MAPLE SWAMP WETLAND MITIGATION SITE
FINAL ANNUAL MONITORING REPORT – YEAR 0

Edgecombe County, NC
NCDEQ Contract No. 200206-01
NCDMS ID No. 100190
NCDWR Project No. 2021-0409v2
USACE Action ID: SAW-2021-00345
RFP No. 16-20200206

Tar-Pamlico River Basin
HUC 03020102
July 2022
Prepared For:
NC Department of Environmental Quality
Division of Mitigation Services
1652 Mail Service Center, Raleigh, NC 27699-1652

Mitigation Services
ENVIRONMENTAL QUALITY

June 27, 2022

Lindsay Crocker
NCDEQ
Division of Mitigation Services
217 West Jones Street
Raleigh, North Carolina 27699

Subject: SAW-2021-00345 / Maple Swamp Wetland Mitigation Site / MY0 DMS Comments/ Tar-Pam 03020102; Edgecombe County, NC

Dear Lindsay,

Eco Terra appreciates your time and thorough review of the project. We have addressed all comments received by DMS staff for the above-mentioned project. Our response comments are in **blue.**

1. Please review the DMS guidance for As-built and 'Monitoring Report Template' on the DMS website and update to match this report template as described in the RFP for this project. Generally, this submitted report contains a lot of extraneous information that was already provided in the Mitigation Plan, and some items that were previously commented on. The report is also missing some of the required appendices and tables.
The Monitoring Report Tables and other pertinent documents have been reviewed. The MY0 report, tables within, and appendices have been revised per the template.
2. QAQC the references in this document. Page 1, Appendix B does not contain the conservation easement. Page 2, The drawings are not in Appendix E, there is no Appendix E. There are multiple errors and inconsistencies that should be reviewed.
References within the report have been reviewed and updated accordingly.
3. Page 1, Goals discussion. Remove discussion and insert Goals and Objectives tables in the guidance and approved Mitigation Plan.
Discussion of project goals has been replaced with Table 2. Table 2 includes information shown in the mitigation plan as well as additional information shown in the DMS Monitoring Report Tables template.
4. Table 2. Revise to match required template headings (Table 1 Quantities and Credits in DMS 'Monitoring Report Tables' on the DMS website) and match credit table in Mitigation Plan (Table 13). This was also a comment in the initial DMS review of the Mitigation Plan.
Table 2 has been updated to match the required table in the monitoring report tables template (see Tables 1a and 1b).

5. Confirm that gages 1-3 were in the same locations as the pre-construction gages with data showing in the Mitigation Plan.
Groundwater gauges 1-3 are in the same location as they were pre-construction. Groundwater gauges 1-3 correspond to the pre-construction data given in the mitigation plan. This note has been added to the monitoring report.

6. Page 2, The Final Mitigation Plan was approved by the IRT on 1/26/2022. It was submitted
October 28, 2021. Please remove dates from narrative or use correct dates.
Please see Table 9 in the revised report (Appendix C).
7. Site Construction. Clarify which parts in this section were changes from the Mitigation Plan design. This is the main section/purpose of the MY0 report and should be matched up to the template area (Summary Section of your 'As-Built' changes).
The 'As-Built' section of the report has been updated per the above comment. Discussion of variances from the proposed mitigation plan and approved construction drawings has been added to the 'As-Built' section of the report.
8. Site Construction. Include the lengths of each of the three ditch plugs.
Length of the constructed ditch plugs has been included in the report and the record drawings.
9. Site Construction. Provide total area of vernal features in drawings or narrative.
Total area of vernal pool features has been added to the record drawings (see sheet EC2.01).
10. Page 2. Planted stems table. The narrative describes different species or zones, but the table does not differentiate which ones where limited to the vernal areas. See comment below regarding planting table from As-built.
Per the below comment, Table 4 in the report has been updated to match the as-built planting table in the record drawings
11. Page 4. Performance Standards. Remove and update to include performance standard table from the Mitigation Plan (Table 9)?
Discussion of performance standards has been removed from the report. Project goals and their associated performance standards are listed in Table 2.
12. Page 5. Monitoring Plan. See comment above and remove to match template (use approved MP table). There appears to be some changes in the number of vegetation plots. Please describe this in the Summary Section of your 'As-Built' changes.
Discussion of the Site monitoring plan has been removed from the report and replaced with Table 5.
13. Page 6 and 7, Maintenance and Contingency Plan. Remove from baseline. This was included in the Mitigation Plan and is unnecessary and N/A

for MY0. In future monitoring reports, this should only be discussed if it applies (i.e., in the event of a maintenance or contingency plan for the site).
This section has been removed from the report.

14. Table 3. Attributes and schedule. Please include day, month and year of completion of earthwork and planting. Our internal system shows 4/7/2022 for both items, but please review and confirm this in the table. Institution date should also be on this table, which is 2/11/2021. This table is available on DMSMonReportTablesOct2020.xls in the guidance.
Please see Table 9 in the revised report (Appendix C).

15. Table 5. Planted stems. Be advised that the IRT requires % species composition and height data as success criteria. This will have to be generated internally by Eco Terra because CVS does not support these metrics in later years of the project.
Please see Table 7 and 8 in the revised report (Appendix B). Percent species composition and height data is included in the revised tables.

As-Built Drawings:

16. Include lengths of the ditch plugs on the as-built drawings. The Mitigation Plan shows a 100' minimum and preserved.
Length of the constructed ditch plugs has been included in the report and the record drawings.

17. The areas where field drainage come into the easement near PP2 and PP3 were shown in the Mitigation Plan as proposed vernal pools with ditch plugs to be matted with biodegradable erosion control matting. These were changed to ditch plugs with sediment forebay. These are considered changes from the Plan drawings and should be shown in red line. Describe these changes in the narrative of the report in the Summary Section of your 'As-Built' changes. There should also be pictures of these features in the report for clarity.
Red lines have been added to the record drawings to reflect changes made to the proposed Site condition during construction. Discussion of variances from the proposed mitigation plan and approved construction drawings has been added to the 'As-Built' section of the report. Pictures of the constructed ditch plugs have been included in Appendix A.

18. "Earthen sills" on the as-built drawings should be shown in red if they are changes/addition to design. Describe these as changes in the narrative of the report in the Summary Section of your 'As-Built' changes.
Red lines have been added to the record drawings to reflect changes made to the proposed Site condition during construction. Discussion of variances from the proposed mitigation plan and approved construction drawings has been added to the 'As-Built' section of the report.

19. Confirm that the contour lines shown on the drawings are post-construction. DMS As-built requirements indicate, "Surveyor will provide a

Topographic Survey (including DTM with 1-foot contour map) of the Limits of Disturbance."

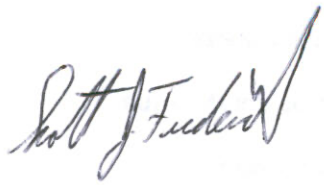
Contour lines shown in the record drawings reflect the post-construction Site conditions.

20. Table 1. In As-built drawings is helpful. Suggest this table should replace Table 1 and Table 4 in your report.

Table 4 in the report has been updated to match the table shows in the record drawings.

Please let us know if additional information is needed for the MY0 Report.

Sincerely,



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MAPLE SWAMP WETLAND MITIGATION SITE
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Edgecombe County, NC

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RFP No. 16-20200206

Tar-Pamlico River Basin

HUC 03020102

Prepared For:

NC Department of Environmental Quality

Division of Mitigation Services

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July 2022

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Appendices

1.0 Project Overview

The Site is a 15.34-acre wetland mitigation project located in Edgecombe County, North Carolina. The Site is approximately two miles northeast of the Town of Leggett, on the north side of NC HWY 97E and is accessed via a dirt farm path. The Site is within the Tar-Pamlico 8-digit HUC 03020102, and more specifically in the 14-digit HUC 03020102060010. The 15.34-acre Site includes 8.635 acres of wetland re-establishment (REE) and 0.449 acres of wetland rehabilitation (RH) to provide a total of 9.084 acres of non-riparian wetland credits for the Tar-Pamlico 03020102 watershed.

1.1 Project Mitigation Quantities and Credits

Site restoration activities included filling on-Site agricultural ditches, planting of native woody wetland vegetation, and establishment of a conservation easement to protect the site in perpetuity. Table 1a and 1b give the as-built quantities and credits for the Site.

Table 1a – Project Mitigation Quantities and Credits

Project Segment	Original Mitigation Plan ft/ac	As-Built ft/ac	Original Mitigation Category	Original Restoration Level	Original Mitigation Ratio (X:1)	Credits
Wetland						
Wetland 1	8.635	8.635	NR	REE	1.000	8.635
Wetland 2 (Ditch A)	0.449	0.449	NR	RH	1.000	0.449
					Total:	**9.084**

Table 1b – Project Credit Summary

Restoration Level	Stream			Riparian Wetland	Non-Rip Wetland	Coastal Marsh
	Warm	Cool	Cold			
Restoration						
Re-establishment					8.635	
Rehabilitation					0.449	
Enhancement						
Enhancement I						
Enhancement II						
Creation						
Preservation						
Total:	**0.000**	**0.000**	**0.000**	**0.000**	**9.084**	**0.000**

1.2 Project Goals and Objectives

The Site was chosen due to proximity of adjacent forested habitats and corridor servicing the sub-watershed to Maple Swamp as well as the ability to restore and protect a non-riparian system and support overarching goals listed by the North Carolina Division of Mitigation Services (NCDMS) in the 2018 Tar-Pamlico River Basin Restoration Priorities (RBRP) document. Restoration of the Site will directly and indirectly address specific goals and stressors related to the goals identified in the RBRP. Table 2 lists the goals and objectives of the project.

