FINAL

Valley Fields Stream and Wetland Restoration
Monitoring Baseline Report

Davidson County, North Carolina

USGS HUC: 03040103
Project ID: 020593902
EEP Project ID #407

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Prepared for:

NCDENR-Ecosystem Enhancement Program
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Executive Summary

The goals of the Valley Fields Stream and Wetland Restoration Project (Project) relate to providing ecological improvements to the Site's streams, wetlands, and riparian buffers through beneficial modifications of hydrology, water quality, and habitat.

The project site is located in the USGS Hydrologic Unit Code **03040103**030030. It began as North Carolina Department of Transportation (NCDOT) feasibility report performed by Kimley-Horn and Associates, Inc. (KHA) in May of 2003. The Ecosystem Enhancement Program (EEP) oversaw the project after completion of the feasibility study. KHA finalized the construction plans in January of 2007. North State Environmental, Inc. (North State) completed construction of the project in June of 2008 with repairs to Reach B completed in November 2008.

The Site consists of a tract of land owned by a single landowner. NCDOT purchased a conservation easement covering a large portion of the floodplain. Prior to restoration, the floodplain consisted of a mix of cleared land, crop land, and forested areas. The Project streams were generally incised, entrenched, and had unstable banks. Sand deposits reduced bed feature diversity. Beavers had dammed portions of the streams. The landscape of project wetlands generally fell into two categories: forested with some populations of invasive species or completely cleared. Stream bed degradation led to lower base elevations that in turn lowered groundwater elevations in the adjacent wetlands. One cleared wetland had been crowned to promote surface water run-off and limit water retention.

The reaches were restored using a combination of priority I and II approaches. The work used in-stream structures to control grade, stabilize stream banks, and add bed form diversity (e.g. pools and riffles). The work restored wetland hydrology through the elevation of the stream bed. The stream banks, wetlands, and riparian area were replanted with live stakes, bare roots, and containerized stock.

The work closely followed the design plan. The work followed the plan and profile design specifications in all sections except lower reach C and a meander of upper reach A where minor adjustments were made to avoid utilities. The work also differed from design where a few A-vanes were converted to cross vanes and a few rock structures were converted to log structures due to the onsite availability of logs. These changes improved or maintained design goals and reduced costs.

Monitoring will occur annually for five (5) years. Morphology monitoring includes twenty-two (22) cross sections and seven (7) longitudinal profile segments. Channel stability assessment will cover the entire restored length and includes thirty-eight (38) permanent photos. Hydrology monitoring includes four (4) groundwater gauges and four (4) crest gauges. Vegetation monitoring includes twenty-nine (29) plots.

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Location and Setting

The Project Site (Site) lies approximately 3.2 miles northwest of High Point, North Carolina in Davidson County adjacent to Wallburg-High Point Road about 1 mile east of the intersection of Wallburg-High Point Road and Horneytown Road (Figure 1).

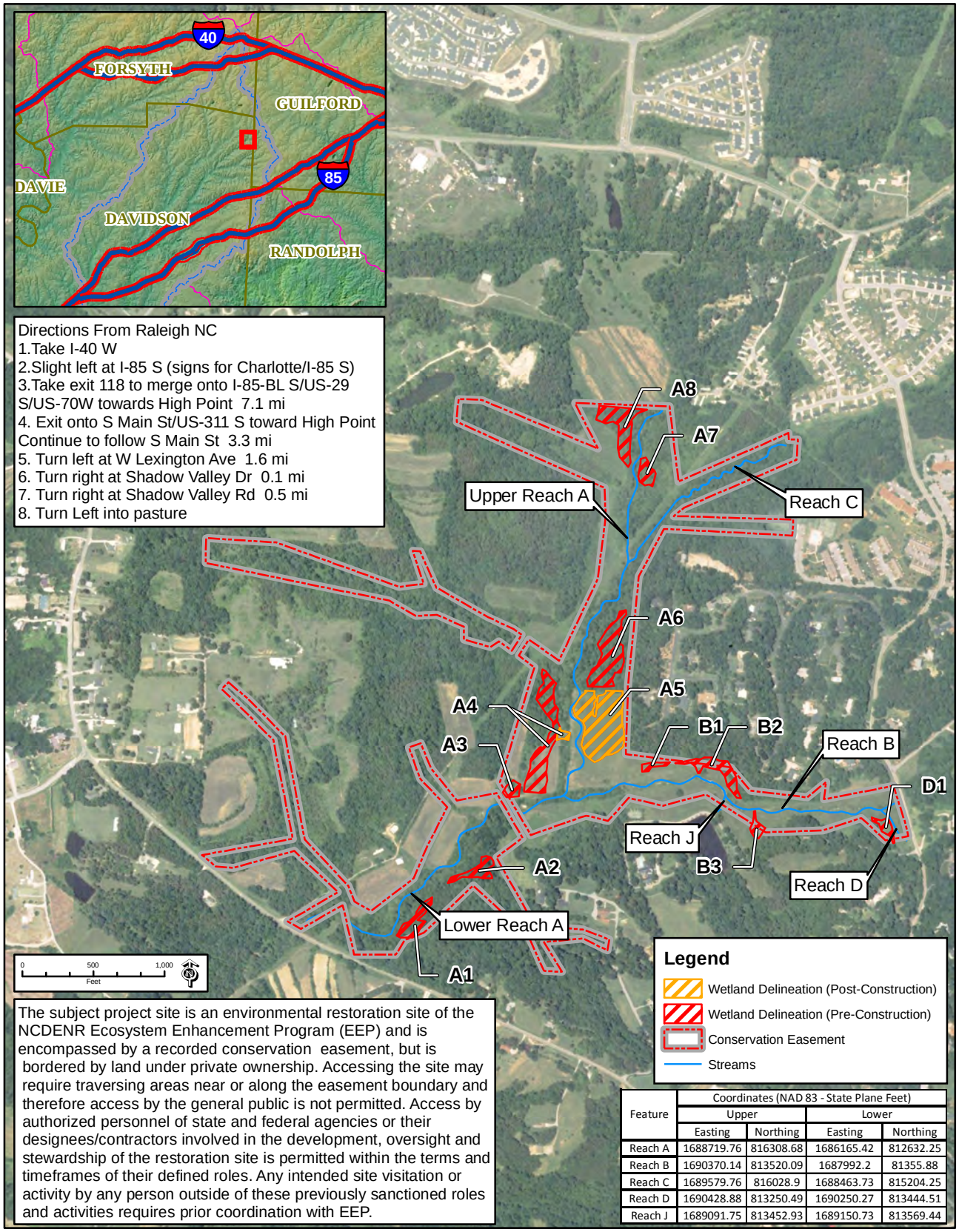
The Valley Fields Farm Stream and Wetland Restoration Project (Project) falls within the Yadkin River Sub basin (03040103030030 Hydrologic Unit Code). The Site includes Rich Fork and its tributaries. The North Carolina Environmental and Natural Resources, Division of Water Quality (NCDENR-DWQ) lists Rich Fork from its source downstream to Abbot's Creek as an impaired water due to fecal coliform on the 2002 Integrated 305(b) and 303 (d) report (North Carolina Department of Environment and Natural Resources - Division of Water Quality: Planning Branch 2003a).

The project watershed lies within the Piedmont – Southern Outer Piedmont Ecoregion, part of the Piedmont physiographic province. Valley slopes between 0.003 and 0.011 typify the topography of the project watershed.

The Site lies within an area that has been used for agriculture. Some of these areas have reforested while other areas continue to be used for agriculture or are maintained as cleared land. The Site also includes two utility easements (gas line/ fiber optic and sanitary sewer that cross the stream and/or run parallel to the streams.

Upstream development of the watershed has increased the frequency of flooding events. The portion of impervious surface composing reach drainage areas ranges from 1.0% to 16.5%. Reach B, the primary tributary to Rich Fork, has the most developed drainage area with impervious surfaces composing up to 16.5% of the total drainage area. Much of the watershed has not been developed; however, current trends indicate strong growth in both commercial and residential developments within the project watershed.

Figure 1: Project Map



Feature	Coordinates (NAD 83 - State Plane Feet)			
	Upper		Lower	
	Easting	Northing	Easting	Northing
Reach A	1688719.76	816308.68	1686165.42	812632.25
Reach B	1690370.14	813520.09	1687992.2	81355.88
Reach C	1689579.76	816028.9	1688463.73	815204.25
Reach D	1690428.88	813250.49	1690250.27	813444.51
Reach J	1689091.75	813452.93	1689150.73	813569.44

Project Goals and Objectives

The goals of the project relate to providing ecological improvements to the Site's streams, wetlands, and riparian buffers through beneficial modifications of hydrology, water quality, and habitat.

Goals related to hydrology include:

- Better manage hydrologic energies and improve system hydraulics through the re-establishment of a floodplain connection at the bankfull discharge and by increasing flood storage events above bankfull
- Improve wetland hydrology by raising the water table and/or enhancing surface water floodplain interactions

Goals related to water quality include:

- Reduce bank sediment losses to the receiving watershed from erosion
- Provide substantive thermoregulation via vegetative shading for reaches C, D, and J within the standard 5 year monitoring timeframe and over the longer term for reaches A and B through the provision of a sufficiently dense and vigorous riparian community
- Proved turbulence derived oxygenation in the base flow range

Goals related to habitat include:

- Improve instream habitat through diversification of bedform
- Improving bank habitat by increasing stability and woody biomass
- Improving wetland and floodplain habitat by establishing microtopography and hydrology, removing invasive vegetation, and increasing habitat diversity
- Improving food web dynamics by adding biomass (such as detritus, woody debris, and leaf matter) and re-establishing floodplain connection

The restoration achieves these goals through the following objectives:

- Stabilizing channel bed and banks through modifying dimension, pattern, and profile using natural channel design priority I and II techniques. Priority I is the re-establishment of a connection to the historic floodplain by raising the stream bed and priority II is the establishment of a new floodplain at the current stream elevation.
- Installing in-stream structures such as rock vanes, log vanes, and constructed riffles
- Raising stream bed elevations or lowering floodplains
- Removing invasive vegetation
- Planting native vegetation in riparian buffer
- Removing crowns from wetland areas

Project Structure

The Site includes Rich Fork and several of its tributaries. The mitigation work restored six (6) reaches and preserved several others. The mitigation work restored a large riparian buffer that surrounds the project reaches. The Site also includes several wetlands. The mitigation work restored one (1) wetland tract (A-5) and enhanced several others. Figure 1 shows the locations of the restored features and Table 1 provide a summary of mitigation values.

Restoration Type and Approach

Prior to restoration activities, the stream features consisted of steep, vertical banks, little riparian buffer, excessive turbidity during rain events, severely eroded banks, and sediment filled culverts. Some wetland features were forested while others were entirely cleared. Some of the forested wetlands contained significant populations of invasive species. The hydrology of all the wetlands were impaired due to lowered base elevations of the adjacent incised, entrenched stream channels. One wetland had been graded to promote drainage of surface / flood waters. Sections of the riparian buffer had been entirely cleared. Other sections consisted of isolated populations of invasive species.

The design of the channel reaches employed a Rosgen priority I and priority II restoration approach. Morphological data from the reference reach, piedmont rural regional curves, regime equations, and the existing channel morphology of the Site's stable reaches were used in the design. The designer, KHA, sampled bed materials and performed sediment transport calculations to validate the designed profile and dimensions. The restored channels have banks constructed at a 3:1 slope to ensure stability until deep rooted vegetation can become established. To promote proper bed width using these slopes, the channels for this project are designed Rosgen type C channels. However, the designer anticipates that with maturing vegetation the channel will narrow and evolve into a Rosgen type E channel. Increasing sinuosity on all channels for restoration decreased average stream slopes and provides the proper pool and riffle sequencing found in natural reference stream systems.

The Site's wetlands were restored and enhanced though improvements to hydrology and vegetation. Raising the stream bed elevations raised groundwater elevations leading to reestablished flooding dynamics between the channel and adjacent wetlands. Tract A-5 was further restored by modifying the ground surface to better retain surface water inputs.

Vegetation was planted in five (5) zones that reflect different conditions within the site. Zone 1, stream channel, was planted with live stake, successional species that provide immediate bank stability. Zone 2, stream bank, includes live stakes and bare roots that were planted around structure installations and the outside of meander bends to provide an area of high density root mass. Zones 3 and 4, riparian and transitional, cover the floodplain and consist of planted live stakes, bare roots, and container stock. Zone 5, maintained easement, was planted with native grasses. Zone 5 includes areas where utility easement cross the conservation easement. The easements typically cannot have deep rooting plants because of the potential damage they could cause to underground utilities. In addition, these easements are typically maintained by the owner/operator of the easement which is why only native grasses were placed in these areas.

Table 1: Stream Restoration Component Attribute Table

	Reach A	Reach B	Reach C	Reach D	Reach J
Drainage Area	6.5	2.3	0.2	0.2	0.1
Stream Order	3	2	1	1	1
Restored length (feet)	5,013	2,492	1,489	295	61
Perennial or Intermittent	Perennial	Perennial	Perennial	Perennial	Perennial
Watershed type	Developing	Developing	Developing	Developing	Developing
Rosgen classification of pre-existing	G5c→F5	G5	F5→B5	B5	G
Rosgen classification of As-built	B5c→C5	B5c→C5	C5c→E5	B5c→C5	Ba

Table 2: Stream Mitigation Summary Table

Project Component or Reach ID	Pre-Construction Length (Feet)	Constructed Length (Feet)	Mitigation Type	Mitigation Ratio	SMUs
Upper A	3,100	3,078	Restoration	1:1	3,078
Lower A	2,284	1,935	Restoration	1:1	1,935
B	2,550	2,492	Restoration	1:1	2,492
C	1,560	1,489	Restoration	1:1	1,489
D	240	295	Restoration	1:1	295
J (Pond Tributary)	61	61	Restoration	1:1	61
Reach A	276	-	Preservation	5:1	55
Reach E	2,930	-	Preservation	5:1	586
Reach F	1,840	-	Preservation	5:1	368
Reach G	1,200	-	Preservation	5:1	240
Reach H	1,400	-	Preservation	5:1	280
Reach K	240	-	Preservation	5:1	48
Reach L	700	-	Preservation	5:1	140
Reach M	420	-	Preservation	5:1	84
Total Credits					11,151

*Utility Easements subtracted out of constructed length and are not included in SMU's.

Table 3: Wetland Mitigation Summary Table

Project Component or Reach ID	Pre-Construction Area (Acres)	Constructed Area (Acres)	Mitigation Type	Mitigation Ratio	WMUs
Wetland A-5	-	3.0	Restoration	1:1	3.0
Wetland A-4	-	0.1	Restoration	1:1	0.1
Wetland B-1	0.1	0.1	Enhancement	2.5:1	0.04
Wetland B-2	0.7	0.4	Enhancement	2.5:1	0.28
Wetland B-3	0.2	0.08	Enhancement	2.5:1	0.08
Wetland D-1	0.2	0.2	Enhancement	2.5:1	0.08
Wetland A-6	1.7	1.7	Enhancement	2.5:1	0.68
Wetland A-4	1.8	1.8	Enhancement	2.5:1	0.72
Wetland A-3	0.2	0.2	Enhancement	2.5:1	0.08
Wetland A-1	0.6	0.6	Preservation	5:1	0.12
Wetland A-2	0.5	0.5	Preservation	5:1	0.10
Wetland A-7	0.4	0.4	Preservation	5:1	0.08
Wetland A-8	1.2	1.2	Preservation	5:1	0.24
				Total Credits	5.60

Project History

KHA prepared the Valley Fields Farm project feasibility report for NCDOT in May 2003 (TIP No. R-2568WM). The project was transferred to EEP and awarded to KHA for Design and Construction Management in January 2005. KHA completed design in January 2007 and North State Environmental, Inc. completed construction in June 2008. On August 27th and 28th 2008 the project was damaged by rainfall caused by Hurricane Fay resulting in multiple failures to Reach B and Reach D. KHA completed the repair design in October 2008 and North State Environmental, Inc completed the repair construction in November 2008.

Success Criteria

Channel Morphology and Stability

The stream geometry will be considered successful if the cross-section geometry, profile, and sinuosity are stable or reach a dynamic equilibrium. It is expected that there will be changes towards a stable stream type in the designed cross sections, profile, and/or substrate composition. Changes that may occur during the monitoring period will be

evaluated to determine if they represent a movement toward a more unstable condition (e.g. down cutting, erosion, mid-channel bars, etc.) or are changes that represent an increase in stability (e.g. settling, vegetative changes, coarsening of bed material, etc.).

An initial, though not exclusive, indicator of success will be adherence to design or reference ratios of stream geometry found in the Baseline Stream Data Summary tables (table 5 set) or in comparable and stable reference systems.

Deviation from the design ratios will not necessarily denote failure as it is possible to maintain stability and not stay within the design geometry. Additionally, determination of true bankfull will be difficult until the stream has had adequate and diverse flow events to create strong bankfull indicators. The following key indicators of stability provide a more complete picture of stream stability:

- Stream Type: Maintenance of the design stream type or progression or conversion to stable stream type such as B, C, or E will indicate stability
- Bank Height Ratio: Bank height ratio between 1.0 and 1.1 will indicate flood flows have access to the active floodplain and that higher flows do not apply excessive stresses to stream banks

The nature of the watershed presents challenges to stream restoration. The contributing watersheds lie within a rapidly developing region. The urbanizing watershed's runoff character will continue to change as the nature of the land cover shifts to less permeable surfaces. The hydrograph will shift such that bankfull flooding events will become more frequent, peak discharges will be higher, and overall sediment budget will fluctuate. The cross sections have been designed with bankfull benches to account for some shifting in bankfull discharges.

Dimension

General maintenance of a stable cross-section and hydrologic access to the floodplain features over the course of the monitoring period will generally represent success in dimensional stability. However, some change is natural and expected and can even indicate that the design was successful and appropriate for the hydrologic and sediment regime. Examples include depositional processes resulting in the development of constructive features on the banks and floodplain, such as an inner berm, a slightly narrower channel, modest natural levees, and general floodplain deposition. Significant widening of the channel cross-section or trends of increase in the cross-sectional area generally represent concern, although some adjustment in this direction is acceptable if the process is arrested after a period of modest adjustment. In the case of riffle cross sections, maintenance of depths that represent small changes to target competency (e.g. consistently low BHRs <1.2) would also reflect stability. Although a pool cross-section may experience periodic infilling due to watershed activity and the timing of events relative to monitoring, the majority of pools within a project stream reach should demonstrate maintenance of greater depths and flat water surface slopes over time. The critical habitat value of pool depth should be maintained over time and rates of lateral migration should not be significant.

Pattern and Profile

For the channels' profile, the reach under assessment should not demonstrate any trends in significant thalweg aggradation or degradation over significant continuous portion of its length. Over the monitoring period, the profile should also demonstrate the maintenance or development of bedform (facets) more in keeping with reference level diversity and distributions for the stream type in question. It should also provide a meaningful contrast in terms of bedform diversity against the pre-existing condition. Bedform distributions, riffle/pool lengths, and slopes will vary, but should do so with maintenance around general design distributions. This requires that the majority of pools are maintained at greater depths with lower water surface slopes and riffles are shallow with greater water surface slopes. Pattern features should show minimal adjustment over the standard five (5) year monitoring period.

Substrate

Substrate measurement should indicate a progression towards, or the maintenance of the known distributions from the design phase.

Sediment Transport

Upstream construction activities driven by land development likely will lead to episodic sediment pulses sent downstream through the stream network. Additionally, erosion of upstream unstable stream banks will persistently contribute sediment to the project reaches. The designer anticipates that the excess sediment will either be routed though the project area or deposited in target areas such as point bars and the floodplain. While stream restoration projects are designed to transport bedload in equilibrium and carry overall sediment loads at bankfull, fines can be transported even at low discharges and upstream instability beyond design projections can contribute to widespread deposition as storm event recede in areas of energy dissipation such as restored reaches. This can have the effect of obscuring bedform especially in the first few years after the implementation of a stream restoration project. In many cases subsequent narrowing and reduction of width/depth ratios as a project develops and stabilizes it can then increase transport efficiency and return bedform to intended distribution, but some tendency for modest filling of pools and glides may persist. The pools are designed to be over dug to account for some sedimentation of pools and glides. Changes that may occur during the monitoring period will be evaluated to determine if they represent a movement toward a more unstable condition or are minor changes that represent an increase in stability or insignificant changes.

Vegetation

The project site was planted in phases as the construction progressed. The initial plantings were completed in May 2008. Reach B was replanted after the repairs in November 2008. KHA collected vegetation plot data originally in June 2008 and in June 2009 for Reach B. The time interval between the final baseline vegetation data collection and submittal of this report is approximately 8 weeks. The success of riparian vegetation planting will be gauged by stem counts of planted and recruited species and an assessment community composition. Stem counts of over 260 trees per acres after 5

years will be considered successful. Interim stem count criteria will be 320 trees per acre for year 3 and 288 trees per acre for year 4. The composition of the vegetation community should trend toward a predominance of target species. A majority (80%) of the target species should be present in the reforestation area in numbers and condition conducive to continuing the species through the maturation of the community. The population of invasive species will be kept below 10% of the total population.

Hydrology

Streams

A minimum of two bankfull events must be documented within the standard five (5) year monitoring period. In order for the monitoring to be considered complete, the two (2) verification events must occur in separate monitoring years.

Wetlands

The minimum requirement to judge establishment of wetland hydrology will be adherence to USACE guidelines (United States Army Corps of Engineers 1987) including saturation of the upper 12" of the soils for a minimum period of 18 consecutive days (~7.5%) during the microbial growing season. Further success of the restoration and enhancement of wetland hydrology will be measured by improvements to the frequency and duration of flood flows, groundwater levels, flood storage, and surface water infiltration. The following changes from baseline conditions will indicate enhancement or restoration of wetland hydrology:

- Indicators of overbank inputs to wetlands
- Rise in groundwater elevations
- Maintenance of floodplain based on morphology indicators and gauging
- Increase in volume of surface water infiltration

Monitoring Plan

The monitoring will assess the Site's stream, wetland, and riparian areas to determine restoration success. The monitoring plan has been set up based on guidance provided by The Stream Mitigation Guidelines disseminated by the United States Corps of Engineers – Wilmington District (McLendon, Scott, Fox, Becky et al. 2003), version 1.2 (11/16/2006) of the North Carolina Ecosystem Enhancement Program (EEP) document entitled "Content, Format, and Data Requirements for EEP Monitoring Reports", version 2.0 (3/27/2008) of the EEP document entitled "Mitigation Plan Document Format, Data Requirements, and Content Guidance".

The monitoring will occur annually for five (5) years. The monitoring period should include two (2) separate years with bankfull events. Bankfull events will be verified using an installed crest gauge that will be inspected during each monitoring visit. If there are not two (2) bankfull events, the monitoring period may be extended at the discretion of the Corps of Engineers, Raleigh Regulatory Field Office Project Manager and the 401-Wetlands Unit. Monitoring reports will be submitted during years 1-5.

Monitoring work will include reference photographs, materials sampling, site survey, visual assessment, mapping of significant features, vegetation sampling, and groundwater monitoring.

Hydrology

Each site visit by the monitoring performer must include documentation of the wetland and stream hydrology gauges described below.

Wetland

The Site includes four (4) groundwater gauges that were installed during the design phase. Three (3) gauges are located within the restoration wetland (A-5) and one (1) gauge is located within a reference wetland immediately north of wetland A-5. These gauges continue to function and will be used to continue to monitor wetland hydrology. The gauges should be downloaded during each monitoring visit.

Stream

Installed crest gauges will be used to verify the occurrence of bankfull events. The gauge should be reset after each observation. Observations of wrack and deposition may serve to augment gauge observations when necessary.

Channel Morphology and Stability

Dimension

The survey of channel dimension consists of twenty-two (22) permanent cross sections placed throughout the project extent. The cross sections represent fourteen (14) riffles and eight (8) pools. Annual photographs showing both banks and upstream and downstream views will be taken for each cross section.

Profile

The survey of the longitudinal profile covers seven (7) sections located throughout the project reaches. The longitudinal profile sections include portions of Upper A, Lower A, B, and C. Reaches D and J were not surveyed due to their short length and will be assessed visually. The thalweg of the channel should be used as a baseline and profile measures should be stationed relative to the thalweg.

Pattern

Pattern data will be collected in year 5 and then only if there were any indications through profile and dimensional data that significant geomorphological adjustments occurred.

Substrate

Channel material measurements will be collected by using pebble counts for each longitudinal profile section.

Visual Channel and Bank Stability Assessment

Thirty-eight (38) permanent photo stations have been set up to visually monitor stream conditions. These photo stations are mapped on the As-Built drawings.

The entire restored length of stream will be investigated for channel stability and in-stream structure functionality. Any evidence of channel instability will be identified, mapped, and photographed. All structures will be inventoried for functionality and impaired structures will be photographed.

Vegetation

Twenty-nine (29) permanent quadrants have been setup to sample the riparian buffer and restored wetland. Each quadrant covers 100 square meters. The annual assessments will track the growth and health of planted stems and provide an overall count of woody stems including recruits. The vegetation survey will occur during the growing season. Permanent photo points have been set up for each quadrant. Planted specimens have been flagged, but not mapped. Not all species were identified due to the bare roots lacking distinguishable features. The plot setup may be modified to match Carolina Vegetation Survey (CVS) Level 1 and 2 protocols.

Watershed

Excessive sediments enter the reaches from their watershed for all reaches but especially reach B. These Sediments should wash through the system; however, due to the drought conditions in the Piedmont, NC there has been a lack of channel forming flows. The sediment is causing mid channel bars to form: however these seem to be temporary in nature and migrating as the excess sediment is flushed and deposited on the benches and point bars.

A review of land use change during the monitoring period will provide a clearer picture of stream channel stability and performance.

Maintenance and Contingency Plans

If problem areas arise during the monitoring period, corrective action may be required. If the problem is isolated in nature it may not require remedial action; however, if the issue is determined to systemic, corrective action may be needed. The following provides an outline for maintenance thresholds and contingency plans for the Site's streams, wetlands, and planted areas (Riparian Buffer and Wetland).

Stream Issue Threshold:

- Beaver repopulation
- BHR >1.2 and visual indication of systemic instability or the problem threatens to create instability.
- Excess sediment from site features. Design assumes sediment pulses from upstream.

Stream Remedial Actions:

- Beaver removal
- Hand repairs and/or mobilization of equipment.
- Investigation of upstream sediment inputs to determine any violations to the state or federal land and water quality rules and regulations.

Wetland Criteria:

- Hydrology does not meet USACE guidelines and reference values

Wetland Remedial Actions:

- Verify climate conditions are normal
- Mobilization of equipment to either raise or lower the grade.

Planted Area Issue Thresholds:

- >15% invasives
- Not meeting stem count or diversity

Planted Area Remedial Actions:

- Nuisance vegetation removal/treatment
- Supplemental plantings

References

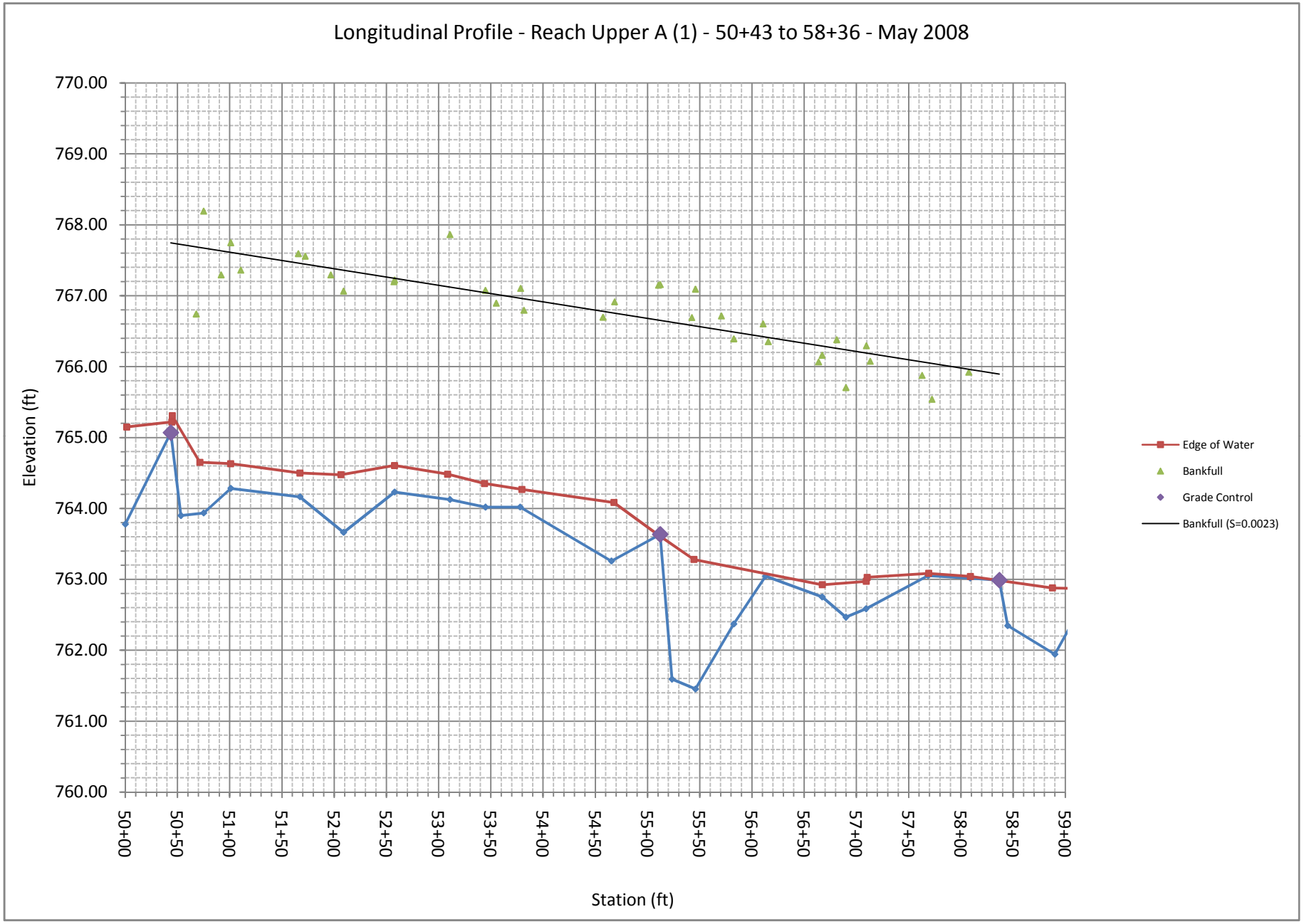
McLendon, Scott, Becky Fox, et al. (2003). Stream Mitigation Guidelines. United States Army Corps of Engineers - Wilmington District, United States Environmental Protection Agency, North Carolina Wildlife Resources Commission and North Carolina Department of Natrual Resources - Division of Water Quality.

Rosgen, David L. (1997). A Geomorphic Approach to Restoration of Incised Rivers. Management of Landscapes Disturbed by Channel Incision.

Appendix 1

Baseline Monitoring

Longitudinal Profile


Longitudinal Profile - Reach Upper A (1) - 50+43 to 58+36 - May 2008
770.00
769.00
768.00
767.00
766.00
765.00
764.00
763.00
762.00
761.00
760.00
Elevation (ft)
50+00
50+50
51+00
51+50
52+00
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54+00
54+50
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58+00
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Station (ft)
Edge of Water
Bankfull
Grade Control
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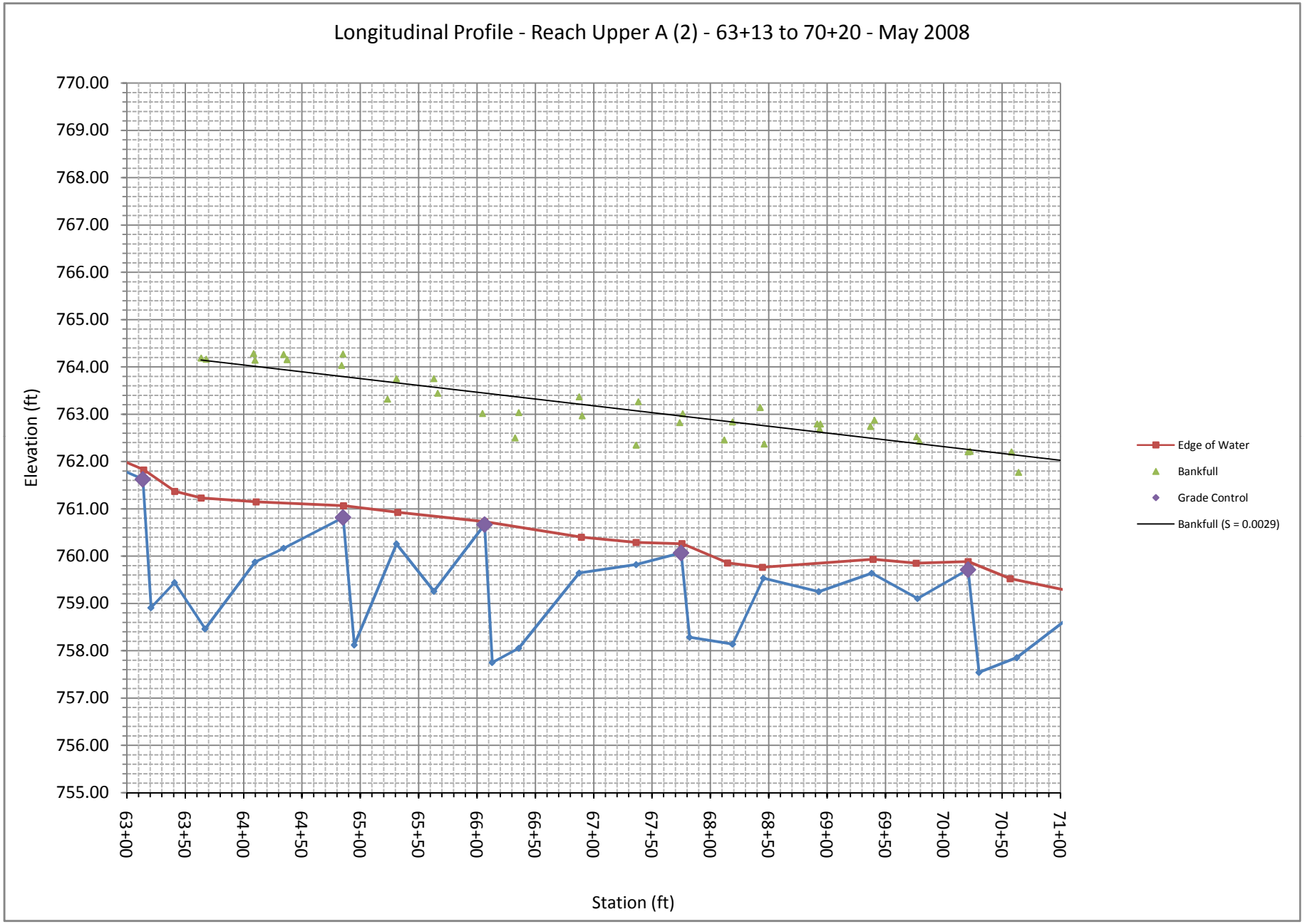
Longitudinal Profile - Reach Upper A (2) - 63+13 to 70+20 - May 2008
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767.00
766.00
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65+50
66+00
66+50
67+00
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68+00
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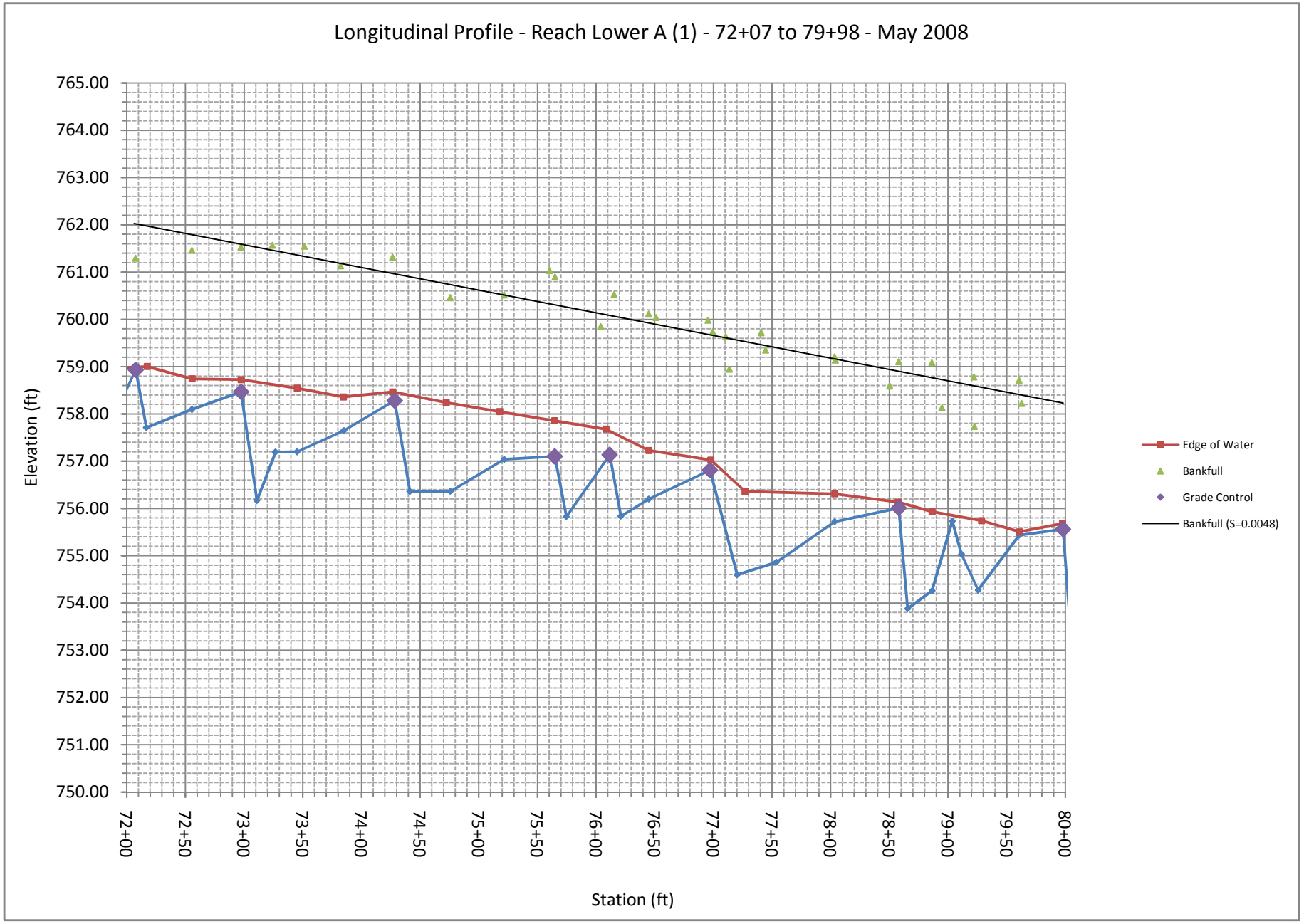
70+50
71+00
Station (ft)
Edge of Water
Bankfull
Grade Control
Bankfull (S = 0.0029)


