BASELINE MONITORING DOCUMENT & AS BUILT BASELINE REPORT

SLIVER MOON NON-RIPARIAN WETLAND MITIGATION SITE

CRAVEN COUNTY, NORTH CAROLINA
EEP PROJECT ID: 95017

DATA COLLECTED APRIL 9TH 2012

PREPARED FOR:

NC DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
ECOSYSTEM ENHANCEMENT PROGRAM
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Part 1 - Executive Summary

This **Baseline Monitoring Document & As-Built Baseline Report** describes the **Sliver Moon Non-Riparian Wetland Mitigation Site (Site)** and is designed specifically to assist in fulfilling North Carolina Ecosystem Enhancement Program wetland restoration goals. The Site is located approximately 4 miles east of Dover, NC in the western portion of Craven County (Figures 1 and 2) and positioned within the Core Creek Targeted Local Watershed 03020202080010 of the Neuse River Basin (8-digit HUC 03020202). Core Creek, has been assigned a Best Usage Classification of **C; NSW, Sw** and is considered biologically impaired.

The 2010 Neuse River Basin Restoration Priorities plan identified stormwater runoff and other development impacts as likely contributors to turbidity and chlorophyll violations within this TLW (Online: http://www.nceep.net/services/restplans/FINAL%20RBRP%20Neuse%2020110523.pdf). Additionally, the upper portion of the Core Creek watershed has a severely limited bioclassification due to biological impairment of water ways (*Final Neuse River Basinwide Water Quality Plan* - NCDWQ 2009). Both periodic toxic inputs from agricultural activities and inadequate macro-invertebrate habitat due to channelization and lack for hydrologic flow are listed as most likely stressors to the Core Creek system. The Sliver Moon Non-riparian Wetland Mitigation Project was identified as a non-riparian wetland restoration opportunity to improve water quality, enhance flood attenuation, and to restore wildlife habitat within the TLW. The project goals aim to address stressors identified in the TLW and include the following:

- Remove non-point sources of pollution associated with vegetation maintenance including:
  a. the cessation of broadcasting fertilizer, pesticides, and other agricultural chemicals into and adjacent to Site drainage ditches; and
  b. providing a vegetated wetland to aid in the treatment of runoff.
- Restore wetland hydro periods that satisfy wetland jurisdictional requirements and approximate the Site's natural range and variation.
- Promote floodwater attenuation by filling ditches and enhancing groundwater storage capacity.
- Restore and reestablish natural community structure, habitat diversity, and functional continuity.
- Enhance and protect the Site's full potential of wetland functions and values in perpetuity.

Physiologically, the Site is located within an interstream flat north of Core Creek and adjacent to the rim of a Carolina bay. The Site was cleared of native forest vegetation, ditched to remove groundwater hydrology, and previously to Site construction was utilized for row crop production. Detailed soil mapping conducted by licensed soil scientists in January 2011 indicate that the entire 17.1 acre Site is underlain by non-riparian hydric soils of the Torhunta and Pantego Series. In a minimally invasive approach, Site restoration included the re-introduction of hydrology and the establishment of native regional specific vegetation. With existing Site soil characteristics being nearly level and slow draining, hydrology was restored by installing low density earthen ditch plugs placed in critical areas, followed by the filling of existing perimeter and interior ditches.

Additionally, native vegetation was reintroduced based on reference forest data, existing site vegetation and characteristic Non-Riverine Wet Hardwood Forest vegetation as described in Schafale & Weakley's *Classification of Natural Communities of NC*. Planting of said vegetation occurred throughout the 17.1 acre Site. Hydrology will be monitored using nine (9) RDS Ecotone® WM Water Level Instruments for a period of (7) seven years. Vegetation monitoring will follow CVS protocol at fourteen (14) vegetation monitoring plots measuring 10 meters x 10 meters, for a period of seven years. These activities will insure the success of restoring 14 non-riparian wetland mitigation units (WMU) for the purpose of fulfilling the North Carolina Ecosystem Enhancement Program's wetland restoration goals.

Part 2 - Project Goals, Background & Attributes

2.1 Location and Setting

Located approximately 4 miles east of Dover, NC in western Craven County the Site is situated within the Carolina Flatwoods section of the Middle Atlantic Coastal Plain physiographic province of North Carolina, United State Geological Survey (USGS) HUC 03020202 (North Carolina Division of Water Quality [NCDWQ] Subbasin Number 03-04-08) of the Neuse River Basin. The Site is situated within an interstream flat north of Core Creek, Stream Index Number 27-90. Core Creek has been assigned a Best Usage Classification of **C; NSW, Sw** (NCDWQ 2010a) and the Core Creek watershed (HUC 03020202080010) was identified in the 2010 Neuse River Basin Restoration Priorities as a Targeted Local Watershed. (NCEEP 2010)

Regional physiography is characterized by flat plains on lightly dissected marine terraces; swamps, low gradient streams with sandy and silty substrates; and Carolina bays (Griffith et al. 2002). Elevations within the Site are nearly level averaging between 52 - 54 feet above sea level based on the National Geodetic Vertical Datum (USGS Cove City, NC 7.5-minute topographic quadrangle). Historically the Site has been used for row crop production and surrounding land use is primarily agricultural, with some sparse, low-density residential housing and unlogged Non-Riverine Wet Hardwood Forest. The Core Creek watershed is dominated by agricultural land, forest, pasture, and sparse residential property. Impervious surfaces account for less than 5 percent of the watershed's land surface.

2.2 Project Goals and Objectives

2.2.1 Project Goals

- Improving Water Quality
  - Removing non-point sources of pollution associated with agricultural activities, including a) eliminating the application of fertilizer, pesticides, and other agricultural materials into ditches that flow to adjacent streams and wetlands; and b) providing a vegetated wetland to aid in the treatment of pollutants such as sediment and/or agricultural pollutants from the adjacent landscape.
  - Reducing sedimentation onsite and in adjacent ditches by a) reducing ditch erosion associated with tillage and b) planting a diverse woody vegetative to reduce runoff.
- Enhancing Flood Attenuation
  - Promoting floodwater attenuation by a) removing ditches to reduce the amount of runoff that occurs during high precipitation; b) restoring wetland hydroperiods that satisfy wetland jurisdictional requirements and approximate the Site's natural range of variation; c) restoring non-riparian wetlands, resulting in increased storage capacity during precipitation events within the Site; d) re-vegetating the Site to reduce sheet flow off the Site.
- Restoring Non-riparian Habitat
  - Restore and reestablish natural community structure, habitat diversity, and functional continuity.
  - Enhance and protect the Site's full potential of wetland functions and values in perpetuity.

2.2.2 Project Objectives

The project goals will be addressed through the following project objectives:

- Providing 14 non-riparian Wetland Mitigation Units, as calculated in accordance with the requirements stipulated in RFP #16-003571. This will be accomplished by restoring 14 acres of non-riparian wetland through the eliminating of row crop

production, filling agricultural ditches, restoring historic water table elevations, redirecting ditches located near the Site to avoid possible draw down, and planting the Site with native non-riparian forest vegetation.

