 66.8 | | | | 17.8 | 45.2 | | | |
| Entrenchment Ratio | >2.4 | 4.4 | | | | >4.3 | 4.9 | | | | >8.7 | 5.2 | | | |
| Wetted Perimeter (ft) | 12.7 | 12.8 | | | | 16.8 | 17.5 | | | | 7.9 | 11.9 | | | |
| Hydraulic Radius (ft) | 0.7 | 0.7 | | | | 0.3 | 0.3 | | | | 0.3 | 0.3 | | | |
| Bank Height Ratio | * | 1.0 | | | | * | 1.0 | | | | * | 1.0 | | | |
| SUBSTRATE (Reachwide) | MY1-2007 | MY2-2008 | MY3-2009 | MY4-2010 | MY5-2011 | MY1-2007 | MY2-2008 | MY3-2009 | MY4-2010 | MY5-2011 | MY1-2007 | MY2-2008 | MY3-2009 | MY4-2010 | MY5-2011 |
| D50 (mm) | 0.4 | ** | | | | 0.5 | ** | | | | 13.0 | ** | | | |
| D84 (mm) | 0.4 | | | | | 0.5 | | | | | 20.0 | | | | |

*Data was not reported

**Data will not be collected for MY2-5

2.2.7 Hydrologic Criteria

A crest gauge is located on the main channel and its tributary of the DT site. Table 2.4 below, verifies that one bankfull or greater event occurred within the DT restoration project in monitoring year 2008. Other indicators such as old wrack lines and staining were observed at the bankfull and greater elevations within the restoration site as well.

Table 2.4
Verification of Bankfull Events
Dula Thoroughfare/Project No. 65

| Date of Collection | Date of Occurrence | Method | Photo # (if available) |
|--------------------|--------------------|---|------------------------|
| 12/2007 | N/A* | Crest Gauge (Main Channel and Tributary) | N/A |
| 9/30/2008 | Unknown | Crest Gauge (Main Channel and Tributary) | N/A |

*Note from previous monitoring report: No bankfull events were observed to have occurred during the Year-1 (2007) monitoring period.

2.3 Wetland Assessment

Three groundwater monitoring gauges were installed on the DT site by EcoScience. The monitoring gauges are programmed to download groundwater levels daily and were downloaded monthly in order to capture hydrological data during the 2008 growing season. The target wetland hydrological success criterion is saturation or inundation for at least 12.5 percent of the growing season in the lower landscape (floodplain) positions. To achieve the above hydrologic success criterion, groundwater levels must be within 12-inches of the ground surface for 31 consecutive days, which is 12.5 percent of the March 15 to November 18 (249 days) growing season. However, for this monitoring report hydrologic data is shown through September 30, 2008 due to site access restrictions administered by the landowner.

2.3.1 Wetland Current Condition Plan View

There were no problem areas observed within the wetland restoration zones for the DT Site. Within the wetland zones, hydrophytic vegetation and hydrology indicators have developed. The planted woody stem species throughout the wetland areas are meeting the required success criteria; however, missing woody stems were observed within plot 14. It is suspected that the missing planted stems may be due to high growth rate of non-planted species that are crowding out woody species. The general success of hydrology within the wetland restoration zones is adequate to meet success requirements. Surface inundation to ground saturation was observed throughout the site; therefore, appropriate hydrological condition for the wetland zones appear to be present.

2.3.2 Wetland Criteria Attainment

All gauges on site achieved the wetland success criterion of soil saturation within the upper 12 inches for 31 consecutive days during the growing season. Please refer to Appendix 3 for wetland raw data tables and plots and Table 2.5 for a summary of wetland criteria attainment.

Table 2.5
Wetland Criteria Attainment
Dula Thoroughfare/Project No. 65

| Gauge ID | Hydrology Threshold Met (Y/N)* | Hydrology Met During Growing Season (%)* | Vegetation Plot ID | Vegetation Survival Threshold Met (Y/N) | Vegetation Survival per site (%) |
|--|---------------------------------------|---|---------------------------|--|---|
| Gauge 1 | Y | 73 | Plot 8 | Y | 100 |
| Gauge 2 | Y | 49 | Plot 9 | Y | |
| Gauge 3 | Y | 67 | Plot 10 | Y | |
| <i>*Results include only part of the growing season from March 15 through September 30 due to land access restrictions</i> | | | Plot 11 | Y | |
| | | | Plot 12 | Y | |
| | | | Plot 13 | Y | |
| | | | Plot 14 | N | 67 |
| | | | Plot 15 | Y | |



SECTION 3
METHODOLOGY

SECTION 3

METHODOLOGY

3.1 Methodology

Methods employed for the DT Site were a combination of those established by standard regulatory guidance and procedures documents and as well as previous monitoring reports completed by EcoScience. Geomorphic and stream assessments were performed following guidelines outlined in the Stream Channel Reference Sites: An Illustrated Guide to Field Techniques (Harrelson et al., 1994) and in the Stream Restoration a Natural Channel Design Handbook (Doll et al, 2003). Vegetation assessments were performed following the Carolina Vegetation Survey-NCEEP Level 2 Protocol (Lee et al., 2006). JJG used the *Flora of the Carolinas, Virginia, Georgia, and surrounding areas* by Alan S. Weakley as the taxonomic standard for vegetation nomenclature for this report. Precipitation data for the hydrographs was obtained from Weather Underground for the Albemarle, NC weather station (the nearest offering daily precipitation data) through the following URL.

http://www.wunderground.com/history/airport/KVUJ/2008/1/1/CustomHistory.html?dayend=14&monthend=10&yearend=2008&req_city=NA&req_state=NA&req_statename=NA



SECTION 4

REFERENCES

SECTION 4

REFERENCES

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Harrelson, Cheryl C; Rawlins, C.L.; Potyondy, John P. 1994. *Stream Channel Reference Sites: An Illustrated Guide to Field Technique*. Gen. Tech. Rep. RM-245. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 61 p.

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SECTION 5
FIGURES

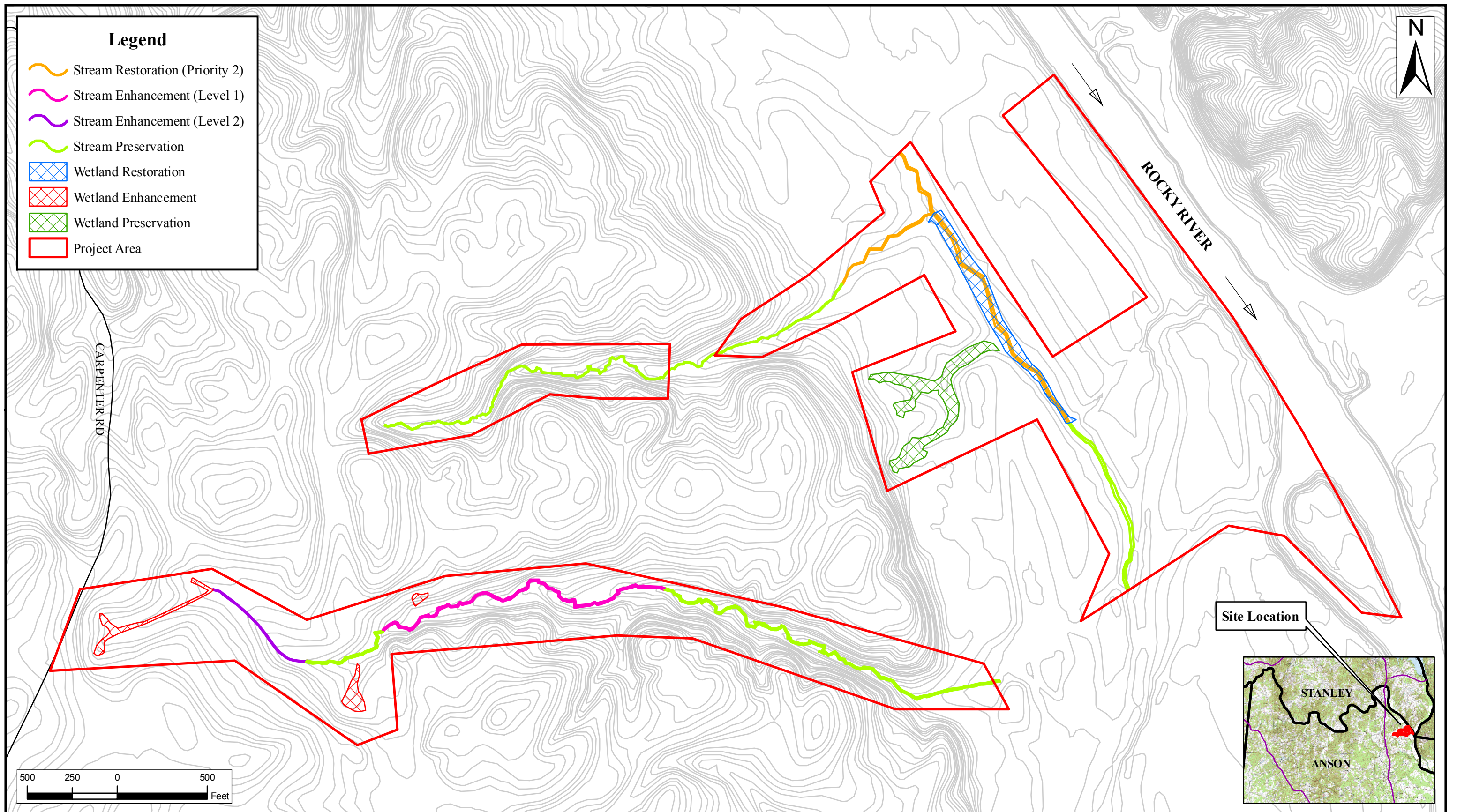
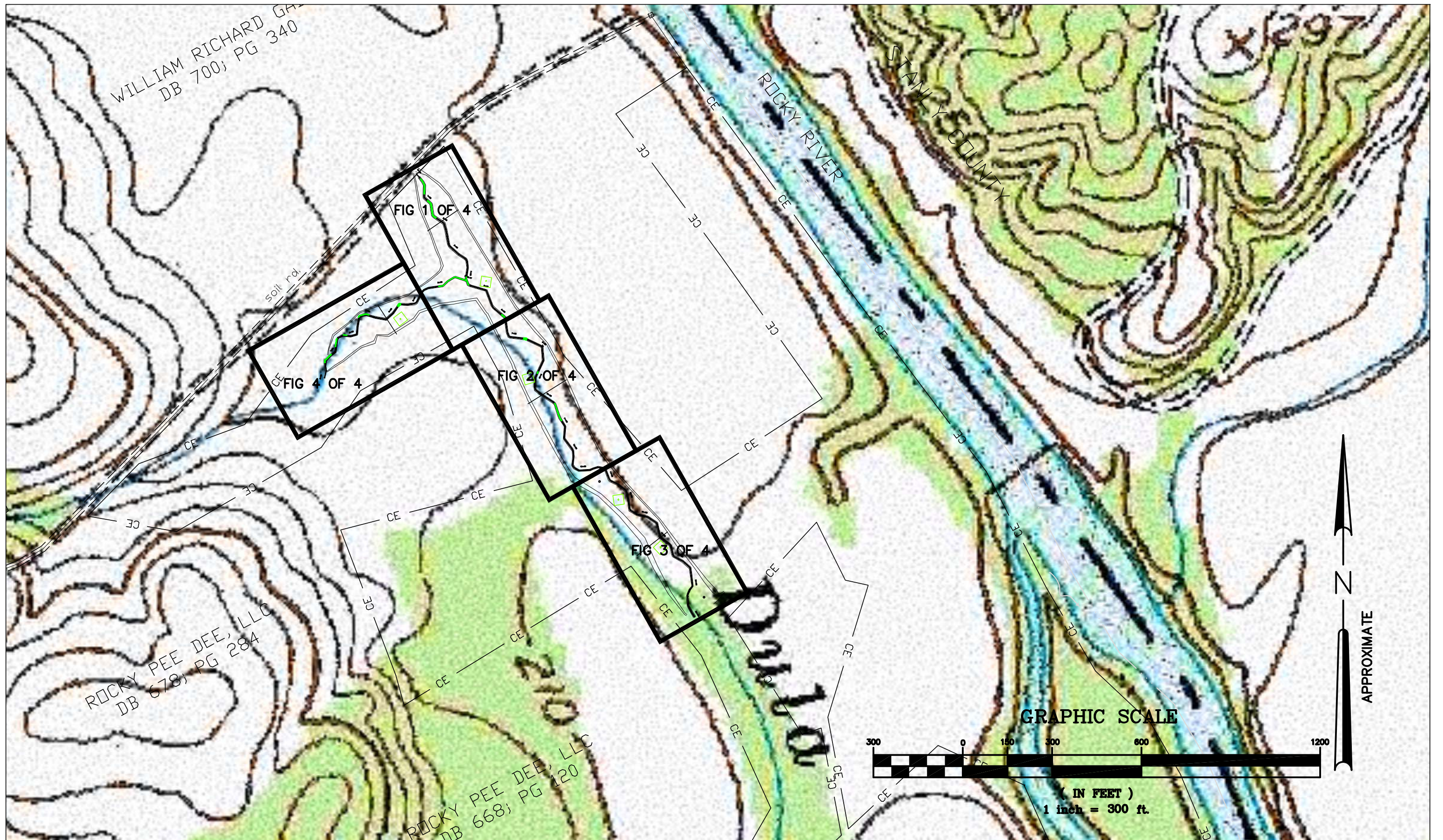


Figure 1.1 Project Location Map
 Dula Thoroughfare Stream Restoration
 Anson County, NC
 Year 2 of 5



Project No. 65
 February 2009



NOTES:
 1. GENERAL SITE DATA PROVIDED BY NCEEP.
 2. ALL LOCATIONS ARE APPROXIMATE.

PROJECT NO. 65
 ANSON COUNTY
 NORTH CAROLINA
 MONITORING
 YEAR 2 of 5



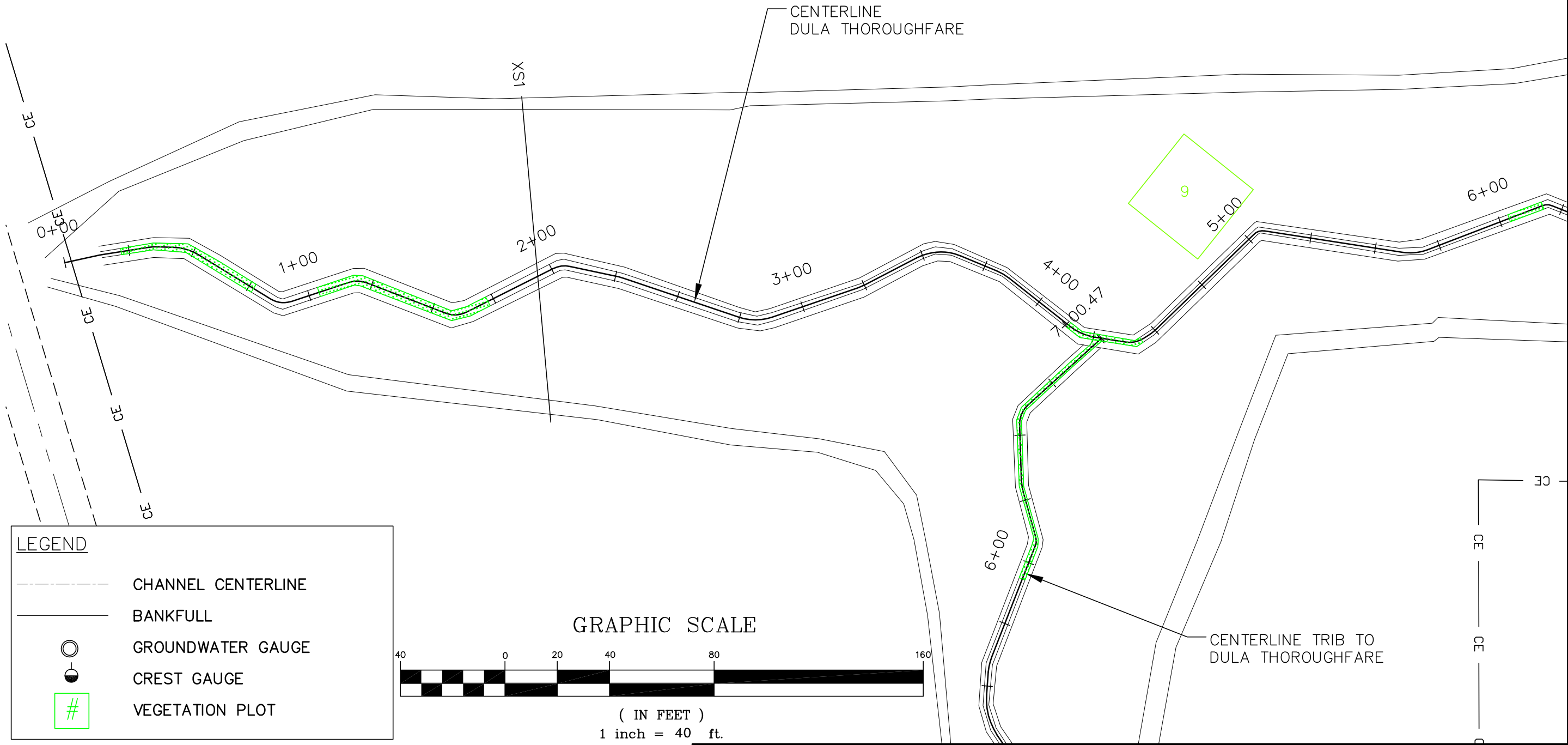
NC ECOSYSTEM ENHANCEMENT PROGRAM
 DULA THOROUGHFARE STREAM AND WETLAND RESTORATION

FIGURE 1.2
 MONITORING PLAN VIEW

DATE : FEBRUARY 2009
 SCALE : 1"=300'
 JOB NO.: 03060005

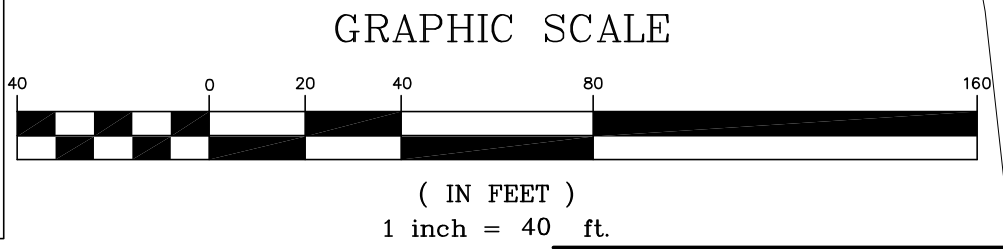
FIGURE KEY

CE — CE — CE — CE — CE — CE — CE — CE — CE — CE — CE — CE — CE — CE — CE — CE — CE — CE — CE — CE



LEGEND

- CHANNEL CENTERLINE
- BANKFULL
- GROUNDWATER GAUGE
- ⊖ CREST GAUGE
- # VEGETATION PLOT



MATCHLINE SEE FIGURE 4 OF 4

MATCHLINE SEE FIGURE 2 OF 4



NOTES:
1. GENERAL SITE DATA PROVIDED BY NCEEP.
2. ALL LOCATIONS ARE APPROXIMATE.

PROJECT NO. 65
ANSON COUNTY
NORTH CAROLINA
MONITORING
YEAR 2 of 5



NC ECOSYSTEM ENHANCEMENT PROGRAM
DULA THOROUGHFARE STREAM AND WETLAND RESTORATION

FIGURE 1.2
MONITORING PLAN VIEW

DATE : FEBRUARY 2009
SCALE : 1"=40'
JOB NO.: 03060005

FIGURE 1 OF 4

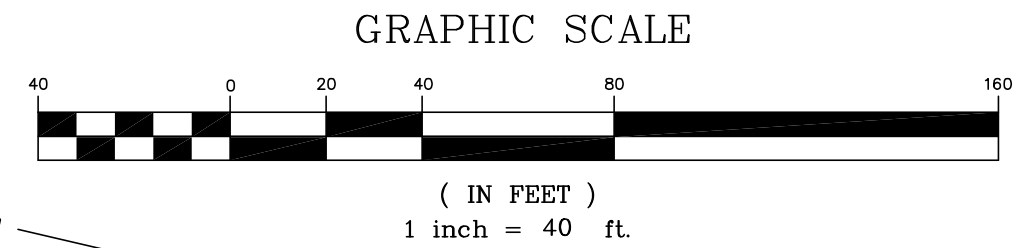
MATCHLINE SEE FIGURE 1 OF 4

MATCHLINE SEE FIGURE 3 OF 4



LEGEND

- CHANNEL CENTERLINE
- BANKFULL
- GROUNDWATER GAUGE
- CREST GAUGE
- VEGETATION PLOT



NOTES:
1. GENERAL SITE DATA PROVIDED BY NCEEP.
2. ALL LOCATIONS ARE APPROXIMATE.

PROJECT NO. 65
ANSON COUNTY
NORTH CAROLINA
MONITORING
YEAR 2 of 5

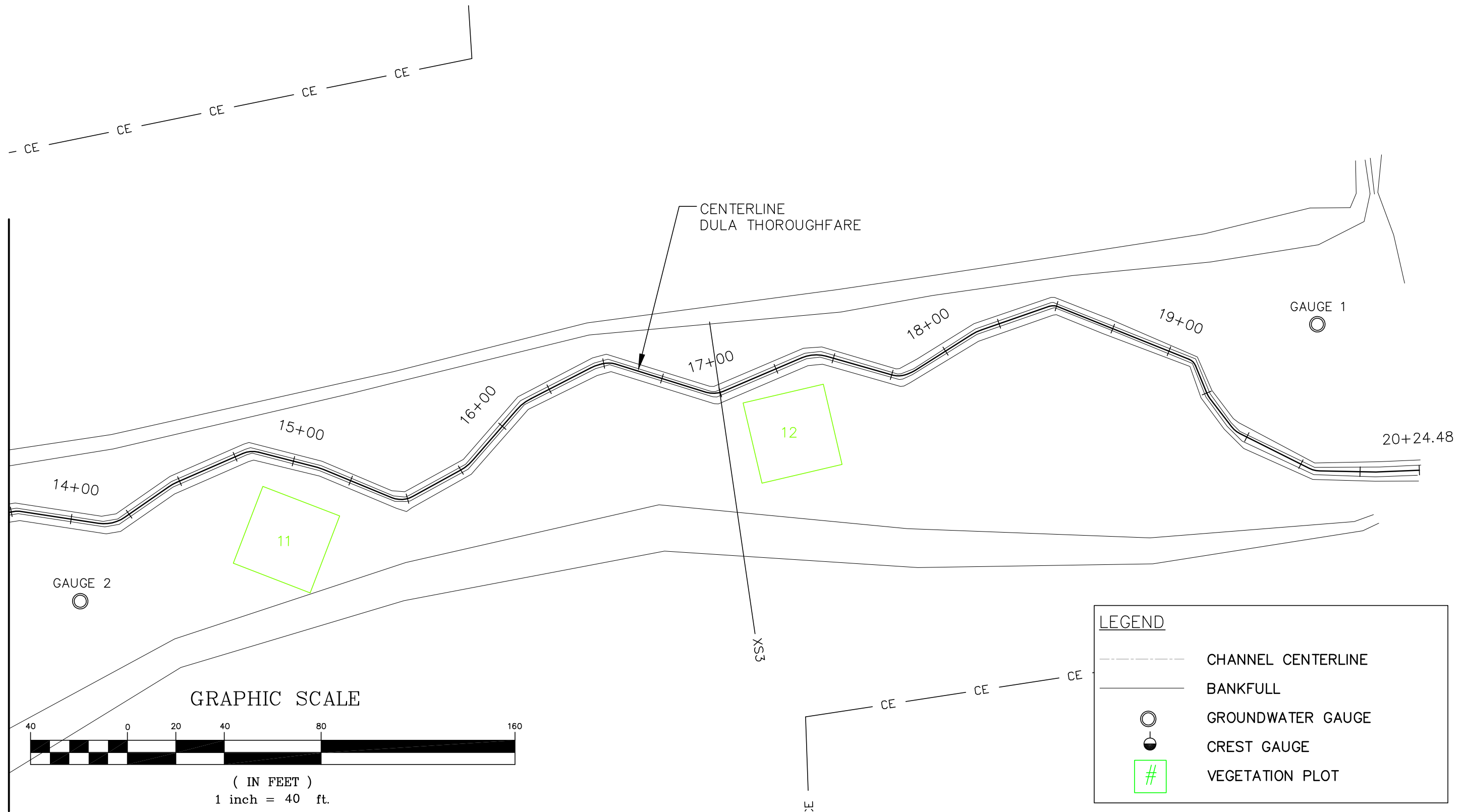


NC ECOSYSTEM ENHANCEMENT PROGRAM
DULA THOROUGHFARE STREAM AND WETLAND RESTORATION

DATE : FEBRUARY 2009
SCALE : 1"=40'
JOB NO.: 03060005

FIGURE 1.2
MONITORING PLAN VIEW

MATCHLINE SEE FIGURE 1 OF 4



| LEGEND | |
|--------|--------------------|
| | CHANNEL CENTERLINE |
| | BANKFULL |
| | GROUNDWATER GAUGE |
| | CREST GAUGE |
| | VEGETATION PLOT |



NOTES:
 1. GENERAL SITE DATA PROVIDED BY NCEEP.
 2. ALL LOCATIONS ARE APPROXIMATE.