Longitudinal Profile - Reach Lower A (1) - 72+07 to 79+98 - May 2008
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762.00
761.00
760.00
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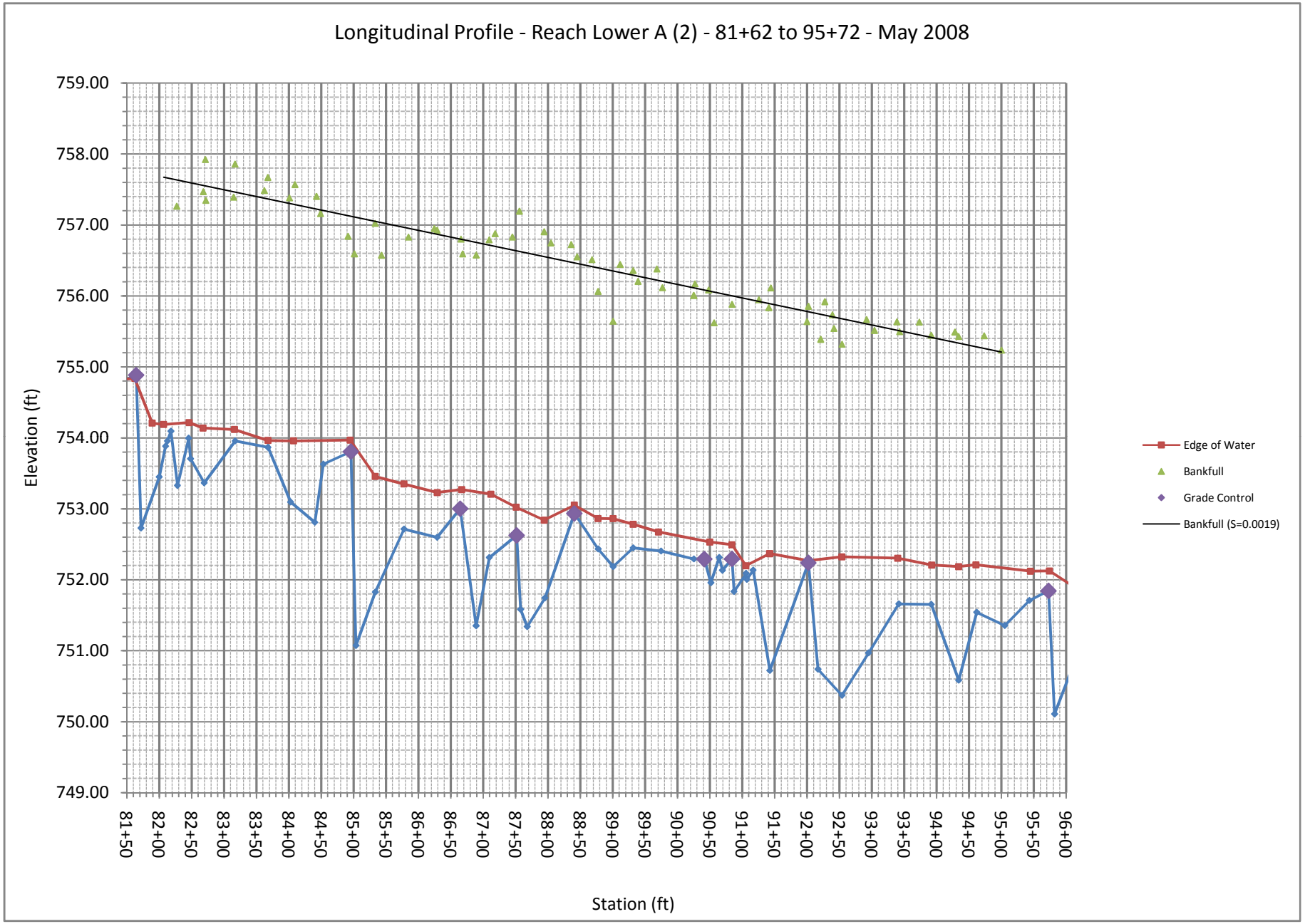
757.00
756.00
755.00
754.00
753.00
752.00
751.00
750.00
Elevation (ft)
72+00
72+50
73+00
73+50
74+00
74+50
75+00
75+50
76+00
76+50
77+00
77+50
78+00
78+50
79+00
79+50
80+00
Station (ft)
Edge of Water
Bankfull
Grade Control
Bankfull (S=0.0048)


Longitudinal Profile - Reach Lower A (2) - 81+62 to 95+72 - May 2008
Elevation (ft)
759.00
758.00
757.00
756.00
755.00
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752.00
751.00
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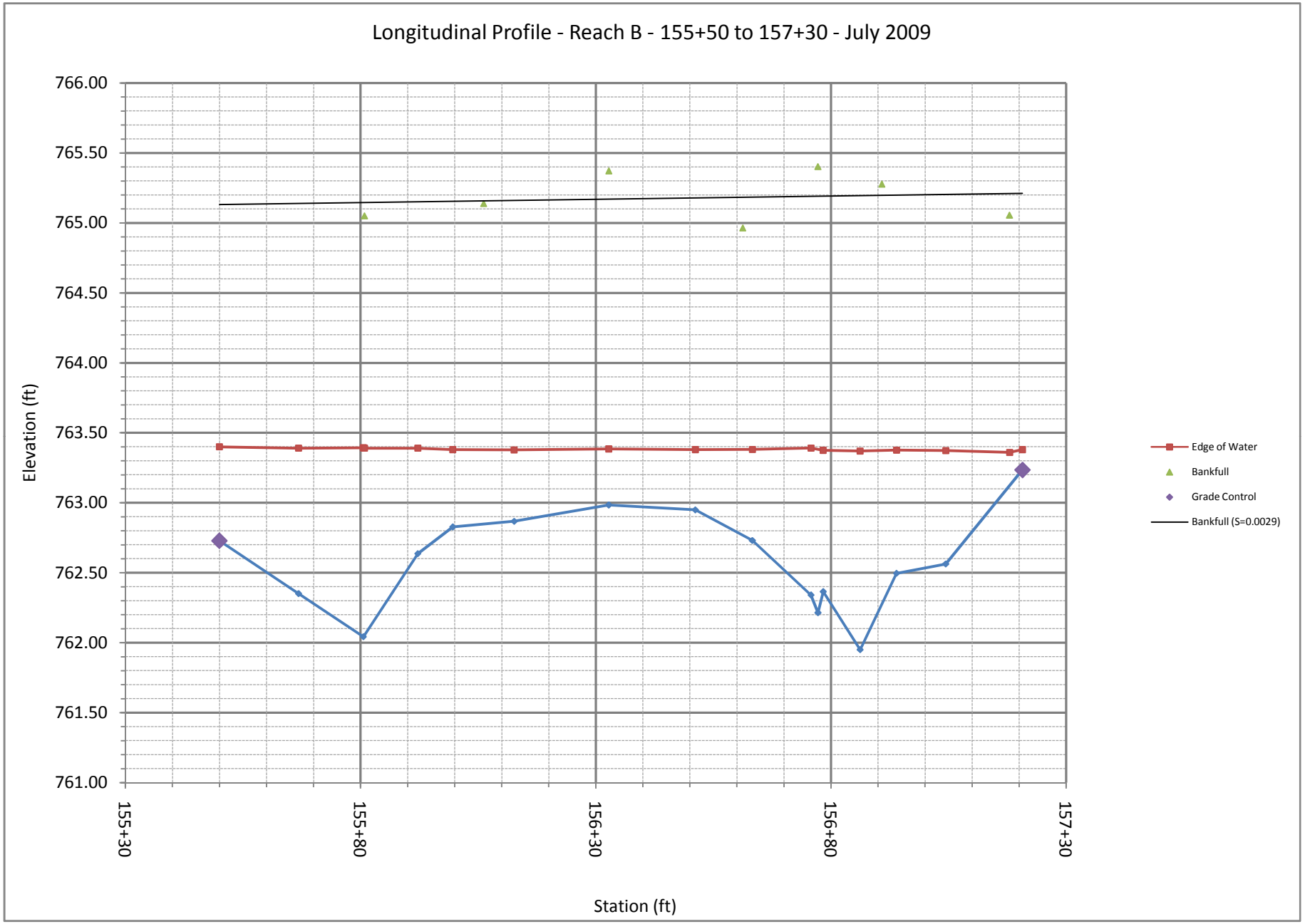
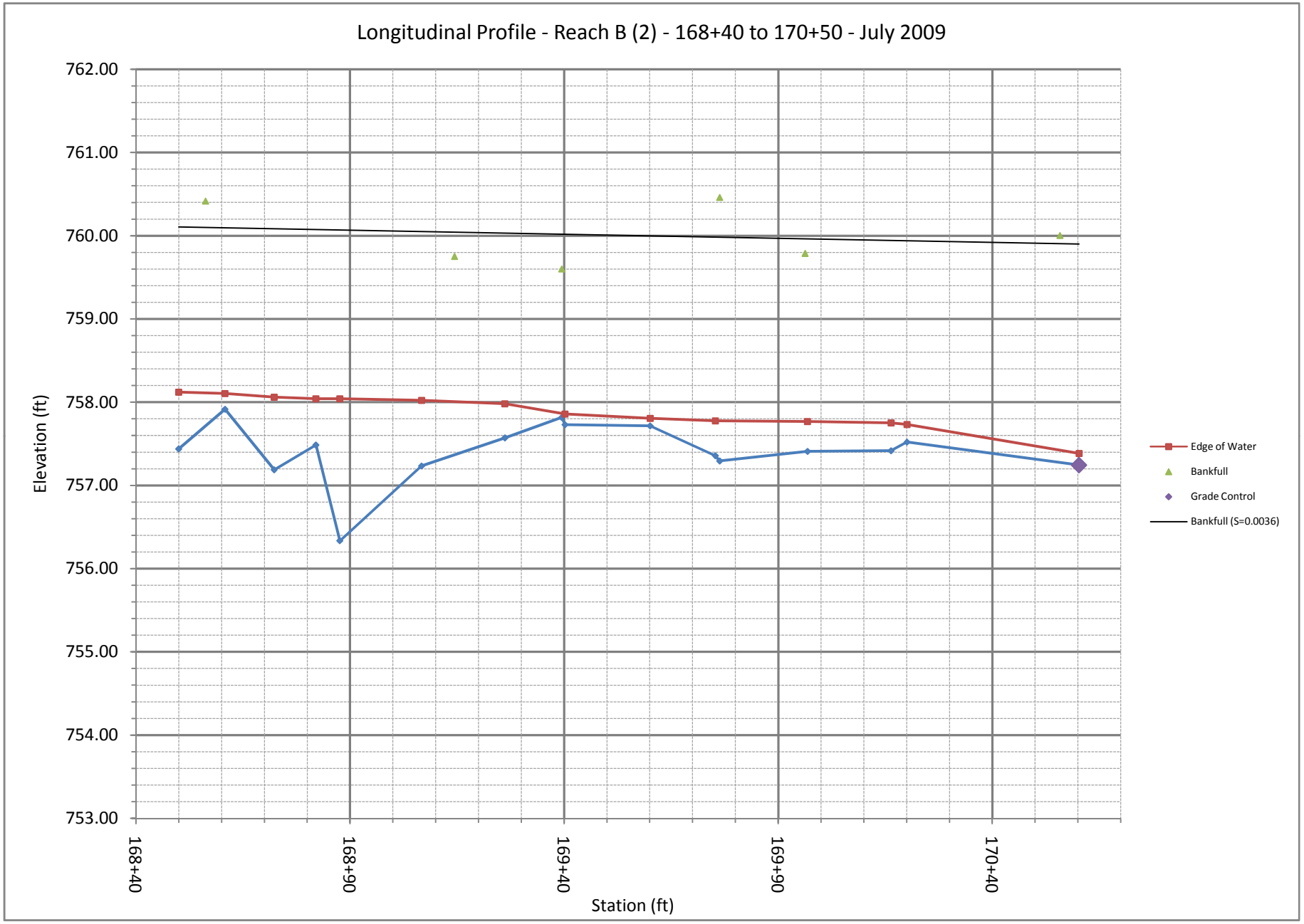
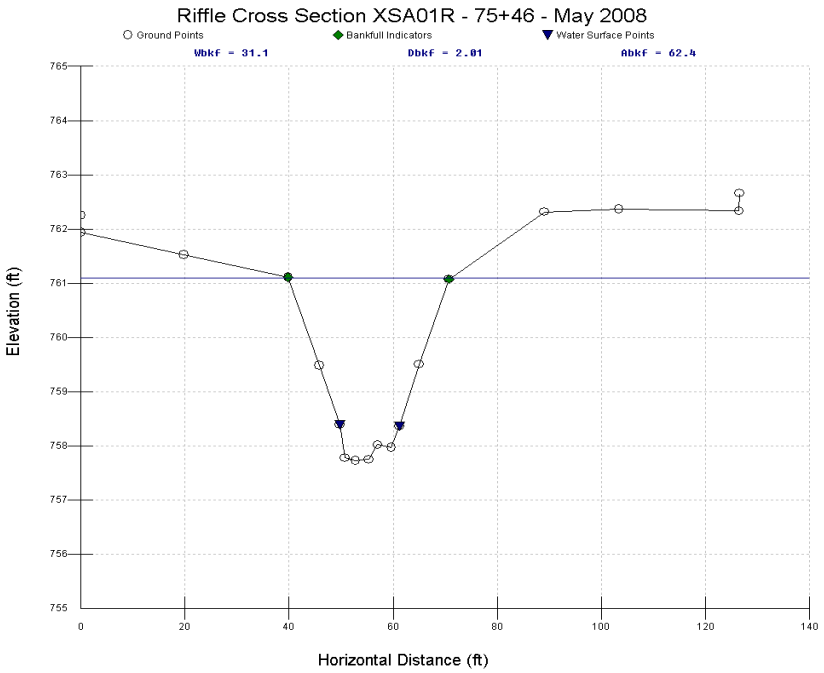
Station (ft)
Edge of Water
Bankfull
Grade Control
Bankfull (S=0.0019)


Longitudinal Profile - Reach B - 155+50 to 157+30 - July 2009
766.00
765.50
765.00
764.50
764.00
763.50
763.00
762.50
762.00
761.50
761.00
Elevation (ft)
155+30
155+80
156+30
156+80
157+30
Station (ft)
Edge of Water
Bankfull
Grade Control
Bankfull (S=0.0029)


Longitudinal Profile - Reach B (2) - 168+40 to 170+50 - July 2009
762.00
761.00
760.00
759.00
758.00
757.00
756.00
755.00
754.00
753.00
Elevation (ft)
168+40
168+90
169+40
169+90
170+40
Station (ft)
Edge of Water
Bankfull
Grade Control
Bankfull (S=0.0036)

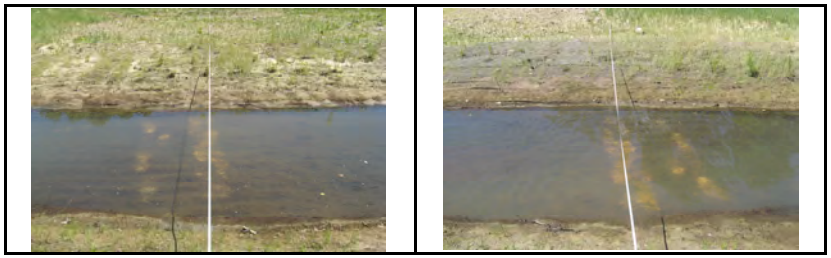

Longitudinal Profile - Reach C - 100+00 to 113+18 - May 2008
780.00
779.00
778.00
777.00
776.00
775.00
774.00
773.00
772.00
771.00
770.00
769.00
768.00
767.00
766.00
765.00
764.00
763.00
762.00
761.00
760.00
759.00
Elevation (ft)
100+00
105+00
110+00
115+00
Station (ft)
Thalweg
Edge of Water
Bankfull
Grade Control

