ANNUAL REPORT FOR 2012

Banks School Road Wetland Mitigation Site
Lenoir County
TIP No. R-2719A
COE Action ID: 200511238
DWQ: 20050787

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SUMMARY

The following report summarizes the wetland monitoring activities conducted during 2012 at the Banks School Road Mitigation Site. This site, situated adjacent to the new US 70 Bypass near Kinston, was designed and constructed during 2012 by the North Carolina Department of Transportation (NCDOT) in order to provide mitigation for wetland impacts associated with the construction of Transportation Improvement Program (TIP) number R-2719A. This report provides the monitoring results for the first formal year of monitoring (Year 2012). The site must demonstrate hydrologic and vegetation success for a minimum of five years or until the site is deemed successful.

The site hydrology is monitored with three groundwater gauges including two gauges in the restoration area and one gauge in the enhancement area. All three of the groundwater gauges met the jurisdictional criteria for wetland hydrology (>12.5% of the growing season) in 2012.

There were two vegetation monitoring plots established throughout the wetland restoration area. The 2012 vegetation monitoring of the site revealed an average tree density of 537 trees per acre. This average is well above the minimum success criteria of 320 trees per acre for Year 1. NCDOT will plant the buffer area of the Banks School Road Mitigation Site between November 15, 2012 and March 15, 2013.

NCDOT will continue hydrologic and vegetation monitoring at the Banks School Road Mitigation Site in 2013.

1.0 INTRODUCTION

1.1 Project Description

The following report summarizes the wetland monitoring activities that have occurred during 2012 at the Banks School Road Mitigation Site. The site is located adjacent to new US 70 Bypass near Kinston (Figure 1). The site was constructed to provide mitigation for wetland impacts associated with (TIP number) R-2719A in Lenoir County. The 21.28 acre site provides the following types of mitigation: 0.68 acre of non-riverine wetland restoration, 2.1 acres of riparian buffer, 2.07 acres of wetland enhancement, 3.92 acres of jurisdictional wetland preservation and preservation of 13.01 acres of non-jurisdictional uplands.

1.2 Purpose

In order to demonstrate successful mitigation, hydrologic and vegetative monitoring must be conducted for a minimum of five years or until success criteria are satisfied. Success criteria are based on federal guidelines for wetland mitigation. Criteria for hydrologic conditions and vegetation survival are included in these documents. The following report details the results of hydrologic and vegetation monitoring during the 2012-growing season at the Banks School Road Mitigation Site.

1.3 Project History

May 2011	Site Constructed
June 2011	Gauges Installed
March 2012	Site Planted
March-November 2012	Hydrologic Monitoring (Year 1)
July 2012	Vegetation Monitoring (Year 1)

1.4 Debit Ledger

The entire Banks School Road mitigation site was used for the R-2719A project to compensate for unavoidable wetland impacts.

Figure 1. Site Location Map

2.0 HYDROLOGY

2.1 Success Criteria

In accordance with the mitigation plan and permit for wetland mitigation, the success criteria for hydrology states that the area must be inundated or saturated (within 12" of the surface) by surface or ground water for at least a consecutive 12.5% of the growing season. The hydrologic monitoring shall persist for a total of five years with monitoring reports submitted annually. After the five year monitoring period, if the monitoring requirements are not met, the site may still be deemed successful at the discretion of and written approval of the Division of Water Quality (401 permit conditions).

The growing season in Lenoir County begins March 17 and ends November 15. These dates correspond to a 50% probability that temperatures will remain above 28^{o} F or higher after March 17 and before November 15. The growing season is 244 days; therefore hydrology for 12.5% of the growing season is at least 31 consecutive days. Local climate must represent average conditions for the area in order for the hydrologic data to be valid.

2.2 Hydrologic Description

Three groundwater monitoring gauges are used to record site hydrologic data including two in the restoration area and one gauge in the enhancement area. The groundwater gauges are set to record daily water levels. The hydrologic response (groundwater) to rainfall events is evaluated using data provided by the North Carolina State Climate Office.

Appendix A contains a plot of the water depth for each of the groundwater monitoring gauges for 2012. Precipitation events, provided by the State Climate Office, are included on each groundwater graph as bars.

2.3 Results of Hydrologic Monitoring

2.3.1 Site Data

The total number of consecutive days that the groundwater was within twelve inches of the surface was determined for each groundwater monitoring gauge. This number was converted into a percentage of the growing season. Table 1 presents the hydrologic results for 2012. Figure 3 is a graphical representation of the hydrologic monitoring results for 2012.