- Protecting the Site in perpetuity with a conservation easement.

Part 3 - Project Structure, Restoration Type & Approach

3.1 Project Structure

Traditionally, the Site resembled a Non-Riverine Wet Hardwood Forest as described in *Classification of the Natural Communities of North Carolina* (Schafale and Weakley 1990). It was only in the past 40 to 50 years that the 17.1 acre Site consisting of the non-riparian soils was cleared of hardwood vegetation, ditched and ultimately used for agricultural production. In general, the overall restoration strategy and approach was to fill and plug perimeter and interior ditches followed by planting the Site with native hardwood understory and canopy species.

Appendix A: Figure 2 – Project Components
Appendix A: Table 1 – Project Components and Mitigation Credits
Appendix A: Table 4 – Project Baseline Information & Attributes Table

3.2 Restoration Type

The 17.1 acre project consists of 14 acres of non-riparian wetland restoration, for a total for 14 non-riparian wetland mitigation units (WMUS). The composition of planted species mimicked Schafale and Weakley's *Classification of the Natural Communities of North Carolina* (1990) description of a Non-Riverine Wet Hardwood Forest, supplemented by reference and onsite species.

Appendix A: Table 5 – Planted Species

3.3 Approach:

The approach to achieving the project goal of restoring 14 non-riparian WMUS was achieved through a three part process. The first objective was to permanently divert the existing boundary ditch south of the Site (Sheet B, Appendix D). Two, 12" diameter corrugated pipes were installed at a depth of no less than 24" below grade and covered in soil to insure agricultural activities would not be affected. This work was done outside of the project conservation easement to allow the closure of the southern boundary ditch and keep the adjacent farming operation in operation.

Once the southern boundary ditch was re-routed, the second objective was re-introducing historic groundwater conditions. To do so, eight (8) low density earthen ditch plugs were installed in strategic ditch locations (Sheet B, Appendix D). All of the Site's internal ditches and all but the southeastern boundary ditches were then backfilled using existing spoil material adjacent to each ditch.

During the filling of the Site's western boundary ditch, a single 6" corrugated pipe was discovered originating from the adjacent property. The property to the west is an un-ditched and unlogged non-riverine wet hardwood forest, used primarily for hunting and as a reference forest and reference groundwater monitoring well location for this project. Upon further inspection of the pipe, it was determined its purpose was to drain surface water from the western property to the Site's boundary ditch. This pipe drained multiple small springs originating in low lying areas of the adjacent land. The natural grade of the landscape from east to west directed the surface water flow in the direction of the western ditch. In order to avoid possible hydrologic trespassing if the pipe was removed, as well as re-introducing

historical surface hydrology, a meandering shallow swale was constructed through the Site, ultimately connecting back into the remaining south-eastern ditch (Sheet B, Appendix D).

Elevations were taken of the pipe and throughout the Site to determine the path of least resistance. This approach was taken for two reasons A) to minimize the possible draw down from the swale and; B) maintain and enhance the Site's existing micro-topography, minimizing the amount of cut soil. Filling the western boundary ditch without allowing the surface hydrology to naturally flow through the Site would have undoubtedly inundated the neighbor's road and surrounding land. Ultimately, the additional surface hydrology is a bonus to the Site and will help further the success of the wetland restoration. The location where the swale was reconnected to the existing southeastern ditch is a portion of the Site's 17.1 acres that was not calculated for non-riparian wetland restoration credit. There is no concern that the swale will have any draw down affect within the 14 acres of non-riparian wetland restoration. For surety purposes, three of the nine monitoring wells were placed in specific locations to monitor any possible drawn down affect that would cause the Site to not reach hydrology success criteria (Sheet D, Appendix D).

The final objective was to re-introduce native regionally specific hardwood bare root stems. The composition of planted species mimicked Schafale and Weakley's *Classification of the Natural Communities of North Carolina* (1990) description of a Non-Riverine Wet Hardwood Forest, supplemented by reference and onsite species. The entire 17.1 acre Site was planted at a density of approximately 750 stems per acre (Sheet C, Appendix D).

Part 4 - Project History, Contacts and Attribute Data

The Site is located within the Neuse River Basin in 14-digit USGS Cataloging Unit and Targeted Local Watershed 03020202080010 of the South Atlantic/Gulf Region (NCDWQ sub-basin number 03-04-08). The Site is located within an inter-stream flat adjacent to the rim of a Carolina bay. The inter-stream flat lies between two stream systems, Core Creek to the south which has been assigned Stream Index Number 27-90 and Mill Branch to the North which has been assigned Stream Index Number 27-90-2. Both stream systems have been assigned a Best Usage Classification of C; NSW, Sw (NCDWQ 2010a). Based on county soil survey mapping (USDA 1989) and confirmed by a licensed soil scientist from Axiom Environmental, the Site contains two soil series: Torhunta fine sandy loam (*Typic humaquepts*) and Pantego fine sandy loam (*Umbric Paleaquults*). Soils have been impacted by land clearing, ditching, and till from row plant production.

Appendix A: Table 2 - Project Activity & Reporting History
Appendix A: Table 3 - Project Contact
Appendix A: Table 4 - Project Baseline Information & Attributes Table

Part 5 - Success Criteria

5.1 Hydrology Success Criteria

Located within an interstream-flat, the Site's hydrology is precipitation driven and thus, subject to drought periods during the growing season. Based on the Sites location and hydrology source, target hydrological characteristics include saturation or inundation for 7.5 percent of the growing season at a minimum of 12 inches below ground level during average conditions for a period of seven (7) years. During growing seasons with atypical climatic conditions, groundwater gauges in reference wetlands may be used by the USACE/NCIRT to evaluate hydrology success.

5.2 Vegetation Success Criteria

Success criteria have been established to verify that the vegetation component supports community elements necessary for forest development. Success of vegetation criteria at the Site indicates successful restoration of non-riparian habitat within and adjacent to aquatic wetland resources as well as improvement of overall water quality resulting from the treatment of runoff from agriculture fields.

Success criteria are dependent upon the density and growth of living, planted stems throughout the planted areas of the Site including Non-riverine Wet Hardwood Flat community. The presence of desirable volunteer species will also be considered by the USACE/NCIRT in making a determination whether the Site has successfully met the stated goals and objectives. An average density of 320 stems per acre of living, planted stems must be surviving in the first three monitoring years. Subsequently, 260 living, planted stems per acre must be surviving in year 5 and 210 living, planted stems per acre in year 7.

Part 6 - Monitoring Plan

Monitoring of restoration efforts will be performed for a minimum of 7 years or until success criteria are fulfilled. The detailed monitoring plan is depicted in As-Built Sheet D, Appendix C.