Permanent Cross Sections



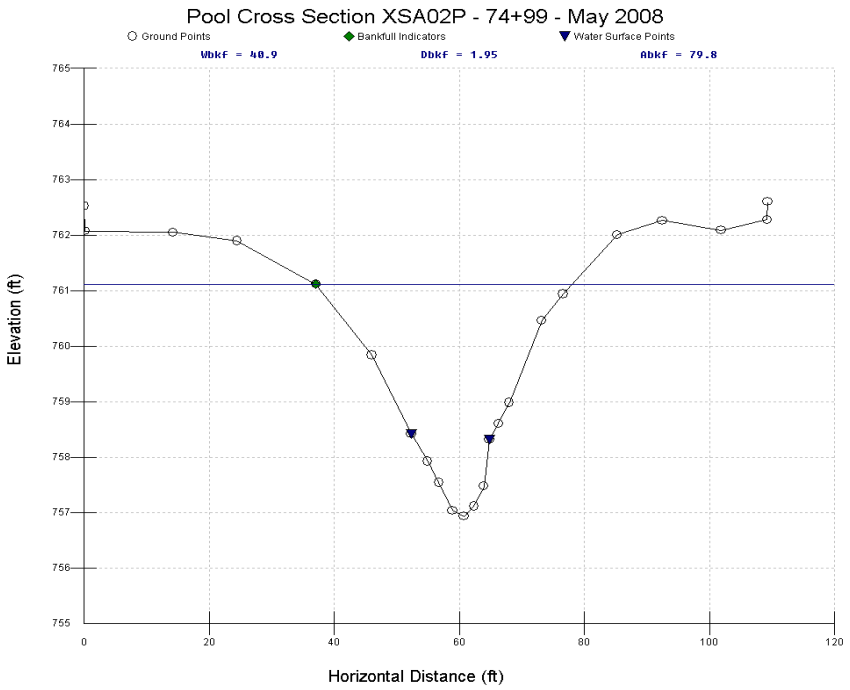
Upstream

Downstream



Left Bank

Right Bank

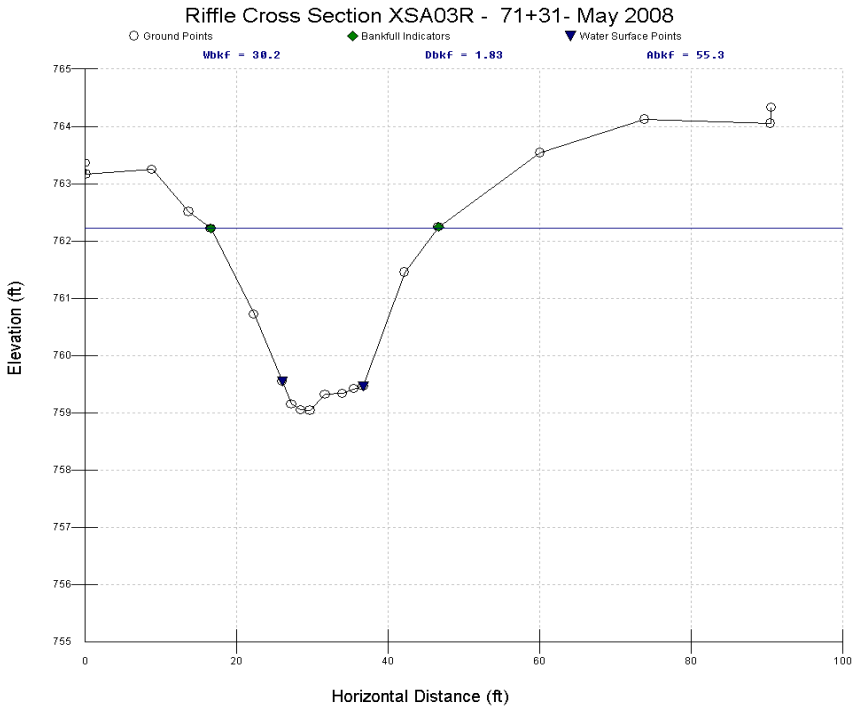


Upstream

Downstream

Left Bank

Right Bank

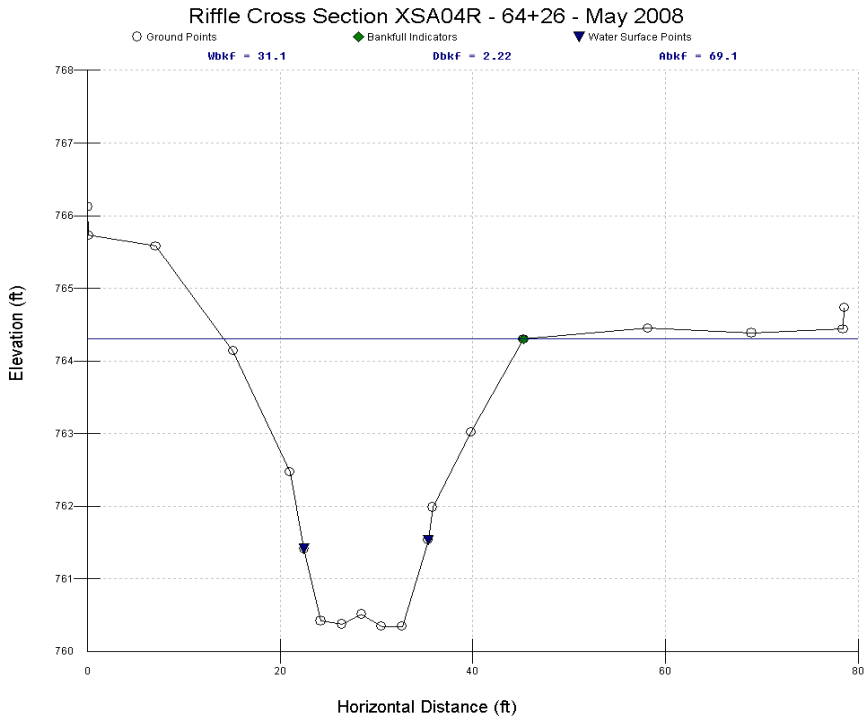


Upstream

Downstream

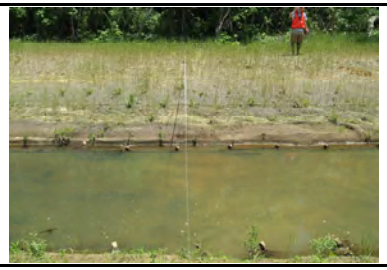
Left Bank

Right Bank



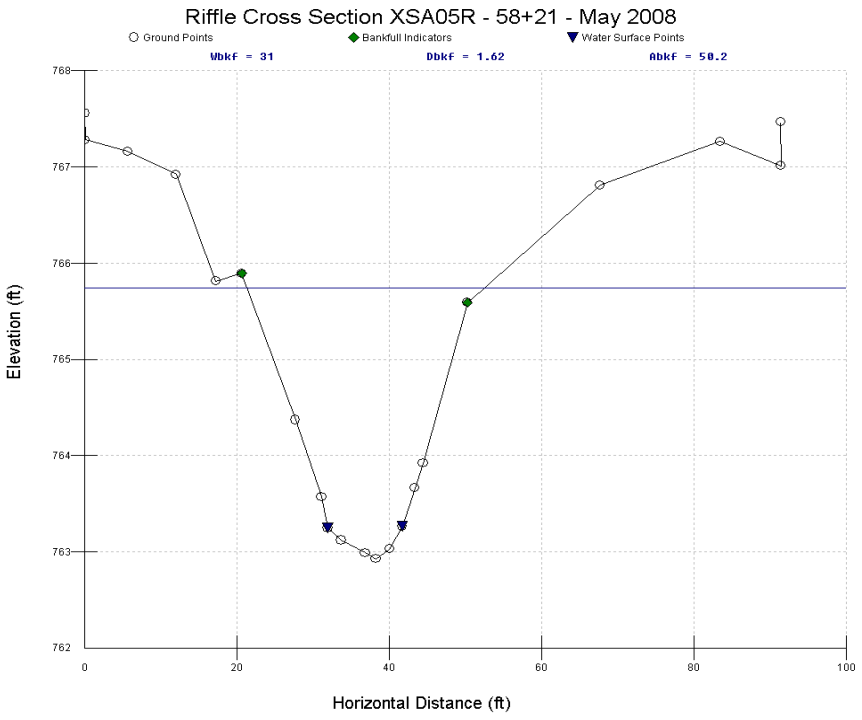
Upstream

Downstream



Left Bank

Right Bank

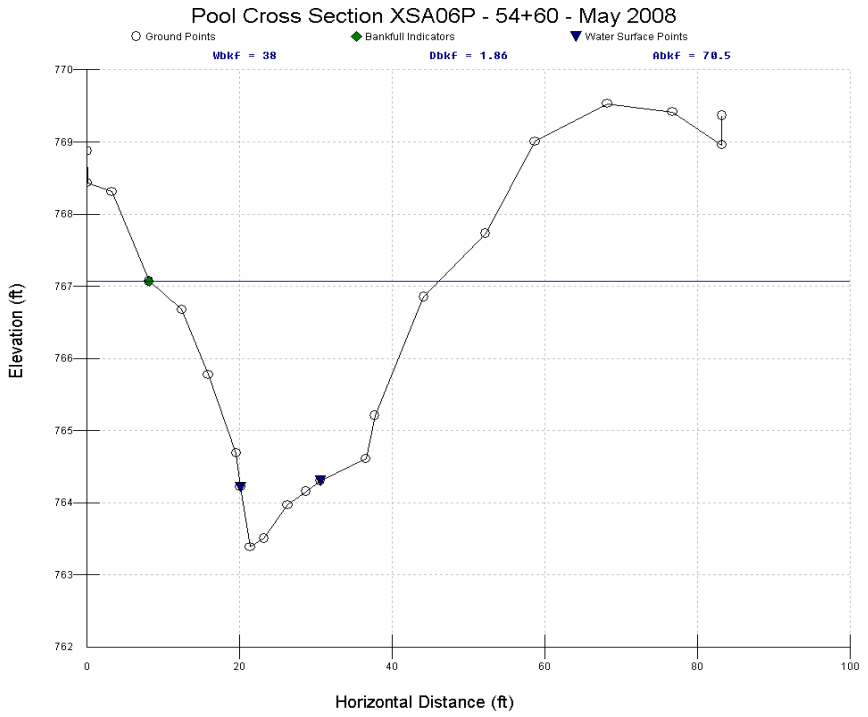


Upstream

Downstream

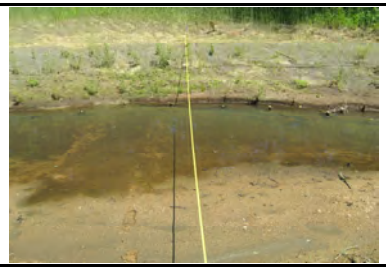
Left Bank

Right Bank



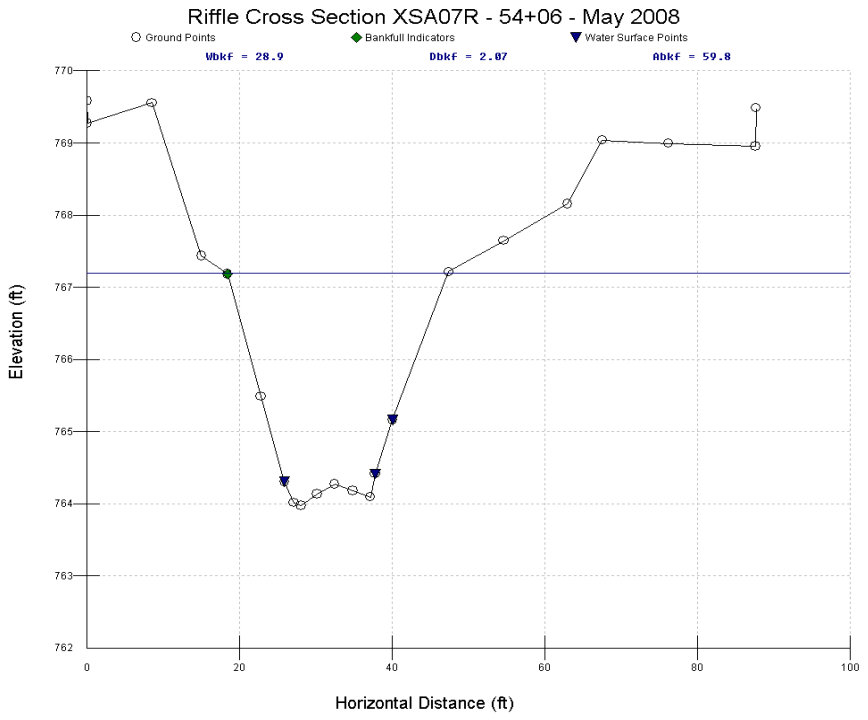
Upstream

Downstream



Left Bank

Right Bank

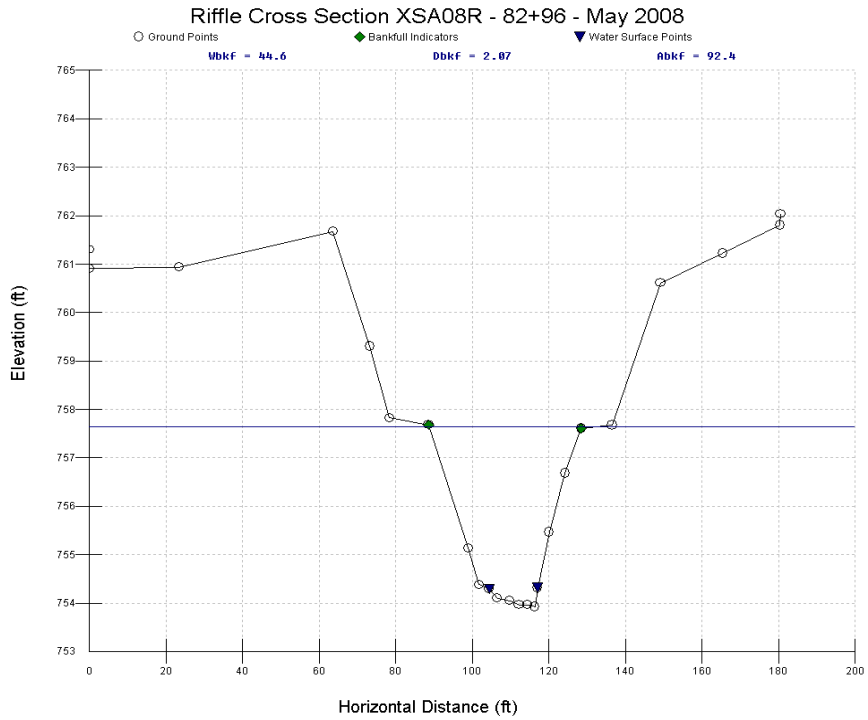


Upstream

Downstream

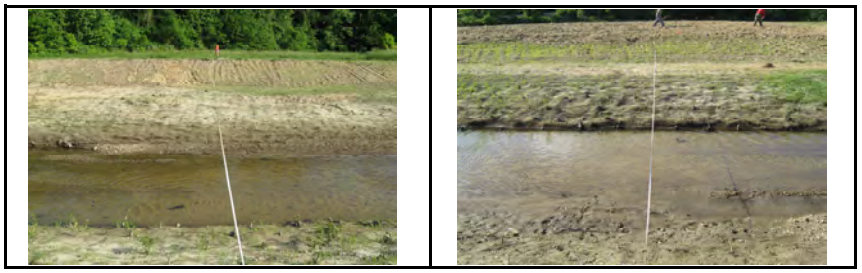
Left Bank

Right Bank



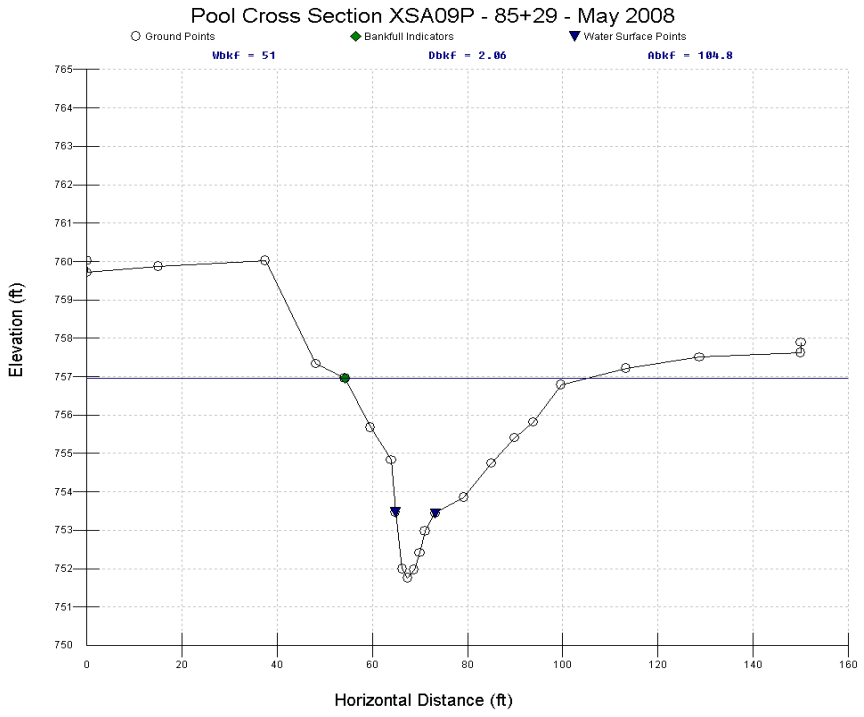
Upstream

Downstream



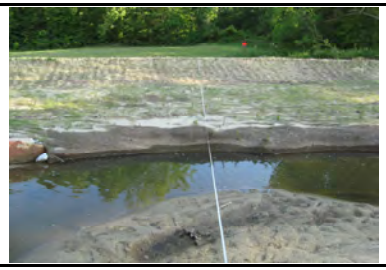
Left Bank

Right Bank



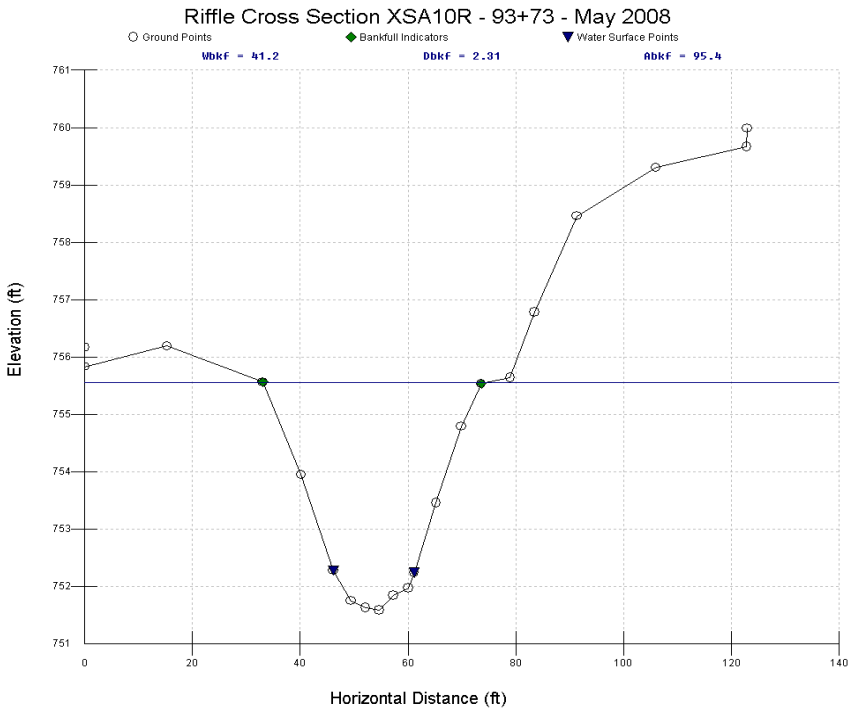
Upstream

Downstream



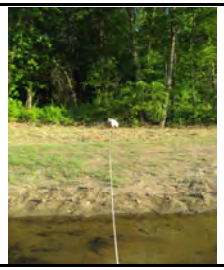
Left Bank

Right Bank

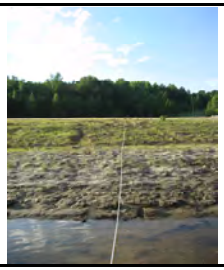


Upstream

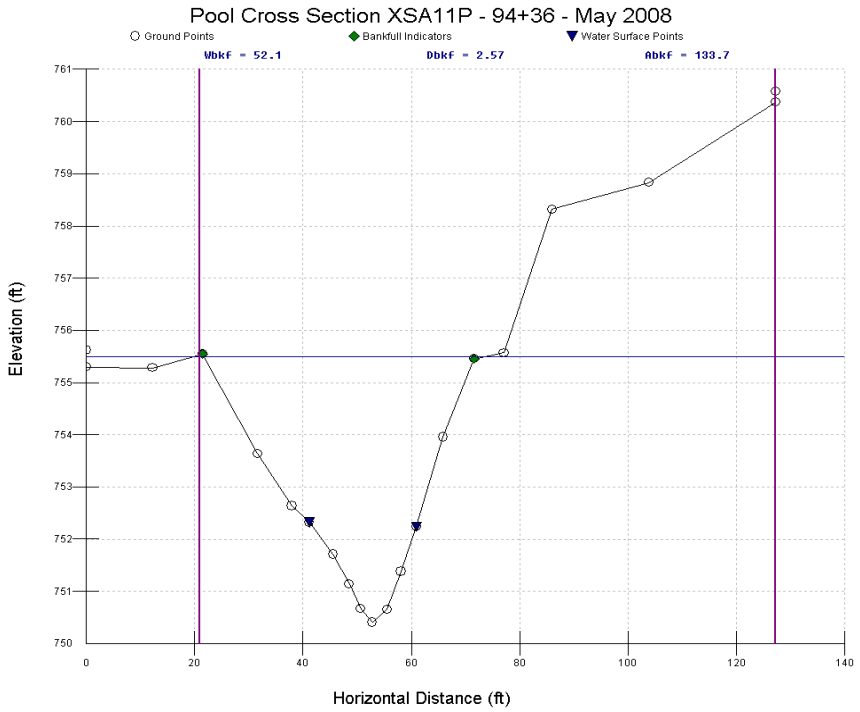
Downstream



Left Bank



Right Bank

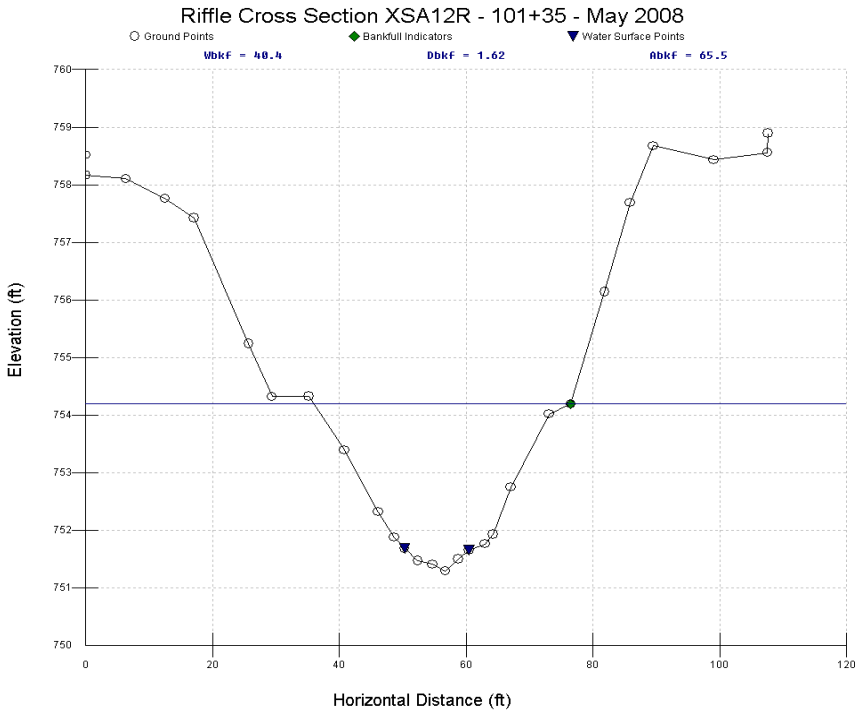


Upstream

Downstream

Left Bank

Right Bank

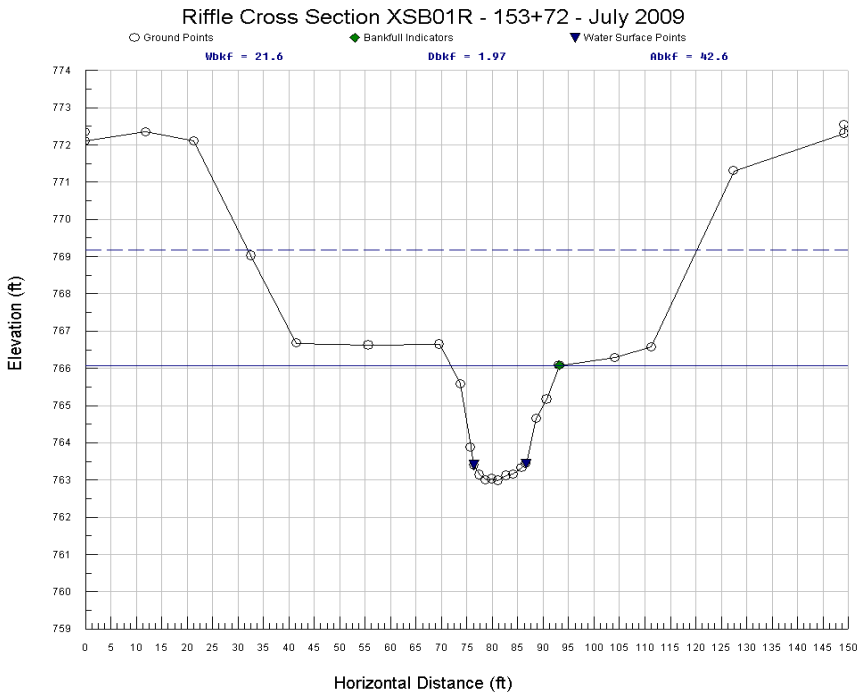


Upstream

Downstream

Left Bank

Right Bank

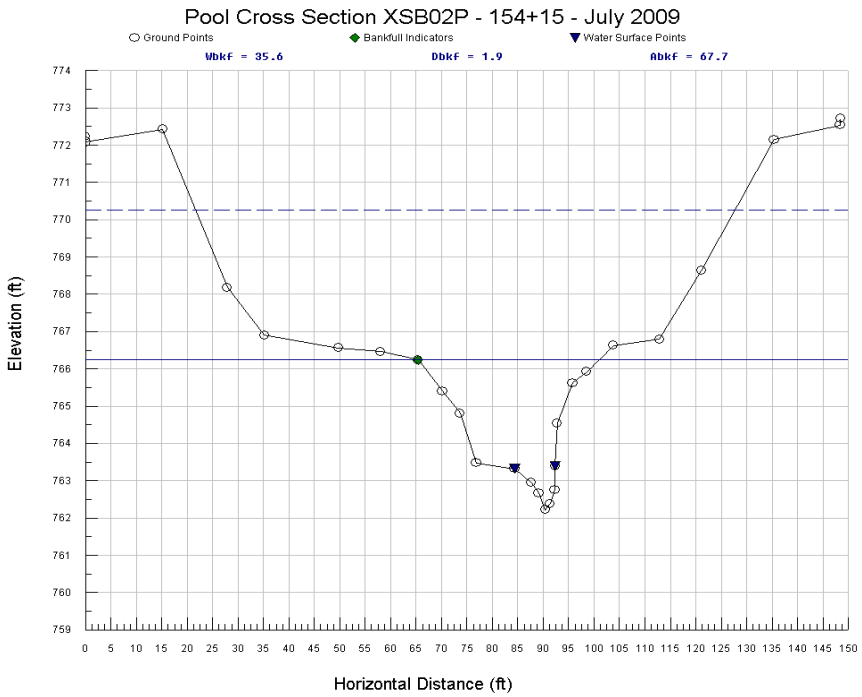


Left Bank

Right Bank

Upstream

Downstream

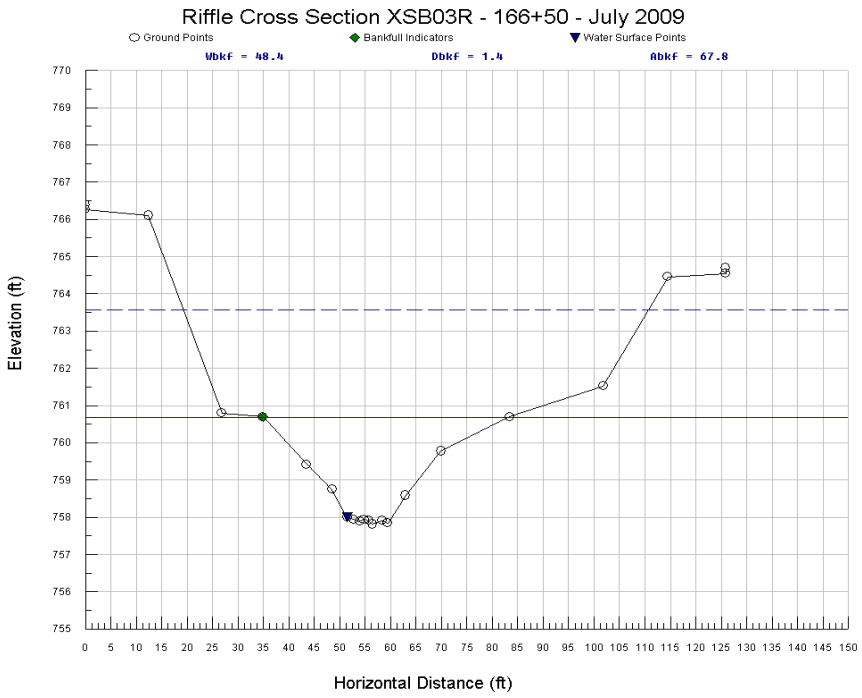


Upstream

Downstream

Left Bank

Right Bank

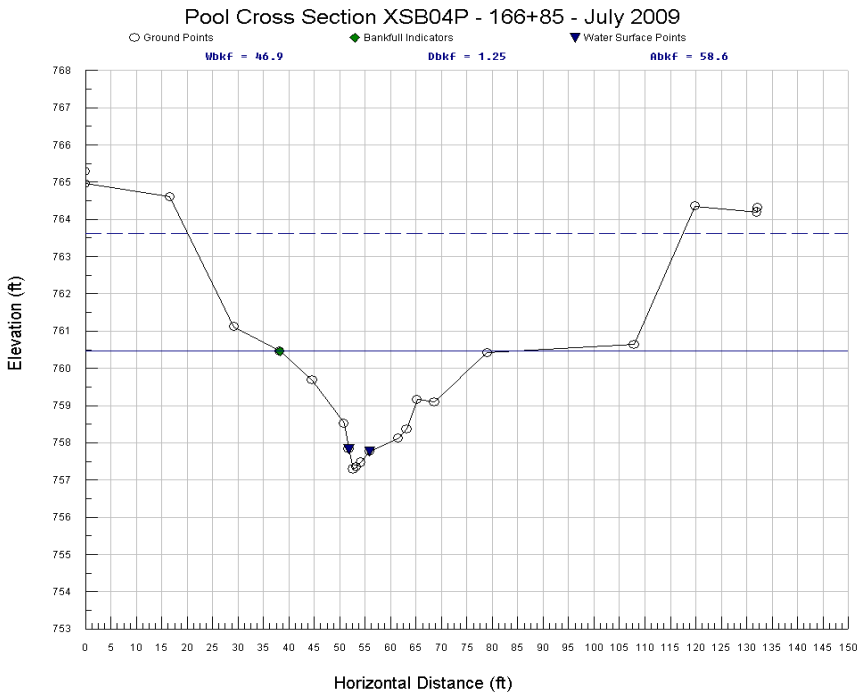


Left Bank

Right Bank

Upstream

Downstream

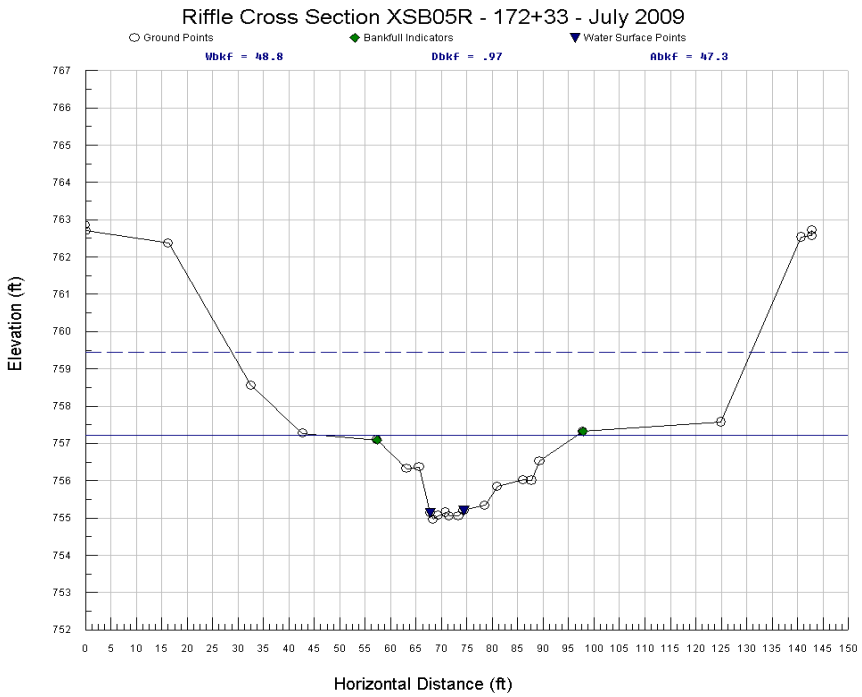


Upstream

Downstream

Left Bank

Right Bank

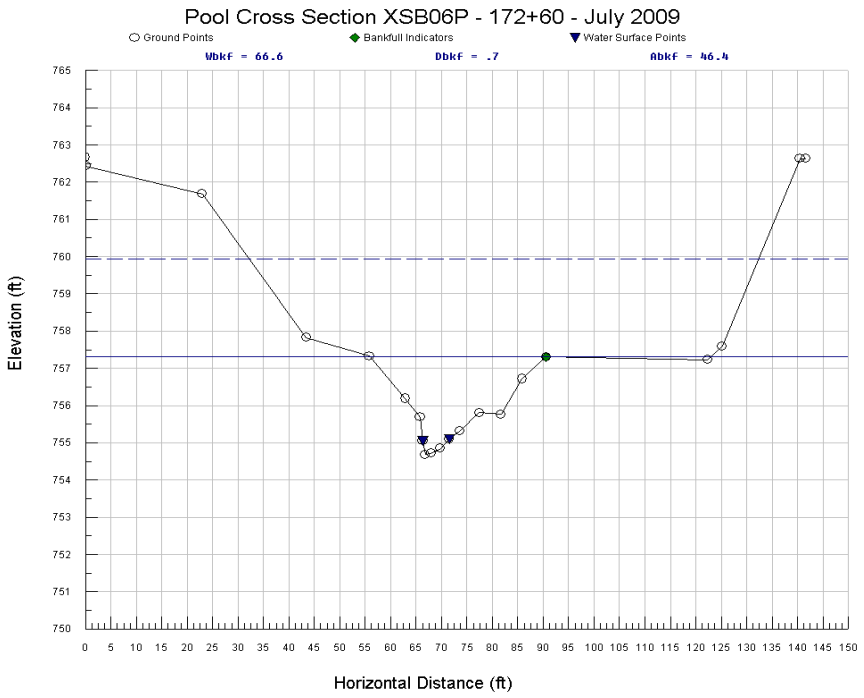


Upstream

Downstream

Left Bank

Right Bank

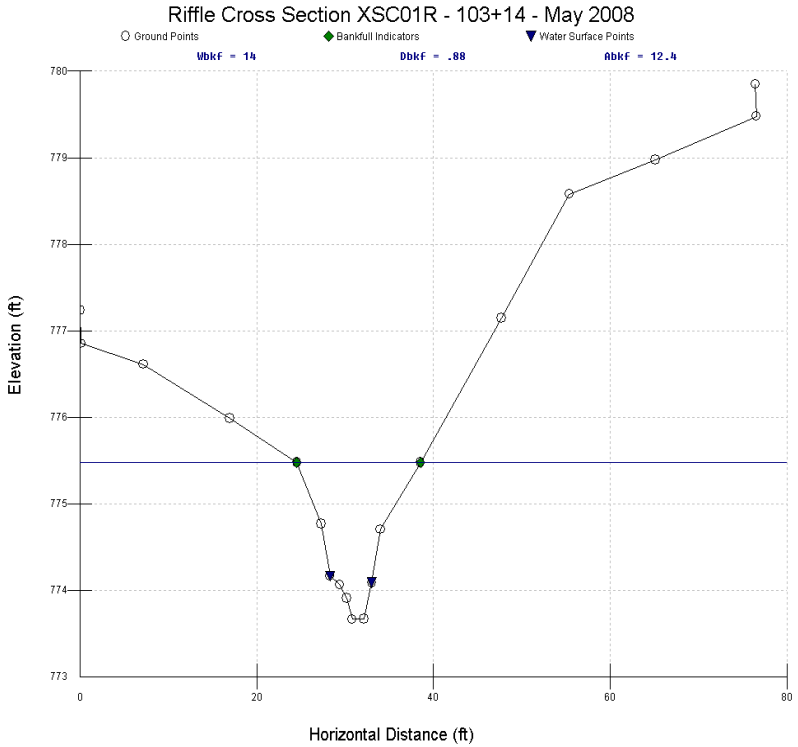


Left Bank

Right Bank

Upstream

Downstream

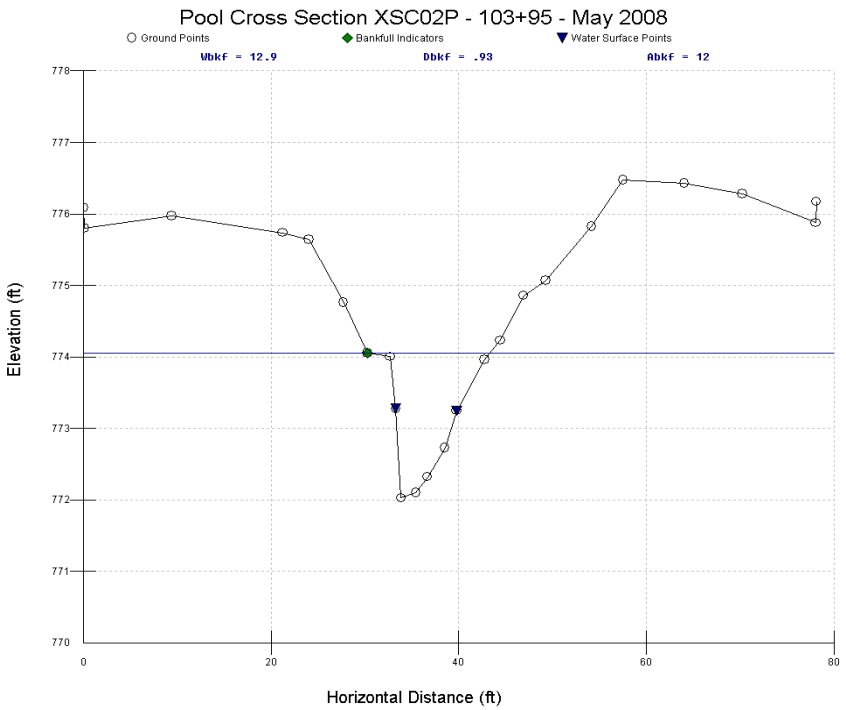


Upstream

Downstream

Left Bank

Right Bank

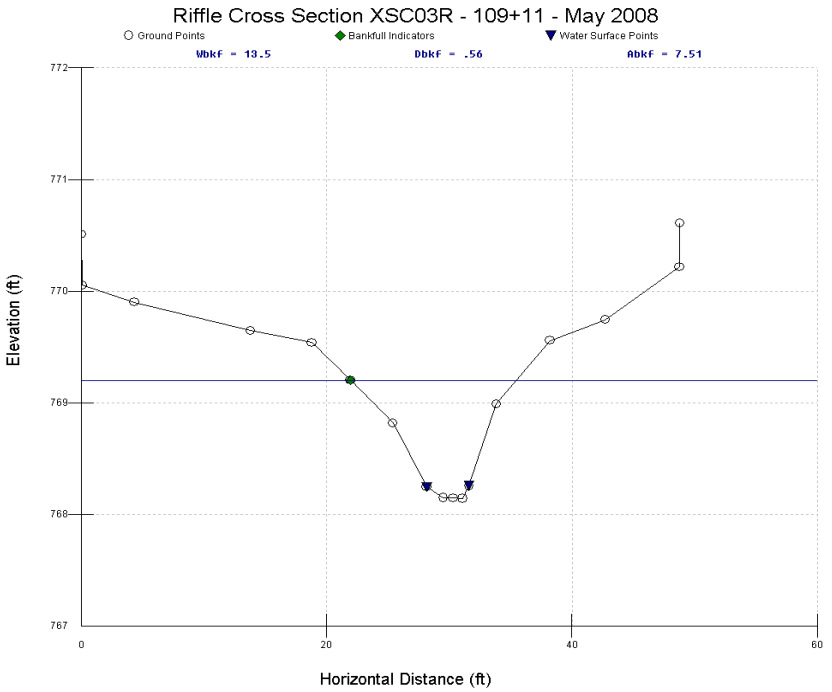


Upstream

Downstream

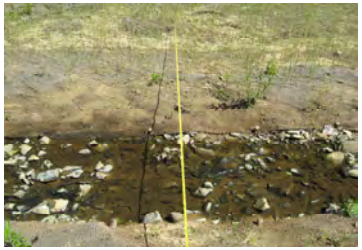
Left Bank

Right Bank



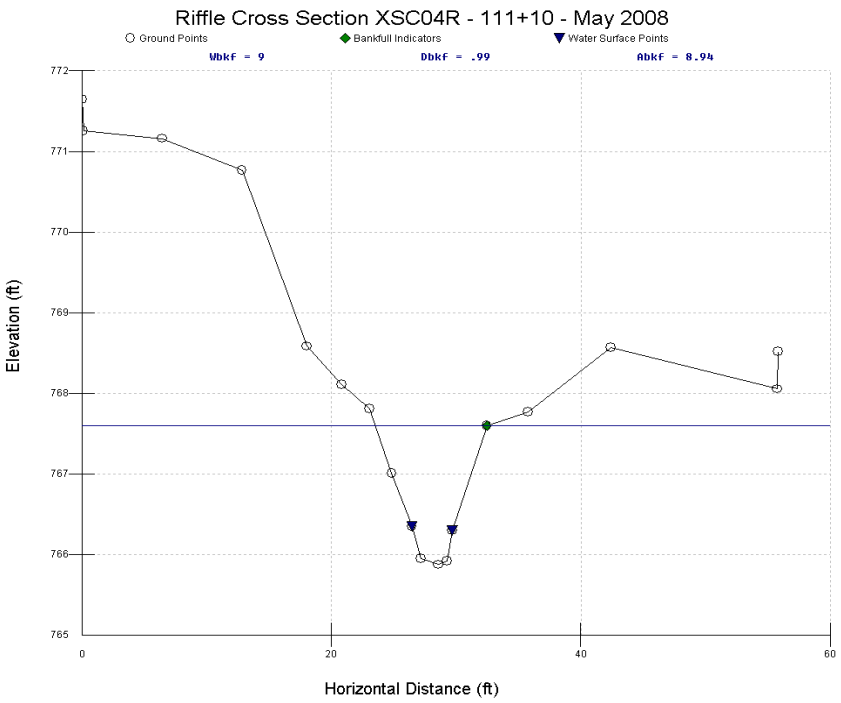
Upstream

Downstream



Left Bank

Right Bank



Upstream

Downstream

Left Bank

Right Bank

Vegetation Data

Stem counts for each species arranged by plot.

Valley Fields Farm/407

REACH A

Plots	1				2				3				4				5				6				7				8				9				10			
Year	2009				2008				2008				2008				2008				2008				2008				2008				2008				2008			
Species																																								
Liriodendron tulipera	1																1				1																			
Unknown	3				1				1								1								2												6			
Unidentified					3				3				6				8								1				3				4				6			
Alnus serrulata																																								
Betula nigra	1																																							
Carpinus caroliniana	2																																							
Quercus nigra																																								
Fraxinus pennsylvanica																	1																							
Cephalanthus occidentalis																																								
Crategeou crus-gali					1																																			
Sassafras albidum																																								
Quercus michauxii					1												1																							
Plantanus occidentalis									2				1								3				3															
Acer rubrum																	1								2								1							
Pinus echinata																																	1							
Acer negundo																																								
Total Stems	7	0	0	0	6	0	0	0	6	0	0	0	7	0	0	0	13	0	0	0	4	0	0	0	8	0	0	0	3	0	0	0	6	0	0	0	12	0	0	0
Plot Size (acres)	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247
Stems Per Acre	283	0	0	0	243	0	0	0	243	0	0	0	283	0	0	0	526	0	0	0	162	0	0	0	324	0	0	0	121	0	0	0	243	0	0	0	486	0	0	0
Stems Per acre Requirements	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260

Plots	11				12				13			
Year	2009				2008				2008			
Species												
Liriodendron tulipera									1			
Unknown	10				10				4			
Unidentified	1								2			
Alnus serrulata												
Betula nigra												
Carpinus caroliniana												
Quercus nigra												
Fraxinus pennsylvanica					1							
Cephalanthus occidentalis												
Crategeou crus-gali												
Sassafras albidum												
Quercus michauxii												
Plantanus occidentalis												
Acer rubrum												
Ilex opaca					1							
Acer negundo									1			
Total Stems	11	0	0	0	12	0	0	0	8	0	0	0
Plot Size (acres)	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247
Stems Per Acre	445	0	0	0	486	0	0	0	324	0	0	0
Stems Per acre Requirements	260	260	260	260	260	260	260	260	260	260	260	260

Stem counts for each species arranged by plot.

Valley Fields Farm/407

REACH B

Plots	1				2				3				4				5				6				7			
Year	2009				2009				2009				2009				2009				2009				2009			
Species																												
Liriodendron tulipera	4																								1			
Unknown	2				3																1				2			
Alnus serrulata									1								1											
Betula nigra	3								2								4								4			
Carpinus caroliniana	1				1				2				1												1			
Quercus nigra									1																1			
Fraxinus pennsylvanica									2																1			
Cephalanthus occidentalis					4								2				2								2			
Total Stems	10	0	0	0	8	0	0	0	8	0	0	0	3	0	0	0	7	0	0	0	1	0	0	0	12	0	0	0
Plot Size (acres)	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247
Stems Per Acre	405	0	0	0	324	0	0	0	324	0	0	0	121	0	0	0	283	0	0	0	40	0	0	0	486	0	0	0
Stems Per acre Requirements	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260

Stem counts for each species arranged by plot.

Valley Fields Farm/407

REACH C

Plots	1				2				3			
Year	2008				2008				2008			
Species												
Liriodendron tulipera	1											
Unknown	5								2			
Unidentified	4				8				5			
Alnus serrulata												
Betula nigra												
Carpinus caroliniana												
Quercus nigra												
Fraxinus pennsylvanica	1								1			
Cephalanthus occidentalis												
Crategeou crus-gali												
Sassafras albidum												
Quercus michauxii					1							
Plantanus occidentalis					1							
Acer rubrum												
Pinus echinata												
Salix nigra												
Total Stems	11	0	0	0	10	0	0	0	8	0	0	0
Plot Size (acres)	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247
Stems Per Acre	445	0	0	0	405	0	0	0	324	0	0	0
Stems Per acre Requirements	260	260	260	260	260	260	260	260	260	260	260	260

Stem counts for each species arranged by plot.

Valley Fields Farm/407

REACH D

Plots	**1**				**2**			
Year	2009				2009			
Species								
Liriodendron tulipera	1							
Unknown	3				1			
Alnus serrulata					2			
Betula nigra								
Carpinus caroliniana								
Quercus nigra								
Fraxinus pennsylvanica								
Cephalanthus occidentalis								
Total Stems	4	0	0	0	3	0	0	0
Plot Size (acres)	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247
Stems Per Acre	162	0	0	0	121	0	0	0
Stems Per acre Requirements	260	260	260	260	260	260	260	260

Stem counts for each species arranged by plot.

Valley Fields Farm/407

WETLAND

Plots	**1**				**2**				**3**				**4**			
Year	2008				2008				2008				2008			
Species																
Liriodendron tulipera													1			
Unknown	3								4				4			
Unidentified	4				4				5							
Alnus serrulata																
Betula nigra																
Carpinus caroliniana																
Quercus nigra																
Fraxinus pennsylvanica																
Cephalanthus occidentalis																
Crategeou crus-gali																
Sassafras albidum																
Quercus michauxii																
Plantanus occidentalis																
Acer rubrum																
Pinus echinata																
Salix nigra																
Ulmus americana																
Cornus amomum	1				3								1			
Ilex opaca					1											
Total Stems	8	0	0	0	8	0	0	0	9	0	0	0	6	0	0	0
Plot Size (acres)	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247	0.0247
Stems Per Acre	324	0	0	0	324	0	0	0	364	0	0	0	243	0	0	0
Stems Per acre Requirements	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260

Permanent Monitoring Photographs

Photo Page 1

Monitoring Photo PA01: Looking downstream (July 1, 2008)

Monitoring Photo PA02: Looking downstream (July 1, 2008)

Photo Page 2

Monitoring Photo PA03: Looking upstream (July 1, 2008)

Monitoring Photo PA04: Looking upstream, where Reach C joins Reach A (July 1, 2008)

Photo Page 3

Monitoring Photo PA05: Looking downstream (July 1, 2008)

Monitoring Photo PA06: Looking at right bank(July 1, 2008)

Photo Page 4

Monitoring Photo PA07: Looking at right bank (July 1, 2008)

Monitoring Photo PA08: Looking downstream (July 1, 2008)

Photo Page 5

Monitoring Photo PA09: Looking at right bank (July 1, 2008)

Monitoring Photo PA10: Looking at left bank (July 9, 2009)

Photo Page 6

Monitoring Photo PA13: Looking upstream (July 9, 2009)

Monitoring Photo PA14: Looking upstream (July 1, 2008)

Monitoring Photo PA11: Looking upstream, where Reach B joins Reach A (July 9, 2009)

Monitoring Photo PA12: Looking downstream (July 1, 2008)

Monitoring Photo PA13: Looking downstream (July 1, 2008)

Monitoring Photo PA14: Looking at left bank (July 1, 2008)

Photo Page 9

Monitoring Photo PA15: Looking downstream (July 1, 2008)

Monitoring Photo PA16: Looking downstream (July 1, 2008)

Monitoring Photo PA17: Looking downstream (July 1, 2008)

Monitoring Photo PB01: Looking towards road (July 9, 2009)

Monitoring Photo PB02: Looking upstream (July 9, 2009)

Monitoring Photo PB03: Looking downstream (July 9, 2009)

Monitoring Photo PB04: Looking upstream (July 9, 2009)

Monitoring Photo PB05: Looking across stream (July 9, 2009)

Monitoring Photo PB06: Looking downstream (July 9, 2009)

Monitoring Photo PB07: Looking across stream (July 9, 2009)

Monitoring Photo PB08: Looking downstream (July 9, 2009)

Monitoring Photo PB09: Looking downstream (July 9, 2009)

Monitoring Photo PB10: Looking downstream, where Reach B joins Reach A (July 9, 2009)

Monitoring Photo PB11: Looking upstream (July 9, 2009)

Monitoring Photo PC01: Looking downstream (July 1, 2008)

Monitoring Photo PC02: Looking upstream (July 1, 2008)

Monitoring Photo PC03: Looking upstream (July 1, 2008)

Monitoring Photo PC04: Looking downstream (July 1, 2008)

Monitoring Photo PC05: Looking upstream (July 1, 2008)

Monitoring Photo PC06: Looking upstream (July 1, 2008)

Monitoring Photo PD01: Looking downstream (July 9, 2009)

Monitoring Photo PD02: Looking upstream (July 9, 2009)

Vegetation Quad Photographs

Photo Page 1

Vegetation Quad Photo VQA1: Looking into Quad from Origin (July 9, 2009)

Vegetation Quad Photo VQA2: Looking into Quad from Origin (June 19, 2008)

Photo Page 2

Vegetation Quad Photo VQA3: Looking into Quad from Origin (July 1, 2008)

Vegetation Quad Photo VQA4: Looking into Quad from Origin (July 1, 2008)

Photo Page 3

Vegetation Quad Photo VQA5: Looking into Quad from Origin (July 1, 2008)

Vegetation Quad Photo VQA6: Looking into Quad from Origin (July 1, 2008)

Photo Page 4

Vegetation Quad Photo VQA7: Looking into Quad from Origin (July 1, 2008)

Vegetation Quad Photo VQA8: Looking into Quad from Origin (June 19, 2008)

Photo Page 5

Vegetation Quad Photo VQA9: Looking into Quad from Origin (June 19, 2008)

Vegetation Quad Photo VQA10: Looking into Quad from Origin (June 19, 2008)

Photo Page 6

Vegetation Quad Photo VQA11: Looking into Quad from Origin (July 1, 2008)

Vegetation Quad Photo VQA12: Looking into Quad from Origin (July 1, 2008)

Vegetation Quad Photo VQA13: Looking into Quad from Origin (July 1, 2008)

Vegetation Quad Photo VQB1: Looking into Quad from Origin (July 9, 2009)

Vegetation Quad Photo VQB2: Looking into Quad from Origin (July 9, 2009)

Vegetation Quad Photo VQB3: Looking into Quad from Origin (July 9, 2009)

Photo Page 9

Vegetation Quad Photo VQB4: Looking into Quad from Origin (July 9, 2009)

Vegetation Quad Photo VQB5: Looking into Quad from Origin (July 9, 2009)

Vegetation Quad Photo VQB6: Looking into Quad from Origin (July 9, 2009)

Vegetation Quad Photo VQB7: Looking into Quad from Origin (July 9, 2009)

Photo Page 11

Vegetation Quad Photo VQC1: Looking into Quad from Origin (July 1, 2008)

Vegetation Quad Photo VQC2: Looking into Quad from Origin (July 1, 2008)

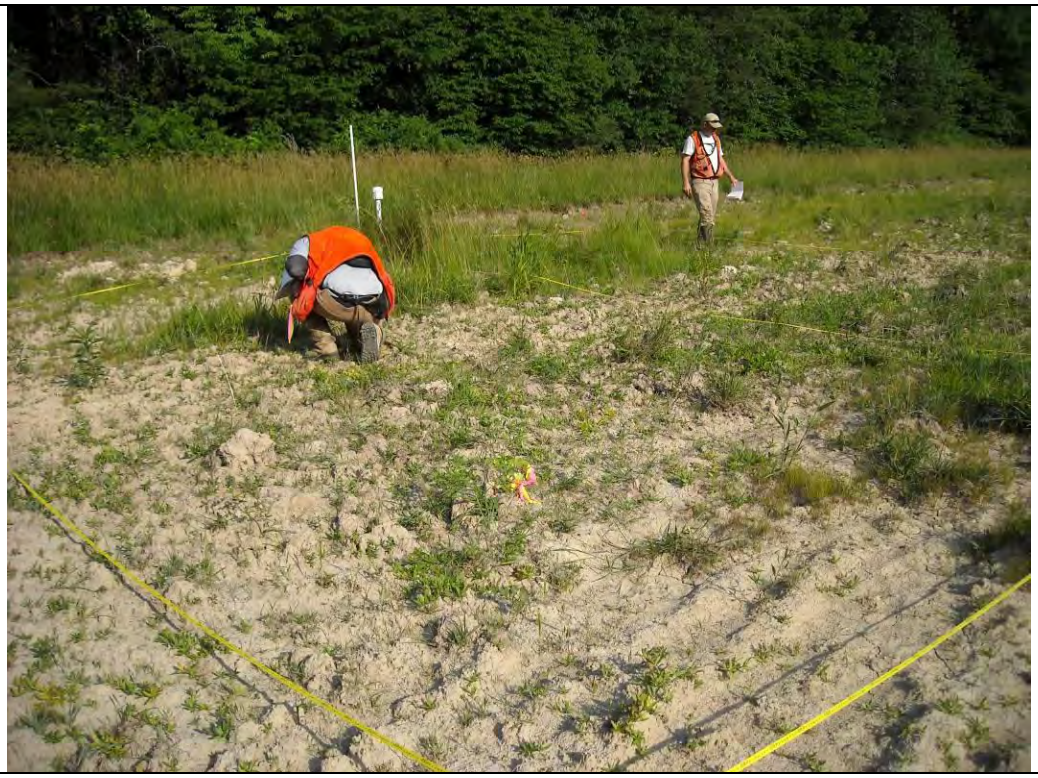
Vegetation Quad Photo VQC3: Looking into Quad from Origin (July 1, 2008)

Vegetation Quad Photo VQD1: Looking into Quad from Origin (July 9, 2009)

Photo Page 13

Vegetation Quad Photo VQD2: Looking into Quad from Origin (July 9, 2009)

Vegetation Quad Photo VQW1: Looking into Quad from Origin (June 19, 2008)



Vegetation Quad Photo VQW2: Looking into Quad from Origin (June 19, 2008)

Vegetation Quad Photo VQW3: Looking into Quad from Origin (June 19, 2008)

Photo Page 15

Vegetation Quad Photo VQW4: Looking into Quad from Origin (June 19, 2008)

Raw Data

		Elevation (ft)			
Reach	Station (ft)	Thalweg	Edge of Water	Bankfull	Grade Control
A	5000.00	763.78			
	5001.26		765.15		
	5043.65	765.07			x
	5044.39		765.22		
	5044.89		765.31		
	5053.25	763.90			
	5067.88			766.74	
	5071.39		764.65		
	5074.98	763.93		768.19	
	5075.58				
	5091.73			767.29	
	5100.22				
	5100.69		764.63		
	5100.95	764.28		767.75	
	5110.57			767.36	
	5165.67			767.59	
	5167.07		764.50		
	5167.17	764.16			
	5170.04				
	5172.28			767.56	
	5196.74			767.29	
	5206.32		764.48		
	5208.86				
	5208.92	763.66		767.07	
	5257.21			767.20	
	5257.61				
	5257.62		764.61		
	5257.81	764.23		767.22	
	5306.12				
	5308.47		764.48		
	5310.87	764.12		767.86	
	5343.80		764.35		
	5344.80	764.02		767.08	
	5355.14			766.89	
	5378.02	764.02			
	5378.45			767.10	
	5379.57		764.27		
	5381.67			766.80	
	5457.36			766.70	
	5465.42	763.26			
	5467.84		764.08		
	5468.43			766.91	
	5510.46			767.15	
	5511.14		763.62		
	5511.39				

	5512.12	763.63		767.16	x
	5523.40	761.59			
	5542.40			766.69	
	5544.27		763.28		
	5545.86	761.45		767.09	
	5548.21				
	5570.71			766.71	
	5580.44				
	5582.58	762.37		766.39	
	5610.63			766.60	
	5612.98	763.04			
	5613.01				
	5614.17				
	5615.55			766.35	
	5663.74			766.07	
	5667.15	762.75		766.16	
	5667.23		762.92		
	5668.41				
	5681.14			766.38	
	5688.76				
	5689.93	762.47		765.70	
	5709.21	762.58	762.97		
	5709.50			766.29	
	5710.07		763.03		
	5713.21			766.08	
	5762.82			765.88	
	5768.52	763.05			
	5769.01		763.08		
	5772.30			765.54	
	5807.56			765.92	
	5808.25				
	5808.92	763.02	763.04		
	5836.77	762.99			x
	5836.95			765.66	
	5837.20				
	5837.45				
	5838.20			765.43	
	5844.78	762.35			
	5882.27			764.80	
	5887.56		762.88		
	5890.02	761.94		765.61	
	5917.48			765.51	
	5918.73				
	5919.34	762.72			
	5920.31				
	5922.18			765.27	
	5961.89			765.39	

	5962.63		762.85		
	5963.87	762.69		764.63	
	6005.77	762.74		765.40	x
	6007.04				
	6008.47		762.94		
	6010.91			765.37	
	6014.43	762.49			
	6037.24				
	6037.77		762.70		
	6038.39	761.94		765.17	
	6100.28	762.50	762.89	765.23	
	6102.48				
	6108.02				
	6115.30			765.56	
	6115.71		762.82		
	6120.12	761.97			
	6133.28				
	6138.38	762.28			
	6141.84		762.73		
	6146.93	761.91			
	6147.41				
	6147.54				
	6170.23				
	6170.28		762.66		
	6170.95	762.25			
	6202.30				
	6203.84	761.37			
	6204.33		762.41		
	6205.20				
	6225.06	759.98		765.24	
	6237.38		762.27		
	6249.23		762.20		
	6252.88	759.39			
	6256.38			764.86	
	6269.11				
	6269.97			764.33	
	6275.63			765.00	
	6276.69				
	6277.11	762.01	762.21		
	6277.50				
	6280.46			764.11	
	6282.79				
	6313.45				
	6313.50			764.40	
	6313.68	761.62		764.40	x
	6314.31			764.26	
	6314.52		761.82		

	6320.60	758.91			
	6339.40			764.44	
	6340.82	759.44			
	6341.18		761.37		
	6343.65				
	6343.67			764.32	
	6363.67		761.23		
	6363.68			764.19	
	6366.95	758.46			
	6367.35				
	6368.01			764.16	
	6408.51				
	6408.60			764.28	
	6409.83	759.87		764.14	
	6410.85		761.15		
	6434.32	760.16		764.26	
	6436.83				
	6437.30			764.15	
	6484.03			764.03	
	6485.20	760.82		764.27	x
	6485.69		761.06		
	6485.73				
	6494.81	758.12			
	6523.35			763.32	
	6527.82				
	6531.02	760.26		763.75	
	6532.27		760.92		
	6563.07	759.26		763.75	
	6563.36				
	6564.69				
	6566.40			763.44	
	6604.74			763.01	
	6606.51	760.67			x
	6606.57		760.73		
	6607.93				
	6608.55				
	6613.00	757.75			
	6632.69			762.50	
	6633.56				
	6635.83	758.05		763.03	
	6687.59	759.64		763.37	
	6687.66				
	6689.46		760.40		
	6690.10			762.96	
	6735.40				
	6736.40	759.82	760.29	762.35	
	6738.28			763.26	

	6773.76			762.82	
	6774.91	760.07			x
	6775.33				
	6775.69		760.26		
	6776.35			763.01	
	6782.18	758.28			
	6811.94			762.46	
	6814.66		759.85		
	6819.00	758.14		762.83	
	6842.69			763.14	
	6844.51		759.76		
	6845.40	759.53			
	6845.80				
	6846.10			762.37	
	6891.56			762.79	
	6892.67				
	6892.90	759.25			
	6893.55				
	6893.62			762.69	
	6894.26			762.79	
	6937.21			762.74	
	6937.50				
	6938.26	759.64			
	6939.38		759.93		
	6940.64			762.87	
	6976.00				
	6976.22		759.85		
	6976.70			762.52	
	6977.52	759.10			
	6979.14			762.43	
	7019.97				
	7020.78	759.71	759.88	762.20	x
	7022.61			762.21	
	7030.15	757.54			
	7056.79		759.52		
	7058.03			762.20	
	7062.60	757.85			
	7063.14				
	7064.11			761.77	
	7107.52	758.70			
	7107.97				
	7109.11			762.25	
	7109.97			762.22	
	7110.49		759.25		
	7144.69		759.34		
	7145.57	759.28			x
	7154.80	757.39			

	7174.23				
	7177.59		758.96		
	7178.15	757.35			
	7178.21	757.36			
	7206.27				
	7207.67	758.93		761.29	
	7208.87				
	7216.74	757.71			
	7217.43		759.00		
	7254.80				
	7255.63	758.09	758.74	761.46	
	7297.42	758.46		761.53	x
	7297.42		758.72		
	7300.13				
	7310.93	756.16			
	7324.17			761.57	
	7324.22				
	7326.79	757.19			
	7330.34				
	7345.21	757.20	758.54		
	7347.34				
	7351.55			761.54	
	7382.34			761.13	
	7383.30				
	7384.69		758.36		
	7385.05	757.65			
	7426.65			761.31	
	7426.70		758.46		
	7426.76				
	7428.33	758.28			x
	7441.32	756.36			
	7472.35		758.24		
	7475.78	756.36		760.46	
	7517.93		758.05		
	7521.74	757.04		760.51	
	7522.79				
	7560.51			761.03	
	7564.76	757.10	757.85		x
	7565.17			760.89	
	7565.86				
	7574.65	755.82			
	7604.06			759.85	
	7608.44		757.67		
	7611.60	757.13			x
	7612.92				
	7615.43			760.52	
	7621.06	755.83			

	7644.90	756.20	757.22	760.11	
	7647.16				
	7651.17			760.04	
	7695.50			759.98	
	7697.09	756.81			x
	7697.83		757.02		
	7699.43			759.73	
	7710.55			759.64	
	7713.76			758.95	
	7720.22	754.60			
	7726.04				
	7726.95		756.36		
	7740.81			759.72	
	7744.61			759.35	
	7751.52				
	7753.59	754.86			
	7803.37	755.72	756.31	759.21	
	7803.70				
	7803.94			759.14	
	7850.33			758.59	
	7857.58		756.13		
	7858.01	756.01		759.10	x
	7858.49				
	7865.52	753.88			
	7886.33	754.25	755.93	759.08	
	7892.93				
	7894.84			758.13	
	7902.77				
	7903.65	755.73			
	7905.27				
	7911.40	755.03			
	7922.10			758.78	
	7922.58			757.73	
	7925.60	754.27			
	7928.53		755.74		
	7960.03				
	7960.58	755.43		758.71	
	7960.85		755.50		
	7962.82			758.22	
	7996.77				
	7997.46		755.68		
	7998.02	755.56			x
	8001.54			757.93	
	8003.12			757.45	
	8005.08	753.16			
	8019.29			757.18	
	8025.45				

	8027.77	753.56		758.06	
	8035.13				
	8037.27	753.88		758.25	
	8052.77			758.07	
	8056.88		755.01		
	8057.64				
	8057.95	754.07			
	8061.92			757.63	
	8103.65			757.78	
	8103.78	754.66	754.81	757.78	
	8104.78				
	8106.12			757.59	
	8154.41			757.52	
	8154.84				
	8155.63			757.48	
	8162.27		754.84		
	8163.80				
	8164.32	754.88			x
	8171.71	752.73			
	8185.05			756.87	
	8189.14		754.21		
	8191.38				
	8193.60				
	8199.93	753.45			
	8206.72		754.19		
	8209.64	753.88			
	8212.47	753.95			
	8212.56				
	8214.65				
	8217.99	754.09			
	8227.19			757.26	
	8227.61				
	8228.02	753.33			
	8245.31	753.99			
	8246.05		754.22		
	8248.26	753.70			
	8248.35				
	8267.58		754.14		
	8268.20			757.47	
	8269.25	753.37			
	8271.33			757.92	
	8272.02			757.35	
	8315.01			757.39	
	8316.06		754.12		
	8317.15	753.96		757.86	
	8317.63				
	8362.37			757.48	

	8367.79	753.87	753.96	757.67	x
	8401.18			757.38	
	8401.55				
	8402.65	753.09			
	8407.43		753.96		
	8409.63			757.57	
	8440.09	752.81			
	8440.20				
	8440.84				
	8442.81			757.40	
	8449.10			757.16	
	8453.30	753.63			
	8454.23				
	8456.58				
	8491.51			756.84	
	8494.76		753.97		
	8495.83	753.81			x
	8496.26				
	8501.42			756.59	
	8503.63	751.07			
	8514.44				
	8529.30				
	8533.47	751.83	753.46	757.02	
	8543.20			756.57	
	8577.77	752.71	753.35		
	8579.86				
	8584.86			756.83	
	8624.68			756.95	
	8627.15				
	8628.97	752.60	753.23	756.92	
	8664.57	753.00			x
	8665.86			756.80	
	8666.80		753.27		
	8668.45			756.59	
	8689.04	751.35			
	8689.33			756.57	
	8709.34	752.31		756.79	
	8711.75		753.21		
	8718.61			756.88	
	8745.16			756.83	
	8749.21				
	8751.09		753.02		
	8751.68	752.63			
	8755.43				
	8756.07			757.19	
	8757.70	751.58			
	8760.29				