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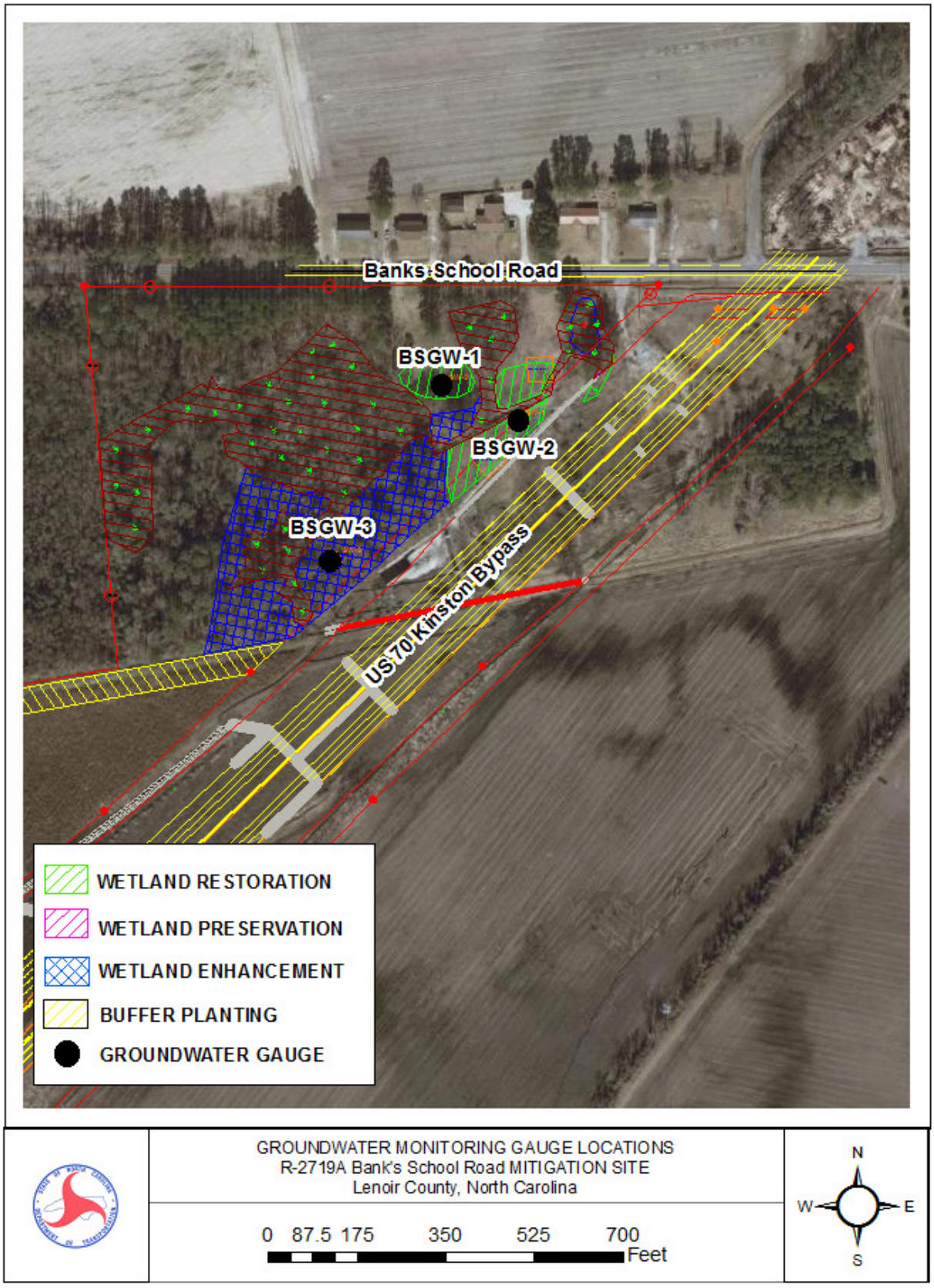


Figure 2. Monitoring Gauge Location Map

Table 1. 2012 Hydrologic Monitoring Results

Monitoring Gauge	< 5%	5 – 12.5%	> 12.5%	Actual %	Dates of Success
BSGW-1			**X**	52.0	March 17-June 19; July 12-November 15
BSGW-2			**X**	52.5	March 17-July 9; July 11-November 15
BSGW-3			**X**	14.8	Aug 16-Sept 20

*BSGW-3 is located in the enhancement area.
*Appendix A contains plots of surface and groundwater data during 2012.