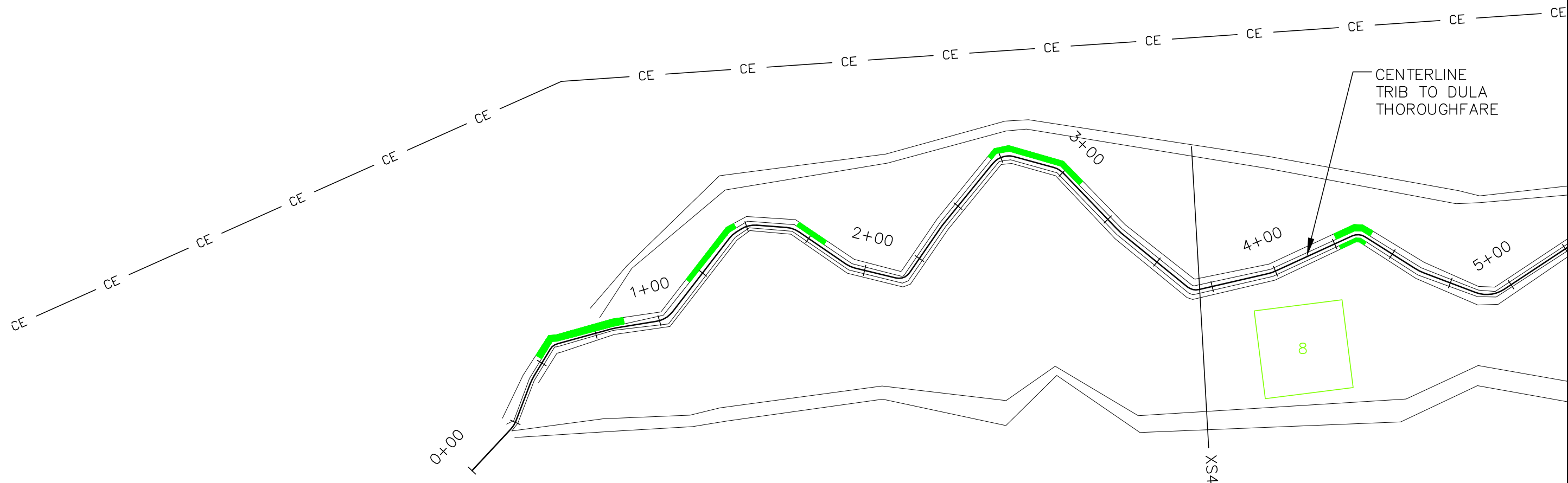
PROJECT NO. 65
 ANSON COUNTY
 NORTH CAROLINA
 MONITORING
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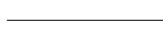



NC ECOSYSTEM ENHANCEMENT PROGRAM
 DULA THOROUGHFARE STREAM AND WETLAND RESTORATION

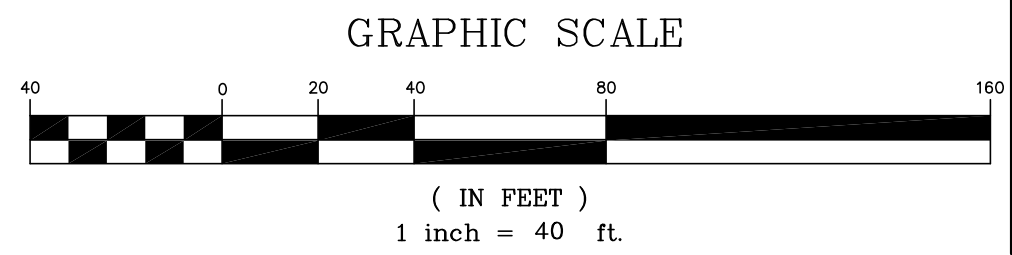
DATE : FEBRUARY 2009
 SCALE : 1"=40'
 JOB NO.: 03060005

FIGURE 1.2
 MONITORING PLAN VIEW



LEGEND

-  CHANNEL CENTERLINE
-  BANKFULL
-  GROUNDWATER GAUGE
-  CREST GAUGE
-  VEGETATION PLOT



MATCHLINE SEE FIGURE 1 OF 4



NOTES:
1. GENERAL SITE DATA PROVIDED BY NCEEP.
2. ALL LOCATIONS ARE APPROXIMATE.

PROJECT NO. 65
ANSON COUNTY
NORTH CAROLINA
MONITORING
YEAR 2 of 5



NC ECOSYSTEM ENHANCEMENT PROGRAM
DULA THOROUGHFARE STREAM AND WETLAND RESTORATION

FIGURE 1.2
MONITORING PLAN VIEW

DATE : FEBRUARY 2009
SCALE : 1"=40'
JOB NO.: 03060005

Click on the Desired Link Below

Appendix 1

Appendix 2

Appendix 3

Appendix 4



SECTION 6

APPENDICES

Appendix 1 - Vegetation Raw Data

Appendix 2 - Geomorphic and Stream Stability Data

Appendix 3 - Wetland Raw Data

Appendix 4 – Integrated Current Condition Plan View



APPENDIX 1 VEGETATION RAW DATA

- 1. Vegetation Survey Data Tables***
- 2. Representative Vegetation Current Condition Photos**
- 3. Vegetation Monitoring Plot Photos**

*Raw data tables have been provided electronically.

Dula Thoroughfare-Main Channel (2,025 lf)

| Feature Issue | Station Numbers | Suspected Cause | Photo ID # |
|-----------------------|-----------------|-------------------------------|------------|
| Poor Vegetative Cover | 7+38-7+55 | Lack of vegetation growth- BB | 1 |

Dula Thoroughfare-Tributary (705 lf)

| Feature Issue | Station Numbers | Suspected Cause | Photo ID # |
|-----------------------|-----------------|------------------------------|------------|
| Poor Vegetative Cover | 0+51-0+87 | Lack of vegetative cover- LB | 3 |
| | 1+19-1+46 | | |
| | 1+69-1+81 | | |
| | 2+72-3+08 | Lack of vegetative cover- BB | |
| | 4+26-6+43 | | |

LB - Left Bank Looking Downstream, RB - Right Bank Looking Downstream, BB - Both Banks, TOB - Top of Bank

Table 1. Vegetation Metadata

| | |
|--|---|
| Report Prepared By | Kirsten Young |
| Date Prepared | 9/16/2008 0:00 |
| database name | D05010S-BishopStream-2008-VMD-entryTool-v2.2.5.mdb |
| database location | P:\03\03060\005\M6-Field Monitoring Data\MY-2008\Vegetation\Bishop Site |
| DESCRIPTION OF WORKSHEETS IN THIS DOCUMENT----- | |
| Metadata | Description of database file, the report worksheets, and a summary of project(s) and project data. |
| 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. |
| Stem Count by Plot and Spp | A matrix of the count of total living stems of each species (planted and natural volunteers combined) for each plot; dead and missing stems are excluded. |
| PROJECT SUMMARY----- | |
| Project Code | D05010S |
| project Name | Dula Thoroughfare and UT Dula Thoroughfare (Bishop Site) |
| Description | Stream and wetland restoration/enhancement in Anson County |
| length(ft) | |
| stream-to-edge width (ft) | |
| area (sq m) | 100 |
| Required Plots (calculated) | 8 |
| Sampled Plots | 8 |

**Table 2. Vegetation Vigor by Species
Dula Thoroughfare**

| | Species | 4 | 3 | 2 | 1 | 0 | Missing | Unknown |
|---------------|----------------------------------|-----------|-----------|----------|----------|----------|----------------|----------------|
| | <i>Betula nigra</i> | 34 | 2 | | | | 1 | |
| | <i>Carya ovata</i> | | 1 | | | | | |
| | <i>Celtis laevigata</i> | | 1 | | | | | |
| | <i>Cephalanthus occidentalis</i> | 6 | 6 | | | | | |
| | <i>Cornus amomum</i> | 6 | 10 | | | | | |
| | <i>Fraxinus pennsylvanica</i> | 6 | 1 | | | 1 | 1 | |
| | <i>Nyssa biflora</i> | 2 | | | | | | |
| | <i>Quercus michauxii</i> | 1 | 3 | | | | | |
| | <i>Quercus pagoda</i> | 3 | 1 | | | | 1 | |
| | <i>Quercus phellos</i> | 5 | 1 | | | | | |
| | <i>Platanus occidentalis</i> | 4 | 2 | | | | | |
| | <i>Ulmus americana</i> | 2 | 2 | | | | 1 | |
| TOTAL: | 12 | 69 | 30 | | | 1 | 4 | |

**Table 2. Vegetation Vigor by Species
UT Dula Thoroughfare**

| | Species | 4 | 3 | 2 | 1 | 0 | Missing | Unknown |
|---------------|--------------------------|----------|----------|----------|----------|----------|----------------|----------------|
| | <i>Celtis laevigata</i> | 2 | | | | 1 | 1 | |
| | <i>Cornus florida</i> | | 2 | | | | | |
| | <i>Nyssa biflora</i> | 1 | | | | | | |
| | <i>Quercus falcata</i> | 1 | 2 | 1 | | | 1 | |
| | <i>Quercus phellos</i> | 1 | | | | | | |
| | <i>Fagus grandifolia</i> | | 1 | | | | 1 | |
| | <i>Quercus rubra</i> | 4 | 2 | 1 | | | 1 | |
| TOTAL: | 7 | 9 | 7 | 2 | | 1 | 4 | |

**Table 3. Vegetation Damage by Species
Dula Thoroughfare**

| | Species | All Damage Categories | (no damage) | other damage | Deer | Drought | Unknown |
|---------------|----------------------------------|-----------------------|-------------|--------------|----------|----------|----------|
| | <i>Betula nigra</i> | 37 | 34 | 1 | | 1 | 1 |
| | <i>Carya ovata</i> | 1 | 1 | | | | |
| | <i>Celtis laevigata</i> | 1 | 1 | | | | |
| | <i>Cephalanthus occidentalis</i> | 12 | 7 | | 1 | 4 | |
| | <i>Cornus amomum</i> | 16 | 14 | | 1 | 1 | |
| | <i>Fraxinus pennsylvanica</i> | 9 | 8 | 1 | | | |
| | <i>Nyssa biflora</i> | 2 | 2 | | | | |
| | <i>Platanus occidentalis</i> | 6 | 6 | | | | |
| | <i>Quercus michauxii</i> | 4 | 3 | | | 1 | |
| | <i>Quercus pagoda</i> | 5 | 5 | | | | |
| | <i>Quercus phellos</i> | 6 | 6 | | | | |
| | <i>Ulmus americana</i> | 5 | 5 | | | | |
| TOTAL: | 12 | 104 | 92 | 2 | 2 | 7 | 1 |

**Table 3. Vegetation Damage by Species
UT Dula Thoroughfare**

| | <i>Species</i> | <i>All Damage Categories</i> | | | | |
|---------------|--------------------------|------------------------------|---------------------|----------------|----------------|----------|
| | | <i>(no damage)</i> | <i>other damage</i> | <i>Drought</i> | <i>Unknown</i> | |
| | <i>Celtis laevigata</i> | 4 | 2 | | | 2 |
| | <i>Cornus florida</i> | 2 | 1 | | 1 | |
| | <i>Fagus grandifolia</i> | 2 | 1 | | | 1 |
| | <i>Nyssa biflora</i> | 1 | 1 | | | |
| | <i>Quercus falcata</i> | 5 | 1 | 1 | 2 | 1 |
| | <i>Quercus phellos</i> | 1 | 1 | | | |
| | <i>Quercus rubra</i> | 8 | 5 | | 2 | 1 |
| TOTAL: | 7 | 23 | 12 | 1 | 5 | 5 |

**Table 4. Vegetation Damage by Plot
Dula Thoroughfare**

| | <i>plot</i> | <i>All Damage Categories</i> | <i>(no damage)</i> | <i>other damage</i> | <i>Deer</i> | <i>Drought</i> | <i>Unknown</i> |
|---------------|---------------------------|------------------------------|--------------------|---------------------|-------------|----------------|----------------|
| | D05010S-JG,SD-0008-year:2 | 16 | 14 | 1 | | 1 | |
| | D05010S-JG,SD-0009-year:2 | 39 | 38 | | | 1 | |
| | D05010S-JG,SD-0010-year:2 | 29 | 22 | 1 | 2 | 3 | 1 |
| | D05010S-JG,SD-0011-year:2 | 12 | 12 | | | | |
| | D05010S-JG,SD-0012-year:2 | 8 | 6 | | | 2 | |
| TOTAL: | 5 | 104 | 92 | 2 | 2 | 7 | 1 |

**Table 4. Vegetation Damage by Plot
UT Dula Thoroughfare**

| | <i>plot</i> | <i>All Damage Categories</i> | <i>(no damage)</i> | <i>other damage</i> | <i>Drought</i> | <i>Unknown</i> |
|---------------|---------------------------|------------------------------|--------------------|---------------------|----------------|----------------|
| | D05010S-JG,SD-0013-year:2 | 13 | 5 | | 3 | 5 |
| | D05010S-JG,SD-0014-year:2 | 3 | | 1 | 2 | |
| | D05010S-JG,SD-0015-year:2 | 7 | 7 | | | |
| TOTAL: | 3 | 23 | 12 | 1 | 5 | 5 |

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

| Species | Total Stems | # plots | avg# stems | D05010S-JG,SD-0008-year:2 | D05010S-JG,SD-0009-year:2 | D05010S-JG,SD-0010-year:2 | D05010S-JG,SD-0011-year:2 | D05010S-JG,SD-0012-year:2 |
|----------------------------------|-------------|-----------|------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| <i>Betula nigra</i> | 43 | 5 | 9 | 1 | 21 | 15 | 3 | 3 |
| <i>Carya ovata</i> | 1 | 1 | 1 | | | | 1 | |
| <i>Celtis laevigata</i> | 1 | 1 | 1 | | | 1 | | |
| <i>Cephalanthus occidentalis</i> | 13 | 4 | 3 | 1 | 5 | 3 | | 4 |
| <i>Cornus amomum</i> | 21 | 4 | 5 | 3 | 12 | 5 | | 1 |
| <i>Fraxinus pennsylvanica</i> | 8 | 3 | 3 | 3 | | 4 | 1 | |
| <i>Nyssa biflora</i> | 2 | 2 | 1 | 1 | 1 | | | |
| <i>Quercus michauxii</i> | 4 | 3 | 1 | 2 | | 1 | 1 | |
| <i>Quercus pagoda</i> | 4 | 3 | 1 | 2 | 1 | 1 | | |
| <i>Quercus phellos</i> | 6 | 4 | 2 | 2 | 2 | 1 | 1 | |
| <i>Liquidambar</i> | 1 | 1 | 1 | | | | 1 | |
| <i>Quercus</i> | 5 | 2 | 3 | | 1 | 4 | | |
| <i>Platanus occidentalis</i> | 6 | 2 | 3 | | 1 | | 5 | |
| <i>Acer negundo</i> | 1 | 1 | 1 | 1 | | | | |
| <i>Ulmus americana</i> | 5 | 2 | 3 | | 4 | 1 | | |
| TOTAL: 15 | 121 | 15 | 2 | 16 | 48 | 36 | 13 | 8 |

Table 5. Stem Count by Plot and Species
UT Dula Thoroughfare

| | <i>Species</i> | <i>Total Stems</i> | <i># plots</i> | <i>avg# stems</i> | <i>D05010S-JG,SD-0013-year:2</i> | <i>D05010S-JG,SD-0014-year:2</i> | <i>D05010S-JG,SD-0015-year:2</i> |
|---------------|--------------------------|--------------------|----------------|-------------------|----------------------------------|----------------------------------|----------------------------------|
| | <i>Celtis laevigata</i> | 3 | 1 | 3 | 3 | | |
| | <i>Cornus amomum</i> | 2 | 1 | 2 | 2 | | |
| | <i>Cornus florida</i> | 2 | 2 | 1 | | 1 | 1 |
| | <i>Nyssa biflora</i> | 1 | 1 | 1 | | | 1 |
| | <i>Quercus falcata</i> | 4 | 3 | 1 | 1 | 2 | 1 |
| | <i>Quercus phellos</i> | 2 | 1 | 2 | | | 2 |
| | <i>Liquidambar</i> | 2 | 2 | 1 | | 1 | 1 |
| | <i>Fagus grandifolia</i> | 1 | 1 | 1 | | | 1 |
| | <i>Quercus rubra</i> | 7 | 2 | 4 | 5 | | 2 |
| TOTAL: | 9 | 24 | 9 | 2 | 11 | 4 | 9 |



1. Poor Vegetation Cover-Main Channel
Dula Thoroughfare (5/2008)



2. In-Stream Vegetation-Main Channel
Dula Thoroughfare (5/2008)



3. Poor Vegetation Cover-Tributary
Dula Thoroughfare (5/2008)



4. In-Stream Vegetation-Tributary
Dula Thoroughfare (5/2008)

Prepared For:

Dula Thoroughfare Stream Restoration
Year 2 of 5

Date: February 2009

Project No.: 65



Appendix 1.2 Representative Vegetation Current Condition Photos





5. In-Stream Vegetation
UT Dula Thoroughfare (5/2008)

Prepared For:

Dula Thoroughfare Stream Restoration
Year 2 of 5

Date: February 2009

Project No.: 65



Appendix 1.2 Representative Vegetation Current Condition Photos





Monitoring Plot 8
Dula Thoroughfare (9/2008)



Monitoring Plot 9
Dula Thoroughfare (9/2008)



Monitoring Plot 10
Dula Thoroughfare (9/2008)



Monitoring Plot 11
Dula Thoroughfare (9/2008)

Prepared For:

Dula Thoroughfare Stream Restoration
Year 2 of 5

Date: February 2009

Project No.: 65



Appendix 1.3 Vegetation Monitoring Plot Photos





Monitoring Plot 12
Dula Thoroughfare (9/2008)



Monitoring Plot 13
UT Dula Thoroughfare (9/2008)



Monitoring Plot 14
UT Dula Thoroughfare (9/2008)



Monitoring Plot 15
UT Dula Thoroughfare (9/2008)

Prepared For:

Dula Thoroughfare Stream Restoration
Year 2 of 5

Date: February 2009

Project No.: 65



Appendix 1.3 Vegetation Monitoring Plot Photos





APPENDIX 2 GEOMORPHIC AND STREAM STABILITY DATA

- 1. Stream Current Condition Table**
- 2. Representative Stream Current Condition Photos**
- 3. Stream Photo Station Photos**
- 4. Stream Cross-Section Photos**
- 5. Qualitative Visual Stability Assessment**
- 6. Cross-Section Plots and Raw Data Tables***
- 7. Longitudinal Plots and Raw Data Tables***
- 8. Pebble Count Plots and Raw Data Tables***

*Raw data tables have been provided electronically.