	8767.92	751.34			
	8794.16		752.84		
	8794.18			756.90	
	8795.24	751.74			
	8798.95				
	8804.72			756.75	
	8835.95			756.72	
	8840.67	752.93			
	8840.86		753.05		
	8841.78				
	8845.09			756.55	
	8868.11			756.51	
	8877.47	752.43	752.86	756.06	
	8900.62	752.19	752.86	755.64	
	8911.49			756.44	
	8931.51	752.45	752.78	756.36	
	8939.12			756.20	
	8968.26			756.38	
	8970.77		752.67		
	8974.44	752.40			
	8976.77			756.11	
	9025.03			756.01	
	9025.17	752.29		756.01	
	9027.01			756.17	
	9041.41	752.29			x
	9048.07			756.08	
	9049.84		752.53		
	9051.49	751.96			
	9052.30				
	9056.54			755.62	
	9064.38	752.31			
	9066.25				
	9068.42				
	9069.23	752.13			
	9084.16	752.29	752.49	755.88	
	9087.12	751.83			
	9087.64				
	9105.64		752.20		
	9105.72	752.09			
	9106.99	752.00			
	9107.89				
	9116.69	752.13			
	9125.72			755.94	
	9140.96			755.83	
	9140.96				
	9142.17		752.37		
	9142.41	750.72			

	9142.51		752.37		
	9144.09			756.11	
	9200.01			755.64	
	9200.93				
	9202.08	752.24	752.27	755.85	x
	9216.81	750.74			
	9220.37				
	9221.07			755.39	
	9227.41			755.92	
	9239.14			755.73	
	9239.46				
	9241.45			755.54	
	9242.66				
	9248.95				
	9251.72				
	9253.92	750.37	752.32	755.32	
	9255.29				
	9256.66				
	9289.84				
	9291.78			755.67	
	9293.80				
	9294.81	750.97			
	9303.97			755.51	
	9338.66			755.63	
	9340.05		752.30		
	9341.45				
	9341.57	751.66			
	9342.80			755.50	
	9373.24			755.63	
	9391.63				
	9391.69	751.65		755.45	
	9392.40		752.21		
	9428.17			755.49	
	9431.88				
	9433.94	750.58	752.18	755.43	
	9460.63		752.21		
	9461.82	751.54			
	9461.97				
	9465.22				
	9473.34			755.44	
	9500.03			755.24	
	9501.35				
	9505.04	751.35			
	9505.95				
	9508.53			755.37	
	9542.18				
	9543.02	751.71			

	9544.19			755.23	
	9544.54			755.10	
	9545.10		752.12		
	9572.82	751.84			x
	9573.18				
	9573.85			754.95	
	9574.16		752.12		
	9577.13			755.39	
	9582.03	750.11			
	9595.59				
	9617.23			755.07	
	9620.54				
	9621.26	751.05			
	9623.81		751.83		
	9625.69			755.12	
	9672.75				
	9673.07	751.50			
	9673.16		751.95		
	9673.48			754.43	
	9675.11			754.55	
	9721.83	751.48		754.45	
	9722.77		751.78		
	9724.35			754.63	
	9755.33	750.51		754.58	
	9759.55		751.70		
	9765.03			754.81	
	9802.58			754.79	
	9806.80	750.32			
	9807.57				
	9807.59			754.54	
	9808.10		751.72		
	9869.47			754.29	
	9870.75				
	9873.18		752.03		
	9873.26	751.37		754.58	
	9924.55			754.51	
	9927.83	751.36		754.55	
	9927.90				
	9932.22		751.92		
	9932.93				
	9948.83			754.20	
	9955.75		751.92		
	9958.17			754.24	
	9960.03				
	9960.57	751.58			
	9966.21				
	9987.93			754.39	

	9989.21				
	9989.29	751.45			x
	9993.00				
	9994.72			753.45	
	9997.76	749.18		754.49	
	10001.84			754.24	
	10025.86	749.67		754.13	
	10028.00		751.54		
	10029.83			753.68	
	10053.72			754.05	
	10055.57		751.61		
	10059.62	750.54		754.04	
	10135.03			754.12	
	10135.47		751.60		
	10135.60	751.12		754.16	
	10135.77				
	10135.84		751.60		
	10136.07			754.12	
	10178.82			754.21	
	10180.25				
	10180.99	751.14			x
	10182.10			754.09	
	10182.10		751.38		
	10192.08	749.72			
	10206.08				
	10206.25			753.76	
	10207.57		751.37		
	10209.05	750.38			
	10211.76			753.28	
	10255.21			754.05	
	10255.75				
	10256.02	748.58			
	10258.23				
	10260.04			753.82	
	10291.58	750.07			
	10293.78			753.92	
	10293.97		751.26		
	10294.44				
	10298.95			754.00	
	10322.47		751.25		
	10325.20				
	10326.19	750.88		754.02	

B	15550.00	762.73	763.40		x
	15566.82	762.35	763.39		
	15580.60	762.04	763.39		
	15580.82		763.39	765.05	

	15592.17	762.64	763.39		
	15599.60	762.83	763.38		
	15606.17			765.14	
	15612.65	762.87	763.38		
	15632.75	762.99	763.39		
	15632.78	762.99		765.37	
	15651.15	762.95	763.38		
	15661.26			764.96	
	15663.27	762.73	763.38		
	15675.75	762.34	763.39		
	15677.23	762.21		765.40	
	15678.35	762.37	763.38		
	15686.20	761.95	763.37		
	15690.84			765.28	
	15693.92	762.50	763.38		
	15704.38	762.56	763.37		
	15717.96		763.36	765.06	
	15720.69	763.24	763.38		x
	16850.00	757.44	758.12		
	16856.27			760.41	
	16860.82	757.91	758.10		
	16872.30	757.19	758.06		
	16882.04	757.48	758.04		
	16887.61	756.33	758.04		
	16906.71	757.23	758.02		
	16914.41			759.75	
	16926.17	757.57	757.98		
	16939.44	757.82		759.60	
	16940.20	757.73	757.86		
	16960.09	757.71	757.80		
	16975.30	757.36	757.78		
	16976.33	757.29		760.46	
	16996.27			759.79	
	16996.84	757.41	757.77		
	17016.34	757.42	757.75		
	17020.05	757.52	757.73		
	17055.79			760.00	
	17060.24	757.24	757.38		x

C	10000.00	776.38		778.08	
	10002.09			777.86	
	10018.50			777.96	
	10020.33				
	10021.64	776.67			x
	10021.95				
	10022.98		776.87		
	10024.98			777.51	

	10025.13			778.10	
	10028.54	775.47			
	10052.00	775.89		777.49	
	10052.55		776.21		
	10053.96			777.48	
	10098.73			777.66	
	10099.88		775.81		
	10100.60	775.71			x
	10101.94			776.65	
	10109.65	774.76			
	10128.09			777.63	
	10129.11		775.40		
	10131.83			777.28	
	10155.54			776.57	
	10156.13			776.21	
	10156.45	775.02			
	10156.53		775.13		
	10157.25				
	10163.41	774.97			x
	10177.71			776.10	
	10181.65	774.94		776.22	
	10182.71		775.03		
	10215.22			775.70	
	10215.32				
	10215.60				
	10215.65	774.68	774.98		
	10216.22			776.06	
	10253.84				
	10254.43	774.80	774.84	775.88	x
	10255.58			776.09	
	10263.32	773.03			
	10280.20	773.88	774.27	775.10	
	10286.81			775.97	
	10325.36			775.67	
	10325.72			775.15	
	10325.78	773.97		775.15	x
	10325.92		774.17		
	10326.16				
	10333.09	772.51			
	10346.04	773.19		775.41	
	10347.01		773.33		
	10350.63			775.28	
	10387.99		773.07		
	10389.66	771.88		774.04	
	10389.75				
	10395.14			774.56	
	10427.56			774.48	

	10431.09				
	10431.16	772.61		773.82	
	10432.20				
	10450.54			773.57	
	10453.42				
	10454.67	773.07	773.24	773.80	x
	10461.33	771.54			
	10473.17			773.60	
	10474.93				
	10480.27	771.40		773.86	
	10507.47			773.24	
	10509.46				
	10509.89	772.58	772.57	773.68	x
	10515.94	770.89			
	10530.65	770.63		773.15	
	10533.79				
	10535.93			773.08	
	10572.49			773.27	
	10574.93				
	10576.58	771.80	772.24	773.06	
	10601.23			773.00	
	10603.47		772.18		
	10603.56			772.68	
	10603.66				
	10606.48	771.87			x
	10612.19	770.74			
	10621.68	770.63			
	10623.76				
	10624.42				
	10628.06				
	10628.35			773.12	
	10640.16			772.58	
	10641.19				
	10642.16	771.46	771.71	772.57	
	10662.25			772.19	
	10662.54	771.12			x
	10662.97				
	10663.17		771.49		
	10663.33			772.55	
	10679.71	769.50		771.74	
	10680.04				
	10681.69			771.93	
	10703.01	769.70			x
	10703.04			770.83	
	10703.09				
	10703.72		770.12		
	10703.84			771.31	

	10712.38	768.88			
	10728.65			770.52	
	10729.05		769.45		
	10729.28			770.77	
	10729.55	768.73			
	10729.73				
	10778.92				
	10779.24			769.90	
	10779.73	768.80			
	10780.37		768.98		
	10781.07			770.08	
	10793.58	768.25			
	10793.63			769.90	
	10793.64				
	10794.38				
	10794.91			769.91	
	10813.75			769.85	
	10814.18				
	10814.70				
	10814.74	768.35		770.45	
	10842.24				
	10842.94	768.69	768.82	769.42	
	10848.37			770.08	
	10871.47			769.69	
	10871.71	768.56		769.64	x
	10871.71				
	10871.78		768.77		
	10889.80	767.33		769.45	
	10894.41				
	10895.82			769.65	
	10900.54			769.59	
	10901.21			769.55	
	10901.38		768.46		
	10901.77	768.15			
	10926.29		767.86		
	10926.46			768.56	
	10926.53			768.65	
	10926.62				
	10926.81	767.85			x
	10935.48			768.95	
	10936.91				
	10937.47	766.17			
	10937.67				
	10937.87			769.01	
	10948.03		767.23		
	10948.31				
	10948.32			768.27	

	10948.32			768.36	
	10948.57	767.12			
	10986.08			769.26	
	10987.38			767.68	
	10988.02		766.83		
	10988.52	766.59			x
	10996.17	765.80			
	11005.69				
	11006.02	766.37		768.16	
	11006.56		766.80		
	11007.61			768.25	
	11030.97			768.01	
	11031.46			767.51	
	11031.65				
	11031.81		766.63		
	11031.92	766.46			
	11062.92			767.96	
	11063.43		766.63		
	11063.68	766.53			x
	11063.83				
	11065.80			768.46	
	11071.66	765.03			
	11092.70			767.75	
	11093.21				
	11093.21	766.17			
	11093.28				
	11093.79		766.37		
	11094.18			767.68	
	11129.24			767.20	
	11130.40			767.32	
	11130.46				
	11130.52	765.93		767.32	x
	11130.88		766.06		
	11141.29	764.74			
	11151.58				
	11151.62	765.23			
	11151.69			766.74	
	11151.85			767.17	
	11152.36		765.77		
	11175.31				
	11175.36		765.49		
	11175.65			767.10	
	11175.68			766.54	
	11175.74	765.29		766.54	
	11175.85			767.10	
	11204.52	764.37		767.41	
	11204.56		765.23		

	11205.37				
	11205.74			766.47	
	11215.96	764.51			x
	11226.49			766.66	
	11227.03				
	11228.22	763.76	764.88		
	11228.55			766.39	
	11261.31			765.77	
	11261.41				
	11261.45		764.73		
	11261.70	764.62		766.22	
	11316.56			766.02	
	11317.40			765.93	
	11317.51	764.40		765.93	
	11317.59				
	11317.82		764.54		
	11352.10				
	11352.13			765.22	
	11352.26		764.40		
	11352.41	764.36			x
	11353.10			765.81	
	11360.11	762.60			
	11371.70				
	11371.75		764.14		
	11372.05	763.38		765.70	
	11372.91			765.42	
	11409.59	763.65			x
	11409.74			764.71	
	11409.85				
	11409.89		763.77		
	11409.91			765.39	
	11426.98			764.48	
	11427.20		762.61		
	11432.15	760.74			
	11433.18				
	11433.82			765.20	
	11448.87	762.44	762.59	764.73	
	11449.49				
	11453.50			764.62	
	11460.48			764.42	
	11461.74	762.18			x
	11461.89				
	11462.04			764.05	
	11462.19		762.46		
	11467.86	761.88			
	11470.90			763.62	
	11475.67				

	11476.36			764.12	
	11479.20	761.65			
	11479.93		762.45		

REACH A

XSA01R

TAPE	ELEV	ELEV (CORR.)	NOTE
0	99.15402	762.25436	pin
0.05	98.83588	761.93622	fp
19.77	98.42372	761.524064	fp
39.83	98.00844	761.108781	bkf
45.86	96.38009	759.480437	
49.75	95.28922	758.389568	lew
50.72	94.67882	757.779164	
52.77	94.628	757.728343	
55.29	94.65002	757.750364	
57.05	94.91995	758.020291	
59.63	94.8687	757.96904	
61.22	95.26348	758.363825	rew
65	96.40034	759.500684	
70.76	97.97194	761.072287	bkf
89.04	99.21282	762.313163	
103.33	99.26684	762.36718	
126.47	99.23083	762.331176	
126.55	99.55666	762.657006	pin

XSA02P

TAPE	ELEV	ELEV (CORR.)	NOTE
0	99.44153	762.52534	pin
0.11	98.98816	762.07197	
14.24	98.96382	762.047629	
24.45	98.81304	761.896855	
37.09	98.03071	761.114524	bkf
46.02	96.75376	759.837568	
52.3	95.33774	758.421551	lew
54.95	94.84119	757.925004	
56.71	94.4542	757.538009	
58.96	93.95003	757.033844	
60.72	93.84953	756.933346	
62.33	94.02845	757.112263	
63.93	94.38843	757.472242	
64.84	95.23334	758.317156	rew
66.26	95.5203	758.604111	
68	95.89743	758.98124	
73.19	97.38018	760.463996	
76.61	97.8511	760.934914	
85.26	98.92021	762.004026	
92.47	99.17545	762.259262	
101.86	99.00203	762.085838	
109.22	99.19381	762.277624	
109.29	99.51559	762.5994	pin

XSA03R

TAPE	ELEV	ELEV (CORR.)	NOTE
0	100.3529	763.35623	pin
0.12	100.1624	763.165725	
8.83	100.2432	763.246535	
13.64	99.50423	762.507594	
16.56	99.21339	762.216756	bkf
22.27	97.71667	760.72003	
26.03	96.53879	759.542154	lew
27.21	96.14205	759.145415	

XSA12R

TAPE	ELEV	ELEV (CORR.)	NOTE
0	100.518717	758.51343	pin
0	100.173414	758.168127	
6.34	100.109465	758.104178	
12.56	99.761786	757.756499	
17.12	99.430084	757.424797	lb
25.71	97.242165	755.236878	
29.41	96.32637	754.321083	
35.24	96.32912	754.323833	
40.84	95.399397	753.39411	
46.17	94.32261	752.317323	
48.7	93.881214	751.875927	
50.32	93.687777	751.68249	lew
52.38	93.471954	751.466667	
54.68	93.412779	751.407492	
56.73	93.294839	751.289552	
58.75	93.500108	751.494821	
60.46	93.660086	751.654799	rew
63.03	93.764952	751.759665	
64.27	93.929502	751.924215	
67.06	94.752151	752.746864	
73.09	96.022759	754.017472	
76.54	96.199332	754.194045	bkf
81.88	98.14304	756.137753	
85.91	99.689234	757.683947	
89.49	100.679002	758.673715	rb
99.1	100.43516	758.429873	
107.54	100.559481	758.554194	
107.62	100.898395	758.893108	pin

REACH B

XSB01R

TAPE	ELEV	ELEV (CORR.)	NOTE
0	99.943155	772.344	pin
0.01	99.701412	772.102	
11.82	100.049951	772.344	
21.33	100.133096	772.102	
32.52	96.626042	769.027	
41.46	94.273426	766.674	
55.64	94.217466	766.619	
69.59	94.239858	766.641	
73.75	93.176398	765.577	
75.75	91.482089	763.883	
76.34	91.00336	763.404	lew
77.51	90.736227	763.137	
78.75	90.595982	762.997	
79.97	90.62825	763.029	
81.14	90.584354	762.985	
82.68	90.714643	763.116	
84.12	90.749108	763.15	
85.78	90.931705	763.333	
86.66	91.031509	763.433	rew
88.65	92.251956	764.653	
90.7	92.764953	765.166	

28.44	96.04532	759.048679	
29.7	96.03738	759.040739	
31.67	96.31816	759.321521	
33.96	96.3306	759.333958	
35.45	96.41316	759.416524	
36.69	96.46013	759.463491	rew
42.14	98.44712	761.450481	
46.66	99.23931	762.242677	bkf
60.03	100.5334	763.536811	
73.81	101.1172	764.120612	
90.47	101.0488	764.052172	
90.56	101.3271	764.33049	pin

XSA04R

0	100.1607	766.1209	pin
0.11	99.76873	765.728922	
7.06	99.61916	765.579345	
15.12	98.17613	764.136321	
21.02	96.51036	762.470552	
22.48	95.45299	761.413181	lew
24.23	94.46016	760.420346	
26.42	94.41449	760.374681	
28.43	94.55429	760.51448	
30.52	94.3867	760.346894	
32.66	94.38468	760.344874	
35.36	95.57314	761.533331	rew
35.82	96.02578	761.985971	
39.81	97.05827	763.018455	
45.29	98.34261	764.302802	bkf
58.16	98.48768	764.447867	
68.95	98.42312	764.38331	
78.47	98.47993	764.440119	
78.56	98.77394	764.734129	pin

XSA05R

0	98.24607	767.55917	pin
0.06	97.96897	767.28207	
5.64	97.84851	767.161616	
11.99	97.60952	766.922624	lb
17.23	96.5009	765.813999	
20.63	96.58159	765.89469	bkf
27.66	95.05797	764.371077	
31.12	94.25902	763.572127	
31.9	93.93668	763.249782	lew
33.68	93.80769	763.12079	
36.82	93.67869	762.991791	
38.21	93.614	762.927106	
40.05	93.71674	763.02984	
41.7	93.95331	763.266417	rew
43.33	94.35055	763.663658	
44.41	94.60842	763.921526	
50.23	96.27776	765.59086	bkf
67.66	97.49733	766.81043	
83.41	97.95029	767.26339	
91.41	97.69972	767.012822	
91.37	98.15499	767.468093	pin
93.16	93.674653	766.076	bkf
104.17	93.8835	766.285	
111.24	94.169732	766.571	
127.5	98.902458	771.304	
149.21	99.906425	772.307	
149.25	100.143909	772.545	pin

XSB02P

0	99.824567	772.226	pin
0.11	99.688063	772.089	
15.18	100.023845	772.425	
27.85	95.775982	768.177	
35.17	94.499719	766.901	
49.68	94.162787	766.564	
58.06	94.054956	766.456	
65.39	93.837362	766.238	bkf
70.17	93.001653	765.403	
73.64	92.401603	764.803	
76.85	91.074218	763.475	
84.4	90.916645	763.318	lew
87.66	90.548738	762.95	
89.11	90.262789	762.664	
90.44	89.813356	762.214	
91.38	89.982397	762.383	
92.29	90.348601	762.75	
92.35	91.000899	763.402	rew
92.77	92.140031	764.541	
95.79	93.217735	765.619	
98.52	93.521867	765.923	
103.79	94.22558	766.627	
112.82	94.390058	766.791	
121.13	96.233055	768.634	
135.41	99.743987	772.145	
148.4	100.136788	772.538	
148.45	100.310987	772.712	pin

XSB03R

0	100.623945	766.391	pin
0.01	100.498434	766.265	
12.41	100.337732	766.105	
26.86	95.033573	760.8	
34.93	94.92718	760.694	bkf
43.49	93.656296	759.423	
48.52	92.978194	758.745	
51.5	92.232003	757.999	lew
52.7	92.172597	757.94	
53.9	92.119086	757.886	
54.78	92.174744	757.942	
55.7	92.14222	757.909	
56.42	92.047809	757.815	
58.3	92.142158	757.909	
59.44	92.078316	757.845	
62.92	92.820298	758.587	
69.89	94.008582	759.775	
83.39	94.927766	760.695	
101.77	95.758703	761.526	

XSA06P

0	100.1074	768.87571	pin
0.04	99.66505	768.433348	
3.27	99.54393	768.312232	lb
8.11	98.30495	767.073248	bkf
12.44	97.90916	766.677457	
15.86	97.00609	765.774391	
19.57	95.91852	764.686825	
20.08	95.45043	764.218728	lew
21.35	94.61977	763.38807	
23.19	94.73739	763.505692	
26.3	95.20316	763.971457	
28.71	95.39218	764.160477	
30.58	95.53874	764.307038	rew
36.55	95.8444	764.612696	
37.7	96.43868	765.206976	
44.1	98.08432	766.852617	
52.24	98.96661	767.734914	
58.72	100.2418	769.010131	
68.2	100.7607	769.528967	
76.72	100.6474	769.415655	
83.2	100.1897	768.958012	
83.19	100.5977	769.366009	pin

XSA07R

0	100.7604	769.58628	pin
0.07	100.4497	769.275538	
8.52	100.7304	769.556269	lb
14.99	98.61021	767.436082	
18.41	98.36051	767.186378	bkf
22.81	96.66265	765.488521	
25.86	95.48226	764.308136	lew
27.1	95.18621	764.012083	
28.06	95.14883	763.974705	
30.17	95.3081	764.133968	
32.47	95.44714	764.273008	
34.86	95.35254	764.17841	
37.12	95.26772	764.093591	
37.78	95.58848	764.414354	rew
40.04	96.33485	765.160717	rew
47.38	98.38705	767.212919	
54.61	98.81879	767.644664	
62.94	99.32948	768.155354	
67.53	100.2136	769.039429	
76.2	100.1665	768.992326	
87.58	100.1312	768.957072	
87.67	100.6584	769.484223	pin

XSA08R

0	102.3783	761.296179	pin
0.02	101.9901	760.907994	fp
23.48	102.02	760.937888	fp
63.71	102.759	761.676946	lb
73.27	100.3846	759.30248	
78.41	98.90836	757.826273	
88.65	98.7631	757.681012	bkf
114.48	98.693252	764.46	
125.86	98.784527	764.551	
125.9	98.924588	764.691	pin

XSB04P

0	99.509452	765.276	pin
0	99.187798	764.955	
16.56	98.839327	764.606	
29.19	95.345265	761.112	
38.21	94.692487	760.459	bkf
44.56	93.911634	759.679	
50.82	92.754943	758.522	
51.76	92.071898	757.839	lew
52.66	91.525457	757.292	
53.26	91.575765	757.343	
54.09	91.702665	757.47	
55.88	91.996539	757.763	rew
61.52	92.356501	758.123	pb
63.17	92.593071	758.36	pb
65.24	93.393256	759.16	pb
68.6	93.325553	759.092	pb
79.02	94.647168	760.414	
107.86	94.865066	760.632	
119.89	98.582626	764.35	
132.05	98.425104	764.192	
132.15	98.548202	764.315	pin

XSB05R

0	105.526713	762.857	pin
0.04	105.372185	762.702	
16.3	105.042628	762.373	
32.54	101.223885	758.554	
42.74	99.942059	757.272	
57.37	99.763592	757.093	bkf
63.17	98.994809	756.325	
65.62	99.039575	756.369	
67.77	97.804962	755.135	lew
68.4	97.634285	754.964	
69.38	97.737116	755.067	
70.82	97.813272	755.143	
71.58	97.722657	755.053	
73.33	97.719034	755.049	
74.37	97.871316	755.201	rew
78.56	98.008627	755.339	
81.03	98.518818	755.849	
86.12	98.686853	756.017	
87.71	98.6758	756.006	
89.29	99.200774	756.531	
97.82	99.988909	757.319	bkf
124.97	100.238238	757.568	
140.71	105.199125	762.529	
142.83	105.236337	762.566	
142.87	105.392824	762.723	pin

XSB06P

0	105.340843	762.671	pin
0.1	105.10286	762.433	

99.01	96.2144	755.132319	
101.83	95.46265	754.380567	
104.47	95.36952	754.287437	lew
106.54	95.18433	754.102251	
109.83	95.13104	754.048957	
112.24	95.04716	753.965081	
114.47	95.04724	753.965154	
116.37	95.00417	753.922083	
117.06	95.40394	754.32186	rew
120.11	96.54661	755.464526	
124.29	97.76575	756.683671	
128.48	98.69143	757.609342	bkf
136.54	98.75801	757.675926	
149.16	101.6961	760.614034	lb
165.42	102.3079	761.225864	fp
180.4	102.8861	761.803971	fp
180.51	103.1216	762.03949	pin

XSA09P

0	101.1301	760.02597	pin
0.08	100.8156	759.711423	
15.04	100.9799	759.875743	fp
37.49	101.1305	760.026324	lb
48.14	98.44219	757.33801	
54.25	98.06037	756.956193	bkf
59.61	96.77198	755.6678	
63.99	95.93916	754.83498	
64.83	94.57591	753.471734	lew
66.25	93.09743	751.993258	
66.26	93.09804	751.993863	
67.42	92.85668	751.752502	
68.78	93.07216	751.967988	
69.94	93.51419	752.410009	
71.1	94.07645	752.972271	
73.24	94.53843	753.434252	rew
79.2	94.9547	753.850523	
84.98	95.84594	754.741762	
89.91	96.51393	755.40975	
93.78	96.91291	755.808729	
99.63	97.88934	756.785164	
113.3	98.32128	757.217104	
128.77	98.61301	757.508831	
150.01	98.72935	757.625174	
150.11	98.9974	757.893226	pin

XSA10R

0	96.22121	756.16682	pin
0	95.88522	755.830833	fp
15.25	96.24452	756.190127	fp
33.04	95.61827	755.563876	bkf
40.16	94.00368	753.949292	
46.13	92.32652	752.272124	lew
49.38	91.80238	751.747986	
22.98	104.355736	761.686	
43.42	100.491749	757.822	
55.79	99.997771	757.328	
62.88	98.858378	756.188	
65.82	98.354114	755.684	
66.31	97.715619	755.045	lew
66.82	97.348852	754.679	
68	97.388442	754.718	
69.75	97.516672	754.847	
71.52	97.775127	755.105	rew
73.66	97.997192	755.327	
77.41	98.478956	755.809	
81.68	98.426873	755.757	
85.81	99.388789	756.719	
90.54	99.980635	757.311	bkf
122.31	99.90324	757.233	
125.22	100.264553	757.594	
140.5	105.302105	762.632	
141.7	105.299519	762.629	pin

REACH C

XSC01R

0	104.744435	777.23594	pin
0.06	104.363731	776.855236	
7.17	104.120976	776.612481	
16.94	103.495942	775.987447	
24.52	102.988078	775.479583	bkf
27.29	102.278208	774.769713	
28.29	101.67263	774.164135	lew
29.37	101.574999	774.066504	
30.2	101.418014	773.909519	
30.79	101.173649	773.665154	
32.13	101.175563	773.667068	
33.01	101.599792	774.091297	rew
34	102.211888	774.703393	
38.53	102.988335	775.47984	bkf
47.68	104.655858	777.147363	
55.38	106.087136	778.578641	rb
65.13	106.485735	778.97724	
76.55	106.989188	779.480693	
76.43	107.360733	779.852238	pin

XSC02P

0	103.522905	776.09012	pin
0.07	103.23504	775.802255	
9.37	103.403866	775.971081	
21.25	103.16826	775.735475	
24.02	103.077213	775.644428	lb
27.72	102.192893	774.760108	
30.27	101.485775	774.05299	bkf
32.68	101.436451	774.003666	
33.28	100.708826	773.276041	lew
33.84	99.461714	772.028929	

52.15	91.68314	751.628748	
54.69	91.63972	751.585329	
57.26	91.89427	751.839875	
60.1	92.02426	751.96987	
61.17	92.29401	752.239622	rew
65.21	93.50951	753.455122	
69.88	94.84186	754.787466	
73.62	95.59134	755.536947	bkf
78.96	95.69317	755.63878	
83.47	96.83927	756.784879	
91.34	98.51096	758.456568	rb
106.01	99.35818	759.303792	fp
122.84	99.72316	759.668764	fp
122.94	100.0439	759.989536	pin

XSA11P

0	95.56217	755.622	pin
0.04	95.23733	755.297156	fp
12.22	95.22258	755.282408	fp
21.47	95.48829	755.548113	bkf
31.63	93.57682	753.636651	
37.94	92.57733	752.637156	
41.2	92.26484	752.32467	lew
45.53	91.64777	751.707595	
48.54	91.07819	751.138012	
50.69	90.60165	750.661476	
52.79	90.3453	750.405126	
55.56	90.59488	750.654706	
58.13	91.32064	751.380468	
60.94	92.17831	752.238133	rew
65.86	93.89894	753.958771	
71.61	95.39468	755.454506	bkf
77.1	95.50808	755.567908	
86.01	98.25809	758.317918	rb
103.83	98.77213	758.831952	fp
127.24	100.3115	760.371358	fp
127.26	100.5121	760.571954	pin

35.44	99.532665	772.09988	
36.67	99.75628	772.323495	
38.53	100.160566	772.727781	
39.79	100.679268	773.246483	rew
42.76	101.396299	773.963514	
44.44	101.66303	774.230245	
46.91	102.291429	774.858644	
49.27	102.504327	775.071542	
54.18	103.255332	775.822547	
57.52	103.908436	776.475651	rb
64.03	103.86525	776.432465	
70.25	103.715464	776.282679	
78.08	103.310992	775.878207	
78.13	103.608053	776.175268	pin

XSC03R

0	98.109987	770.50952	pin
0.08	97.652054	770.051587	
4.31	97.500543	769.900076	
13.78	97.244629	769.644162	
18.78	97.138917	769.53845	
21.94	96.80252	769.202053	bkf
25.39	96.417942	768.817475	
28.14	95.847868	768.247401	lew
29.5	95.747258	768.146791	
30.31	95.746487	768.14602	
31.07	95.742524	768.142057	
31.6	95.856787	768.25632	rew
33.85	96.589427	768.98896	
38.21	97.158874	769.558407	
42.72	97.343878	769.743411	
48.78	97.817492	770.217025	
48.8	98.209466	770.608999	pin

XSC04R

0	105.789172	771.64449	pin
0.1	105.401934	771.257252	
6.42	105.30359	771.158908	
12.82	104.912536	770.767854	lb
18.02	102.728526	768.583844	lb
20.83	102.250413	768.105731	
23.07	101.951734	767.807052	
24.82	101.151911	767.007229	
26.44	100.492844	766.348162	lew
27.18	100.092046	765.947364	
28.59	100.019519	765.874837	
29.28	100.062668	765.917986	
29.7	100.44213	766.297448	rew
32.47	101.742097	767.597415	bkf
35.78	101.91072	767.766038	
42.43	102.712779	768.568097	
55.75	102.199062	768.05438	
55.84	102.664283	768.519601	pin

Appendix 2

EEP Baseline Morphology Tables

Table 2. Project Activity and Reporting History
Valley Fields Farm/407

Activity or Deliverable	Data Collection Complete	Completion or Delivery
Restoration Plan	N/A	March 1, 2006
Final Design – Construction Plans	N/A	September 6, 2006
Construction	N/A	May 16, 2008
Temporary S&E mix applied to entire project area	N/A	May 16, 2008
Permanent seed mix applied	N/A	May 16, 2008
Baseline Monitoring Report	May-08	N/A
Final Design – Construction Plans (Reach B - redesign)	N/A	November 12, 2008
Structural maintenance (new alignment, bench expansion) Reach B	N/A	December 5, 2008
Temporary S&E mix applied to Reach B	N/A	December 5, 2008
Permanent seed mix applied to Reach B	N/A	December 5, 2008
Baseline Monitoring Report	Jun-09	August 17, 2009
Year 1 Monitoring		
Year 2 Monitoring		
Year 3 Monitoring		
Year 4 Monitoring		
Year 5 Monitoring		
Closeout		

Table 3. Project Contacts Table Valley Fields Farm/407	
Designer	P.O. BOX 33068
	Raleigh, North Carolina 27636-3068
Kimley-Horn and Associates, Inc.	Will Wilhelm Phone: (704) 333-5131
Construction Contractor	2889 Lowery Street
	Winston-Salem, NC 27101
North State Environmental	Phone: (336)725-2010
Survey Contractor	530 North Trade Street, Suite 302
	Winston-Salem, NC 27101
Cavanaugh and Associates, P.A.	Phone: (336)759.9001
Planting Contractor	2889 Lowery Street
	Winston-Salem, NC 27101
North State Environmental	Phone: (336)725-2010
Seeding Contractor	2889 Lowery Street
	Winston-Salem, NC 27101
North State Environmental	Phone: (336)725-2010
Seed Mix Sources	Green Resource, LLC (800) 225-6061
Nursery Stock Suppliers	Green Resource, LLC (800) 225-6061
Monitoring Performers	Kimley-Horn and Associates, Inc.
	P.O. BOX 33068
	Raleigh, North Carolina 27636-3068
Stream Monitoring POC	Will Wilhelm Phone: (704) 333-5131
Vegetation Monitoring POC	Will Wilhelm Phone: (704) 333-5131
Wetland Monitoring POC	Will Wilhelm Phone: (704) 333-5131

Table 4. Project Attribute Table Valley Fields Farm/407						
Project County	Davidson County					
Physiographic Region	Piedmont					
Ecoregion	Southern Oter Piedmont					
Project River Basin	Yadkin					
USGS HUC for Project (14 digit)	3040103030030					
NCDWQ Sub-basin for Project	Yadking Sub Basin					
Within extent of EEP Watershed Plan?	Yadkin Pee-Dee River Basin Restoration Priorities 2009					
WRC Hab Class (Warm, Cool, Cold)	-					
% of project easement fenced or demarcated	0					
Beaver activity observed during design phase?	Yes					
Restoration Component Attribute Table						
	Reach A	Reach B	Reach C	Reach D	Reach J	Wetland A-5
Drainage area (mi^2)	6.5	2.3	0.2	0.2	0.1	N/A
Stream order	3	2	1	1	1	N/A
Restored length (feet)	5013	2492	1489	295	61	N/A
Perennial or Intermittent	P	P	P	P	P	N/A
Watershed type (Rural, Urban, Developing etc.)	Developing	Developing	Developing	Developing	Developing	N/A
Watershed LULC Distribution (e.g.)						
Developed	35%					
Cultivated	22%					
Forested	43%					
Watershed impervious cover (%)	5	124	2	1	1	N/A
NCDWQ AU/Index number	C/3	C/2	C/1	C/1	C/1	N/A
NCDWQ classification	C	C	C	C	C	N/A
303d listed?	Yes	Yes	Yes	Yes	Yes	N/A
Upstream of a 303d listed segment?	Yes	Yes	Yes	Yes	Yes	N/A
Reasons for 303d listing or stressor	Degraded water quality due to sediment					N/A
Total acreage of easement	31.0	8.5	2.3	0.5	0.1	N/A
Total vegetated acreage within the easement	22.4	6.9	1.7	0.4	0.1	N/A
Total planted acreage as part of the restoration	22.4	6.9	1.7	0.4	0.1	N/A
Rosgen classification of pre-existing	G5	G5	Incised B5	Incised B5	G	N/A
Rosgen classification of As-built	B5	B5c	C5	B5c	Ba	N/A
Valley type	VIII	VIII	VIII	VIII	VIII	N/A
	0.30%	0.50%	1.10%	1.10%	15%	N/A
Valley side slope range (e.g. 2-3.%)	15-20%	12-20%	15-40%	25-30%	30-35%	N/A
Valley toe slope range (e.g. 2-3.%)	2-3%	1-3%	3-5%	10-14%	1-2%	N/A
Cowardin classification	N/A	N/A	N/A	N/A	N/A	NC
Trout waters designation	No	No	No	No	No	N/A
Species of concern, endangered etc.? (Y/N)	Greensbor burrowing crayfish is of concern					
Dominant soil series and characteristics	Chewacla loam and Wehadkee loam					
Series	N/A	N/A	N/A	N/A	N/A	ChA
Depth	N/A	N/A	N/A	N/A	N/A	80"
Clay%	N/A	N/A	N/A	N/A	N/A	5-40%
K	N/A	N/A	N/A	N/A	N/A	0.28
T	N/A	N/A	N/A	N/A	N/A	5.00

Use N/A for items that may not apply. Use "-" for items that are unavailable and "U" for items that are unknown

Attachment 1

As-Built/Record Drawings

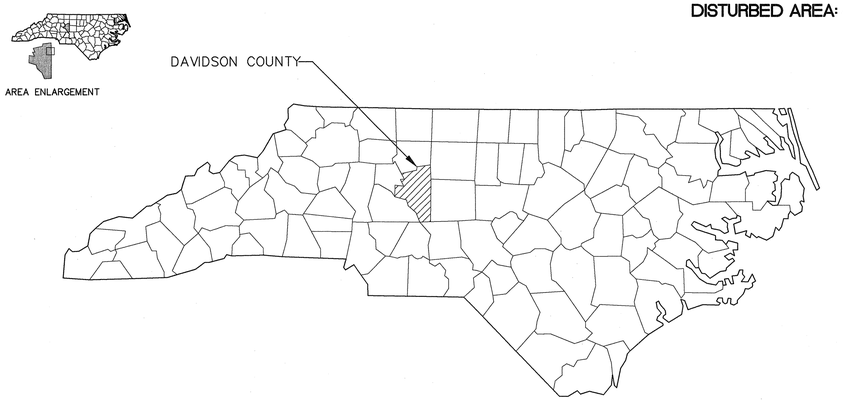
STATE OF NORTH CAROLINA
ECOSYSTEM ENHANCEMENT PROGRAM

AS BUILT/RECORD DRAWINGS FOR

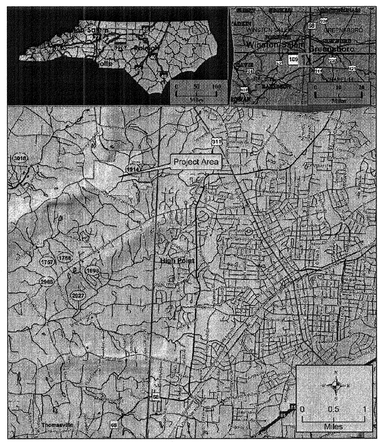
VALLEY FIELDS FARM
STREAM AND WETLAND RESTORATION PROJECT

DAVIDSON COUNTY, NORTH CAROLINA
STATE PROJECT NO.: 020593902

NC-EEP CONTACT: MELONIE ALLEN (919) 368-9352
KIMLEY-HORN AND ASSOCIATES CONTACT: WILLIAM R. WILHELM, P.E. (704) 319-7684
REVIEW COORDINATOR: LIN XU (919) 715-7571
DISTURBED AREA: 43.0 ACRES



STATE OF NORTH CAROLINA



LOCATION MAP

REACH A CENTERLINE STATION 50+00 = LAT 35.988356 LONG -80.052202
NAD83 WGS80

INDEX OF SHEETS

SURVEY PREPARED BY:

CAVANAUGH
Solutions through integrity and partnership
Cavanaugh & Associates, P.A. 305 West Fourth Street, Suite 1A, Winston-Salem, NC 27101
336/759-9001 fax: 336/759-1005 www.cavanaughsolutions.com

CONTRACTOR:

NORTH STATE ENVIRONMENTAL, INC.