Table 2 – Site Goals and Performance Standards

Goal	Objective	Expected Outcome	Function Supported	Performance Standard	Measurement
Reduce Nutrients and Sediment in Agricultural Areas	Remove fertilizer and agricultural byproducts applied to wetland. Establish native woody wetland vegetation, securing soil in place, and reducing wind and runoff erosion.	Improve Water Quality through nutrient & sediment reduction.	Biological Physicochemical	N/A	Vegetation Plots - Fixed (n=9) - Random (n=2) Visual assessment of the Site
Restore Wetland Hydrology	Fill drainage ditches and remove drain tiles to restore Site hydrology.	Increase hydrology and shallow water table during the early growing season (9%), reduce nutrients and sediment in agricultural areas, and increase wetland habitats.	Hydrological Physicochemical Biological	Shallow groundwater within 12 inches of the soil surface for a minimum of 9% (21 consecutive growing season days) (MY1-MY2) and 12% (28 consecutive growing season days (MY3-MY7).	Groundwater Gauges (n=9)

Table 2 (continued) – Site Goals and Performance Standards

Goal	Objective	Expected Outcome	Function Supported	Performance Standard	Measurement
Improve Habitat	Establish native woody wetland vegetation. Promote habitat in near vicinity to existing conserved lands.	Increase native wetland tree species diversity and habitats. Increase habitat from non-riparian forest wetland to Maple Swamp non-riparian corridor and near vicinity protected lands associated with 1,290 NCWRC Lower Fishing Creek Game Lands.	Biological	N/A	Visual assessment of the Site
Restore Wetland Vegetation	Establish native woody wetland vegetation in proposed wetland re-establishment areas.	Increase native wetland tree species quantity and diversity. Increase nutrient cycling and sequestering sediment.	Physiochemical Biological	Survival of 210 planted stems/ac (MY7). Interim survival of at least 320 planted stems/ac (MY3) and at least 260 stems/ac (MY5). Planted stems must average 7 ft in height (MY5) and 10 feet in height (MY7).	Vegetation Plots - Fixed (n=9) - Random (n=2)
Protect the Site in Perpetuity	Record permanent Conservation Easement to protect the Site in perpetuity.	Protect Site from future impacts and encroachment and direct impacts to wetlands. Support all wetland functions in perpetuity.	Hydrological Physicochemical Biological	Record Conservation Easement	Visual assessment for easement encroachment and Site integrity

1.3 Project Attributes

The Site is situated on an approximately 356-acre parcel used for row crop production and agricultural rotations. Mature forests along Moore's Swamp to the north and Maple Swamp to the east border the cleared parcel and a smaller stand of mature forest exists to the west. Moore's Swamp and Maple Swamp are classified as water supply (WS-IV) and nutrient sensitive waters (NSW). Site hydrology drains to Maple Swamp (28-79-31-(0.7)) via a series of agricultural ditches which artificially drain groundwater from the adjacent agricultural fields.

Table 3: Project Attributes

Project Information			
Project Name	Maple Swamp Wetland Mitigation Site		
County	Edgecombe		
Project Area [Planted Area] (acres)	15.34 [13.68]		
Project Coordinates (latitude and longitude decimal degrees)	36.013378, -77.559158		
Project Watershed Summary Information			
Physiographic Province	Coastal Plain		
River Basin	Tar-Pamlico		
USGS Hydrologic Unit 8-digit; 14-digit	3020102; 03020102060010		
DWR Sub-basin	03-03-04		
Project Drainage Area (acres)	49.4		
Project Drainage Area Percentage of Impervious Area	0%		
Land Use Classification	Agriculture		
Wetland Summary Information			
Parameters	**Wetland 1**	**Wetland 2 (Ditch A)**	
Pre-project (acres)	8.635	0.449	
Post-project (acres)	8.635	0.449	
Wetland Type (non-riparian, riparian)	Non-Riparian	Non-Riparian	
Mapped Soil Series	Roanoke	Roanoke	
Soil Hydric Status	Hydric (100%)	Hydric (100%)	
Regulatory Considerations			
Parameters	**Applicable?**	**Resolved?**	**Supporting Docs?**
Water of the United States - Section 404	Yes	Yes	PJD
Water of the United States - Section 401	Yes	Yes	PJD
Endangered Species Act	Yes	Yes	Cat. Ex.
Historic Preservation Act	Yes	Yes	Cat. Ex.
Coastal Zone Management Act (CZMA or CAMA)	No	Yes	Cat. Ex.
Essential Fisheries Habitat	No	Yes	Cat. Ex.

2.0 As-Built Condition (Baseline)

The Site was constructed and planted from February – April 2022. The site was generally constructed as specified in the Final Mitigation Plan. Site construction included filling a drainage ditch, construction of three ditch plugs, minor grading of the wetland restoration area, application of temporary and permanent seed mixes, and planting bare root seedlings. McAdams performed the as-built survey for the Site in May 2022.

2.1 As-Built / Record Drawings

Sealed record drawings are included in Appendix D. Record drawings show the recorded conservation easement, as-built topographic survey, and long-term monitoring devices installed following construction. Few and minor adjustments were made during construction that differ from the proposed Site condition as discussed in the approved Final Mitigation Plan. Deviations from the Final Mitigation Plan are discussed below.

2.1.1 Site Grading

Three ditch plugs were constructed on Site to prevent potential future erosion of fill material placed in the previously existing ditches. The proposed ditch plugs were described in the Final Mitigation Plan and construction drawings to be minimum 100 feet long with the exposed face to be lined with biodegradable erosion control matting. Based on field conditions and observed runoff trends during construction, it was determined that 100-foot-long ditch plugs were not necessary to ensure long-term stability of fill material in the two ditches on the western side of the property. Short ditch plugs (10-20 feet in length) were constructed and sediment forebays, heavily planted with woody stems, were constructed downslope of the ditch plugs to dissipate concentrated flows and retain sediment from entering the wetland restoration area. The exposed face of the two ditch plugs were protected with riprap to ensure long-term stability of the plugs. The ditch plug constructed in the central ditch (Ditch A) in the southeast corner of the Site was constructed to be 100-feet long as proposed. The exposed face of this ditch plug was also protected with riprap. All ditch plugs were constructed of clay material and densely planted to ensure long-term stability. Photographs of the constructed ditch plugs are included in Appendix A.

After filing the central ditch (Ditch A), three minor earthen sills, approximately 6-8 inches tall and 15-20 feet wide, were constructed across the center of previous ditch alignment. These sills were constructed to slow the flow of runoff through the site to keep exposed soils and seed from washing away prior to the establishment of temporary ground cover and planted trees.

During Site grading, concentrated flow was noticed coming onto the Site along the toe of the historic spoil pile on the north side of the existing irrigation pond. A small (0.007 acre) vernal pool was constructed outside of the credit area to capture the incoming concentrated flow and provide shallow, diffuse flow to the credit area. This vernal pool was heavily planted with obligate wetland (OBL) and facultative wetland (FACW) species.

2.1.2 Site Planting

The entire easement area was mechanically planted with woody tree and shrub plant material in two planting zones matching potential future hydrology conditions. Bare root planting zones proposed in the Final Mitigation Plan and construction drawings were modified based on field conditions and observed drainage patterns following Site grading. The wettest areas, including vernal pools, were planted with species tolerant of longer inundation times and designated as Zone 2. Zone 1 was designated as higher landscape position wetland areas and planted with appropriate tree species. The central ditch alignment of the Site exhibited prolonged inundation tendencies which likely would have resulted in mortality of several species designated for planting in the location in the Final Mitigation Plan. The location of planting zones described in the Final Mitigation were adjusted such that more hydrophytic species would be planted in the central part of the ditch alignment and vernal pool areas to ensure survival of planted stems. Species, quantity, and percent composition of bare root stems planted onsite are presented in Table 4 and the record drawings (Appendix D).

Table 4: Site Planted Stems

Scientific Name	Common Name	Vegetative Strata	Planting Zone	Wetland Indicator Status	%	Quantity
Quercus michauxii	Swamp Chestnut Oak	Canopy	1	FACW	17%	2000
~~*Gordonia lasianthus*~~	~~Loblolly bay~~	~~Understory~~	~~1~~	~~FACW~~	--	--
~~*Quercus pagoda*~~	~~Cherrybark oak~~	~~Canopy~~	~~1~~	~~FACW~~	--	--
~~*Carpinus caroliniana*~~	~~Ironwood~~	~~Understory~~	~~1~~	~~FACW~~	--	--
Quercus phellos	Willow Oak	Canopy	1	FACW	8%	1000
Quercus laurifolia	Laurel Oak	Canopy	1	FACW	4%	500
Quercus nigra	Water Oak	Canopy	1	FAC	8%	1000
~~*Nyssa biflora*~~	~~Swamp blackgum~~	~~Canopy~~	~~1~~	~~OBL~~	--	--
~~*Magnolia virginiana*~~	~~Sweetbay magnolia~~	~~Understory~~	~~1~~	~~FACW~~	--	--
Ulmus americana	American elm	Canopy	1	FAC	4%	500
~~*Persea palustris*~~	~~Swamp bay~~	~~Understory~~	~~1~~	~~FACW~~	--	--
Platanus occidentalis	Sycamore	Overstory	1	FACW	4%	500
Taxodium distichum	Bald cypress	Overstory	1/2	OBL	17%	2000
Nyssa aquatica	Swamp tupelo	Overstory	2	FACW	4%	500
Quercus shumardii	Shumard Oak	Overstory	1	FAC	17%	2000
Fraxinus pennsylvanica	Green ash	Overstory	1	FACW	3%	300
Cephalanthus occidentalis	Buttonbush	Understory	2	OBL	4%	500
Quercus lyrata	Overcup Oak	Overstory	1/2	OBL	8%	1000
				Total:	100%	11800

Species listed in Table 4 with strike through marks were included in the conceptual planting plan in the Final Mitigation Plan but were not planted at the Site.

Prior to planting, all trees were mixed in planting containers to ensure appropriate species distribution across the Site in each Zone. Trees and shrubs were installed on an approximate 6'x10' spacing (726 stems/ac) to ensure survival and vigorous regeneration of the restored wetland forest community.