6.1 Hydrology

Measurement of wetland hydrology will be performed in accordance with traditional methods as per the April 2003 USACE Wilmington District Stream Mitigation Guidelines. Nine (9) continuously recording, surficial monitoring gauges were installed within the 14 acres of restoration in accordance with specifications in *Installing Monitoring Wells/Piezometers in Wetlands* (NCWRP 1993); in addition one (1) reference gauge (Sheet D, Appendix C) was installed. Monitoring gauges were set to a depth no shallower than 24 inches below the soil surface. Screened portions of each gauge were surrounded by filter fabric, buried in screened well sand, and sealed with a bentonite cap to prevent siltation and surface flow infiltration during floods. Data will be downloaded at least every 30 days during the growing season.

Hydrological sampling will be performed in restoration and reference areas during the growing season. The growing season will primarily be determined by the USDA Soil Survey of Craven County, North Carolina. In abnormally seasonable years the growing season may be based on the USACE Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coasts Plain Region 2010. Which states:

> *The growing season has begun on a site in a given year when two or more different non-evergreen vascular plant species growing in the wetland or surrounding areas exhibit one or more of the following indicators of biological activity:*
>
> *a. Emergence of herbaceous plants from the ground*
> *b. Appearance of new growth from vegetative crowns (e.g., in graminoids, bulbs, and corms)*
> *c. Coleoptile/cotyledon emergence from seed*
> *d. Bud burst on woody plants (i.e., some green foliage is visible between spreading bud scales)*
> *1. Emergence or elongation of leaves of woody plants*
> *f. Emergence or opening of flowers*
>
> *The end of the growing season is indicated when woody deciduous species lose their leaves and/or the last herbaceous plants cease flowering and their leaves*

become dry or brown, generally in the fall due to cold temperatures or reduced moisture availability. Early plant senescence due to the initiation of the summer dry season in some areas does not necessarily indicate the end of the growing season and alternative procedures (e.g., soil temperature) should be used.

6.2 Vegetation

The monitoring of planted vegetation will follow the Carolina Vegetation Survey (CVS) EEP Protocol for Recording Vegetation (Lee et al. 2006) between June 1 and September 30 until the vegetation success criteria are achieved. Fourteen (14), 10 by 10-meter vegetation plots have been placed within the 14 acres of restored wetlands (Sheet D, Appendix C). Vegetation will receive a visual evaluation on a periodic basis to ascertain the degree of overtopping of planted elements by nuisance species.

Part 7 - Maintenance and Contingency Plans

7.1 Hydrologic Contingency

Hydrologic contingency may include soil surface modifications such as re-directing surface water from the groundwater springs or the installation of additional ditch plugs. Recommendations for contingency to establish wetland hydrology may be implemented and monitored until Hydrology Success Criteria is achieved.

7.2 Vegetation Contingency

If vegetation success criteria are not achieved based on average density calculations from combined plots over the entire restoration area, supplemental planting may be performed with tree species approved by regulatory agencies. Supplemental planting may be performed as needed until achievement of vegetation success criteria.

Part 8 - References

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1.United States Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.

Griffith, G.E., J.M. Omernik, J.A. Comstock, M.P. Schafale, W.H. McNab, D.R. Lenat, T.F. MacPherson, J.B. Glover, and V.B. Shelbourne. 2002. Ecoregions of North Carolina and South Carolina. U.S. Geological Survey, Reston, Virginia.

Lee, M.T., R.K. Peet, S.D. Roberts, and T.R. Wentworth. 2006. CVS-EEP Protocol for Recording Vegetation. Version 4.0.North Carolina Department of Environment and Natural Resources, Ecosystem Enhancement Program. Raleigh, North Carolina.

North Carolina Wetlands Restoration Program (NCWRP). 1993. Installing Monitoring Wells/Piezometers in Wetlands (WRP Technical Note HY-IA-3.1). North Carolina Department of Environment, Health, and Natural Resources, Raleigh, North Carolina

North Carolina Ecosystem Enhancement Program (NCEEP). 2010. Neuse River Basin Restoration Priorities (online). Available: http://www.nceep.net/services/restplans/FINAL%20RBRP%20Neuse%2020110523.pdf [October 31, 2011]. North Carolina Department of Environment and Natural Resources, Raleigh, North Carolina.

Schafale, M.P. and A.S. Weakley. 1990. Classification of the Natural Communities of North Carolina: Third Approximation. North Carolina Natural Heritage Program, Division of Parks and Recreation, N.C. Department of Environment, Health, and Natural Resources. Raleigh, North Carolina.

US Army Corps of Engineers (USACE). 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantis and Golf Coasts Plain Regional 2010 (online). Available: http://www.usace.army.mil/CECW/Documents/cecwo/reg/AGCP_regsupV2.pdf [April, 2011] USACE**,** Wetlands Regulatory Assistance Program.

Appendix A: General Figures and Tables

Table 1. Project Components and Mitigation Credits

Sliver Moon Non-Riparian Wetland Mitigation Site, Craven County, EEP Project ID: 95017

Mitigation Credits									
	Stream		Riparian Wetland		Non-riparian Wetland		Buffer	Nitrogen Nutrient Offset	Phosphorous Nutrient Offset
Type	R	RE	R	RE	R	RE			
Totals					14				
Project Components									
Project Component -or- Reach ID	Stationing/Location		Existing Footage/Acreage		Approach (PI,PII etc.)		Restoration – or- Restoration Equivalent	Restoration Footage or Acreage	Mitigation Ratio
Non-riparian restoration	NA		17.01		NA		Restoration	14	1:1
Component Summation									
Restoration Level	Stream (linear feet)		Riparian Wetland (acres)		Non-riparian Wetland (acres)		Buffer (square feet)	Upland (acres)	
			Riverine	Non-Riverine					
Restoration	0		0	0	14		0	0	
Enhancement			0	0	0		0	0	
Enhancement 1	0								
Enhancement II	0								
Creation			0	0	0				
Preservation	0		0	0	0			0	
High Quality Preservation	0		0	0	0			0	

Table 2: Project Activity and Reporting History

Sliver Moon Non-Riparian Wetland Mitigation Site, Craven County, EEP Project ID: 95017

Activity or Report	Data Collection Complete	Completion or Delivery
CE Document	NA	October - 2011
Conservation Easement	NA	February - 2012
Mitigation Plan	NA	February - 2012
Construction	NA	March - 2012
Bare Root Planting	NA	March - 2012
Baseline Monitoring Document	April-2012	In Progress

Table 3: Project Contact Table

Sliver Moon Non-Riparian Wetland Mitigation Site, Craven County, EEP Project ID: 95017