RECORD DOCUMENT

REV. No.:	REVISION:	DATE:	DRAWN BY:	CHECKED BY:

PREPARED IN THE OFFICE OF:
Kimley-Horn and Associates, Inc.
NC LICENSE #F-0102
P.O. BOX 33068 - RALEIGH, NORTH CAROLINA 27636-3068
PHONE: (919) 677-2000 FAX: (919) 677-2050

CLIENT: NC-EEP

TITLE: VALLEY FIELDS FARM

NORTH CAROLINA PROFESSIONAL SEAL 026484 ENGINEER WILLIAM R. WILHELM
SEAL

DATE:	01-28-10
HORIZONTAL SCALE:	N/A
VERTICAL SCALE:	N/A
DRAWN BY:	JIK
DESIGNED BY:	ARK/JCD
CHECKED BY:	WRW

PROJECT: VALLEY FIELDS FARM

ATTACHED REFERENCE FILES:
JOB NUMBER: 011795020
SHEET NUMBER: 1

FINAL DESIGN LEGEND:

- PERMANENT CONSERVATION EASEMENT
- 10+00 ℄ FINAL DESIGN CREEK
- FINAL DESIGN ROOT WAD
- FINAL DESIGN LOG VANE
- FINAL DESIGN ROCK CROSS VANE
- FINAL DESIGN ROCK A-VANE
- FINAL DESIGN J-HOOK VANE
- FINAL DESIGN CONSTRUCTED RIFFLE
- CHANNEL BLOCK
- FILL (OLD CHANNEL)
- OXBOW LAKE (PRESERVE/EXPAND ABANDONED STREAM)
- EXISTING WETLANDS

AS-BUILT SURVEY LEGEND

- 10+00 ℄ AS-BUILT SURVEY CREEK
- AS-BUILT SURVEY TOE
- AS-BUILT SURVEY TOP
- AS-BUILT SURVEY ROCK CROSS VANE
- AS-BUILT SURVEY ROCK A-VANE
- AS-BUILT SURVEY J-HOOK VANE
- AS-BUILT SURVEY CONSTRUCTED RIFFLE OR RIP-RAP
- AS-BUILT SURVEY LOG STEP POOL
- AS-BUILT SURVEY BED ROCK
- AS-BUILT SURVEY ROOT WAD
- AS-BUILT SURVEY LOG VANE

EXISTING CONDITIONS SURVEY LEGEND:

- ℄ PRECONSTRUCTION STREAM
- PROPERTY LINE
- SS SANITARY SEWER
- OHP OVERHEAD POWER
- G NATURAL GAS
- FO FIBER OPTIC
- UTILITY EASEMENT
- MAJOR CONTOURS
- MINOR CONTOURS
- N34°00'00"E 152.78' PROPERTY LINE
- TREELINE
- WM WATER METER
- SS SEWER MANHOLE
- POWER / UTILITY POLE
- CAPPED REBAR

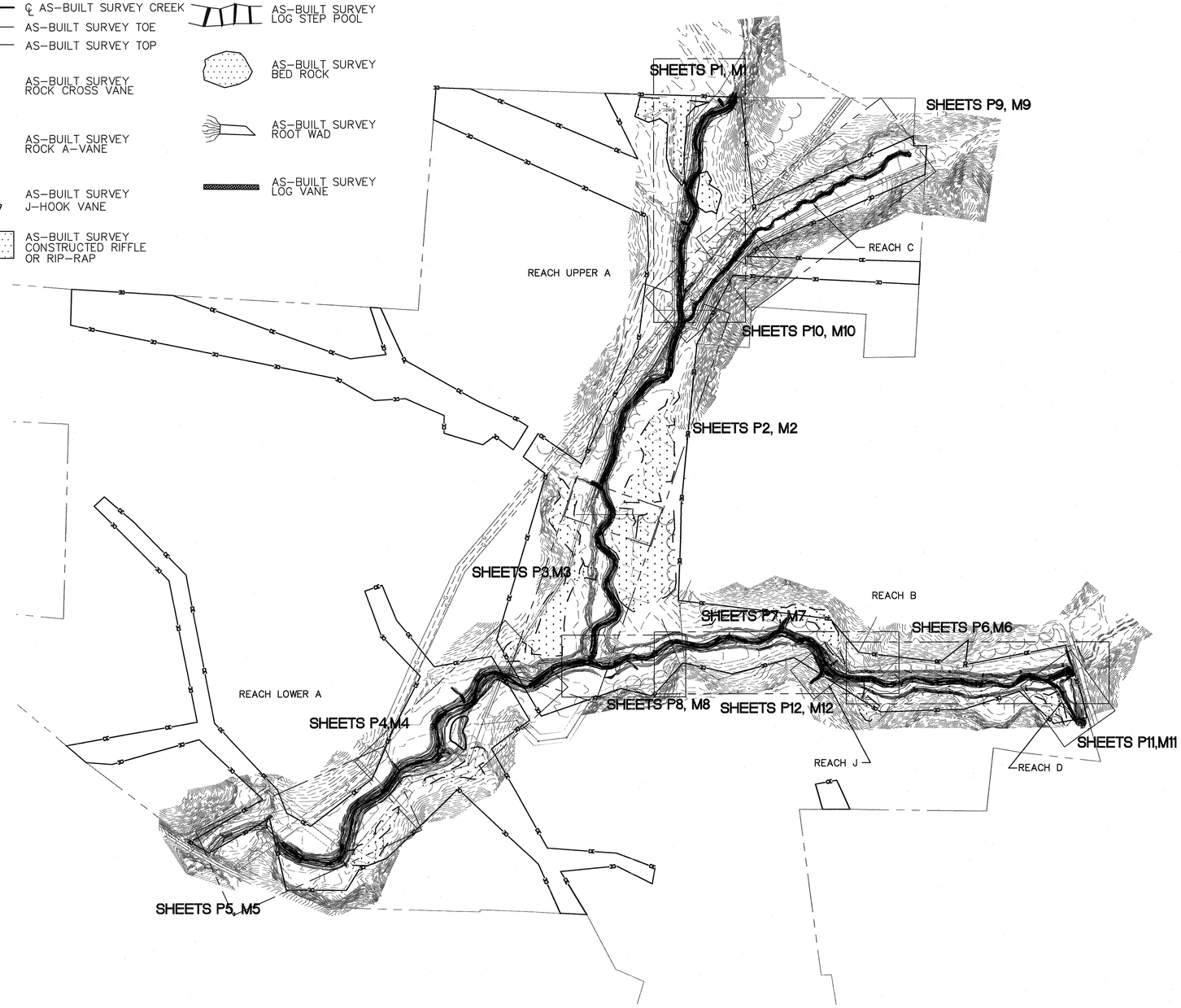
MONITORING LEGEND:

- MONITORING CROSS SECTION
- MONITORING CROSS SECTION BENCHMARKS
- MONITORING GAUGE
- VEG 01/05 XX MONITORING VEGETATION PLOT
- MONITORING VEGETATION PLOT ORIGIN
- MONITORING PHOTO POINT

WETLAND GRADING LEGEND:

- IP ISLAND POCKET
- DP DEPRESSION POCKET
- CONFLUENCE WETLAND
- CHANNEL FILL
- EXISTING WETLAND
- CHANNEL BLOCK

REACH A DESIGN CENTERLINE STA 50+00=LAT 35.988356 LONG -80.052202



NOTE:
AS-BUILT SURVEY INFORMATION PROVIDED BY NORTH STATE ENVIRONMENTAL'S SURVEY SUB-CONSULTANT, CAVENAUGH ASSOCIATES, PA

RECORD DOCUMENT

REV. No.:	REVISION:	DATE:	DRAWN BY:	CHECKED BY:

PREPARED IN THE OFFICE OF:
Kimley-Horn and Associates, Inc.
NC LICENSE #F-0102
P.O. BOX 33068 - RALEIGH, NORTH CAROLINA 27636-3068
PHONE: (919) 677-2000 FAX: (919) 677-2050

CLIENT: NC-EEP

TITLE: KEY/SYMBOLOGY SHEET

NORTH CAROLINA PROFESSIONAL SEAL 025484 ENGINEER WILLIAM R WILHELM 1/9/10

SEAL

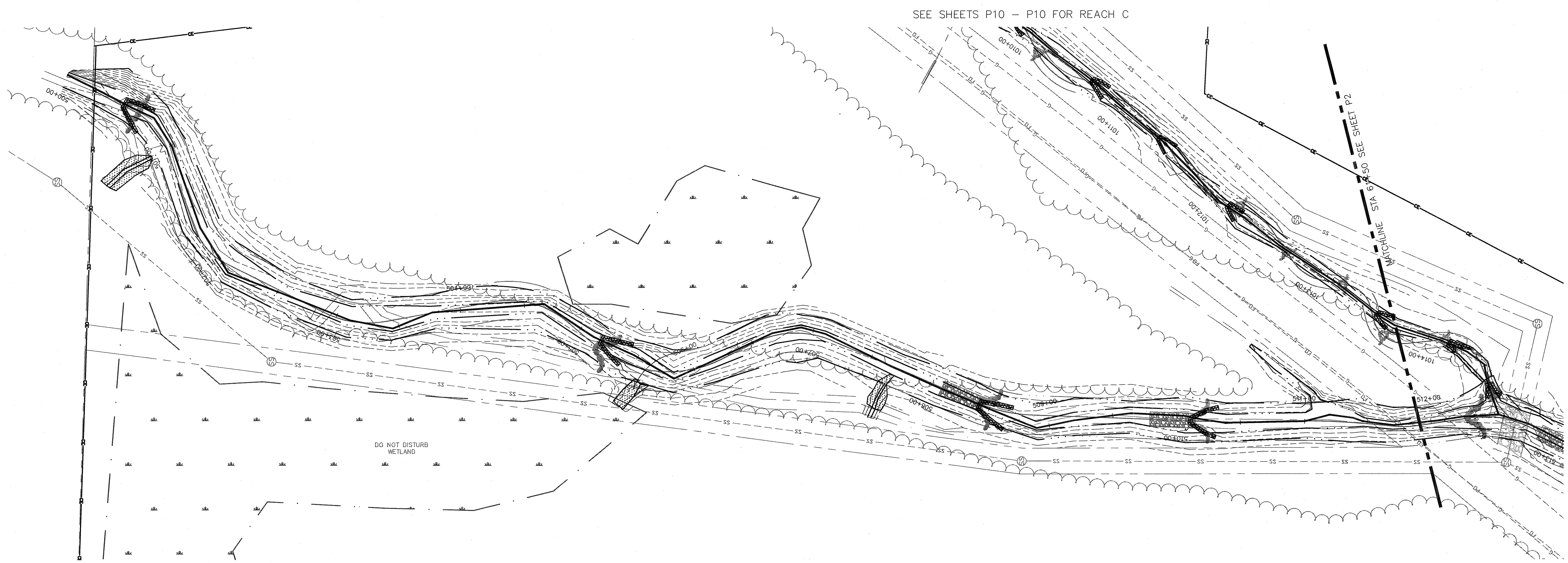
DATE: 01-28-10
HORIZONTAL SCALE: N.T.S.
VERTICAL SCALE: N/A
DRAWN BY: JIK
DESIGNED BY: ARK/JCD
CHECKED BY: WRW

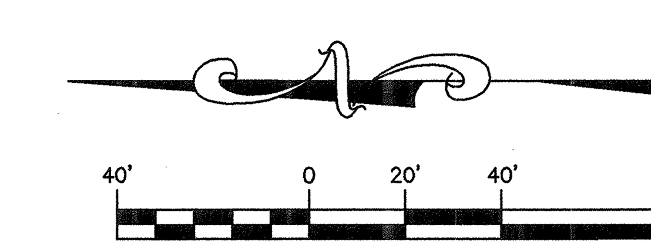
PROJECT: VALLEY FIELDS FARM

ATTACHED REFERENCE FILES:

JOB NUMBER: 011795020

SHEET NUMBER: 2





RECORD DOCUMENT

REV. No.:	REVISION:	DATE:	DRAWN BY:	CHECKED BY:

PREPARED IN THE OFFICE OF:
Kimley-Horn and Associates, Inc.
NC LICENSE #F-0102
P.O. BOX 33068 – RALEIGH, NORTH CAROLINA 27636-3068
PHONE: (919) 677-2000 FAX: (919) 677-2050

CLIENT: NC-EEP

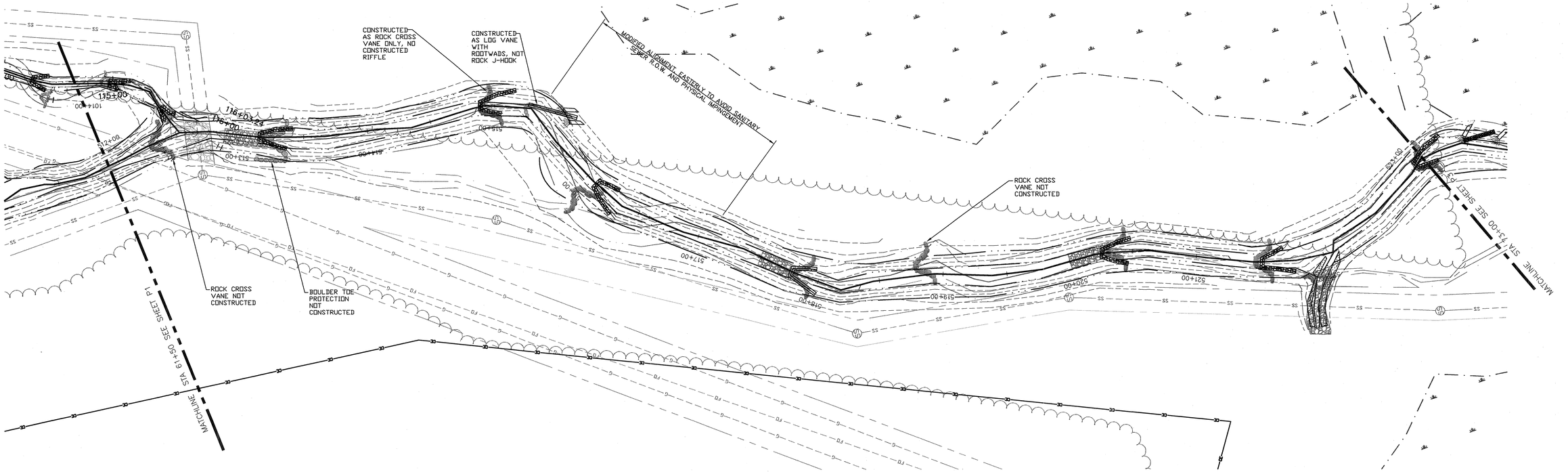
TITLE: PLAN - REACH A

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 026484 WILLIAM R. WILHELM 2/9/10

DATE: 01-28-10
HORIZONTAL SCALE:
VERTICAL SCALE:
DRAWN BY: JIK
DESIGNED BY: ARK/JCD
CHECKED BY: WRW

PROJECT: VALLEY FIELDS FARM

ATTACHED REFERENCE FILES:
JOB NUMBER: 011795020
SHEET NUMBER: P1



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PHONE: (919) 677-2000 FAX: (919) 677-2050

CLIENT: NC-EEP

TITLE: PLAN - REACH A

NORTH CAROLINA PROFESSIONAL SEAL 026484 ENGINEER WILLIAM R. WILKINS
SEAL

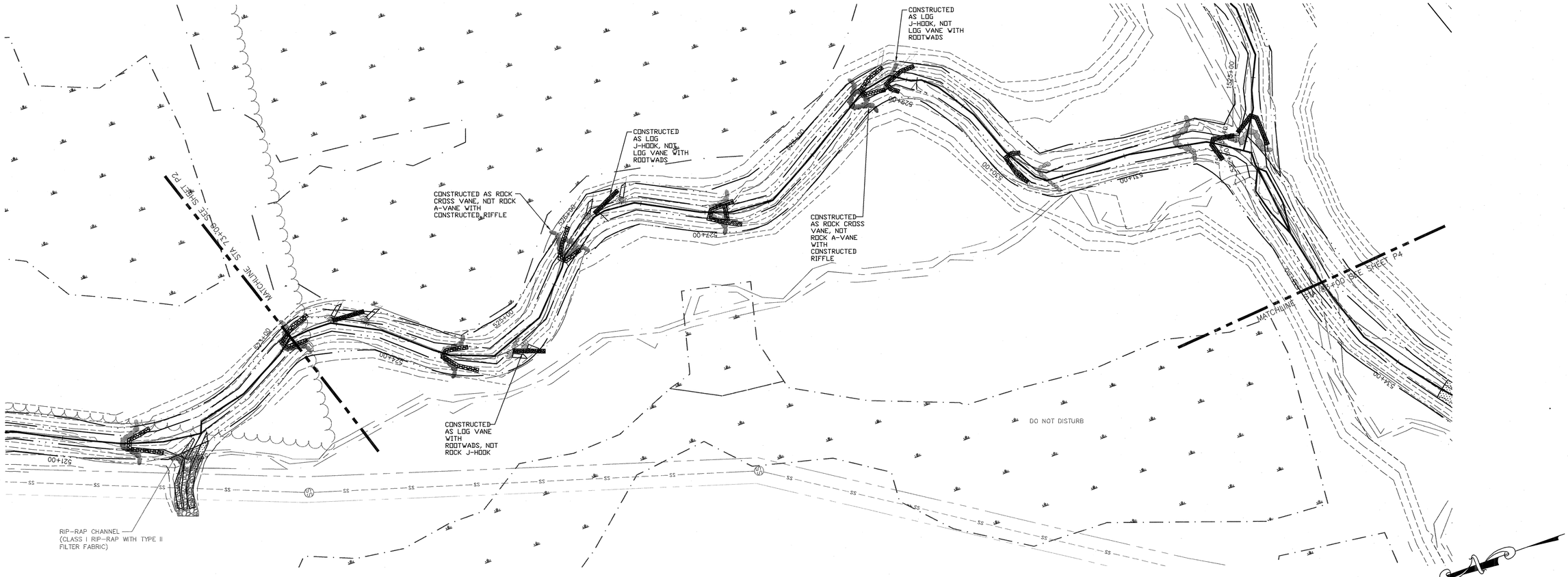
DATE:	01-28-10
HORIZONTAL SCALE:	
VERTICAL SCALE:	
DRAWN BY:	JIK
DESIGNED BY:	ARK/JCD
CHECKED BY:	WRW

PROJECT: VALLEY FIELDS FARM

ATTACHED REFERENCE FILES:	JOB NUMBER:	SHEET NUMBER:
	011795020	P2

NOTE:
SEE SHEET P13 FOR WETLAND GRADING PLAN

SEE SHEETS P6 - P8 FOR REACH B



40' 0 20' 40' 80'

RECORD DOCUMENT

REV. No.:	REVISION:	DATE:	DRAWN BY:	CHECKED BY:

PREPARED IN THE OFFICE OF:
Kimley-Horn and Associates, Inc.
NC LICENSE #F-0102
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PHONE: (919) 677-2000 FAX: (919) 677-2050

CLIENT: NC-EEP

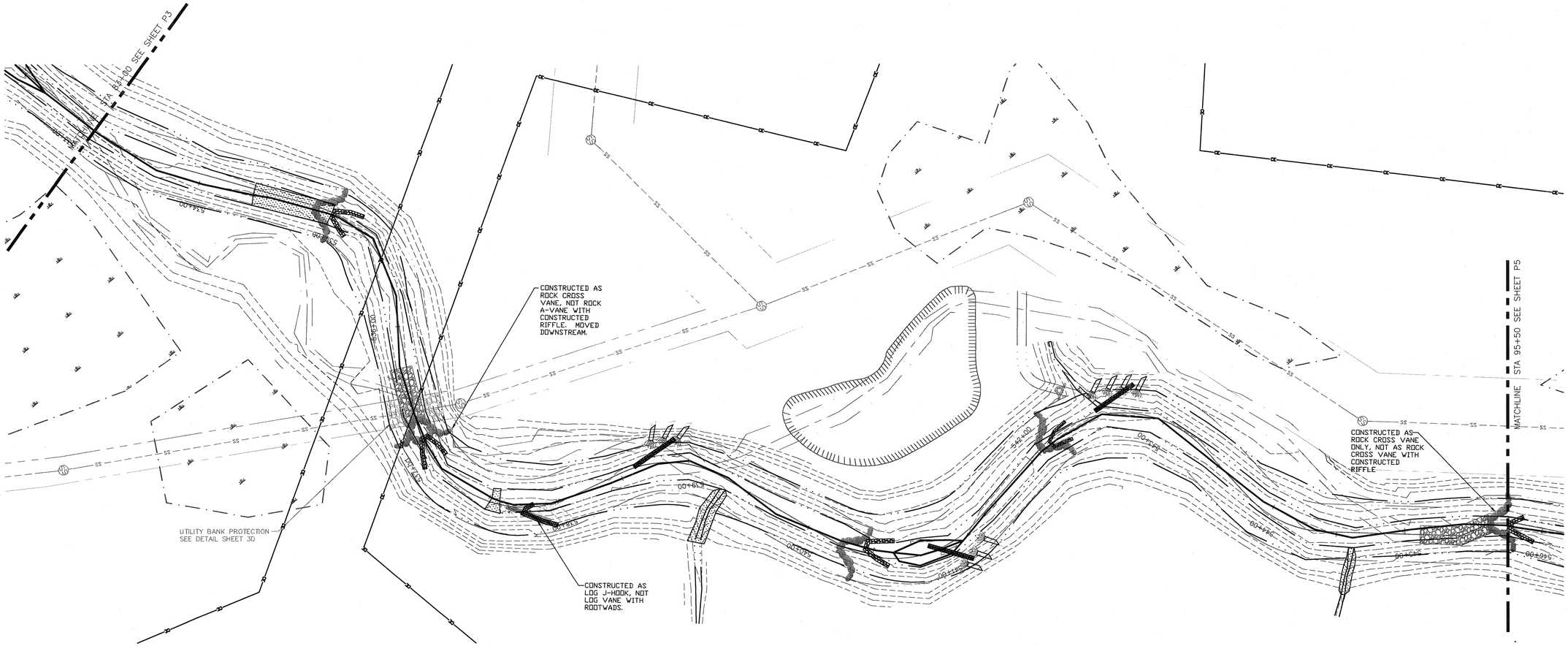
TITLE: PLAN- REACH A

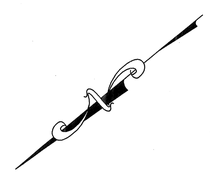
NORTH CAROLINA PROFESSIONAL SEAL 026484 ENGINEER WILLIAM B. WILHELM
SEAL:

DATE: 01-28-10
HORIZONTAL SCALE:
VERTICAL SCALE:
DRAWN BY: JIK
DESIGNED BY: ARK/JCD
CHECKED BY: WKW

PROJECT: VALLEY FIELDS FARM

ATTACHED REFERENCE FILES:
JOB NUMBER: 011795020
SHEET NUMBER: P3





40' 0 20' 40' 80'

RECORD DOCUMENT

REV. No.:	REVISION:	DATE:	DRAWN BY:	CHECKED BY:

PREPARED IN THE OFFICE OF:
Kimley-Horn and Associates, Inc.
NC LICENSE #F-0102
P.O. BOX 33068 - RALEIGH, NORTH CAROLINA 27636-3068
PHONE: (919) 677-2000 FAX: (919) 677-2050

CLIENT: NC-EEP

TITLE: PLAN - REACH A

NORTH CAROLINA PROFESSIONAL SEAL 026484 ENGINEER WILLIAM R. WILKINS
SIGNATURE:

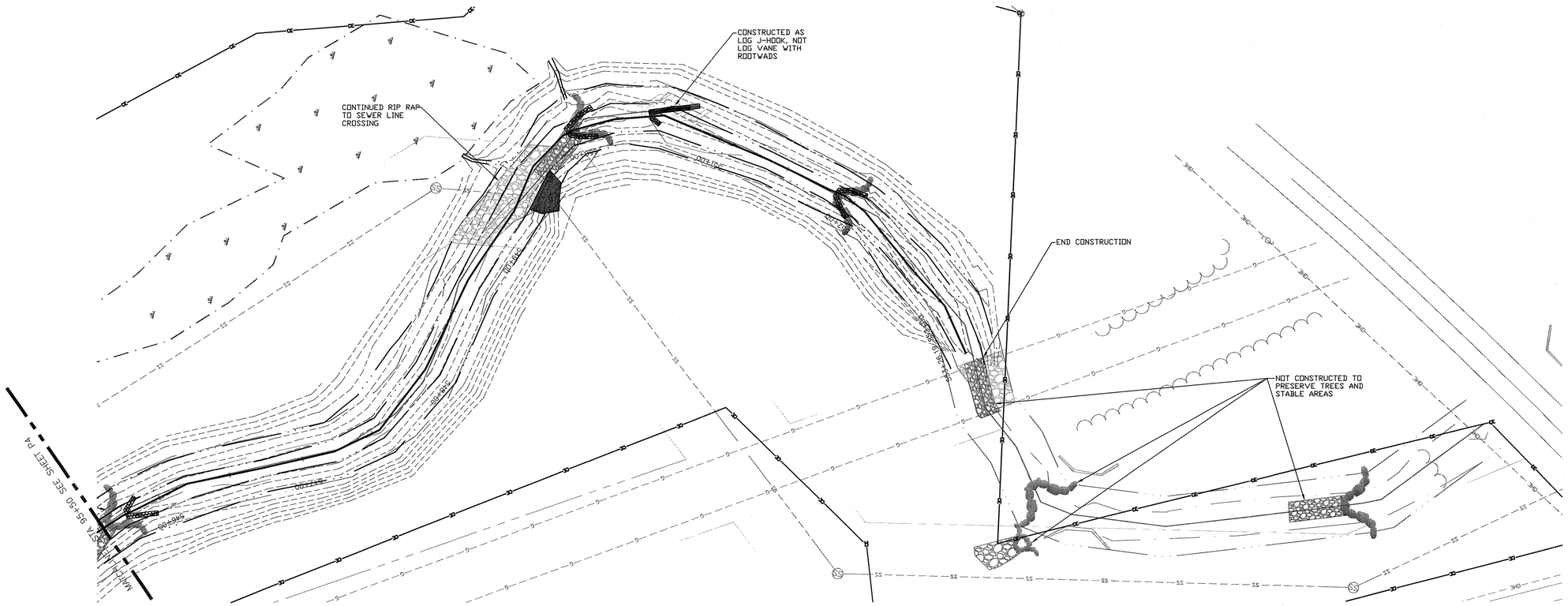
DATE: 01-28-10
HORIZONTAL SCALE:
VERTICAL SCALE:
DRAWN BY: JIK
DESIGNED BY: ARK/JCD
CHECKED BY: WRW

PROJECT: VALLEY FIELDS FARM

ATTACHED REFERENCE FILES:

JOB NUMBER: 011795020

SHEET NUMBER: P4



40' 0 20' 40' 80'

RECORD DOCUMENT

REV. No.:	REVISION:	DATE:	DRAWN BY:	CHECKED BY:

PREPARED IN THE OFFICE OF:
Kimley-Horn and Associates, Inc.
NC LICENSE #F-0102
P.O. BOX 33068 - RALEIGH, NORTH CAROLINA 27636-3068
PHONE: (919) 677-2000 FAX: (919) 677-2050

CLIENT: NC-EEP

TITLE: PLAN - REACH A

NORTH CAROLINA PROFESSIONAL SEAL 026484 ENGINEER WILLIAM R. WELMELM

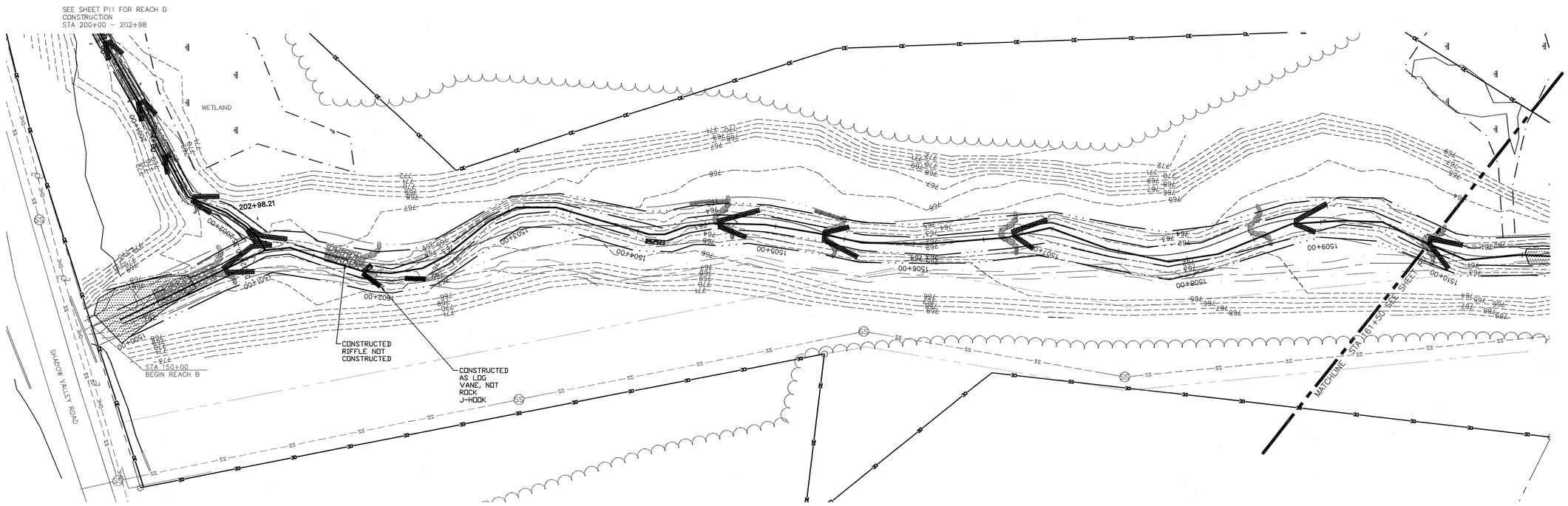
DATE: 01-28-10
HORIZONTAL SCALE:
VERTICAL SCALE:
DRAWN BY: JJK
DESIGNED BY: ARK/JCD
CHECKED BY: WRW

PROJECT: VALLEY FIELDS FARM

ATTACHED REFERENCE FILES:

JOB NUMBER: 011795020

SHEET NUMBER: P5



NOTE:
STA 150+00 TO STA 175+24 AND STA 200+00 TO STA 202+98 WAS REPAIRED AFTER HURRICANE STORM DAMAGE PER CHANGE ORDER 2 AND 3.

RECORD DOCUMENT

REV. No.:	REVISION:	DATE:	DRAWN BY:	CHECKED BY:

PREPARED IN THE OFFICE OF:
Kimley-Horn and Associates, Inc.
NC LICENSE #F-0102
P.O. BOX 33068 - RALEIGH, NORTH CAROLINA 27636-3068
PHONE: (919) 677-2000 FAX: (919) 677-2050

CLIENT: NC-EEP

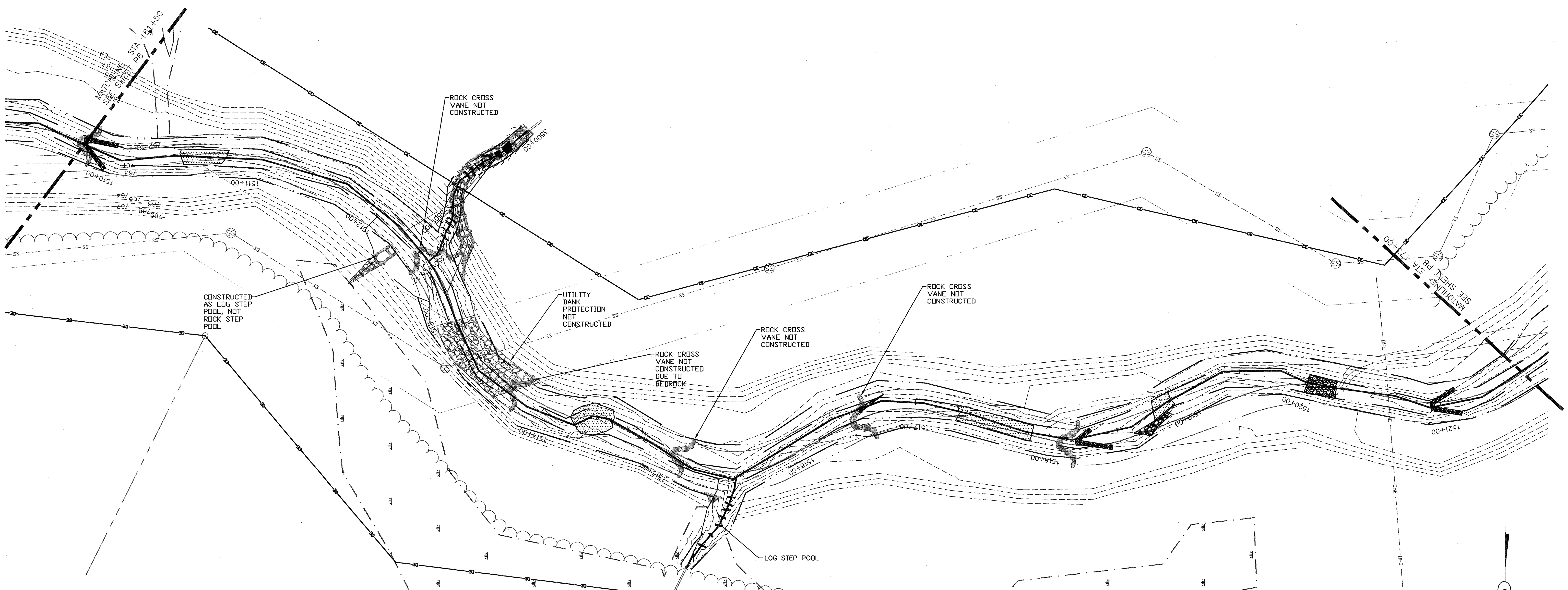
TITLE: PLAN - REACH B

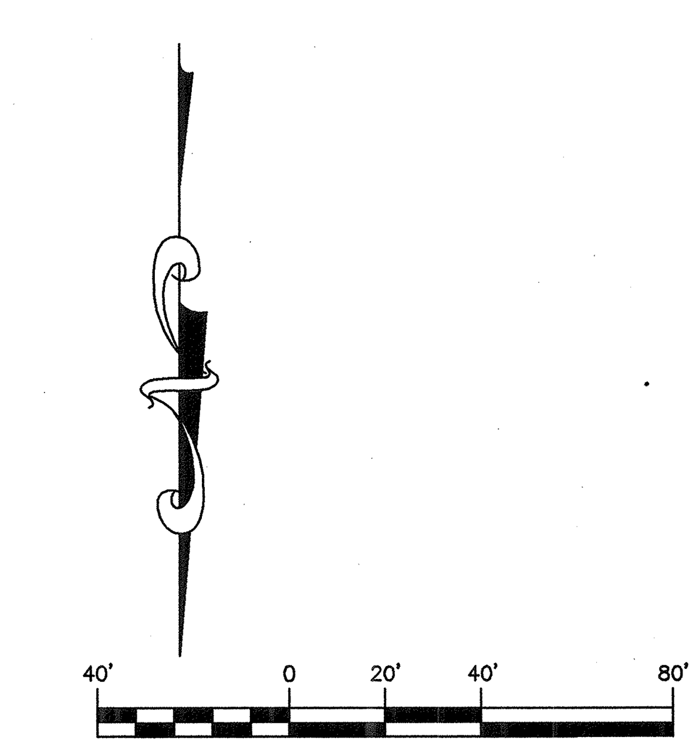
NORTH CAROLINA PROFESSIONAL SEAL 026484 ENGINEER WILLIAM B. WILKERSON 2/9/10

DATE:	01-28-10
HORIZONTAL SCALE:	
VERTICAL SCALE:	
DRAWN BY:	JIK
DESIGNED BY:	ARK/JCD
CHECKED BY:	WRW

PROJECT: VALLEY FIELDS FARM

ATTACHED REFERENCE FILES:	JOB NUMBER:	SHEET NUMBER:
	011795020	P6





NOTE:
STA 150+00 TO STA 175+24 AND STA 200+00 TO STA 202+98 WAS REPAIRED AFTER HURRICANE STORM DAMAGE PER CHANGE ORDER 2 AND 3. FOR CLARITY.

RECORD DOCUMENT

REV. No.:	REVISION:	DATE:	DRAWN BY:	CHECKED BY:

PREPARED IN THE OFFICE OF:
Kimley-Horn and Associates, Inc.
NC LICENSE #F-0102
P.O. BOX 33068 – RALEIGH, NORTH CAROLINA 27636-3068
PHONE: (919) 677-2000 FAX: (919) 677-2050

CLIENT: NC-EEP

TITLE: PLAN - REACH B

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 026484 ENGINEER WILLIAM R. WILHELM 2/9/10

DATE: 01-28-10
HORIZONTAL SCALE:
VERTICAL SCALE:
DRAWN BY: JIK
DESIGNED BY: ARK/JCD
CHECKED BY: WRW

PROJECT: VALLEY FIELDS FARM

ATTACHED REFERENCE FILES:
JOB NUMBER: 011795020
SHEET NUMBER: P7

NOTE:
STA 150+00 TO STA 175+24 AND STA 200+00 TO STA 202+98
WAS REPAIRED AFTER HURRICANE STORM DAMAGE PER CHANGE
ORDER 2 AND 3.

