TAR RIVER HEADWATERS WETLAND RESTORATION SITE

FINAL MITIGATION PLAN

Tar-Pamlico River HUC # 03020101-0102
PERSON COUNTY, NC

DEQ Contract # 6746
DMS Project ID # 97071
DATE: December 2016

MITIGATION PLAN CONTRIBUTORS:

Richard Mogensen – Mogensen Mitigation
Daniel Kuefler – Mogensen Mitigation
Gerald Pottern – Mogensen Mitigation
Heather Smith – Ecological Engineering
Lane Sauls – Ecological Engineering

PREPARED FOR:

NC Dept of Environmental Quality
Division of Mitigation Services
1652 Mail Service Center
Raleigh, NC 27699-1652

This mitigation plan has been written in conformance with the following documents governing NCDMS operations and procedures for the delivery of compensatory mitigation:
1. Federal rule for compensatory mitigation project sites as described in the Federal Register Title 33 Navigation and Navigable Waters Volume 3 Chapter 2 Section § 332.8 paragraphs (c)(2) through (c)(14).
2. NCDEQ Division of Mitigation Services In-Lieu Fee Instrument signed and dated July 28, 2010.

Table of Contents

Tables

Figures

Appendices

1.0 Project Introduction

The Tar River Headwaters Wetland Restoration Site (TRHWR) is a full-delivery wetland mitigation project located in eastern Person County, between Roxboro and Oxford, North Carolina, within the Piedmont Physiographic Province (Figure 1). The site comprises 9.98 acres which includes a 1.06 acre connector area, most of which is drained and degraded wetlands or former wetlands (see photo below), with hydric soil indicators. This includes the 1-acre 570-foot connector corridor. The remaining areas include non-hydric soils, drainage ditches, and a riparian corridor along an intermittent stream connecting the TRHWR site to the adjacent Tar River Headwaters Riparian Buffer and Nutrient Offset Mitigation Bank project. Both projects are designed and implemented by Mogensen Mitigation, Inc. (MMI), and are located on a 228-acre farm owned by Roy and Joyce Huff, in the Tar-Pamlico River Basin 12-digit HUC # 03020101-0102. The Huff Farm property is located at 333 Bunnie Huff Road, Oxford NC 27565. The access road into the TRHWR site is at Latitude = 36.3913, Longitude = -78.8171.

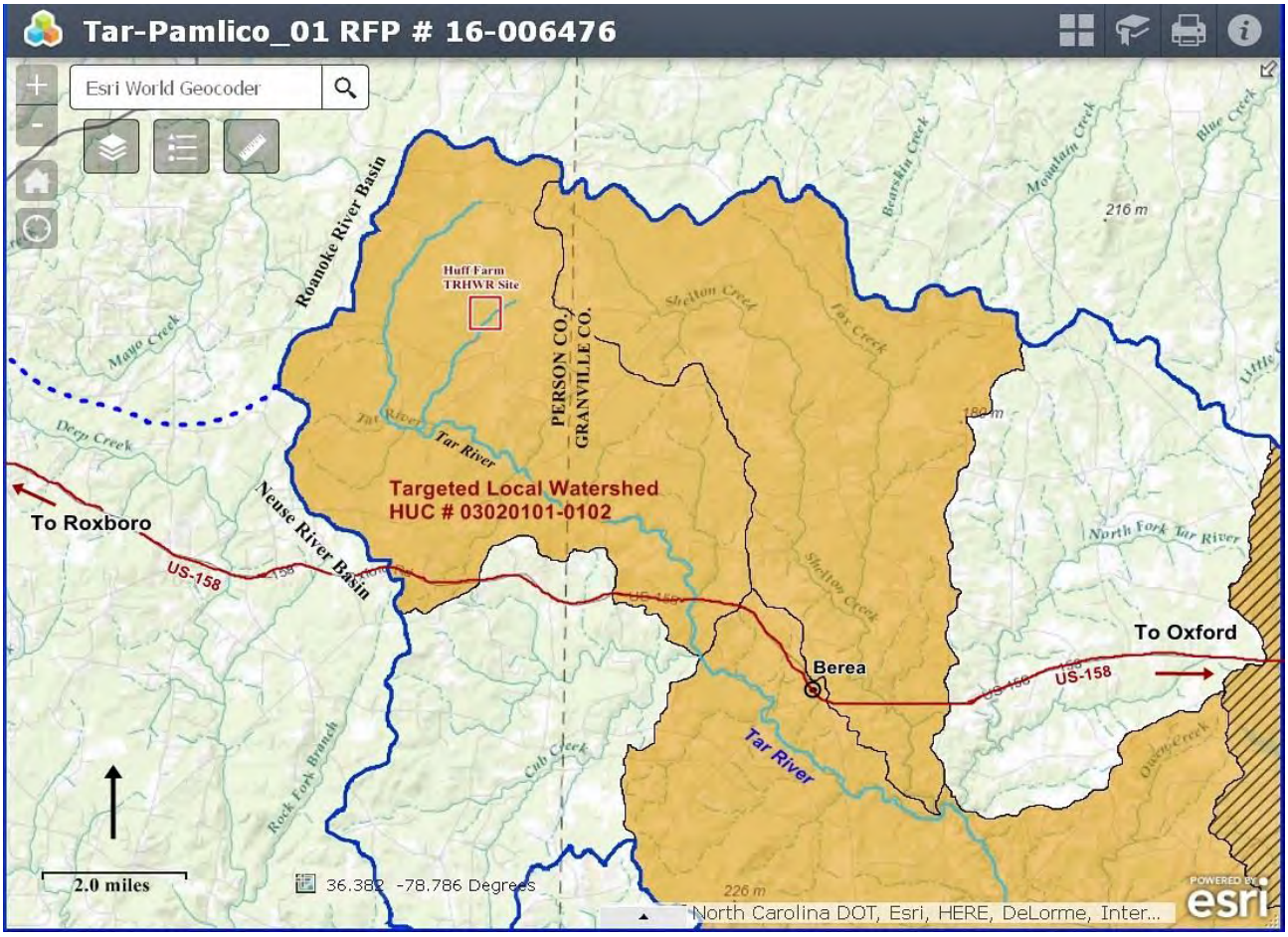


Figure 1. Project vicinity and watershed map, Upper Tar-Pamlico River Basin. DMS Targeted Local Watersheds (TLW) are highlighted in gold. Tar River Headwaters Wetland Restoration Site, on Huff Farm, Person County NC.

The TRHWR site was cleared and ditched for pasture use in the 1940s according to the owner, and is currently used for grazing cattle. The project involves plugging drainage ditches to restore wetland hydrology, fencing to exclude livestock, and planting native trees and shrubs to restore a Headwater Forest wetland ecosystem similar to what occurred prior to site clearing and drainage. The remnant mature trees left for shade, hydrophytic groundcover plants mixed among the pasture grasses, and plant species recorded in adjacent forests (on the same soil mapping unit) provide data for the planting plan.

The proposed work will restore approximately 7.65 acres of headwater riparian wetland (6.53 acres reestablishment plus 1.12 acres rehabilitation) and will generate an estimated 7.28 or more riparian wetland mitigation credits (RWMC), exceeding the 5.0 RWMC requested by the NC Division of Mitigation Services (DMS) in RFP # 16-006476. Approximately 1.27 acres with non-hydric soils in the southeast corner of the mitigation site will also be reforested, and a 100-foot wide by 570-ft long riparian corridor (1.06 acre) extending southeastward along the ditch will connect the TRHWR site to MMI's adjacent stream restoration and nutrient buffer bank project to the south. Total acreage of the wetland mitigation site and riparian connector is 9.98 acres.

The proposed wetland restoration and cattle exclusion will reduce soil erosion and nutrient-enriched runoff from adjacent pasture and cropland within its watershed, and help retain agricultural chemicals used on these lands. Erosion will be significantly reduced by buffering with native tree plantings. It is expected to improve water quality and habitat in the receiving tributary and reduce fine sediment loading which will enhance the overall watershed particularly in the adjacent stream and nutrient mitigation bank.

Directions to TRHWR site: From Raleigh, follow NC-50 north to Creedmoor, NC. Continue north and west on NC-56, Brodgen Rd, Old Rte-75, Culbreth Rd, NC-158, and Old Roxboro Rd. At the Granville/Person County line Old Roxboro Rd becomes Denny Store Rd, and 1.5 miles past the county line turn right (north) on Bunnie Huff Road. Go 0.4 mile to a gravel driveway on the left (just past the Huffs' house and sign) and follow it through the farm gate and across the creek to the TRHWR site.

2.0 Watershed Approach and Site Selection

The TRHWR site is in the northern portion of the uppermost local watershed of the Tar-Pamlico River basin, 12-digit HUC # 03020101-0102. This DMS Targeted Local Watershed (TLW) is the headwaters for the City of Oxford's water supply (rated as Class WS-IV; NSW) and also one of the most ecologically significant stream ecosystems in the NC Piedmont, with high biodiversity and several rare and endemic aquatic species (Figure 2).

The location and scope of this project enables it to address multiple Restoration Goals outlined in the Tar-Pamlico River Basin Restoration Priorities Report (2010). One such goal specific to this project's Catalogue Unit is to "protect, augment, and connect Natural Heritage Areas and other conservation lands." The TRHWR site is approximately 570 feet north of MMI's existing stream restoration and nutrient buffer bank project (connected by riparian corridor), and is close to the Denny Store Gabbro

Forest Significant Natural Heritage Area (SNHA) designated by NC Natural Heritage Program (NHP), located 1,000 feet to the north and east of the TRHWR site. The southeastern portion of this SNHA is on the Huff Farm property and abutting the north end of the stream and buffer bank project.

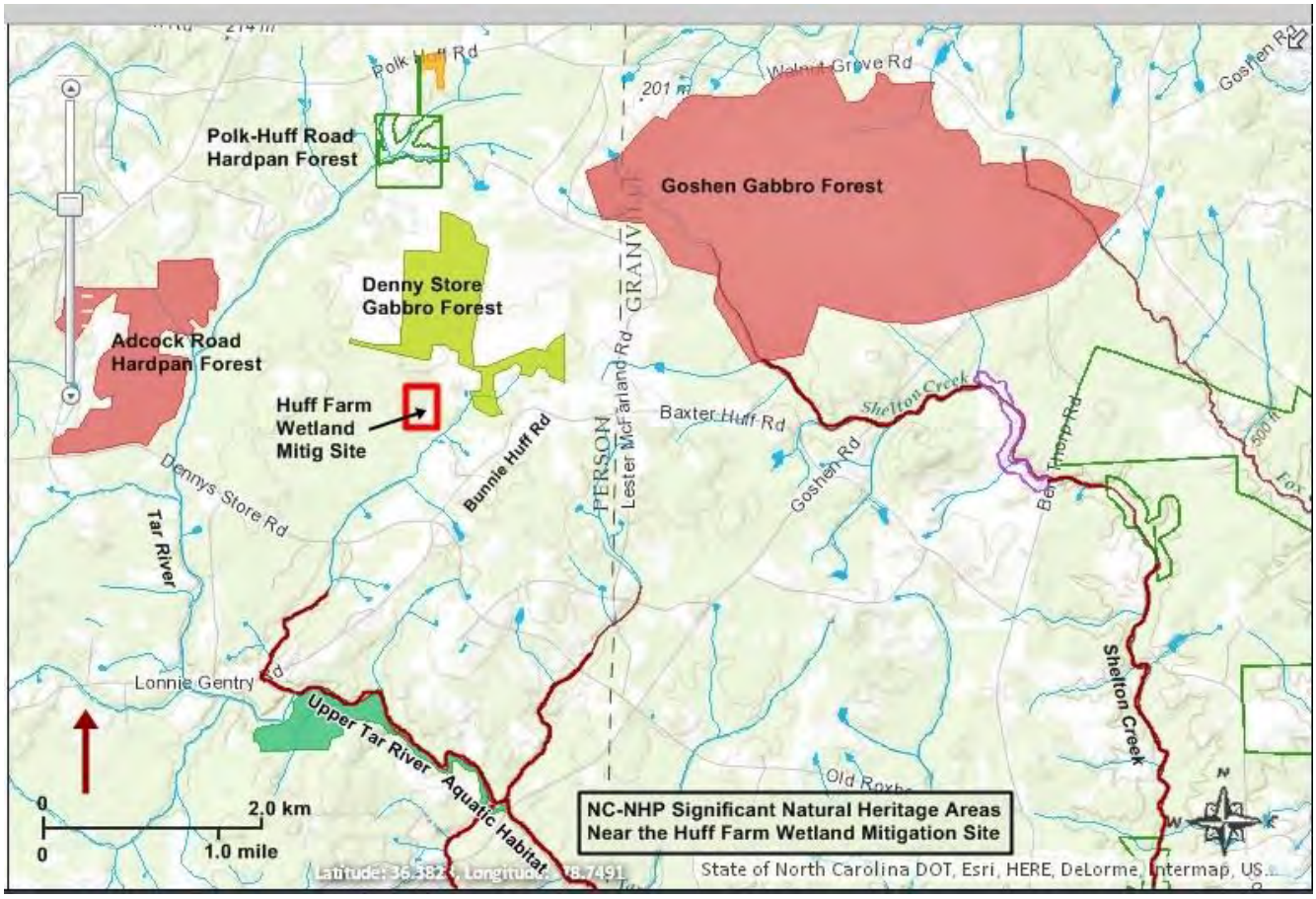


Figure 2. NHP Significant Natural Heritage Areas (SNHA) near the TRHWR site and Huff Farm. Stream segments colored brown (Upper Tar River Aquatic Habitat) are known to support rare species.

Downstream of the Huff Farm property, the Upper Tar River Aquatic Habitat SNHA supports 15 rare species of stream-dwelling animals (mussels, fishes, crayfishes, and salamanders) known to occur within eight miles downstream of the project on the Triple Springs and Moriah USGS Quadrangles (NHP database, 2015). This riverine SNHA begins 1.2 miles downstream of the Huff Farm property, and 1.5 miles below the TRHWR site. NC's most viable population of the federally endangered dwarf wedgemussel occurs within this SNHA in the Tar River between the Person/Granville County line and US Highway 15 bridge south of Oxford.

Restoration Priorities for the Upper Tar River Targeted Local Watershed (TLW) include projects that "address agricultural inputs (nutrients and sediment) and those that reestablish woody buffers". This project directly addresses both of those listed priorities through the rehabilitation and re-establishment of native wetlands, the exclusion of cattle, and reforestation and protection of a riparian corridor

between two mitigation projects. The river and tributaries in Person County are not designated impaired (303d listed) but DEQ Biological Assessment Branch staff noted excessive sediment, channel instability, and nutrient enrichment impacts in several streams in the upper Tar River watershed (DWQ, 2007). MMI staff observed these agricultural impact symptoms in the intermittent stream reach immediately downslope from the proposed wetland restoration area and in the perennial stream just below that reach, in the Tar River Headwaters Riparian Buffer and Nutrient Offset Mitigation Bank project area. By restoring and protecting a headwater wetland this project will help improve downstream water quality and thereby support the overall watershed planning framework.

3.0 Existing Conditions (Baseline)

3.1 Watershed Processes & Landscape Characteristics

The project is located in the Carolina Slate Belt region of the Piedmont Physiographic Province. Elevations on the project site range from approximately 582 feet above mean sea level (MSL) at the northern edge to 570 feet at the southern edge of the wetland restoration area. Valley slope from north to south was calculated at 1.2 percent (12 feet in height / 978 feet in length), and lateral slopes on either side, between 1 and 2 percent. The connector channel drops another 6 feet (from 570 feet to 564 feet) along its 570-foot course from the wetland restoration area to its confluence with the larger stream in the buffer bank project (Figures 3 and 4).

The US Department of Agriculture's 1995 Soil Survey of Person County maps the project area as Orange loam (OnA), but this mapping unit was later revised to Iredell loam (Ir) in the online Web Soil Survey. This extensive soil map unit (more than 2 square miles) continues eastward into Granville County (Figure 3). Onsite analysis by Licensed Soil Scientist Heather Smith of Ecological Engineering, Inc. determined that the majority of the THRWR area soils, with exception of the southeast corner, are unmapped hydric inclusions of Wehadkee soil (Table 1 and Appendix 9) or a wet phase of Iredell soil (Mac Haupt, NCDWR comments). These areas have dense clayey subsoil with slow infiltration, and can accumulate "perched" saturation or ponding especially in winter when evapotranspiration is low.

The 1.27-acre non-hydric area in the southeast corner of the project site exhibited insufficient redoximorphic features to meet the hydric soil criteria and is most likely the mapped Iredell soil type. It is unclear however, whether this area may have once been hydric. Redoximorphic features may have weakened due to oxidation over the 70 years since it was ditched and drained. Soils along the connector corridor between the proposed wetland restoration area and the existing stream and buffer bank project downslope are mapped as Chewacla loam. The lower 250-foot segment of this ditched channel (below the existing vehicle crossing) was field-designated by DEQ Division of Water Resources (DWR) as a stream subject to Tar-Pamlico Buffer rules in June 2013. US Army Corps of

Engineers (USACE) agent Eric Alsmeyer confirmed on 06 July 2016 that the ditch segment within the TRHWR area is not a jurisdictional water subject to Section 404-401 regulation.