2.3.2 Climatic Data

Figure 4 is a comparison of monthly rainfall for the period of January 2012 through November 2012 to historical precipitation (collected between 1982 and 2011) for the Kinston Agriculture Research Station in Lenoir County. This comparison gives an indication of how 2012 relates to historical data in terms of climate conditions. The NC State Climate Office provided all local rainfall information.

For the 2012 monitoring year, the months of January, February, April June, September and November experienced below average rainfall. The months of March and October experienced average rainfall while May, July and August experienced above average rainfall. Overall 2012 experienced an average to below average rainfall year.

2.4 Conclusions

The 2012 year represents the first full growing season that hydrologic data has been collected on the Banks School Road Mitigation Site. All three groundwater monitoring gauges met the jurisdictional criteria wetland hydrology (>12.5% of the growing season) during the 2012 growing season.

NCDOT will continue to monitor the hydrology at the Banks School Road Mitigation Site in 2013.

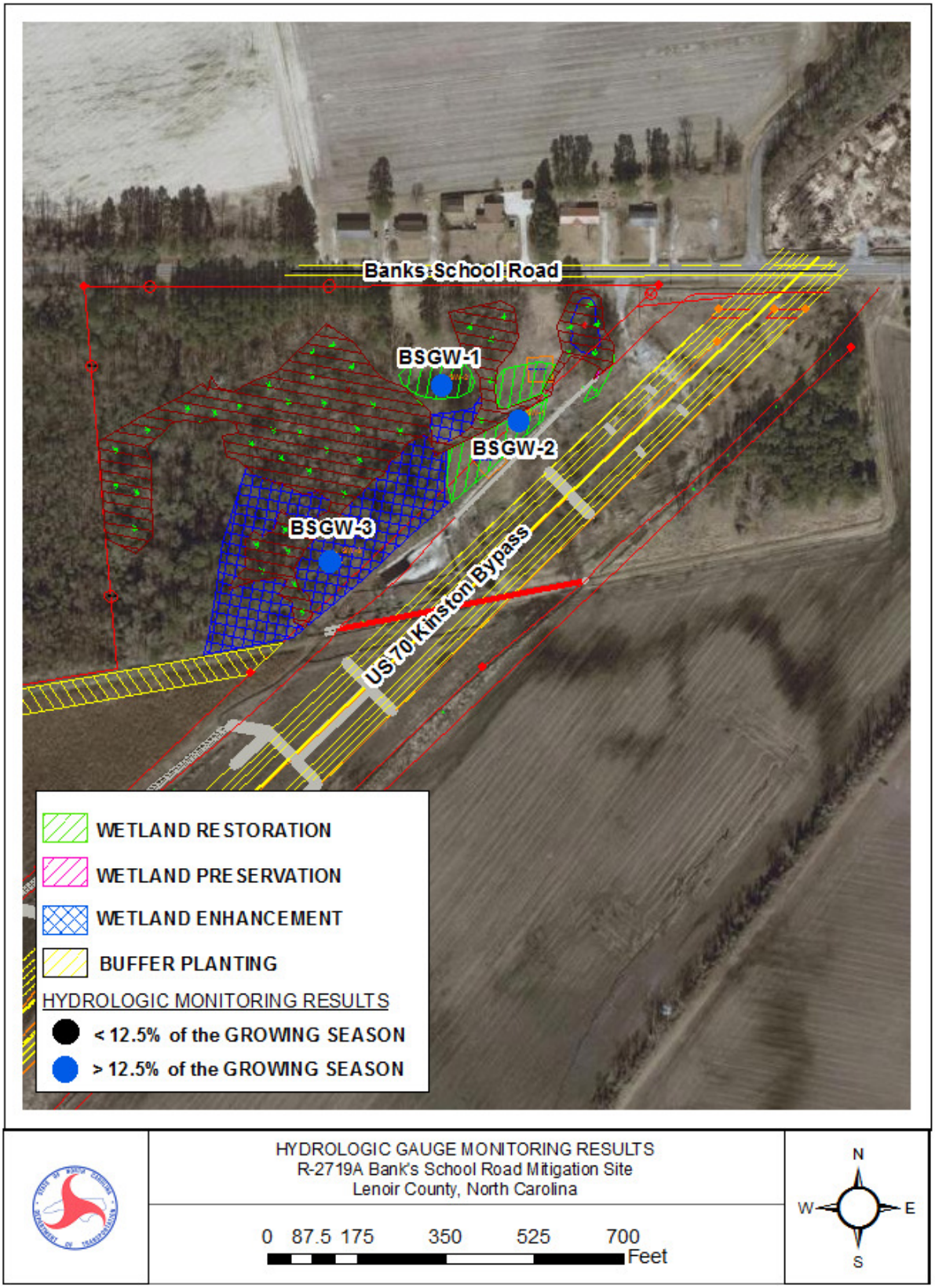


Figure 3. 2012 Hydrologic Monitoring Results

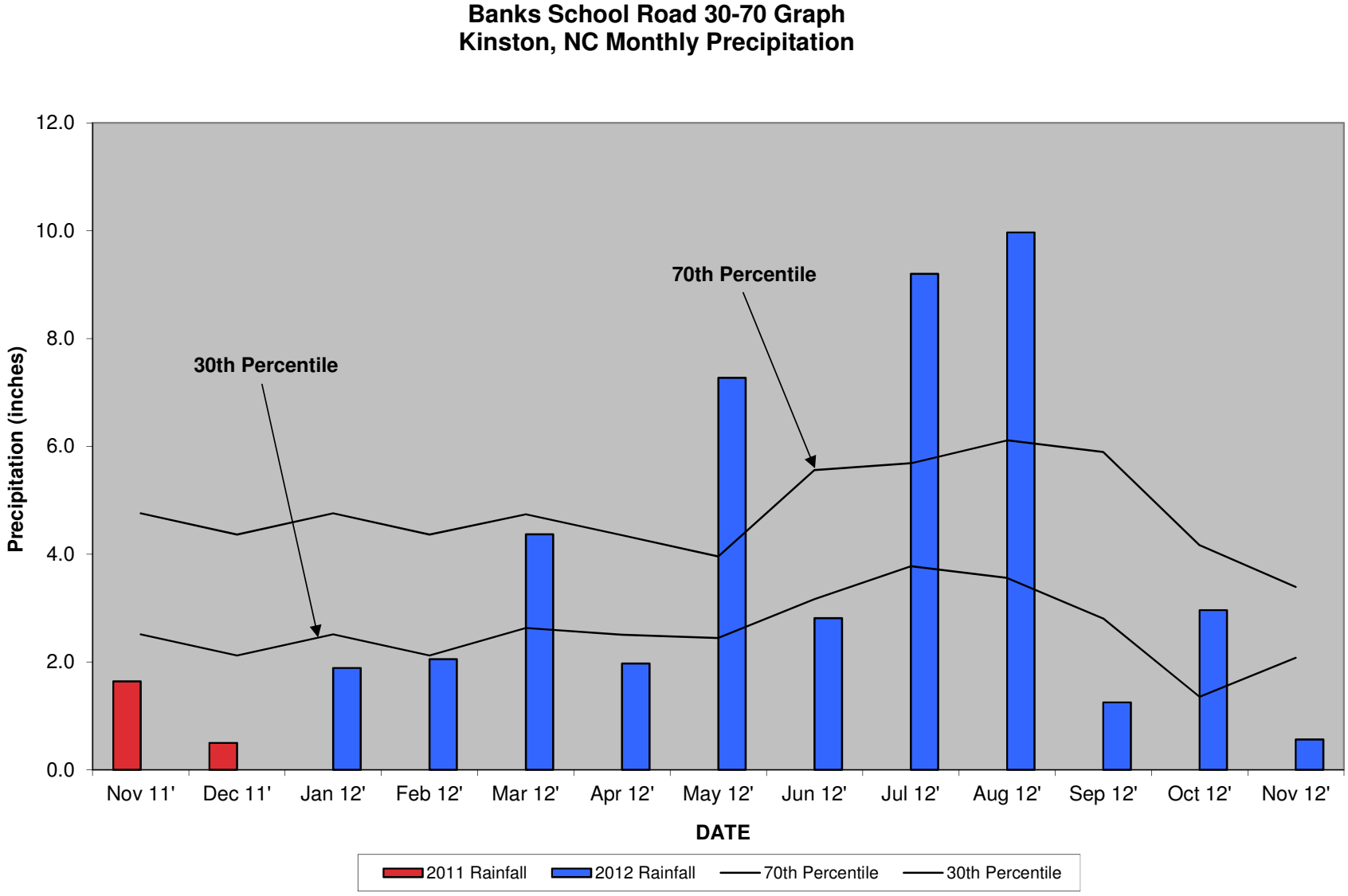


Figure 4. 30-70 Percentile Graph 2012

3.0 VEGETATION: BANKS SCHOOL ROAD MITIGATION SITE (YEAR 1 MONITORING)

3.1 Success Criteria

Wetland Success Criteria states that vegetation success shall be measured by survivability over a 5-year period. Survivability will be based on 320 planted stems/acre after three years and 260 planted stems/acre after 5 years. A survey of vegetation during the growing season shall be conducted annually over the five-year monitoring period and submitted to the