During construction, no trees were removed from the spoil area around the pond due to potentially dangerous Site conditions felling or girdling trees on steep slopes. Aggressive pioneer trees such as loblolly pine and sweetgum will be monitored and controlled if the area around the pond provides seed in planted areas on the southern end of the project.

Temporary and permanent seed, including a native riparian and wetland seed mix, was applied to the Site following grading activities. Riparian and wetland permanent seed mix compositions are included in the record drawings.

2.1.3 Site Monitoring Devices

Site monitoring devices were installed at the Site post-construction in accordance with current DMS guidance. 11 vegetation plots were established at the Site (Figure 1). In the Final Mitigation Plan, eight vegetation plots were proposed for post-construction monitoring; however, it was determined that this number and spatial distribution of vegetation plots was not sufficient for the Site. Additionally, no vegetation plot was proposed in the Final Mitigation Plan to be located within the 50-foot buffer surrounding the wetland credit area. Fixed vegetation plot 3 is located in the 50-foot buffer to monitor vegetative success in this area.

Seven fixed photo points were located along the perimeter of the Site post-construction, two more than proposed in the Final Mitigation Plan (Figure 1). Two additional photo points were located to provide better clarity and overall improved visual assessment of the Site's condition in each annual monitoring report.

3.0 Performance Standards

The success of the planted vegetation, restored wetland hydrology, and integrity of the easement boundary will be monitored on a yearly basis for a minimum of seven years to determine overall Site success and the expected ecological uplift described in the final mitigation plan. The performance standards for the Site will follow current accepted and approved performance standards presented in the 2016 USACE IRT guidance. Specific performance standards and monitoring components associated with each Project goal are given in Table 2.

4.0 Monitoring Plan

To ensure performance standards are met and project goals and objectives are achieved, annual monitoring will be completed following the end of the growing season for each reporting year (Table 5). Monitoring reports documenting performance standards will be prepared annually and submitted to the DMS no later than December 1st of each monitoring year data is collected (Table 9, Appendix C). Figure 1 shows the layout of Site monitoring devices.

Table 5: Site Monitoring Components

Parameter	Monitoring Feature	Quantity	Frequency	Notes
Wetland Hydrology	Shallow Groundwater Gauge	9	Tri-Annual	1
Wetland Vegetation	Fixed/Random Plots (CVS Level II)	9 Fixed 2 Random	Annual (Years 1, 2, 3, 5 and 7)	2
Visual Assessment	General Site Observations and Photos, Vernal Pool and Ditch Plug Integrity	Variable	Semi-Annual	3
Exotic and Nuisance Vegetation Assessment	General Site Observations and Photos	Variable	Semi-Annual	4
Project Easement Boundary Assessment	General Site Observations and Photos	Variable	Semi-Annual	5
Plot Photos and Photo Points	Fixed Photographs	11 Vegetation Plots 7 Photo Points	Annual	6

[1] Groundwater gauges 1-3 were installed pre-construction to establish baseline conditions for the Site. Groundwater data will be presented in annual monitoring reports.

[2] Vegetation plots (10m x 10m) represent minimum 2% of the planted acreage. Fixed plots will be monitored according to CVS Level II methodology.

[3] The Site will be visually inspected twice a year minimum. All Site data will be included in the Annual Monitoring Report. If necessary, the Adaptive Management Plan will be implemented to address issues jeopardizing project success.

[4] Exotic and nuisance vegetation will be noted and documented as necessary in Annual Reports.

[5] Project encroachments will be noted and documented as necessary in Annual Reports.

[6] Project photos will be provided in Annual Reports.

5.0 Monitoring Year 0 Data Assessment

Preliminary Site monitoring took place during and following construction and planting. Collected data was analyzed and is summarized the following sections. Raw data for MY0 and presented in the appropriate appendices.

5.1 Vegetation Assessment

Vegetation assessment for MY0 was conducted in March 2022. Vegetation surveys in the 11 established plots resulted in calculated stem densities ranging from 607 – 1012 stems per acre. The calculated average stem density was 787 stems per acre, well above the interim success criteria of 320 stems per acres in MY3. All 11 vegetation plots exceeded the MY3 interim success

criteria. Heavy rains washed away much of the initial temporary and permanent seed applied to the Site, requiring reapplication of seed. This has delayed the establishment of dense herbaceous ground cover; however, ground cover is being established at the Site. Vegetation plot photographs are included in Appendix A and vegetation plot data is included in Appendix B.

There are currently no areas of concern with respect to Site vegetation. The Site will continue to be monitored for invasive and aggressive pioneer species. Any future vegetation treatments will be conducted in accordance with the approved adaptive management plan and will be discussed the annual monitor reports.

5.2 Wetland Assessment

Nine groundwater wells were installed at the Site to collect groundwater data. Groundwater wells 1-3 were installed pre-construction to establish baseline conditions for the Site. Groundwater wells 4-9 were installed post-construction for long-term Site monitoring. Groundwater gauge data will be collected and presented in the MY1 annual monitoring report.

5.3 Visual Assessment

Visual assessment of the Site indicates that the Site is stable and planted vegetation is in good health. Constructed ditch plugs show no signs of deterioration and there are signs of sediment deposition in the two constructed sediment forebays on the western side of the Site. The Site boundary has been well marked with signage and there is no evidence of encroachment. Photographs taken from the seven established photo points are presented in the Appendix A.

5.4 MY0 Assessment Summary

Overall, the Site is in good condition. Planted stems appear to be in good health and herbaceous ground cover is establishing across the Site. Average stem density for the Site was 787 stems per acres, well above the interim success criteria. Constructed ditch plugs are stable and there are no signs of active erosion at the Site.

Groundwater data will be presented in the MY1 annual monitoring report. There have been no noticed signs of encroachment within the Site.

6.0 Methodology

Vegetation monitoring followed the Carolina Vegetation Survey – EEP Level II Protocol (Lee et al., 2008). Visual assessment followed most recent guidance put forth by the USACE and NCIRT (USACE, 2016).

7.0 References

Eco Terra, LLC. 2022. Final Mitigation Plan - Maple Swamp Wetland Mitigation Site.

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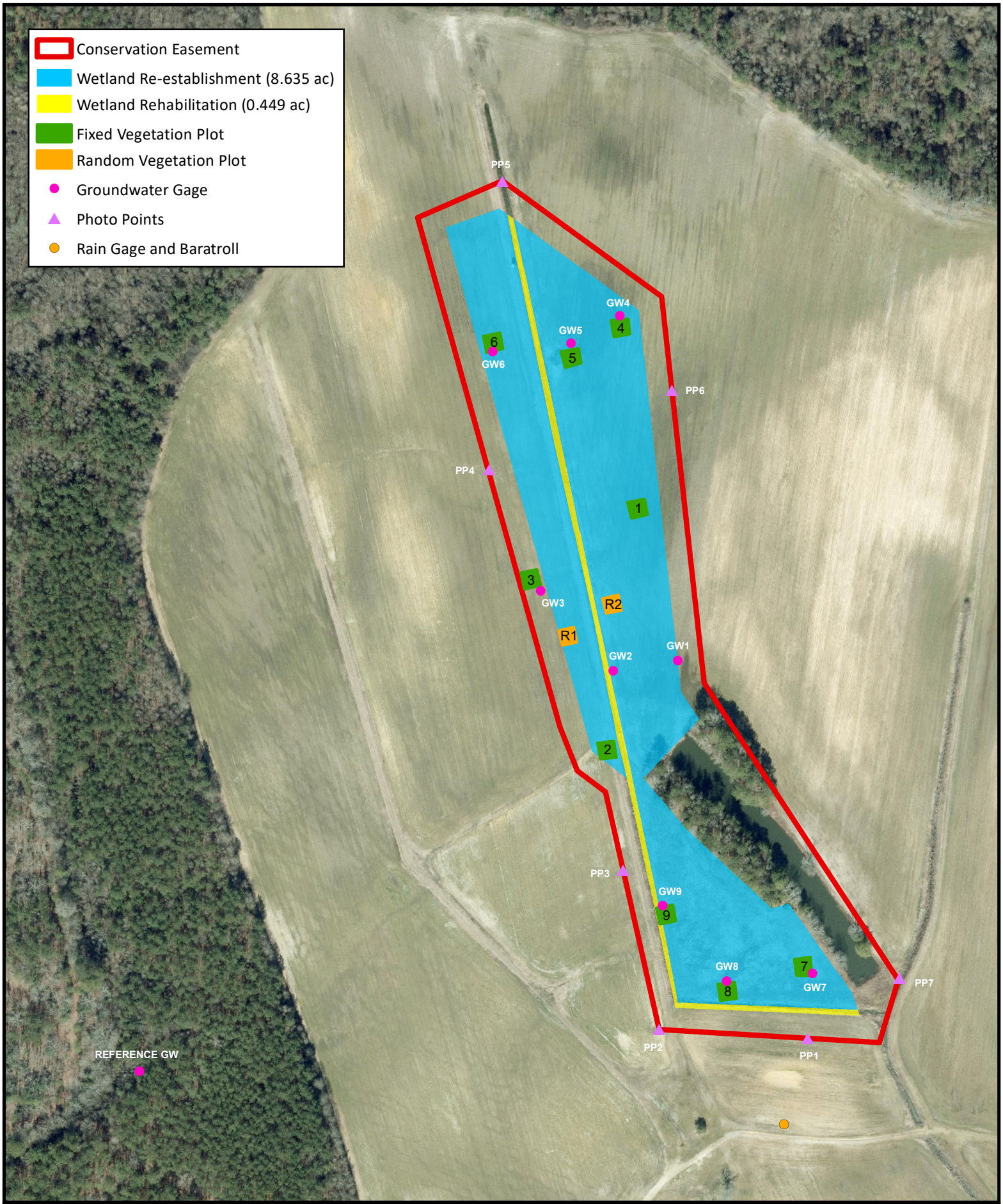
US Army Corps of Engineers. 2016. Wilmington District Stream and Wetland Compensatory Mitigation Update. North Carolina Interagency Review Team – October 24, 2016. Available: http://saw-reg.usace.army.mil/PN/2016/Wilmington-District-Mitigation-Update.pdf