	Firm	POC & Address
Designer:	Restoration Systems, LLC with preliminary consulting by: Axiom Environmental, Inc.	Axiom: Grant Lewis; 919.215.1693 218 Snow Ave. Raleigh, NC 27603
Construction Contractor:	Land Mechanics, Inc.	Lloyd Glover; 919.422.3392 780 Landmark Road Willow Spring, NC 27592-7756
Planting Contractor:	Carolina Silvics	Dwight McKinney 252.482.8491 908 Indian Trail Road Edenton, NC 27932
Seeding Contractor:	Land Mechanics, Inc.	Lloyd Glover; 919.422.3392 780 Landmark Road Willow Spring, NC 27592-7756
Nursery Stock Suppliers:	ArborGen	1.888.888.7158
Baseline Data Collection	Restoration Systems, LLC	Ray Holz; 919.604.9314 1101 Haynes St. Raleigh, NC 27604
Vegetation Monitoring:	Restoration Systems, LLC	Ray Holz; 919.604.9314 1101 Haynes St. Raleigh, NC 27604
Wetland Monitoring:	Restoration Systems, LLC	Ray Holz; 919.604.9314 1101 Haynes St. Raleigh, NC 27604

Table 4: Project Baseline Information & Attributes Table

Sliver Moon Non-Riparian Wetland Mitigation Site, Craven County, EEP Project ID: 95017

Project Information			
Project Name	Sliver Moon		
County	Craven		
Project Area (acres)	17.01		
Project Coordinates (latitude and longitude)	35.204817, -77.360605 (NAD 83/WGS 84)		
Project Watershed Summary Information			
Physiographic Province		Carolina Flatwoods section of the Middle Atlantic Coastal Plain	
River Basin		Neuse	
USGS Hydrologic Unit 8-digit	03020202	USGS Hydrologic Unit 14-digit	03020202080010
DWQ Sub-basin		03-04-08	
Project Drainage Area, Total Outfall (acres)		+/- 130	
Groundwater Treated by Site (acres)		+/- 20	
Project Drainage Area Percentage of Impervious Area		< 1%	
CGIA Land Use Classification		Cropland and Pasture	
Wetland Summary Information			
Parameters		**Wetland 1**	
Size of Wetland (acres)		14.00	
Wetland Type (non-riparian, riparian riverine or riparian non riverine)		Non-riparian	
Mapped Soil Series		Torhunta & Pantego	
Drainage class		Poorly Drained	
Soil Hydric Status		Class A	
Source of Hydrology		Rain Events	
Hydrologic Impairment		Ditches	
Native vegetation community		Non-Riverine Wet Harwood Forest	
Percent composition of exotic invasive vegetation		0%	
Regulatory Considerations			
Regulation	**Applicable?**	**Resolved?**	**Supporting Documentation**
Waters of the United States – Section 404	Yes	Yes	Appendix D
Waters of the United States – Section 401	Yes	Yes	Appendix D
Endangered Species Act	No		
Historic Preservation Act	No		
Coastal Zone Management Act [CZMA/Coastal Area Management Act (CAMA)]	No		
FEMA Floodplain Compliance	No		
Essential Fisheries Habitat	No		
Sediment & Erosion Control Plan (S&EC)	Yes	Yes	Appendix D

Table 5: Reference Vegetation Species

Sliver Moon Non-Riparian Wetland Mitigation Site, Craven County, EEP Project ID: 95017

Canopy Species	Understory Species
cherrybark oak (*Quercus pagota*)	wax myrtle (*Myrica cerifera*)
laurel oak (*Quercus laurifolia*)	sweet bay (*Magnolia virginiana*)
loblolly pine (*Pinus taeda*)	red bay (*Peresa borbonia*)
water oak (*Quercus nigra*)	
tulip poplar(*Liriodendron tulipifera*)	
swamp chestnut oak (*Quercus michauxii*)	
willow oak (*Quercus phellos*)	
black gum (*Nyssa sylvatica*)	

Table 6: Planted Tree Species

Sliver Moon Non-Riparian Wetland Mitigation Site, Craven County, EEP Project ID: 95017

Vegetation Association: A nonriverine wet hardwood forest Area: 17.1 acres planted		
Canopy Species	**Total Number Planted**	**Percentage of Total**
Black Gum (*Nyssa sylvatica*)	1500	11.72%
Cherry Bark Oak (*Quercus pagoda*)	1500	11.72%
Laurel Oak (*Quercus laurifolia*)	1200	9.375%
Swamp Chestnut Oak (*Quercus michauxii*)	1200	9.375%
Yellow poplar (*Liriodendron tulipifera*)	1200	9.375%
Willow Oak (*Quercus phellos*)	1400	10.93%
Water Oak (*Quercus nigra*)	1200	9.375%
Understory Species	**Total Number Planted**	**Percentage of Total**
Swamp Red Bay (*Persea palustris*)	1200	9.375%
Sweet bay Magnolia (*Magnolia virginiana*)	1200	9.375%
Wax Myrtle (*Morella cerifera*)	1200	9.375%
Totals:	12,800	100.00%

Appendix B: Baseline Vegetation Data, Plot Photos

Table 7. Baseline Vegetation

Vegetation Plot Photos 1-14

Table 7: Baseline Vegetation Table

Sliver Moon Non-Riparian Wetland Mitigation Site, Craven County, EEP Project ID: 95017

Living planted stems, excluding live stakes, per acre: Negative (red) numbers indicate the project failed to reach requirements in a particular year.

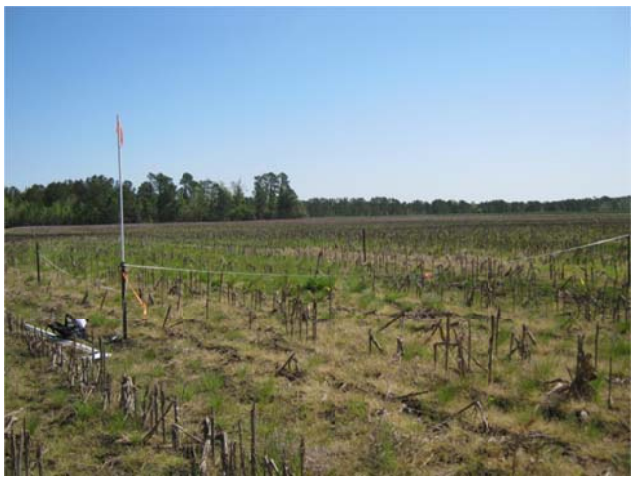
Project Code	Project Name	River Basin	Year 0 (baseline)
Sliver M	Sliver Moon Non-riparian Wetland Mitigation Site	Neuse 01	644.61