NCDWQ. Monitoring should include tree density counts, photo documentation, and plots sufficient enough to demonstrate survival and diversity of tree species. If the surviving vegetation densities are below the required thresholds after the five-year monitoring period, the site may still be declared successful at the discretion of and with written approval from NCDWQ.

Buffer Success Criteria states that monitoring shall consist of visual review and photo evidence. An annual report shall be submitted to the DWQ for a period of five years showing monitoring results, survival rate/success of tree and vegetation establishment, and that diffuse flow through the riparian buffer has been maintained. The first annual report shall be submitted within one year of final planting. Failure to achieve a buffer density of 320 trees per acre after five years will require the annual report to provide appropriate remedial actions to be implemented and a schedule of implementation. Approval of the final annual report and a formal "close out" of the mitigation site by the DWQ is required.

3.2 Description of Species

The following tree species were planted in the Wetland Restoration Area:

Betula nigra, River Birch

Fraxinus pennsylvanica, Green Ash

Quercus lyrata, Overcup Oak

Quercus michauxii, Swamp Chestnut Oak

3.3 Results of Vegetation Monitoring

Table 2. Vegetation Monitoring Statistics

Plot #	River Birch	Green Ash	Overcup Oak	Swamp Chestnut Oak	Total (Year 1)	Total (at planting)	Density (Trees/Acre)
1	7	18	7	4	36	37	662
2		5	14	4	23	38	412
Average Density (Trees/Acre)							537