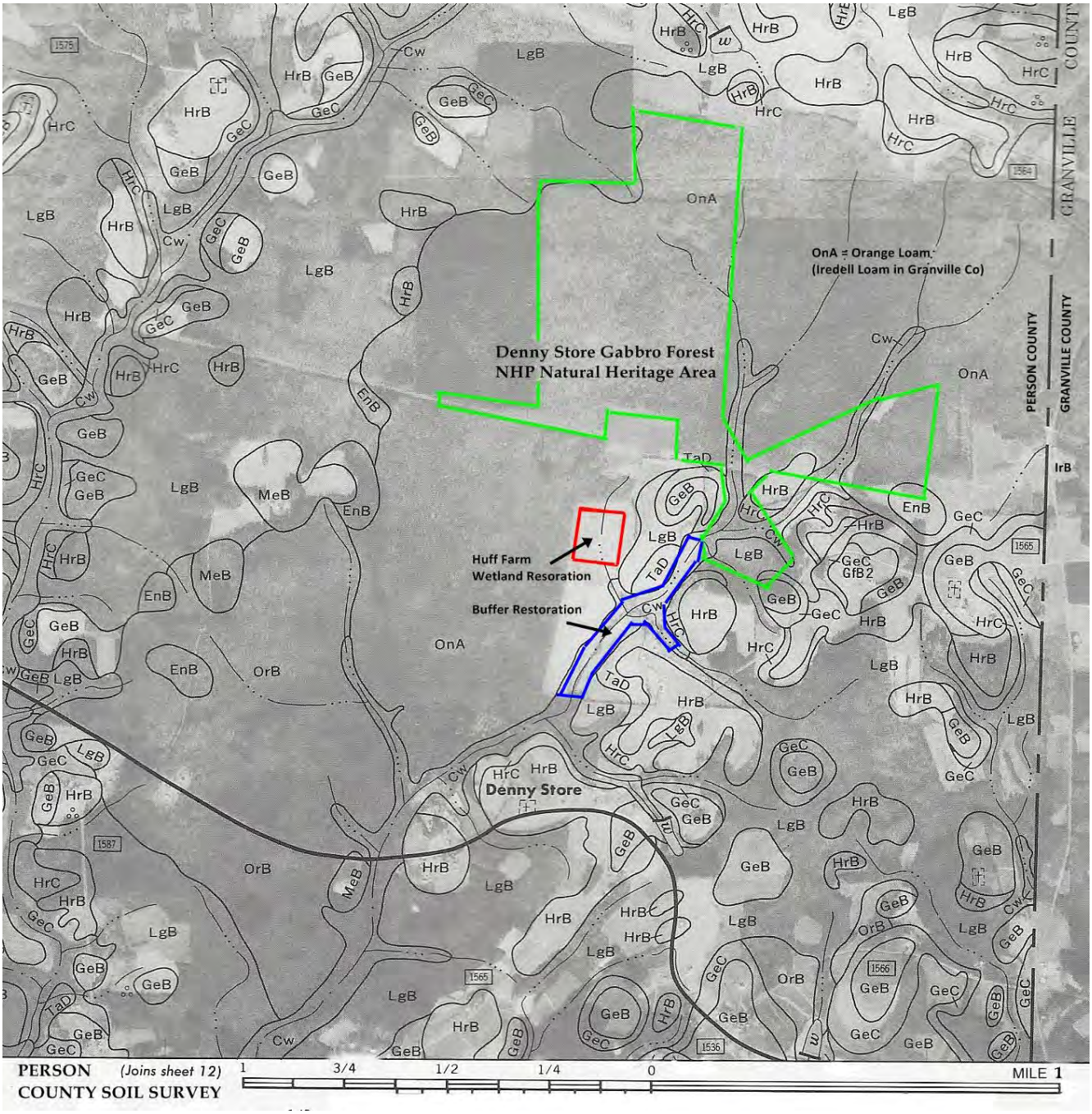


Figure 3. Person County Soil Survey Map, Tar River Headwaters Wetland Restoration Site (Proposed), Stream Buffer Restoration Site (approved, in progress), and Denny Store Gabbro Forest, a NHP Natural Heritage Area.

Table 1. Mapped Soils within Project Area

Soil Type	Hydrologic Soil Group	General Soil Description, from USDA Soil Survey
Iredell Loam* (Orange Loam)	C/D	Fine, mixed, active, thermic Oxyaquic Vertic Hapludalfs. Moderately well drained, very slowly permeable soils, formed in material weathered from rocks high in ferro-magnesium minerals. On Piedmont uplands, mostly 0 to 6 percent slopes.
Chewacla Loam	C	Fine-loamy, mixed, thermic Fluvaquentic Dystrochrept. Somewhat poorly drained soil formed in recent alluvium on nearly level floodplains along streams that drain from the Mountains and Piedmont physiographic provinces. Slopes range from 0 to 2 percent.
Wehadkee Loam[#] (inclusions)	**D**	**Fine-loamy, mixed, nonacid, thermic Typic Fluvaquent. A hydric soil that develops within lower swales of the floodplain. Slopes are considered nearly level and the soils are poorly drained.**

*Area was mapped Orange according to the 1995 USDA-NRCS Person County Soil Survey. The soil was changed to Iredell loam during a revision of mapping units and is shown as Iredell on the Web Soil Survey.

#The majority of the restoration area was classified as Wehadkee during an onsite soil examination by Ecological Engineering (Appendix 9). NCDWR soil scientist Mac Haupt suggested it may be a wet phase of Iredell soil.

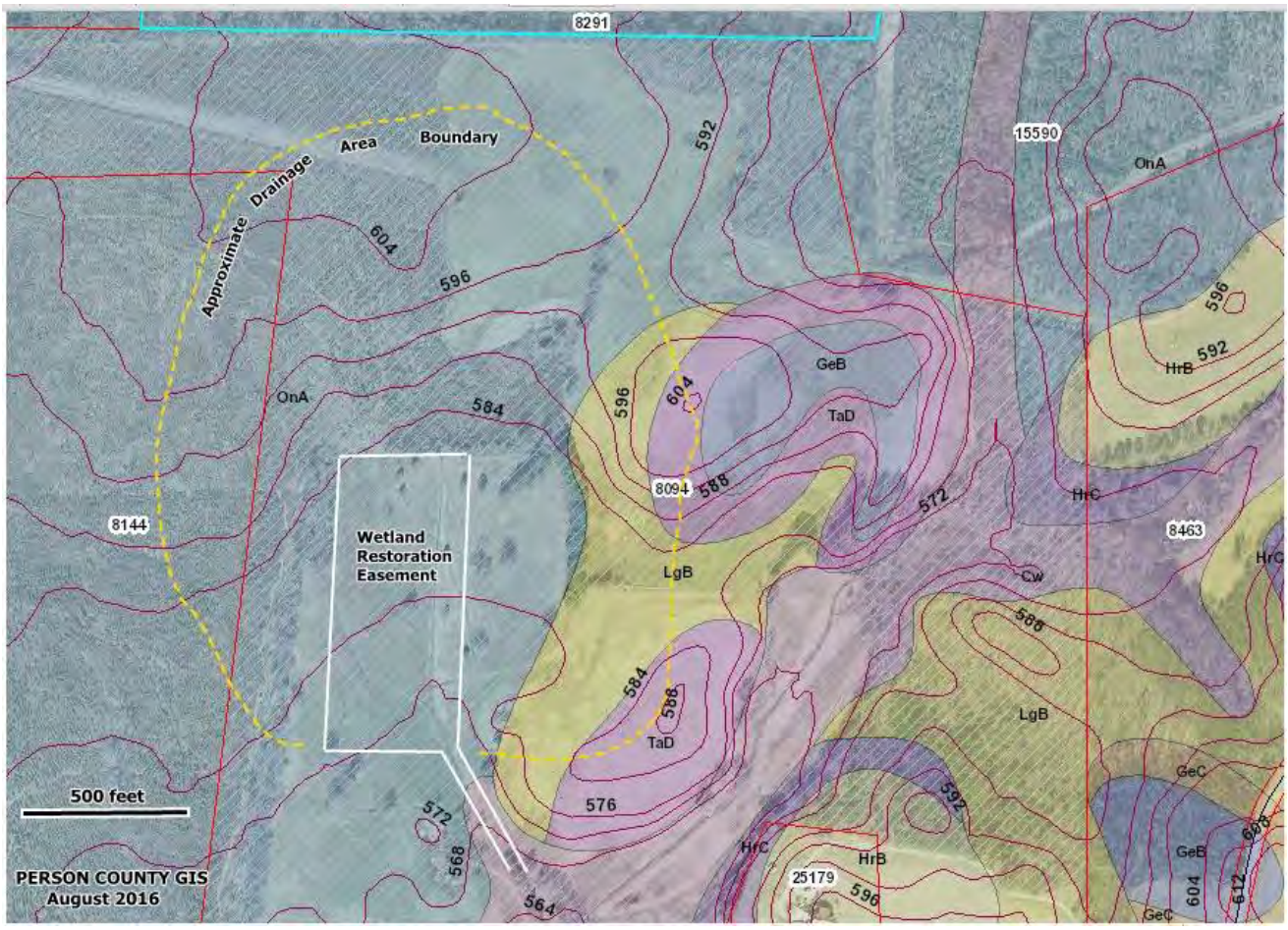


Figure 4. LIDAR topography and project watershed boundary (approximately 60 acres), from Person County GIS. Tar River Headwaters Wetland Restoration Site, Person County NC.

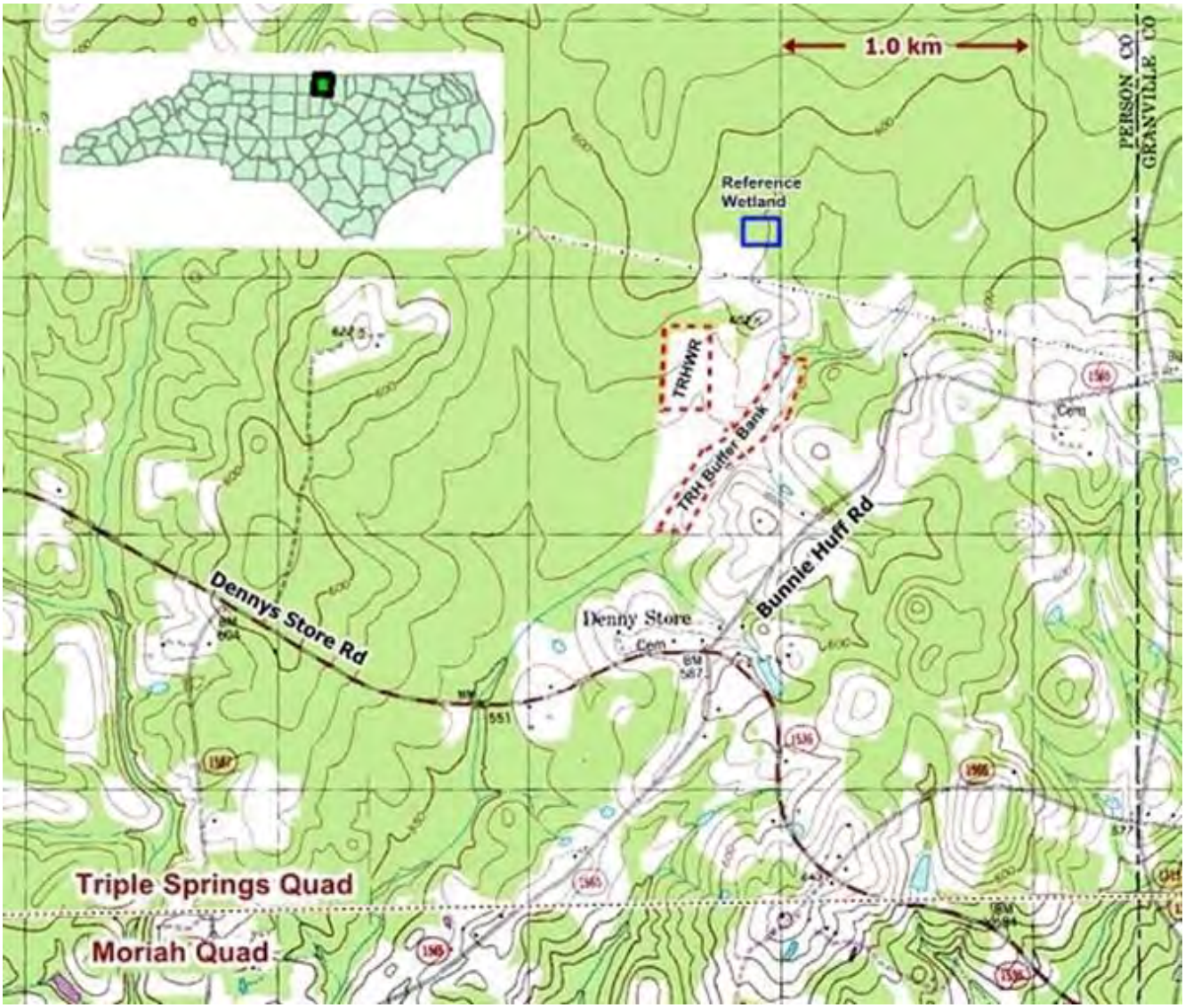


Figure 5. USGS Topographic Quadrangles: Triple Springs and Moriah Quads. Tar River Headwaters Wetland Restoration Site and Stream & Nutrient Buffer Offset Bank, Huff Farm, Person County NC.

3.2 Land Use and Land Cover

The project site is presently a cattle pasture dominated by non-native forage grasses interspersed with native and non-native herbs. Several large trees were left standing to provide shade for the cattle when the site was cleared in the 1940s, and a few younger trees have sprouted and survived. Existing trees include seven of the rare swamp white oak (*Quercus bicolor*), plus several willow oak (*Quercus phellos*), silver maple (*Acer saccharinum*), boxelder (*Acer negundo*), sweetgum (*Liquidambar styraciflua*), black gum (*Nyssa sylvatica*) and loblolly pine (*Pinus taeda*). Hydrophytic herbs (FACW and OBL) are present among the pasture grasses including swamp milkweed (*Asclepias incarnata*),

rushes (*Juncus* spp), spikerush (*Eleocharis* spp), woolgrass bulrush (*Scirpus cyperinus*), New York ironweed (*Vernonia novaboracensis*), buttonweed (*Diodia virginiana*), various sedges (*Carex, Cyperus, Rhynchospora* spp), and fall sneezeweed (*Helenium autumnale*). Other than pasture grasses (mainly fescue) and some limited patches of Japanese honeysuckle and multiflora rose are also present. Iinvasive weeds do not appear to be a major problem on the project site.

The Denny Store Gabbro Forest, a designated SNHA (privately owned and unprotected to our knowledge) lies to the north and east of the TRHWR site, and also borders the adjacent stream and buffer mitigation bank easement (Figure 5). This natural area "contains one of the best quality and most extensive hardwood forests over high pH soils in the northern Piedmont, with excellent examples of Basic Oak-Hickory Forest, Basic Mesic Forest on Flats, Upland Depression Swamp Forest, and Mesic Hardpan Forest" (LeGrand, 2007, Person County Natural Areas Inventory). Rare species recorded on this site include swamp white oak , Chinquapin oak (*Quercus muehlenbergii*), glade wild quinine (*Parthenium auriculatum*), and Lewis's heartleaf (*Hexastylis lewisii*). It is likely that some of these other rare species (in addition to Swamp White Oak) may have occurred on the project site and could be reintroduced, or may recolonize on their own from the nearby natural area.

The TRHWR site has been in continuous agricultural use for about 70 years, and land use in the surrounding area has changed little over the past several decades. The nearest municipalities (Roxboro, Oxford, and Butner) are 8 to 10 miles away, and there are no plans to extend public water and sewer service to the Denny Store vicinity in the foreseeable future. The rate of urban development in the project vicinity is likely to remain very low for decades. Most of the project site's watershed is on the Huff Farm property, where land use and land cover are likely to remain similar to current conditions. Periodic harvest of timber may occur in the project watershed and adjacent forest lands, but this activity should have little effect on the project site.

3.3 Watershed Disturbance and Response

Based on information obtained from the landowner, the shallow drainage ditches were constructed in the 1940s to dewater the wetland sufficiently for pasture use. An east-west ditch across the northern perimeter of the site intercepts overland flows from the north, and channels the water into a south-flowing main ditch that discharges into a natural intermittent stream downslope of the proposed restoration area. Two additional lateral ditches, one on each side of the main ditch, join the main ditch about 700 feet south of the ditch at the northern edge. Because the water table is perched over dense clay and shallow bedrock, these shallow ditches can effectively drain water off a much wider area than if the soils were more permeable and drainage not limited by a shallow aquitard. Seventy years of cattle grazing may have further compacted the soils on the site.

It is unclear how far upslope the intermittent receiving stream may have extended prior to clearing and ditching. The Soil Survey of Person County shows it extending through the TRHWR site and about 500 feet northward beyond the east-west-ditch, almost to the powerline right-of-way (refer back to Figure 5). However, this map was prepared several decades after clearing and ditching, and the natural

stream versus ditch transition would have been indistinguishable. The areas mapped as "OnA" soils to the north and west of the TRHWR site have few stream channels depicted. Based on MMI's analysis and observations in the Denny Store Gabbro Forest to the north (reference site), it is likely that surface runoff from the TRHWR site prior to ditching flowed southward via multiple indistinct braided channels, seeps and pools, rather than a discrete stream.