	Species	CommonName	Total Planted Stems	# plots	avg# stems	plot Sliver M-RS-0001	plot Sliver M-RS-0002	plot Sliver M-RS-0003	plot Sliver M-RS-0004	plot Sliver M-RS-0005	plot Sliver M-RS-0006	plot Sliver M-RS-0007	plot Sliver M-RS-0008	plot Sliver M-RS-0009	plot Sliver M-RS-0010	plot Sliver M-RS-0011	plot Sliver M-RS-0012	plot Sliver M-RS-0013	plot Sliver M-RS-0014
	Liriodendron tulipifera	tuliptree	27	12	2.3	2	2	1	2	3	5	1	1	1	5			2	2
	Magnolia virginiana	sweetbay	18	9	2		2		1			3	1	2	2	1	3		3
	Nyssa sylvatica	blackgum	20	11	1.8		1	2	2	1	2		4	2	1	1		1	3
	Persea palustris	swamp bay	9	6	1.5	2	2	1					1	1		2			
	Quercus laurifolia	laurel oak	32	12	2.7	1	2	3	3	3	1		1	2	2	5		5	4
	Quercus michauxii	swamp chestnut oak	29	11	2.6	5		2	2	1	1	7	2	2	2	2	3		
	Quercus nigra	water oak	28	10	2.8	4		1			3	1	3	7		1	2	4	2
	Quercus pagoda	cherrybark oak	32	10	3.2	4	4	5	4	3	2		1				1	6	2
	Quercus phellos	willow oak	28	11	2.6			1	3	6	2	2	1	2	3	3	4	1	
TOT:	**9**	**9**	**223**	**9**		**18**	**13**	**16**	**17**	**17**	**16**	**14**	**15**	**19**	**15**	**15**	**13**	**19**	**16**

Vegetation Plot 1

Vegetation Plot 2

Vegetation Plot 3



Vegetation Plot 4

Vegetation Plot 5

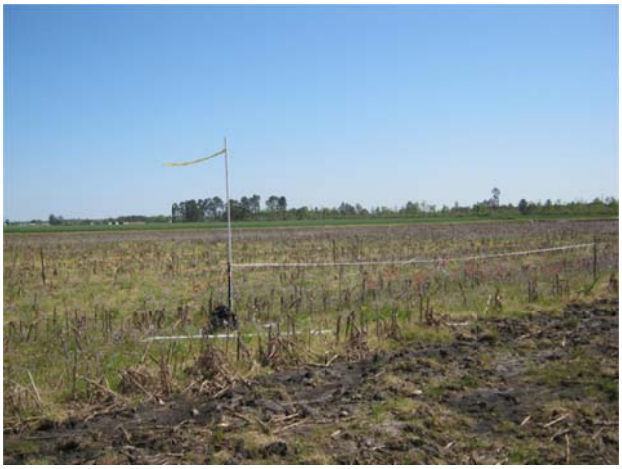
Vegetation Plot 6

Vegetation Plot 7

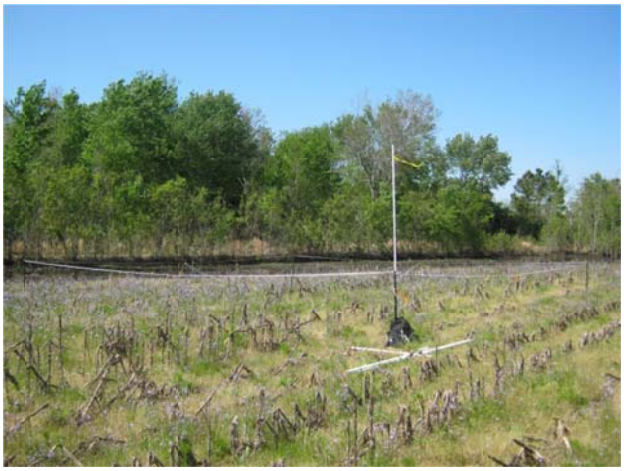
Vegetation Plot 8

Vegetation Plot 9

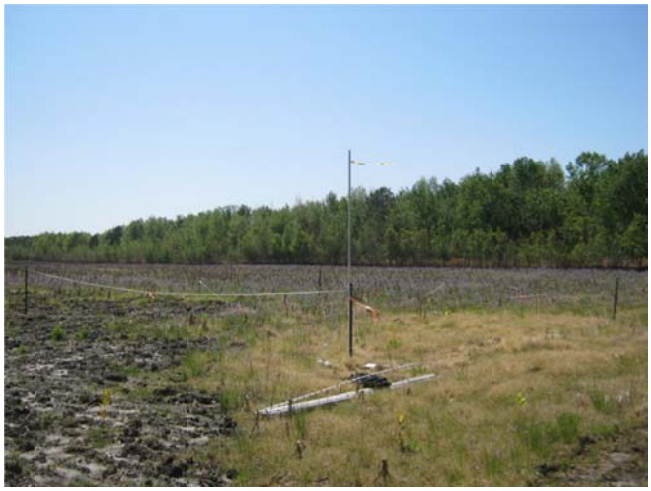
Vegetation Plot 10



Vegetation Plot 11



Vegetation Plot 12



Vegetation Plot 13

Vegetation Plot 14

Appendix C: As-Built Plan Sheets

Sheet A. Title Page
Sheet B. Construction
Sheet C. Planting
Sheet D. Monitoring
Construction Photos

SLIVER MOON
NON-RIPARIAN WETLAND MITIGATION SITE
AS-BUILT PLAN SHEETS

CRAVEN COUNTY, NORTH CAROLINA

PROJECT DESCRIPTION

The Sliver Moon Non-Riparian Wetland Mitigation Site (Site) is designed specifically to assist in fulfilling the North Carolina Ecosystem Enhancement Program wetland restoration goals. The Site is located approximately 4 miles east of Dover in western Craven County and within the Targeted Local Watershed 03020202080010. The Site encompasses approximately 17.1 acres of land used for row crop production. Within the Site, 17.1 acres of non-riparian hydric soils have been cleared and ditched. 14 non-riparian wetland mitigation units(WMUs) are being offered. Located within an interstream flat north of Core Creek and adjacent to the rim of a Carolina bay the Site has been cleared of native forest vegetation, ditched to remove groundwater hydrology, and is currently utilized for row crop production.

Construction activities at the site will re-elevate the groundwater table to historic conditions prior to the ditching of the Site. Construction methods were based primarily on a carbon copy method for wetland restoration, mimicking reference (relatively undisturbed) wetlands in the region. The project is designed to maximize groundwater re-charge and water quality benefits in the Neuse River Basin.