Dula Thoroughfare-Main Channel (2,025 lf)

| Feature Issue | Station Numbers | Suspected Cause | Photo ID # |
|----------------------|-----------------|---|------------|
| In-Stream Vegetation | 0+22-0+77 | Vegetation growing in middle of channel | 2 |
| | 1+04-1+73 | | |
| | 4+14-4+44 | | |
| | 6+04-6+18 | | |
| | 8+89-8+96 | | |
| | 10+32-10+95 | | |

Dula Thoroughfare-Tributary (705 lf)

| Feature Issue | Station Numbers | Suspected Cause | Photo ID # |
|----------------------|-----------------|---|------------|
| In-Stream Vegetation | 5+93-6+92 | Vegetation growing in middle of channel | 4 |

UT to Dula Thoroughfare (2,351 lf)

| Feature Issue | Station Numbers | Suspected Cause | Photo ID # |
|----------------------|-----------------|--|------------|
| Channel Dry | N/A | Abnormal flow conditions along a few riffles | 5 |
| In-Stream Vegetation | N/A | Vegetation growing in middle of channel | 6 |

LB - Left Bank Looking Downstream, RB - Right Bank Looking Downstream, BB - Both Banks, TOB - Top of Bank



1. Poor Vegetation Cover-Main Channel
Dula Thoroughfare (5/2008)



2. In-Stream Vegetation-Main Channel
Dula Thoroughfare (5/2008)



3. Poor Vegetation Cover-Tributary
Dula Thoroughfare (5/2008)



4. In-Stream Vegetation-Tributary
Dula Thoroughfare (5/2008)

Prepared For:

Dula Thoroughfare Stream Restoration
Year 2 of 5

Date: February 2009

Project No.: 65



Appendix 2.2 Representative Stream Current Condition Photos





5. Dry Channel
UT Dula Thoroughfare (5/2008)



6. In-Stream Vegetation
UT Dula Thoroughfare (5/2008)

Prepared For:

Dula Thoroughfare Stream Restoration
Year 2 of 5

Date: February 2009

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Appendix 2.2 Representative Stream Current Condition Photos





Photo Point 1-View Upstream
UT Dula Thoroughfare (5/2008)



Photo Point 1-View Downstream (5/2008)
UT Dula Thoroughfare (5/2008)



Photo Point 2-View Upstream
UT Dula Thoroughfare (5/2008)



Photo Point 2-View Downstream
UT Dula Thoroughfare (5/2008)

Prepared For:

Dula Thoroughfare Stream Restoration
Year 2 of 5

Date: February 2009

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Appendix 2.3 Stream Photo Station Photos





Photo Point 3-View Upstream
UT Dula Thoroughfare (5/2008)



Photo Point 3-View Downstream
UT Dula Thoroughfare (5/2008)



Photo Point 4-View Upstream
UT Dula Thoroughfare (5/2008)



Photo Point 4-View Downstream
UT Dula Thoroughfare (5/2008)

Prepared For:

Dula Thoroughfare Stream Restoration
Year 2 of 5

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Appendix 2.3 Stream Photo Station Photos





Cross-Section 1-View Upstream
Dula Thoroughfare (5/2008)



Cross-Section 1-View Downstream
Dula Thoroughfare (5/2008)



Cross-Section 2-View Upstream
Dula Thoroughfare (5/2008)



Cross-Section 2-View Downstream
Dula Thoroughfare (5/2008)

Prepared For:

Dula Thoroughfare Stream Restoration
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Appendix 2.4 Stream Cross-Section Photos





Cross-Section 3-View Upstream
Dula Thoroughfare (5/2008)



Cross-Section 3-View Downstream
Dula Thoroughfare (5/2008)



Cross-Section 4-View Upstream
Dula Thoroughfare (5/2008)



Cross-Section 4-View Downstream
Dula Thoroughfare (5/2008)

Prepared For:

Dula Thoroughfare Stream Restoration
Year 2 of 5

Date: February 2009

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Appendix 2.4 Stream Cross-Section Photos





Cross-Section 5-View Upstream
UT Dula Thoroughfare (5/2008)



Cross-Section 5-View Downstream
UT Dula Thoroughfare (5/2008)



Cross-Section 6-View Upstream
UT Dula Thoroughfare (5/2008)



Cross-Section 6-View Downstream
UT Dula Thoroughfare (5/2008)

Prepared For:

Dula Thoroughfare Stream Restoration
Year 2 of 5

Date: February 2009

Project No.: 65



Appendix 2.4 Stream Cross-Section Photos





Cross-Section 7-View Upstream
UT Dula Thoroughfare (5/2008)



Cross-Section 7-View Downstream
UT Dula Thoroughfare (5/2008)

Prepared For:

Dula Thoroughfare Stream Restoration
Year 2 of 5

Date: February 2009

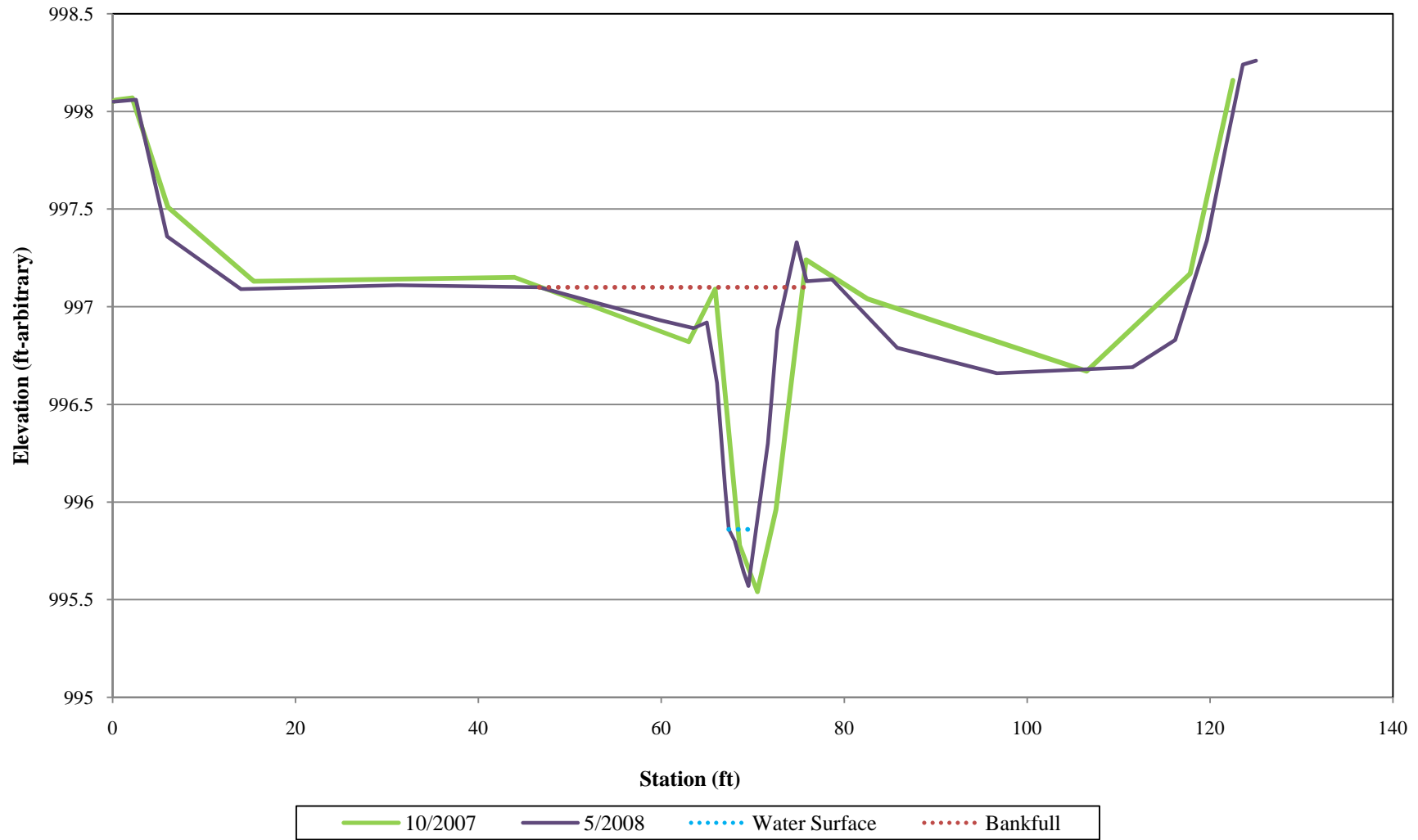
Project No.: 65



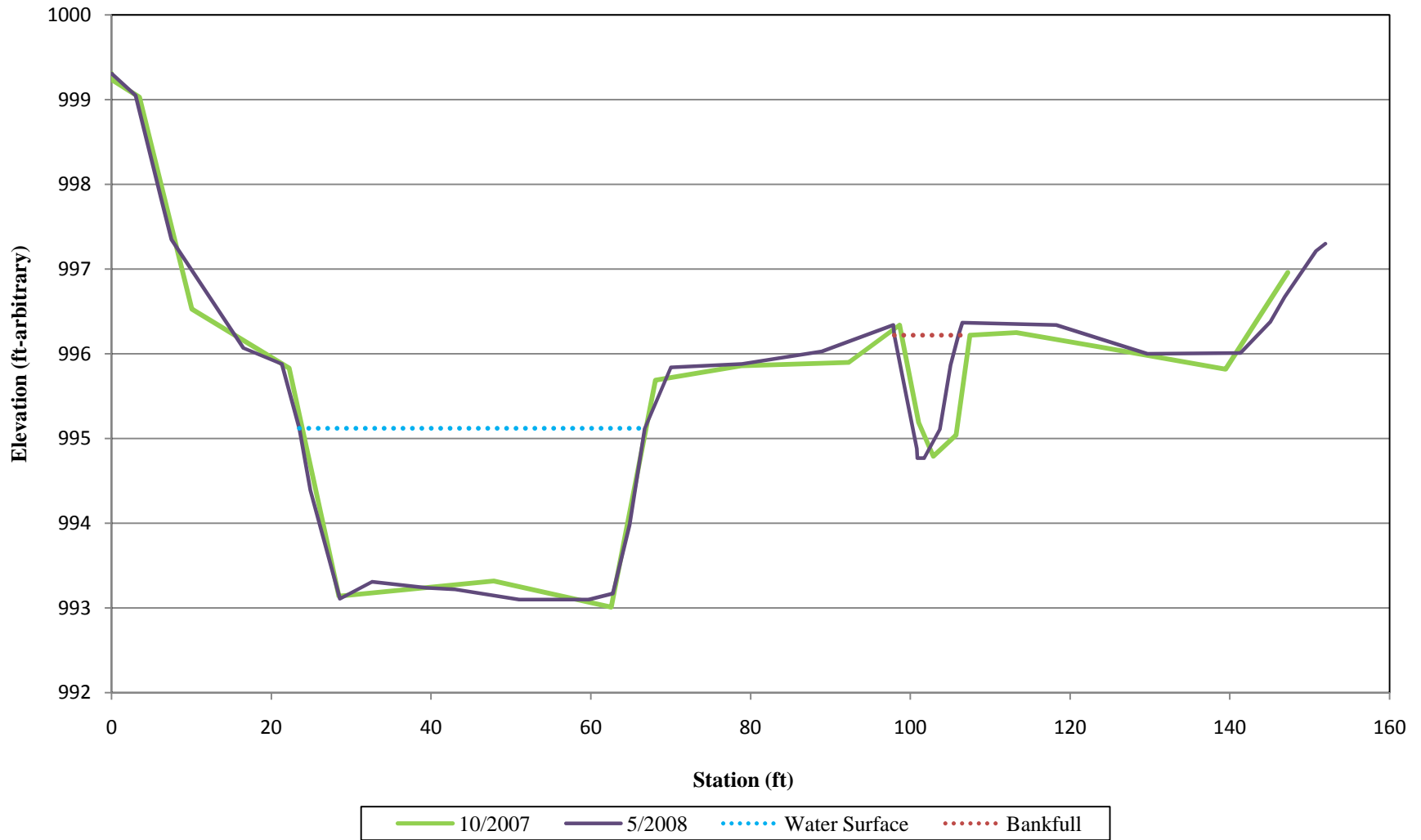
Appendix 2.4 Stream Cross-Section Photos