McADAMS

Prepared For: eco terra

MAPLE SWAMP WETLAND MITIGATION SITE

CURRENT CONDITIONS SITE MAP

Tar-Pamlico 03020102
Edgecombe County, North Carolina

N
0 125 250
Feet

FIGURE
1

APPENDIX A

Visual Assessment Data

Table 6: Visual Vegetation Assessment
Maple Swamp Wetland Mitigation Site
DMS ID No. 100190
Monitoring Year 0 – 2022

Planted Acreage = 13.68 ac

Vegetation Category	Definitions	Mapping Threshold	Combined Acreage	% of Planted Acreage
Bare Areas	Very limited cover of both woody and herbaceous material.	0.10 acres	0.00	0.0%
Low Stem Density Areas	Woody stem densities clearly below target levels based on current MY stem count criteria.	0.10 acres	0.00	0.0%
		Total	0.00	0.0%
Areas of Poor Growth Rates	Planted areas where average height is not meeting current MY Performance Standard.	0.10 acres	0.00	0.0%
		Cumulative Total	0.00	0.0%

Easement Acreage = 15.34 ac

Vegetation Category	Definitions	Mapping Threshold	Combined Acreage	% of Easement Acreage
Invasive Areas of Concern	Invasives may occur outside of planted areas and within the easement and will therefore be calculated against the total easement acreage. Include species with the potential to directly outcompete native, young, woody stems in the short-term or community structure for existing communities. Species included in summation above should be identified in report summary.	0.10 acres	0.00	0.0%
Easement Encroachment Areas	Encroachment may be point, line, or polygon. Encroachment to be mapped consists of any violation of restrictions specified in the conservation easement. Common encroachments are mowing, cattle access, vehicular access. Encroachment has no threshold value as will need to be addressed regardless of impact area.	None	0 Encroachments Noted	

Vegetation Plot Photographs

MAPLE SWAMP WETLAND MITIGATION SITE – VEGETATION PLOTS PHOTO LOG

Vegetation Plot 1 – taken 3/10/2022

Vegetation Plot 2 – taken 3/10/2022

Vegetation Plot 3 – taken 3/10/2022

Vegetation Plot 4 – taken 3/10/2022

Vegetation Plot 5 – taken 3/10/2022

Vegetation Plot 6 – taken 3/10/2022

Vegetation Plot 7 – taken 3/10/2022

Vegetation Plot 8 – taken 3/10/2022

Vegetation Plot 9 – taken 3/10/2022

Random Vegetation Plot 1 (background)– taken 4/8/2022

Random Vegetation Plot 2 (background) – taken 4/8/2022

Photo Point Photographs

MAPLE SWAMP WETLAND MITIGATION SITE – PHOTO POINT LOG

Photo Point 1 – taken 3/10/2022

Photo Point 2 – taken 3/10/2022

Photo Point 3 – taken 3/10/2022

Photo Point 4 – taken 3/10/2022

Photo Point 5 – taken 3/10/2022

Photo Point 6 – taken 3/10/2022

Photo Point 7 – taken 3/10/2022

North project view (March 29, 2022)

Ditch Plug Photographs

MAPLE SWAMP WETLAND MITIGATION SITE – DITCH PLUG PHOTO LOG

Northernmost Ditch Plug with Sediment Forebay on Western Site Boundary – view west

Southernmost Ditch Plug with Sediment Forebay on Western Site Boundary – view southwest

Ditch Plug at Southeastern Site Boundary (Ditch A) – view east

APPENDIX B

Vegetation Plot Data

Table 7: Vegetation Plot Data

Maple Swamp Wetland Mitigation Site

DMS ID No. 100190

Monitoring Year 0 – 2022

	Scientific Name	Common Name	Tree / Shrub	Indicator Status	Veg Plot 1 F		Veg Plot 2 F		Veg Plot 3 F		Veg Plot 4 F	
					Planted	Total	Planted	Total	Planted	Total	Planted	Total
Species Included in Approved Mitigation Plan	*Cephalanthus occidentalis*	Buttonbush	Tree	OBL			2	2				
	Fraxinus pennsylvanica	Green ash	Tree	FACW	2	2			2	2		
	Nyssa aquatica	Swamp tupelo	Tree	FACW			6	6				
	Platanus occidentalis	Sycamore	Tree	FACW	2	2			1	1	3	3
	Quercus laurifolia	Laurel oak	Tree	FACW	1	1	1	1			3	3
	Quercus lyrata	Overcup oak	Tree	OBL	1	1	1	1	8	8	3	3
	Quercus michauxii	Swamp chestnut oak	Tree	FACW	4	4	2	2	2	2	2	2
	Quercus nigra	Water oak	Tree	FAC	4	4	1	1	3	3	3	3
	Quercus phellos	Willow oak	Tree	FACW			3	3	3	3	1	1
	Quercus shumardii	Shumard oak	Tree	FAC	1	1			1	1	1	1
	Taxodium distichum	Bald-cypress	Tree	OBL	5	5			4	4	4	4
	Ulmus americana	American elm	Tree	FAC	3	3	4	4	1	1	1	1
Sum				Performance Standard	23	23	20	20	25	25	21	21
Mitigation Plan Performance Standard				Current Year Stem Count		23		20		25		21
				Stems/Acre		931		809		1012		850
				Species Count		9		8		9		9
				Dominant Species Composition (%)		22%		30%		32%		19%
				Average Plot Height (ft)		1.5		1.5		1.6		1.5
				% Invasives		0%		0%		0%		0%
Post Mitigation Plan Performance Standard				Current Year Stem Count		23		20		25		21
				Stems/Acre		931		809		1012		850
				Species Count		9		8		9		9
				Dominant Species Composition (%)		22%		30%		32%		19%
				Average Plot Height (ft)		1.5		1.5		1.6		1.5
				% Invasives		0%		0%		0%		0%

1). Bolded species are proposed for the current monitoring year, italicized species are not approved, and a regular font indicates that the species has been approved.

2). The "Species Included in Approved Mitigation Plan" section contains only those species that were included in the original approved mitigation plan. The "Post Mitigation Plan Species" section includes species that are being proposed through a mitigation plan addendum for the current monitoring year (bolded) , species that have been approved in prior monitoring years through a mitigation plan addendum (regular font), and species that are not approved (italicized).

3). The "Mitigation Plan Performance Standard" section is derived only from stems included in the original mitigation plan, whereas the "Post Mitigation Plan Performance Standard" includes data from mitigation plan approved, post mitigation plan approved, and proposed stems.

Table 7: Vegetation Plot Data

Maple Swamp Wetland Mitigation Site

DMS ID No. 100190

Monitoring Year 0 – 2022

	Scientific Name	Common Name	Tree / Shrub	Indicator Status	Veg Plot 5 F		Veg Plot 6 F		Veg Plot 7 F		Veg Plot 8 F	
					Planted	Total	Planted	Total	Planted	Total	Planted	Total
Species Included in Approved Mitigation Plan	*Cephalanthus occidentalis*	Buttonbush	Tree	OBL	1	1						
	Fraxinus pennsylvanica	Green ash	Tree	FACW	1	1	1	1				
	Nyssa aquatica	Swamp tupelo	Tree	FACW	1	1	1	1			3	3
	Platanus occidentalis	Sycamore	Tree	FACW	2	2	4	4				
	Quercus laurifolia	Laurel oak	Tree	FACW	2	2	1	1	3	3	2	2
	Quercus lyrata	Overcup oak	Tree	OBL	1	1	1	1	7	7	6	6
	Quercus michauxii	Swamp chestnut oak	Tree	FACW	1	1	3	3	1	1	2	2
	Quercus nigra	Water oak	Tree	FAC	1	1	2	2	1	1		
	Quercus phellos	Willow oak	Tree	FACW	3	3	1	1	1	1		
	Quercus shumardii	Shumard oak	Tree	FAC	2	2					1	1
	Taxodium distichum	Bald-cypress	Tree	OBL	3	3	1	1	2	2	6	6
	Ulmus americana	American elm	Tree	FAC	1	1	5	5				
Sum	Performance Standard				19	19	20	20	15	15	20	20
Mitigation Plan Performance Standard	Current Year Stem Count					19		20		15		20
	Stems/Acre					769		809		607		809
	Species Count					12		10		6		6
	Dominant Species Composition (%)					16%		25%		47%		30%
	Average Plot Height (ft)					1.6		1.6		1.6		1.7
	% Invasives					0%		0%		0%		0%
Post Mitigation Plan Performance Standard	Current Year Stem Count					19		20		15		20
	Stems/Acre					769		809		607		809
	Species Count					12		10		6		6
	Dominant Species Composition (%)					16%		25%		47%		30%
	Average Plot Height (ft)					1.6		1.6		1.6		1.7
	% Invasives					0%		0%		0%		0%

1). Bolded species are proposed for the current monitoring year, italicized species are not approved, and a regular font indicates that the species has been approved.

2). The "Species Included in Approved Mitigation Plan" section contains only those species that were included in the original approved mitigation plan. The "Post Mitigation Plan Species" section includes species that are being proposed through a mitigation plan addendum for the current monitoring year (bolded) , species that have been approved in prior monitoring years through a mitigation plan addendum (regular font), and species that are not approved (italicized).

3). The "Mitigation Plan Performance Standard" section is derived only from stems included in the original mitigation plan, whereas the "Post Mitigation Plan Performance Standard" includes data from mitigation plan approved, post mitigation plan approved, and proposed stems.