PROJECT LOCATION

Directions From the City of Kinston
- Head southeast on US 70 Byp for 7.2 miles
- Turn left at SR 1005/Dover Road
- Continue onto Old US Hwy 70 for 0.3 miles
- Continue onto W Kornegay St for 1.3 miles
- Continue onto Old US Hwy 70 for 3.7 miles
- Turn left at Daisy Ln

Type of Work: Wetland Restoration
- Ditch Clearing
- Ditch Filling
- Site Grading
- Site Planting

Index of Sheets
- A: Title Page
- B: Construction
- C: Planting
- D: Monitoring

Firm Name & POC
Raymond Holz - 919.334.9122
1101 haynes Street, Suite 211
Raleigh, NC 27604

RESTORATION SYSTEMS, LLC
1101 HAYNES ST, SUITE 211
RALEIGH, NC 27604
PHONE : 919.755.9490
FAX : 919.755.9492

SCALE: 1 in = 12,500 ft
DATE: MAY - 2012
PROJECT: SM

SHEET A: TITLE PAGE

Sliver Moon Non-Riparian Wetland Mitigation Site
RFP # 16-003571 EEP Project ID 95017
Contract # 003985 SPO # 25-AM
Craven County, North Carolina

COORDINATE SYSTEM: NAD 1983 NC FEET

RESTORATION SYSTEMS, LLC
1101 HAYNES ST, SUITE 211
RALEIGH, NC 27604
PHONE : 919.755.9490
FAX : 919.755.9492

SCALE: 1 in = 250 ft
DATE: MAY - 2012
PROJECT: SM

SHEET B: CONSTRUCTION PLAN

Sliver Moon Non-Riparian Wetland Mitigation Site
RFP # 16-003571 EEP Project ID 95017
Contract # 003985 SPO # 25-AM
Craven County, North Carolina

Aerial Imagery (c) 2010 Microsoft Corporation
COORDINATE SYSTEM: NAD 1983 NC FEET

Table 6: Planted Tree Species

Sliver Moon Non-Riparian Wetland Mitigation Site, Craven County, EEP Project ID: 95017

Vegetation Association: A nonriverine wet hardwood forest	Area: 17.1 acres planted	
Canopy Species	**Total Number Planted**	**Percentage of Total**
Black Gum (*Nyssa sylvatica*)	1500	11.72%
Cherry Bark Oak (*Quercus pagoda*)	1500	11.72%
Laurel Oak (*Quercus laurifolia*)	1200	9.375%
Swamp Chestnut Oak (*Quercus michauxii*)	1200	9.375%
Yellow poplar (*Liriodendron tulipifera*)	1200	9.375%
Willow Oak (*Quercus phellos*)	1400	10.93%
Water Oak (*Quercus nigra*)	1200	9.375%
Understory Species	**Total Number Planted**	**Percentage of Total**
Swamp Red Bay (*Persea palustris*)	1200	9.375%
Sweet bay Magnolia (*Magnolia virginiana*)	1200	9.375%
Wax Myrtle (*Morella cerifera*)	1200	9.375%
Totals:	12,800	100.00%

RESTORATION SYSTEMS, LLC
1101 HAYNES ST, SUITE 211
RALEIGH, NC 27604
PHONE : 919.755.9490
FAX : 919.755.9492

SCALE: 1 in = 250 ft

DATE: MAY - 2012

PROJECT: SM

SHEET C: PLANTING PLAN

Sliver Moon Easement Boundary

Planted Area - 17.1 acres

Sliver Moon Non-Riparian Wetland Mitigation Site
RFP # 16-003571 EEP Project ID 95017
Contract # 003985 SPO # 25-AM
Craven County, North Carolina

Aerial Imagery (c) 2010 Microsoft Corporation
COORDINATE SYSTEM: NAD 1983 NC FEET

RESTORATION SYSTEMS, LLC
1101 HAYNES ST, SUITE 211
RALEIGH, NC 27604
PHONE : 919.755.9490
FAX : 919.755.9492

SCALE: 1 in = 250 ft
DATE: MAY - 2012
PROJECT: SM

SHEET D: MONITORING PLAN

Sliver Moon Non-Riparian Wetland Mitigation Site
RFP # 16-003571 EEP Project ID 95017
Contract # 003985 SPO # 25-AM
Craven County, North Carolina

COORDINATE SYSTEM: NAD 1983 NC FEET

Construction Staging Area

Pipe Layout

Pipe Outlet, Rip-Rap Headwall

Pipe Install

Eastern Boundary – 2 days after construction

Northern Boundary – 2 days after construction

Vegetation Plot 5

Vegetation Plot 6

South East Corner & Surface Hydrology Outfall

Surface Hydrology Outfall & Eastern Boundary

Appendix D: Permits

401
404
Sediment and Erosion Control

U.S. ARMY CORPS OF ENGINEERS
WILMINGTON DISTRICT

Action ID: **SAW-2012-00096** County: **Craven** USGS Quad: **Cove City**

GENERAL PERMIT (REGIONAL AND NATIONWIDE) VERIFICATION

Owner/Applicant: **North Carolina Ecosystem Enhancement Program**
Attn: Mr. Wyatt Brown
Address: **1652 Mail Service Center**
Raleigh, NC 27699-1652 Telephone No.: **(919) 715-1616**

Authorized Agent: **Restoration Systems, LLC**
Attn: Mr. Worth Creech
Address: **1101 Haynes Street, Suite 211**
Raleigh, NC 27604 Telephone No.: **(919) 755-9490**

Size and location of property (waterbody, road name/number, town, etc.): **The project (Sliver Moon Wetland Restoration Site) is located west of Daisy Lane, 0.5 mile north of Old US Hwy 70, in Craven County, NC.**

Site Coordinates: **35.2048 °N -77.3606 °W** Waterway: **Core Creek** River Basin: **Neuse**

Description of project area and activity: **This permit authorizes excavation, mechanized land clearing, and the placement of fill material associated with the construction of Sliver Moon Wetland Restoration Project. Authorized impacts to waters of the U.S. are identified on the table on page 2 of this authorization.**

Applicable Law: ☒ Section 404 (Clean Water Act, 33 USC 1344)
☐ Section 10 (Rivers and Harbors Act, 33 USC 403)
Authorization: Nationwide or Regional General Permit Number(s): **27**

SEE ATTACHED NATIONWIDE CONDITIONS AND SPECIAL CONDITIONS ON PAGE 2 OF THIS FORM

Your work is authorized by the above referenced permit provided it is accomplished in strict accordance with the attached conditions and your submitted application and attached information dated February 16, 2012. Any violation of the attached conditions or deviation from your submitted plans may subject the permittee to a stop work order, a restoration order and/or appropriate legal action.

- This verification is valid until the NWP is modified, reissued, or revoked. All of the existing NWPs are scheduled to be modified, reissued, or revoked prior to March 18, 2012. It is incumbent upon you to remain informed of changes to the NWPs. We will issue a public notice when the NWPs are reissued. Furthermore, if you commence or are under contract to commence this activity before the date that the relevant nationwide permit is modified or revoked, you will have twelve (12) months from the date of the modification or revocation of the NWP to complete the activity under the present terms and conditions of this nationwide permit.
- Activities subject to Section 404 (as indicated above) may also require an individual Section 401 Water Quality Certification. You should contact the NC Division of Water Quality (telephone (919) 733-1786) to determine Section 401 requirements.
- For activities occurring within the twenty coastal counties subject to regulation under the Coastal Area Management Act (CAMA), prior to beginning work you must contact the N.C. Division of Coastal Management.
- This Department of the Army verification does not relieve the permittee of the responsibility to obtain any other required Federal, State or local approvals/permits.
- If there are any questions regarding this verification, any of the conditions of the Permit, or the Corps of Engineers regulatory program, please contact Todd Tugwell at telephone (919) 846-2564.