The intermittent stream downslope of the proposed restoration area (lower segment of the TRHWR connector corridor) has mostly forested banks but is accessible to cattle and thus subject to hoof-shear. It is unclear to what extent this stream's entrenched condition and bank erosion is due to channelization decades ago, versus ongoing erosion due to cattle damage. The lowermost 50-foot reach of this stream was fenced to exclude cattle (in 2015) before it joins the perennial stream.

4.0 Functional Uplift Potential

The TRHWR site provides an excellent opportunity for wetland restoration. The majority of the site has redoximorphic features indicating hydric soils, and groundwater monitoring from February to July 2016 (a period with higher than average rainfall) indicates that most of the site has less than 20 consecutive days of shallow saturation (water table within 12 inches of ground surface) except in the existing wetlands (Figure 6, blue areas). The site was cleared and ditched in the 1940s, or possibly earlier, and has been used as cattle pasture for many decades. The native hardwood vegetation is sparse (about a dozen scattered mature oaks, maple, hickory and ash trees remain) and the site's ability to infiltrate rainfall, filter nutrients and store base flow is impaired. The small watershed draining to the site (mostly on the Huff property) comprises woodland, corn fields, and a powerline right-of-way; no buildings or impervious surface exists in this catchment, and no development is planned. The crop fields, powerline right-of-way, and adjacent pasture areas beside the TRHWR site will likely remain non-forested.

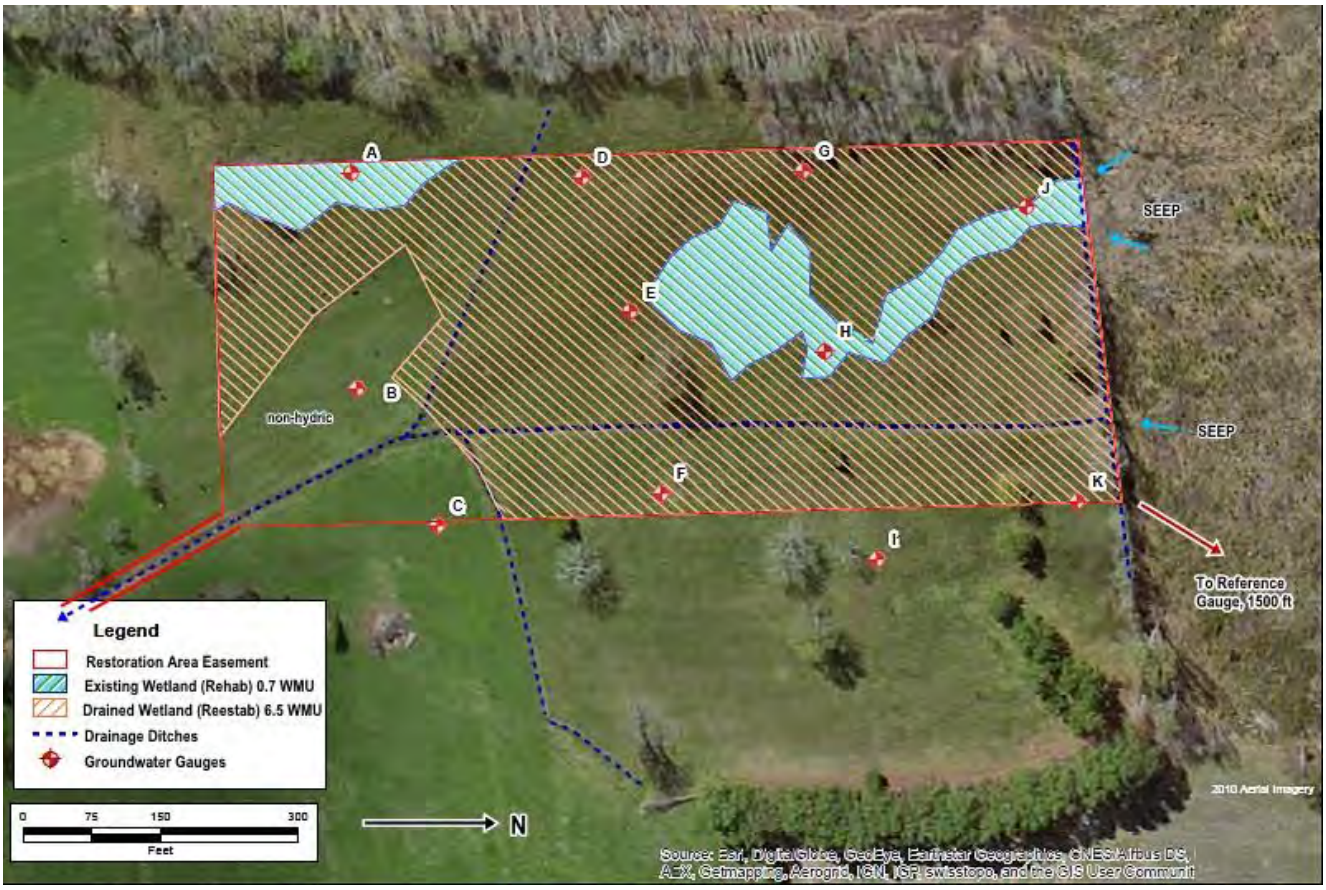


Figure 6. Existing Conditions and Proposed Project Assets: existing and drained wetlands to be restored, non-wetlands, ditches to be plugged, and groundwater gauges, Tar River Headwaters Wetland Restoration Site. See also Figure 8 for proposed relocation of groundwater gauges for post-construction monitoring.

Cattle fencing, aerating, ditch plugging and reforestation should be effective at improving infiltration, increasing nutrient uptake by plants and soil microbes, and reducing runoff of eroded soils, excessive nutrients and fecal bacteria into the receiving ditch and thus into the Tar River tributary a few hundred feet downstream. With increased water-holding capacity due to the ditch plugs, stream temperature is expected to fluctuate less widely due to the improved infiltration and shading effects once the trees grow large enough. Increased shallow ponding in depressions in the restored wetland will provide breeding habitat for amphibians, dragonflies, and other wildlife that use vernal pool habitats.

The 1.27-acre area in the southern part of the restoration area that currently lacks sufficient redoximorphic features to be considered "hydric soil" in 2015 will also become wetter, and might achieve sufficient hydrology to become part of the wetland. It is unclear whether this area may have once been hydric, but redoximorphic features have weakened due to oxidation over the 70 years since it was ditched, or whether it was non-hydric prior to drainage. Since no wetland credit is sought for this this area; if it does meet wetland hydrology criteria at the end of the monitoring period, it will be a non-credited "bonus" wetland area.

The connector area between the proposed wetland restoration area and the nutrient and buffer bank (below the existing vehicle crossing) will be stabilized with tree plantings. No geomorphic improvements are proposed.

The intermittent stream reach from the vehicle crossing downstream to the buffer bank project easement is incised (ditched) but has adequate woody root density along the banks. Simply fencing out the cattle and planting a buffer should provide adequate uplift for this short reach. No geomorphic improvements are proposed for this reach.

The proximity of the TRHWR site to the Denny Store Gabbro Forest SNHA and presence of rare species onsite (see section 3.1.2 above) enhances the project's ecological uplift potential. Existing mature forests within this SNHA are located about 1,000 feet to the north and east of the site and MMI's adjacent Tar River Headwaters Riparian Buffer and Nutrient Offset Mitigation Bank project (planted in Dec 2015) will provide an additional 18-acre bridge between the SNHA area and the TRHWR area. In addition to the rare Swamp White Oaks already on site, several other state-listed rare plant species known to occur in the adjacent SNHA may colonize the two restored project easements. Also, since the Upper Tar River Aquatic Habitat SNHA begins just 1.2 miles downstream of the Huff Farm property, this pair of projects has high potential to benefit the 15 species of protected stream-dwelling animals (one federally endangered and 14 federal FSC or state-protected) known to occur in that SNHA.

Constraints on functional uplift are relatively minimal for this project. The watershed does include some row-crop land and a powerline right-of-way, but no other existing or planned utilities or development. The existing farm vehicle crossing on the ditch, midway between the wetland project area and the buffer bank project, will remain unfenced and is not included in the conservation easement. The FEMA-regulated floodplain along the perennial stream begins about 5,000 feet downstream of the Huff Farm property (Person County GIS); no FEMA flood-prone lands will be affected. No hydrologic trespass issues will occur since the site receives runoff from the land to the north and west. There is a perimeter ditch that will remain along the northern edge of the site. The flow regime to the areas south and east will not change. In addition, there are no currently or planned development threats nearby. Any increased ponding generated as a result of implementation will be entirely within the conservation easement. There is adequate access across the site for construction and planting crews and required equipment.

No adverse impacts to federally listed species or cultural resources will occur., Attached concurrence letters from US Fish and Wildlife Service (FWS) and NC State Historic Preservation Office (SHPO) are provided in the Appendix. Historical environmental site assessment data was obtained from Environmental Data Resources, Inc. (EDR) to evaluate the potential for on-site or nearby soil and water contamination. The project site is not listed in any of the databases searched by EDR, and there

are no federal or state records of "recognized environmental conditions" within a one-mile radius of the project site.

5.0 Mitigation Project Goals and Objectives

The goal of this project is to restore a Headwater Forest wetland community that was cleared, drained and converted to pasture in the 1940s (according to the landowner). The site topography and presence of remnant mature swamp white oak and laurel oak trees on the site suggest that the original plant community may have been Upland Depression Swamp Forest, Piedmont Headwater Stream Forest (Hardpan Subtype), or some intermediate between those types (Schafale and Weakley 1990; Schafale 2012). These headwater wetlands typically have a shorter and more fluctuating hydro-period than alluvial wetlands along larger streams do, and rely more on rainwater ponding and surface runoff rather than groundwater seepage or over-bank flooding (Schafale 2012). A similar natural forest (Denny Store Gabbro Forest) documented by NHP located to the north and east of the site will be used as a reference wetland for hydrologic comparison and vegetation planning. The project will complement MMI's ongoing riparian buffer and stream restoration project along the adjacent stream on the Huff Farm property. Specific project GOALS and corresponding OBJECTIVES include:

GOALS:

- Restore the natural jurisdictional wetland hydro-period to five or more acres of forested wetland within a nine-acre site;
- Restore forested wetland habitat and improve habitat connectivity between Denny Store Gabbro Forest (NHP Natural Heritage Area) to the north and the Tar River tributaries;
- Buffer storm water runoff from fecal and other cattle-related pollutants.

OBJECTIVES:

- Plug existing ditches and create sheet flows throughout the site. Aerate soils to reduce compaction, improve infiltration, and create micro-topography to retain surface flows;
- Preserve the remnant mature Swamp White Oaks (a regionally rare species) for seed source. Plant appropriate native hardwood trees at a sufficient frequency to establish a diverse bottomland wetland forest. Treat and/or remove invasive species which may cause problems for site restoration, including Chinese privet and multi-flora rose;
- Install fencing to exclude cattle and establish a conservation easement to provide permanent protection on the site.

  *The proposed hydro-period and other success criteria are described in the Performance Standards in Table 4.

6.0 Design Approach and Mitigation Work Plan

6.1 Conceptual Approach

The project involves 7.65 acres of wetland restoration and 1.27 acres of reforestation to non-wetland areas. Existing on-site ditches appear to be effectively draining surface water from the site during the growing season. Although the ditches are shallow, their drainage effect is efficient because this peculiar type of headwater wetland relies on dense clay and/or shallow bedrock to maintain "perched" wetland hydrology. Observations by the property owner that the existing field remains wet for prolonged periods during winter suggests that an appropriate growing season hydrology can be reestablished by ditch plugging. The NHP "Classification of the Natural Communities of North Carolina" by Schafale & Weakley (1990) describes Forested Headwater Wetlands as typically situated in poorly drained broad upland flats with seasonal or intermittent saturation, with stable climax forest communities maintained by their hydro-period.

The overall work approach includes plugging the existing ditches (central north-south ditch and two lateral ditches) with native clay excavated from the surrounding areas. Existing mature vegetation will be left intact and the entire project area will be planted with native woody species, fenced, and protected in perpetuity.

6.2 Wetland Design

This project involves both components (re-establishment and rehabilitation) of the restoration category for wetland mitigation credit generation. The re-establishment portions of the project are no longer functioning as jurisdictional wetlands while the rehabilitation areas are functioning at a lower capacity due to impacts by cattle, altered vegetation and altered hydrology. Eleven groundwater gauges were installed throughout the project site to monitor pre-restoration groundwater levels and one was installed in a reference wetland approximately 1,500 linear feet to the northeast (photo in Appendix 2B). Data from these gauges (March to July 2016) were used to distinguish the boundaries between the re-establishment and rehabilitation acreages as approved by the USACE (Jurisdictional Determination letter attached).

Based on LIDAR topographic mapping (from NCDOT LIDAR Contours) the watershed draining to the wetland restoration site is approximately 20 acres with an average slope of 1-2%. The relatively flat topography in this area makes watershed boundaries difficult to discern, and subsurface geologic and soil features may divert flow in ways not apparent based on ground surface topography. This watershed is undeveloped, containing natural hardwood forest, planted pines, cropland, pasture, and a powerline. The only man-made structures in the watershed are two powerline towers. The dense soil in the TRHWR area is a natural feature of Wehadkee soils, but long-term pasture use may have compacted it further. Hydrology on the site is from direct precipitation and surface runoff during large storm events from the small watershed, mostly to the north.

The main drainage ditch flows southward through the TRHWR site, with roughly 80% of the easement area located west of the ditch and 20% east of the ditch. A perpendicular ditch runs east-west across the northern perimeter of the site, forming a T-shape with the main ditch. The perimeter ditch collects surface flows from the upstream watershed area. Two additional lateral ditches (one to the east, one to the west) join the main ditch about 700 feet south of the "T" at the northern edge. All of these drainage ditches are shallow, primarily intended to channel surface runoff and shallow sub-surface flow, rather than deeper groundwater. Bedrock and/or hard clay was observed between 15 and 40 inches deep over most of the TRHWR site, supporting a perched seasonal water table. The main ditch becomes an intermittent stream (as determined by DWR in June 2013) about 250 feet southeast of the site

6.3 Hydroperiod Justification

The hydrology of the existing on-site wetlands is affected mainly by precipitation, surface water run-off from the contributing watershed, and the presence of an impervious clay layer, creating a perched water table. The existing hydrologic regime at the site is altered due to surface water removal via a main north-south ditch and two small lateral ditches. These ditches are not at a depth sufficient to affect groundwater but serve to quickly remove runoff from the contributing watershed. A water budget was calculated to determine the volume of water at the TRHWR pre and post wetland restoration. In order to calculate the water budget, the following assumptions were made:

- The precipitation amount and distribution throughout the year will be constant pre- and post-restoration.
- Surface water runoff from the contributing watershed is currently leaving TRHWR through the main north-south ditch.
- Surface water runoff from the contributing watershed post restoration will remain on-site.
- Surface water runoff from TRHWR will be reduced post restoration due to the establishment of forest-type vegetation and the plugging of the on-site ditches.
- The groundwater inflow and outflow will be constant pre and post restoration.
- Evapotranspiration of the contributing watershed is constant pre-and post-restoration.
- Evapotranspiration of TRHWR is greater post restoration due to the establishment of forested-type vegetation instead of the current pasture land use.
- Inflow to the TRHWR site is based on direct precipitation plus runoff entering the site from the north and northwest portion (20 acres) of the overall watershed (Figure 4). Inflow from the east and southwest portions of the watershed may also contribute to groundwater hydrology on the site, but the contributing drainage to those areas is not as readily directed into a ditch for quick off-site conveyance and were not included in the inflow calculations.

The water budget (Appendix 2) indicated there would be an additional 467,000 cubic feet of water held on-site for the TTHWR post restoration, which is equivalent to an additional 14.4 inches of water on the site yearly or an additional 1-1.5 inches of water per month across the site, depending on precipitation. The additional volume of water will infiltrate through the soil profile and result in

increased hydroperiods post-restoration activities. Ancillary benefits from this project that include increased organic matter and reduced rainfall impact from herbaceous growth, and development of soil structure and biology through reduction of animal compaction may further improve soil water holding capacity and soil infiltration rates, benefitting hydrology.

The TRHWR currently has 11 gauges that monitored pre-restoration groundwater levels from April to June 2016. Four of these gauges (A, E, H, & J) are located within the proposed rehabilitation areas, deemed by the USACE as jurisdictional wetlands (Appendix 2). The additional precipitation volume predicted from the water budget should increase the hydrology and hydrologic footprint of these rehabilitation areas. In the areas proposed for reestablishment, additional precipitation volume predicted from the water budget should raise hydroperiods to those mimicking current jurisdictional (rehabilitation) areas.

MMI installed a reference wetland monitoring well in a natural area matching the design wetland approximately 1,500 feet northeast of the site on 31 March 2016 (Figure 6). The water table has remained within 12 inches of the ground surface at this well almost continuously from Apr 1 to July 5, aside from a six-day period in mid-June when it dropped 1 to 2 inches lower. Local rain data indicate that many months of current year exceed historical 70th percentiles for wetness as shown in figure 7, below.