Table 7: Vegetation Plot Data

Maple Swamp Wetland Mitigation Site

DMS ID No. 100190

Monitoring Year 0 – 2022

	Scientific Name	Common Name	Tree / Shrub	Indicator Status	Veg Plot 9 F		Veg Plot R1	Veg Plot R2
					Planted	Total	Total	Total
Species Included in Approved Mitigation Plan	*Cephalanthus occidentalis*	Buttonbush	Tree	OBL				
	Fraxinus pennsylvanica	Green ash	Tree	FACW			1	1
	Nyssa aquatica	Swamp tupelo	Tree	FACW	2	2		
	Platanus occidentalis	Sycamore	Tree	FACW	2	2	1	1
	Quercus laurifolia	Laurel oak	Tree	FACW	2	2	1	1
	Quercus lyrata	Overcup oak	Tree	OBL	5	5	3	3
	Quercus michauxii	Swamp chestnut oak	Tree	FACW	5	5	4	4
	Quercus nigra	Water oak	Tree	FAC	1	1	2	1
	Quercus phellos	Willow oak	Tree	FACW	1	1	3	
	Quercus shumardii	Shumard oak	Tree	FAC			1	
	Taxodium distichum	Bald-cypress	Tree	OBL	2	2		8
	Ulmus americana	American elm	Tree	FAC			2	
Sum				Performance Standard	20	20	18	19
Mitigation Plan Performance Standard				Current Year Stem Count		20	18	19
				Stems/Acre		809	728	769
				Species Count		8	9	7
				Dominant Species Composition (%)		25%	22%	42%
				Average Plot Height		1.5	1.5	1.9
				% Invasives		0%	0%	0%
Post Mitigation Plan Performance Standard				Current Year Stem Count		20	18	19
				Stems/Acre		809	728	769
				Species Count		8	9	7
				Dominant Species Composition (%)		25%	22%	42%
				Average Plot Height		1.5	1.5	1.9
				% Invasives		0%	0%	0%

1). Bolded species are proposed for the current monitoring year, italicized species are not approved, and a regular font indicates that the species has been approved.

2). The "Species Included in Approved Mitigation Plan" section contains only those species that were included in the original approved mitigation plan. The "Post Mitigation Plan Species" section includes species that are being proposed through a mitigation plan addendum for the current monitoring year (bolded) , species that have been approved in prior monitoring years through a mitigation plan addendum (regular font), and species that are not approved (italicized).

3). The "Mitigation Plan Performance Standard" section is derived only from stems included in the original mitigation plan, whereas the "Post Mitigation Plan Performance Standard" includes data from mitigation plan approved, post mitigation plan approved, and proposed stems.

Table 8: Vegetation Performance Standards Summary

Maple Swamp Wetland Mitigation Site

DMS ID No. 100190

Monitoring Year 0 – 2022

	Veg Plot 1 F				Veg Plot 2 F				Veg Plot 3 F			
	Stems/Acre	Avg Ht (ft)	# Species	% Invasive	Stems/Acre	Avg Ht (ft)	# Species	% Invasive	Stems/Acre	Avg Ht (ft)	# Species	% Invasive
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3												
Monitoring Year 2												
Monitoring Year 1												
Monitoring Year 0	931	1.5	9	0	809	1.5	8	0	1012	1.6	9	0
	Veg Plot 4 F				Veg Plot 5 F				Veg Plot 6 F			
	Stems/Acre	Avg Ht (ft)	# Species	% Invasive	Stems/Acre	Avg Ht (ft)	# Species	% Invasive	Stems/Acre	Avg Ht (ft)	# Species	% Invasive
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3												
Monitoring Year 2												
Monitoring Year 1												
Monitoring Year 0	850	1.5	9	0	769	1.6	12	0	809	1.6	10	0
	Veg Plot 7 F				Veg Plot 8 F				Veg Plot 9 F			
	Stems/Acre	Avg Ht (ft)	# Species	% Invasive	Stems/Acre	Avg Ht (ft)	# Species	% Invasive	Stems/Acre	Avg Ht (ft)	# Species	% Invasive
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3												
Monitoring Year 2												
Monitoring Year 1												
Monitoring Year 0	607	1.6	6	0	809	1.7	6	0	809	1.5	8	0
	Veg Plot R1				Veg Plot R2							
	Stems/Acre	Avg Ht (ft)	# Species	% Invasive	Stems/Acre	Avg Ht (ft)	# Species	% Invasive				
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3												
Monitoring Year 2												
Monitoring Year 1												
Monitoring Year 0	728	1.5	9	0	769	1.9	7	0				

*Each monitoring year represents a different plot for the random vegetation plot "groups". Random plots are denoted with an R, and fixed plots with an F.

APPENDIX C

Project Timeline and Contacts Info

Table 9: Project Activity and Reporting History
Maple Swamp Wetland Mitigation Site
DMS ID No. 100190
Monitoring Year 0 – 2022

Activity or Report	Data Collection Complete	Completion or Scheduled Delivery
Project Instituted	N/A	February 11, 2021
Mitigation Plan Approved	N/A	January 26, 2022
Construction (Grading) Completed	N/A	March 7, 2022
As-Built Survey Completed	May 2022	May 2022
Planting Completed	N/A	March 7, 2022
Baseline Monitoring Document (Year 0) - Vegetation Survey	March 2022	July 2022
Year 1 Monitoring - Vegetation Survey	2022	November 2022
Year 2 Monitoring - Vegetation Survey	2023	November 2023
Year 3 Monitoring - Vegetation Survey	2024	November 2024
Year 4 Monitoring - Vegetation Survey	2025	November 2025
Year 5 Monitoring - Vegetation Survey	2026	November 2026
Year 6 Monitoring - Vegetation Survey	2027	November 2027
Year 7 Monitoring - Vegetation Survey	2028	November 2028

Table 10: Project Contacts
Maple Swamp Wetland Mitigation Site
DMS ID No. 100190
Monitoring Year 0 – 2022

Designer Eco Terra - Scott Frederick	Eco Terra, LLC 117 Centrewest Ct Cary, NC 27513 984.354.3800
Engineer McAdams - Rebecca Stubbs, PE	McAdams 2905 Meridian Parkway Durham, NC 27713 919.361.5000
Construction Contractor William Gilbert	W Gilbert and Co., Inc 487 Fillmore Rd Tarboro, NC 27886 252.469.3989
Monitoring Eco Terra - Scott Frederick	Eco Terra, LLC 117 Centrewest Ct Cary, NC 27513 984.354.3800

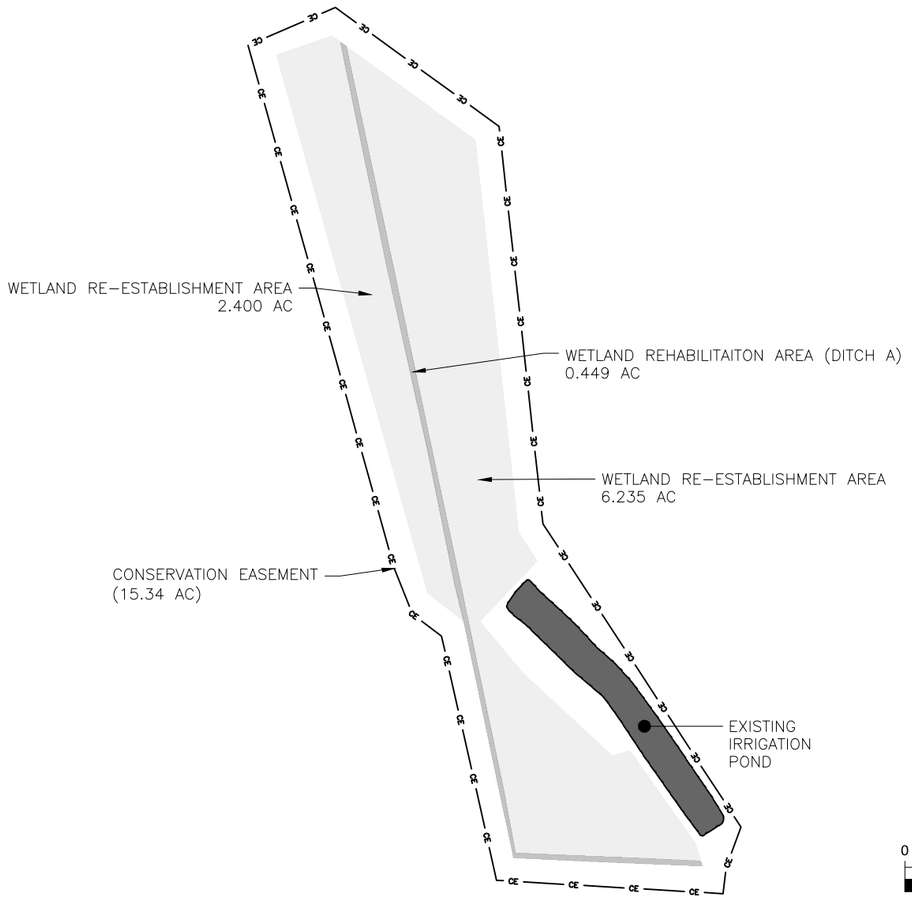
APPENDIX D

Record Drawings

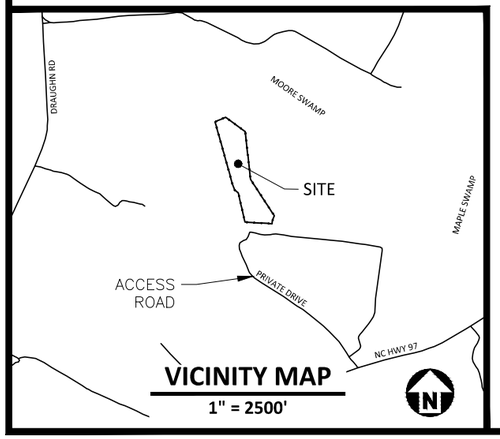
MAPLE SWAMP MITIGATION SITE
TAR-PAMLICO 03020102 RIVER BASIN
AS-BUILT RECORD DRAWINGS

EDGECOMBE COUNTY, NORTH CAROLINA
DATE: JULY 5, 2022

SITE DATA TABLE	
RIVER BASIN	TAR–PAMLICO
8–DIGIT HUC	03020102
DMS PROJECT ID NO.	100190
FULL DELIVERY CONTRACT NO.	200206–01
USACE ACTION ID NO.	SAW–2021–00345
DWR PROJECT NO.	2021–0409V2
RFP NO.	16–20200206E
COORDINATE SYSTEM	NAD83 NORTH CAROLINA STATE PLANES, US FOOT



SHEET INDEX



GRAPHIC SCALE
0 150 300 600
1 inch = 300 ft.