Corps Regulatory Official: Todd J Tugwell Digitally signed by TUGWELL.TODD.JASON.1048429293 Date: 2012.02.27 09:14:16 -05'00'

Date: **February 27, 2012** Expiration Date of Nationwide Permit Verification: **March 18, 2012**

Summary of Authorized Impacts and Required Mitigation

NWP / GP #	Open Water (ac)		Wetland (ac)		Unimportant Steam (lf)		Important Stream (lf)	
	Temporary	Permanent	Temporary	Permanent	Temporary	Permanent	Temporary	Permanent
27	**0**	**0**	**0.21**	**0**	**0**	**0**	**0**	**0**
Impact Totals	**0**	**0**	**0.21**	**0**	**0**	**0**	**0**	**0**

Total Loss of Waters of the U.S. (ac)	**0**	Total Loss of Waters of the U.S. (lf)	**0**
Required Wetland Mitigation (ac)	**0**	Required Stream Mitigation (lf)	**0**

Additional Remarks and/or Special Permit Conditions:
The following special conditions apply:

1. This Nationwide Permit verification does not imply approval of the suitability of this property for compensatory wetland mitigation for any particular project. The use of any portion of this site as compensatory mitigation for a particular project will be determined during our public interest review and 404 (b) (1) Guidelines analysis during the permit review process for that project.

Copy Furnished:

The Wilmington District is committed to providing the highest level of support to the public. To help us ensure we continue to do so, please complete the Customer Satisfaction Survey located at our website at http://regulatory.usacesurvey.com/ to complete the survey online.

Determination of Jurisdiction

A. ☒ Based on preliminary information, there appear to be waters of the US including wetlands within the above described project area. This preliminary determination is not an appealable action under the Regulatory Program Administrative Appeal Process (Reference 33 CFR Part 331).

B. ☐ There are Navigable Waters of the United States within the above described project area subject to the permit requirements of Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

C. ☐ There are waters of the US and/or wetlands within the above described project area subject to the permit requirements of Section 404 of the Clean Water Act (CWA)(33 USC § 1344). Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

D. ☐ The jurisdictional areas within the above described project area have been identified under a previous action. Please reference the jurisdictional determination issued on (Action ID:).

Basis of Jurisdictional Determination: Wetlands within this project abut and drain directly to Core Creek, a Relatively Permanent Water, which in turn drains to the Neuse River, a Traditionally Navigable Waterway.

E. Attention USDA Program Participants: This delineation/determination has been conducted to identify the limits of Corps' Clean Water Act jurisdiction for the particular site identified in this request. The delineation/determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985. If you or your tenant are USDA Program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service, prior to starting work.

F. Appeals Information (This information applies only to approved jurisdictional determinations as indicated in B and C above): This correspondence constitutes an approved jurisdictional determination for the above described site. If you object to this determination, you may request an administrative appeal under Corps regulations at 33 CFR Part 331. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet and request for appeal (RFA) form. If you request to appeal this determination you must submit a completed RFA form to the following address:

US Army Corps of Engineers
South Atlantic Division
Attn: Jason Steele, Review Officer
60 Forsyth Street SW, Room 10M15
Atlanta, Georgia 30303-8801
Phone: (404) 562-5137

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete; that it meets the criteria for appeal under 33 CFR part 331.5, and that it has been received by the Division Office within 60 days of the date of the NAP. Should you decide to submit an RFA form, it must be received at the above address by . **It is not necessary to submit an RFA form to the District Office if you do not object to the determination in this correspondence.**

Corps Regulatory Official: Digitally signed by TUGWELL.TODD.JASON.1048429293 Date: 2012.02.27 09:13:58 -05'00'

Date: **February 27, 2012** Expiration Date of Jurisdictional Determination: **February 27, 2017**

WILMINGTON DISTRICT
POST-CONSTRUCTION COMPLIANCE FORM

Action ID Number: **SAW-2012-00096** County: **Craven**

Permittee: **North Carolina Ecosystem Enhancement Program** **Attn: Mr. Wyatt Brown**

Date Permit Issued: **February 27, 2012**

Project Manager: **Todd Tugwell**

Upon completion of the activity authorized by this permit and any mitigation required by the permit, sign this certification and return it to the address of the Regulatory Field Office indicated below:

☐ Asheville Regulatory Field Office
US Army Corps of Engineers
151 Patton Avenue, Room 208
Asheville, North Carolina 28801-5006

☒ Washington Regulatory Field Office
US Army Corps of Engineers
2407 West Fifth Street
Washington, NC 27889

☐ Raleigh Regulatory Field Office
US Army Corps of Engineers
3331 Heritage Trade Drive, Suite 105
Wake Forest, North Carolina 27587

☐ Wilmington Regulatory Field Office
US Army Corps of Engineers
69 Darlington Avenue
Wilmington, NC 28403

Please note that your permitted activity is subject to a compliance inspection by a U. S. Army Corps of Engineers representative. If you fail to comply with this permit you are subject to permit suspension, modification, or revocation.

I hereby certify that the work authorized by the above referenced permit has been completed in accordance with the terms and condition of the said permit, and required mitigation was completed in accordance with the permit conditions.

_____ _____

Signature of Permittee **Date**

NCDENR
North Carolina Department of Environment and Natural Resources
Division of Water Quality

Beverly Eaves Perdue
Governor

Charles Wakild, P. E.
Director

Dee Freeman
Secretary

March 13, 2012

DWQ Express Project # 11-1108
Craven County

NCEEP
Mr. Wyatt Brown
2728 Capital Blvd. Suite 1H 103
Raleigh, NC 27604

Subject Property: Sliver Moon Wetland Mitigation Site
Neuse River Basin, Core Creek (NEU 08, 27-90; NSW, C, Sw)

Approval of 401 Water Quality Certification with Additional Conditions, Express Review

Dear Mr. Brown:

You have our approval, in accordance with the attached conditions and those listed below, to place fill within or otherwise impact 0.21 acres of 404 wetlands for the purpose of conversion agriculture field into 14 acre wetland mitigation site as described within your application dated February 16, 2012 and received by the N.C. Division of Water Quality (DWQ) on March 12, 2012. After reviewing your application, the proposed impacts are covered by General Water Quality Certification Number(s) 3689 (GC3689). The Certification(s) allows you to use Nationwide Permit(s) 27 when issued by the US Army Corps of Engineers (USACE). In addition, you should obtain or otherwise comply with any other required federal, state or local permits before you go ahead with your project including (but not limited to) Erosion and Sediment Control, Non-discharge regulations. **Also, this approval to proceed with your proposed impacts or to conduct impacts to waters as depicted in your application shall expire upon expiration of the 404 or CAMA Permit.**

This approval is for the purpose and design that you described in your application. If you change your project, you must notify us and you may be required to send us a new application. If the property is sold, the new owner must be given a copy of this Certification and approval letter and is thereby responsible for complying with all conditions. If total fills for this project (now or in the future) exceed one acre of wetland or 150 linear feet of stream, compensatory mitigation may be required as described in 15A NCAC 2H .0506 (h). **This approval requires you to follow the conditions listed in the attached certification and any additional conditions listed below.**

The Additional Conditions of the Certification are:

North Carolina Division of Water Quality
943 Washington Square Mall
Washington, NC 27889

Internet: www.ncwaterquality.org
Phone: 252-946-6481
FAX 252-946-9215

1. Impacts Approved

The following impacts are hereby approved as long as all of the other specific and general conditions of this Certification (or Isolated Wetland Permit) are met. **No other impacts are approved including incidental impacts:**

	Amount Approved (Units)	Plan Location or Reference
Stream	(feet)	
404/CAMA Wetlands	0.21 (acres) fill	Figure C:Mitigation Plan
Waters	(acres)	
Buffers	(square ft.)	