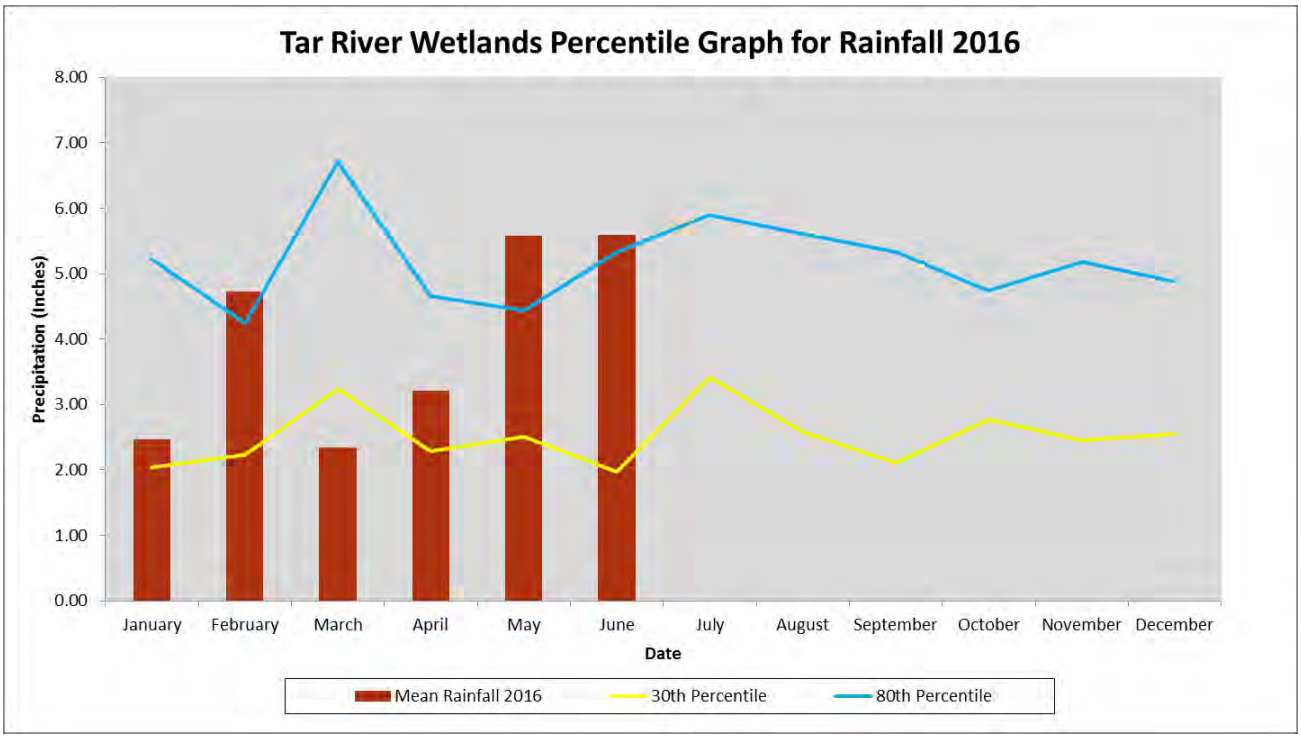


Figure 7. Mean monthly rainfall with 30-year percentiles, Tar River Headwaters Wetland Restoration Site. *Historical rainfall data referenced from USDA Field Office Database for Station: 'Roxboro 7 ESE' from years 1981-2010.

Although the average hydroperiod for these four rehabilitation gauges was measured at approximately 13.2%, the rainfall during this same timeframe was 75% greater than the average and therefore significantly higher than normal. It can be assumed that these elongated hydroperiods shown in the pre-restoration gauge data are consistent with elevated rainfall events given that this is a precipitation driven system. Based on the gauge data and its relationship to precipitation for this system, along with predicted increases in water on-site from the water budget, MMI believes a target proposed hydroperiod of 10% is realistic for the reestablishment gauges.

The proposed restoration area is relatively flat, with a gradient slope of approximately 1.2%. Most of the underlying soils are hydric except for some slightly drier areas along the southern portion. The soils in this area exhibit slightly higher chroma values and less distinct redoximorphic features. The proposed ditch plugs are designed to decrease surface runoff, increase saturation frequency and duration throughout the site, so that even the drier areas are likely to attain wetland hydrology criteria.

6.4 Site Preparation and Construction

Riparian wetland restoration at the Site will occur through wetland re-establishment and rehabilitation of existing wetlands, on an area approximately 500 feet upstream of a jurisdictional stream. This work will be accomplished by placing multiple clay plugs within the main surface water drainage ditches throughout the Site. The clay plugs will be placed to maximize the retention of surface water. Ditch remnants will be left as natural depressions to increase surface ponding capacity and act as vernal pools in the spring. The majority of the re-establishment area will be aerated to a depth of no greater than six inches in order to avoid disrupting the clay layer. Areas within the dripline of large trees and the wetland rehabilitation areas will not be aerated.

Onsite soil samples were sent to GeoTesting Express lab (test results available) and the results indicate that onsite clays may exceed the liquid limit and plasticity index specified in the construction plans in Appendix 1. Therefore, we will amend the onsite soils to be used for plugs with a sufficient percentage of imported fine sand or silt to conform to the plan specifications. The percentage of fine sand or silt per ton of soil will be determined by laboratory testing prior to construction. The fine sand or silt will be mixed with native clay to create a consistent medium for the soil plugs prior to installation. In the event the on-site soils are unable to meet the required specifications off-site soils will be used.

6.5 Vegetation and Planting Plan

The TRHWR Site planting plan will attempt to restore a native vegetation community similar to what presumably occurred on the site prior to its conversion to pasture use in the 1940s. The nine-acre project site contains about a dozen large trees, several of which appear older than 70 years and probably pre-date the conversion to pasture. As previously mentioned, these include willow oak, swamp white oak, silver maple (*Acer saccharinum*), boxelder (*Acer negundo*), sweetgum

(*Liquidambar styraciflua*), black gum (*Nyssa sylvatica*) and loblolly pine (*Pinus taeda*). The target community for the planting plan is based on the existing remnant species in the pasture, species in adjacent forests, and published descriptions for this community type (Schafale and Weakley 1990; LeGrand 2007). The relative uniformity of the restoration area makes it unnecessary to designate planting zones for different species.

Table 2. Plant Species for Wetland Restoration and Riparian Stabilization

Common Name	Scientific Name	Wetland Status	Size
Trees (At least seven species depending on availability)			
River Birch	*Betula nigra*	FACW	3/8“ cal. 18-24 “
Black Gum	*Nyssa sylvatica*	FAC	3/8“ cal. 18-24 “
Green Ash	*Fraxinus pennsylvaticum*	FACW	3/8“ cal. 18-24 “
Tulip Poplar	*Liriodendron tulipifera*	FAC	3/8“ cal. 18-24 “
Swamp White Oak	*Quercus bicolor*	FACW	3/8“ cal. 18-24 “
Cherrybark Oak	*Quercus pagoda*	FACU	3/8“ cal. 18-24 “
American Sycamore	*Plantanus occidentalis*	FACW	3/8“ cal. 18-24 “
American Elm	*Ulmus americana*	FACW	3/8“ cal. 18-24 “
Laurel Oak	*Quercus laurifolia*	FACW	3/8“ cal. 18-24 “
Pin Oak	*Quercus palustris*	FACW	3/8“ cal. 18-24 “
Overcup Oak	*Quercus lyrata*	FACW	3/8“ cal. 18-24 “
Hornbeam (Musclewood)	*Carpinus caroliniana*	FAC	3/8“ cal. 18-24 “
Swamp Blackgum	*Nyssa biflora*	FACW	3/8“ cal. 18-24 “

Note: A minimum of seven species will be planted, depending on availability.

Trees to be planted will be selected from species listed in Table 2. After aerating the compacted soil surface (except within the drip line of large trees to be protected), trees will be planted initially at 9 to 10-foot average spacing (400 to 500 stem per acre). Gallon-size saplings will be planted using post-hole diggers, and smaller stock will be planted using Dibble bars or similar equipment. Native herbs are abundant on the site and will not require seeding in most areas, except where grading will occur. Soil has been analyzed by the Person County Extension Service and found to be low in lime and Phosphorus. We will utilize fertilizer and lime as indicated in the soil tests. No other added soil amendments are planned. Site preparation will involve spraying for weed control except in the existing wetlands as they contain a diverse array of desirable native perennial and herbaceous herbs, and few exotics. Fall spraying was used on the adjacent stream buffer project to kill fescue and other non-native pasture grasses and resulted in dense growth of opportunistic native herbaceous plants which is preferable to fescue.

6.6 Mitigation Credit Generation Summary

Table 3. Mitigation Acreages and Project Assets

Mitigation Acreages and Project Assets			
Feature	**Area /Length**	**Mitigation Type**	**Credits Generated**
Riparian Wetland	1.12 ac	Rehabilitation (1:1.5)	0.75
Riparian Wetland	6.53 ac	Re-establishment (1:1)	6.53
Upland	1.27 ac	Reforestation	0
Connector Area	1.06 ac	Buffer & Nutrient	-
TOTALS	9.98 ac	RWMC	7.28

7.0 Monitoring and Performance Standards

7.1 Monitoring Plan

In order to determine success across the site, vegetation monitoring plots will be installed and monitored across the Site in accordance with the "Stream and Wetland Monitoring Guidelines (February 2014)." The number and locations of the permanent monitoring quadrants will be established within the areas enhanced by planting. At least 2% of the planted area will have 100-meter square vegetation plots that will be located and surveyed immediately after construction. Vegetation monitoring plots will not be installed under existing tree canopies. Vegetation monitoring will occur in the fall (between September and November), prior to the loss of leaves.

Each annual monitoring report must be submitted to DMS by December 1st of the year during which the monitoring was conducted. The project success criteria of 260 stems per acre must be met at the end of the 7th year of monitoring, or monitoring will continue until the success criteria are met.

Eleven (11) self-recording groundwater monitoring gauges have been installed to gather pre-restoration data to assist with water budget analysis. All gauges will be removed during construction and replaced immediately after restoration activities have been completed. Some of the gauges will be re-installed at their existing locations, and others will be moved to new locations to achieve optimal representation of all wetland rehabilitation and reestablishment areas throughout the project site (Figure 8). Due to the shallow natural confining layer, gauges in some areas are less than 20 inches deep. The restored hydrology in wetlands will need to be at least 10% of the growing season, per discussions with the IRT.

7.2 Performance Standards

Project success criteria is based on vegetation success, achieving jurisdictional hydrology, and permanent cattle exclusion. See Table 4 below.

Table 4. Performance Standards and Monitoring Approach

GOAL	OBJECTIVE	PERFORMANCE STANDARD	MONITORING APPROACH
Restore natural hydro-period for headwater forest wetland.	Plug existing ditches and create sheet flow throughout the site. Aerate soils to reduce compaction, improve infiltration, and create micro-topography to retain surface flows.	Water must be on or within 12 inches of the surface for 10% of the growing season* Hydrographs will indicate jurisdictional hydrology.	Utilize 11 shallow groundwater self-reading gauges throughout the site at a frequency of about one per acre. Visual inspection of ponding duration.
Restore forested wetland habitat and improve habitat connectivity with existing forests.	Preserve mature swamp white oak trees for seed source. Plant appropriate native hardwood trees at 10-ft average spacing (435 stems/ac) Treat invasive species.	Survival of 320 stems per acre at year 3, 260 stems per acre at year 5 and 210 stems per acre at MY 7.	Monitor vegetation plots annually and calculate densities of surviving planted stems.
Buffer storm water runoff from fecal and other cattle-related nutrient inputs.	Plant trees, fence perimeter and establish a permanent conservation easement.	Insure the integrity of the cattle exclusion fencing for the life of the contract.	Visual inspection will note fence condition through site pictures. Observations will be included in annual monitoring reports.

****To provide data for the determination of the growing season for the wetland areas, one soil temperature probe will be installed. The growing season will be defined as when soil temperatures at 20 inches below the soil surface are higher than biologic zero (41 degrees F). Alternatively, and in the absence of reliable soil temperature data, growing season length will be determined the WETS Station data for Roxboro 7 ESE in Person County at moderate freeze air temperatures (3/28 to 11/3, 220 days).***

8.0 Site Management Plans

8.1 Adaptive Management Plan

Experienced environmental professionals from MMI will supervise project construction and planting. In the event the mitigation site or a specific component of the mitigation site fails to achieve the necessary performance standards as specified in the mitigation plan, the sponsor shall notify the members of the IRT and work with the IRT to develop contingency plans and remedial actions.

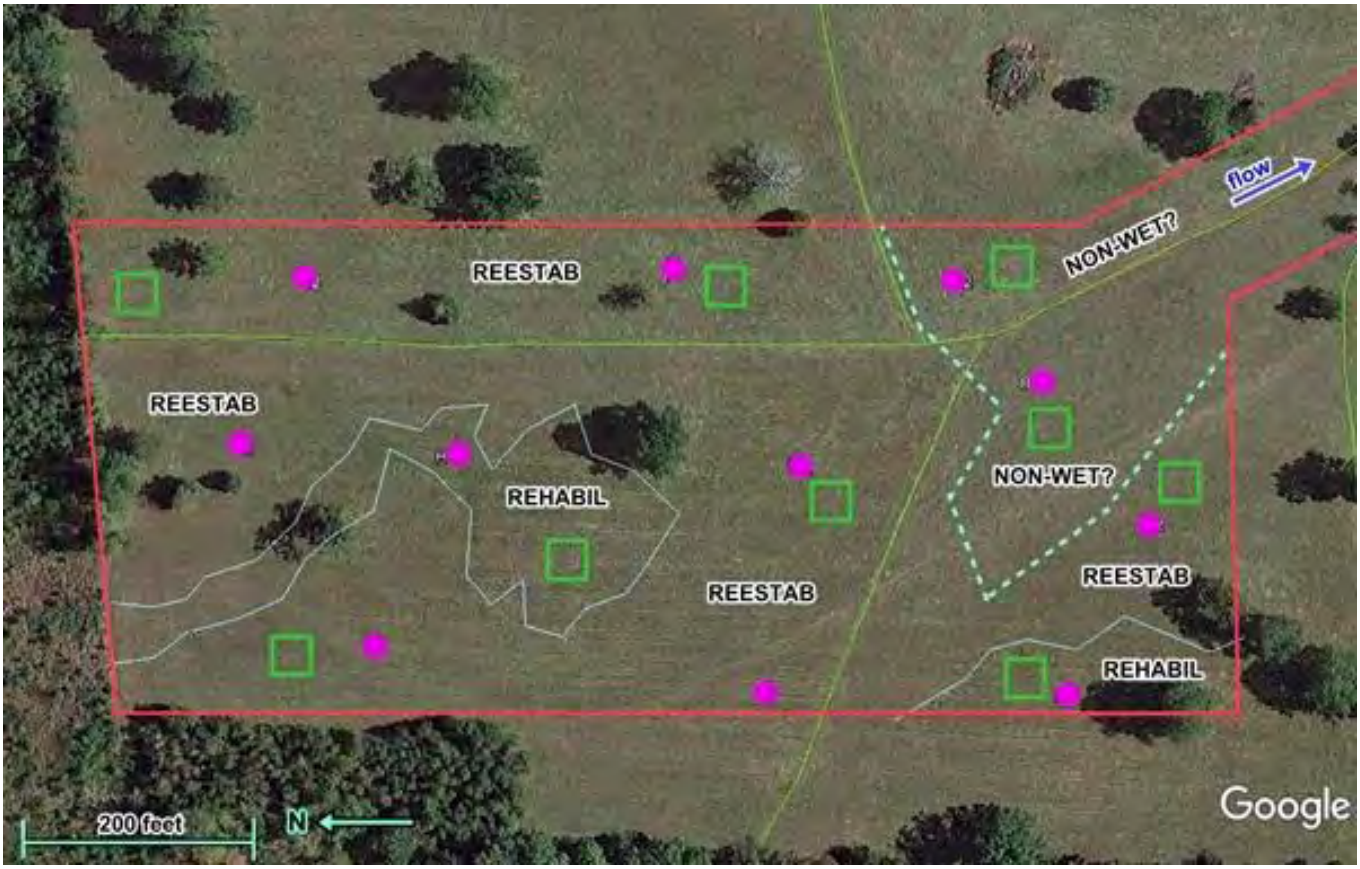


Figure 8. Proposed post-construction groundwater gauge locations (pink circles) and vegetation monitoring plot locations (green squares) in the Wetland Rehabilitation and Wetland Reestablishment areas, Tar River Headwaters Wetland Restoration Site.

8.2 Long Term Management Plan

The site will be transferred to the DEQ Stewardship Program (or 3rd party if approved). This party shall serve as conservation easement holder and long-term steward for the property and will conduct periodic inspection of the site to ensure that restrictions required in the conservation easement are upheld. Funding will be supplied by the responsible party on a yearly basis until such time an endowment is established. The DEQ Stewardship Program is developing an endowment system within the non-reverting, interest-bearing Conservation Lands Conservation Account. The use of funds from the Endowment Account will be governed by North Carolina General Statue GS 113A-232(d)(3). Interest gained by the endowment fund may be used for the purpose of stewardship, monitoring, stewardship administration, and land transaction costs, if applicable. The Stewardship Program will periodically install signage as needed to identify boundary markings as needed. Any livestock or associated fencing or permanent crossings will be the responsibility of the landowner to maintain.