RECORD DRAWINGS ONLY
NORTH CAROLINA PROFESSIONAL SEAL 049073 ENGINEER REBECCA STUBBS
RECORD DRAWINGS ONLY

The John R. McAdams Company, Inc.
2905 Meridian Parkway
Durham, NC 27713

phone 919. 361. 5000
fax 919. 361. 2269
license number: C-0293, C-187

www.mcadamsco.com

ECO TERRA PARTNERS, LLC
1328 DEKALB AVE. NE
ATLANTA, GA 30307
CONTACT: NORTON WEBSTER
PHONE: 919.548.0949

LEGEND AND SYMBOLS

CE CE — PROPOSED CONSERVATION EASEMENT

PROPERTY LINE

250 — EXISTING MAJOR CONTOUR

EXISTING MINOR CONTOUR

EXISTING DITCH CENTERLINE

EXISTING TREE LINE

EXISTING IRRIGATION POND

FEMA 100–YR FLOODPLAIN

FEMA 500–YR FLOODPLAIN

AS-BUILT LEGEND AND SYMBIOLS

250 — MAJOR CONTOUR

MINOR CONTOUR

SITE CREDIT AREA

VEGETATION MONITORING PLOT

GROUNDWATER MONITORING WELL

PHOTO POINT

RAIN GAGE / BARATROLL

WETLAND REHABILITAITON AREA

WETLAND RE–ESTABLISHMENT AREA

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MAPLE SWAMP MITIGATION SITE

AS-BUILT RECORD DRAWINGS

EDGECOMBE COUNTY, NORTH CAROLINA

ecoterra

PLAN INFORMATION

PROJECT NO.	ECT2101.02
FILENAME	ECT2101.02-XC-AB
CHECKED BY	RAS
DRAWN BY	RHW
SCALE	
DATE	07.05.2022

LEGEND AND SYMBOLS

C1.00

Table 6.24d Permanent Seeding Recommendations -- Coastal Plain Region

Common Name	Scientific Name	Cultivars	Type*	Percentage of Mix	Optimal Planting Dates	Soil Drainage Adaptation	Shade Tolerance	Height
Switchgrass	Panicum virgatum	**Blackwell --** well drained **Shelter --** well drained **Kanlow --** poorly drained **Carthage --** well drained	Warm Season	10-15%	Dec. 1 - Apr. 1	Cultivar Dependent	Poor	6
Switchgrass	Panicum virgatum	**Alamo --** poorly-drained	Warm Season	10-15%	Dec. 1 - May 1	Cultivar Dependent	Poor	6
Indiangrass*	Sorghastrum nutans*	**Rumsey, Osage, Cheyenne**	Warm Season	10-30%	Dec. 1 - Apr. 1	Well-drained to Droughty	Poor	6
Indiangrass*	Sorghastrum nutans*	**Lometa**	Warm Season	10-30%	Dec. 1 - May 1	Well-drained to Droughty	Poor	6
Big Bluestem	Andropogon gerardii	**Earl**	Warm Season	10-30%	Dec. 1 - Apr. 1	Well-drained to Droughty	Poor	6
Little Bluestem	Schizachyrium scoparium	**Cimarron**	Warm Season	10-30%	Dec. 1 - Apr. 1	Well-drained to Droughty	Poor	4
Sweet Woodreed	Cinna arundinacea		Warm Season	1-10%	Dec. 1 - Apr. 1	Poorly-drained to Well-drained	Moderate	5
Rice Cutgrass	Leersia oryzoides		Warm Season	5-25%	Dec. 1 - Apr. 1	Poorly-drained	Poor	5
Redtop Panicgrass	Panicum rigidulum		Warm Season	10-20%	Dec. 1 - Apr. 1	Well-drained	Poor	3.5
Beaked Panicgrass	Panicum anceps		Warm Season	10-20%	Dec. 1 - Apr. 1	Poorly-drained	Moderate	3.5
Eastern Gammagrass	Tripsacum datyoides		Warm Season	5-10%	Dec. 1 - Apr. 1	Well-drained to Poorly-drained	Poor	4.5
Purple top	Tridens flavus		Warm Season	5-10%	Dec. 1 - Apr. 1	Well-drained to Droughty	Poor	2.5
Indian Woodoats	Chasmanthium latifolium		Cold Season	1-10%	Feb. 15 - Mar. 20, Sep. 1 - Nov. 1	Well-drained to Droughty	Moderate	4
Virginia Wildrye	Elymus virginicus		Cold Season	5-25%	Feb. 15 - Mar. 20, Sep. 1 - Nov. 1	Well-drained to Droughty	Moderate	3
Rough Bentgrass	Agrostis scabra		Cold Season	10-20%	Feb. 15 - Mar. 20, Sep. 1 - Nov. 1	Poorly-drained	Poor	2.5
Soft Rush	Juncus effusus		Wetland	1-10%	Dec. 1 - Apr. 15	Poorly-drained	Poor	4
Shallow Sedge	Carex lurida		Wetland	1-10%	Dec. 1 - Apr. 15	Poorly-drained	Poor	3
Fox Sedge	Carex vulpinoidea		Wetland	1-10%	Dec. 1 - Apr. 15	Poorly-drained	Poor	3
Leathery Rush	Juncus coriaceus		Wetland	2-5%	Dec. 1 - Apr. 15	Poorly-drained	Poor	2

* Only Lometa in eastern coastal plain (Plant Hardiness Zone 8).
* Pick at least four species, including one from each type.

PERMANENT SEEDING SCHEDULE:

PLANT MATERIAL SELECTION

1. REFER TO TABLE 6.24D (LEFT) FOR APPROPRIATE SELECTIONS OF NATIVE PERMANENT SEEDS.
2. PERMANENT SEED INCLUSION IN THE MIXTURE SHOULD TOTAL 15 LBS OF PURE LIVE SEED (PLS) PER ACRE DRILLED OR 15-20 LBS pls/AC BROADCAST APPLIED.
3. AT LEAST 4 SPECIES SHOULD BE SELECTED FOR THE MIXTURE INCLUDING ONE SPECIES FROM EACH TYPE (WARM SEASON, COLD SEASON, WETLAND). SELECTION OF MORE THAN 4 SPECIES IS RECOMMENDED FOR INCREASING CHANCES OF SUCCESSFUL VEGETATION ESTABLISHMENT.
4. IF OTHER SPECIES SUCH AS WILDFLOWERS ARE ADDED TO THE MIX, THEY SHOULD NOT BE COUNTED IN THE MINIMUM SEEDING RATE FOR GRASSES.

SEEDBED PREPARATION

1. DISTURBED SOILS WITHIN RIPARIAN AREAS MUST BE AMENDED TO PROVIDE AN OPTIMUM ENVIRONMENT FOR SEED GERMINATION AND SEEDLING GROWTH.
2. THE pH OF THE SOIL MUST BE SUCH THAT IT IS NOT TOXIC AND NUTRIENTS ARE AVAILABLE.
3. SOIL ANALYSIS SHOULD BE PERFORMED TO DETERMINE NUTRIENT AND LIME NEEDS OF EACH SITE.
4. APPROPRIATE pH LEVELS ARE BETWEEN 5.5 AND 7.0.
5. RIPARIAN BUFFERS REGULATED FOR NUTRIENT MANAGEMENT MAY BE LIMITED TO A SINGLE APPLICATION OF FERTILIZER.
6. SUITABLE MECHANICAL MEANS SUCH AS DISKING, RAKING, OR HARROWING MUST BE EMPLOYED TO LOOSEN COMPACTED SOIL PRIOR TO SEEDING.

PLANTING

1. APPLY SEED UNIFORMLY WITH A CYCLONE SEEDER, DROP-TYPE SPREADER, DRILL, OR HYDROSEEDER ON A FIRM, FRIABLE SEEDBED.
2. IN FINE SOILS, SEEDS SHOULD BE DRILLED 0.25 - 0.5 INCHES. IN COARSE SANDY SOILS, SEEDS SHOULD BE PLANTED NO DEEPER THAN 0.75 INCHES.

MULCH

1. MULCH ALL PLANTINGS IMMEDIATELY AFTER SEEDING.
2. IF PLANTING ON STREAM BANKS STEEPER THAN 10% OR AREAS SUBJECT TO FLOODING, A BIODEGRADABLE ROLLED EROSION CONTROL PRODUCT IS RECOMMENDED TO HOLD SEED AND SOIL IN PLACE.

MAINTENANCE

1. THE RECOMMENDED PERMANENT GRASS SPECIES MAY REQUIRE TWO YEARS FOR ESTABLISHMENT, DEPENDING ON SITE CONDITIONS.
2. INSPECT SEEDED AREAS FOR FAILURE AND MAKE NECESSARY REPAIRS, SOIL AMENDMENTS, AND RE-SEEDINGS.
3. IF WEEDY EXOTIC SPECIES HAVE TAKEN OVER THE AREAS AFTER THE FIRST GROWING SEASON, THE INVASIVE SPECIES MUST BE ERADICATED TO ALLOW NATIVE SPECIES TO GROW.
4. MONITOR THE SITE UNTIL LONG-TERM STABILITY HAS BEEN ESTABLISHED.

TEMPORARY SEEDING SCHEDULE:

TEMPORARY SEEDING SHALL BE APPLIED AS NEEDED DURING CONSTRUCTION TO STABILIZE BARE OR DISTURBED AREAS OF SOIL AND AT THE COMPLETION OR ALL GRADING AND EARTHWORK ACTIVITIES WITHIN A PARTICULAR AREA OF THE SITE. PERMANENT SEED MAY BE DISTRIBUTED WITH TEMPORARY SEED UPON THE FINAL APPLICATION OF TEMPORARY SEED.