Site Notes: The control access fence was installed after the site was planted and set through Vegetation Plot #2. Some of the planted seedlings were disturbed due to the control access fence being set. The lower year one stem count in Vegetation Plot #2 reflects this disturbance but overall the planted seedlings are surviving across the site. Other species noted onsite included tulip poplar, sweetgum, fennel, *Scirpus* sp., *Juncus* sp., black willow, pine, cattail, red maple, wax myrtle, and various grasses. The buffer area planting has not been completed due to site prep work (mowing and herbicide application) that is scheduled to take place prior to planting. The buffer area will be planted between November 15, 2012 and March 15, 2013.

3.4 Conclusions

There were two vegetation monitoring plots established throughout the wetland restoration area. The 2012 vegetation monitoring of the site revealed an average tree density of 537 trees per acre. This average is well above the minimum success criteria of 320 trees per acre for year one. NCDOT will plant the buffer area of the Banks School Road Mitigation Site between November 15, 2012 and March 15, 2013. NCDOT proposes to continue vegetation monitoring at the Banks School Road Mitigation Site.

4.0 OVERALL CONCLUSIONS/ RECOMMENDATIONS

The 2012 year represents the first full growing season that hydrologic data has been collected on the Banks School Road Mitigation Site. All three groundwater monitoring gauges met the jurisdictional criteria for wetland hydrology (>12.5% of the growing season), during the 2012 growing season.

There were two vegetation monitoring plots established throughout the wetland restoration area. The 2012 vegetation monitoring revealed an average density of 537 trees per acre, which is well above the minimum success criteria of 320 trees per acre.

NCDOT will continue hydrologic and vegetation monitoring at the Banks School Road Mitigation Site in 2013.