9.0 Financial Assurances

This mitigation site is a full-delivery project with the State of North Carolina (NC DMS contract DEQ #6746). Performance bonding financial assurance is provided to the State of North Carolina as a contractual requirement.

10.0 References

LeGrand, H.E. Jr., 2007. Natural Areas Inventory of Person County, NC. NC Natural Heritage Program, Raleigh NC.

Michigan Department of Transportation, 2006. Drainage Manual. Available: http://www.michigan.gov/stormwatermgt/0,1607,7-205--93193--,00.html.

Natural Resource Conservation Service, 1995. Hydric Soils of North Carolina.

North Carolina Natural Heritage Program, 2016 Online Database NCNHP.

Oishi, C., Oren, R., Novick, K., Palmroth, S., and Katul, G. 2010. Interannual Invariability of Forest Evapotransporation and Its Consequence to Water Flow Downstream.

Schafale, M.P., Weakley, A.S.,1990. Classification of the Natural Communities of North Carolina, Third Approximation. NC Natural Heritage Program, Raleigh, NC.

Schafale, M.P., Weakley, A.S. (2012). Classification of the Natural Communities of North Carolina, Fpurth Approximation. NC Natural Heritage Program, Raleigh, NC.

Threatened and Endangered Species, 2010. Online Database USFWS.

United States Department of Agriculture, 1997. Engineering Field Handbook. 210-EFH, Part 650, 1/92, revised 1997.

United States Department of Agriculture, Field Office Climate Data, 2016. Roxboro Station, Available: http://agacis.rcc-acis.org/37145/mtot.

United States Department of Agriculture, Natural Resources Conservation Service, 1995. Soil Survey of Person County, North Carolina.

United States Department of Agriculture, Natural Resources Conservation Service, 2016. Web Soil Survey. Available: http://websoilsurvey.nrcs.usda.gov/app/

United States Geological Survey, 2013. 7.5 Minute Topographic Quadrangle, *Triple Springs.*

Appendix 1.

Plan Sheets

Close-Ups of Construction Plan Sheet Text -- Sheets PSH-02 and PSH-05

CONSTRUCTION GENERAL NOTES

1. All elevations shown on these plans are referenced to a NAVD 88 datum.

2. The location of all equipment and material staging areas, and access points to be located as noted on these plans. Limits of silt fencing, and construction staging areas are shown as approximate on plans. Limits and locations will be field coordinated with the designer.

3. Contractor to dispose of all waste material off-site and in accordance with all federal, state and local regulations.

4. All disturbed areas will be seeded immediately, as specified in the project specifications.

5. Contractor to provide temporary plant bedding area on site for temporary storage of vegetation transplants. Transplants to be kept watered, mulched and shaded at all times as specified in the project specifications.

6. Construction personnel should park all vehicles within the limits of the designated construction staging areas. All other construction equipment and vehicles should be parked within the construction staging areas when not in use.

7. Contractor shall be responsible for complying with NCDEQ requirements, including, but not limited to maintaining rain gauge on site, documentation of rainfall amounts and dates, inspections and maintenance of erosion control devices, weekly reports and any other supporting documentation as required.

8. Existing utilities noted at the time of the field survey are shown for size, material, type, and relative location only. This plan is not a comprehensive inventory or an as-built survey of existing site utilities. The Contractor is to determine the existence and location of all utilities within the work area.

9. The Contractor shall be responsible for the location and/or relocation of all utilities and coordination with the appropriate utility agency or company. The Contractor is required to call before digging.

10. Contractor will be responsible for repairs to any damage to existing utilities, including but not limited to, overhead and underground utilities, curb and gutter, pavement, sidewalks, storm drainage systems, sanitary sewer systems or fencing. Any required repairs to be made in accordance with any and all applicable state and or local municipality or utility agency standards.

11. The Contractor shall keep the project work area clean of litter and excess debris at all times.

12. Stream plug to be constructed using impervious select material. Material shall be a silty or clay soil meeting requirements of AASHTP M 145 for soil classification A-2, A-6, and A-7, provided such materials do not have a liquid limit (LL) greater than 50. To maintain soil workability for placement and compaction, the following criteria shall apply for plasticity index (PI):

    a. Below water table: PI must be greater than 7 and less than 25
    b. Above water table: PI must be greater than 7 and less than 35

    Plasticity index shall be determined in accordance with AASHTO T90 and the liquid limit shall be determined in accordance with AASHTO T89.

TEMPORARY SEEDING VEGETATIVE SPECIES

Temporary Seeding Throughout Disturbed Areas				**Acres**	**7.8**
Year round	*Secale cereale*	Herb	Grain rye	130 lbs/ac	Single species to be applied
May - September	*Panicum ramosum*	Herb	Brown top millet	40 lbs/ac	
May – September	*Setaria italica*	Herb	German millet	25 lbs/ac	
September – March	*Dactylis glomerata*	Herb	Orchard grass	15 lbs/ac	

PERMANENT SEEDING VEGETATIVE SPECIES

Seeding Summary for Permanent Vegetation per Planting Zone

Wet/Sunny Area				Acres	7.8
Approved Date	**Species Name**	**Stratum**	**Common Name**	**Total lbs**	
n/a	*Trifolium pratense*	Herb	Red clover	47(30%)	Mix to be applied at rate of approx. 20 lbs/ acre
n/a	*Panicum clandestinum*	Herb	Deer tongue	31 (20%)	
n/a	*Carex vulpinoidea*	Herb	Fox Sedge	23 (15%)	
n/a	*Elymus virginicus*	Herb	Virginia wild rye	23 (15%)	
n/a	*Juncus effusus*	Herb	Soft Rush	16 (10%)	
n/a	*Agrostis perennans*	Herb	Upland bentgrass	16 (10%)	
			Subtotal	**156 (100%)**	

SOIL PREPARATION AND AMENDMENT SUMMARY

All Other Areas Within Easement Boundary						Acres	7.8
Mechanical Treatment	**Approx. Date**	**Ground Cover Fabric**	**Mulch Type**	**Mulch Density / Thickness**	**Nutrient Amendments**	**Nutrient Total lbs**	
n/a	n/a	n/a	n/a	n/a	DAP 18-46-0	850	
n/a	n/a	n/a	n/a	n/a	n/a	n/a	
n/a	n/a	n/a	n/a	n/a	n/a	n/a	
					Subtotal	**850**	
					Total	**850**	**7.8**

CONSTRUCTION SEQUENCE

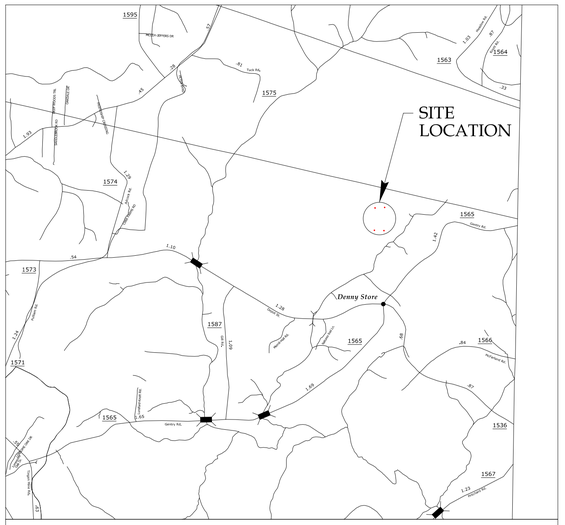
1. Staging areas, stockpile areas, construction entrances and access roads will be identified and located according to the Construction Documents.
2. The primary construction entrance will be installed along Bunnie Huff Rd. through Mr. Huff's property and across the UT to Tar River and as noted in the Erosion Control Plans for access to the property.
3. The Contractor will install silt fencing at applicable staging and spoil areas, as noted on the Erosion Control Plans.
4. The proposed construction will be located as shown on the Construction Documents. Final locations will be field-determined by the Designer.
5. The Contractor will stockpile materials in designated staging areas.
6. Excavated material that is stockpiles will follow erosion and sediment control guidelines as they related to material storage and stockpiling.
7. The Contractor will begin work installing clay plugs into the three drainage ditches at locations designated in the Construction Drawings or at the discretion of the Designer. There will be a total of eight clay plugs installed in the three drainage ditches.
8. The Contractor will install bare root seedlings and containerized plants according to methodology denoted in the Construction Documents. Containerized plants will be intermixed with seedlings.
9. The Contractor will be responsible for the application of seed and straw necessary, to any disturbed areas.

TAR RIVER HEADWATERS WETLAND RESTORATION SITE

PERSON COUNTY, NC

IMS # 97071

DEQ CONTRACT # 6746



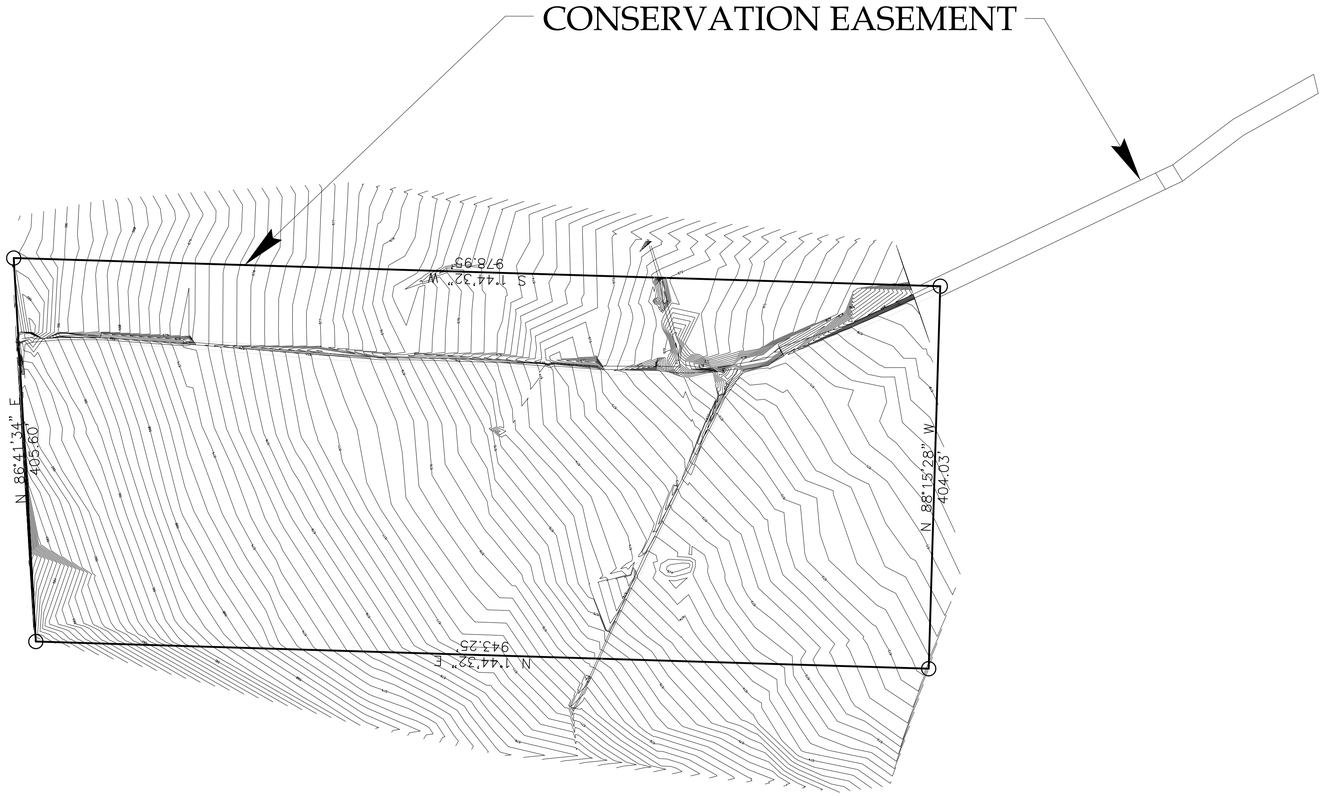
VICINITY MAP

WETLAND REHABILITATION: 1.12 AC

WETLAND RE-ESTABLISHMENT: 6.53 AC

DIRECTIONS TO PROJECT SITE

- FROM OXFORD, NC HEAD NORTH ON HWY 96
- TURN LEFT ONTO US-158 HEADING WEST
- TURN LEFT ONTO OLD ROXBORO RD IN WALNUT GROVE
- TURN LEFT ONTO ROXBORO ROAD.
- CONTINUE ONTO US-158 WEST
- TURN RIGHT ONTO OLD ROXBORO RD.
- CONTINUE ONTO DENNY'S STORE RD.
- TURN RIGHT ONTO BUNNY HUFF RD.
- SITE IS APPROXIMATELY 0.1 MILE ON THE LEFT



MOGENSEN MITIGATION, INC.
PO Box 690429
Charlotte, NC 28227
(704) 576-111
CONTACT:
Richard K. Mogensen, President

REVISIONS

TAR RIVER HEADWATERS WETLAND RESTORATION SITE

PERSON COUNTY, NC

TITLE SHEET

DEQ CONTRACT # 6746	30815-003 PROJECT NO.	IMS # 97071
PSH-01	F-1148 FIRM NO.	

HYDRAULIC ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ECOLOGICAL ENGINEERING
NC FIRM LICENSE No: F-1148
1151 SE Cary Parkway
Suite 101
Cary, NC 27518
(919) 557-0929

CONSTRUCTION SEQUENCE AND GENERAL NOTES

CONSTRUCTION SEQUENCE

1. Staging areas, stockpile areas, construction entrances and access roads will be identified and located according to the Construction Documents.
2. The primary construction entrance will be installed along Bunnie Huff Rd. through Mr. Huff's property and across the UT to Tar River and as noted in the Erosion Control Plans for access to the property.
3. The Contractor will install silt fencing at applicable staging and spoil areas, as noted on the Erosion Control Plans.
4. The proposed construction will be located as shown on the Construction Documents. Final locations will be field-determined by the Designer.
5. The Contractor will stockpile materials in designated staging areas.
6. Excavated material that is stockpiles will follow erosion and sediment control guidelines as they related to material storage and stockpiling.
7. The Contractor will begin work installing clay plugs into the three drainage ditches at locations designated in the Construction Drawings or at the discretion of the Designer. There will be a total of eight clay plugs installed in the three drainage ditches.
8. The Contractor will install bare root seedlings and containerized plants according to methodology denoted in the Construction Documents. Containerized plants will be intermixed with seedlings.
9. The Contractor will be responsible for the application of seed and straw necessary, to any disturbed areas.

GENERAL NOTES

1. All elevations shown on these plans are referenced to a NAVD 88 datum.
2. The location of all equipment and material staging areas, and access points to be located as noted on these plans. Limits of silt fencing, and construction staging areas are shown as approximate on plans. Limits and locations will be field coordinated with the designer.
3. Contractor to dispose of all waste material off-site and in accordance with all federal, state and local regulations.
4. All disturbed areas will be seeded immediately, as specified in the project specifications.
5. Contractor to provide temporary plant bedding area on site for temporary storage of vegetation transplants. Transplants to be kept watered, mulched and shaded at all times as specified in the project specifications.
6. Construction personnel should park all vehicles within the limits of the designated construction staging areas. All other construction equipment and vehicles should be parked within the construction staging areas when not in use.
7. Contractor shall be responsible for complying with NCDEQ requirements, including, but not limited to maintaining rain gauge on site, documentation of rainfall amounts and dates, inspections and maintenance of erosion control devices, weekly reports and any other supporting documentation as required.
8. Existing utilities noted at the time of the field survey are shown for size, material, type, and relative location only. This plan is not a comprehensive inventory or an as-built survey of existing site utilities. The Contractor is to determine the existence and location of all utilities within the work area.
9. The Contractor shall be responsible for the location and/or relocation of all utilities and coordination with the appropriate utility agency or company. The Contractor is required to call before digging.
10. Contractor will be responsible for repairs to any damage to existing utilities, including but not limited to, overhead and underground utilities, curb and gutter, pavement, sidewalks, storm drainage systems, sanitary sewer systems or fencing. Any required repairs to be made in accordance with any and all applicable state and or local municipality or utility agency standards.
11. The Contractor shall keep the project work area clean of litter and excess debris at all times.
12. Stream plug to be constructed using impervious select material. Material shall be a silty or clay soil meeting requirements of AASHTP M 145 for soil classification A-2, A-6, and A-7, provided such materials do not have a liquid limit (LL) greater than 50. To maintain soil workability for placement and compaction, the following criteria shall apply for plasticity index (PI):

    a. Below water table: PI must be greater than 7 and less than 25
    b. Above water table: PI must be greater than 7 and less than 35

    Plasticity index shall be determined in accordance with AASHTO T90 and the liquid limit shall be determined in accordance with AASHTO T89.

MOGENSEN MITIGATION, INC.
PO Box 690429
Charlotte, NC 28227
(704) 576-111
CONTACT:
Richard K. Mogensen, President

REVISIONS

TAR RIVER HEADWATERS
WETLAND RESTORATION SITE

PERSON COUNTY, NC
CONSTRUCTION SEQUENCE
AND GENERAL NOTES

DEQ CONTRACT # 6746

30815-003 PROJECT NO.