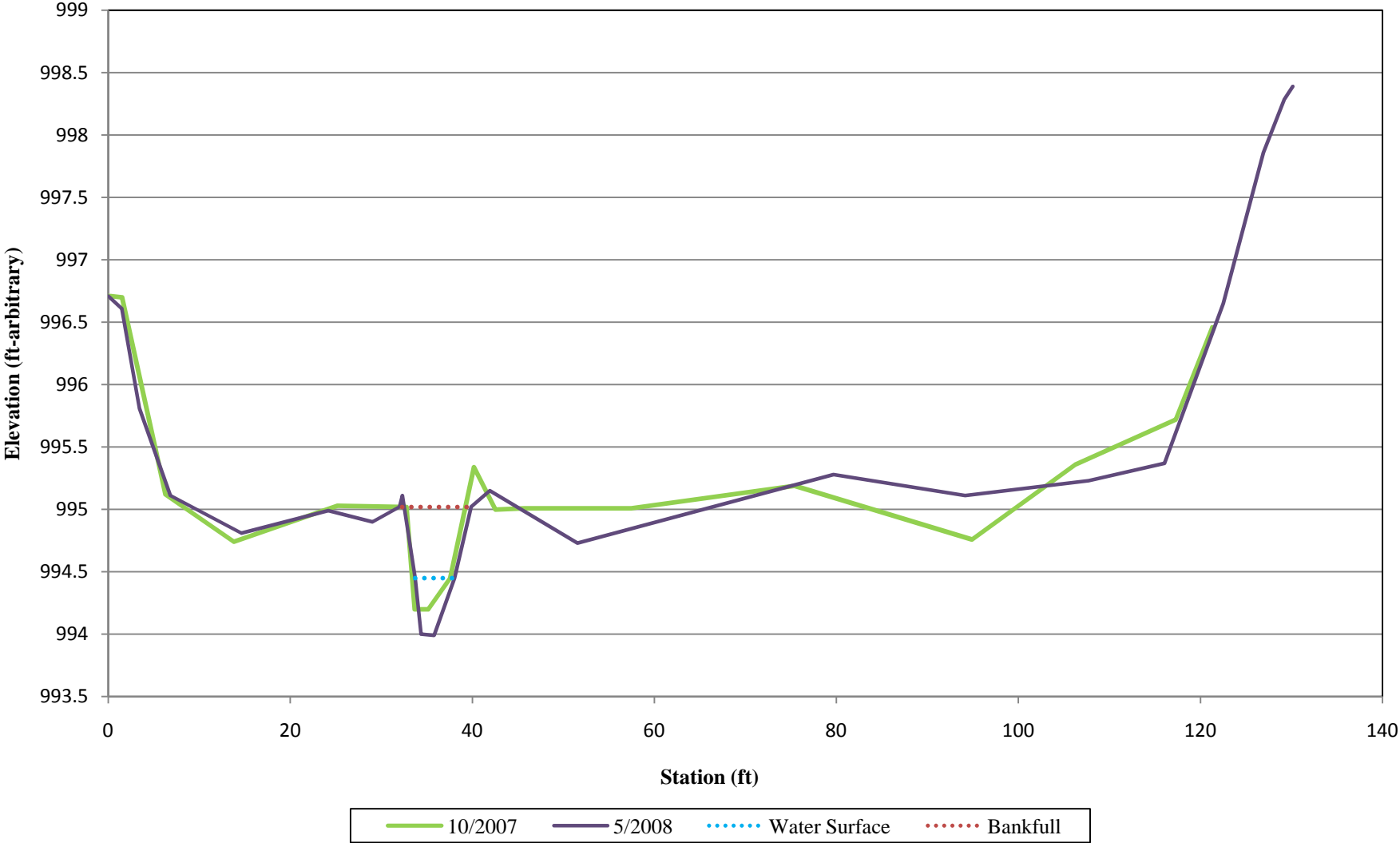
Cross-Section 1-Pool Dula Thoroughfare



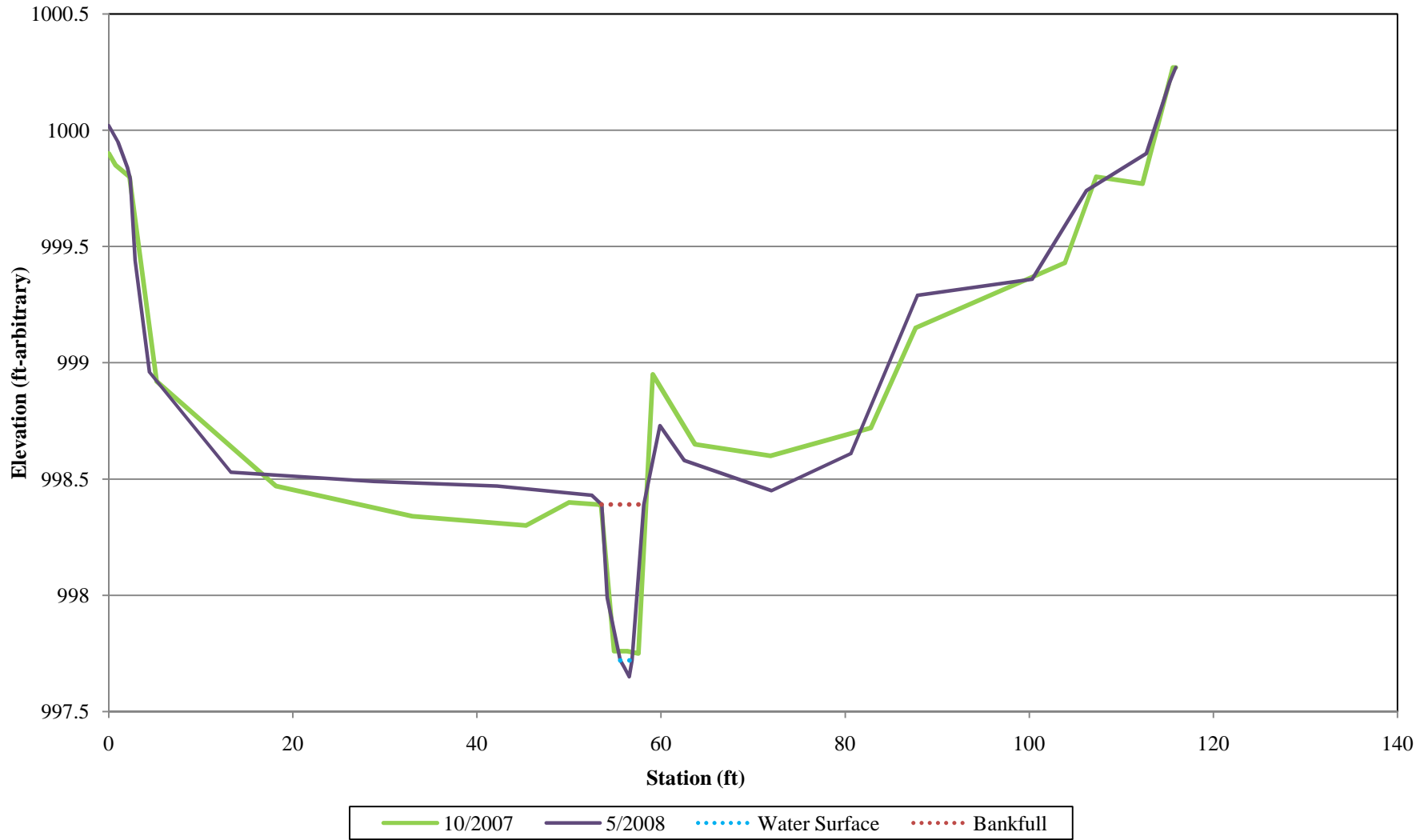
Cross-Section 2-Run Dula Thoroughfare



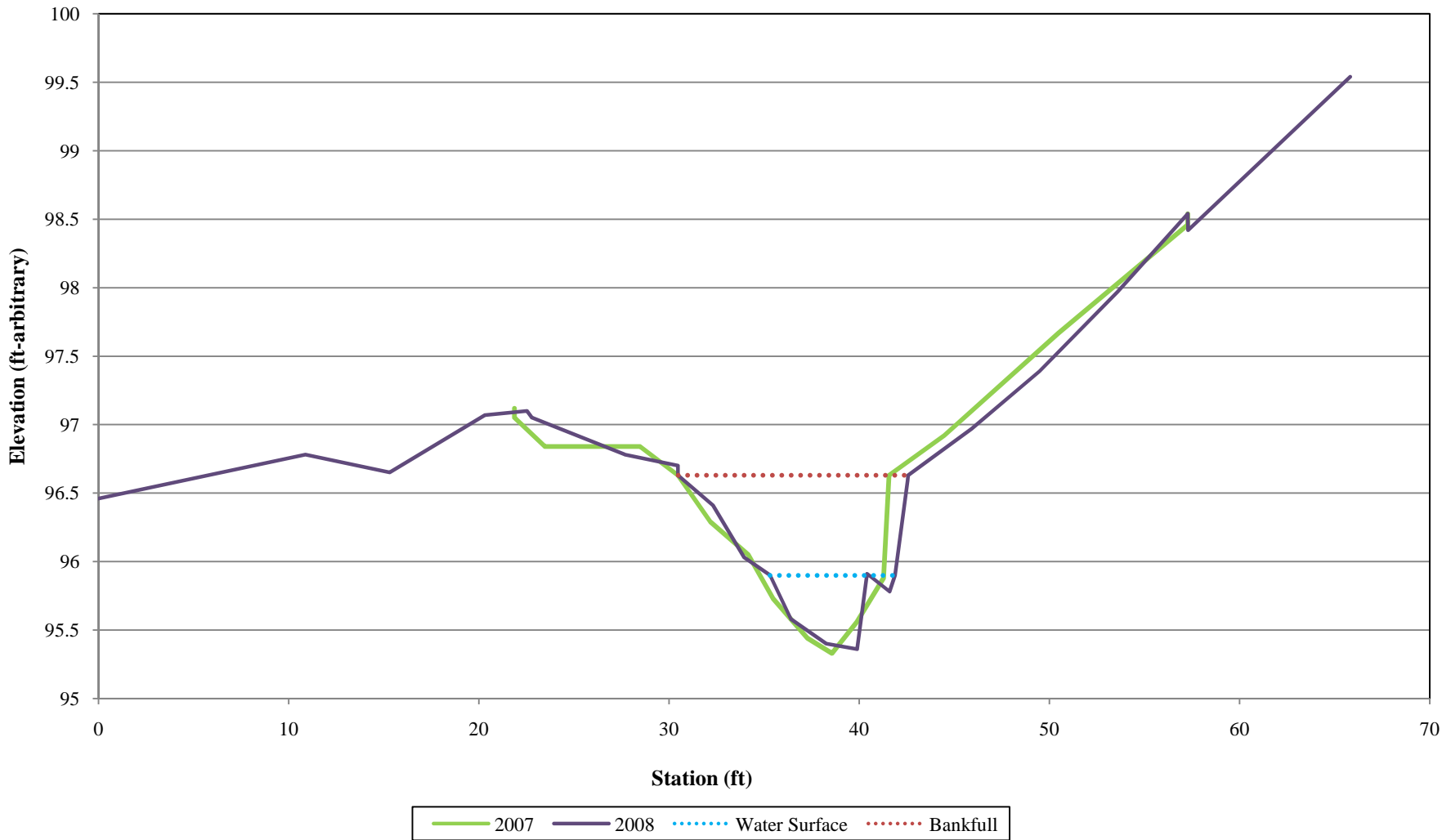
Cross-Section 3-Pool Dula Thoroughfare



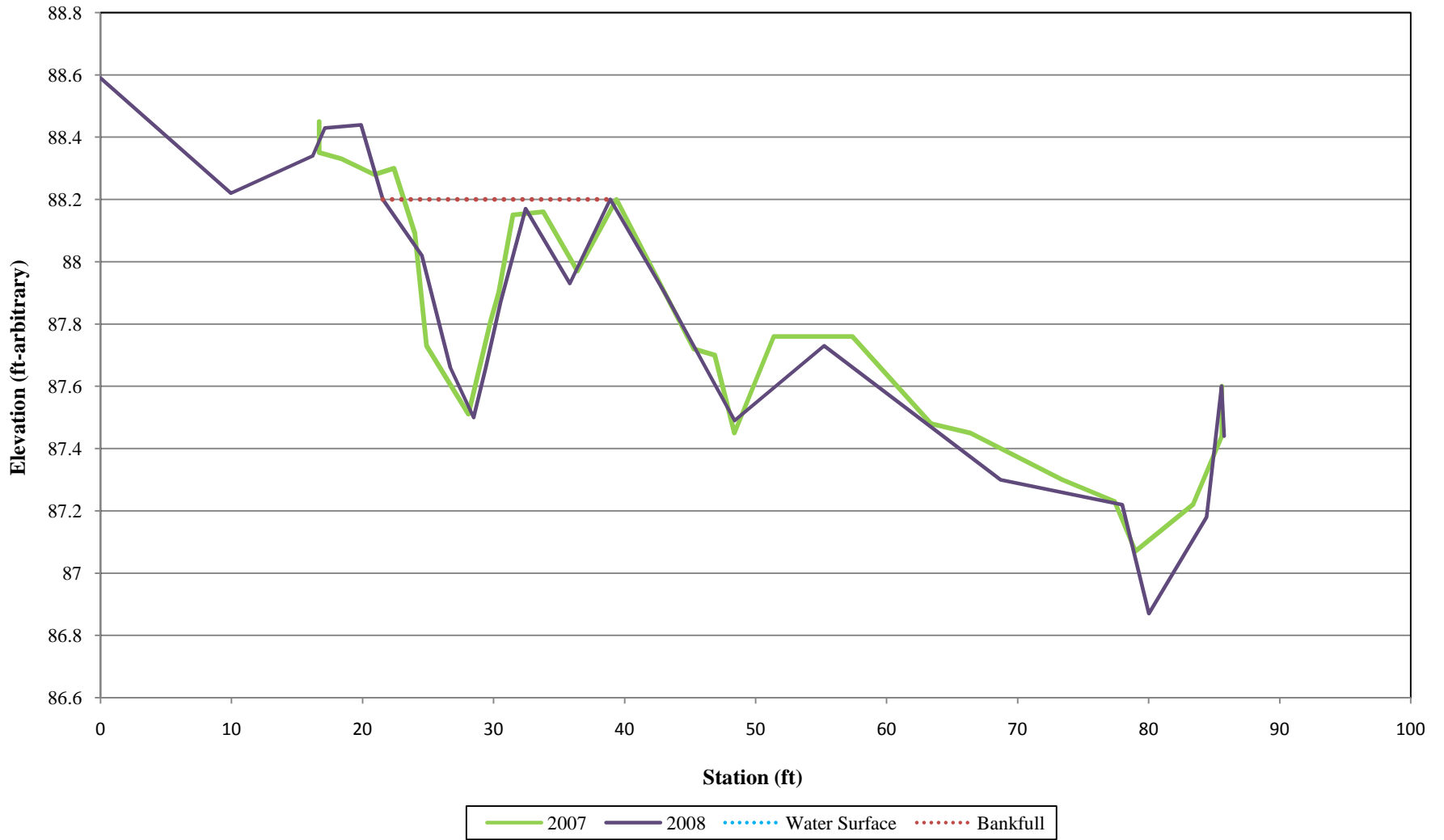
Cross-Section 4-Run Dula Thoroughfare



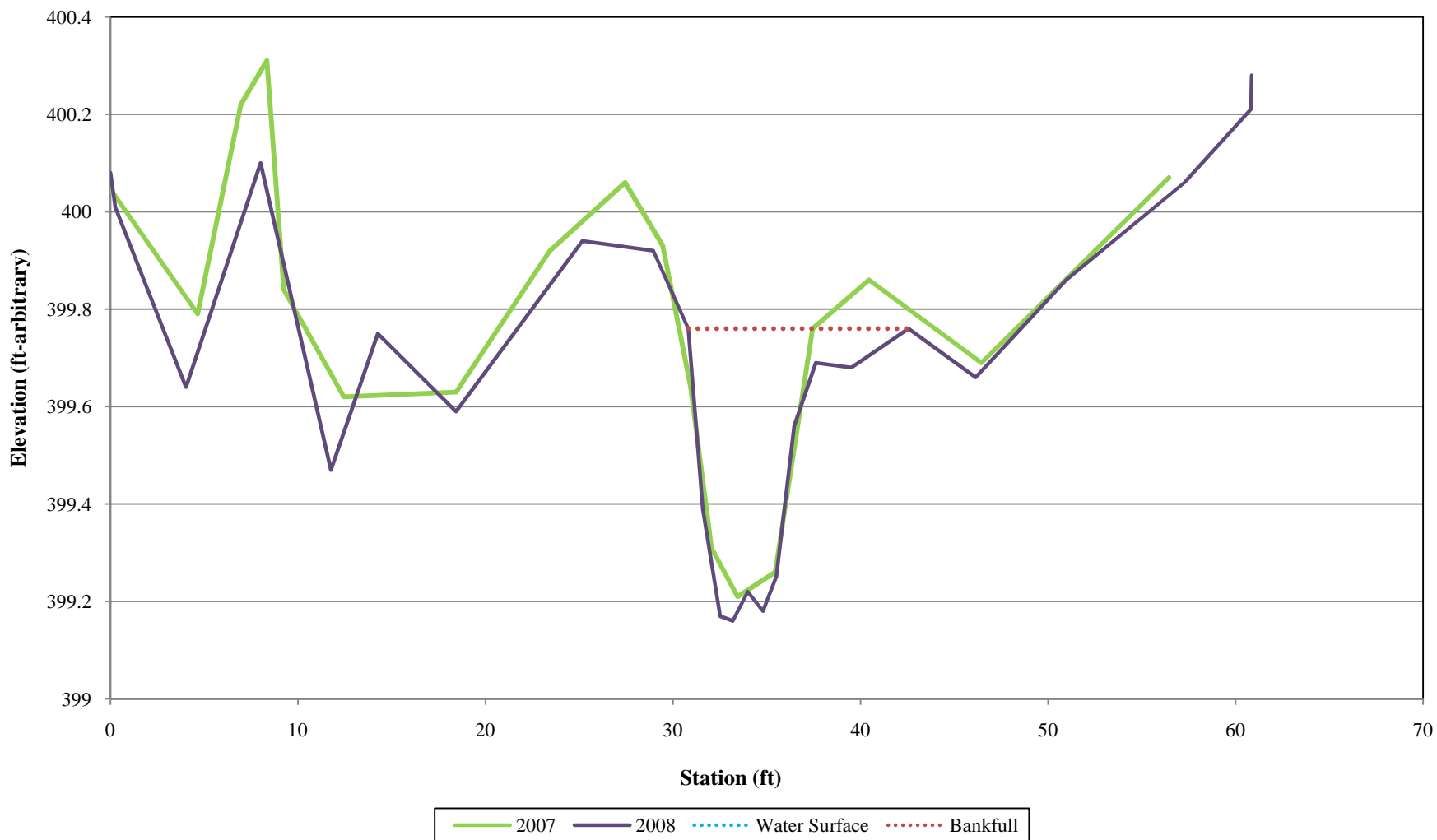
Cross-Section 5 UT Dula Thoroughfare



Cross-Section 6 UT Dula Thoroughfare

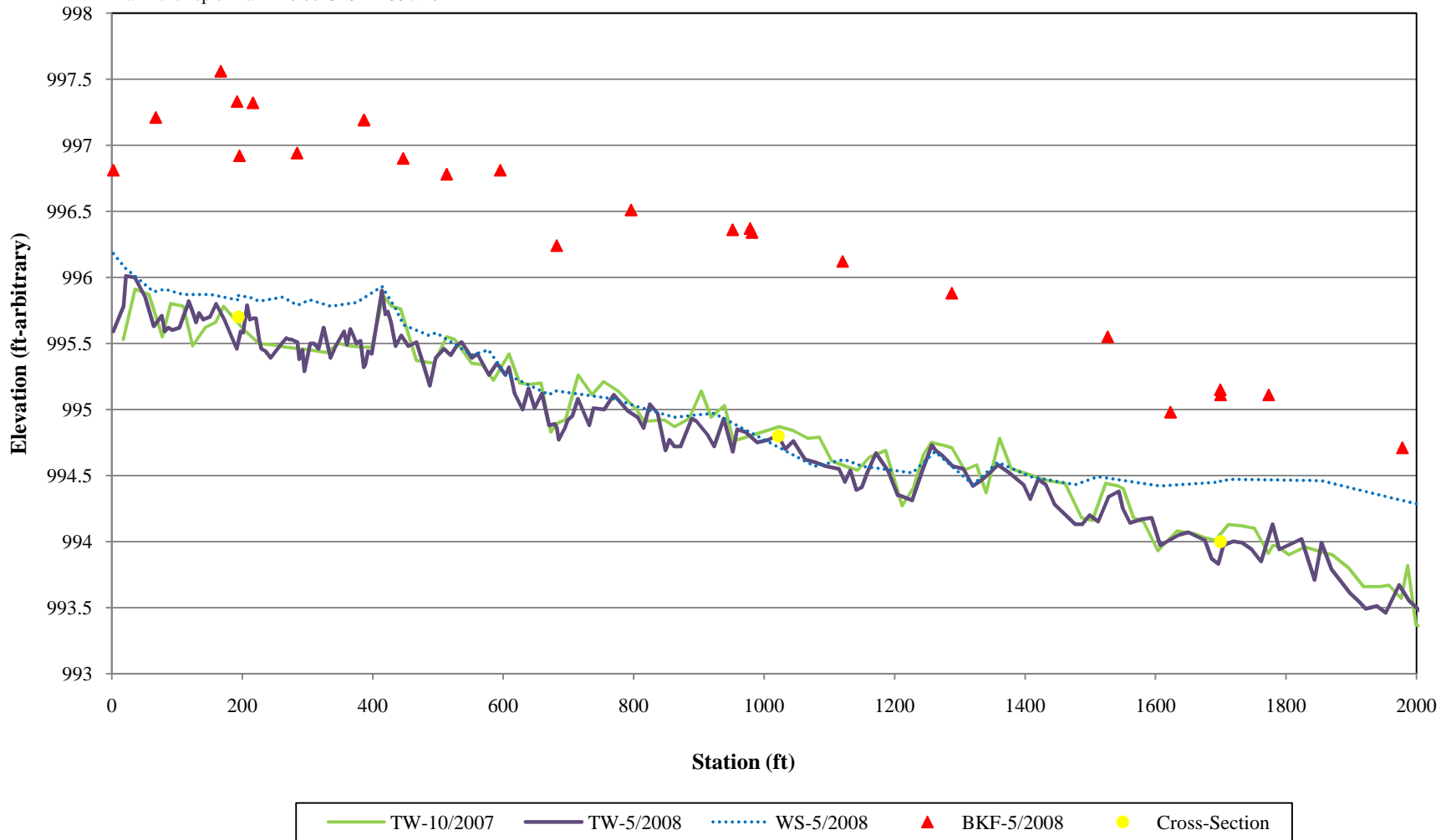


Cross-Section 7 UT Dula Thoroughfare



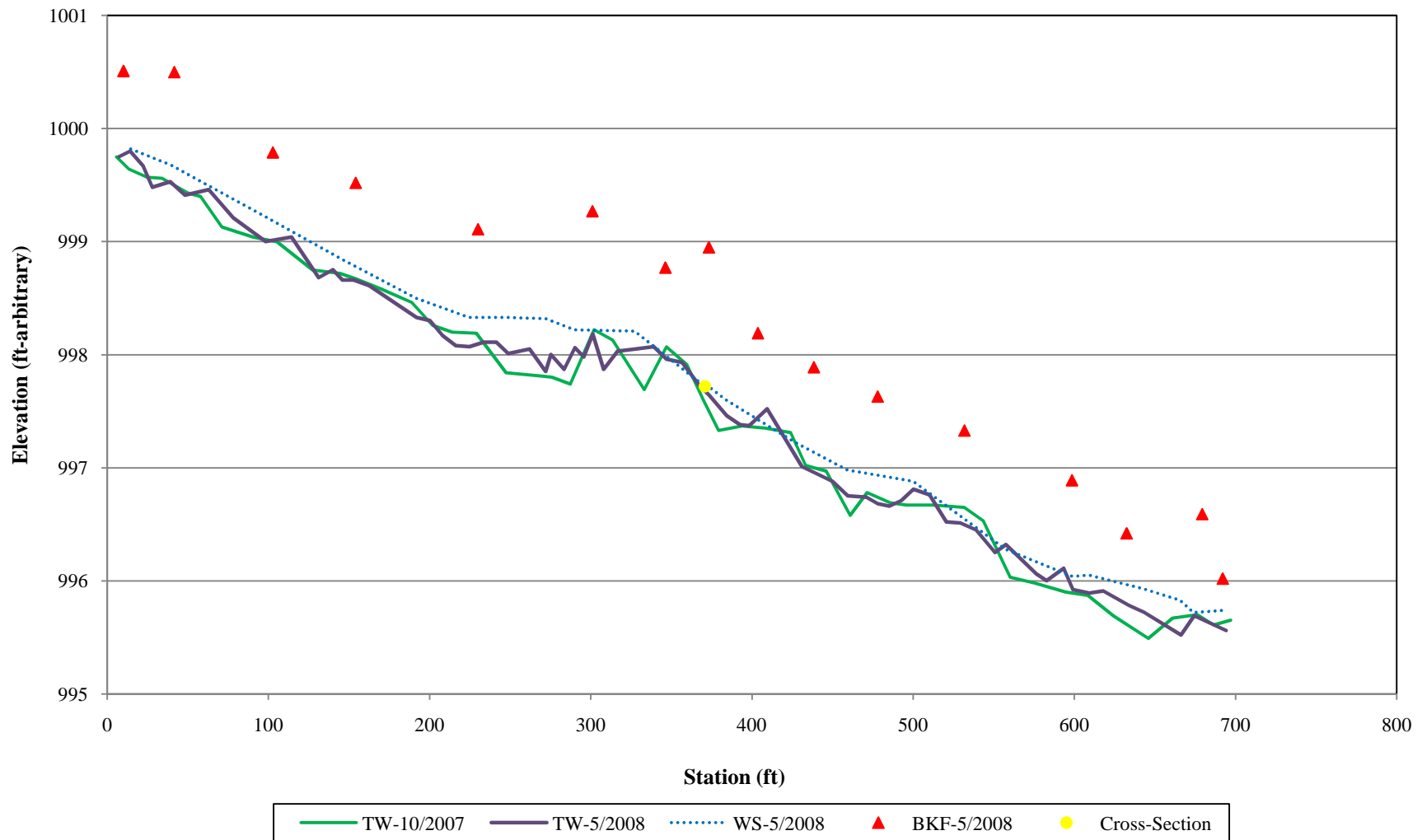
**Dula Thoroughfare-Main Channel
Longitudinal Profile
2008 Monitoring Year**

Bankfull/Top of Bank= $-0.0013 \cdot \text{STA} + 997.46$

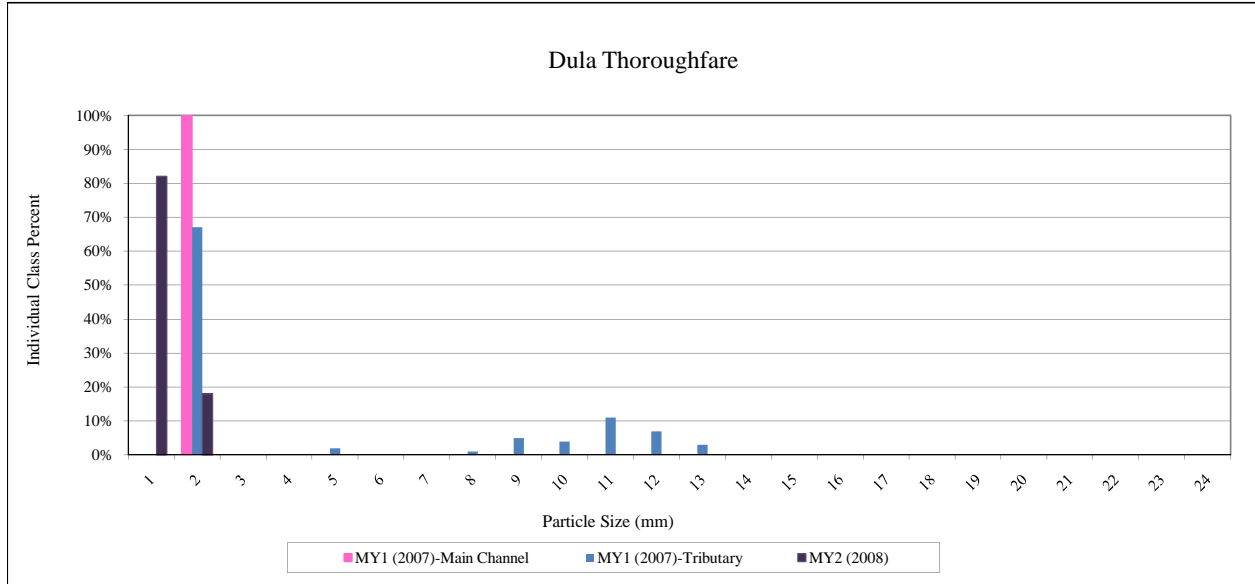
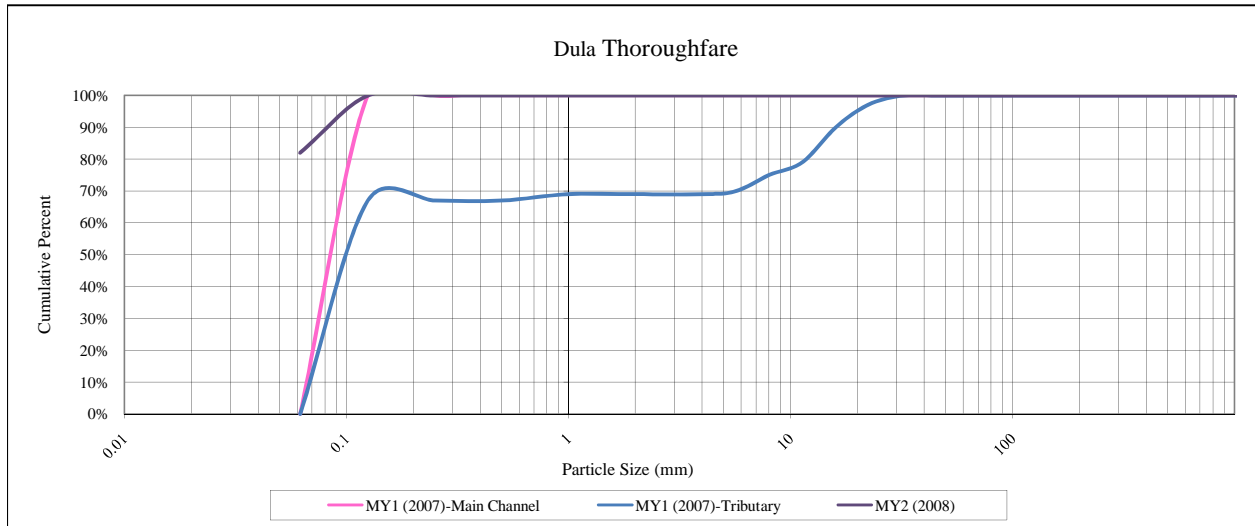


**Dula Thoroughfare-Tributary
Longitudinal Profile
2008 Monitoring Year**

Bankfull/Top of Bank= $-0.0063*STA+1000.7$



Project Name: Dula Thoroughfare
 Reachwide Pebble Count





APPENDIX 3 WETLAND RAW DATA

- 1. Data Tables for Hydrological Data***
- 2. Precipitation – Water Level Plots for Gauges***

*Raw data tables have been provided electronically.

Gauge 1
Serial Number: 000009DE7744

| Date | Time | Level | Units |
|-----------|------|-------|-------|
| 1/1/2008 | 8:00 | 2.5 | in |
| 1/2/2008 | 8:00 | 0.4 | in |
| 1/3/2008 | 8:00 | -4 | in |
| 1/4/2008 | 8:00 | -6.1 | in |
| 1/5/2008 | 8:00 | -5 | in |
| 1/6/2008 | 8:00 | -0.5 | in |
| 1/7/2008 | 8:00 | -1.1 | in |
| 1/8/2008 | 8:00 | -1.5 | in |
| 1/9/2008 | 8:00 | -0.5 | in |
| 1/10/2008 | 8:00 | -2.3 | in |
| 1/11/2008 | 8:00 | -0.5 | in |
| 1/12/2008 | 8:00 | -1.3 | in |
| 1/13/2008 | 8:00 | -2.7 | in |
| 1/14/2008 | 8:00 | -3.8 | in |
| 1/15/2008 | 8:00 | -5.5 | in |
| 1/16/2008 | 8:00 | -7.4 | in |
| 1/17/2008 | 8:00 | -0.8 | in |
| 1/18/2008 | 8:00 | 2.4 | in |
| 1/19/2008 | 8:00 | 2.1 | in |
| 1/20/2008 | 8:00 | 1.6 | in |
| 1/21/2008 | 8:00 | -2.8 | in |
| 1/22/2008 | 8:00 | -0.8 | in |
| 1/23/2008 | 8:00 | 2.2 | in |
| 1/24/2008 | 8:00 | 1.6 | in |
| 1/25/2008 | 8:00 | -2.5 | in |
| 1/26/2008 | 8:00 | -0.8 | in |
| 1/27/2008 | 8:00 | -1.6 | in |
| 1/28/2008 | 8:00 | -3.8 | in |
| 1/29/2008 | 8:00 | -1.4 | in |
| 1/30/2008 | 8:00 | 1.2 | in |

Gauge 2
Serial Number: 00000B6513B5

| Date | Time | Level | Units |
|-----------|------|-------|-------|
| 1/1/2008 | 8:00 | -1.6 | in |
| 1/2/2008 | 8:00 | -4.4 | in |
| 1/3/2008 | 8:00 | -6.9 | in |
| 1/4/2008 | 8:00 | -7.6 | in |
| 1/5/2008 | 8:00 | -7.3 | in |
| 1/6/2008 | 8:00 | -7 | in |
| 1/7/2008 | 8:00 | -7.1 | in |
| 1/8/2008 | 8:00 | -7.1 | in |
| 1/9/2008 | 8:00 | -6.7 | in |
| 1/10/2008 | 8:00 | -7.1 | in |
| 1/11/2008 | 8:00 | -6.3 | in |
| 1/12/2008 | 8:00 | -7 | in |
| 1/13/2008 | 8:00 | -7.4 | in |
| 1/14/2008 | 8:00 | -7.8 | in |
| 1/15/2008 | 8:00 | -8.6 | in |
| 1/16/2008 | 8:00 | -9.9 | in |
| 1/17/2008 | 8:00 | -7 | in |
| 1/18/2008 | 8:00 | -0.9 | in |
| 1/19/2008 | 8:00 | -3.3 | in |
| 1/20/2008 | 8:00 | -1.1 | in |
| 1/21/2008 | 8:00 | -5.5 | in |
| 1/22/2008 | 8:00 | -4.9 | in |
| 1/23/2008 | 8:00 | -3.4 | in |
| 1/24/2008 | 8:00 | -3.5 | in |
| 1/25/2008 | 8:00 | -5.3 | in |
| 1/26/2008 | 8:00 | -4.9 | in |
| 1/27/2008 | 8:00 | -4.7 | in |
| 1/28/2008 | 8:00 | -5.3 | in |
| 1/29/2008 | 8:00 | -4.8 | in |
| 1/30/2008 | 8:00 | -3.1 | in |

Gauge 3
Serial Number: 000009DF22A3

| Date | Time | Level | Units |
|-----------|-------|-------|-------|
| 1/1/2008 | 20:00 | -1.9 | in |
| 1/2/2008 | 20:00 | -3.7 | in |
| 1/3/2008 | 20:00 | -4.7 | in |
| 1/4/2008 | 20:00 | -5.3 | in |
| 1/5/2008 | 20:00 | -5.7 | in |
| 1/6/2008 | 20:00 | -6 | in |
| 1/7/2008 | 20:00 | -6.4 | in |
| 1/8/2008 | 20:00 | -6.4 | in |
| 1/9/2008 | 20:00 | -6.4 | in |
| 1/10/2008 | 20:00 | -6.3 | in |
| 1/11/2008 | 20:00 | -6.1 | in |
| 1/12/2008 | 20:00 | -7 | in |
| 1/13/2008 | 20:00 | -7.2 | in |
| 1/14/2008 | 20:00 | -7.7 | in |
| 1/15/2008 | 20:00 | -8.3 | in |
| 1/16/2008 | 20:00 | -8.5 | in |
| 1/17/2008 | 20:00 | -2.9 | in |
| 1/18/2008 | 20:00 | -5.6 | in |
| 1/19/2008 | 20:00 | -2.2 | in |
| 1/20/2008 | 20:00 | -5.5 | in |
| 1/21/2008 | 20:00 | -6 | in |
| 1/22/2008 | 20:00 | -5.6 | in |
| 1/23/2008 | 20:00 | -5.6 | in |
| 1/24/2008 | 20:00 | -6.2 | in |
| 1/25/2008 | 20:00 | -6.6 | in |
| 1/26/2008 | 20:00 | -6.5 | in |
| 1/27/2008 | 20:00 | -6.7 | in |
| 1/28/2008 | 20:00 | -6.8 | in |
| 1/29/2008 | 20:00 | -6.7 | in |
| 1/30/2008 | 20:00 | -6.7 | in |