SEEDING DATE	SEEDING MIXTURE	APPLICATION RATE
AUG 15 - APRIL 15	RYE (GRAIN)	50~~30~~ LBS/AC
~~AUG 15 - APRIL 15~~	~~WHEAT~~	~~30 LBS/AC~~
~~APRIL 15 - AUG 15~~	~~GERMAN MILLET~~	~~10 LBS/AC~~
~~APRIL 15 - AUG 15~~	~~BROWNTOP MILLET~~	~~10 LBS/AC~~

SEEDING METHODS

1. EVENLY APPLY SEED USING A CYCLONE SEEDER, DRILL, CULTIPACKER SEEDER, OR HYDROSEEDER. THIS MUST BE DONE WITHIN 48 HOURS OF LAND DISTURBING ACTIVITIES.
2. MULCH WITH CLEAN WHEAT STRAW.
3. AFTER SEEDING, APPLY MULCH TO AREAS UNDER HARSH CONDITIONS SUCH AS AREAS THAT HAVE BEEN GRADED, OR THOSE WHICH WILL RECEIVE CONCENTRATED FLOWS. AREAS CONSIDERED TO BE UNDER HARSH CONDITIONS WILL BE CONSIDERED THE AREAS GRADED FOR THE WETLAND VALLEY.
4. RESEED AND MULCH AREAS WHERE SEEDLING EMERGENCE IS LESS THAN 80% COVERAGE, OR WHERE EROSION OCCURS, AS SOON AS POSSIBLE. DO NOT MOW. PROTECT FROM TRAFFIC AS MUCH AS POSSIBLE.

NOTES

1. TEMPORARY ANNUAL SEED SELECTION SHOULD BE BASED ON SEASON OF PROJECT INSTALLATION.
2. A SINGLE SPECIES FOR TEMPORARY COVER IS ACCEPTABLE
3. IN SOME CASES WHERE SEASONS OVERLAP, A MIXTURE OF TWO OR MORE SPECIES MAY BE NECESSARY. HOWEVER, APPLICATION RATES SHOULD NOT EXCEED THE TOTAL RECOMMENDED RATE PER ACRE.
4. TEMPORARY SEED SHOULD BE MIXED AND APPLIED SIMULTANEOUSLY WITH THE PERMANENT SEED MIX IF OPTIMAL PLANTING DATES ALLOW.

AS-BUILT SEEDING SPECIES

PERMANENT SEED MIX

Common Name	Scientific Name
Indiangrass	*Sorgastrum nutans*
German foxtail millet	*Setaria italica*
Switchgrass	*Panicum virgatum*
Big bluestem	*Andropogan gerardi*

Applied to the entire Site at a rate of 10-15 lbs/acre

WETLAND SEED MIX

Common Name	Scientific Name
Fox Sedge	*Carex vulpinoidea*
Shallow Sedge	*Carex lurida*
Soft Rush	*Juncus effusus*

Applied to the entire Site at a rate of 10-15 lbs/acre

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MAPLE SWAMP MITIGATION SITE

AS-BUILT RECORD DRAWINGS
EDGECOMBE COUNTY, NORTH CAROLINA

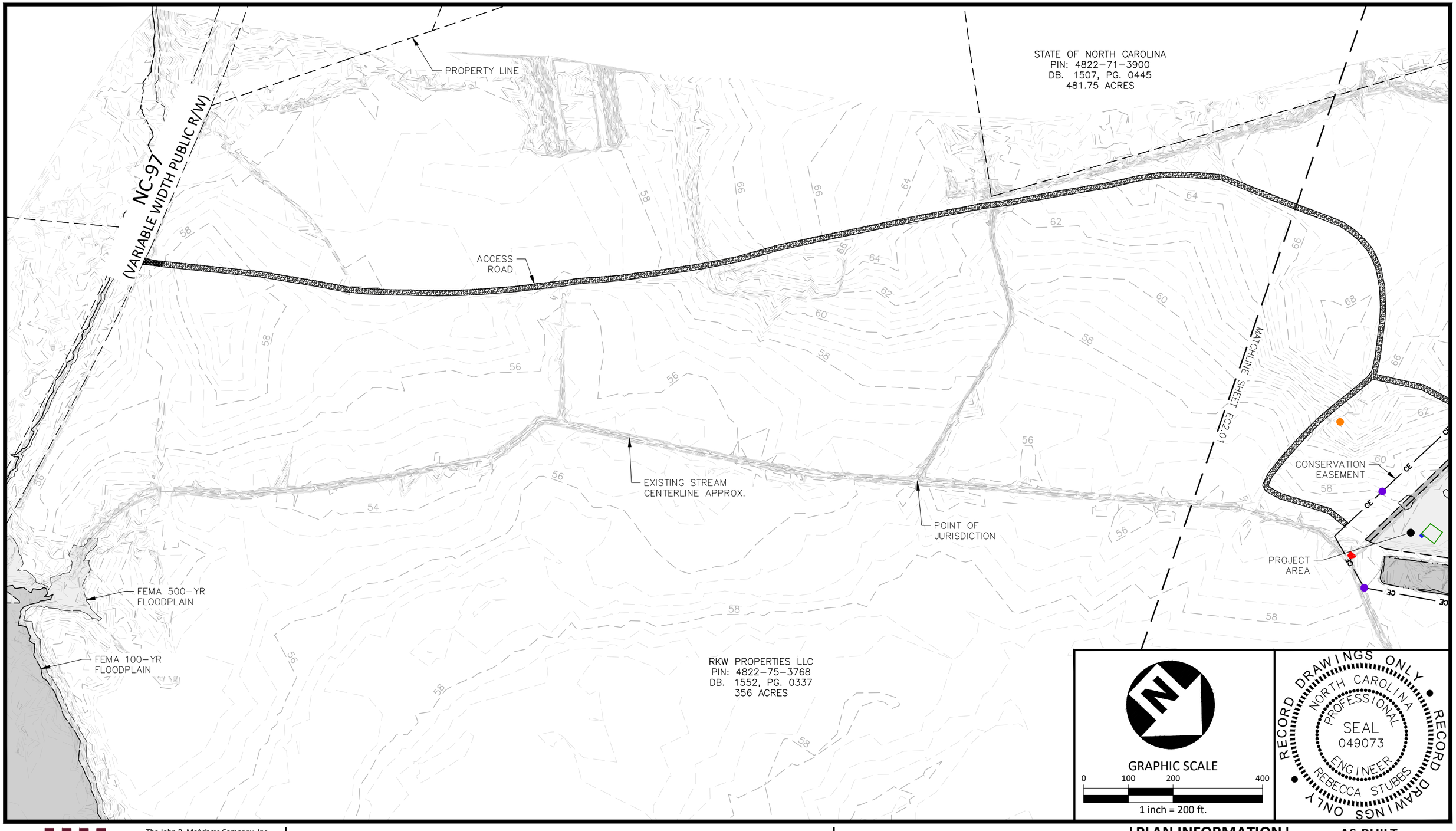
ecoterra

PLAN INFORMATION

PROJECT NO.	ECT2101.02
FILENAME	ECT2101.02-EC-AB
CHECKED BY	RAS
DRAWN BY	RHW
SCALE	
DATE	07.05.2022

AS-BUILT SEEDING

EC1.01



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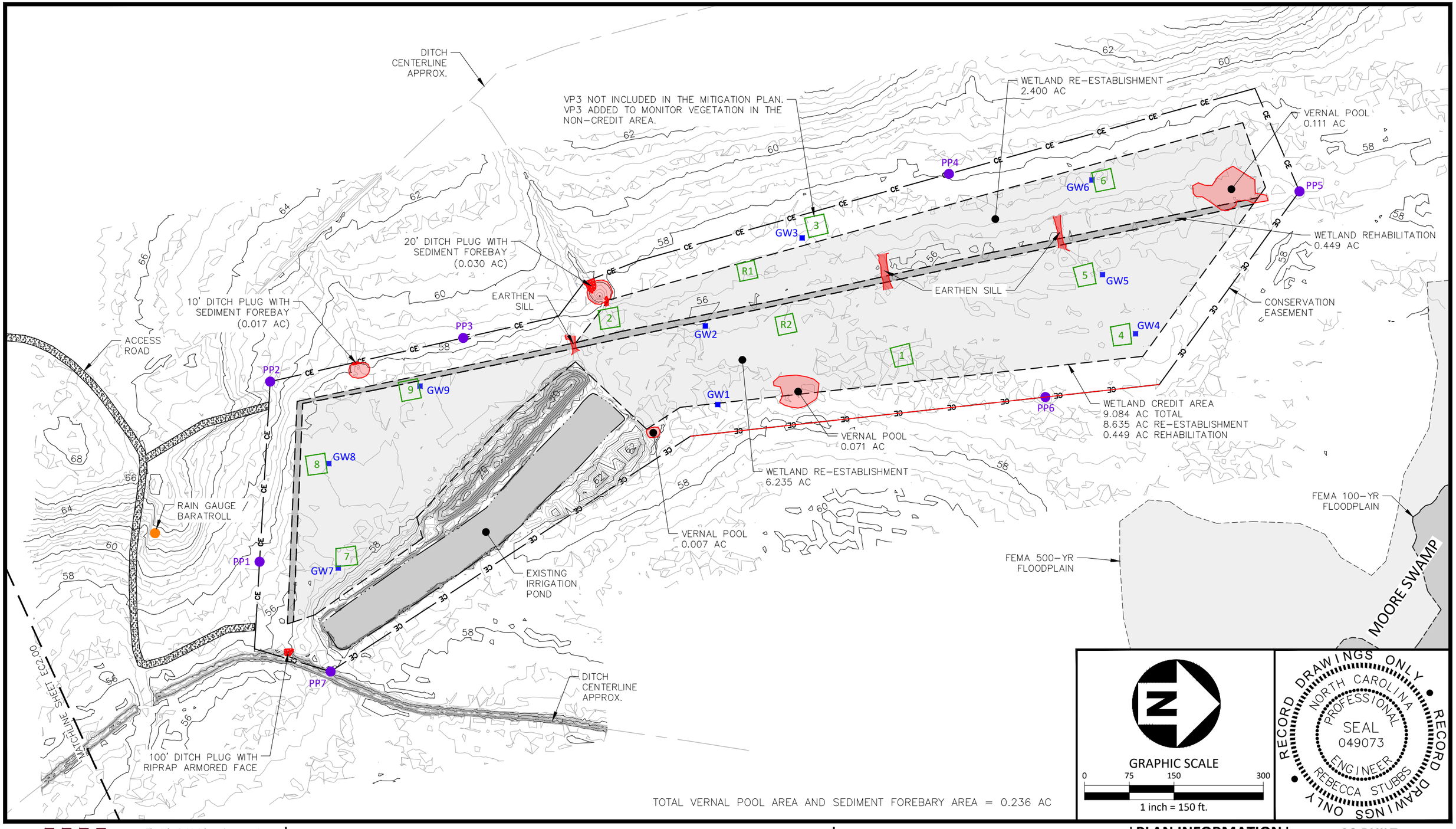
PROJECT NO.	ECT2101.02
FILENAME	ECT2101.02-EC-AB
CHECKED BY	RAS
DRAWN BY	RHW
SCALE	1" = 200'
DATE	07.05.2022