IMS # 97071

PSH-02

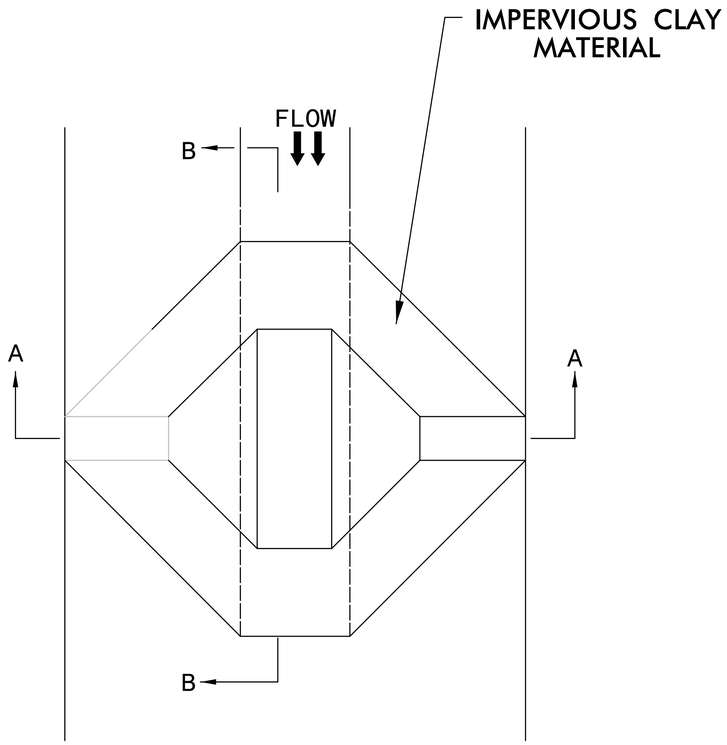
F-1148 FIRM NO.

HYDRAULIC ENGINEER

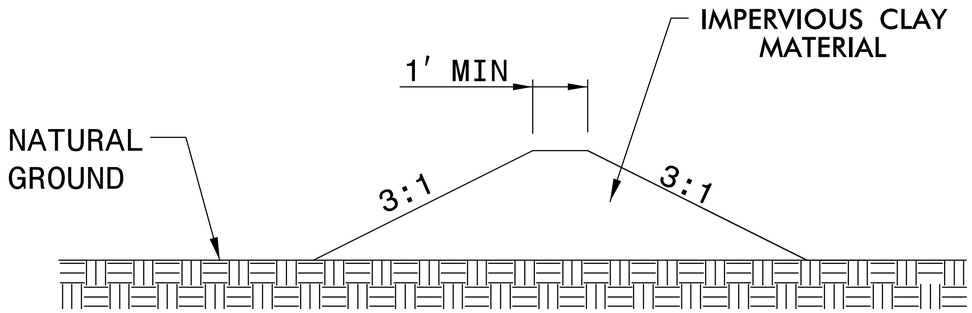
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ECOLOGICAL ENGINEERING
NC FIRM LICENSE No: F-1148
1151 SE Cary Parkway
Suite 101
Cary, NC 27518
(919) 557-0929

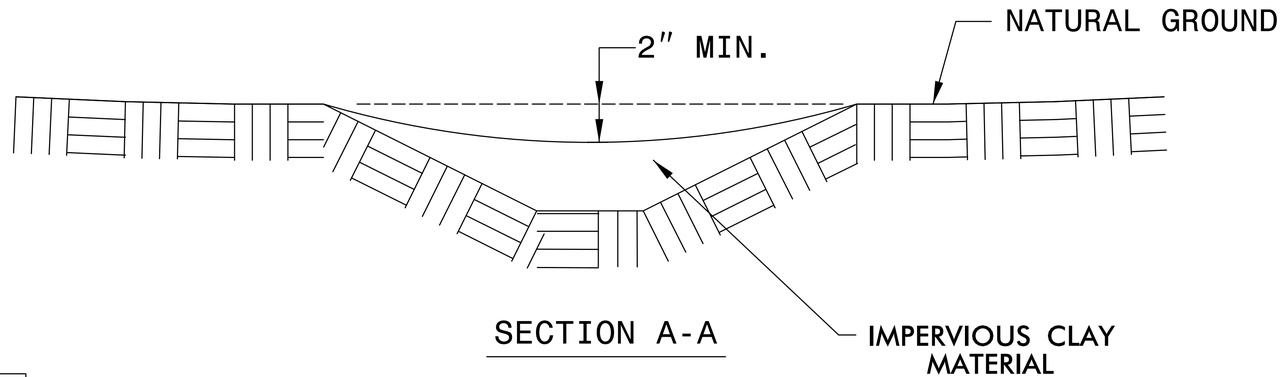
CLAY PLUG



PLAN



SECTION B-B



SECTION A-A

NOTES:

CLAY PLUG TO BE CONSTRUCTED USING IMPERVIOUS CLAY MATERIAL.

CLAY PLUG TO BE A MINIMUM OF 20' LONG IN THE DIRECTION OF FLOW.

MOGENSEN MITIGATION, INC.
PO Box 690429
Charlotte, NC 28227
(704) 576-111
CONTACT:
Richard K. Mogensen, President

REVISIONS

TAR RIVER HEADWATERS
WETLAND RESTORATION SITE

PERSON COUNTY, NC

CLAY PLUG DETAIL

DEQ CONTRACT # 6746	30815-003 PROJECT NO.	IMS # 97071
PSH-03 SHEET	F-1148 FIRM NO.	NOT TO SCALE

HYDRAULIC ENGINEER

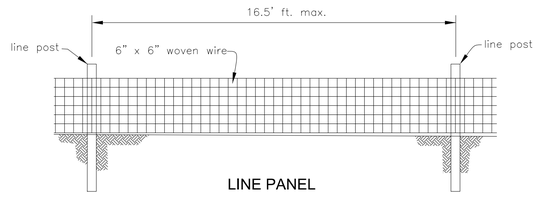
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ECOLOGICAL ENGINEERING
NC FIRM LICENSE No: F-1148
1151 SE Cary Parkway
Suite 101
Cary, NC 27518
(919) 557-0929

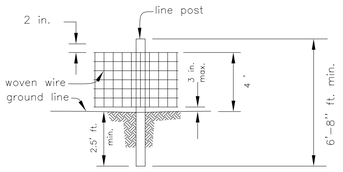
DETAILS

FENCING

NOT TO SCALE



LINE PANEL



WOVEN WIRE

ASTM Class 3 galvanized. Top and bottom wires min. 12.5 gauge. Intermediate and stay wires min. 14.5 gauge.

Line posts (wooden): min. 4.0 in. diam. or 4.0 in. square.

PRESSURE TREATMENT FOR ALL WOOD:(1)
*All Quantities in lbs/cu.ft

For Fence Posts:

CCA	ACQ	CBA-A	CA-B	micro CA
0.40	0.4	0.41	0.21	0.14

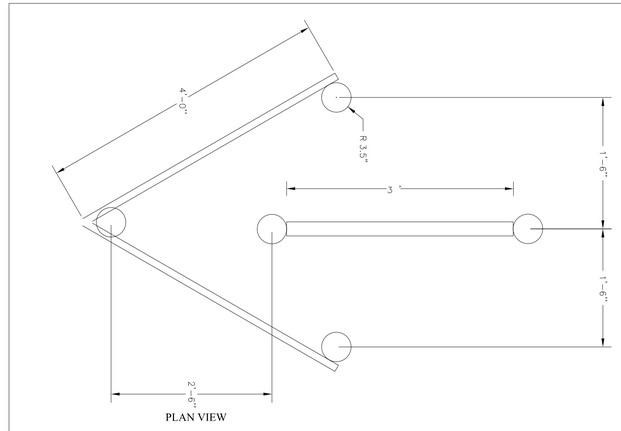
CCA - Chromated Copper Arsenate
ACQ - Alkaline Copper Quat,
CBA-A - Copper Boron Azole Type A
CA-B - Copper Azole Type B
Micro-CA - Dispersed Copper Azole or Micronized Copper Azole

(1) All recommendations are taken from American Wood Protection Association (AWPA) Table 5C "Sawn Products– Commodity Specification A". Except CBA–A which is the recommendation of Simpson Strong Tie Company.

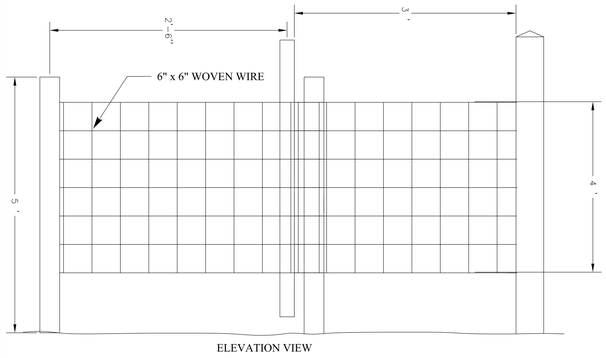
Drawing not to scale. Standardized drawing must be adapted to the specific site.

SOURCE: U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
DELAWARE CONSERVATION DISTRICTS

WOVEN WIRE FENCING (Wf)



PLAN VIEW



ELEVATION VIEW

NOTES:

1 INSIDE DIMENSIONS ARE MINIMUM CLEAR DISTANCES REQUIRED TO MEET ACCESSIBILITY STANDARDS.

2 THESE DRAWINGS ARE TYPICAL DRAWINGS AND MAY REQUIRE MINOR MODIFICATION FOR INSTALLATION.

WALK THROUGH GATE (Wg)

MOGENSEN MITIGATION, INC.
PO Box 690429
Charlotte, NC 28227
(704) 576-111
CONTACT:
Richard K. Mogensen, President

REVISIONS

TAR RIVER HEADWATERS WETLAND AND RESTORATION SITE
PERSON COUNTY, NC
FENCING DETAIL

DEQ CONTRACT # 6746	30815-003 PROJECT NO.	IMS # 97071
PSH-03A	F-1148 FIRM NO.	NOT TO SCALE

HYDRAULIC ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

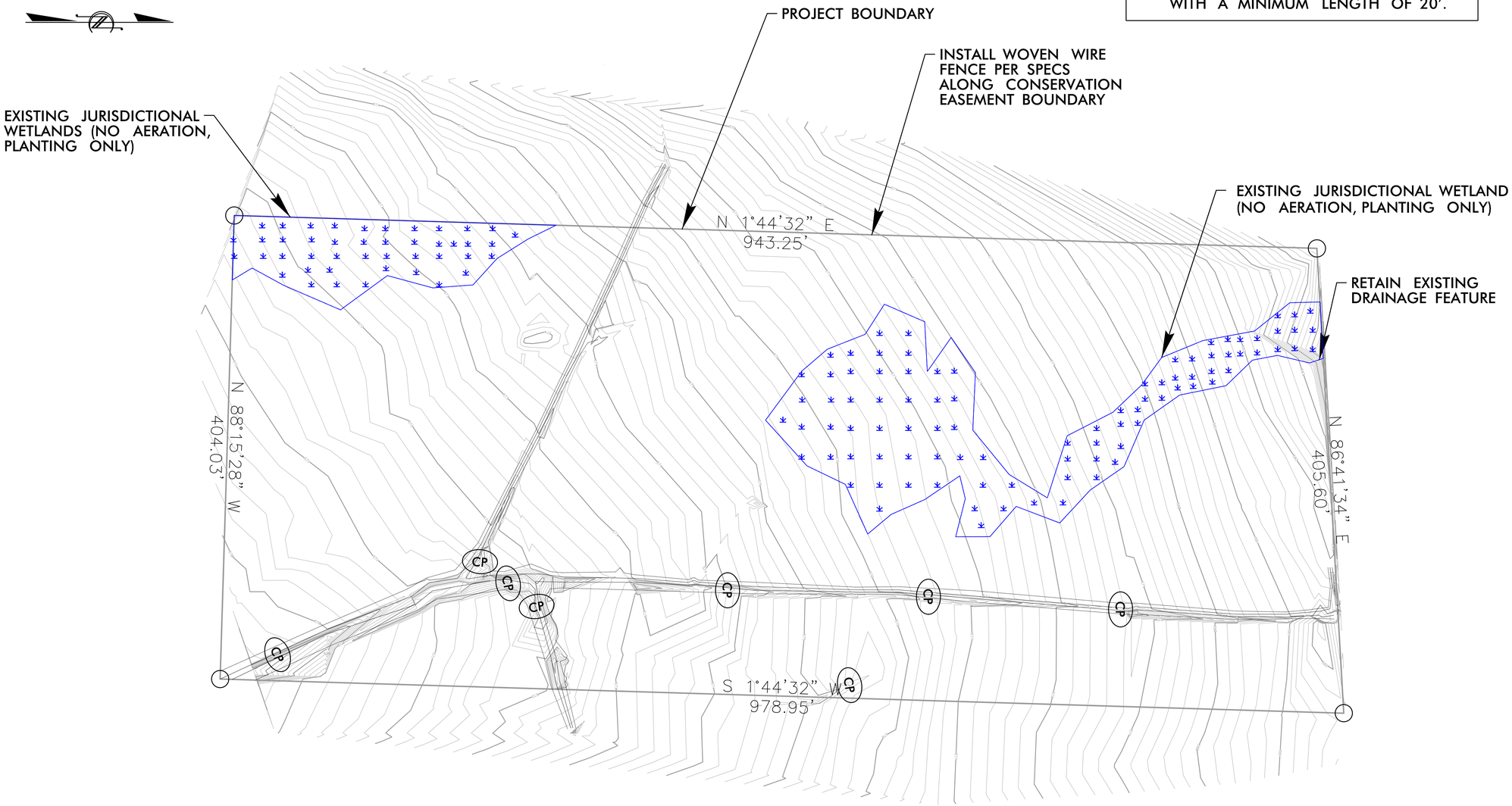
ECOLOGICAL ENGINEERING
NC FIRM LICENSE No: F-1148
1151 SE Cary Parkway
Suite 101
Cary, NC 27518
(919) 557-0929

LEGEND

CP CLAY PLUG

NOTES:

1. CONTRACTOR WILL AERATE NON–JURISDICTIONAL AREAS.
2. CONTOUR INTERVAL SHOWN AT 0.2′.
3. CLAY PLUGS TO BE CONSTRUCTED WITH A MINIMUM LENGTH OF 20′.



25 0 50
SCALE

MOGENSEN MITIGATION, INC.
PO Box 690429
Charlotte, NC 28227
(704) 576-111
CONTACT:
Richard K. Mogensen, President

REVISIONS

TAR RIVER HEADWATERS WETLAND RESTORATION SITE
PERSON COUNTY, NC
GRADING PLAN

DEQ CONTRACT # 6746	30815-003 PROJECT NO.	IMS # 97071
PSH-04	F-1148 FIRM NO.	

HYDRAULIC ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ECOLOGICAL ENGINEERING
NC FIRM LICENSE No: F-1148
1151 SE Cary Parkway
Suite 101
Cary, NC 27518
(919) 557-0929

SITE STABILIZATION PLAN

SOIL AMENDMENTS

SOIL PREPARATION AND AMENDMENT SUMMARY

All Other Areas Within Easement Boundary						Acres	7.8
Mechanical Treatment	Approx. Date	Ground Cover Fabric	Mulch Type	Mulch Density / Thickness	Nutrient Amendments	Nutrient Total lbs	
n/a	n/a	n/a	n/a	n/a	DAP 18-46-0	850	
n/a	n/a	n/a	n/a	n/a	n/a	n/a	
n/a	n/a	n/a	n/a	n/a	n/a	n/a	
					Subtotal	850	
					Total	850	7.8

TEMPORARY SEEDING VEGETATIVE SPECIES

Temporary Seeding Throughout Disturbed Areas				Acres	7.8
Year round	*Secale cereale*	Herb	Grain rye	130 lbs/ac	Single species to be applied
May - September	*Panicum ramosum*	Herb	Brown top millet	40 lbs/ac	
May – September	*Setaria italica*	Herb	German millet	25 lbs/ac	
September – March	*Dactylis glomerata*	Herb	Orchard grass	15 lbs/ac	

PERMANENT SEEDING VEGETATIVE SPECIES

Seeding Summary for Permanent Vegetation per Planting Zone

Wet/Sunny Area				Acres	7.8
Approved Date	Species Name	Stratum	Common Name	Total lbs	Mix to be applied at rate of approx. 20 lbs/ acre
n/a	*Trifolium pratense*	Herb	Red clover	47(30%)	
n/a	*Panicum clandestinum*	Herb	Deer tongue	31 (20%)	
n/a	*Carex vulpinoidea*	Herb	Fox Sedge	23 (15%)	
n/a	*Elymus virginicus*	Herb	Virginia wild rye	23 (15%)	
n/a	*Juncus effusus*	Herb	Soft Rush	16 (10%)	
n/a	*Agrostis perennans*	Herb	Upland bentgrass	16 (10%)	
			Subtotal	156 (100%)	

EXCLUDE WETLAND REHABILITATION AREAS

MOGENSEN MITIGATION, INC.
PO Box 690429
Charlotte, NC 28227
(704) 576-111
CONTACT:
Richard K. Mogensen, President

REVISIONS

TAR RIVER HEADWATERS
WETLAND RESTORATION SITE
PERSON COUNTY, NC
SITE STABILIZATION PLAN

DEQ CONTRACT # 6746
30815-003 PROJECT NO.
IMS # 97071
PSH-05
F-1148 FIRM NO.