Rain Gauge

| Date | Level | Units |
|-----------|-------|-------|
| 1/1/2008 | 0 | in |
| 1/2/2008 | 0 | in |
| 1/3/2008 | 0 | in |
| 1/4/2008 | 0 | in |
| 1/5/2008 | 0 | in |
| 1/6/2008 | 0 | in |
| 1/7/2008 | 0 | in |
| 1/8/2008 | 0 | in |
| 1/9/2008 | 0 | in |
| 1/10/2008 | 0.01 | in |
| 1/11/2008 | 0.08 | in |
| 1/12/2008 | 0 | in |
| 1/13/2008 | 0 | in |
| 1/14/2008 | 0 | in |
| 1/15/2008 | 0 | in |
| 1/16/2008 | 0 | in |
| 1/17/2008 | 0.44 | in |
| 1/18/2008 | 0 | in |
| 1/19/2008 | 0.13 | in |
| 1/20/2008 | 0.01 | in |
| 1/21/2008 | 0 | in |
| 1/22/2008 | 0.05 | in |
| 1/23/2008 | 0 | in |
| 1/24/2008 | 0 | in |
| 1/25/2008 | 0 | in |
| 1/26/2008 | 0 | in |
| 1/27/2008 | 0 | in |
| 1/28/2008 | 0 | in |
| 1/29/2008 | 0 | in |
| 1/30/2008 | 0.04 | in |

Gauge 1
Serial Number: 000009DE7744

| Date | Time | Level | Units |
|-----------|------|-------|-------|
| 1/31/2008 | 8:00 | -4 | in |
| 2/1/2008 | 8:00 | 2.5 | in |
| 2/2/2008 | 8:00 | 2.2 | in |
| 2/3/2008 | 8:00 | 1.4 | in |
| 2/4/2008 | 8:00 | 1.6 | in |
| 2/5/2008 | 8:00 | 1.6 | in |
| 2/6/2008 | 8:00 | 1.6 | in |
| 2/7/2008 | 8:00 | 0.7 | in |
| 2/8/2008 | 8:00 | -0.8 | in |
| 2/9/2008 | 8:00 | -1.5 | in |
| 2/10/2008 | 8:00 | -3 | in |
| 2/11/2008 | 8:00 | -5.1 | in |
| 2/12/2008 | 8:00 | -4.3 | in |
| 2/13/2008 | 8:00 | 3.4 | in |
| 2/14/2008 | 8:00 | 1.1 | in |
| 2/15/2008 | 8:00 | 1 | in |
| 2/16/2008 | 8:00 | 0.8 | in |
| 2/17/2008 | 8:00 | 0.4 | in |
| 2/18/2008 | 8:00 | 3.8 | in |
| 2/19/2008 | 8:00 | 2.2 | in |
| 2/20/2008 | 8:00 | 1.2 | in |
| 2/21/2008 | 8:00 | 0.5 | in |
| 2/22/2008 | 8:00 | 3.3 | in |
| 2/23/2008 | 8:00 | 3.3 | in |
| 2/24/2008 | 8:00 | 2.5 | in |
| 2/25/2008 | 8:00 | 2.2 | in |
| 2/26/2008 | 8:00 | 2.4 | in |
| 2/27/2008 | 8:00 | 3.3 | in |
| 2/28/2008 | 8:00 | 1.7 | in |
| 2/29/2008 | 8:00 | 1.4 | in |

Gauge 2
Serial Number: 00000B6513B5

| Date | Time | Level | Units |
|-----------|------|-------|-------|
| 1/31/2008 | 8:00 | -5.7 | in |
| 2/1/2008 | 8:00 | -1 | in |
| 2/2/2008 | 8:00 | 0 | in |
| 2/3/2008 | 8:00 | 0 | in |
| 2/4/2008 | 8:00 | 0.1 | in |
| 2/5/2008 | 8:00 | 0 | in |
| 2/6/2008 | 8:00 | 0 | in |
| 2/7/2008 | 8:00 | -0.5 | in |
| 2/8/2008 | 8:00 | -1.1 | in |
| 2/9/2008 | 8:00 | -1.6 | in |
| 2/10/2008 | 8:00 | -2.2 | in |
| 2/11/2008 | 8:00 | -2.7 | in |
| 2/12/2008 | 8:00 | -2.9 | in |
| 2/13/2008 | 8:00 | 0.1 | in |
| 2/14/2008 | 8:00 | -0.4 | in |
| 2/15/2008 | 8:00 | -0.5 | in |
| 2/16/2008 | 8:00 | -0.2 | in |
| 2/17/2008 | 8:00 | -0.3 | in |
| 2/18/2008 | 8:00 | 2.8 | in |
| 2/19/2008 | 8:00 | 0.1 | in |
| 2/20/2008 | 8:00 | 0 | in |
| 2/21/2008 | 8:00 | 0 | in |
| 2/22/2008 | 8:00 | 0.7 | in |
| 2/23/2008 | 8:00 | 0.5 | in |
| 2/24/2008 | 8:00 | 0.3 | in |
| 2/25/2008 | 8:00 | 0.2 | in |
| 2/26/2008 | 8:00 | 0.3 | in |
| 2/27/2008 | 8:00 | 0.3 | in |
| 2/28/2008 | 8:00 | -0.1 | in |
| 2/29/2008 | 8:00 | 0 | in |

Gauge 3
Serial Number: 000009DF22A3

| Date | Time | Level | Units |
|-----------|-------|-------|-------|
| 1/31/2008 | 20:00 | -7.2 | in |
| 2/1/2008 | 20:00 | -3 | in |
| 2/2/2008 | 20:00 | -4.5 | in |
| 2/3/2008 | 20:00 | -5 | in |
| 2/4/2008 | 20:00 | -5 | in |
| 2/5/2008 | 20:00 | -5 | in |
| 2/6/2008 | 20:00 | -4.7 | in |
| 2/7/2008 | 20:00 | -5.4 | in |
| 2/8/2008 | 20:00 | -5.8 | in |
| 2/9/2008 | 20:00 | -6 | in |
| 2/10/2008 | 20:00 | -6.4 | in |
| 2/11/2008 | 20:00 | -6.5 | in |
| 2/12/2008 | 20:00 | -5.9 | in |
| 2/13/2008 | 20:00 | -4.2 | in |
| 2/14/2008 | 20:00 | -5.3 | in |
| 2/15/2008 | 20:00 | -5.5 | in |
| 2/16/2008 | 20:00 | -5.7 | in |
| 2/17/2008 | 20:00 | -5.5 | in |
| 2/18/2008 | 20:00 | -3.3 | in |
| 2/19/2008 | 20:00 | -4 | in |
| 2/20/2008 | 20:00 | -4.4 | in |
| 2/21/2008 | 20:00 | -4.6 | in |
| 2/22/2008 | 20:00 | -2.4 | in |
| 2/23/2008 | 20:00 | -2.6 | in |
| 2/24/2008 | 20:00 | -2.9 | in |
| 2/25/2008 | 20:00 | -3.1 | in |
| 2/26/2008 | 20:00 | -0.3 | in |
| 2/27/2008 | 20:00 | -2.4 | in |
| 2/28/2008 | 20:00 | -2.9 | in |
| 2/29/2008 | 20:00 | -2.9 | in |

Rain Gauge

| Date | Level | Units |
|-----------|-------|-------|
| 1/31/2008 | 0 | in |
| 2/1/2008 | 0.69 | in |
| 2/2/2008 | 0 | in |
| 2/3/2008 | 0 | in |
| 2/4/2008 | 0 | in |
| 2/5/2008 | 0 | in |
| 2/6/2008 | 0 | in |
| 2/7/2008 | 0 | in |
| 2/8/2008 | 0 | in |
| 2/9/2008 | 0 | in |
| 2/10/2008 | 0 | in |
| 2/11/2008 | 0 | in |
| 2/12/2008 | 0 | in |
| 2/13/2008 | 0.07 | in |
| 2/14/2008 | 0 | in |
| 2/15/2008 | 0 | in |
| 2/16/2008 | 0 | in |
| 2/17/2008 | 0 | in |
| 2/18/2008 | 0.26 | in |
| 2/19/2008 | 0 | in |
| 2/20/2008 | 0 | in |
| 2/21/2008 | 0.03 | in |
| 2/22/2008 | 0.11 | in |
| 2/23/2008 | 0 | in |
| 2/24/2008 | 0 | in |
| 2/25/2008 | 0 | in |
| 2/26/2008 | 0.37 | in |
| 2/27/2008 | 0 | in |
| 2/28/2008 | 0 | in |
| 2/29/2008 | 0 | in |

Gauge 1
Serial Number: 000009DE7744

| Date | Time | Level | Units |
|-----------|------|-------|-------|
| 3/1/2008 | 8:00 | 1.8 | in |
| 3/2/2008 | 8:00 | 1.1 | in |
| 3/3/2008 | 8:00 | 1 | in |
| 3/4/2008 | 8:00 | 2.3 | in |
| 3/5/2008 | 8:00 | 3.9 | in |
| 3/6/2008 | 8:00 | 3.3 | in |
| 3/7/2008 | 8:00 | 3.5 | in |
| 3/8/2008 | 8:00 | 4.1 | in |
| 3/9/2008 | 8:00 | 3.4 | in |
| 3/10/2008 | 8:00 | 3.5 | in |
| 3/11/2008 | 8:00 | 3.8 | in |
| 3/12/2008 | 8:00 | 4.2 | in |
| 3/13/2008 | 8:00 | 4.7 | in |
| 3/14/2008 | 8:00 | 5.1 | in |
| 3/15/2008 | 8:00 | 5.4 | in |
| 3/16/2008 | 8:00 | 5.7 | in |
| 3/17/2008 | 8:00 | 5.4 | in |
| 3/18/2008 | 8:00 | 5.5 | in |
| 3/19/2008 | 8:00 | 5.9 | in |
| 3/20/2008 | 8:00 | 5.7 | in |
| 3/21/2008 | 8:00 | 5.5 | in |
| 3/22/2008 | 8:00 | 5.6 | in |
| 3/23/2008 | 8:00 | 5.6 | in |
| 3/24/2008 | 8:00 | 5.6 | in |
| 3/25/2008 | 8:00 | 5.3 | in |
| 3/26/2008 | 8:00 | 5.4 | in |
| 3/27/2008 | 8:00 | 5.7 | in |
| 3/28/2008 | 8:00 | 5.9 | in |
| 3/29/2008 | 8:00 | 5.9 | in |
| 3/30/2008 | 8:00 | 5.6 | in |

Gauge 2
Serial Number: 00000B6513B5

| Date | Time | Level | Units |
|-----------|------|-------|-------|
| 3/1/2008 | 8:00 | 0.1 | in |
| 3/2/2008 | 8:00 | 0 | in |
| 3/3/2008 | 8:00 | 0 | in |
| 3/4/2008 | 8:00 | 0.6 | in |
| 3/5/2008 | 8:00 | 2.9 | in |
| 3/6/2008 | 8:00 | 0.5 | in |
| 3/7/2008 | 8:00 | 0.7 | in |
| 3/8/2008 | 8:00 | 1.7 | in |
| 3/9/2008 | 8:00 | 0.3 | in |
| 3/10/2008 | 8:00 | 0.3 | in |
| 3/11/2008 | 8:00 | 0.4 | in |
| 3/12/2008 | 8:00 | 0.4 | in |
| 3/13/2008 | 8:00 | 0.4 | in |
| 3/14/2008 | 8:00 | 0.7 | in |
| 3/15/2008 | 8:00 | 0.8 | in |
| 3/16/2008 | 8:00 | 1.7 | in |
| 3/17/2008 | 8:00 | 0.6 | in |
| 3/18/2008 | 8:00 | 0.6 | in |
| 3/19/2008 | 8:00 | 1.4 | in |
| 3/20/2008 | 8:00 | 1.9 | in |
| 3/21/2008 | 8:00 | 0.9 | in |
| 3/22/2008 | 8:00 | 1.1 | in |
| 3/23/2008 | 8:00 | 1.3 | in |
| 3/24/2008 | 8:00 | 1.3 | in |
| 3/25/2008 | 8:00 | 1.1 | in |
| 3/26/2008 | 8:00 | 1.2 | in |
| 3/27/2008 | 8:00 | 1.4 | in |
| 3/28/2008 | 8:00 | 1.7 | in |
| 3/29/2008 | 8:00 | 1.9 | in |
| 3/30/2008 | 8:00 | 1.6 | in |

Gauge 3
Serial Number: 000009DF22A3

| Date | Time | Level | Units |
|-----------|-------|-------|-------|
| 3/1/2008 | 20:00 | -3 | in |
| 3/2/2008 | 20:00 | -3.5 | in |
| 3/3/2008 | 20:00 | -3.7 | in |
| 3/4/2008 | 20:00 | 1.6 | in |
| 3/5/2008 | 20:00 | 2.3 | in |
| 3/6/2008 | 20:00 | 0.4 | in |
| 3/7/2008 | 20:00 | 3.1 | in |
| 3/8/2008 | 20:00 | 1.6 | in |
| 3/9/2008 | 20:00 | 0 | in |
| 3/10/2008 | 20:00 | 0 | in |
| 3/11/2008 | 20:00 | 0 | in |
| 3/12/2008 | 20:00 | -0.2 | in |
| 3/13/2008 | 20:00 | -0.5 | in |
| 3/14/2008 | 20:00 | -0.7 | in |
| 3/15/2008 | 20:00 | 3.1 | in |
| 3/16/2008 | 20:00 | 1.9 | in |
| 3/17/2008 | 20:00 | 0.3 | in |
| 3/18/2008 | 20:00 | 0.4 | in |
| 3/19/2008 | 20:00 | 2.9 | in |
| 3/20/2008 | 20:00 | 1.4 | in |
| 3/21/2008 | 20:00 | 0.5 | in |
| 3/22/2008 | 20:00 | 0.4 | in |
| 3/23/2008 | 20:00 | 0 | in |
| 3/24/2008 | 20:00 | -0.7 | in |
| 3/25/2008 | 20:00 | -0.7 | in |
| 3/26/2008 | 20:00 | -0.8 | in |
| 3/27/2008 | 20:00 | -0.9 | in |
| 3/28/2008 | 20:00 | -1.2 | in |
| 3/29/2008 | 20:00 | -2.4 | in |
| 3/30/2008 | 20:00 | -2.5 | in |

Rain Gauge

| Date | Level | Units |
|-----------|-------|-------|
| 3/1/2008 | 0 | in |
| 3/2/2008 | 0 | in |
| 3/3/2008 | 0 | in |
| 3/4/2008 | 0.96 | in |
| 3/5/2008 | 0 | in |
| 3/6/2008 | 0 | in |
| 3/7/2008 | 0.4 | in |
| 3/8/2008 | 0.01 | in |
| 3/9/2008 | 0 | in |
| 3/10/2008 | 0 | in |
| 3/11/2008 | 0 | in |
| 3/12/2008 | 0 | in |
| 3/13/2008 | 0 | in |
| 3/14/2008 | 0 | in |
| 3/15/2008 | 0.6 | in |
| 3/16/2008 | 0.01 | in |
| 3/17/2008 | 0 | in |
| 3/18/2008 | 0 | in |
| 3/19/2008 | 0 | in |
| 3/20/2008 | 0 | in |
| 3/21/2008 | 0 | in |
| 3/22/2008 | 0 | in |
| 3/23/2008 | 0 | in |
| 3/24/2008 | 0 | in |
| 3/25/2008 | 0 | in |
| 3/26/2008 | 0 | in |
| 3/27/2008 | 0 | in |
| 3/28/2008 | 0 | in |
| 3/29/2008 | 0.15 | in |
| 3/30/2008 | 0.01 | in |

Gauge 1
Serial Number: 000009DE7744

| Date | Time | Level | Units |
|-----------|------|-------|-------|
| 3/31/2008 | 8:00 | 5.5 | in |
| 4/1/2008 | 8:00 | 5.9 | in |
| 4/2/2008 | 8:00 | 6.1 | in |
| 4/3/2008 | 8:00 | 5.9 | in |
| 4/4/2008 | 8:00 | 5.7 | in |
| 4/5/2008 | 8:00 | 6.2 | in |
| 4/6/2008 | 8:00 | 6.2 | in |
| 4/7/2008 | 8:00 | 5.9 | in |
| 4/8/2008 | 8:00 | 6 | in |
| 4/9/2008 | 8:00 | 6.1 | in |
| 4/10/2008 | 8:00 | 6.1 | in |
| 4/11/2008 | 8:00 | 6.3 | in |
| 4/12/2008 | 8:00 | 6.5 | in |
| 4/13/2008 | 8:00 | 6.1 | in |
| 4/14/2008 | 8:00 | 5.9 | in |
| 4/15/2008 | 8:00 | 5.9 | in |
| 4/16/2008 | 8:00 | 5.8 | in |
| 4/17/2008 | 8:00 | 6.1 | in |
| 4/18/2008 | 8:00 | 6 | in |
| 4/19/2008 | 8:00 | 6.2 | in |
| 4/20/2008 | 8:00 | 6.4 | in |
| 4/21/2008 | 8:00 | 6.2 | in |
| 4/22/2008 | 8:00 | 6.4 | in |
| 4/23/2008 | 8:00 | 6.5 | in |
| 4/24/2008 | 8:00 | 6.4 | in |
| 4/25/2008 | 8:00 | 6.4 | in |
| 4/26/2008 | 8:00 | 6.5 | in |
| 4/27/2008 | 8:00 | 6.7 | in |
| 4/28/2008 | 8:00 | 6.8 | in |
| 4/29/2008 | 8:00 | 6.5 | in |

Gauge 2
Serial Number: 00000B6513B5

| Date | Time | Level | Units |
|-----------|------|-------|-------|
| 3/31/2008 | 8:00 | 1.7 | in |
| 4/1/2008 | 8:00 | 2.8 | in |
| 4/2/2008 | 8:00 | 2.8 | in |
| 4/3/2008 | 8:00 | 2.6 | in |
| 4/4/2008 | 8:00 | 3 | in |
| 4/5/2008 | 8:00 | 4.3 | in |
| 4/6/2008 | 8:00 | 4.4 | in |
| 4/7/2008 | 8:00 | 4.2 | in |
| 4/8/2008 | 8:00 | 4.5 | in |
| 4/9/2008 | 8:00 | 4.7 | in |
| 4/10/2008 | 8:00 | 4.9 | in |
| 4/11/2008 | 8:00 | 5.1 | in |
| 4/12/2008 | 8:00 | 5.2 | in |
| 4/13/2008 | 8:00 | 5 | in |
| 4/14/2008 | 8:00 | 4.9 | in |
| 4/15/2008 | 8:00 | 4.8 | in |
| 4/16/2008 | 8:00 | 4.1 | in |
| 4/17/2008 | 8:00 | 3.8 | in |
| 4/18/2008 | 8:00 | 3.8 | in |
| 4/19/2008 | 8:00 | 3.8 | in |
| 4/20/2008 | 8:00 | 4.4 | in |
| 4/21/2008 | 8:00 | 4.3 | in |
| 4/22/2008 | 8:00 | 4.3 | in |
| 4/23/2008 | 8:00 | 4.5 | in |
| 4/24/2008 | 8:00 | 4.2 | in |
| 4/25/2008 | 8:00 | 4 | in |
| 4/26/2008 | 8:00 | 4 | in |
| 4/27/2008 | 8:00 | 4 | in |
| 4/28/2008 | 8:00 | 4.6 | in |
| 4/29/2008 | 8:00 | 4.6 | in |

Gauge 3
Serial Number: 000009DF22A3

| Date | Time | Level | Units |
|-----------|-------|-------|-------|
| 3/31/2008 | 20:00 | -0.3 | in |
| 4/1/2008 | 20:00 | -0.9 | in |
| 4/2/2008 | 20:00 | -2 | in |
| 4/3/2008 | 20:00 | 1.6 | in |
| 4/4/2008 | 20:00 | -0.7 | in |
| 4/5/2008 | 20:00 | 3.4 | in |
| 4/6/2008 | 20:00 | 2.7 | in |
| 4/7/2008 | 20:00 | 1.3 | in |
| 4/8/2008 | 20:00 | 0.9 | in |
| 4/9/2008 | 20:00 | 0.8 | in |
| 4/10/2008 | 20:00 | 0.7 | in |
| 4/11/2008 | 20:00 | 0.6 | in |
| 4/12/2008 | 20:00 | 0.5 | in |
| 4/13/2008 | 20:00 | 0 | in |
| 4/14/2008 | 20:00 | -0.2 | in |
| 4/15/2008 | 20:00 | -1.1 | in |
| 4/16/2008 | 20:00 | -1.5 | in |
| 4/17/2008 | 20:00 | -1.5 | in |
| 4/18/2008 | 20:00 | -1.8 | in |
| 4/19/2008 | 20:00 | -1.6 | in |
| 4/20/2008 | 20:00 | -1.9 | in |
| 4/21/2008 | 20:00 | -2.2 | in |
| 4/22/2008 | 20:00 | -1.5 | in |
| 4/23/2008 | 20:00 | -2.4 | in |
| 4/24/2008 | 20:00 | -2.6 | in |
| 4/25/2008 | 20:00 | -2.9 | in |
| 4/26/2008 | 20:00 | -3.5 | in |
| 4/27/2008 | 20:00 | 2.5 | in |
| 4/28/2008 | 20:00 | 2.7 | in |
| 4/29/2008 | 20:00 | -1.5 | in |

Rain Gauge

| Date | Level | Units |
|-----------|-------|-------|
| 3/31/2008 | 0.17 | in |
| 4/1/2008 | 0.05 | in |
| 4/2/2008 | 0 | in |
| 4/3/2008 | 0.06 | in |
| 4/4/2008 | 0.34 | in |
| 4/5/2008 | 0.15 | in |
| 4/6/2008 | 0 | in |
| 4/7/2008 | 0 | in |
| 4/8/2008 | 0 | in |
| 4/9/2008 | 0 | in |
| 4/10/2008 | 0 | in |
| 4/11/2008 | 0 | in |
| 4/12/2008 | 0 | in |
| 4/13/2008 | 0 | in |
| 4/14/2008 | 0 | in |
| 4/15/2008 | 0 | in |
| 4/16/2008 | 0 | in |
| 4/17/2008 | 0 | in |
| 4/18/2008 | 0 | in |
| 4/19/2008 | 0 | in |
| 4/20/2008 | 0 | in |
| 4/21/2008 | 0 | in |
| 4/22/2008 | 0 | in |
| 4/23/2008 | 0 | in |
| 4/24/2008 | 0 | in |
| 4/25/2008 | 0 | in |
| 4/26/2008 | 0 | in |
| 4/27/2008 | 0 | in |
| 4/28/2008 | 0 | in |
| 4/29/2008 | 0 | in |