RECORD DOCUMENT

REV. No.:	REVISION:	DATE:	DRAWN BY:	CHECKED BY:

PREPARED IN THE OFFICE OF:
Kimley-Horn and Associates, Inc.
NC LICENSE #F-0102
P.O. BOX 33068 - RALEIGH, NORTH CAROLINA 27636-3068
PHONE: (919) 677-2000 FAX: (919) 677-2050

CLIENT: NC-EEP

TITLE: PLAN - REACH B

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 026484 WILLIAM R. WILHELM 2/9/10

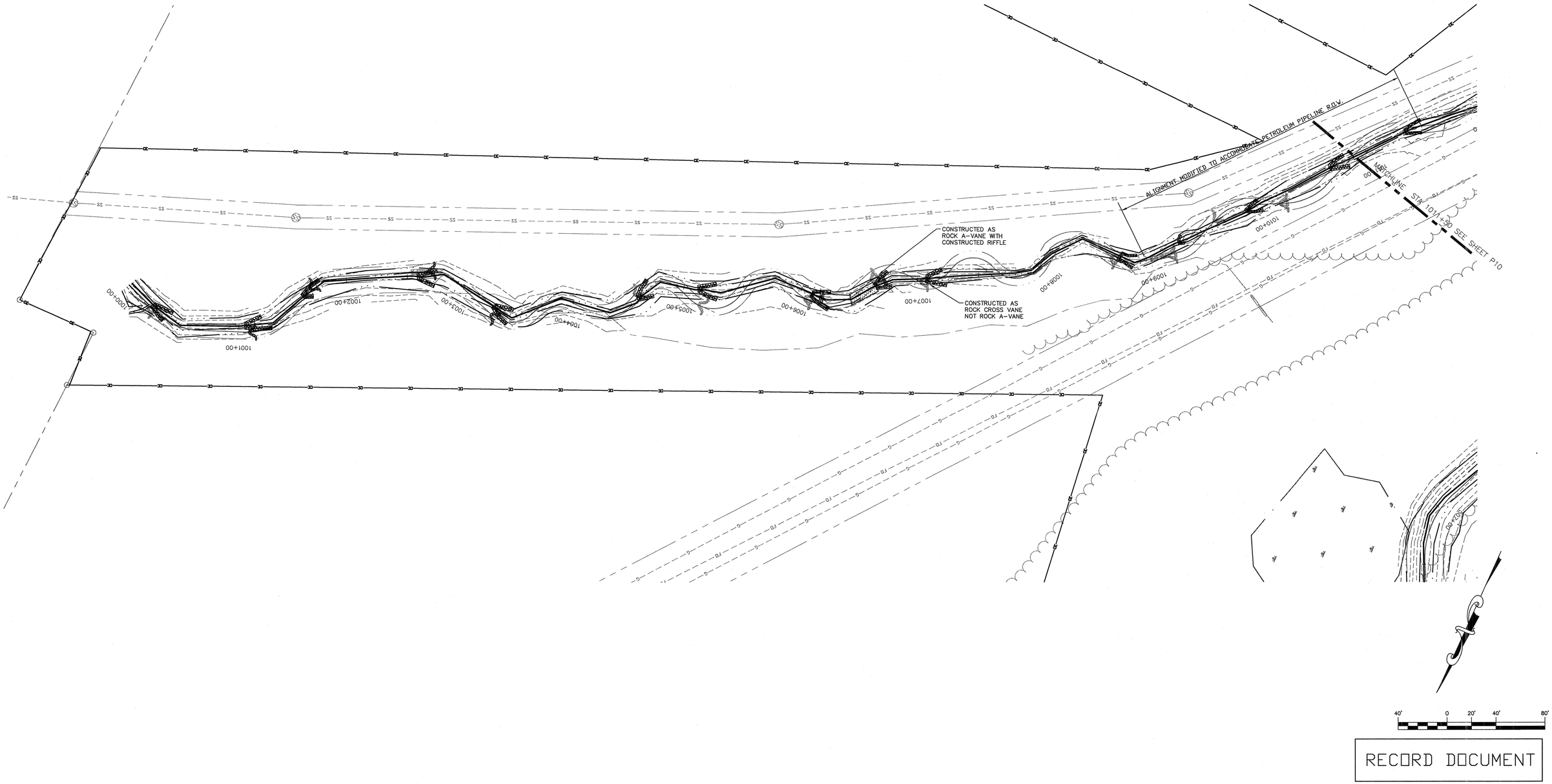
DATE: 01-28-10
HORIZONTAL SCALE:
VERTICAL SCALE:
DRAWN BY: JIK
DESIGNED BY: ARK/JCD
CHECKED BY: WRW

PROJECT: VALLEY FIELDS FARM

ATTACHED REFERENCE FILES:
JOB NUMBER: 011795020
SHEET NUMBER: P8

February 09, 2010 - 2:25pm By: nancy.mumford

K:\CHL_Environmental\011795 EEP Raleigh\000 Valley Field Farm\CADD\Record Drawings - 01-2010\Blackandwhite\3-PLANS.dwg



RECORD DOCUMENT

REV. No.:	REVISION:	DATE:	DRAWN BY:	CHECKED BY:

PREPARED IN THE OFFICE OF:
Kimley-Horn and Associates, Inc.
NC LICENSE #F-0102
P.O. BOX 33068 - RALEIGH, NORTH CAROLINA 27636-3068
PHONE: (919) 677-2000 FAX: (919) 677-2050

CLIENT: NC-EEP

TITLE: PLAN - REACH C

NORTH CAROLINA PROFESSIONAL SEAL 026484 ENGINEER WILLIAM R. WILHELM
SEAL

DATE: 01-28-10
HORIZONTAL SCALE:
VERTICAL SCALE:
DRAWN BY: JIK
DESIGNED BY: ARK/JCD
CHECKED BY: WRW

PROJECT: VALLEY FIELDS FARM

ATTACHED REFERENCE FILES:

JOB NUMBER: 011795020

SHEET NUMBER: P9

February 09, 2010 – 2:25pm By: nancy.mumford

RECORD DOCUMENT

REV. No.:	REVISION:	DATE:	DRAWN BY:	CHECKED BY:

PREPARED IN THE OFFICE OF:
Kimley-Horn and Associates, Inc.
NC LICENSE #F-0102
P.O. BOX 33068 – RALEIGH, NORTH CAROLINA 27636-3068
PHONE: (919) 677-2000 FAX: (919) 677-2050

CLIENT: NC-EEP

TITLE: PLAN - REACH C

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 026484 WILLIAM R. WILHELM 2/9/10

DATE: 01-28-10
HORIZONTAL SCALE:
VERTICAL SCALE:
DRAWN BY: JIK
DESIGNED BY: ARK/JCD
CHECKED BY: WRW

PROJECT: VALLEY FIELDS FARM

ATTACHED REFERENCE FILES:
JOB NUMBER: 011795020
SHEET NUMBER: P10

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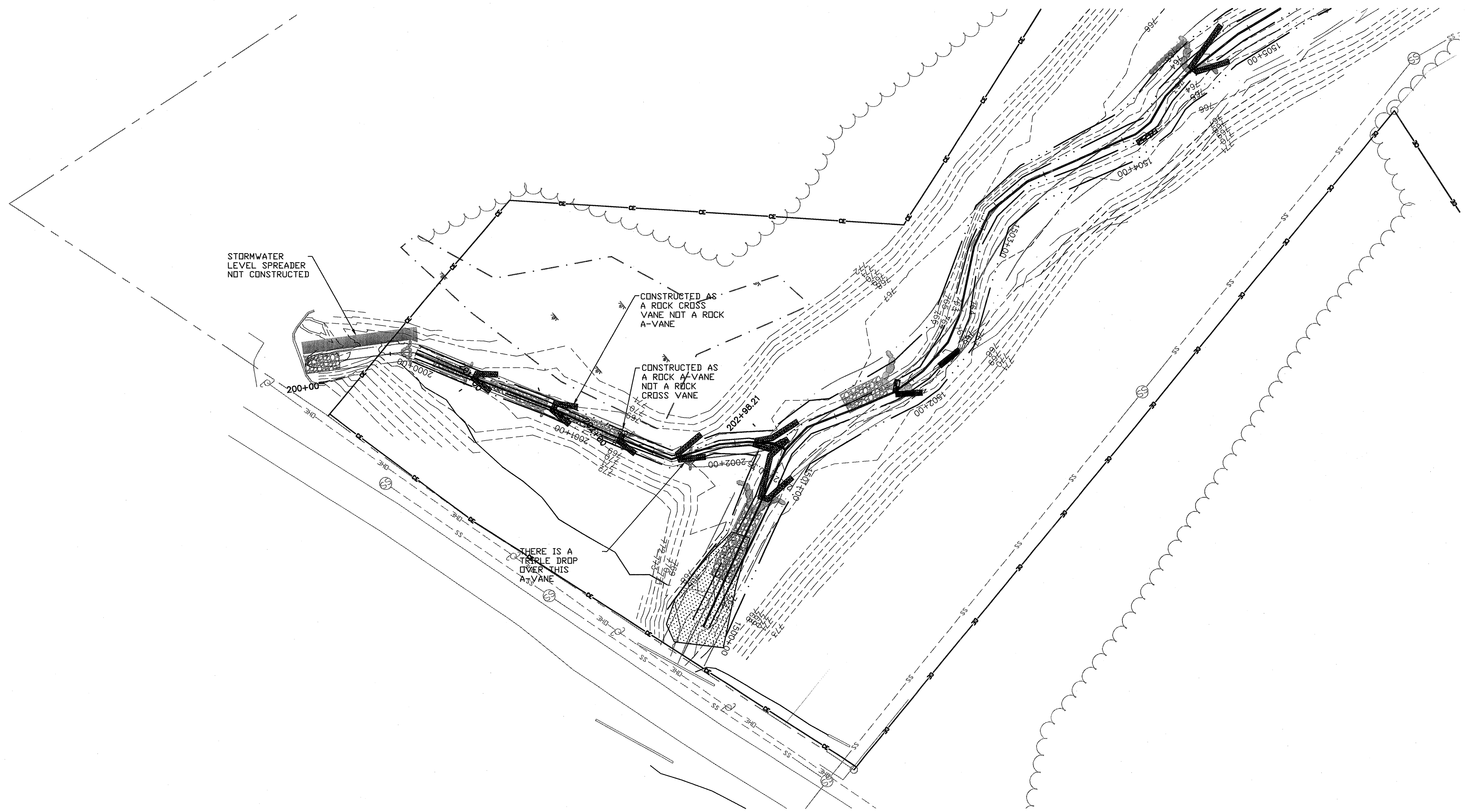
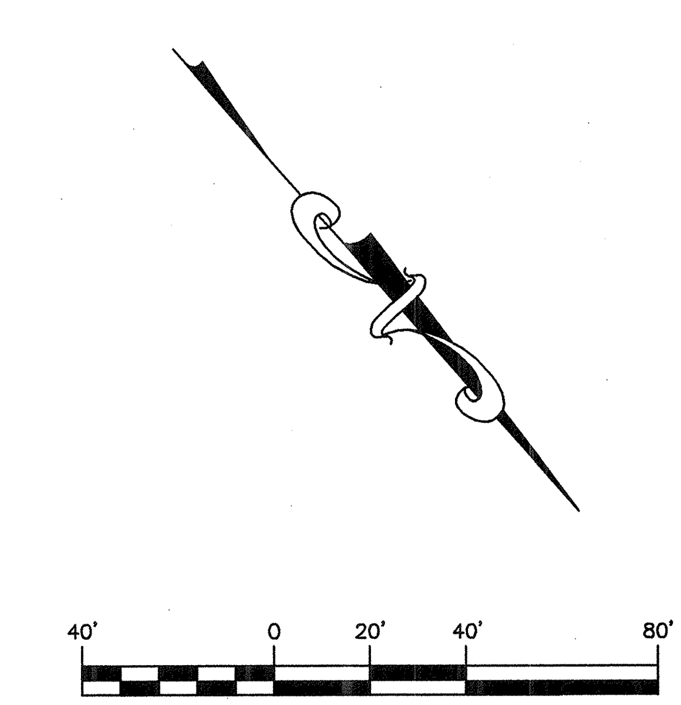




NOTE:
STA 150+00 TO STA 175+24 AND STA 200+00 TO STA 202+98
WAS REPAIRED AFTER HURRICANE STORM DAMAGE PER CHANGE
ORDER 2 AND 3.

RECORD DOCUMENT

REV. No.:	REVISION:	DATE:	DRAWN BY:	CHECKED BY:

PREPARED IN THE OFFICE OF:
Kimley-Horn and Associates, Inc.
NC LICENSE #F-0102
P.O. BOX 33068 – RALEIGH, NORTH CAROLINA 27636-3068
PHONE: (919) 677-2000 FAX: (919) 677-2050

CLIENT: NC-EEP

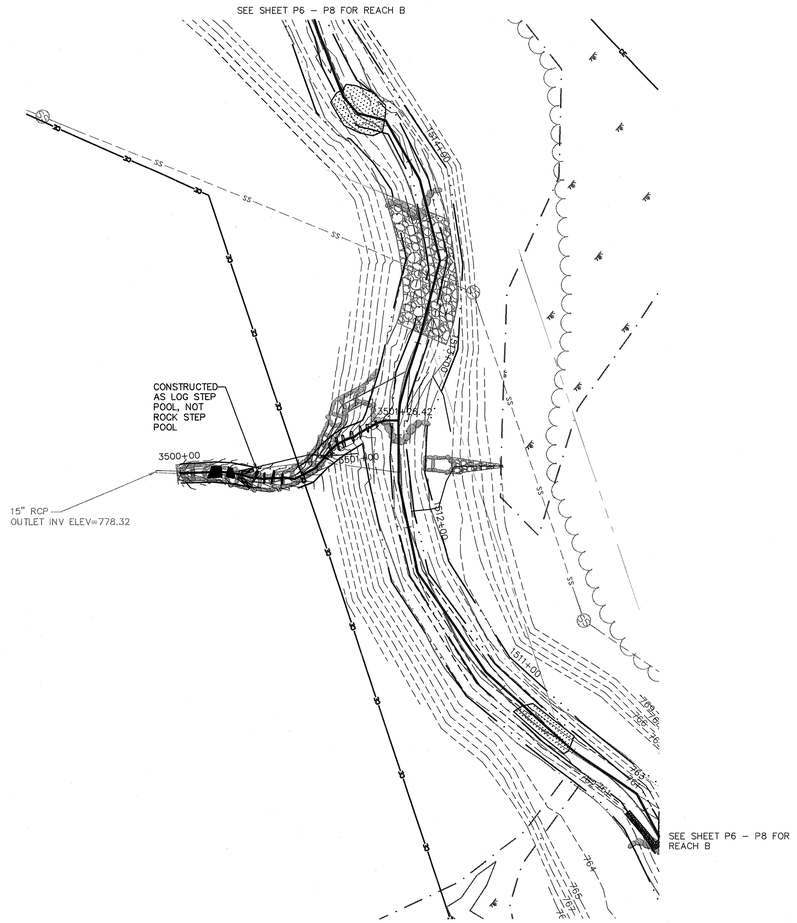
TITLE: PLAN - REACH D

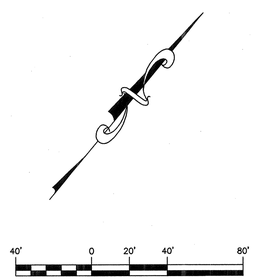
SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 026484 WILLIAM R. WILHELM 2/9/10

DATE: 01-28-10
HORIZONTAL SCALE:
VERTICAL SCALE:
DRAWN BY: JIK
DESIGNED BY: ARK/JCD
CHECKED BY: WRW

PROJECT: VALLEY FIELDS FARM

ATTACHED REFERENCE FILES:
JOB NUMBER: 011795020
SHEET NUMBER: P11





RECORD DOCUMENT

REV. No.:	REVISION:	DATE:	DRAWN BY:	CHECKED BY:

PREPARED IN THE OFFICE OF:
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NC LICENSE #F-0102
P.O. BOX 33068 - RALEIGH, NORTH CAROLINA 27636-3068
PHONE: (919) 677-2000 FAX: (919) 677-2050

CLIENT: NC-EEP

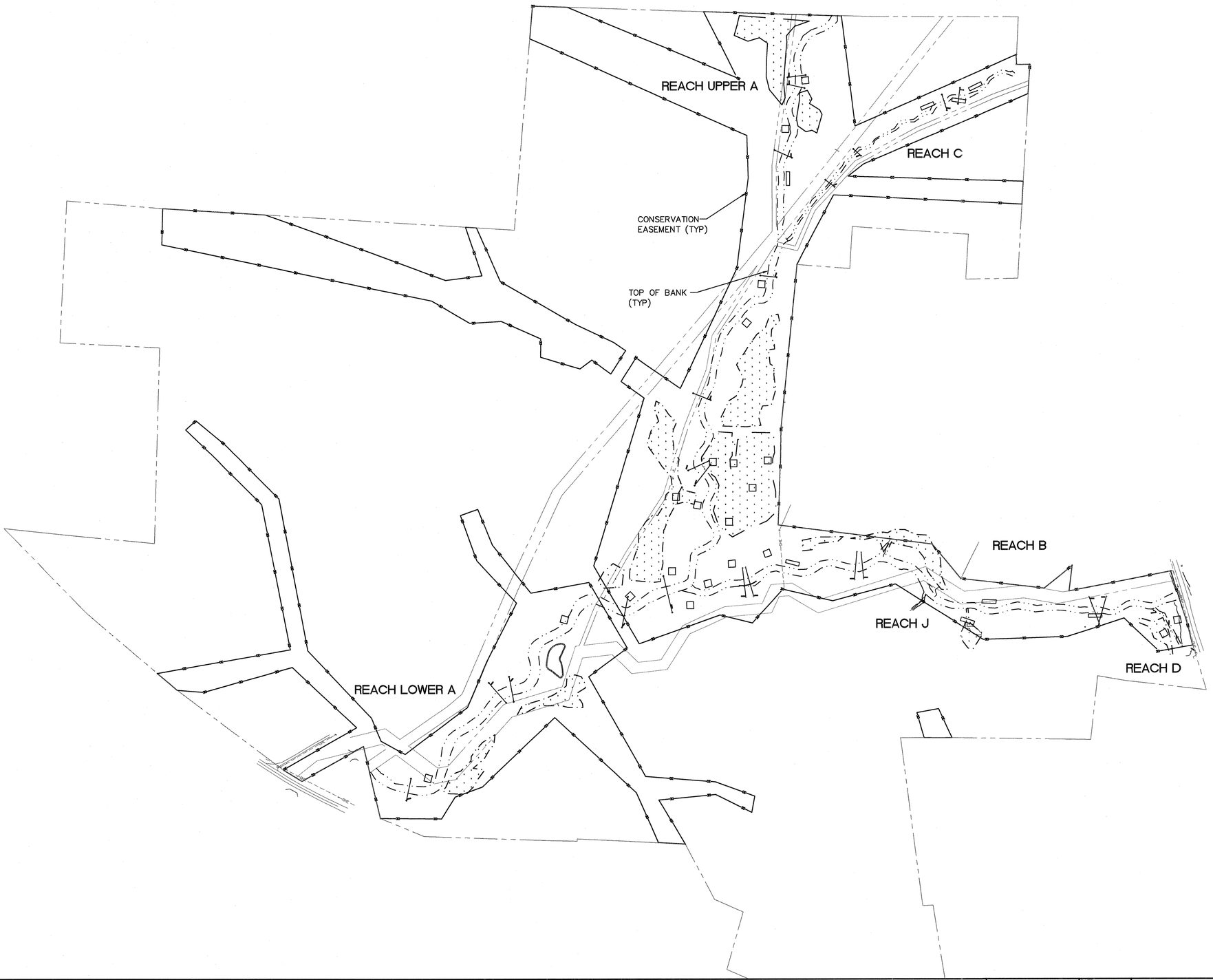
TITLE: PLAN - REACH J

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 026484 ENGINEER WILLIAM R. WILKERSON

DATE: 01-28-10
HORIZONTAL SCALE:
VERTICAL SCALE:
DRAWN BY: JJK
DESIGNED BY: ARK/JCD
CHECKED BY: WRW

PROJECT: VALLEY FIELDS FARM

ATTACHED REFERENCE FILES:
JOB NUMBER: 011795020
SHEET NUMBER: P12



250' 0 125' 250' 500'

RECORD DOCUMENT

REV. No.:	REVISION:	DATE:	DRAWN BY:	CHECKED BY:

PREPARED IN THE OFFICE OF:
Kimley-Horn and Associates, Inc.
NC LICENSE #F-0102
P.O. BOX 33068 - RALEIGH, NORTH CAROLINA 27636-3068
PHONE: (919) 677-2000 FAX: (919) 677-2050

CLIENT: NC-EEP

TITLE: OVERALL MONITORING PLAN

NORTH CAROLINA PROFESSIONAL SEAL 026484 ENGINEER WILLIAM R. WYNEKEN

DATE: 01-28-10
HORIZONTAL SCALE:
VERTICAL SCALE:
DRAWN BY: JIK
DESIGNED BY: ARK/JCD
CHECKED BY: WRW

PROJECT: VALLEY FIELDS FARM

ATTACHED REFERENCE FILES:
JOB NUMBER: 011795020
SHEET NUMBER: M1

FINAL DESIGN NOTES

1. Redistribute crown materials throughout restoration area

2. Grade site to base elevation

Base elevation will be set at designer's direction and will be set at a target height above the adjacent stream's base flow water surface elevation. The target height will be set in the reference wetland and should equal the elevation difference between point A, base flow water surface elevation, and point B, a point on the ground that is 6" above the mean ground water elevation during the growing season as derived from monitoring wells in the reference wetland. The base elevation will be set from the target height above the newly constructed stream's base flow water surface elevation for transects (A# - B#) throughout the restoration area.

3. Create depressional and island pockets. Depressional pockets should be set 8-12" below base elevation and island pockets should be set 8-12" above base elevation.

4. Disk entire restoration area to loosen soils and create microtopography

RECORD DOCUMENT

REV. No.:	REVISION:	DATE:	DRAWN BY:	CHECKED BY:

PREPARED IN THE OFFICE OF:
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P.O. BOX 33068 - RALEIGH, NORTH CAROLINA 27636-3068
PHONE: (919) 677-2000 FAX: (919) 677-2050

CLIENT: NC-EEP

TITLE: WETLAND GRADING PLAN

NORTH CAROLINA PROFESSIONAL SEAL 026484 ENGINEER WILLIAM R. WILHELM
SEAL

DATE:	01-28-10
HORIZONTAL SCALE:	N.T.S.
VERTICAL SCALE:	N/A
DRAWN BY:	JIK
DESIGNED BY:	ARK/JCD
CHECKED BY:	WRW

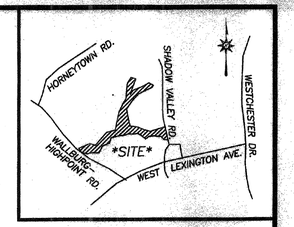
PROJECT: VALLEY FIELDS FARM

ATTACHED REFERENCE FILES:	JOB NUMBER:	SHEET NUMBER:
	011795020	P13

LEGEND:

THESE STANDARD SYMBOLS WILL BE FOUND IN THE DRAWING.

- UNMARKED POINT
- EXISTING IRON REBAR (EIR)
- ⅝" NEW IRON REBAR (NIR)
- EXISTING IRON PIPE (EIP)
- R.R. SPIKE FOUND
- R.R. SPIKE SET
- PK NAIL FOUND
- PK NAIL SET
- CONCRETE MONUMENT FOUND
- CONCRETE MONUMENT SET
- FIRE HYDRANT
- WATER VALVE
- WATER METER
- WELL
- GAS VALVE
- GAS METER
- TELEPHONE PEDESTAL
- TELEPHONE MANHOLE
- ELECTRICAL MANHOLE
- ELECTRICAL BOX
- TRANSFORMER
- POWER / UTILITY POLE
- LIGHT POLE
- SEWER MANHOLE
- SEWER CLEAN-OUT
- CURB INLET
- YARD INLET
- ICV IRRIGATION CONTROL VALVE
- SIGN
- W — WATER
- SS — SANITARY SEWER
- E — UNDERGROUND POWER
- G — NATURAL GAS
- x — BARB WIRE FENCE
- RIGHT OF WAY LINE
- CENTERLINE
- CONTROL POINT
- ROCKS
- ROCK CROSS VANE



VICINITY MAP
(N.T.S.)

NC GRID (NAD 83/86)

NOTES

1.) ALL PROPERTIES SHOWN HEREON ARE SUBJECT TO ANY EASEMENT (WRITTEN OR UNWRITTEN).
2.) ALL FEATURES ARE MARKED AS SHOWN IN THE LEGEND UNLESS OTHERWISE NOTED.
3.) DEED REFERENCES: CONSERVATION EASEMENT AND EASEMENT OF INGRESS AND EGRESS DEED BOOK 1488 PG. 985–993.
4.) THIS MAP IS NOT INTENDED TO BE PREPARED FOR RECORDING IN ACCORDANCE WITH G.S. 47–30, AS AMENDED.
5.) THE BENCH MARK FOR ALL ELEVATIONS SHOWN HEREON IS A NCDOT TRAVERSE DISK NUMBER "R2568WM GPS 1" HAVING NC GRID NAD "83/86" COORDINATES AS FOLLOWS: N:812497.152 US FT, E:1686318.780 US FT: ELEV: 775.03 US FT (NGVD 29) AS SHOWN ON A SURVEY DONE BY M.L. MOTSINGER, DATED 12/04/2003 ENTITLED: SURVEY OF VALLEYFIELDS FARM, INC. CONSERVATION EASEMENTS ACQUIRED BY NORTH CAROLINA DEPARTMENT OF TRANSPORTATION FOR NORTH CAROLINA WILDLIFE RESOURCE COMMISSION.
6.) ALL DISTANCES SHOWN HEREON ARE HORIZONTAL GROUND DISTANCES UNLESS OTHERWISE NOTED.
7.) THE COMBINED SCALE FACTOR FOR THE ENTIRE PROJECT IS 0.999920223 (GROUND TO GRID).
8.) ALL UTILITIES SHOWN WERE LOCATED BY PHYSICAL ABOVE GROUND EVIDENCE AND THEREFORE ALL SUBSURFACE UTILITIES MY NOT BE SHOWN ON THIS SURVEY.
9.) ALL CONTOURS ARE AT A 1 FOOT CONTOUR INTERVAL.
10.) ALL EASEMENT AND BOUNDARY INFORMATION BASED ON A DIGITAL FILE OBTAINED FROM KIMLEY–HORN & ASSOCIATES AND IS SUBJECT TO ACCURACY THEREOF.
11.) PROPERTY IS ZONED "RS".

N46°46'53"W 423.90'
(NOT TO SCALE)
S43°21'39"E 446.05'
(NOT TO SCALE)
S21°59'03"E 120.76'
CONSERVATION EASEMENT & EASEMENT OF INGRESS AND EGRESS PER DEED BOOK 1488 PG. 985–993
SEWER MANHOLE
MH ELEV: 760.40'
INV. IN: 747.25'
INV. OUT: 747.20'
24" CLAY
S81°16'31"E 132.00'
11' GRAVEL DRIVE
407.64'
N59°46'08"E
SEWER MANHOLE
MH ELEV: 759.96'
INV. IN: 746.66'
INV. OUT:746.46
STONE CORNER
N52°45'09"W 639.20'
339.35'
S60°30'10"W
N59°27'34"W 104.29'
N: 812,669.814'
E: 1,686,400.336'
Z: 761.094'
SEWER MANHOLE
MH ELEV: 757.72'
INV. IN: 745.87'
INV. OUT: 745.82'
WALLBURG–HIGHPOINT RD. (SR 1741)
TBM ELEV: 834.50'
NCDOT TRAVERSE DISK "GPS1"
N: 812107.3874 US FT
E: 1687334.8183 US FT

N: 812,968.221'
E: 1,686,932.959'
Z: 759.154'
MATCH LINE SEE SHEET 2 OF 8
COLONIAL PLANTATION PIPELINE EASEMENT
50 ft
N52°50'21"E 376.03'
MATCH LINE SEE SHEET 2 OF 8
7+00
6+00
5+00
70.0ft
CONSERVATION EASEMENT & EASEMENT OF INGRESS AND EGRESS PER DEED BOOK 1488 PG. 985–993
4+00
3+00
N: 812,635.821'
E: 1,686,756.925'
Z: 759.320'
SEWER MANHOLE
MH ELEV: 762.33'
INV. IN: 748.33'
INV. OUT:748.23'
24" CLAY
SEWER MANHOLE "SEALED"
1+00
2+00
N13°08'49"W
355.66'
N: 812,536.447'
E: 1,686,666.099'
Z: 758.513'
EIP
N89°37'05"W 293.24'
S46°11'12"W 481.85'
(NOT TO SCALE)
139.29'
S69°42'25"W
123.70'
S32°04'10"W

0' 40' 80' 120'

NCBELS LICENSE NO. C-1273
CAVANAUGH
Solutions through integrity and partnership
Cavanaugh & Associates, P.A. 530 North Trade Street, Suite 302, Winston-Salem, NC 27101
336/759-9001 fax: 336/759-1005 www.cavanaughsolutions.com

STATE OF NORTH CAROLINA
COUNTY OF DAVIDSON

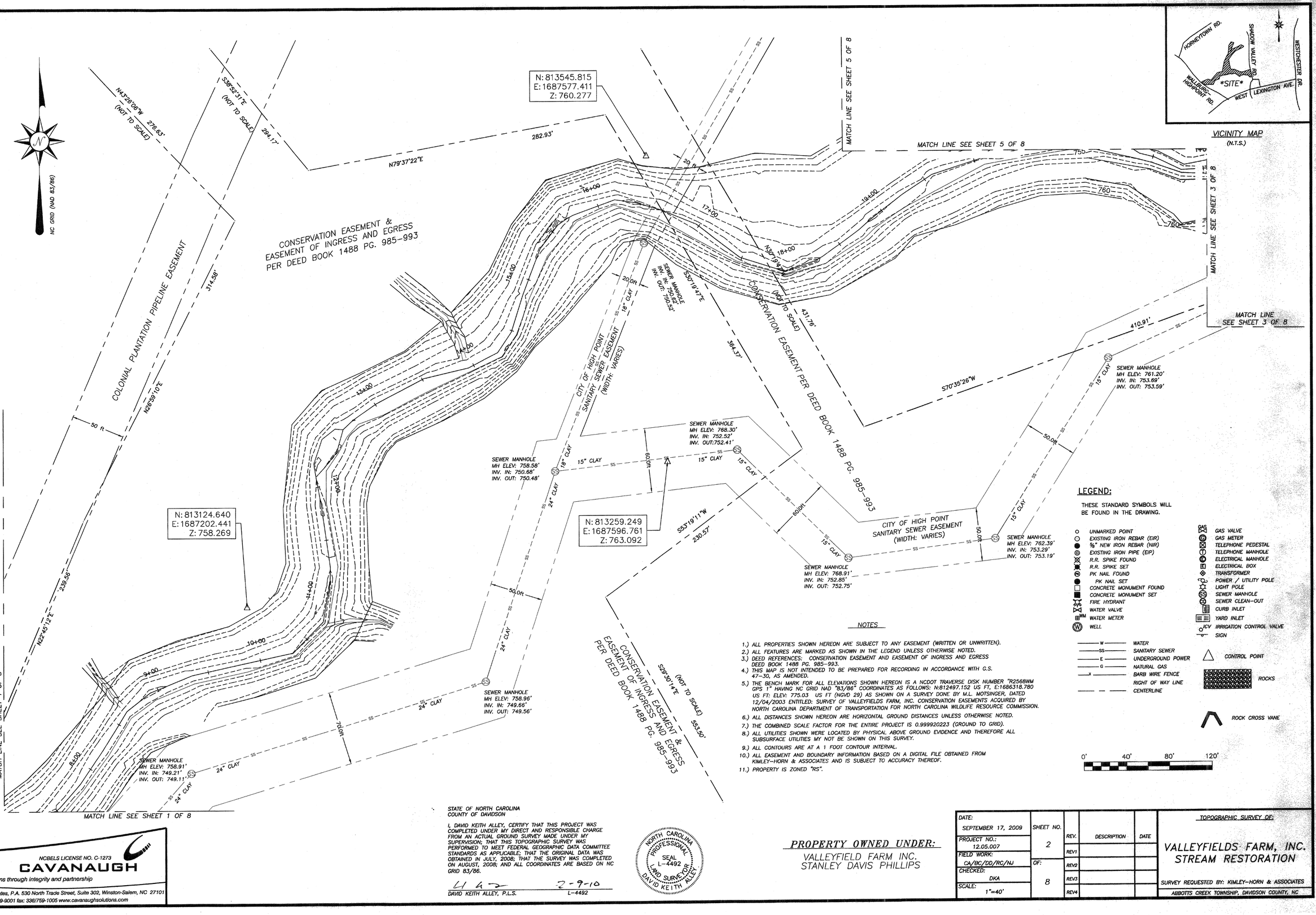
I, DAVID KEITH ALLEY, CERTIFY THAT THIS PROJECT WAS COMPLETED UNDER MY DIRECT AND RESPONSIBLE CHARGE FROM AN ACTUAL GROUND SURVEY MADE UNDER MY SUPERVISION; THAT THIS TOPOGRAPHIC SURVEY WAS PERFORMED TO MEET FEDERAL GEOGRAPHIC DATA COMMITTEE STANDARDS AS APPLICABLE; THAT THE ORIGINAL DATA WAS OBTAINED IN JULY, 2008; THAT THE SURVEY WAS COMPLETED ON AUGUST, 2008; AND ALL COORDINATES ARE BASED ON NC GRID 83/86.

DAVID KEITH ALLEY, P.L.S. L-4492 2-9-10

NORTH CAROLINA PROFESSIONAL SEAL L-4492 LAND SURVEYOR DAVID KEITH ALLEY

PROPERTY OWNED UNDER:
VALLEYFIELD FARM INC.
STANLEY DAVIS PHILLIPS

DATE: SEPTEMBER 17, 2009	SHEET NO. 1 OF: 8	REV.	DESCRIPTION	DATE	TOPOGRAPHIC SURVEY OF: VALLEYFIELDS FARM, INC. STREAM RESTORATION
PROJECT NO.: 12.05.007		REV1			
FIELD WORK: CA/BC/DD/RC/NJ		REV2			
CHECKED: DKA		REV3			SURVEY REQUESTED BY: KIMLEY–HORN & ASSOCIATES
SCALE: 1"=40'		REV4			ABBOTTS CREEK TOWNSHIP, DAVIDSON COUNTY, NC



VICINITY MAP
(N.T.S.)

LEGEND:

THESE STANDARD SYMBOLS WILL BE FOUND IN THE DRAWING.

- UNMARKED POINT
- EXISTING IRON REBAR (EIR)
- ⅝" NEW IRON REBAR (NIR)
- EXISTING IRON PIPE (EIP)
- R.R. SPIKE FOUND
- R.R. SPIKE SET
- PK NAIL FOUND
- PK NAIL SET
- CONCRETE MONUMENT FOUND
- CONCRETE MONUMENT SET
- FIRE HYDRANT
- WATER VALVE
- WATER METER
- WELL
- GAS VALVE
- GAS METER
- TELEPHONE PEDESTAL
- TELEPHONE MANHOLE
- ELECTRICAL MANHOLE
- ELECTRICAL BOX
- TRANSFORMER
- POWER / UTILITY POLE
- LIGHT POLE
- SEWER MANHOLE
- SEWER CLEAN-OUT
- CURB INLET
- YARD INLET
- ICV IRRIGATION CONTROL VALVE
- SIGN
- W — WATER
- SS — SANITARY SEWER
- E — UNDERGROUND POWER
- G — NATURAL GAS
- x — BARB WIRE FENCE
- RIGHT OF WAY LINE
- CENTERLINE
- CONTROL POINT
- ROCKS
- ROCK CROSS VANE

0' 40' 80' 120'

NOTES

1.) ALL PROPERTIES SHOWN HEREON ARE SUBJECT TO ANY EASEMENT (WRITTEN OR UNWRITTEN).
2.) ALL FEATURES ARE MARKED AS SHOWN IN THE LEGEND UNLESS OTHERWISE NOTED.
3.) DEED REFERENCES: CONSERVATION EASEMENT AND EASEMENT OF INGRESS AND EGRESS DEED BOOK 1488 PG. 985-993.
4.) THIS MAP IS NOT INTENDED TO BE PREPARED FOR RECORDING IN ACCORDANCE WITH G.S. 47-30, AS AMENDED.
5.) THE BENCH MARK FOR ALL ELEVATIONS SHOWN HEREON IS A NCDOT TRAVERSE DISK NUMBER "R2568WM GPS 1" HAVING NC GRID NAD "83/86" COORDINATES AS FOLLOWS: N:812497.152 US FT, E:1686318.780 US FT: ELEV: 775.03 US FT (NGVD 29) AS SHOWN ON A SURVEY DONE BY M.L. MOTSINGER, DATED 12/04/2003 ENTITLED: SURVEY OF VALLEYFIELDS FARM, INC. CONSERVATION EASEMENTS ACQUIRED BY NORTH CAROLINA DEPARTMENT OF TRANSPORTATION FOR NORTH CAROLINA WILDLIFE RESOURCE COMMISSION.
6.) ALL DISTANCES SHOWN HEREON ARE HORIZONTAL GROUND DISTANCES UNLESS OTHERWISE NOTED.
7.) THE COMBINED SCALE FACTOR FOR THE ENTIRE PROJECT IS 0.999920223 (GROUND TO GRID).
8.) ALL UTILITIES SHOWN WERE LOCATED BY PHYSICAL ABOVE GROUND EVIDENCE AND THEREFORE ALL SUBSURFACE UTILITIES MY NOT BE SHOWN ON THIS SURVEY.
9.) ALL CONTOURS ARE AT A 1 FOOT CONTOUR INTERVAL.
10.) ALL EASEMENT AND BOUNDARY INFORMATION BASED ON A DIGITAL FILE OBTAINED FROM KIMLEY-HORN & ASSOCIATES AND IS SUBJECT TO ACCURACY THEREOF.
11.) PROPERTY IS ZONED "RS".

STATE OF NORTH CAROLINA
COUNTY OF DAVIDSON

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DAVID KEITH ALLEY, P.L.S. — L-4492 — 2-9-10

NORTH CAROLINA PROFESSIONAL SEAL L-4492 LAND SURVEYOR DAVID KEITH ALLEY

PROPERTY OWNED UNDER:
VALLEYFIELD FARM INC.
STANLEY DAVIS PHILLIPS

DATE:	SHEET NO.	REV.	DESCRIPTION	DATE
SEPTEMBER 17, 2009	2	REV1		
PROJECT NO.: 12.05.007		REV2		
FIELD WORK: CA/BC/DD/RC/NJ	OF: 8	REV3		
CHECKED: DKA		REV4		
SCALE: 1"=40'				

TOPOGRAPHIC SURVEY OF:

VALLEYFIELDS FARM, INC. STREAM RESTORATION

SURVEY REQUESTED BY: KIMLEY-HORN & ASSOCIATES

ABBOTTS CREEK TOWNSHIP, DAVIDSON COUNTY, NC

NCBELS LICENSE NO. C-1273
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- WM WATER METER
- W WELL
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- G GAS METER
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- TRANSFORMER
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- SEWER CLEAN-OUT
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- YARD INLET
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- SIGN

- W WATER
- SS SANITARY SEWER
- E UNDERGROUND POWER
- G NATURAL GAS
- x BARB WIRE FENCE
- RIGHT OF WAY LINE
- CENTERLINE

- CONTROL POINT
- ROCKS
- ROCK CROSS VANE

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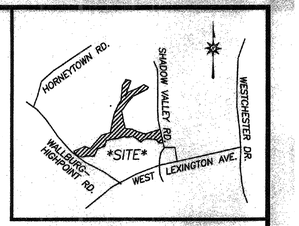

VICINITY MAP
(N.T.S.)

NC GRID (NAD 83/86)

CONSERVATION EASEMENT & EASEMENT OF INGRESS AND EGRESS PER DEED BOOK 1488 PG. 985–993

S82°55'32"E 745.24'

MATCH LINE SEE SHEET 5 OF 8

MATCH LINE SEE SHEET 4 OF 8

12" RCP INV.: 763.22'

S39°57'04"E

N: 813659.126
E: 1689203.112
Z: 766.327

214.48'

SEWER MANHOLE MH ELEV: 767.29' INV. IN: 761.19' INV. OUT: 761.14'

SEWER MANHOLE MH ELEV: 769.12' INV. IN: 761.62' INV. OUT: 761.52'

(R/W WIDTH VARIES) CITY OF HIGH POINT SANITARY SEWER EASEMENT

CITY OF HIGH POINT SANITARY SEWER EASEMENT

SEWER MANHOLE MH ELEV: 770.18' INV. IN: 760.58' INV. OUT: 760.48'

15" CLAY S75°05'55"W 499.22'

N: 813549.209
E: 1689009.306
Z: 774.390

15" RCP INV.: 778.32'

N57°42'35"W

MATCH LINE SEE SHEET 2 OF 8

SEWER MANHOLE MH ELEV: 766.08' INV. IN: 759.78' INV. OUT: 759.68'

SEWER MANHOLE MH ELEV: 766.74' INV. IN: 759.74' INV. OUT: 759.64'

245.28' N76°52'35"W 311.96'

60.0ft

15" CLAY

S42°08'26"W

SEWER MANHOLE MH ELEV: 772.26' INV. IN: 760.18' INV. OUT: 760.08'

SEWER MANHOLE MH ELEV: 762.60' INV. IN: 756.10' INV. OUT: 756.00

SEWER MANHOLE MH ELEV: 767.15' INV. IN: 747.85' INV. OUT: 747.35'

50.0ft

N76°23'11"W 160.50'

218.70'

0' 40' 80' 120'

STATE OF NORTH CAROLINA
COUNTY OF DAVIDSON

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DAVID KEITH ALLEY, P.L.S. L–4492 2-9-10

NORTH CAROLINA PROFESSIONAL SEAL L–4492 LAND SURVEYOR DAVID KEITH ALLEY

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336/759-9001 fax: 336/759-1006 www.cavanaughsolutions.com

PROPERTY OWNED UNDER:
VALLEYFIELD FARM INC.
STANLEY DAVIS PHILLIPS

DATE: SEPTEMBER 17, 2009	SHEET NO. 3	REV.	DESCRIPTION	DATE	TOPOGRAPHIC SURVEY OF: VALLEYFIELDS FARM, INC. STREAM RESTORATION
PROJECT NO.: 12.05.007		REV1			
FIELD WORK: CA/BC/DD/RC/NJ	OF: 8	REV2			
CHECKED: DKA		REV3			SURVEY REQUESTED BY: KIMLEY–HORN & ASSOCIATES
SCALE: 1"=40'		REV4			ABBOTTS CREEK TOWNSHIP, DAVIDSON COUNTY, NC

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- PK NAIL SET
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- CONCRETE MONUMENT SET
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- WATER METER
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- ROCKS
- ROCK CROSS VANE

NOTES

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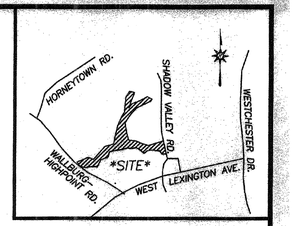
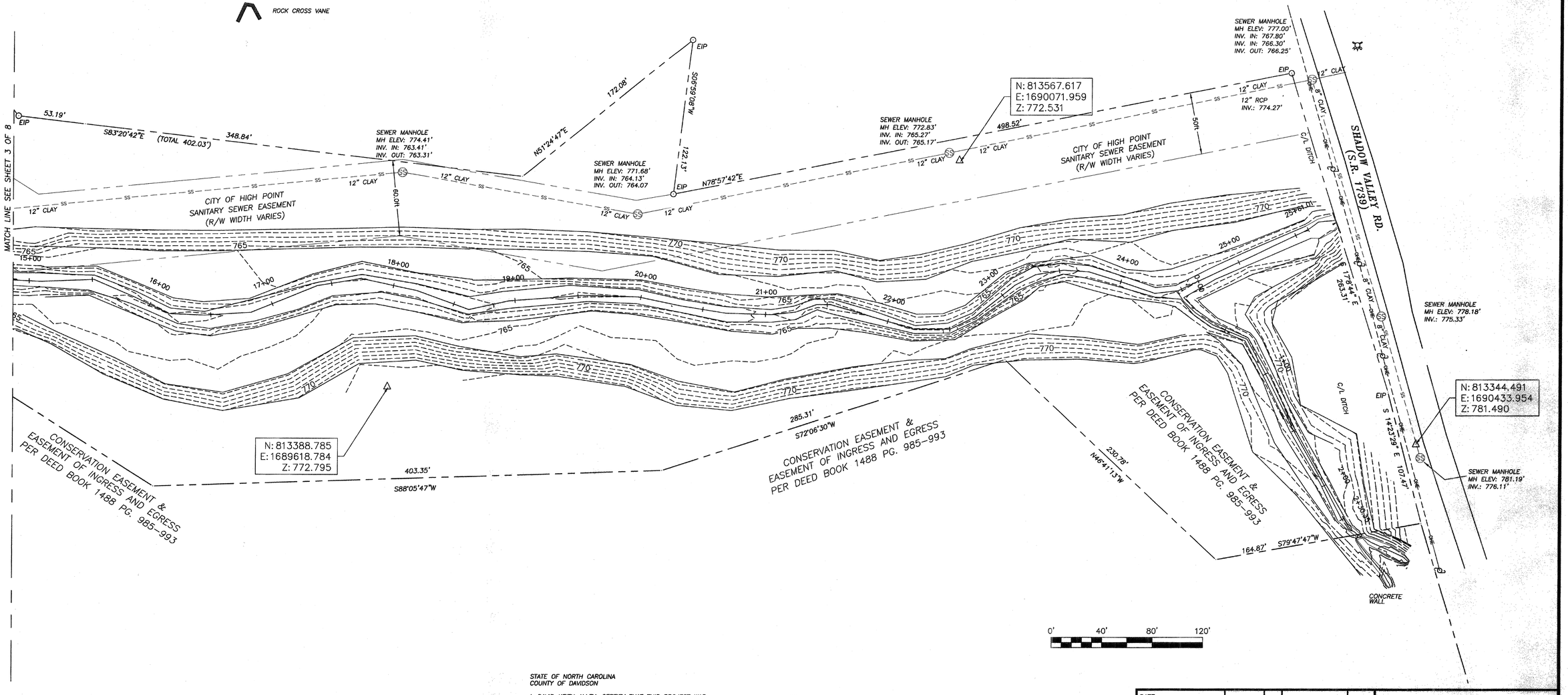
NC GRID (NAD 83/86)



VICINITY MAP
(N.T.S.)