HYDRAULIC ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ECOLOGICAL ENGINEERING
NC FIRM LICENSE No: F-1148
1151 SE Cary Parkway
Suite 101
Cary, NC 27518
(919) 557-0929

LEGEND

TREE PLANTING AREA

25 0 50
SCALE

MOGENSEN MITIGATION, INC.
PO Box 690429
Charlotte, NC 28227
(704) 576-111
CONTACT:
Richard K. Mogensen, President

REVISIONS

TAR RIVER HEADWATERS WETLAND RESTORATION SITE

PERSON COUNTY, NC

SEEDING PLAN

DEQ CONTRACT # 6746	30815-003 PROJECT NO.	IMS # 97071
PSH-06	F-1148 FIRM NO.	

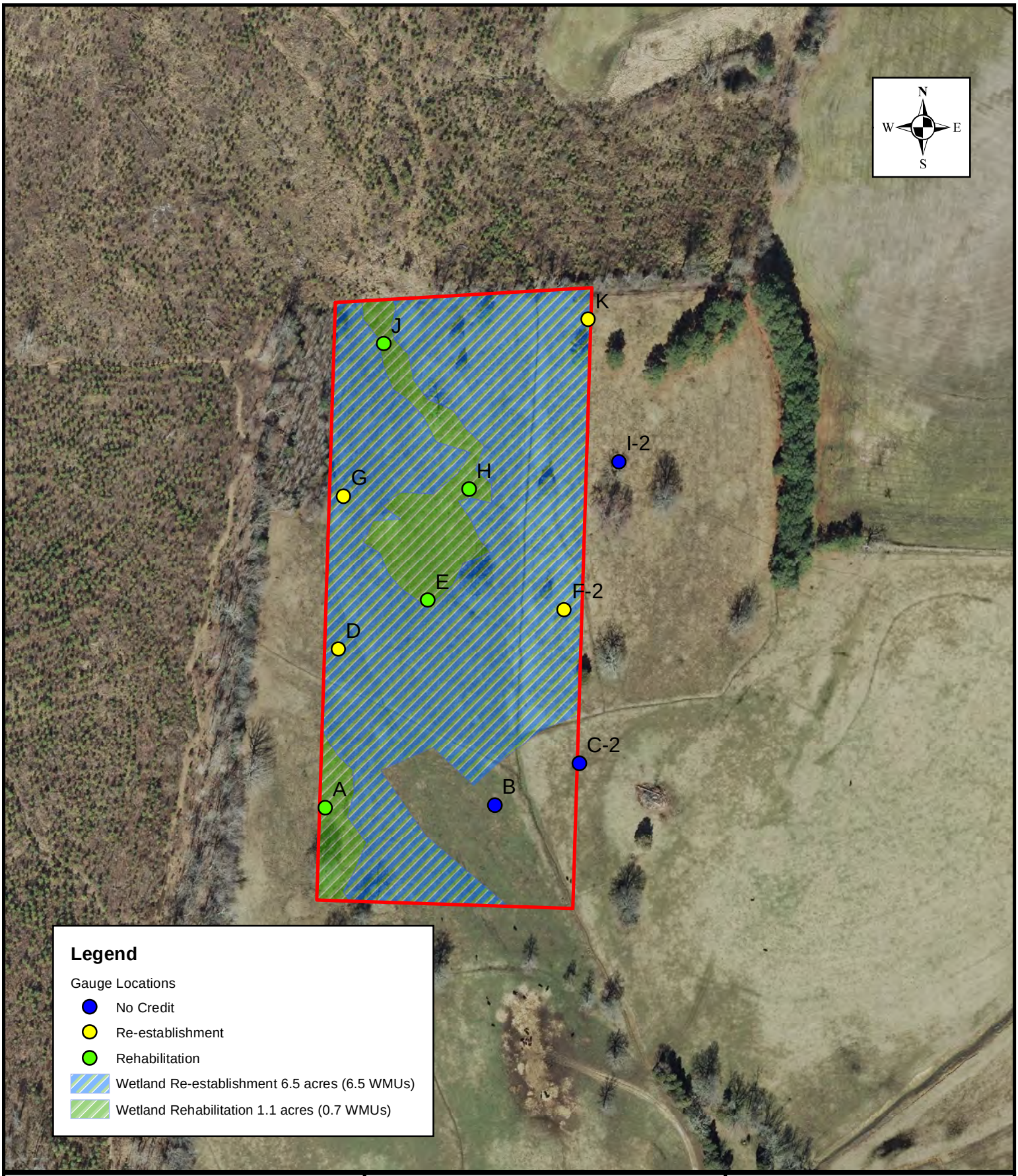
HYDRAULIC ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ECOLOGICAL ENGINEERING
NC FIRM LICENSE No: F-1148
1151 SE Cary Parkway
Suite 101
Cary, NC 27518
(919) 557-0929

Appendix 2.

Hydrologic Data



Prepared By:

ECOLOGICAL ENGINEERING
1151 SE Cary Parkway, Suite 101 · Cary NC 27518

Pre-Restoration Gauge Locations
Tar River Headwaters Wetland Restoration Site
Person County, NC

0 100 200
1" = 200'

Water Budget Methodology and Input Data

Development of the water budget follows equations presented in the Engineering Field Handbook (USDA, 1997). The following equations were used to determine the inflow, outflow and water available for storage on-site.

$\Delta S/\Delta t = Q_i - Q_o$

Where: $\Delta S/\Delta t$ = change in water volume per unit time
Q_i = flow rate of water entering wetland
Q_o = flow rate of water exiting wetland

$Q_i = P + R_i + B_i + G_i + P_i + T_i$

Where: P = direct precipitation
R_i = stormwater runoff from contributing drainage area
B_i = base flow from streams entering wetland
G_i = groundwater entering wetland
P_i = water pumped or artificially added to the wetland
T_i = tidal flow into wetland

$Q_o = R + T + R_o + B_o + G_o + P_o + T_o$

Where: E = evaporation from surface
T = transpiration
R_o = stormwater runoff from site
B_o = base flow leaving wetland
G_o = groundwater leaving wetland
P_o = water pumped or artificially removed from wetland
T_o = tidal flow out of wetland

Inflow

Precipitation

The average annual precipitation over the last 30 years was 42.36 inches, per the USDA Field Office Climate Data as recorded in Roxboro. Over the square footage of the property and contributing watershed, a volume of 4,443,860 ft^3 of rainfall was calculated.

Stormwater Runoff

The stormwater runoff was calculated using an equation presented in the Michigan Division of Transportation Drainage Manual.

Determine weighted curve number for watershed:
$CN_{weighted}=(\Sigma CN_i * A_i)/\Sigma A_i$

CN_i= NRCS curve number for sub-area i
A_i= Number of sub-areas

Determine minimum amount of precipitation that will cause runoff:
$I=0.2((1000/CN_{weighted})-10$
Contributing Watershed Surface Water Runoff
I= 0.2((1000/80.5)
Calculate surface runoff based on runoff triggering events: (See spreadsheet)

$SRO= (P-0.2S)^2/(P+0.8S)$ (inches)
$S=[(1000/CN)-10]$ (inches)

It was assumed the surface water runoff from the contributing watershed left the project site through the main north-south ditch.

Base Flow
Base flow is assumed to be zero.

Groundwater Flow
The groundwater flow was assumed to be constant pre- and post-restoration.

Artificially Added Water
There is no water artificially added to the project site.

Tidal Flow
The water level in the wetlands is not influenced by tidal flows.

Outflow

Evapotranspiration (E + T)
The loss of water due to evaporation and transpiration (ET) was calculated using the Thornthwaite Method. Temperature data was obtained from the USDA Field Office Climate Data as recorded in Roxboro.

$ET = 1.6*(10*T_a / I)^a$

Where: ET = Evapotranspiration
T_a = mean monthly air temperature (^oC)
I = heat index over 12 months
$a = 0.49 + 0.0179*I - 0.0000771*I^2 + 0.000000675*I^3$

I = sum of 12 i values
$i = (T_a / 5)^{1.514}$

Where: i = monthly heat index
T_a = mean monthly air temperature (^oC)

Water loss due to evapotranspiration pre-restoration is 27 inches per year (877,912 ft^3/year) due to a heat index of 63.72. The value of "a" calculates to 1.492.

Water loss due to evapotranspiration post-restoration is 41 inches per year, assuming a forested land cover (1,324587 ft^3/year). (Oishi, C. et al, 2010)

The evapotranspiration of the contributing watershed was assumed to remain constant pre- and post-restoration.

Stormwater Runoff
Stormwater runoff was assumed to leave only from the 8.9 acres restoration site in the post restoration condition. The runoff from the contributing watershed remains on-site during the post restoration condition. (See spreadsheet)

Base Flow

Base flow is assumed to be zero.

Groundwater Flow

The groundwater flow was assumed to be constant pre- and post-restoration.

Artificially Added Water

There is no water artificially removed from the project site.

Tidal Flow

The water level in the wetlands is not influenced by tidal flows.

Summary

Inflow Pre-Restoration

$P = 4{,}443{,}860\ ft^3$
$R_i = 0\ ft^3$
$B_i = 0\ ft^3$
$G_i = 0\ ft^3$
$P_i = 0\ ft^3$
$T_i = 0\ ft^3$

$$Q_i = 4{,}443{,}860\ ft^3$$

Outflow Pre-Restoration

$E + T = 877{,}912\ ft^3$
$R_o = 384{,}543\ ft^3$ (contributing watershed) + $252{,}488 ft^3$(easement with pasture)
$B_o = 0\ ft^3$
$G_o = 0\ ft^3$
$P_o = 0\ ft^3$
$T_o = 0\ ft^3$

$$Q_o = 1{,}514{,}943\ ft^3$$

Volume Pre-Restoration

$Q_i = 4{,}443{,}860\ ft^3$
$Q_o = 1{,}514{,}943\ ft^3$

$$\Delta S/\Delta t = 2{,}928{,}917\ ft^3/year\ (\text{Pre-Restoration})$$

Inflow Post-Restoration

$P = 4{,}443{,}860\ ft^3$
$R_i = 384{,}543\ ft^3$ (contributing watershed)
$B_i = 0\ ft^3$
$G_i = 0\ ft^3$
$P_i = 0\ ft^3$
$T_i = 0\ ft^3$

$$Q_i = 4{,}828{,}403\ ft^3$$

Outflow Post-Restoration

$E + T = 1{,}324{,}587\ ft^3$
$R_o = 108{,}001$(easement with forest)
$B_o = 0\ ft^3$
$G_o = 0\ ft^3$
$P_o = 0\ ft^3$
$T_o = 0\ ft^3$

$$Q_o = 1{,}432{,}588\ ft^3$$

Volume Post-Restoration

$Q_i = 4{,}828{,}403\ ft^3$
$Q_o = 1{,}432{,}588\ ft^3$

$$\Delta S/\Delta t = 3{,}395{,}815\ ft^3/year\ \text{(Post-Restoration)}$$

Difference Pre- and Post-Restoration

$3{,}395{,}815\ ft^3/year - 2{,}928{,}917\ ft^3/year = 466{,}898 ft^3/year$

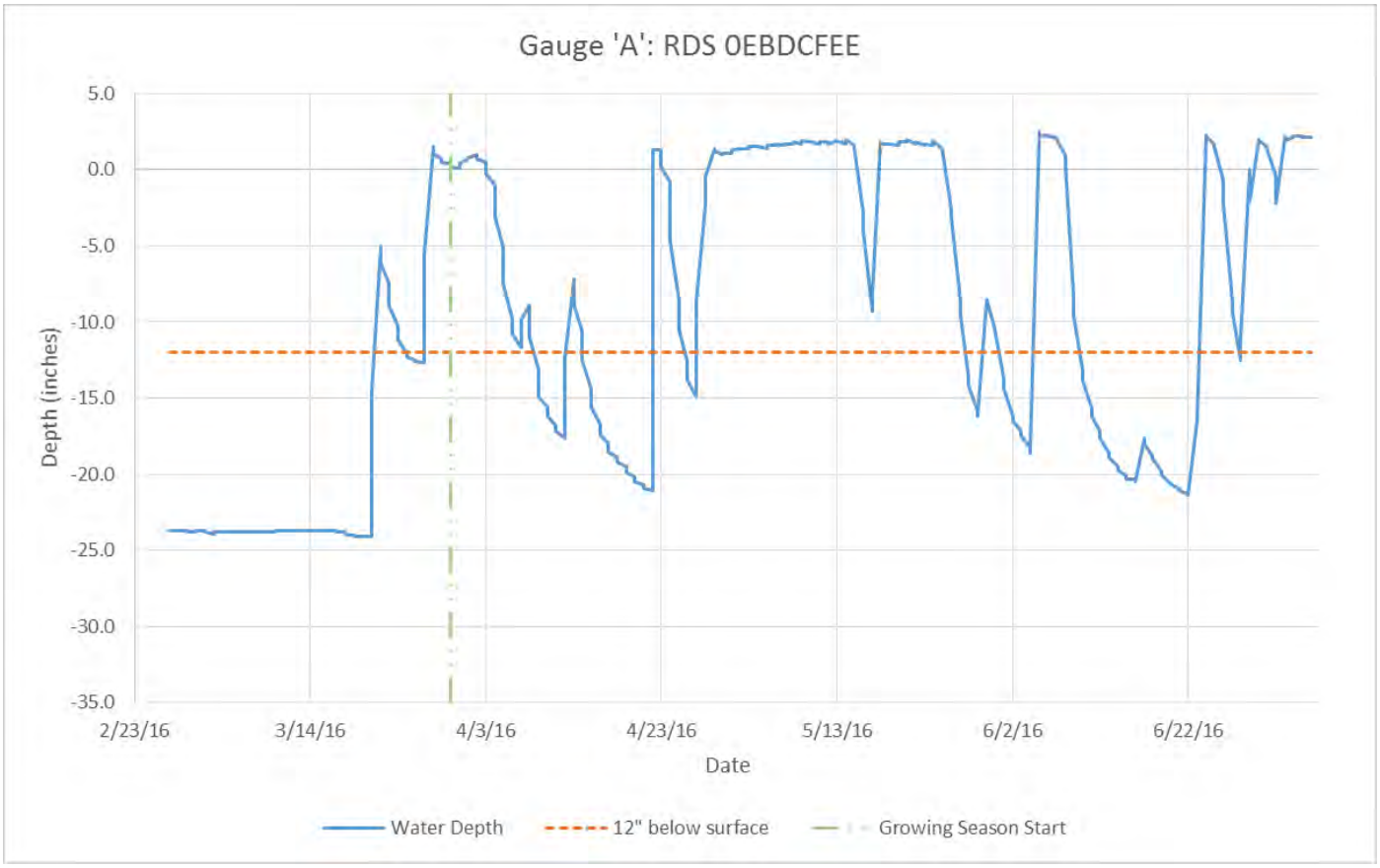
This is equivalent to 1.20 feet of water across the 8.92 acres project site.