AS-BUILT
SITE ACCESS

EC2.00



TOTAL VERNAL POOL AREA AND SEDIMENT FOREBARY AREA = 0.236 AC

GRAPHIC SCALE

0 75 150 300

1 inch = 150 ft.

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PLAN INFORMATION

PROJECT NO.	ECT2101.02
FILENAME	ECT2101.02-EC-AB
CHECKED BY	RAS
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SCALE	1" = 150'
DATE	07.05.2022

AS-BUILT
MONITORING COMPONENTS

EC2.01

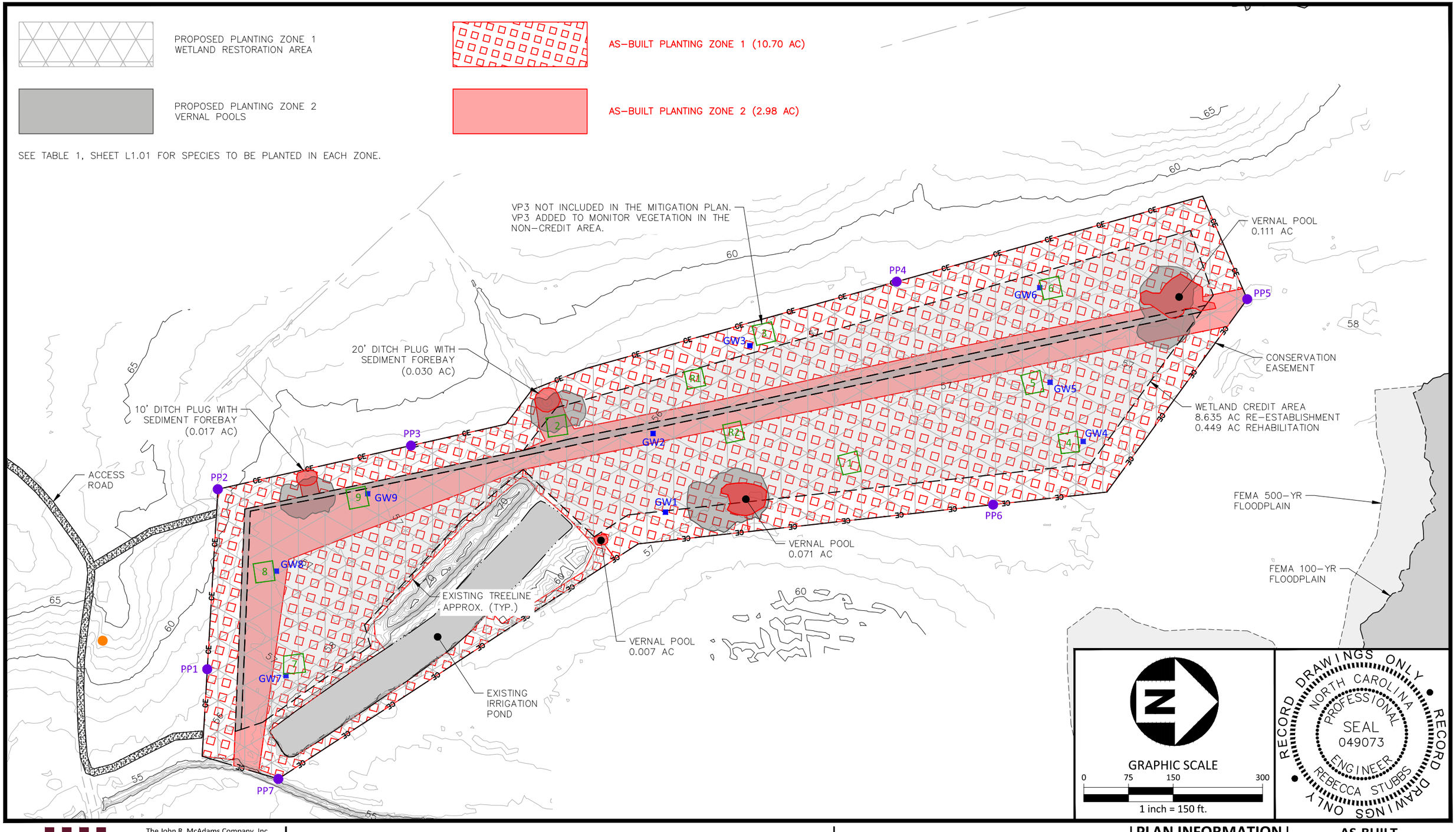
PROPOSED PLANTING ZONE 1
WETLAND RESTORATION AREA

PROPOSED PLANTING ZONE 2
VERNAL POOLS

AS-BUILT PLANTING ZONE 1 (10.70 AC)

AS-BUILT PLANTING ZONE 2 (2.98 AC)

SEE TABLE 1, SHEET L1.01 FOR SPECIES TO BE PLANTED IN EACH ZONE.



GRAPHIC SCALE
0 75 150 300
1 inch = 150 ft.

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SCALE	1" = 150'
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AS-BUILT PLANTING

L1.00

PLANTING NOTES:

1. OBTAIN APPROPRIATE BARE-ROOT SEEDLINGS (18-24") AS AVAILABLE FROM VENDOR AND MIX ACCORDING TO EACH ZONE SPECIFIED IN TABLE 1 (RIGHT).
2. MAINTAIN SEEDLING INTEGRITY WITH ON-SITE OR OFF-SITE COOLING AS NECESSARY.
3. PLANT ACCORDING TO OPTIMAL WEATHER AND SOIL MOISTURE. PLANTING SHOULD NOT BE DONE DURING FREEZING (<32F) OR HIGH WIND (>10 MPH) CONDITIONS. MECHANICAL PLANTING SHOULD NOT OCCUR WITHIN 24 HOURS OF ANTECEDENT RAINFALL OR IF SITE CONDITIONS WILL RESULT IN RUTTING AND COMPACTION FROM PLANTING EQUIPMENT. SATURATED AREAS SHOULD BE HAND-PLANTED.
4. PLANTING SHALL OCCUR WITH A MECHANICAL PLANTER OR MANUALLY WITH TREE SPADES.
5. HERBICIDING WILL BE COMPLETED BY AN NC LICENSED APPLICATOR ACCORDING TO SITE CONDITIONS. AQUATIC-SAFE HERBICIDES WILL BE USED IF NECESSARY IN THE VICINITY OF SURFACE WATERS AND DITCHES.

TABLE 1: BARE-ROOT PLANTING

Scientific Name	Common Name	Vegetative Strata	Zone	Wetland Indicator Status	%	Quantity
Quercus michauxii	Swamp chestnut oak	Canopy	1	FACW	~~10~~ 17	2000
~~*Gordonia lasianthus*~~	~~Loblolly bay~~	~~Understory~~	~~1~~	~~FACW~~	~~<5~~	
~~*Quercus pagoda*~~	~~Cherrybark oak~~	~~Canopy~~	~~1~~	~~FACW~~	~~10~~	
~~*Carpinus caroliniana*~~	~~Ironwood~~	~~Understory~~	~~1~~	~~FACW~~	~~<5~~	
Quercus phellos	Willow oak	Canopy	1	FACW	~~15~~ 8	1000
Quercus laurifolia	Laurel oak	Canopy	1	FACW	~~15~~ 4	500
Quercus nigra	Water oak	Canopy	1	FAC	~~15~~ 8	1000
~~*Nyssa biflora*~~	~~Swamp blackgum~~	~~Canopy~~	~~1~~	~~OBL~~	~~15~~	
~~*Magnolia virginiana*~~	~~Sweetbay magnolia~~	~~Understory~~	~~1~~	~~FACW~~	~~<5~~	
Ulmus americana	American elm	Canopy	1	FAC	~~<5~~ 4	500
~~*Persea palustris*~~	~~Swamp bay~~	~~Understory~~	~~1~~	~~FACW~~	~~<5~~	
Platanus occidentalis	Sycamore	Overstory	1	FACW	~~<5~~ 4	500
Taxodium distichum	Bald Cypress	Overstory	1/2	OBL	~~<5~~ 17	2000
Nyssa aquatica	Water tupelo	Overstory	2	FACW	~~<5~~ 4	500
Quercus shumardii *	Shumard oak	Overstory	1	FAC	17	2000
Fraxinus pennsylvanica *	Green ash	Overstory	1	FACW	3	300
Cephalanthus occidentalis *	Buttonbush	Understory	2	OBL	4	500
Quercus lyrata *	Overcup oak	Overstory	1/2	OBL	8	1000
					TOTAL:	11800

* Species included in the Final Mitigation Plan dated January 2022 but not included the construction drawings

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AS-BUILT
PLANTING SPECIES

L1.01