Gauge 1
Serial Number: 000009DE7744

| Date | Time | Level | Units |
|-----------|------|-------|-------|
| 4/30/2008 | 8:00 | 6.3 | in |
| 5/1/2008 | 8:00 | 6.4 | in |
| 5/2/2008 | 8:00 | 6.7 | in |
| 5/3/2008 | 8:00 | 6.6 | in |
| 5/4/2008 | 8:00 | 6.7 | in |
| 5/5/2008 | 8:00 | 6.8 | in |
| 5/6/2008 | 8:00 | 6.6 | in |
| 5/7/2008 | 8:00 | 6.6 | in |
| 5/8/2008 | 8:00 | 6.8 | in |
| 5/9/2008 | 8:00 | 6.9 | in |
| 5/10/2008 | 8:00 | 6.8 | in |
| 5/11/2008 | 8:00 | 6.8 | in |
| 5/12/2008 | 8:00 | 6.6 | in |
| 5/13/2008 | 8:00 | 6.5 | in |
| 5/14/2008 | 8:00 | 6.4 | in |
| 5/15/2008 | 8:00 | 6.8 | in |
| 5/16/2008 | 8:00 | 7 | in |
| 5/17/2008 | 8:00 | 6.6 | in |
| 5/18/2008 | 8:00 | 6.6 | in |
| 5/19/2008 | 8:00 | 6.6 | in |
| 5/20/2008 | 8:00 | 5.4 | in |
| 5/21/2008 | 8:00 | 4.9 | in |
| 5/22/2008 | 8:00 | 3.5 | in |
| 5/23/2008 | 8:00 | 1.6 | in |
| 5/24/2008 | 8:00 | -0.9 | in |
| 5/25/2008 | 8:00 | -3.8 | in |
| 5/26/2008 | 8:00 | -6.4 | in |
| 5/27/2008 | 8:00 | -8.2 | in |
| 5/28/2008 | 8:00 | -8.6 | in |
| 5/29/2008 | 8:00 | 3.6 | in |

Gauge 2
Serial Number: 00000B6513B5

| Date | Time | Level | Units |
|-----------|------|-------|-------|
| 4/30/2008 | 8:00 | 4.6 | in |
| 5/1/2008 | 8:00 | 4.6 | in |
| 5/2/2008 | 8:00 | 4.6 | in |
| 5/3/2008 | 8:00 | 4.4 | in |
| 5/4/2008 | 8:00 | 4 | in |
| 5/5/2008 | 8:00 | 3.7 | in |
| 5/6/2008 | 8:00 | 3.4 | in |
| 5/7/2008 | 8:00 | 2.9 | in |
| 5/8/2008 | 8:00 | 2.9 | in |
| 5/9/2008 | 8:00 | 2.8 | in |
| 5/10/2008 | 8:00 | 2.3 | in |
| 5/11/2008 | 8:00 | 1.6 | in |
| 5/12/2008 | 8:00 | 1.5 | in |
| 5/13/2008 | 8:00 | 1 | in |
| 5/14/2008 | 8:00 | 0.4 | in |
| 5/15/2008 | 8:00 | 0.7 | in |
| 5/16/2008 | 8:00 | 1.5 | in |
| 5/17/2008 | 8:00 | 0.4 | in |
| 5/18/2008 | 8:00 | -0.6 | in |
| 5/19/2008 | 8:00 | -1.9 | in |
| 5/20/2008 | 8:00 | -4.3 | in |
| 5/21/2008 | 8:00 | 0.6 | in |
| 5/22/2008 | 8:00 | -2.2 | in |
| 5/23/2008 | 8:00 | -7 | in |
| 5/24/2008 | 8:00 | -9.7 | in |
| 5/25/2008 | 8:00 | -12.2 | in |
| 5/26/2008 | 8:00 | -14.6 | in |
| 5/27/2008 | 8:00 | -16.2 | in |
| 5/28/2008 | 8:00 | -18.1 | in |
| 5/29/2008 | 8:00 | -2.9 | in |

Gauge 3
Serial Number: 000009DF22A3

| Date | Time | Level | Units |
|-----------|-------|-------|-------|
| 4/30/2008 | 20:00 | -1.8 | in |
| 5/1/2008 | 20:00 | -2.2 | in |
| 5/2/2008 | 20:00 | -2.7 | in |
| 5/3/2008 | 20:00 | -2.9 | in |
| 5/4/2008 | 20:00 | -3.3 | in |
| 5/5/2008 | 20:00 | -3.8 | in |
| 5/6/2008 | 20:00 | -4.4 | in |
| 5/7/2008 | 20:00 | -4.7 | in |
| 5/8/2008 | 20:00 | -3.9 | in |
| 5/9/2008 | 20:00 | -5 | in |
| 5/10/2008 | 20:00 | -5.8 | in |
| 5/11/2008 | 20:00 | -3.9 | in |
| 5/12/2008 | 20:00 | -6 | in |
| 5/13/2008 | 20:00 | -6.4 | in |
| 5/14/2008 | 20:00 | -6.6 | in |
| 5/15/2008 | 20:00 | -6.2 | in |
| 5/16/2008 | 20:00 | -6.2 | in |
| 5/17/2008 | 20:00 | -7.1 | in |
| 5/18/2008 | 20:00 | -7.3 | in |
| 5/19/2008 | 20:00 | -8.1 | in |
| 5/20/2008 | 20:00 | -3.3 | in |
| 5/21/2008 | 20:00 | -6.8 | in |
| 5/22/2008 | 20:00 | -8.1 | in |
| 5/23/2008 | 20:00 | -8.9 | in |
| 5/24/2008 | 20:00 | -9.6 | in |
| 5/25/2008 | 20:00 | -10.5 | in |
| 5/26/2008 | 20:00 | -11.1 | in |
| 5/27/2008 | 20:00 | -11.6 | in |
| 5/28/2008 | 20:00 | -2.9 | in |
| 5/29/2008 | 20:00 | -7.8 | in |

Rain Gauge

| Date | Level | Units |
|-----------|-------|-------|
| 4/30/2008 | 0 | in |
| 5/1/2008 | 0 | in |
| 5/2/2008 | 0 | in |
| 5/3/2008 | 0 | in |
| 5/4/2008 | 0 | in |
| 5/5/2008 | 0.29 | in |
| 5/6/2008 | 0 | in |
| 5/7/2008 | 0 | in |
| 5/8/2008 | 0.02 | in |
| 5/9/2008 | 0.17 | in |
| 5/10/2008 | 0 | in |
| 5/11/2008 | 0.2 | in |
| 5/12/2008 | 0 | in |
| 5/13/2008 | 0 | in |
| 5/14/2008 | 0 | in |
| 5/15/2008 | 0.02 | in |
| 5/16/2008 | 0.27 | in |
| 5/17/2008 | 0 | in |
| 5/18/2008 | 0.03 | in |
| 5/19/2008 | 0 | in |
| 5/20/2008 | 0.01 | in |
| 5/21/2008 | 0 | in |
| 5/22/2008 | 0 | in |
| 5/23/2008 | 0 | in |
| 5/24/2008 | 0 | in |
| 5/25/2008 | 0 | in |
| 5/26/2008 | 0 | in |
| 5/27/2008 | 0 | in |
| 5/28/2008 | 0.24 | in |
| 5/29/2008 | 0 | in |

Gauge 1
Serial Number: 000009DE7744

| Date | Time | Level | Units |
|-----------|------|-------|-------|
| 5/30/2008 | 8:00 | 1.6 | in |
| 5/31/2008 | 8:00 | -1.4 | in |
| 6/1/2008 | 8:00 | -5.7 | in |
| 6/2/2008 | 8:00 | -2.5 | in |
| 6/3/2008 | 8:00 | -8.2 | in |
| 6/4/2008 | 8:00 | -10 | in |
| 6/5/2008 | 8:00 | -11.7 | in |
| 6/6/2008 | 8:00 | -13.2 | in |
| 6/7/2008 | 8:00 | -14.5 | in |
| 6/8/2008 | 8:00 | -15.4 | in |
| 6/9/2008 | 8:00 | -16.3 | in |
| 6/10/2008 | 8:00 | -17.4 | in |
| 6/11/2008 | 8:00 | -18.2 | in |
| 6/12/2008 | 8:00 | -14.1 | in |
| 6/13/2008 | 8:00 | -14.2 | in |
| 6/14/2008 | 8:00 | -14.8 | in |
| 6/15/2008 | 8:00 | -15 | in |
| 6/16/2008 | 8:00 | -15.7 | in |
| 6/17/2008 | 8:00 | -16.8 | in |
| 6/18/2008 | 8:00 | -18.6 | in |
| 6/19/2008 | 8:00 | -20 | in |
| 6/20/2008 | 8:00 | -21.3 | in |
| 6/21/2008 | 8:00 | -20.7 | in |
| 6/22/2008 | 8:00 | -20.8 | in |
| 6/23/2008 | 8:00 | -14.4 | in |
| 6/24/2008 | 8:00 | -15.7 | in |
| 6/25/2008 | 8:00 | -17.5 | in |
| 6/26/2008 | 8:00 | -18.2 | in |
| 6/27/2008 | 8:00 | -19.2 | in |
| 6/28/2008 | 8:00 | -20.3 | in |

Gauge 2
Serial Number: 00000B6513B5

| Date | Time | Level | Units |
|-----------|------|-------|-------|
| 5/30/2008 | 8:00 | -7 | in |
| 5/31/2008 | 8:00 | -9.1 | in |
| 6/1/2008 | 8:00 | -12.2 | in |
| 6/2/2008 | 8:00 | -13.6 | in |
| 6/3/2008 | 8:00 | -17.1 | in |
| 6/4/2008 | 8:00 | -19 | in |
| 6/5/2008 | 8:00 | -20.6 | in |
| 6/6/2008 | 8:00 | -21.6 | in |
| 6/7/2008 | 8:00 | -22.6 | in |
| 6/8/2008 | 8:00 | -23.6 | in |
| 6/9/2008 | 8:00 | -24.6 | in |
| 6/10/2008 | 8:00 | -25.8 | in |
| 6/11/2008 | 8:00 | -26.9 | in |
| 6/12/2008 | 8:00 | -26.4 | in |
| 6/13/2008 | 8:00 | -28.2 | in |
| 6/14/2008 | 8:00 | -29.2 | in |
| 6/15/2008 | 8:00 | -29.8 | in |
| 6/16/2008 | 8:00 | -30.7 | in |
| 6/17/2008 | 8:00 | -31.4 | in |
| 6/18/2008 | 8:00 | -32.4 | in |
| 6/19/2008 | 8:00 | -33.1 | in |
| 6/20/2008 | 8:00 | -33.9 | in |
| 6/21/2008 | 8:00 | -33.2 | in |
| 6/22/2008 | 8:00 | -34.3 | in |
| 6/23/2008 | 8:00 | -32.2 | in |
| 6/24/2008 | 8:00 | -34.2 | in |
| 6/25/2008 | 8:00 | -35.2 | in |
| 6/26/2008 | 8:00 | -35.8 | in |
| 6/27/2008 | 8:00 | -36.3 | in |
| 6/28/2008 | 8:00 | -36.4 | in |

Gauge 3
Serial Number: 000009DF22A3

| Date | Time | Level | Units |
|-----------|-------|-------|-------|
| 5/30/2008 | 20:00 | -8.7 | in |
| 5/31/2008 | 20:00 | -9.8 | in |
| 6/1/2008 | 20:00 | -9.8 | in |
| 6/2/2008 | 20:00 | -11.3 | in |
| 6/3/2008 | 20:00 | -11.8 | in |
| 6/4/2008 | 20:00 | -13 | in |
| 6/5/2008 | 20:00 | -14.4 | in |
| 6/6/2008 | 20:00 | -15.1 | in |
| 6/7/2008 | 20:00 | -16 | in |
| 6/8/2008 | 20:00 | -16.8 | in |
| 6/9/2008 | 20:00 | -17.5 | in |
| 6/10/2008 | 20:00 | -18.5 | in |
| 6/11/2008 | 20:00 | -19.3 | in |
| 6/12/2008 | 20:00 | -16.8 | in |
| 6/13/2008 | 20:00 | -17.3 | in |
| 6/14/2008 | 20:00 | -18.2 | in |
| 6/15/2008 | 20:00 | -17.9 | in |
| 6/16/2008 | 20:00 | -19 | in |
| 6/17/2008 | 20:00 | -20.4 | in |
| 6/18/2008 | 20:00 | -21.8 | in |
| 6/19/2008 | 20:00 | -22.8 | in |
| 6/20/2008 | 20:00 | -21.1 | in |
| 6/21/2008 | 20:00 | -21.3 | in |
| 6/22/2008 | 20:00 | -19.3 | in |
| 6/23/2008 | 20:00 | -18.8 | in |
| 6/24/2008 | 20:00 | -20.6 | in |
| 6/25/2008 | 20:00 | -21.6 | in |
| 6/26/2008 | 20:00 | -22.7 | in |
| 6/27/2008 | 20:00 | -23.8 | in |
| 6/28/2008 | 20:00 | -25 | in |

Rain Gauge

| Date | Level | Units |
|-----------|-------|-------|
| 5/30/2008 | 0 | in |
| 5/31/2008 | 0 | in |
| 6/1/2008 | 0 | in |
| 6/2/2008 | 0 | in |
| 6/3/2008 | 0 | in |
| 6/4/2008 | 0 | in |
| 6/5/2008 | 0 | in |
| 6/6/2008 | 0 | in |
| 6/7/2008 | 0 | in |
| 6/8/2008 | 0 | in |
| 6/9/2008 | 0 | in |
| 6/10/2008 | 0 | in |
| 6/11/2008 | 0 | in |
| 6/12/2008 | 0.01 | in |
| 6/13/2008 | 0 | in |
| 6/14/2008 | 0 | in |
| 6/15/2008 | 0 | in |
| 6/16/2008 | 0 | in |
| 6/17/2008 | 0 | in |
| 6/18/2008 | 0 | in |
| 6/19/2008 | 0.07 | in |
| 6/20/2008 | 0.06 | in |
| 6/21/2008 | 0 | in |
| 6/22/2008 | 0 | in |
| 6/23/2008 | 0.05 | in |
| 6/24/2008 | 0 | in |
| 6/25/2008 | 0 | in |
| 6/26/2008 | 0 | in |
| 6/27/2008 | 0 | in |
| 6/28/2008 | 0 | in |

Gauge 1
Serial Number: 000009DE7744

| Date | Time | Level | Units |
|-----------|------|-------|-------|
| 6/29/2008 | 8:00 | -21.3 | in |
| 6/30/2008 | 8:00 | -22 | in |
| 7/1/2008 | 8:00 | -23.1 | in |
| 7/2/2008 | 8:00 | -24.2 | in |
| 7/3/2008 | 8:00 | -25.4 | in |
| 7/4/2008 | 8:00 | -25.9 | in |
| 7/5/2008 | 8:00 | -26.3 | in |
| 7/6/2008 | 8:00 | -26.7 | in |
| 7/7/2008 | 8:00 | -27 | in |
| 7/8/2008 | 8:00 | -27.8 | in |
| 7/9/2008 | 8:00 | 5 | in |
| 7/10/2008 | 8:00 | 4.6 | in |
| 7/11/2008 | 8:00 | 4.3 | in |
| 7/12/2008 | 8:00 | 2.6 | in |
| 7/13/2008 | 8:00 | -0.3 | in |
| 7/14/2008 | 8:00 | 4 | in |
| 7/15/2008 | 8:00 | 2.9 | in |
| 7/16/2008 | 8:00 | -0.3 | in |
| 7/17/2008 | 8:00 | -4.3 | in |
| 7/18/2008 | 8:00 | -7.1 | in |
| 7/19/2008 | 8:00 | -8.1 | in |
| 7/20/2008 | 8:00 | -8.8 | in |
| 7/21/2008 | 8:00 | -10.1 | in |
| 7/22/2008 | 8:00 | -11.5 | in |
| 7/23/2008 | 8:00 | -12.8 | in |
| 7/24/2008 | 8:00 | 3.9 | in |
| 7/25/2008 | 8:00 | 1.5 | in |
| 7/26/2008 | 8:00 | -1.3 | in |
| 7/27/2008 | 8:00 | -3.5 | in |
| 7/28/2008 | 8:00 | -5.2 | in |

Gauge 2
Serial Number: 00000B6513B5

| Date | Time | Level | Units |
|-----------|------|-------|-------|
| 6/29/2008 | 8:00 | -36.6 | in |
| 6/30/2008 | 8:00 | -36.7 | in |
| 7/1/2008 | 8:00 | -36.8 | in |
| 7/2/2008 | 8:00 | -36.8 | in |
| 7/3/2008 | 8:00 | -36.8 | in |
| 7/4/2008 | 8:00 | -36.8 | in |
| 7/5/2008 | 8:00 | -36.8 | in |
| 7/6/2008 | 8:00 | -36.6 | in |
| 7/7/2008 | 8:00 | -36.6 | in |
| 7/8/2008 | 8:00 | -36.7 | in |
| 7/9/2008 | 8:00 | 3.8 | in |
| 7/10/2008 | 8:00 | 0.8 | in |
| 7/11/2008 | 8:00 | -0.5 | in |
| 7/12/2008 | 8:00 | -4 | in |
| 7/13/2008 | 8:00 | -7.9 | in |
| 7/14/2008 | 8:00 | 1.2 | in |
| 7/15/2008 | 8:00 | -1.5 | in |
| 7/16/2008 | 8:00 | -8.6 | in |
| 7/17/2008 | 8:00 | -13.2 | in |
| 7/18/2008 | 8:00 | -16.3 | in |
| 7/19/2008 | 8:00 | -18.9 | in |
| 7/20/2008 | 8:00 | -20.4 | in |
| 7/21/2008 | 8:00 | -21.1 | in |
| 7/22/2008 | 8:00 | -22.2 | in |
| 7/23/2008 | 8:00 | -23.4 | in |
| 7/24/2008 | 8:00 | 0.6 | in |
| 7/25/2008 | 8:00 | -8.9 | in |
| 7/26/2008 | 8:00 | -12.1 | in |
| 7/27/2008 | 8:00 | -14.2 | in |
| 7/28/2008 | 8:00 | -17 | in |

Gauge 3
Serial Number: 000009DF22A3

| Date | Time | Level | Units |
|-----------|-------|-------|-------|
| 6/29/2008 | 20:00 | -25.9 | in |
| 6/30/2008 | 20:00 | -26.9 | in |
| 7/1/2008 | 20:00 | -28.1 | in |
| 7/2/2008 | 20:00 | -29 | in |
| 7/3/2008 | 20:00 | -29.8 | in |
| 7/4/2008 | 20:00 | -30.5 | in |
| 7/5/2008 | 20:00 | -30.9 | in |
| 7/6/2008 | 20:00 | -31.1 | in |
| 7/7/2008 | 20:00 | -30.4 | in |
| 7/8/2008 | 20:00 | 4.3 | in |
| 7/9/2008 | 20:00 | 1.4 | in |
| 7/10/2008 | 20:00 | -0.4 | in |
| 7/11/2008 | 20:00 | -2 | in |
| 7/12/2008 | 20:00 | -3 | in |
| 7/13/2008 | 20:00 | 3.7 | in |
| 7/14/2008 | 20:00 | -2.7 | in |
| 7/15/2008 | 20:00 | -4.2 | in |
| 7/16/2008 | 20:00 | -4.8 | in |
| 7/17/2008 | 20:00 | -5.3 | in |
| 7/18/2008 | 20:00 | -5.8 | in |
| 7/19/2008 | 20:00 | -6.1 | in |
| 7/20/2008 | 20:00 | -6.8 | in |
| 7/21/2008 | 20:00 | -8.1 | in |
| 7/22/2008 | 20:00 | -9.2 | in |
| 7/23/2008 | 20:00 | -3.6 | in |
| 7/24/2008 | 20:00 | -5.7 | in |
| 7/25/2008 | 20:00 | -6.3 | in |
| 7/26/2008 | 20:00 | -6.4 | in |
| 7/27/2008 | 20:00 | -7.2 | in |
| 7/28/2008 | 20:00 | -7.9 | in |

Rain Gauge

| Date | Level | Units |
|-----------|-------|-------|
| 6/29/2008 | 0 | in |
| 6/30/2008 | 0.01 | in |
| 7/1/2008 | 0 | in |
| 7/2/2008 | 0 | in |
| 7/3/2008 | 0 | in |
| 7/4/2008 | 0 | in |
| 7/5/2008 | 0.14 | in |
| 7/6/2008 | 0.52 | in |
| 7/7/2008 | 0 | in |
| 7/8/2008 | 0 | in |
| 7/9/2008 | 0 | in |
| 7/10/2008 | 0.05 | in |
| 7/11/2008 | 0 | in |
| 7/12/2008 | 0 | in |
| 7/13/2008 | 0 | in |
| 7/14/2008 | 0 | in |
| 7/15/2008 | 0 | in |
| 7/16/2008 | 0 | in |
| 7/17/2008 | 0 | in |
| 7/18/2008 | 0 | in |
| 7/19/2008 | 0.3 | in |
| 7/20/2008 | 0 | in |
| 7/21/2008 | 0 | in |
| 7/22/2008 | 0 | in |
| 7/23/2008 | 0.06 | in |
| 7/24/2008 | 0 | in |
| 7/25/2008 | 0 | in |
| 7/26/2008 | 0 | in |
| 7/27/2008 | 0 | in |
| 7/28/2008 | 0 | in |

Gauge 1
Serial Number: 000009DE7744

| Date | Time | Level | Units |
|-----------|------|-------|-------|
| 7/29/2008 | 8:00 | -8 | in |
| 7/30/2008 | 8:00 | -9.2 | in |
| 7/31/2008 | 8:00 | -10.4 | in |
| 8/1/2008 | 8:00 | -10.8 | in |
| 8/2/2008 | 8:00 | -12.1 | in |
| 8/3/2008 | 8:00 | -14 | in |
| 8/4/2008 | 8:00 | -15.9 | in |
| 8/5/2008 | 8:00 | -17.2 | in |
| 8/6/2008 | 8:00 | -18 | in |
| 8/7/2008 | 8:00 | -18.6 | in |
| 8/8/2008 | 8:00 | -9 | in |
| 8/9/2008 | 8:00 | -13.1 | in |
| 8/10/2008 | 8:00 | -15.4 | in |
| 8/11/2008 | 8:00 | -14.7 | in |
| 8/12/2008 | 8:00 | -17.2 | in |
| 8/13/2008 | 8:00 | -12.9 | in |
| 8/14/2008 | 8:00 | 4 | in |
| 8/15/2008 | 8:00 | 2.5 | in |
| 8/16/2008 | 8:00 | -0.9 | in |
| 8/17/2008 | 8:00 | -4.9 | in |
| 8/18/2008 | 8:00 | 0.8 | in |
| 8/19/2008 | 8:00 | -4.1 | in |
| 8/20/2008 | 8:00 | -7.5 | in |
| 8/21/2008 | 8:00 | -10 | in |
| 8/22/2008 | 8:00 | -11.6 | in |
| 8/23/2008 | 8:00 | -13.1 | in |
| 8/24/2008 | 8:00 | -14.5 | in |
| 8/25/2008 | 8:00 | -15.2 | in |
| 8/26/2008 | 8:00 | -16.2 | in |
| 8/27/2008 | 8:00 | 4.9 | in |