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COUNTY OF DAVIDSON

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2-9-10
DAVID KEITH ALLEY, P.L.S. L-4492

NORTH CAROLINA PROFESSIONAL SEAL L-4492 LAND SURVEYOR DAVID KEITH ALLEY

PROPERTY OWNED UNDER:
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STANLEY DAVIS PHILLIPS

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DATE: SEPTEMBER 17, 2009	SHEET NO. 4	REV.	DESCRIPTION	DATE	TOPOGRAPHIC SURVEY OF:
PROJECT NO.: 12.05.007		REV1			VALLEYFIELDS FARM, INC. STREAM RESTORATION
FIELD WORK: CA/BC/DD/RC/NJ	OF: 8	REV2			
CHECKED: DKA		REV3			SURVEY REQUESTED BY: KIMLEY-HORN & ASSOCIATES
SCALE: 1"=40'		REV4			ABBOTTS CREEK TOWNSHIP, DAVIDSON COUNTY, NC

LEGEND:

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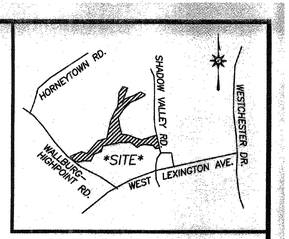

VICINITY MAP
(N.T.S.)

MATCH LINE SEE SHEET 2 OF 8

CITY OF HIGH POINT SANITARY SEWER EASEMENT

20ft

18" CLAY

SEWER MANHOLE
MH ELEV: 764.97'
INV. IN: 753.27'
INV. OUT: 753.07'

SEWER MANHOLE
MH ELEV: 764.34'
INV. IN: 754.24'
INV. OUT: 754.09'

SEWER MANHOLE
MH ELEV: 765.51'
INV. IN: 755.21'
INV. OUT: 755.01'

(NOT TO SCALE)
N16°44'27"E
843.15'

N55°59'53"W
137.04'
(NOT TO SCALE)

COLONIAL PLANTATION PIPELINE EASEMENT

258.73'

CONSERVATION EASEMENT & EASEMENT OF INGRESS AND EGRESS PER DEED BOOK 1488 PG. 985-993

S55°14'43"E
(NOT TO SCALE)

50.01'

N25°24'44"E
(NOT TO SCALE)
637.35'

Z: 764.296

J- HOOK (TYP.)

TOP OF BANK (TYP.)

TOE OF SLOPE (TYP.)

N: 813642.403
E: 1688130.798
Z: 762.019

N: 814143.488
E: 1688111.408
Z: 761.461

N: 813735.101
E: 1688424.842
Z: 763.267

CONSERVATION EASEMENT & EASEMENT OF INGRESS AND EGRESS PER DEED BOOK 1488 PG. 985-993

305.38'
S82°55'32"E
(NOT TO SCALE)

S02°09'08"W

STONE

S01°12'22"W 166.03'

EIP

(NOT TO SCALE)
S05°41'16"W
783.07'

NC GRID (NAD 83/86)

0' 40' 80' 120'

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MATCH LINE SEE SHEET 6 OF 8

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NORTH CAROLINA PROFESSIONAL SEAL L-4492 LAND SURVEYOR DAVID KEITH ALLEY

PROPERTY OWNED UNDER:
VALLEYFIELD FARM INC.
STANLEY DAVIS PHILLIPS

DATE: SEPTEMBER 17, 2009	SHEET NO. 5	REV.	DESCRIPTION	DATE	TOPOGRAPHIC SURVEY OF: VALLEYFIELDS FARM, INC. STREAM RESTORATION
PROJECT NO.: 12.05.007	OF: 8	REV1			
FIELD WORK: CA/BC/DD/RC/NJ		REV2			
CHECKED: DKA		REV3			SURVEY REQUESTED BY: KIMLEY-HORN & ASSOCIATES
SCALE: 1"=40'		REV4			ABBOTTS CREEK TOWNSHIP, DAVIDSON COUNTY, NC

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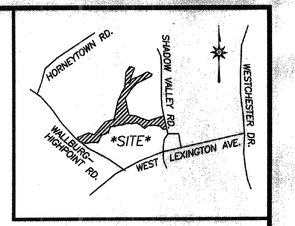
7.) THE COMBINED SCALE FACTOR FOR THE ENTIRE PROJECT IS 0.999920223 (GROUND TO GRID).
8.) ALL UTILITIES SHOWN WERE LOCATED BY PHYSICAL ABOVE GROUND EVIDENCE AND THEREFORE ALL SUBSURFACE UTILITIES MY NOT BE SHOWN ON THIS SURVEY.
9.) ALL CONTOURS ARE AT A 1 FOOT CONTOUR INTERVAL.
10.) ALL EASEMENT AND BOUNDARY INFORMATION BASED ON A DIGITAL FILE OBTAINED FROM KIMLEY–HORN & ASSOCIATES AND IS SUBJECT TO ACCURACY THEREOF.
11.) PROPERTY IS ZONED "RS".



VICINITY MAP
(N.T.S.)

NC GRID (NAD 83/86)

N: 814949.148
E: 1688304.083
Z: 763.870

N: 814777.675
E: 1688235.805
Z: 765.024

N: 815200.181
E: 1688484.685
Z: 764.580

N: 815393.180
E: 1688486.994
Z: 766.164

N: 815879.117
E: 1688422.262
Z: 768.291

SEWER MANHOLE
MH ELEV: 765.89'
INV. IN: 755.59'
INV. OUT: 755.29'

SEWER MANHOLE
MH ELEV: 766.67'
INV. IN: 756.57'
INV. OUT: 756.37'

SEWER MANHOLE
MH ELEV: 766.23'
INV. IN: 757.73
INV. IN: 757.33'
INV. OUT: 757.23'

SEWER MANHOLE
MH ELEV: 766.65'
INV. IN: 758.85'
INV. OUT: 758.65'

SEWER MANHOLE
MH ELEV: 759.79'
INV. IN: 760.79'
INV. OUT: 760.69'

SEWER MANHOLE
MH ELEV: 766.98'
INV. IN: 759.68'
INV. OUT: 759.58'

N25°24'44"E 637.35' (NOT TO SCALE)
N07°08'41"E 435.57'
N01°46'28"W 206.17'
N65°54'48"W 1141.28'
(NOT TO SCALE)
CONSERVATION EASEMENT & EASEMENT OF INGRESS AND EGRESS PER DEED BOOK 1488 PG. 985–993

CONSERVATION EASEMENT & EASEMENT OF INGRESS AND EGRESS PER DEED BOOK 1488 PG. 985–993

COLONIAL PLANTATION PIPELINE EASEMENT

CITY OF HIGH POINT SANITARY SEWER EASEMENT

50.0ft

20.0ft

18" CLAY
10" CLAY
12" CLAY

J–HOOK (TYP.)

TOP OF BANK(TYP.)

S27°45'27"W 378.18' (NOT TO SCALE) EIP

S27°45'27"W (NOT TO SCALE) 378.18'

36+00 37+00 38+00 39+00 40+00 41+00 42+00 43+00 44+00 45+00 46+00 47+00 48+00 1+00 2+00

MATCH LINE SEE SHEET 5 OF 8

MATCH LINE SEE SHEET 7 OF 8

MATCH LINE SEE SHEET 8 OF 8

MATCH LINE SEE SHEET 8 OF 8

0' 40' 80' 120'

LEGEND:

THESE STANDARD SYMBOLS WILL BE FOUND IN THE DRAWING.

- UNMARKED POINT
- EXISTING IRON REBAR (EIR)
- ⅝" NEW IRON REBAR (NIR)
- EXISTING IRON PIPE (EIP)
- R.R. SPIKE FOUND
- R.R. SPIKE SET
- PK NAIL FOUND
- PK NAIL SET
- CONCRETE MONUMENT FOUND
- CONCRETE MONUMENT SET
- FIRE HYDRANT
- WATER VALVE
- WATER METER
- WELL
- W — WATER
- SS — SANITARY SEWER
- E — UNDERGROUND POWER
- G — NATURAL GAS
- x — BARB WIRE FENCE
- RIGHT OF WAY LINE
- CENTERLINE
- GAS VALVE
- GAS METER
- TELEPHONE PEDESTAL
- TELEPHONE MANHOLE
- ELECTRICAL MANHOLE
- ELECTRICAL BOX
- TRANSFORMER
- POWER / UTILITY POLE
- LIGHT POLE
- SEWER MANHOLE
- SEWER CLEAN–OUT
- CURB INLET
- YARD INLET
- ICV IRRIGATION CONTROL VALVE
- SIGN
- CONTROL POINT
- ROCKS
- ROCK CROSS VANE

STATE OF NORTH CAROLINA
COUNTY OF DAVIDSON

I, DAVID KEITH ALLEY, CERTIFY THAT THIS PROJECT WAS COMPLETED UNDER MY DIRECT AND RESPONSIBLE CHARGE FROM AN ACTUAL GROUND SURVEY MADE UNDER MY SUPERVISION; THAT THIS TOPOGRAPHIC SURVEY WAS PERFORMED TO MEET FEDERAL GEOGRAPHIC DATA COMMITTEE STANDARDS AS APPLICABLE; THAT THE ORIGINAL DATA WAS OBTAINED IN JULY, 2008; THAT THE SURVEY WAS COMPLETED ON AUGUST, 2008; AND ALL COORDINATES ARE BASED ON NC GRID 83/86.

2-9-10
DAVID KEITH ALLEY, P.L.S. L–4492

NORTH CAROLINA PROFESSIONAL SEAL L–4492 LAND SURVEYOR DAVID KEITH ALLEY

PROPERTY OWNED UNDER:
VALLEYFIELD FARM INC.
STANLEY DAVIS PHILLIPS

NCBELS LICENSE NO. C-1273
CAVANAUGH
Solutions through integrity and partnership
Cavanaugh & Associates, P.A. 530 North Trade Street, Suite 302, Winston-Salem, NC 27101
336/759-9001 fax: 336/759-1005 www.cavanaughsolutions.com

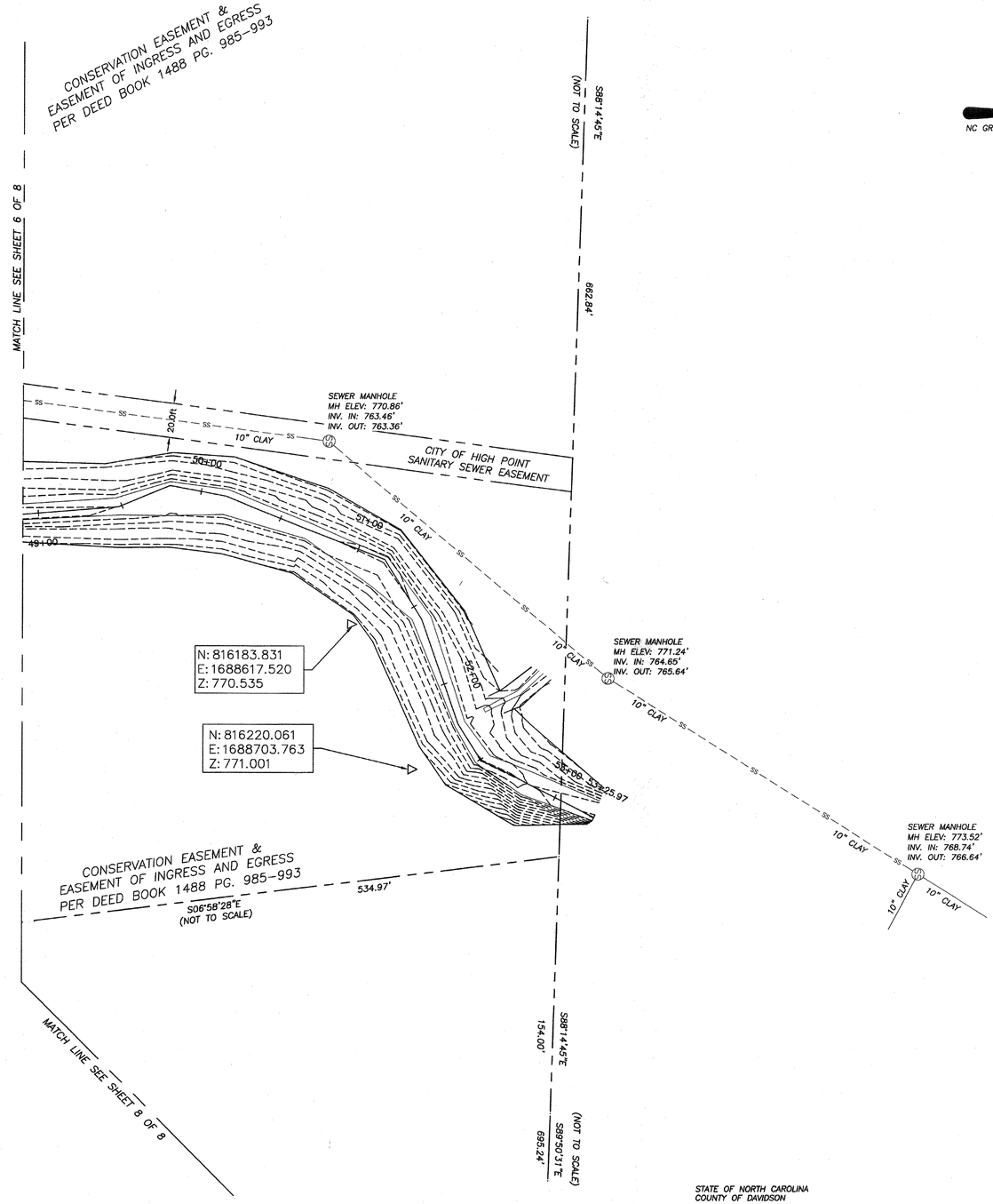
DATE:	SHEET NO.	REV.	DESCRIPTION	DATE
SEPTEMBER 17, 2009				
PROJECT NO.: 12.05.007	6	REV1		
FIELD WORK: CA/BC/DD/RC/NJ	OF:	REV2		
CHECKED: DKA	8	REV3		
SCALE: 1"=40'		REV4		

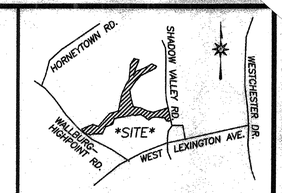
TOPOGRAPHIC SURVEY OF:

VALLEYFIELDS FARM, INC. STREAM RESTORATION

SURVEY REQUESTED BY: KIMLEY–HORN & ASSOCIATES

ABBOTTS CREEK TOWNSHIP, DAVIDSON COUNTY, NC





VICINITY MAP
(N.T.S.)

LEGEND:

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- ⅝" NEW IRON REBAR (NIR)
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- R.R. SPIKE SET
- PK NAIL FOUND
- PK NAIL SET
- CONCRETE MONUMENT FOUND
- CONCRETE MONUMENT SET
- FIRE HYDRANT
- WATER VALVE
- WM WATER METER
- W WELL
- GAS GAS VALVE
- GM GAS METER
- TP TELEPHONE PEDESTAL
- TM TELEPHONE MANHOLE
- EM ELECTRICAL MANHOLE
- E ELECTRICAL BOX
- TRANSFORMER
- POWER / UTILITY POLE
- LIGHT POLE
- SS SEWER MANHOLE
- SEWER CLEAN-OUT
- CURB INLET
- YARD INLET
- ICV IRRIGATION CONTROL VALVE
- SIGN
- W WATER
- SS SANITARY SEWER
- E UNDERGROUND POWER
- G NATURAL GAS
- X BARB WIRE FENCE
- RIGHT OF WAY LINE
- CENTERLINE
- CONTROL POINT
- ROCKS
- ROCK CROSS VANE

NOTES

1.) ALL PROPERTIES SHOWN HEREON ARE SUBJECT TO ANY EASEMENT (WRITTEN OR UNWRITTEN).
2.) ALL FEATURES ARE MARKED AS SHOWN IN THE LEGEND UNLESS OTHERWISE NOTED.
3.) DEED REFERENCES: CONSERVATION EASEMENT AND EASEMENT OF INGRESS AND EGRESS DEED BOOK 1488 PG. 985-993.
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0' 40' 80' 120'

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DAVID KEITH ALLEY, P.L.S. L-4492 2-7-10

NORTH CAROLINA PROFESSIONAL SEAL L-4492 LAND SURVEYOR DAVID KEITH ALLEY

PROPERTY OWNED UNDER:
VALLEYFIELD FARM INC.
STANLEY DAVIS PHILLIPS

DATE: SEPTEMBER 17, 2009	SHEET NO. 7 OF: 8	REV.	DESCRIPTION	DATE	TOPOGRAPHIC SURVEY OF: VALLEYFIELDS FARM, INC. STREAM RESTORATION
PROJECT NO.: 12.05.007		REV1			
FIELD WORK: CA/BC/DD/RC/NJ		REV2			
CHECKED: DKA		REV3			SURVEY REQUESTED BY: KIMLEY-HORN & ASSOCIATES
SCALE: 1"=40'		REV4			ABBOTTS CREEK TOWNSHIP, DAVIDSON COUNTY, NC

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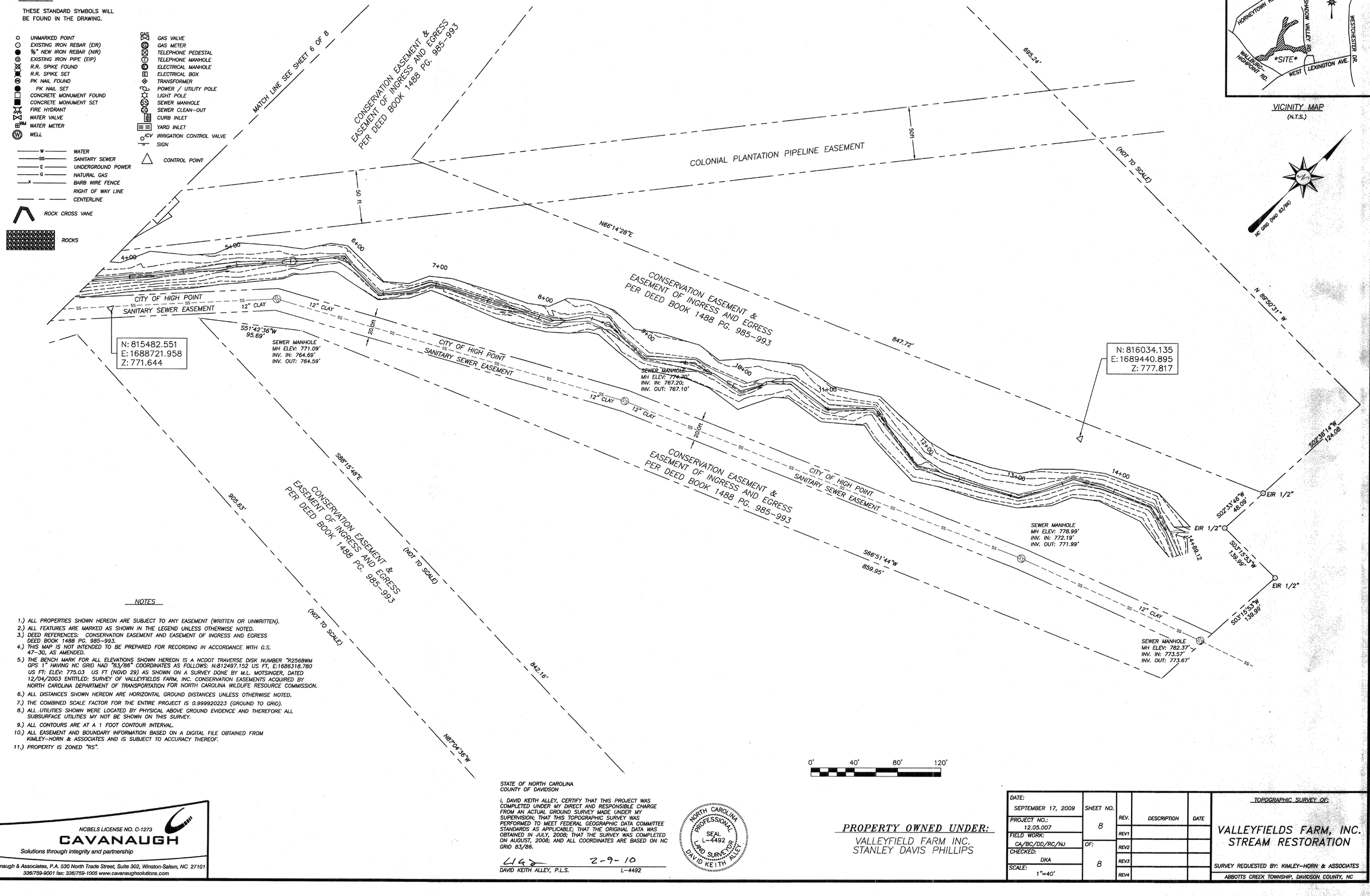

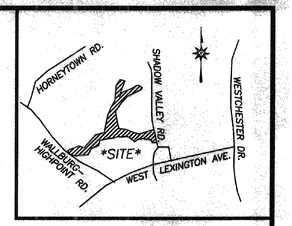

VICINITY MAP
(N.T.S.)

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0' 40' 80' 120'

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STATE OF NORTH CAROLINA
COUNTY OF DAVIDSON

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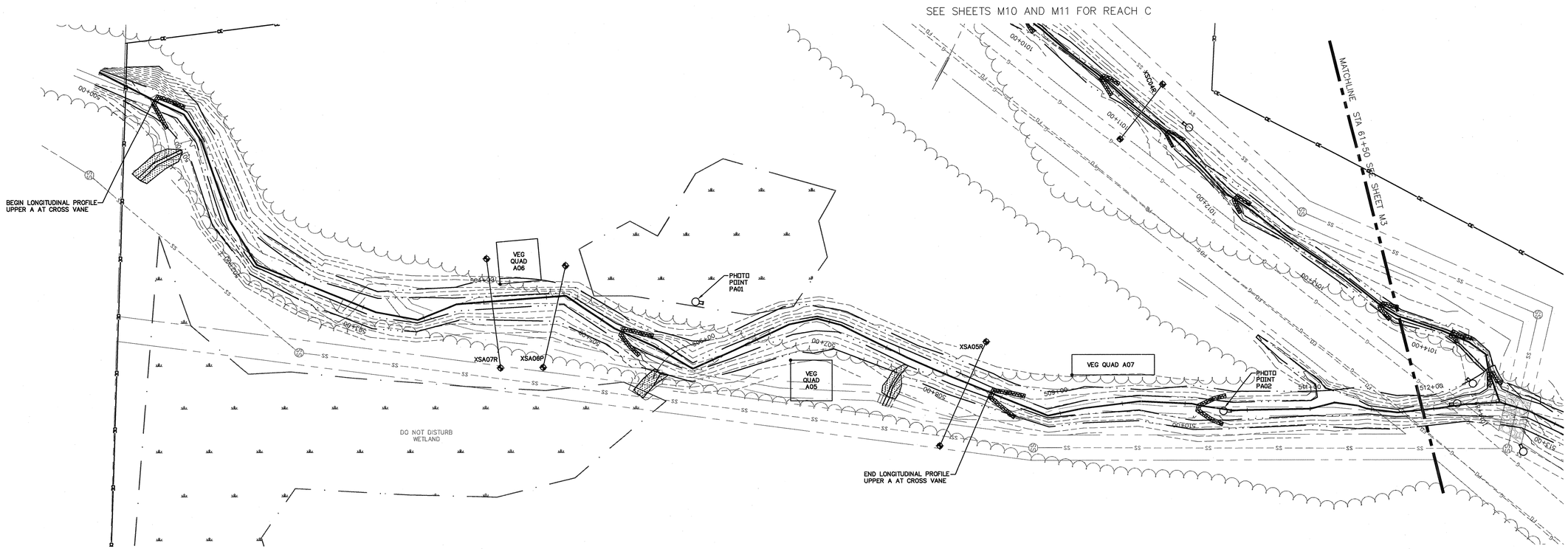
2-9-10
DAVID KEITH ALLEY, P.L.S. L-4492

NORTH CAROLINA PROFESSIONAL SEAL L-4492 LAND SURVEYOR DAVID KEITH ALLEY

PROPERTY OWNED UNDER:
VALLEYFIELD FARM INC.
STANLEY DAVIS PHILLIPS

DATE: SEPTEMBER 17, 2009	SHEET NO.	REV.	DESCRIPTION	DATE	TOPOGRAPHIC SURVEY OF:
PROJECT NO.: 12.05.007	8	REV1			VALLEYFIELDS FARM, INC. STREAM RESTORATION
FIELD WORK: CA/BC/DD/RC/NJ	OF:	REV2			
CHECKED: DKA	8	REV3			SURVEY REQUESTED BY: KIMLEY-HORN & ASSOCIATES
SCALE: 1"=40'		REV4			ABBOTTS CREEK TOWNSHIP, DAVIDSON COUNTY, NC



40' 0 20' 40' 80'

RECORD DOCUMENT

REV. No.:	REVISION:	DATE:	DRAWN BY:	CHECKED BY:

PREPARED IN THE OFFICE OF:
Kimley-Horn and Associates, Inc.
NC LICENSE #F-0102
P.O. BOX 33068 - RALEIGH, NORTH CAROLINA 27636-3068
PHONE: (919) 677-2000 FAX: (919) 677-2050

CLIENT: NC-EEP

TITLE: MONITORING PLAN REACH A

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 026484 2/9/10 WILLIAM R. WILHELM

SEAL:

DATE: 01-28-10
HORIZONTAL SCALE:
VERTICAL SCALE:
DRAWN BY: JIK
DESIGNED BY: ARK/JCD
CHECKED BY: WRW

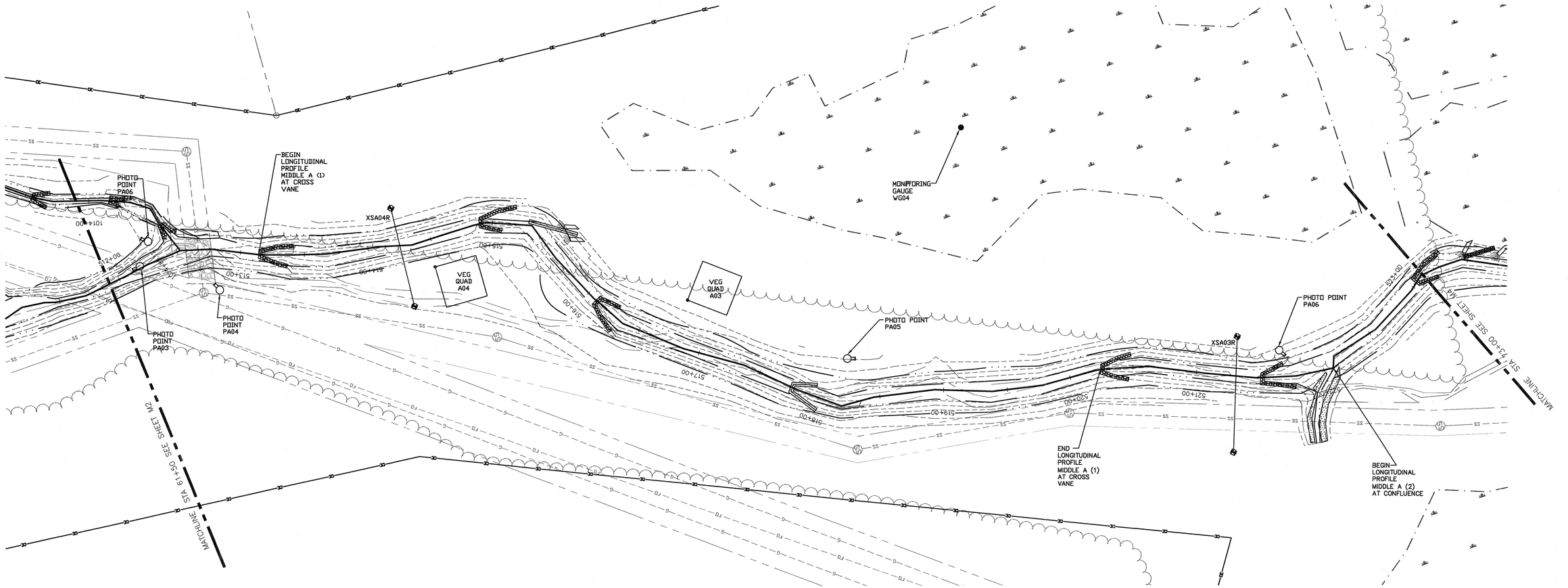
PROJECT: VALLEY FIELDS FARM

ATTACHED REFERENCE FILES:

JOB NUMBER: 011795020

SHEET NUMBER: M2

February 09, 2010 - 1:03pm By: nancyxmumford



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PHONE: (919) 677-2000 FAX: (919) 677-2050

CLIENT: NC-EEP

TITLE: MONITORING PLAN REACH A

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 026484 ENGINEER WILLIAM R. WILHELM 2/9/10

DATE: 01-28-10
HORIZONTAL SCALE:
VERTICAL SCALE:
DRAWN BY: JJK
DESIGNED BY: ARK/JCD
CHECKED BY: WRW

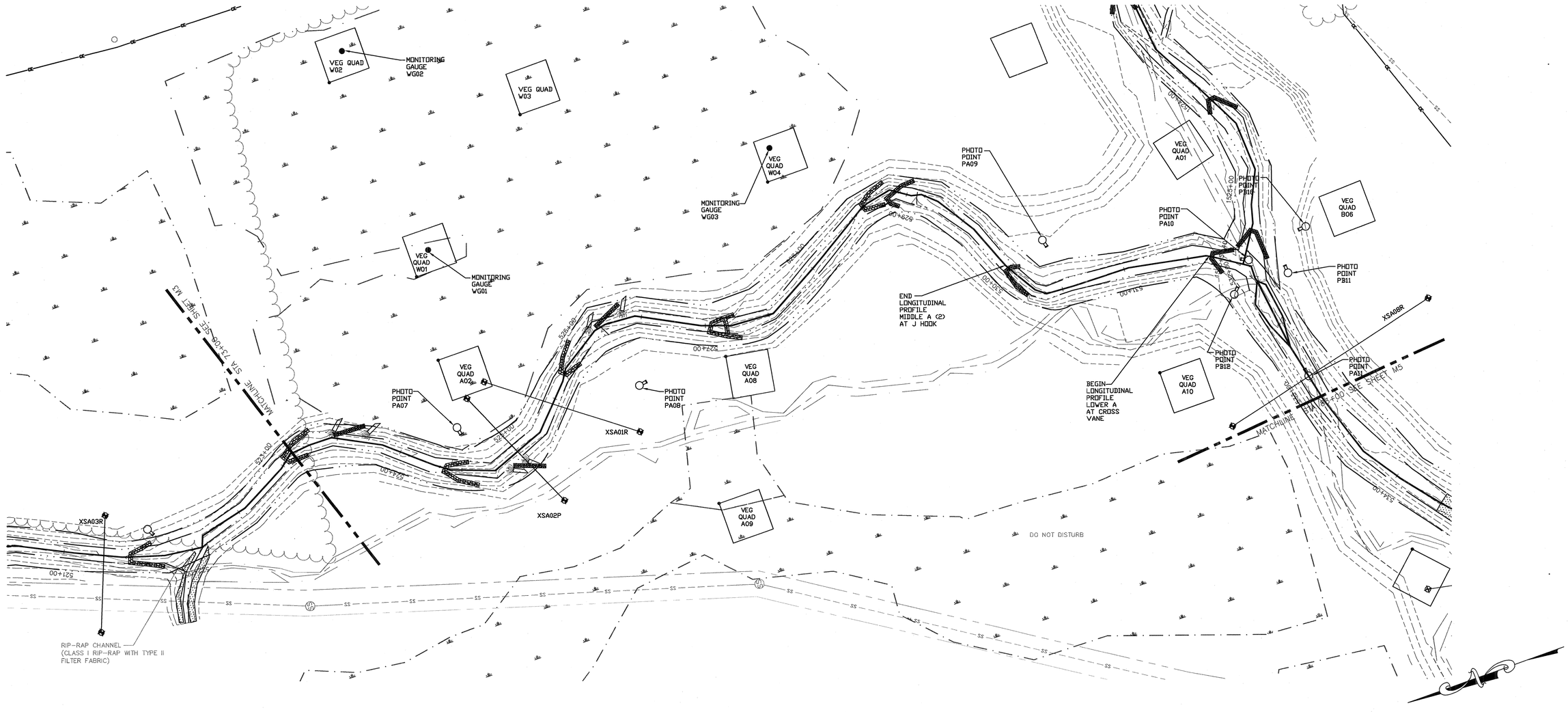
PROJECT: VALLEY FIELDS FARM

ATTACHED REFERENCE FILES:
JOB NUMBER: 011795020
SHEET NUMBER: M3

K:\CHL_Environmental\011795 EEP Raleigh\020 Valley Field Farm\CADD\Record Drawings - 01-2010\BlackandWhite\6B-MONITOR-PLANS.dwg

NOTE:
SEE SHEET P13 FOR WETLAND GRADING PLAN

SEE SHEETS M7 – M9 FOR REACH B



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PHONE: (919) 677-2000 FAX: (919) 677-2050

CLIENT: NC-EEP

TITLE: MONITORING PLAN REACH A

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 026484 ENGINEER WILLIAM R. WILKERSON

DATE:	01-28-10
HORIZONTAL SCALE:	
VERTICAL SCALE:	
DRAWN BY:	JIK
DESIGNED BY:	ARK/JCD
CHECKED BY:	WRW

PROJECT: VALLEY FIELDS FARM

ATTACHED REFERENCE FILES:	JOB NUMBER:	SHEET NUMBER:
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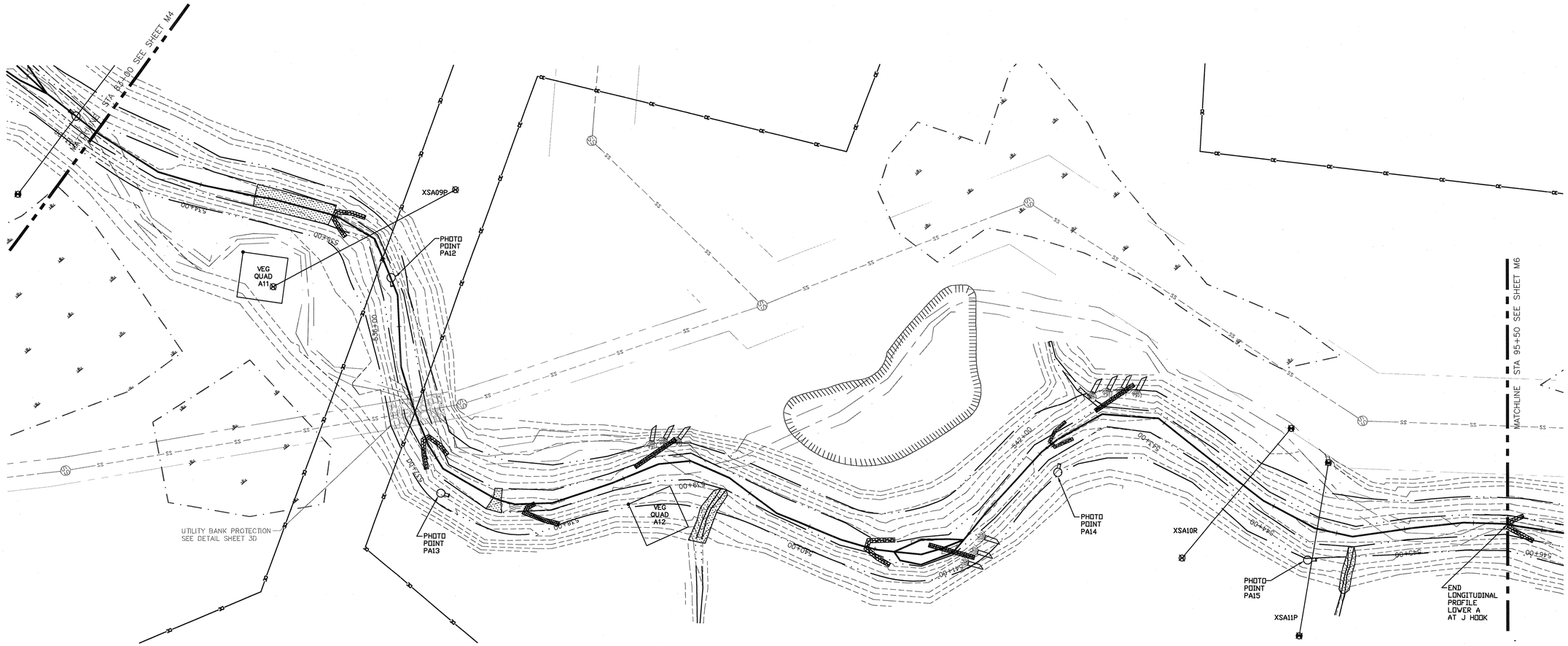

40' 0 20' 40' 80'

RECORD DOCUMENT

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PHONE: (919) 677-2000 FAX: (919) 677-2050

CLIENT: NC-EEP

TITLE: MONITORING PLAN REACH A

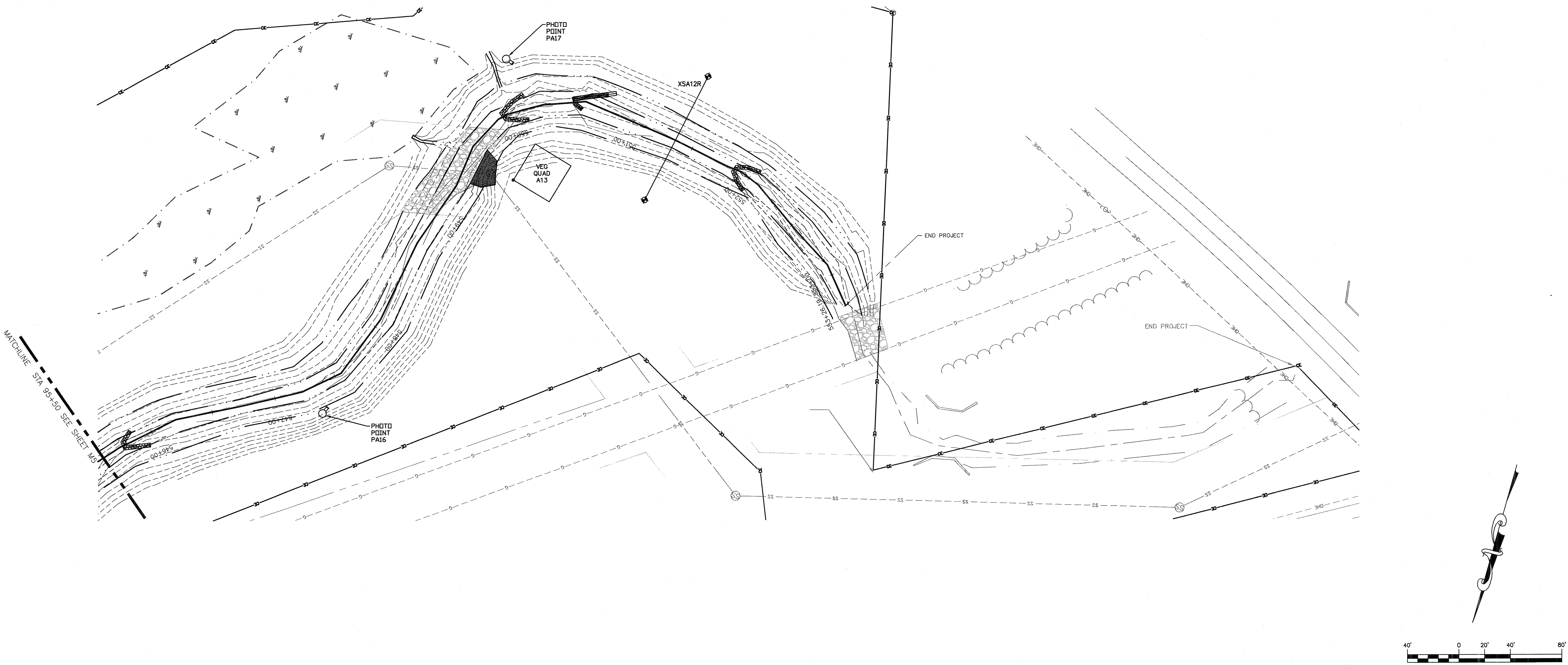
SEAL: NORTH CAROLINA PROFESSIONAL SEAL 026484 ENGINEER WILLIAM R. WYNNLIN 2/9/10