APPENDIX A

DEPTH TO GROUNDWATER CHARTS

APPENDIX B

SITE PHOTOS, PHOTO LOCATIONS, AND PLOT LOCATIONS MAP

Banks School Road

Photo Point #1 looking at Veg. Plot 1

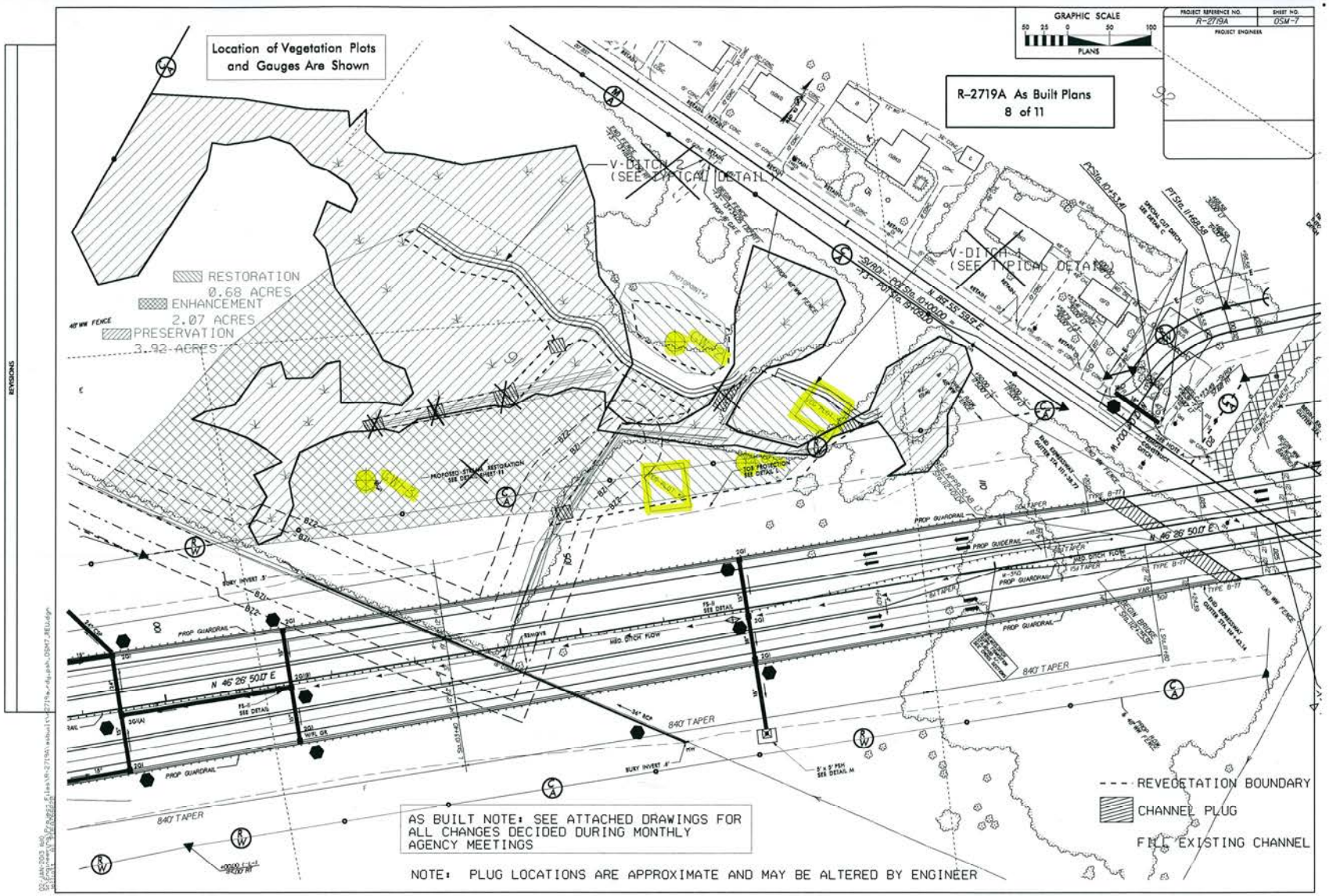
Photo Point #1 looking at Veg. Plot 2

Photo Point #2

Overview of Site

Overview of Site

July 2012


Location of Vegetation Plots and Gauges Are Shown
R-2719A As Built Plans 8 of 11
GRAPHIC SCALE
PLANS
PROJECT REFERENCE NO. R-2719A
SHEET NO. OSM-7
PROJECT ENGINEER
RESTORATION 0.68 ACRES
ENHANCEMENT 2.07 ACRES
PRESERVATION 3.92 ACRES
V-DITCH 2 (SEE TYPICAL DETAIL)
V-DITCH 1 (SEE TYPICAL DETAIL)
N 46° 26' 50.0" E
N 86° 55' 59.5" E
840' TAPER
PROP GUARDRAIL
AS BUILT NOTE: SEE ATTACHED DRAWINGS FOR ALL CHANGES DECIDED DURING MONTHLY AGENCY MEETINGS
NOTE: PLUG LOCATIONS ARE APPROXIMATE AND MAY BE ALTERED BY ENGINEER
REVEGETATION BOUNDARY
CHANNEL PLUG
FILL EXISTING CHANNEL
REVISIONS