Gauge 2
Serial Number: 00000B6513B5

| Date | Time | Level | Units |
|-----------|------|-------|-------|
| 7/29/2008 | 8:00 | -19.4 | in |
| 7/30/2008 | 8:00 | -20.5 | in |
| 7/31/2008 | 8:00 | -21 | in |
| 8/1/2008 | 8:00 | -21.8 | in |
| 8/2/2008 | 8:00 | -23.1 | in |
| 8/3/2008 | 8:00 | -24.4 | in |
| 8/4/2008 | 8:00 | -25.9 | in |
| 8/5/2008 | 8:00 | -27.4 | in |
| 8/6/2008 | 8:00 | -28.7 | in |
| 8/7/2008 | 8:00 | -30 | in |
| 8/8/2008 | 8:00 | -21.1 | in |
| 8/9/2008 | 8:00 | -24.5 | in |
| 8/10/2008 | 8:00 | -27.2 | in |
| 8/11/2008 | 8:00 | -28.5 | in |
| 8/12/2008 | 8:00 | -30.6 | in |
| 8/13/2008 | 8:00 | -31.8 | in |
| 8/14/2008 | 8:00 | 0.2 | in |
| 8/15/2008 | 8:00 | -6 | in |
| 8/16/2008 | 8:00 | -10.9 | in |
| 8/17/2008 | 8:00 | -14.9 | in |
| 8/18/2008 | 8:00 | -9.2 | in |
| 8/19/2008 | 8:00 | -13.7 | in |
| 8/20/2008 | 8:00 | -17.2 | in |
| 8/21/2008 | 8:00 | -19.7 | in |
| 8/22/2008 | 8:00 | -20.6 | in |
| 8/23/2008 | 8:00 | -21.7 | in |
| 8/24/2008 | 8:00 | -22.9 | in |
| 8/25/2008 | 8:00 | -23.8 | in |
| 8/26/2008 | 8:00 | -24.7 | in |
| 8/27/2008 | 8:00 | 1.4 | in |

Gauge 3
Serial Number: 000009DF22A3

| Date | Time | Level | Units |
|-----------|-------|-------|-------|
| 7/29/2008 | 20:00 | -8.2 | in |
| 7/30/2008 | 20:00 | -8.5 | in |
| 7/31/2008 | 20:00 | -9.1 | in |
| 8/1/2008 | 20:00 | -9.9 | in |
| 8/2/2008 | 20:00 | -11.1 | in |
| 8/3/2008 | 20:00 | -12.3 | in |
| 8/4/2008 | 20:00 | -13.4 | in |
| 8/5/2008 | 20:00 | -14.1 | in |
| 8/6/2008 | 20:00 | -15.1 | in |
| 8/7/2008 | 20:00 | -7.9 | in |
| 8/8/2008 | 20:00 | -11.9 | in |
| 8/9/2008 | 20:00 | -14 | in |
| 8/10/2008 | 20:00 | -12.2 | in |
| 8/11/2008 | 20:00 | -14.2 | in |
| 8/12/2008 | 20:00 | -15.4 | in |
| 8/13/2008 | 20:00 | 1.1 | in |
| 8/14/2008 | 20:00 | -7.3 | in |
| 8/15/2008 | 20:00 | -8.6 | in |
| 8/16/2008 | 20:00 | -9.4 | in |
| 8/17/2008 | 20:00 | -7.3 | in |
| 8/18/2008 | 20:00 | -8.8 | in |
| 8/19/2008 | 20:00 | -10.5 | in |
| 8/20/2008 | 20:00 | -11.8 | in |
| 8/21/2008 | 20:00 | -12.7 | in |
| 8/22/2008 | 20:00 | -13.6 | in |
| 8/23/2008 | 20:00 | -14.2 | in |
| 8/24/2008 | 20:00 | -14.8 | in |
| 8/25/2008 | 20:00 | -14.6 | in |
| 8/26/2008 | 20:00 | -4.3 | in |
| 8/27/2008 | 20:00 | -4.9 | in |

Rain Gauge

| Date | Level | Units |
|-----------|-------|-------|
| 7/29/2008 | 0 | in |
| 7/30/2008 | 0 | in |
| 7/31/2008 | 0.71 | in |
| 8/1/2008 | 0.19 | in |
| 8/2/2008 | 0 | in |
| 8/3/2008 | 0 | in |
| 8/4/2008 | 0 | in |
| 8/5/2008 | 0 | in |
| 8/6/2008 | 0 | in |
| 8/7/2008 | 0 | in |
| 8/8/2008 | 0 | in |
| 8/9/2008 | 0 | in |
| 8/10/2008 | 0.09 | in |
| 8/11/2008 | 0 | in |
| 8/12/2008 | 0 | in |
| 8/13/2008 | 0.39 | in |
| 8/14/2008 | 0 | in |
| 8/15/2008 | 0 | in |
| 8/16/2008 | 0 | in |
| 8/17/2008 | 0.16 | in |
| 8/18/2008 | 0 | in |
| 8/19/2008 | 0 | in |
| 8/20/2008 | 0 | in |
| 8/21/2008 | 0 | in |
| 8/22/2008 | 0 | in |
| 8/23/2008 | 0 | in |
| 8/24/2008 | 0 | in |
| 8/25/2008 | 0.06 | in |
| 8/26/2008 | 0.95 | in |
| 8/27/2008 | 1.29 | in |

Gauge 1
Serial Number: 000009DE7744

| Date | Time | Level | Units |
|-----------|------|-------|-------|
| 8/28/2008 | 8:00 | 4 | in |
| 8/29/2008 | 8:00 | 7 | in |
| 8/30/2008 | 8:00 | 4.8 | in |
| 8/31/2008 | 8:00 | 3.4 | in |
| 9/1/2008 | 8:00 | 1.8 | in |
| 9/2/2008 | 8:00 | -1.6 | in |
| 9/3/2008 | 8:00 | -3.9 | in |
| 9/4/2008 | 8:00 | -5.3 | in |
| 9/5/2008 | 8:00 | -6.2 | in |
| 9/6/2008 | 8:00 | 4.6 | in |
| 9/7/2008 | 8:00 | 3.4 | in |
| 9/8/2008 | 8:00 | 0 | in |
| 9/9/2008 | 8:00 | -2.9 | in |
| 9/10/2008 | 8:00 | -4.9 | in |
| 9/11/2008 | 8:00 | 1.9 | in |
| 9/12/2008 | 8:00 | -1.6 | in |
| 9/13/2008 | 8:00 | -3.7 | in |
| 9/14/2008 | 8:00 | -5.5 | in |
| 9/15/2008 | 8:00 | -7.4 | in |
| 9/16/2008 | 8:00 | -9.3 | in |
| 9/17/2008 | 8:00 | -5.7 | in |
| 9/18/2008 | 8:00 | -8.5 | in |
| 9/19/2008 | 8:00 | -11.2 | in |
| 9/20/2008 | 8:00 | -12.5 | in |
| 9/21/2008 | 8:00 | -13.6 | in |
| 9/22/2008 | 8:00 | -14.4 | in |
| 9/23/2008 | 8:00 | -15.7 | in |
| 9/24/2008 | 8:00 | -16.8 | in |
| 9/25/2008 | 8:00 | -17.2 | in |
| 9/26/2008 | 8:00 | -4 | in |

Gauge 2
Serial Number: 00000B6513B5

| Date | Time | Level | Units |
|-----------|------|-------|-------|
| 8/28/2008 | 8:00 | -2.3 | in |
| 8/29/2008 | 8:00 | -6.3 | in |
| 8/30/2008 | 8:00 | -9 | in |
| 8/31/2008 | 8:00 | -11.8 | in |
| 9/1/2008 | 8:00 | -15 | in |
| 9/2/2008 | 8:00 | -18.3 | in |
| 9/3/2008 | 8:00 | -19.9 | in |
| 9/4/2008 | 8:00 | -20.9 | in |
| 9/5/2008 | 8:00 | -21.9 | in |
| 9/6/2008 | 8:00 | -2.9 | in |
| 9/7/2008 | 8:00 | -10 | in |
| 9/8/2008 | 8:00 | -15.1 | in |
| 9/9/2008 | 8:00 | -17.4 | in |
| 9/10/2008 | 8:00 | -19 | in |
| 9/11/2008 | 8:00 | -16.9 | in |
| 9/12/2008 | 8:00 | -17.6 | in |
| 9/13/2008 | 8:00 | -18.4 | in |
| 9/14/2008 | 8:00 | -19.6 | in |
| 9/15/2008 | 8:00 | -20.5 | in |
| 9/16/2008 | 8:00 | -21.6 | in |
| 9/17/2008 | 8:00 | -22.7 | in |
| 9/18/2008 | 8:00 | -23.7 | in |
| 9/19/2008 | 8:00 | -24.8 | in |
| 9/20/2008 | 8:00 | -25.9 | in |
| 9/21/2008 | 8:00 | -26.8 | in |
| 9/22/2008 | 8:00 | -27.9 | in |
| 9/23/2008 | 8:00 | -29 | in |
| 9/24/2008 | 8:00 | -30.1 | in |
| 9/25/2008 | 8:00 | -30.9 | in |
| 9/26/2008 | 8:00 | -29.6 | in |

Gauge 3
Serial Number: 000009DF22A3

| Date | Time | Level | Units |
|-----------|-------|-------|-------|
| 8/28/2008 | 20:00 | -7.1 | in |
| 8/29/2008 | 20:00 | -8.3 | in |
| 8/30/2008 | 20:00 | -9.5 | in |
| 8/31/2008 | 20:00 | -10.7 | in |
| 9/1/2008 | 20:00 | -12 | in |
| 9/2/2008 | 20:00 | -12.5 | in |
| 9/3/2008 | 20:00 | -13.4 | in |
| 9/4/2008 | 20:00 | -14.5 | in |
| 9/5/2008 | 20:00 | -13.8 | in |
| 9/6/2008 | 20:00 | -8 | in |
| 9/7/2008 | 20:00 | -10.1 | in |
| 9/8/2008 | 20:00 | -11.4 | in |
| 9/9/2008 | 20:00 | -12 | in |
| 9/10/2008 | 20:00 | -9 | in |
| 9/11/2008 | 20:00 | -9.9 | in |
| 9/12/2008 | 20:00 | -10.5 | in |
| 9/13/2008 | 20:00 | -11.8 | in |
| 9/14/2008 | 20:00 | -12.5 | in |
| 9/15/2008 | 20:00 | -13.5 | in |
| 9/16/2008 | 20:00 | -13.3 | in |
| 9/17/2008 | 20:00 | -13.7 | in |
| 9/18/2008 | 20:00 | -14.8 | in |
| 9/19/2008 | 20:00 | -15.9 | in |
| 9/20/2008 | 20:00 | -16.2 | in |
| 9/21/2008 | 20:00 | -16.5 | in |
| 9/22/2008 | 20:00 | -17.2 | in |
| 9/23/2008 | 20:00 | -17.9 | in |
| 9/24/2008 | 20:00 | -18.8 | in |
| 9/25/2008 | 20:00 | -18.3 | in |
| 9/26/2008 | 20:00 | -1.3 | in |

Rain Gauge

| Date | Level | Units |
|-----------|-------|-------|
| 8/28/2008 | 0 | in |
| 8/29/2008 | 0 | in |
| 8/30/2008 | 0.35 | in |
| 8/31/2008 | 0 | in |
| 9/1/2008 | 0 | in |
| 9/2/2008 | 0 | in |
| 9/3/2008 | 0 | in |
| 9/4/2008 | 0 | in |
| 9/5/2008 | 0 | in |
| 9/6/2008 | 0.99 | in |
| 9/7/2008 | 0 | in |
| 9/8/2008 | 0 | in |
| 9/9/2008 | 0 | in |
| 9/10/2008 | 0.35 | in |
| 9/11/2008 | 0.02 | in |
| 9/12/2008 | 0 | in |
| 9/13/2008 | 0 | in |
| 9/14/2008 | 0 | in |
| 9/15/2008 | 0 | in |
| 9/16/2008 | 0.61 | in |
| 9/17/2008 | 0 | in |
| 9/18/2008 | 0 | in |
| 9/19/2008 | 0 | in |
| 9/20/2008 | 0 | in |
| 9/21/2008 | 0 | in |
| 9/22/2008 | 0 | in |
| 9/23/2008 | 0 | in |
| 9/24/2008 | 0 | in |
| 9/25/2008 | 0 | in |
| 9/26/2008 | 0.69 | in |

Gauge 1
 Serial Number: 000009DE7744

| Date | Time | Level | Units |
|-----------|------|-------|-------|
| 9/27/2008 | 8:00 | 3.8 | in |
| 9/28/2008 | 8:00 | 2.7 | in |
| 9/29/2008 | 8:00 | -2.5 | in |
| 9/30/2008 | 8:00 | -4.6 | in |

Gauge 2
 Serial Number: 00000B6513B5

| Date | Time | Level | Units |
|-----------|------|-------|-------|
| 9/27/2008 | 8:00 | -5.3 | in |
| 9/28/2008 | 8:00 | -8.8 | in |
| 9/29/2008 | 8:00 | -13 | in |
| 9/30/2008 | 8:00 | -16 | in |

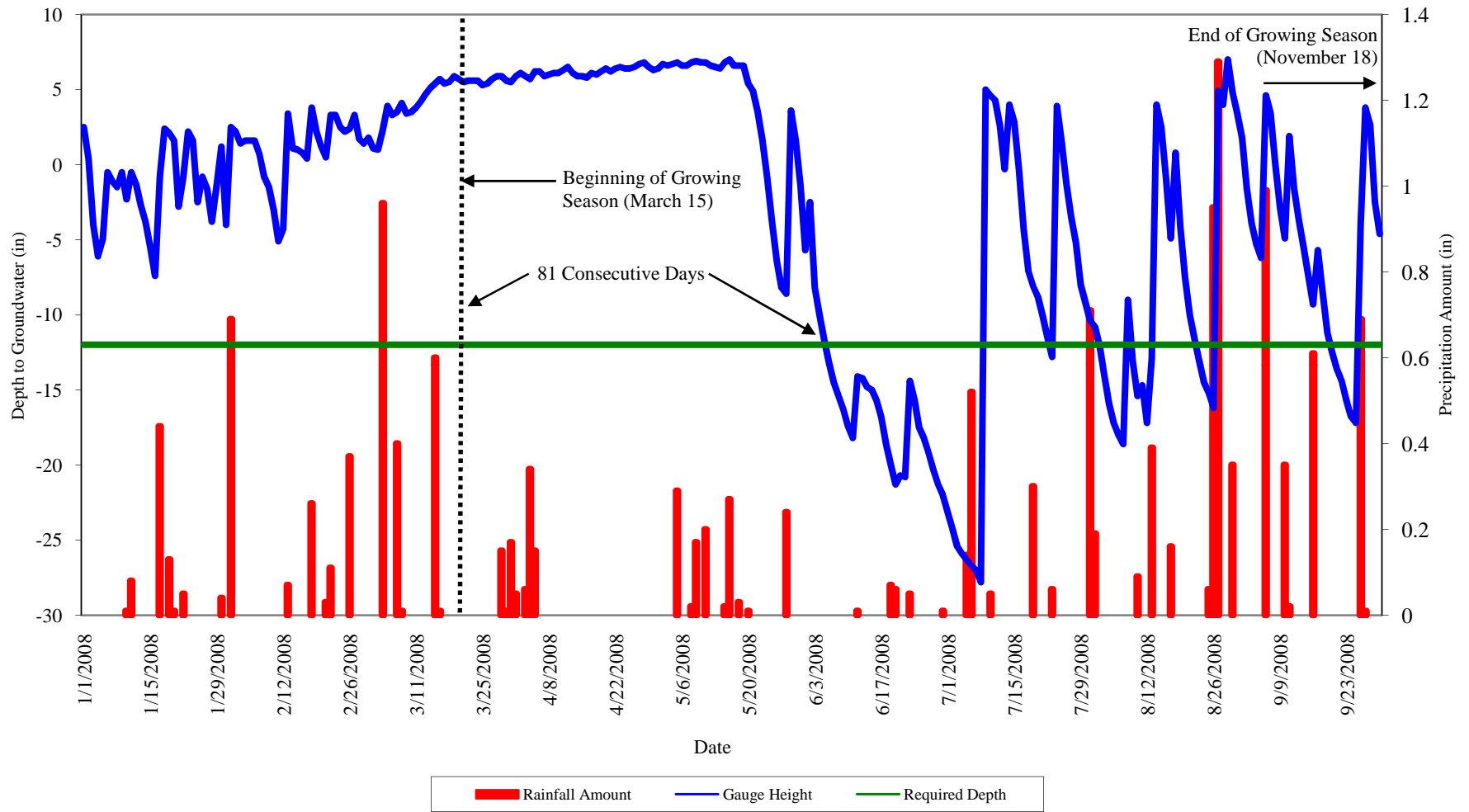
Gauge 3
 Serial Number: 000009DF22A3

| Date | Time | Level | Units |
|-----------|-------|-------|-------|
| 9/27/2008 | 20:00 | -8.1 | in |
| 9/28/2008 | 20:00 | -9.7 | in |
| 9/29/2008 | 20:00 | -11.7 | in |

Rain Gauge

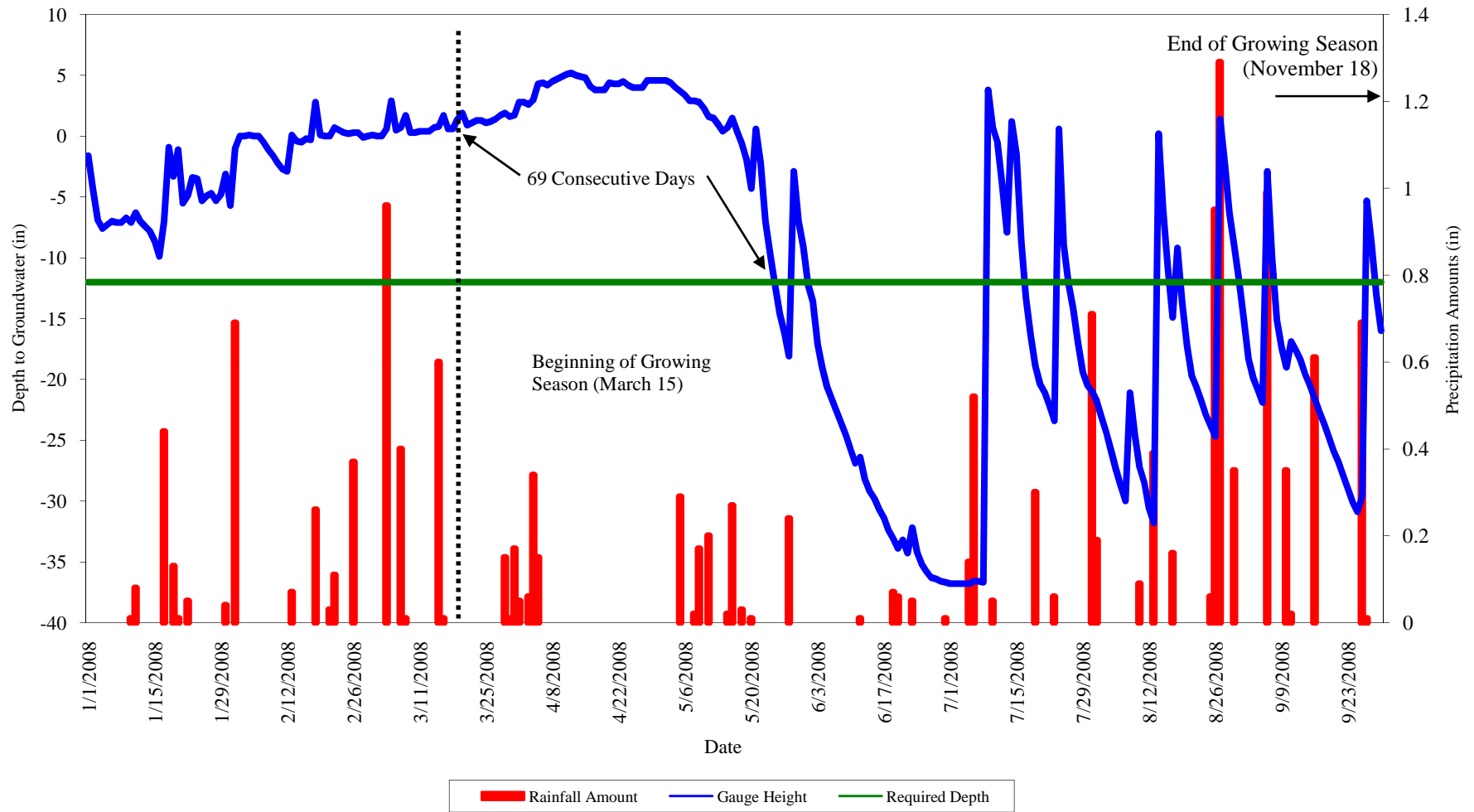
| Date | Level | Units |
|-----------|-------|-------|
| 9/27/2008 | 0.01 | in |
| 9/28/2008 | 0 | in |
| 9/29/2008 | 0 | in |
| 9/30/2008 | 0 | in |