DATE: 01-28-10
HORIZONTAL SCALE:
VERTICAL SCALE:
DRAWN BY: JIK
DESIGNED BY: ARK/JCD
CHECKED BY: WRW

PROJECT: VALLEY FIELDS FARM

ATTACHED REFERENCE FILES:
JOB NUMBER: 011795020
SHEET NUMBER: M5

February 09, 2010 – 1:03pm By: nancy.mumford



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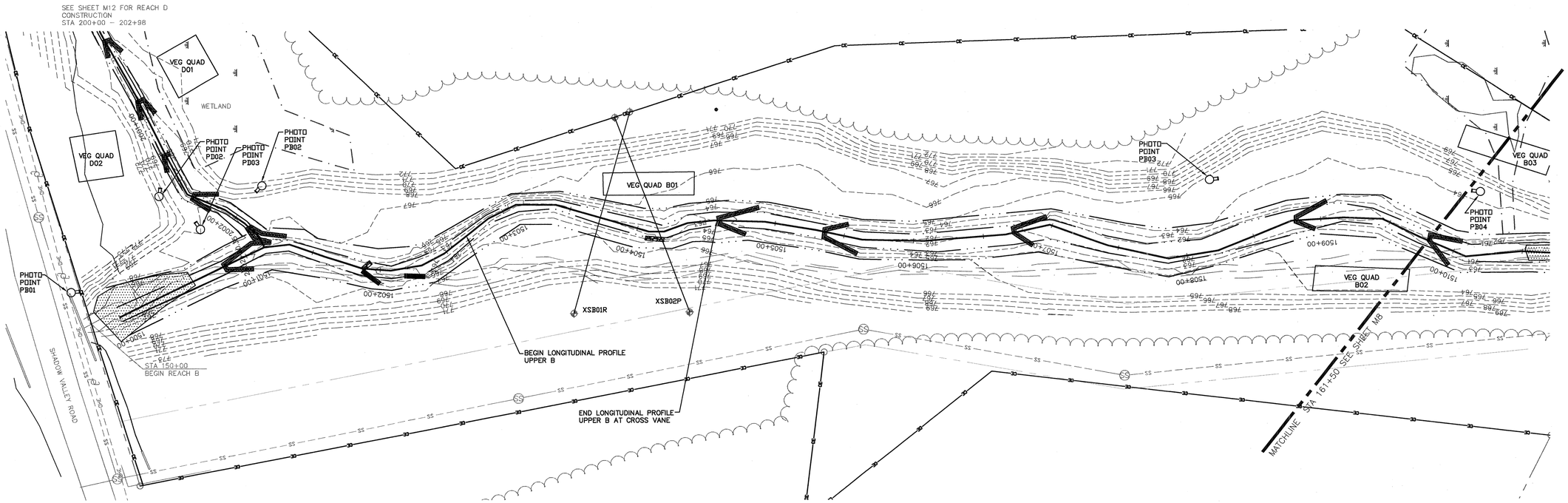
SEAL: NORTH CAROLINA PROFESSIONAL SEAL 026484 2/9/10 ENGINEER WILLIAM R. WILHELM

DATE: 01-28-10
HORIZONTAL SCALE:
VERTICAL SCALE:
DRAWN BY: JIK
DESIGNED BY: ARK/JCD
CHECKED BY: WRW

PROJECT: VALLEY FIELDS FARM

ATTACHED REFERENCE FILES:
JOB NUMBER: 011795020
SHEET NUMBER: M6

K:\CHL_Environmental\011795 EEP Raleigh\020 Valley Field Farm\CADD\Record Drawings – 01-2010\BlackandWhite\6B-MONITOR-PLANS.dwg



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PHONE: (919) 677-2000 FAX: (919) 677-2050

CLIENT: NC-EEP

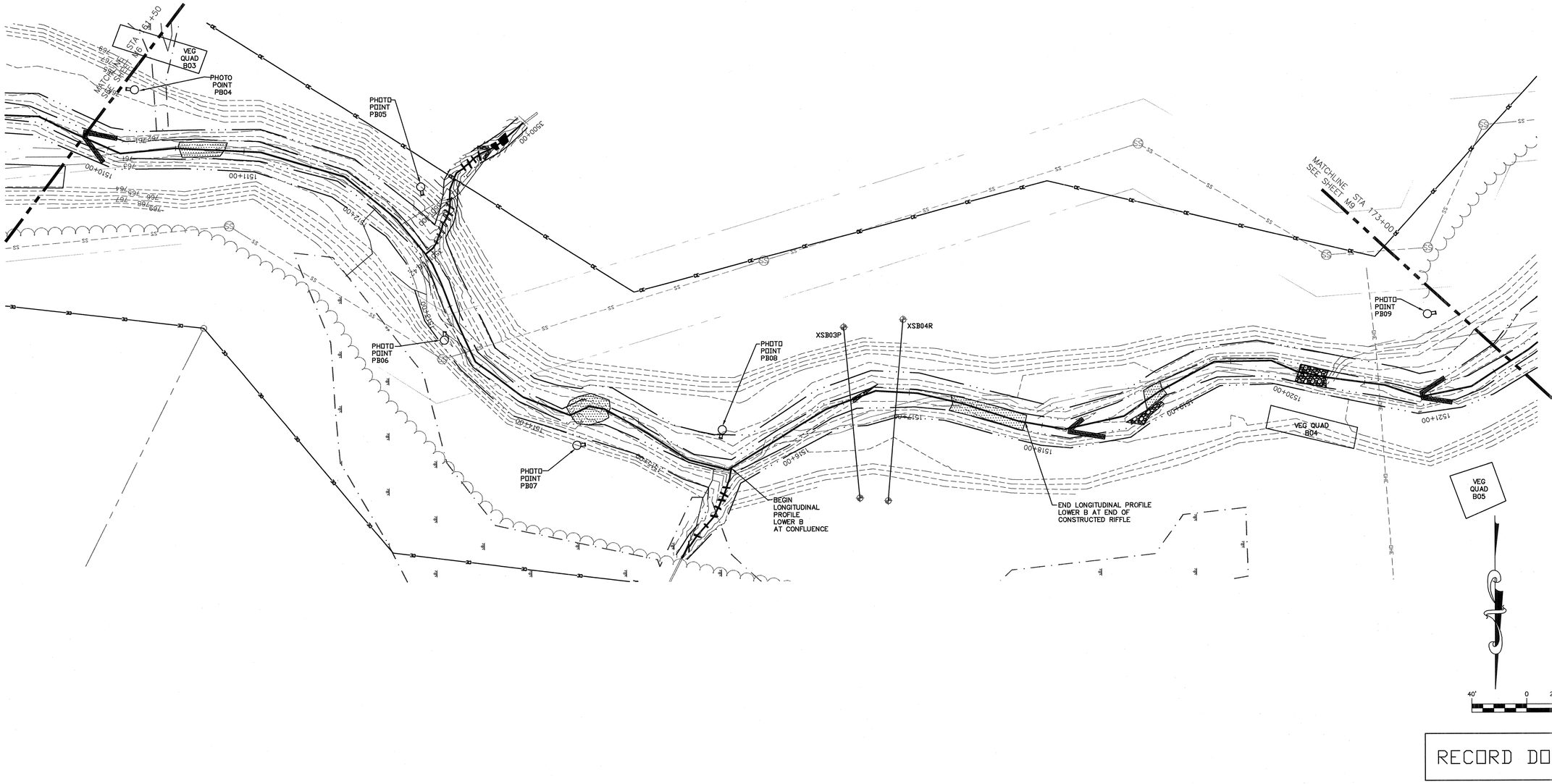
TITLE: MONITORING PLAN REACH B

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 026484 ENGINEER WILLIAM R WYNEKEN 2/9/10

DATE:	01-28-10
HORIZONTAL SCALE:	
VERTICAL SCALE:	
DRAWN BY:	JIK
DESIGNED BY:	ARK/JCD
CHECKED BY:	WRW

PROJECT: VALLEY FIELDS FARM

ATTACHED REFERENCE FILES:	JOB NUMBER:	SHEET NUMBER:
	011795020	M7



RECORD DOCUMENT

REV. No.:	REVISION:	DATE:	DRAWN BY:	CHECKED BY:

PREPARED IN THE OFFICE OF:
Kimley-Horn and Associates, Inc.
NC LICENSE #F-0102
P.O. BOX 33068 - RALEIGH, NORTH CAROLINA 27636-3068
PHONE: (919) 677-2000 FAX: (919) 677-2050

CLIENT: NC-EEP

TITLE: MONITORING PLAN REACH B

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 026484 ENGINEER WILLIAM R. WITHROW

DATE:	01-28-10
HORIZONTAL SCALE:	
VERTICAL SCALE:	
DRAWN BY:	JIK
DESIGNED BY:	ARK/JCD
CHECKED BY:	WRW

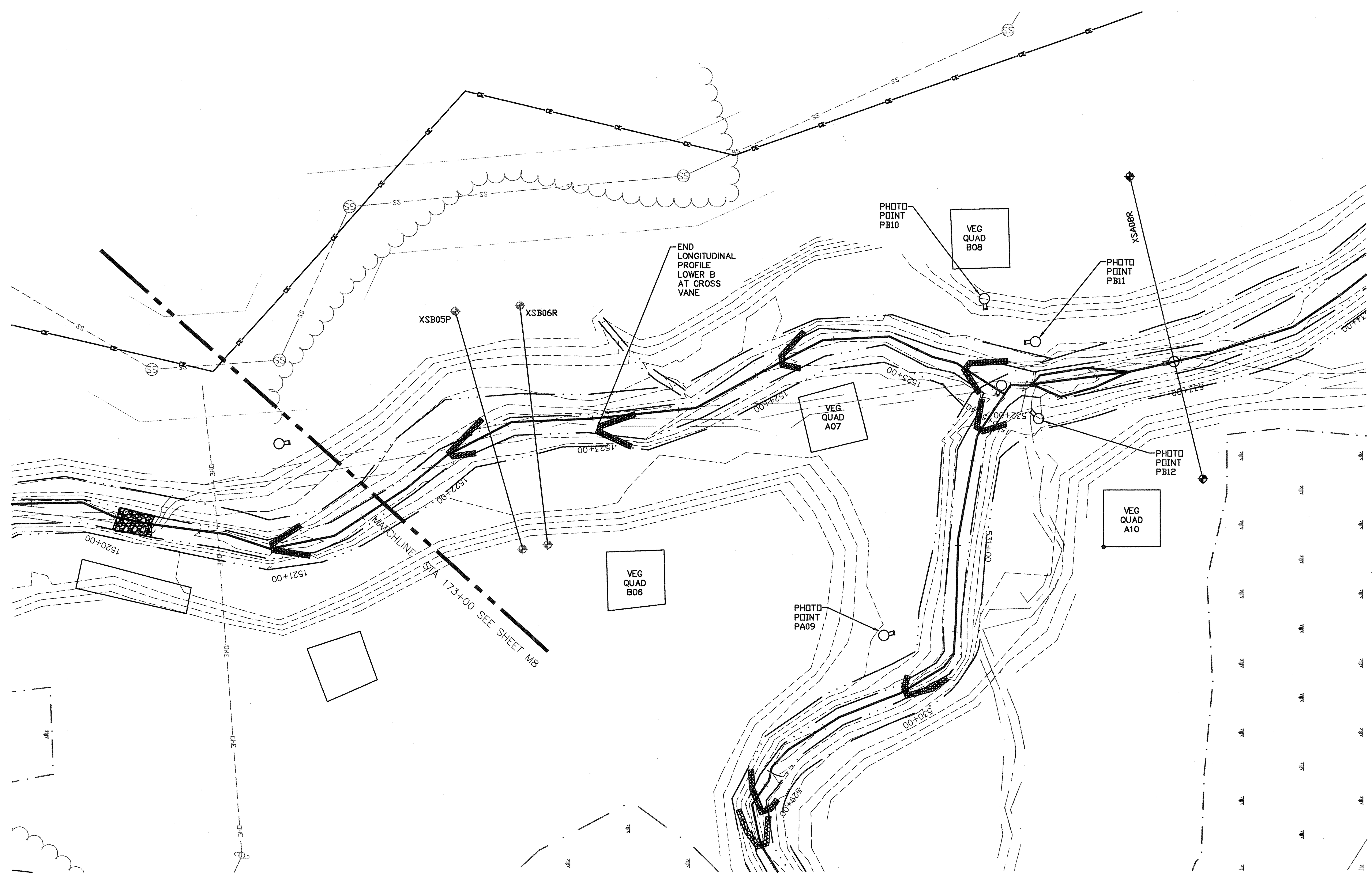
PROJECT: VALLEY FIELDS FARM

ATTACHED REFERENCE FILES:

JOB NUMBER: 011795020

SHEET NUMBER: M8

February 09, 2010 – 1:03pm By: nancy.mumford



40' 0 20' 40' 80'

RECORD DOCUMENT

REV. No.:	REVISION:	DATE:	DRAWN BY:	CHECKED BY:

PREPARED IN THE OFFICE OF:
Kimley-Horn and Associates, Inc.
NC LICENSE #F-0102
P.O. BOX 33068 – RALEIGH, NORTH CAROLINA 27636-3068
PHONE: (919) 677-2000 FAX: (919) 677-2050

CLIENT: NC-EEP

TITLE: MONITORING PLAN REACH B

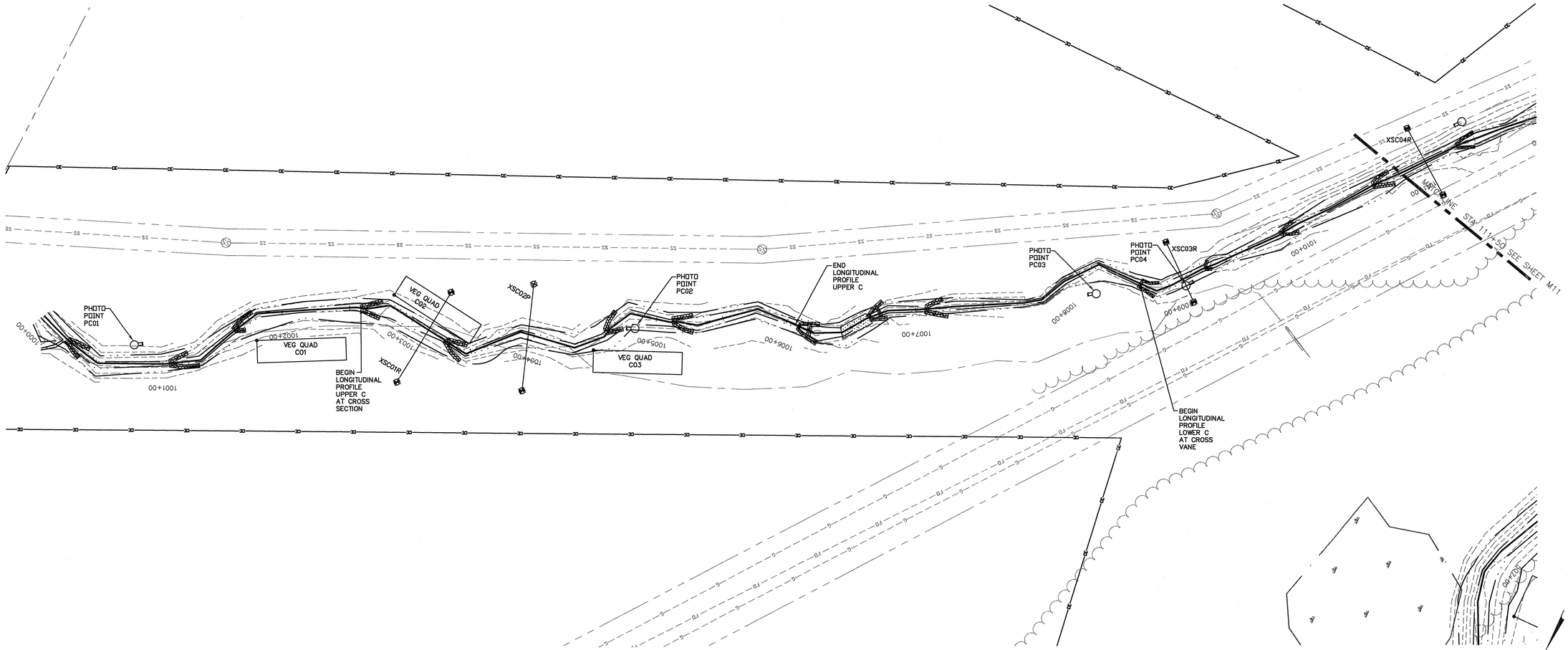
SEAL:

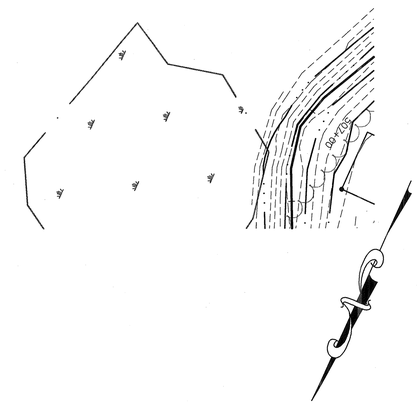
DATE: 01-28-10
HORIZONTAL SCALE:
VERTICAL SCALE:
DRAWN BY: JIK
DESIGNED BY: ARK/JCD
CHECKED BY: WRW

PROJECT: VALLEY FIELDS FARM

ATTACHED REFERENCE FILES:
JOB NUMBER: 011795020
SHEET NUMBER: M9

K:\CHL_Environmental\011795 EEP Raleigh\020 Valley Field Farm\CADD\Record Drawings – 01-2010\BlackandWhite\6B-MONITOR-PLANS.dwg





40' 0 20' 40' 80'

RECORD DOCUMENT

REV. No.	REVISION:	DATE:	DRAWN BY:	CHECKED BY:
2	CORRECTED ELEVATION	11-09-07	JIK	DMP
1	REVISED DUE TO FIELD LOCATION OF GAS PIPELINE	11-01-07	JIK	WRW

PREPARED IN THE OFFICE OF:
Kimley-Horn and Associates, Inc.
NC LICENSE #F-0102
P.O. BOX 33068 - RALEIGH, NORTH CAROLINA 27636-3068
PHONE: (919) 677-2000 FAX: (919) 677-2050

CLIENT: NC-EEP

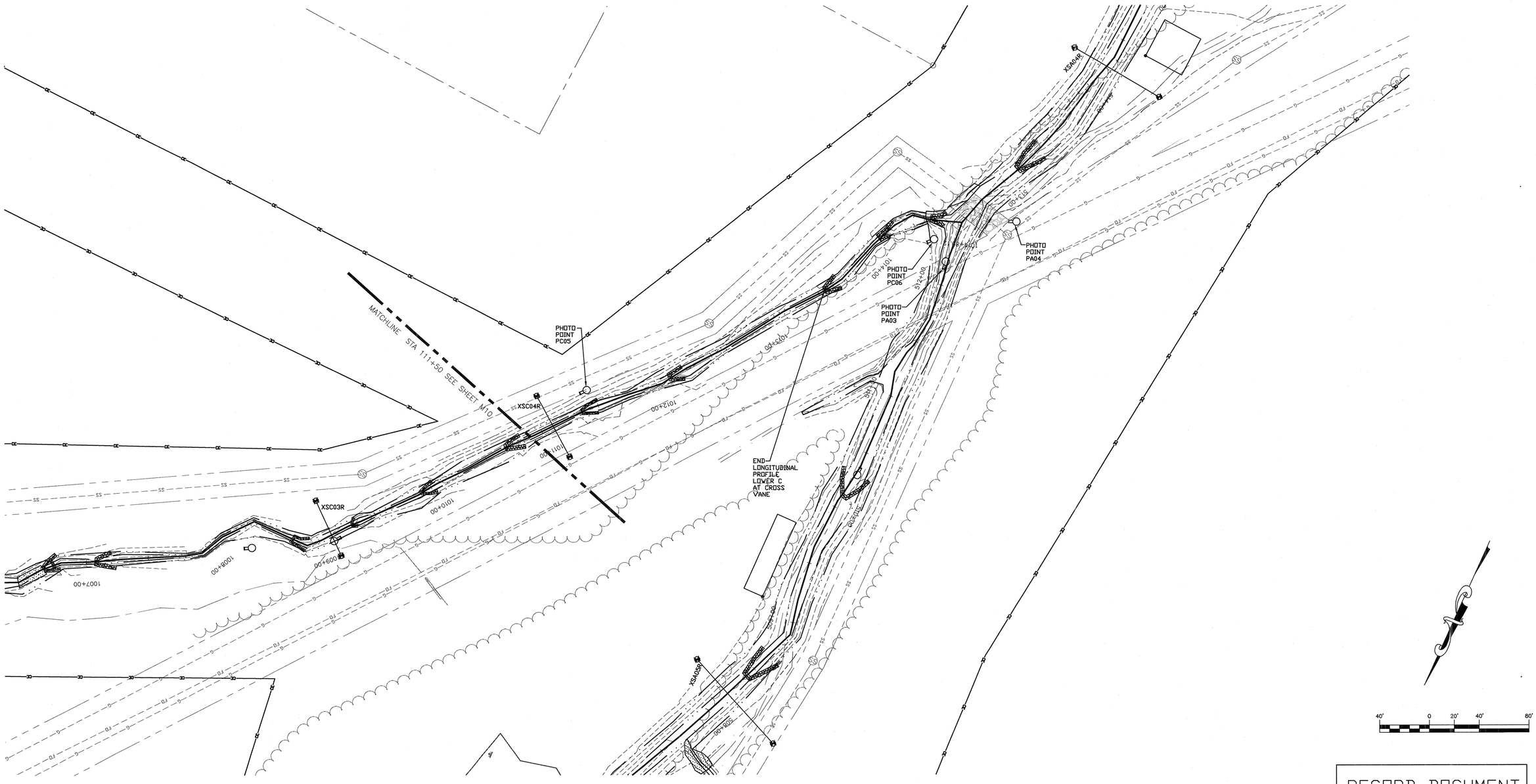
TITLE: MONITORING PLAN REACH C

NORTH CAROLINA PROFESSIONAL SEAL 026484 ENGINEER WILLIAM R. WILHELM

DATE:	01-28-10
HORIZONTAL SCALE:	
VERTICAL SCALE:	
DRAWN BY:	JIK
DESIGNED BY:	ARK/JCD
CHECKED BY:	WRW

PROJECT: VALLEY FIELDS FARM

ATTACHED REFERENCE FILES:	JOB NUMBER:	SHEET NUMBER:
	011795020	M10



RECORD DOCUMENT

REV. No.:	REVISION:	DATE:	DRAWN BY:	CHECKED BY:
1	REVISED DUE TO FIELD LOCATION OF GAS PIPELINE	11-01-07	JIK	WRW

PREPARED IN THE OFFICE OF:
Kimley-Horn and Associates, Inc.
NC LICENSE #F-0102
P.O. BOX 33068 - RALEIGH, NORTH CAROLINA 27636-3068
PHONE: (919) 677-2000 FAX: (919) 677-2050

CLIENT: NC-EEP

TITLE: MONITORING PLAN REACH C

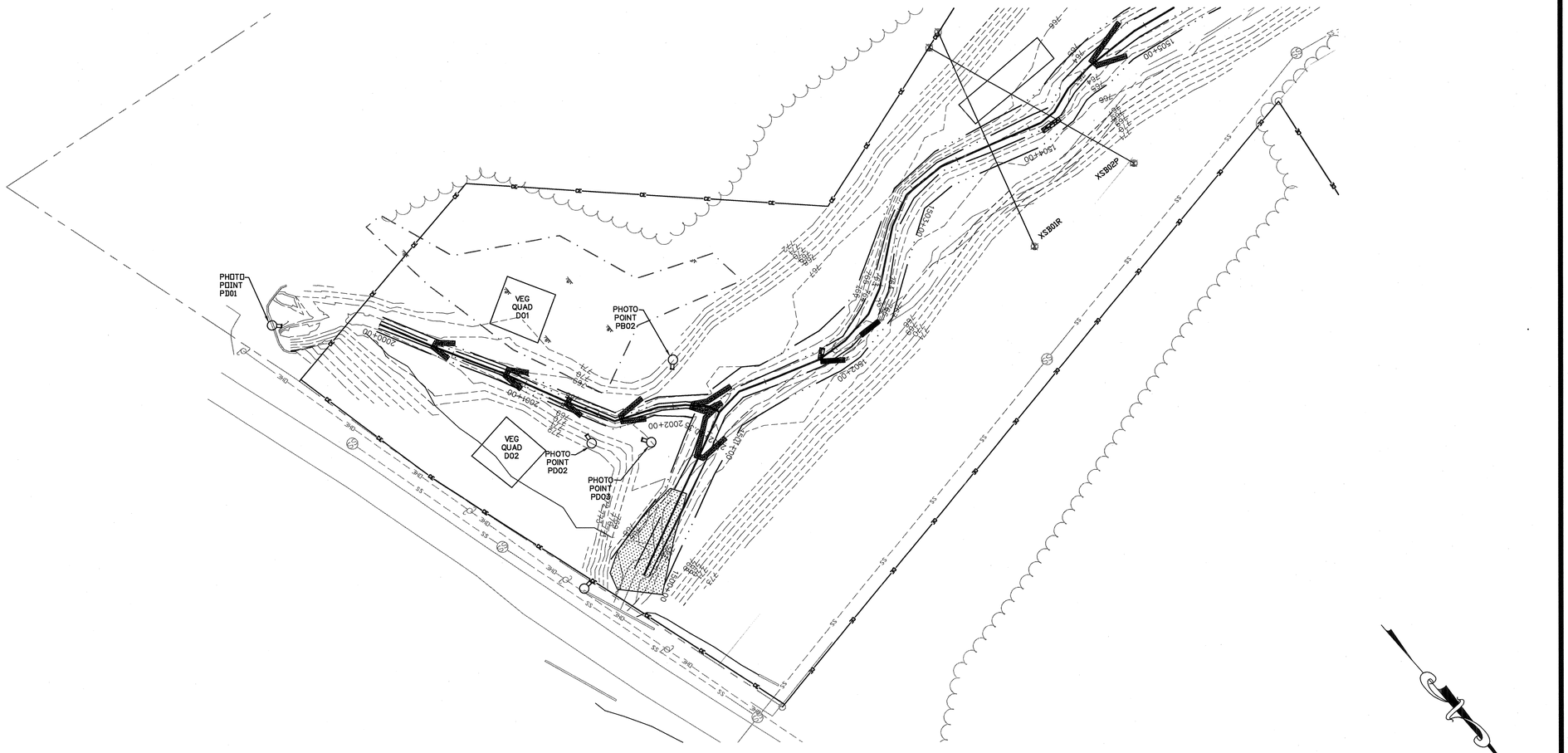
NORTH CAROLINA PROFESSIONAL SEAL 026484 ENGINEER WILLIAM R. WILHELM
SEAL

DATE: 01-28-10
HORIZONTAL SCALE:
VERTICAL SCALE:
DRAWN BY: JIK
DESIGNED BY: ARK/JCD
CHECKED BY: WRW

PROJECT: VALLEY FIELDS FARM

ATTACHED REFERENCE FILES:
JOB NUMBER: 011795020
SHEET NUMBER: M11

February 09, 2010 - 1:03pm By: nancy.mumford



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PREPARED IN THE OFFICE OF:
Kimley-Horn and Associates, Inc.
NC LICENSE #F-0102
P.O. BOX 33068 - RALEIGH, NORTH CAROLINA 27636-3068
PHONE: (919) 677-2000 FAX: (919) 677-2050

CLIENT: NC-EEP

TITLE: MONITORING PLAN REACH D

NORTH CAROLINA PROFESSIONAL SEAL 025484 ENGINEER WILLIAM R. WILHELM
SEAL:

DATE:	01-28-10
HORIZONTAL SCALE:	
VERTICAL SCALE:	
DRAWN BY:	JIK
DESIGNED BY:	ARK/JCD
CHECKED BY:	WRW

PROJECT: VALLEY FIELDS FARM

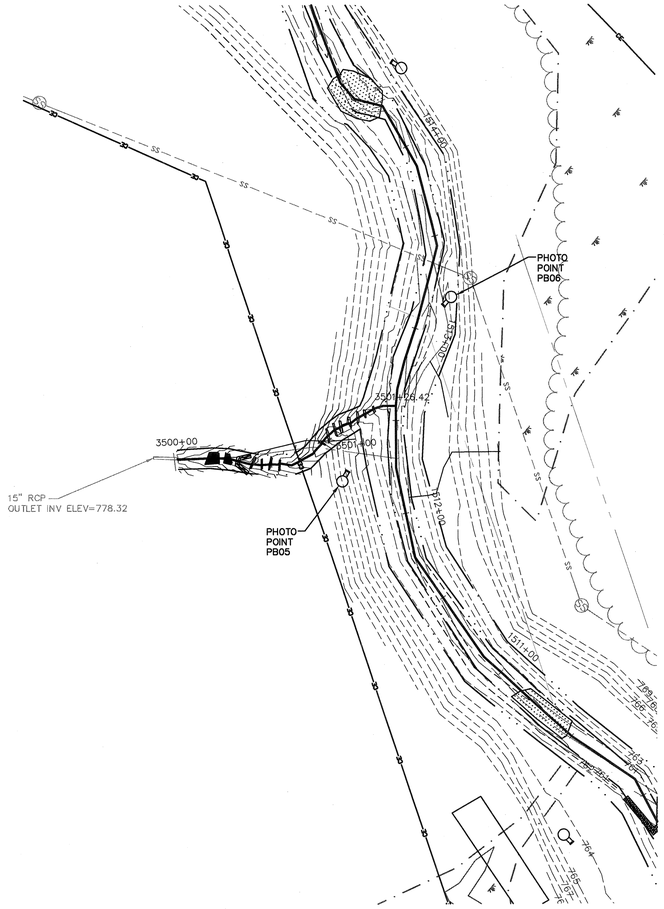
ATTACHED REFERENCE FILES:

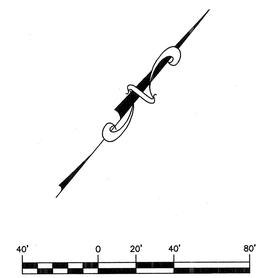
JOB NUMBER: 011795020

SHEET NUMBER: M12

K:\CHL_Environmental\011795 EEP Raleigh\020 Valley Field Farm\CADD\Record Drawings - 01-2010\BlackandWhite\6B-MONITOR-PLANS.dwg

February 09, 2010 - 1:03pm By: nancy.mumford





RECORD DOCUMENT

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PREPARED IN THE OFFICE OF:
Kimley-Horn and Associates, Inc.
NC LICENSE #F-0102
P.O. BOX 33068 - RALEIGH, NORTH CAROLINA 27636-3068
PHONE: (919) 677-2000 FAX: (919) 677-2050

CLIENT: NC-EEP

TITLE: MONITORING PLAN REACH J

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 026484 2/1/10 ENGINEER WILLIAM R. WELHEIM

DATE:	01-28-10
HORIZONTAL SCALE:	
VERTICAL SCALE:	
DRAWN BY:	JJK
DESIGNED BY:	ARK/JCD
CHECKED BY:	WRW

PROJECT: VALLEY FIELDS FARM

ATTACHED REFERENCE FILES:

JOB NUMBER: 011795020

SHEET NUMBER: M13

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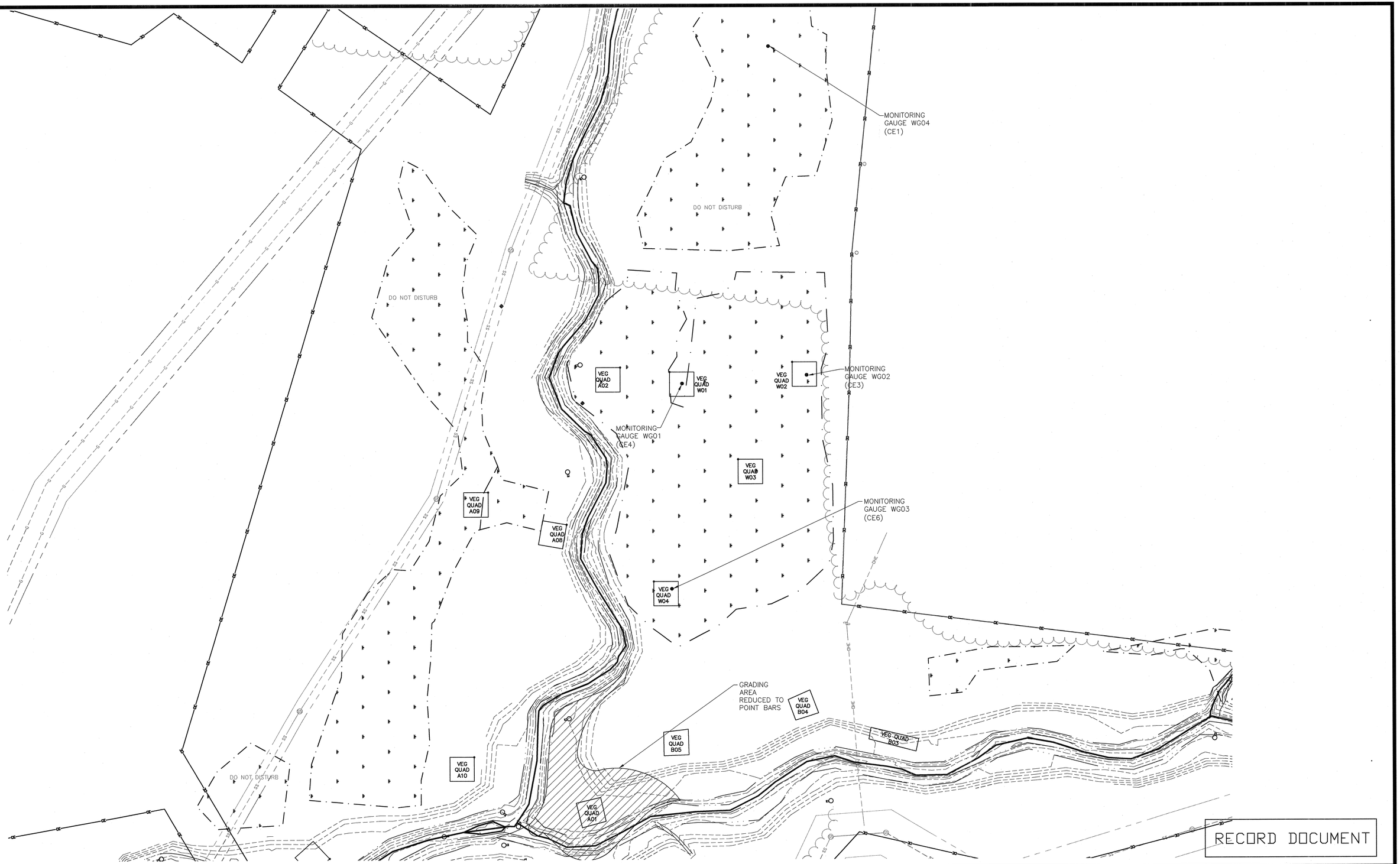

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PREPARED IN THE OFFICE OF:
Kimley-Horn and Associates, Inc.
NC LICENSE #F-0102
P.O. BOX 33068 - RALEIGH, NORTH CAROLINA 27636-3068
PHONE: (919) 677-2000 FAX: (919) 677-2050

CLIENT: NC-EEP

TITLE: WETLAND MONITORING PLAN

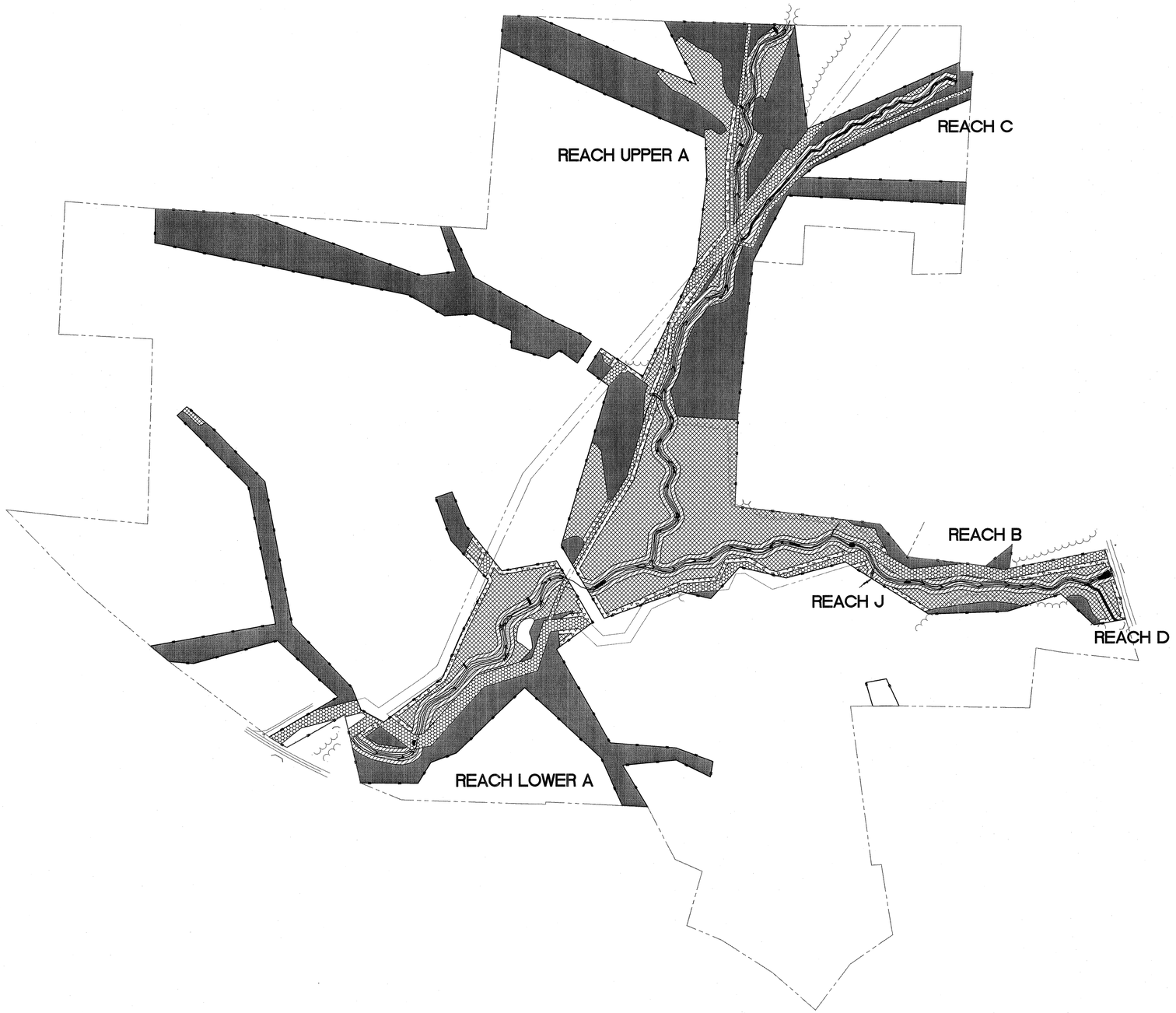
NORTH CAROLINA PROFESSIONAL SEAL 026484 ENGINEER WILLIAM R. WILHELM

SEAL

DATE:	01-28-10
HORIZONTAL SCALE:	N.T.S.
VERTICAL SCALE:	N/A
DRAWN BY:	JIK
DESIGNED BY:	ARK/JCD
CHECKED BY:	WRW

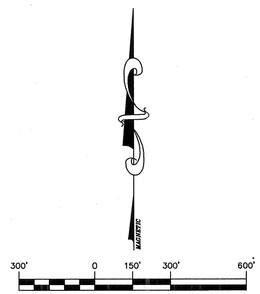
PROJECT: VALLEY FIELDS FARM

ATTACHED REFERENCE FILES:	JOB NUMBER:	SHEET NUMBER:
	011795020	M14



PLANTING PLAN LEGEND

- ZONE 1
- ZONE 2
- ZONE 3
- ZONE 4
- ZONE 5 (UTILITY EASEMENT)
- EXISTING VEGETATION (TO BE LEFT UNDISTURBED)



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PREPARED IN THE OFFICE OF:
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NC LICENSE #F-0102
P.O. BOX 33068 - RALEIGH, NORTH CAROLINA 27636-3068
PHONE: (919) 677-2000 FAX: (919) 677-2050

CLIENT: NC-EEP

TITLE: VEGETATION PLAN

NORTH CAROLINA PROFESSIONAL SEAL 026484 ENGINEER WILLIAM R. WILKERSON
SEAL:

DATE: 01-28-10
HORIZONTAL SCALE:
VERTICAL SCALE:
DRAWN BY: JIK
DESIGNED BY: ARK/JCD
CHECKED BY: WRW

PROJECT: VALLEY FIELDS FARM

ATTACHED REFERENCE FILES:
JOB NUMBER: 011795020
SHEET NUMBER: V1