2. Erosion & Sediment Control Practices

Erosion and sediment control practices must be in full compliance with all specifications governing the proper design, installation and operation and maintenance of such Best Management Practices in order to protect surface waters standards:

a. The erosion and sediment control measures for the project must be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Sediment and Erosion Control Planning and Design Manual.*
b. The design, installation, operation, and maintenance of the sediment and erosion control measures must be such that they equal, or exceed, the requirements specified in the most recent version of the *North Carolina Sediment and Erosion Control Manual.* The devices shall be maintained on all construction sites, borrow sites, and waste pile (spoil) projects, including contractor-owned or leased borrow pits associated with the project.
c. For borrow pit sites, the erosion and sediment control measures must be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Surface Mining Manual.*
d. The reclamation measures and implementation must comply with the reclamation in accordance with the requirements of the Sedimentation Pollution Control Act and the Mining Act of 1971.
e. If the project occurs in waters or watersheds classified as Primary Nursery Areas (PNAs), Trout (Tr), SA, WS-I, WS-II, High Quality (HQW), or Outstanding Resource (ORW) waters, then the sediment and erosion control requirements contained within *Design Standards in Sensitive Watersheds* (15A NCAC 04B .0124) supersede all other sediment and erosion control requirements.

3. No Waste, Spoil, Solids, or Fill of Any Kind

No waste, spoil, solids, or fill of any kind shall occur in wetlands, waters, or riparian areas beyond the footprint of the impacts depicted in the Pre-Construction Notification and authorized by this written approval, including incidental impacts. All construction activities, including the design, installation, operation, and maintenance of sediment and erosion control

Best Management Practices, shall be performed so that no violations of state water quality standards, statutes, or rules occur.

4. No Sediment & Erosion Control Measures w/n Wetlands or Waters

   Sediment and erosion control measures shall not be placed in wetlands or waters without prior approval by DWQ. If placement of sediment and erosion control devices in wetlands and waters is unavoidable, then design and placement of temporary erosion control measures shall not be conducted in a manner that may result in dis-equilibrium of wetlands or stream beds or banks, adjacent to or upstream and downstream of the above structures. All devices shall be removed and the natural grade restored within two (2) months of the date that the Division of Land Resources has released the project.

5. If concrete is used during the construction, then a dry work area should be maintained to prevent direct contact prevent direct contact between curing concrete and stream water. Water that inadvertently contacts uncured concrete should not be discharged to surface waters due to the potential for elevated pH and possible aquatic life/fish kills.

6. Work in the Dry

   All work in or adjacent to stream waters shall be conducted in a dry work area. Approved best management practices from the most current version of the NC Sediment and Erosion Control Manual, or the NC DOT Construction and Maintenance Activities Manual, such as sandbags, rock berms, cofferdams, and other diversion structures shall be used to minimize excavation in flowing water.

7. Certificate of Completion

   Upon completion of all work approved within the 401 Water Quality Certification or applicable Buffer Rules, and any subsequent modifications, the applicant is required to return the attached certificate of completion to the 401 Oversight/Express Review Permitting Unit, North Carolina Division of Water Quality, 1650 Mail Service Center, Raleigh, NC, 27699-1650.

8. The applicant/permittee and their authorized agents shall conduct all activities in a manner consistent with State water quality standards (including any requirements resulting from compliance with §303(d) of the Clean Water Act), and any other appropriate requirements of State and Federal Law. If the Division determines that such standards or laws are not being met, including failure to sustain a designated or achieved use, or that State or Federal law is being violated, or that further conditions are necessary to assure compliance, then the Division may reevaluate and modify this General Water Quality Certification.

9. Monitoring of Project

   Monitoring requirements are to be conducted in accordance to Mitigation Plan (Final Draft) dated December 2011 and submitted to this Office for review on March 12, 2012. On pages

20 through 21, Monitoring Requirements, annual monitoring data is to be reported using EEP monitoring template. Upon close out of the Sliver Moon wetland Mitigation site the long term stewardship of the site is to be transferred to EEP and they shall be responsible for periodic inspections of site.

Violations of any condition herein set forth may result in revocation of this Certification and may result in criminal and/or civil penalties. The authorization to proceed with your proposed impacts or to conduct impacts to waters as depicted in your application and as authorized by this Certification shall expire upon expiration of the 404 or CAMA Permit.

If you do not accept any of the conditions of this Certification (associated with the approved wetland or stream impacts), you may ask for an adjudicatory hearing. You must act within 60 days of the date that you receive this letter. To ask for a hearing, send a written petition, which conforms to Chapter 150B of the North Carolina General Statutes to the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, N.C. 27699-6714. This certification and its conditions are final and binding unless you ask for a hearing.

This letter completes the review of the Division of Water Quality under Section 401 of the Clean Water Act 15A NCAC 02H. .0500. If you have any questions, please telephone Roberto Scheller of the Washington Regional Office at 252-948-3940 or Ian McMillan of the 401 Oversight/Express Unit at 919-807-6364

Sincerely,

For Chuck Wakild, P.E.

Enclosures: Certificate of Completion
GC 3689

cc: Worth Creech, Restoration Systems, LLC
Corps of Engineers Washington Regulatory Field Office
DWQ 401 Oversight/Express Unit
DLR, WaRO
File copy

Filename: 11-1108

CERTIFICATE OF PLAN APPROVAL

The posting of this certificate certifies that an erosion and sedimentation control plan has been approved for this project by the North Carolina Department of Environment and Natural Resources in accordance with North Carolina General Statute 113A – 57 (4) and 113A – 54 (d) (4) and North Carolina Administrative Code, Title 15A, Chapter 4B.0107 (c). This certificate must be posted at the primary entrance of the job site before construction begins and until establishment of permanent groundcover as required by North Carolina Administrative Code, Title 15A, Chapter 4B.0127 (b). SILVER MOON · WETLAND RESTORATION

DAISY LANE - CRAVEN COUNTY

Project Name and Location

3-2-12

Date of Plan Approval

NCDENR

Regional Engineer