Dula Thoroughfare Hydrology Monitoring
Groundwater Gauge 1



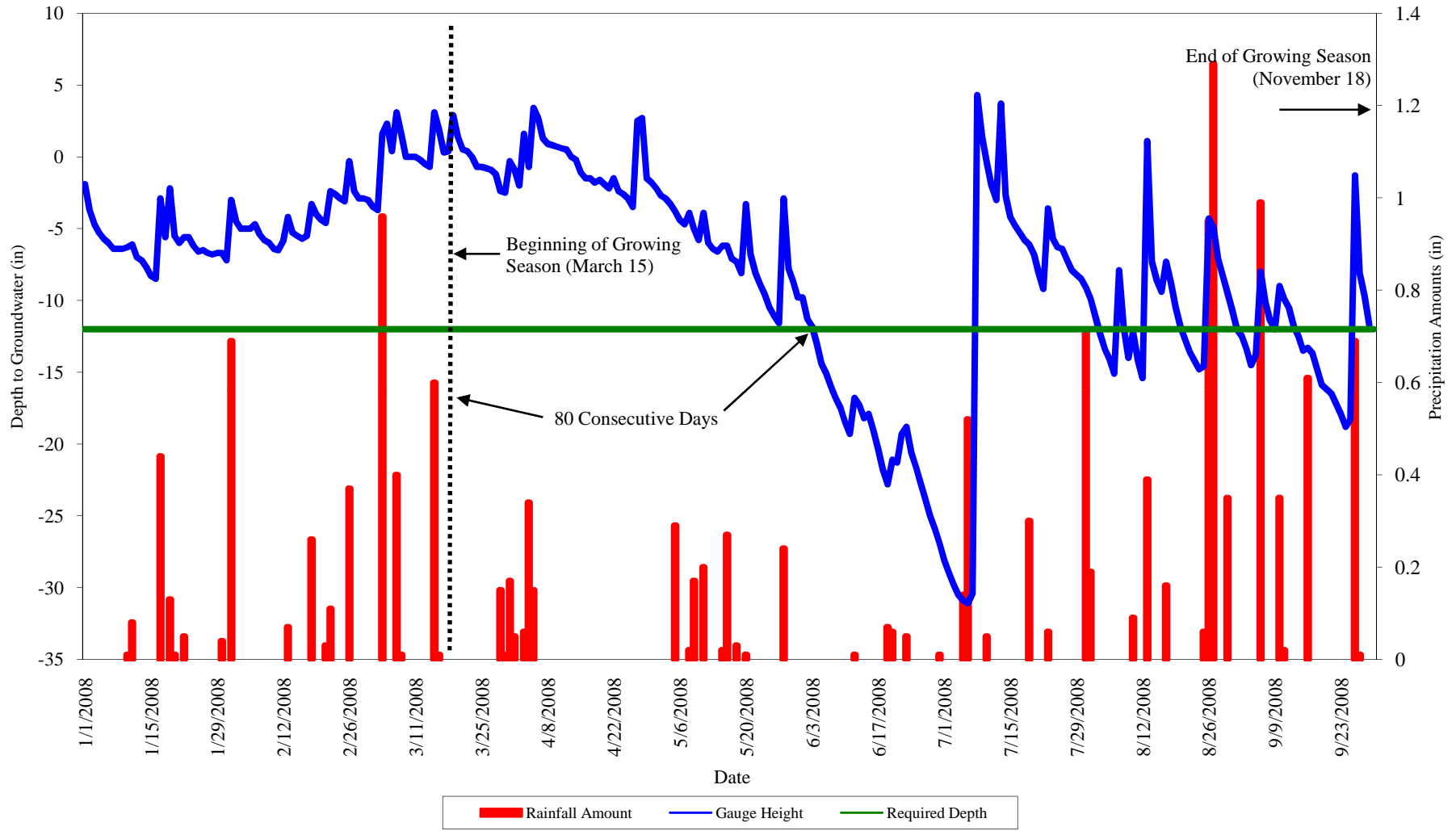
Appendix 3.2 Precipitation - Water Level Plots for Gauges
Dula Thoroughfare Stream and Wetland Restoration
Year 2 of 5

Dula Thoroughfare Hydrology Monitoring Groundwater Gauge 2



Appendix 3.2 Precipitation - Water Level Plots for Gauges
Dula Thoroughfare Stream and Wetland Restoration
Year 2 of 5

Dula Thoroughfare Hydrology Monitoring
Groundwater Gauge 3

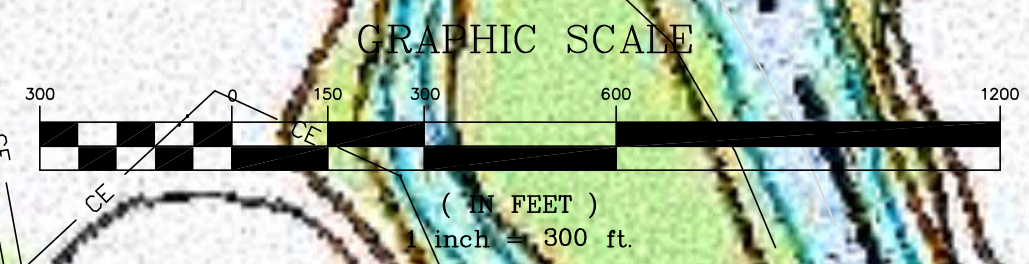
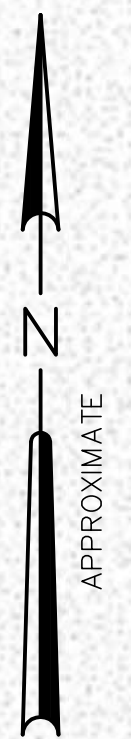


Appendix 3.2 Precipitation - Water Level Plots for Gauges
Dula Thoroughfare Stream and Wetland Restoration
Year 2 of 5



APPENDIX 4 CURRENT CONDITION PLAN VIEW (INTEGRATED)

1. Current Condition Plan View (Integrated)



WILLIAM RICHARD GA
DB 700; PG 340

ROCKY PEE DEE, LLC
DB 678; PG 284

ROCKY PEE DEE, LLC
DB 668; PG 120

NOTES:
1. GENERAL SITE DATA PROVIDED BY NCEP.
2. ALL LOCATIONS ARE APPROXIMATE.

PROJECT NO. 65
ANSON COUNTY
NORTH CAROLINA
MONITORING
YEAR 2 of 5



NC ECOSYSTEM ENHANCEMENT PROGRAM
DULA THOROUGHFARE STREAM AND WETLAND RESTORATION

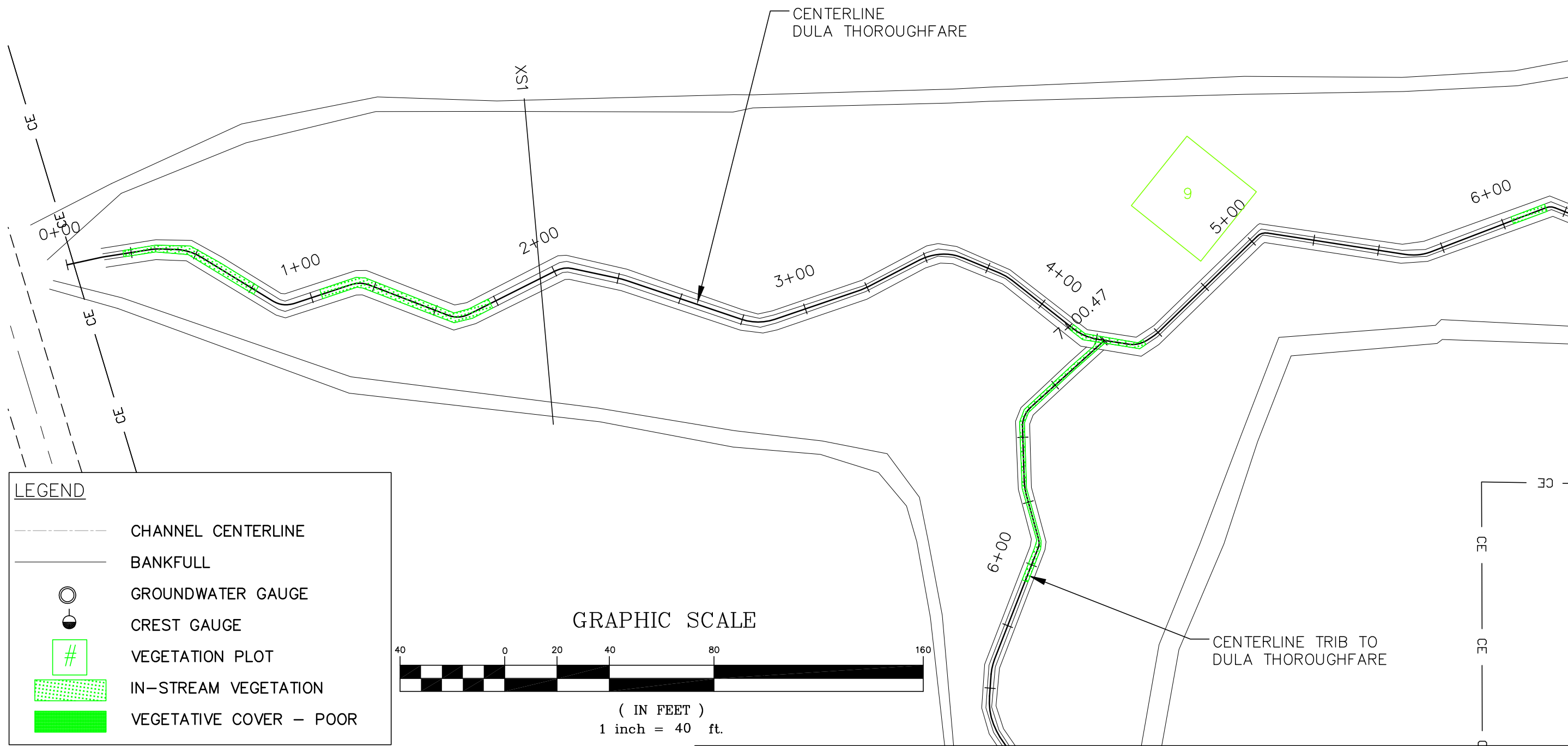
APPENDIX 4
CURRENT CONDITION PLAN VIEW

DATE : FEBRUARY 2009
SCALE : 1"=300'
JOB NO.: 03060005

FIGURE KEY

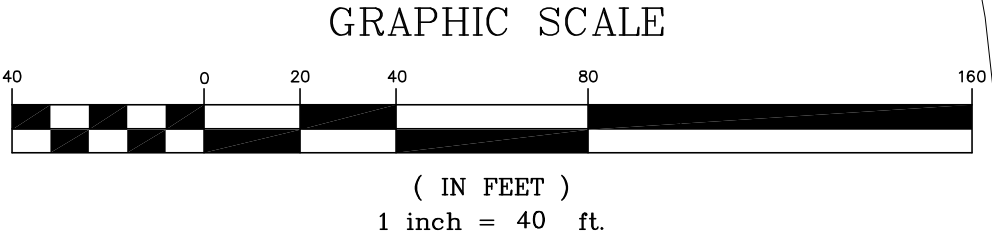


CE — CE



LEGEND

- CHANNEL CENTERLINE
- BANKFULL
- GROUNDWATER GAUGE
- CREST GAUGE
- VEGETATION PLOT
- IN-STREAM VEGETATION
- VEGETATIVE COVER — POOR



MATCHLINE SEE FIGURE 4 OF 4

MATCHLINE SEE FIGURE 2 OF 4



NOTES:
1. GENERAL SITE DATA PROVIDED BY NCEEP.
2. ALL LOCATIONS ARE APPROXIMATE.

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NC ECOSYSTEM ENHANCEMENT PROGRAM
DULA THOROUGHFARE STREAM AND WETLAND RESTORATION

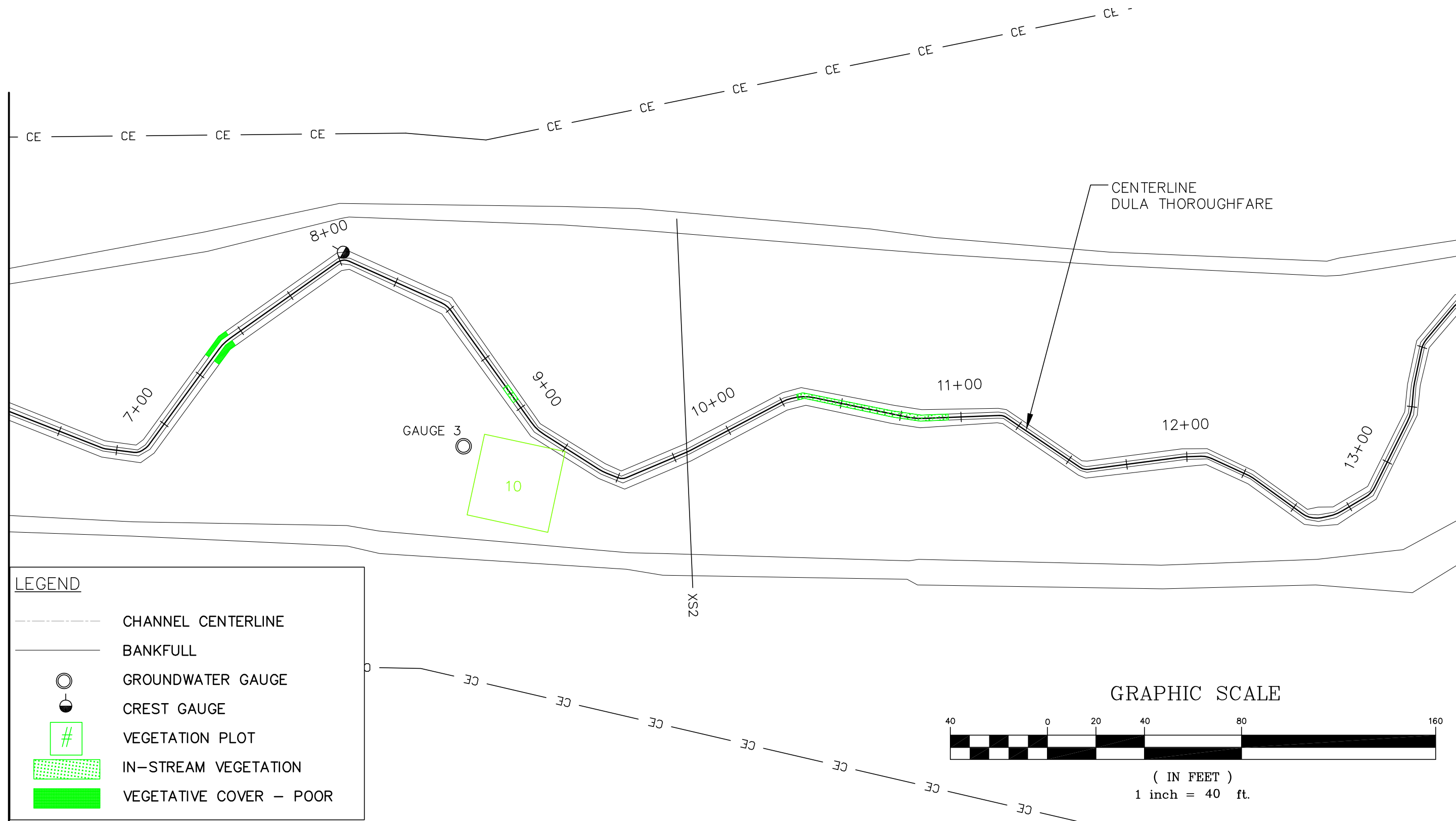
APPENDIX 4
CURRENT CONDITION PLAN VIEW

DATE : FEBRUARY 2009
SCALE : 1"=40'
JOB NO.: 03060005

FIGURE 1 OF 4

MATCHLINE SEE FIGURE 1 OF 4

MATCHLINE SEE FIGURE 3 OF 4



LEGEND

- CHANNEL CENTERLINE
- BANKFULL
- GROUNDWATER GAUGE
- CREST GAUGE
- VEGETATION PLOT
- IN-STREAM VEGETATION
- VEGETATIVE COVER - POOR

NOTES:
 1. GENERAL SITE DATA PROVIDED BY NCEEP.
 2. ALL LOCATIONS ARE APPROXIMATE.

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 MONITORING
 YEAR 2 of 5



NC ECOSYSTEM ENHANCEMENT PROGRAM
 DULA THOROUGHFARE STREAM AND WETLAND RESTORATION

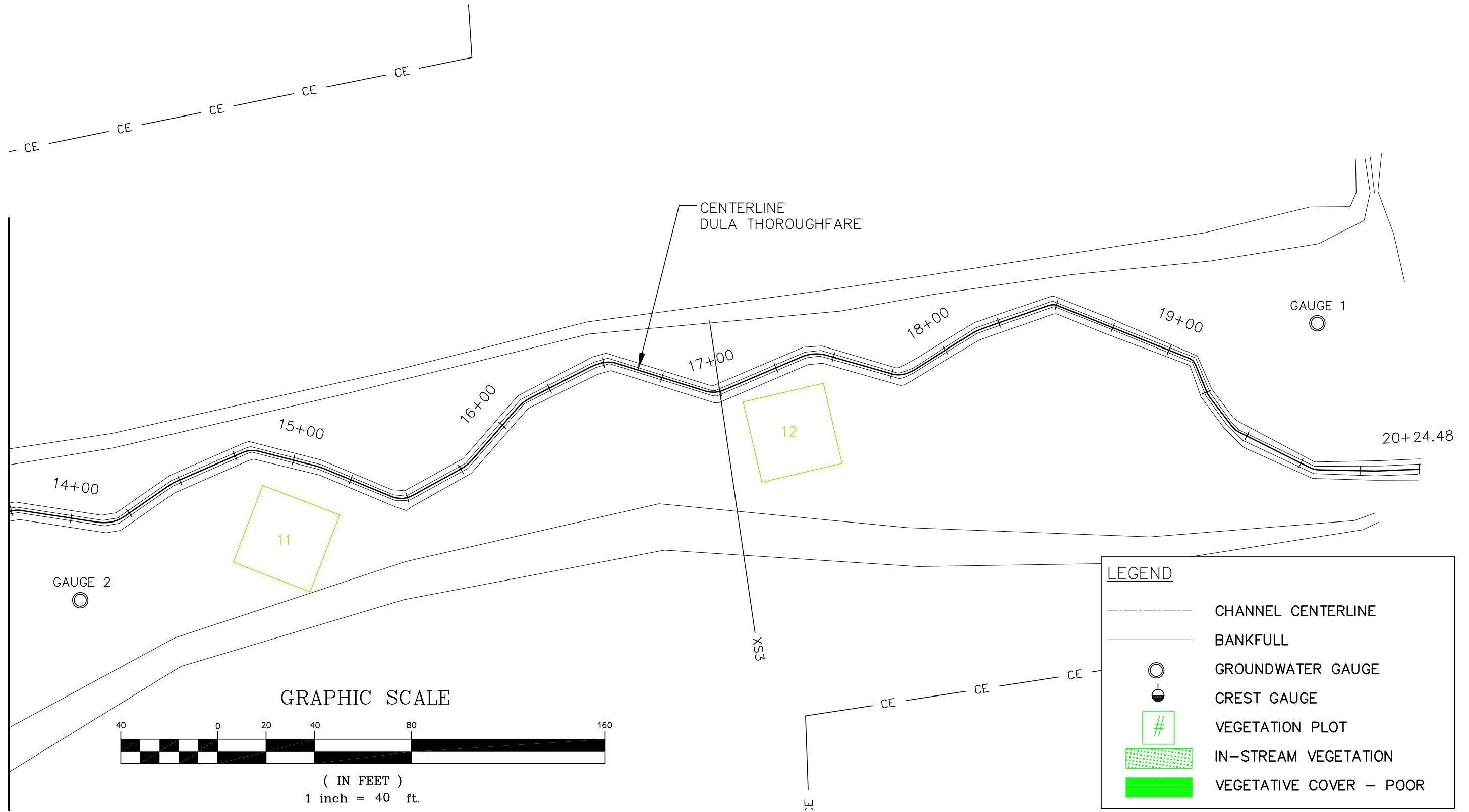
APPENDIX 4
 CURRENT CONDITION PLAN VIEW

DATE : FEBRUARY 2009
 SCALE : 1"=40'
 JOB NO.: 03060005

FIGURE 2 OF 4



MATCHLINE SEE FIGURE 1 OF 4



NOTES:
 1. GENERAL SITE DATA PROVIDED BY NCEEP.
 2. ALL LOCATIONS ARE APPROXIMATE.

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 NORTH CAROLINA
 MONITORING
 YEAR 2 of 5

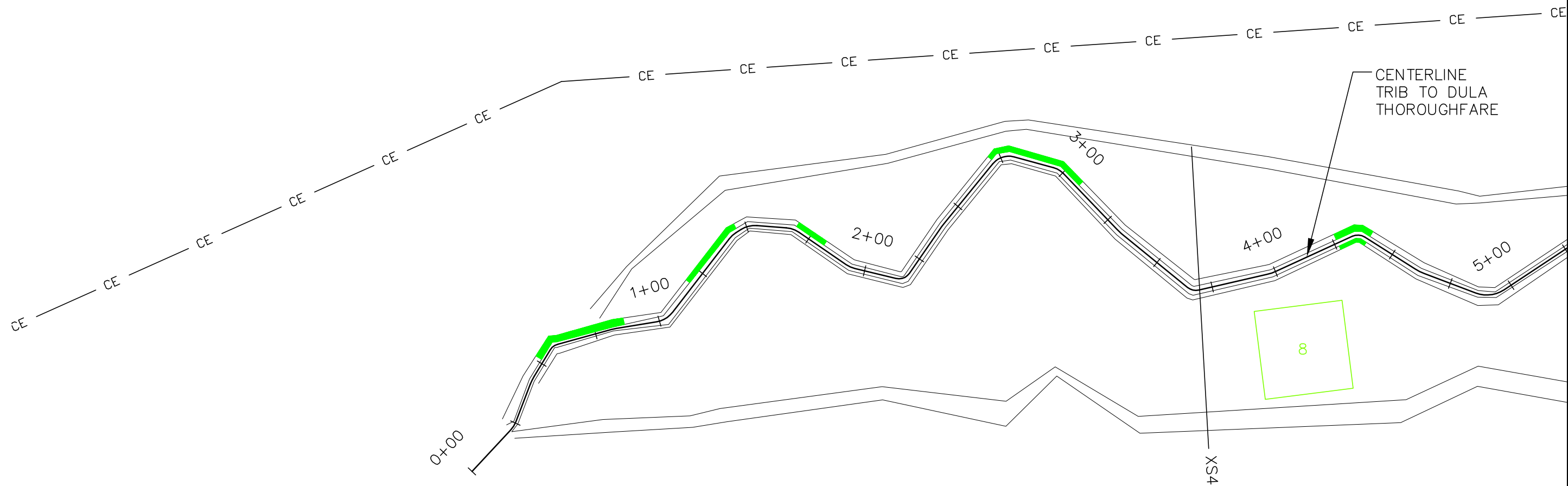


NC ECOSYSTEM ENHANCEMENT PROGRAM
 DULA THOROUGHFARE STREAM AND WETLAND RESTORATION

APPENDIX 4
 CURRENT CONDITION PLAN VIEW






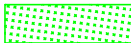

DATE : FEBRUARY 2009
 SCALE : 1"=40'
 JOB NO.: 03060005

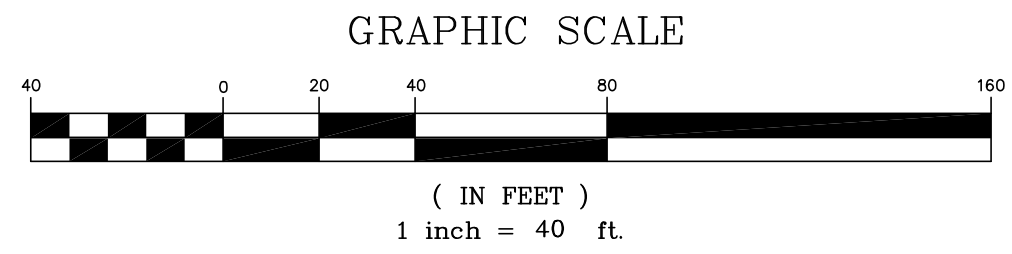
FIGURE 3 OF 4



MATCHLINE SEE FIGURE 1 OF 4

LEGEND

-  CHANNEL CENTERLINE
-  BANKFULL
-  GROUNDWATER GAUGE
-  CREST GAUGE
-  VEGETATION PLOT
-  IN-STREAM VEGETATION
-  VEGETATIVE COVER - POOR



NOTES:
 1. GENERAL SITE DATA PROVIDED BY NCEEP.
 2. ALL LOCATIONS ARE APPROXIMATE.

PROJECT NO. 65
 ANSON COUNTY
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 MONITORING
 YEAR 2 of 5



NC ECOSYSTEM ENHANCEMENT PROGRAM
 DULA THOROUGHFARE STREAM AND WETLAND RESTORATION

APPENDIX 4
 CURRENT CONDITION PLAN VIEW

DATE : FEBRUARY 2009
 SCALE : 1"=40'
 JOB NO.: 03060005

FIGURE 4 OF 4