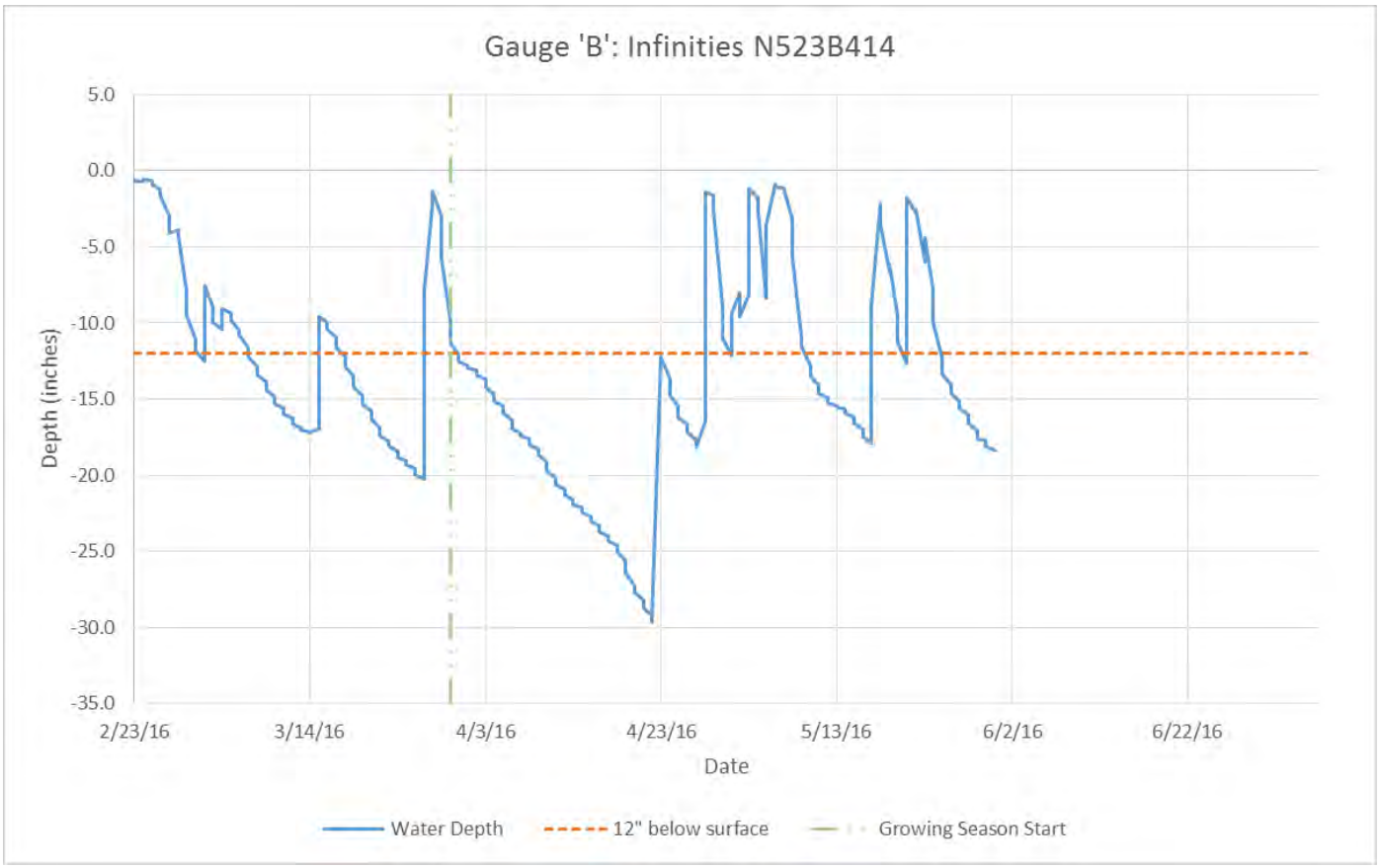
The water budget results verify the presence of increased water on-site and by assuming that base groundwater flow pre- and post-restoration are constant, these calculations present a conservative estimate of available water.

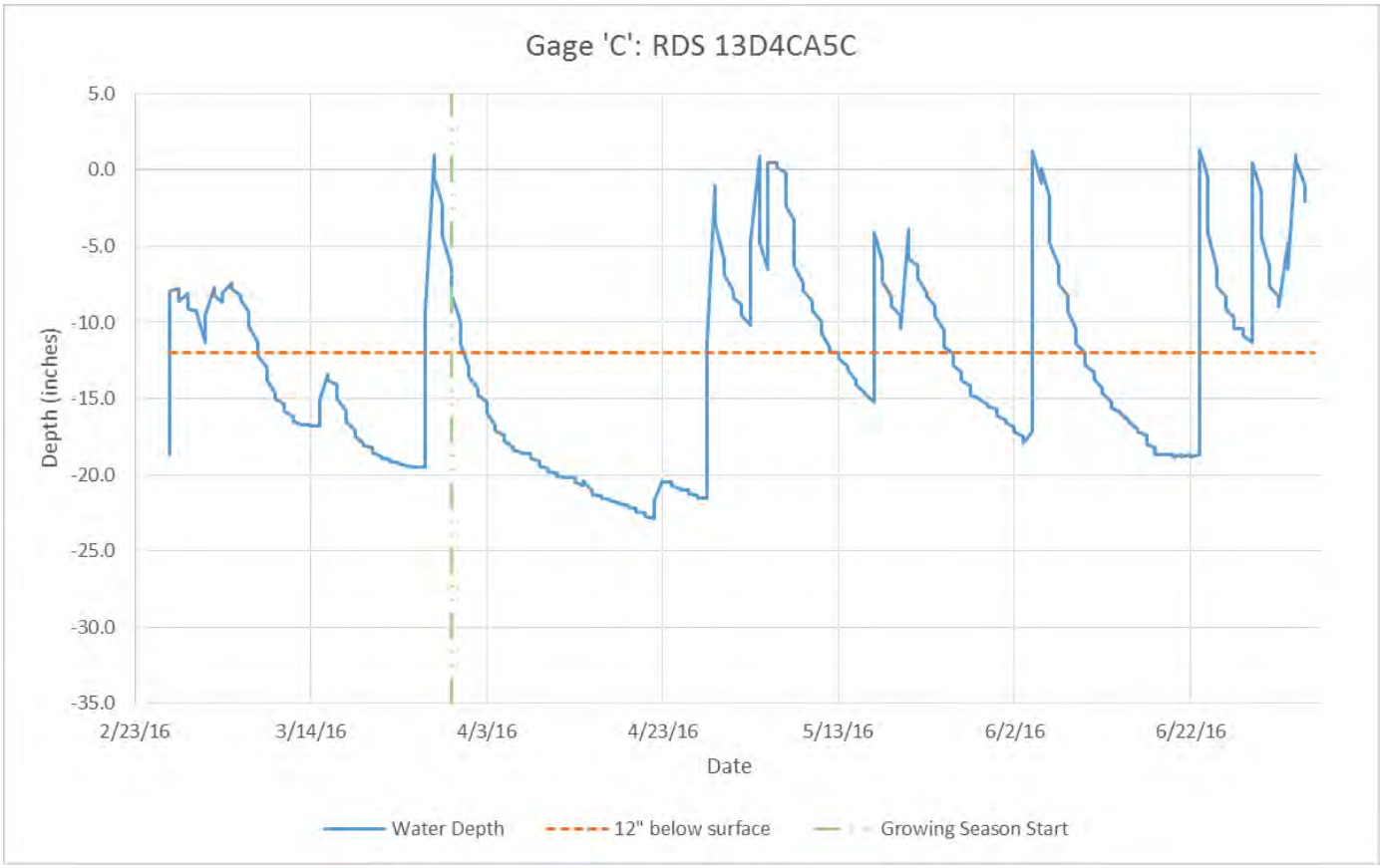
Water Budget Surface Water Runoff Calculations Spreadsheet				
Month	2015 Rainfall EventsTriggering Surface Water Runoff	SRO Fair Pasture Site Pre-Restoration (CN=84) (in)	SRO Good Forest Post Restoration (CN=77) (in)	SRO Contributing Watershed (CN=80.5) (in)
Forumulas		P-(0.2*(S^2))/(1.02+(0.8*S))	P-(0.2*(S^2))/(1.02+(0.8*S))	P-(0.2*(S^2))/(1.02+(0.8*S))
Jan	1.02	0.161259843	0.051578947	0.099183673
	0.42	0.000824742		
Feb	0.85	0.093206751	0.019230769	0.049422383
	0.39	5.2356E-05		
	0.41	0.000466321		
	0.61	0.024835681	3.32226E-05	0.006679842
	1.13	0.212264151	0.079575071	0.13852459
	0.7	0.046126126	0.003225806	0.018473282
March	0.51	0.008325123		0.00037037
	0.41	0.000466321		
	0.65	0.03359447	0.000819672	0.011245136
Apr	0.96	0.135645161		0.08
	0.49	0.0060199		4.14938E-05
	0.75	0.06030837	0.007142857	0.027303371
May	1.18	0.237037037	0.09396648	0.158064516
	0.43	0.001282051		
	1.43	0.373728814	0.179869452	0.269402985
	0.78	0.069565217	0.010188679	0.033333333
	0.76	0.063333333	0.008101266	0.029253731
June	1.83	0.62761194	0.357659574	0.486
	0.45	0.00248731		
	0.59	0.020900474		0.004820717
	0.62	0.026915888	0.00013245	0.007716535
	0.62	0.026915888	0.00013245	0.007716535
	1.52	0.4275	0.215918367	0.314418605
July	1.17	0.232007435	0.091008403	0.15407767
	0.42	0.000824742		
	0.42	0.000824742		
	0.58	0.019047619		0.004
Aug	0.87	0.100460251	0.022293578	0.054516129
	0.46	0.003232323		
	0.73	0.054444444	0.005399361	0.023584906
	1.47	0.39735786	0.195581395	0.289115044
	0.98	0.144	0.042721893	0.086206897
Sept.	1.94	0.703352601	0.413732719	0.552227979
	0.39	5.2356E-05		
	0.62	0.026915888	0.00013245	0.007716535
	1.77	0.587264438	0.328273381	0.45097561
	0.74	0.057345133	0.006242038	0.025413534
Oct.	0.68	0.040909091	0.002077922	0.015384615
	0.47	0.004070352		
	0.6	0.022830189		0.005714286
	0.54	0.012427184		0.001463415
	1.72	0.554197531	0.304466019	0.422417582
Nov.	0.77	0.066419214	0.009116719	0.031263941
	0.67	0.038401826	0.001596091	0.013938224
	0.84	0.089661017	0.017777778	0.046956522
	1.29	0.294697509	0.12902439	0.204392523
	1.24	0.267971014	0.112527473	0.18278481
	0.72	0.051607143	0.004615385	0.021818182
Dec.	0.68	0.040909091	0.002077922	0.015384615
	0.72	0.051607143	0.004615385	0.021818182
	0.57	0.017272727		0.003253012
	1.27	0.28390681	0.122316076	0.195642633
	1.31	0.305618375	0.135876011	0.213281734
	1.83	0.62761194	0.357659574	0.486
	0.74	0.057345133	0.006242038	0.025413534
sum	48.73	7.815266391	3.342949069	5.296733214

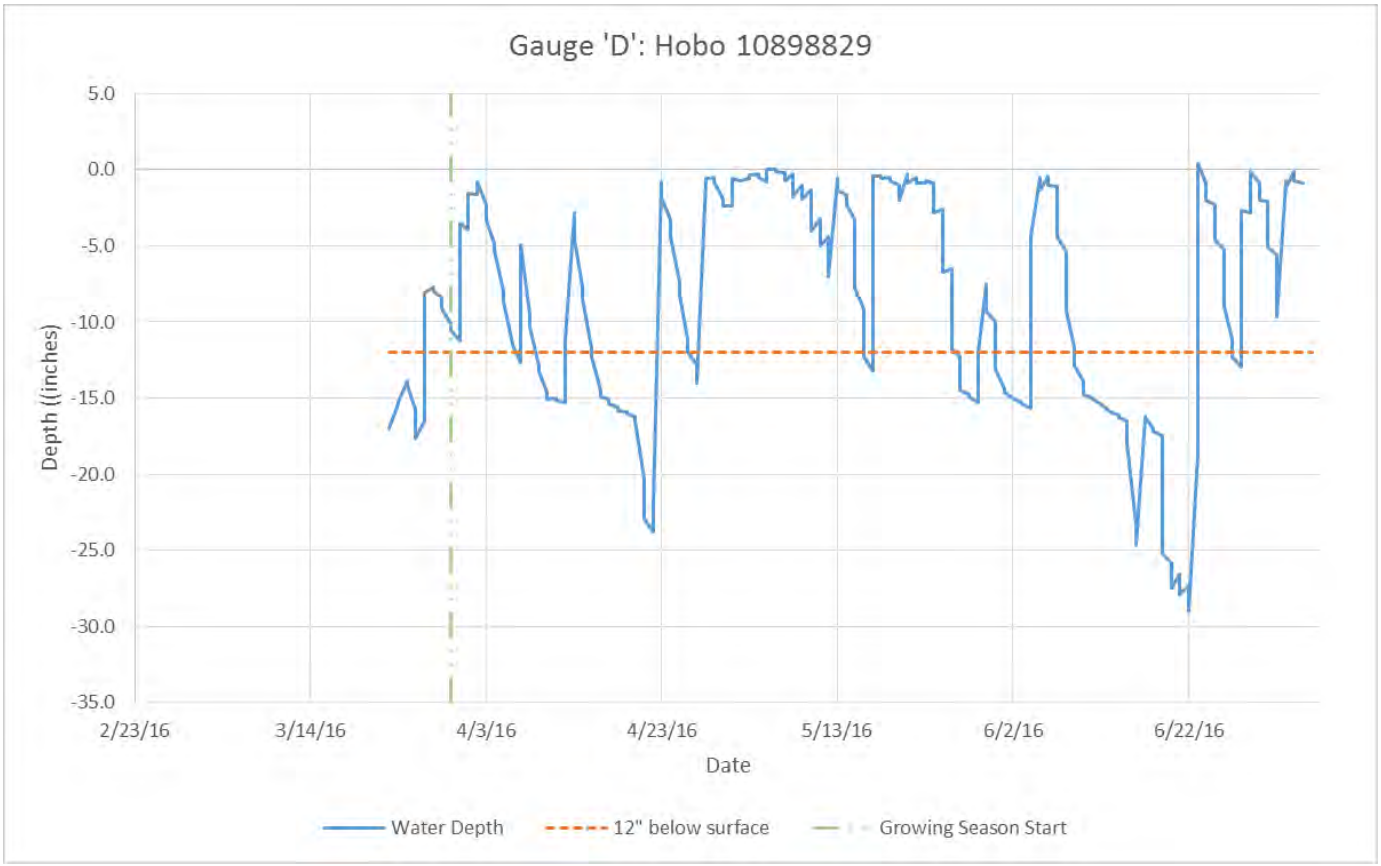
ft/year	0.651272199	0.278579089	0.441394434

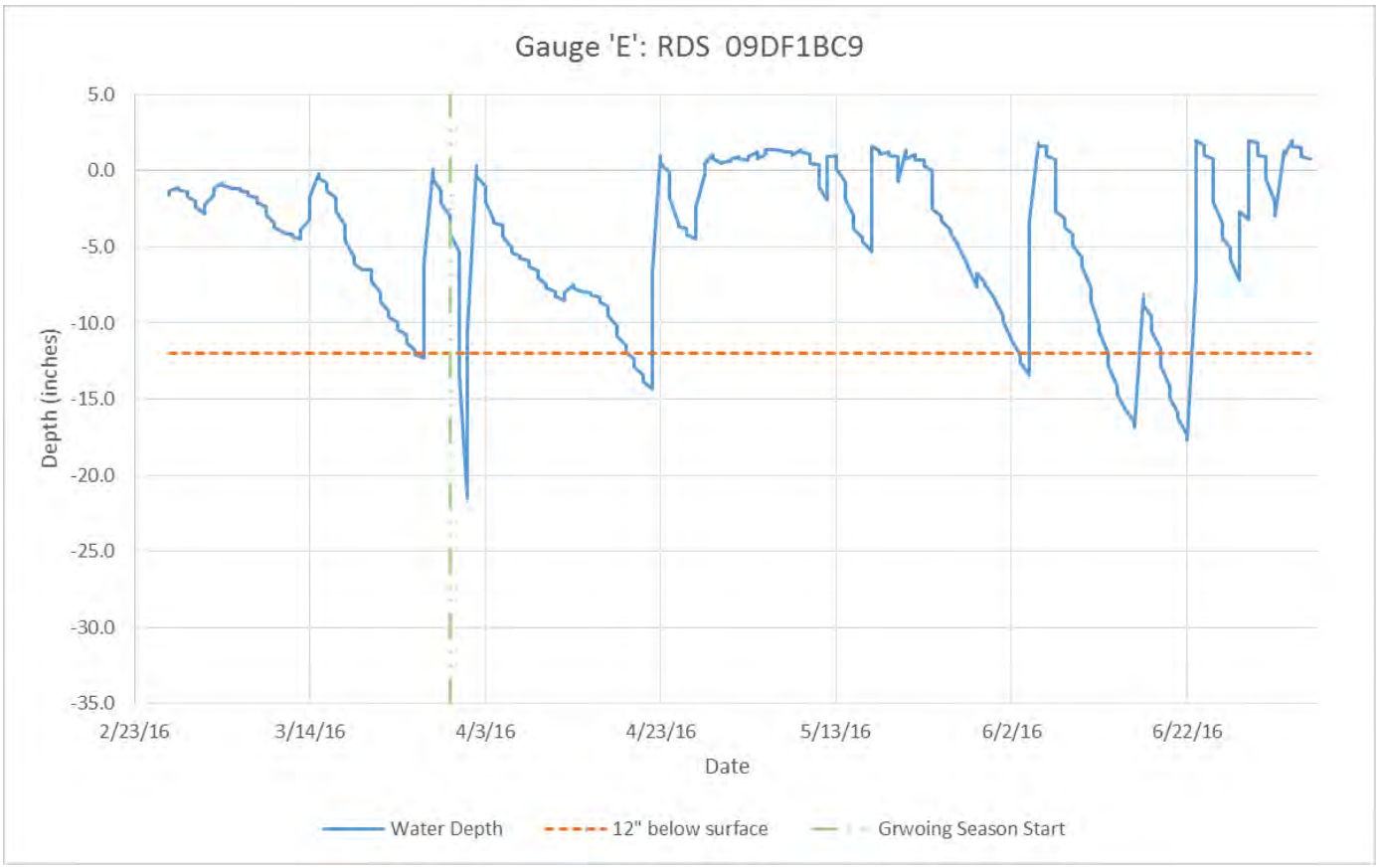
Surface Water Runoff Event Minimum I=0.38"	Surface Water Runoff Event Minimum I=0.6"	Surface Water Runoff Event Minimum I=0.48"
Volume=0.651272199*8.9 acres	Volume=0.278579089*8.9 acres	Volume=0.441394434*20 acres
Volume=252,488ft^3/year	Volume=108,001ft^3/year	Volume=384,543ft^3/year

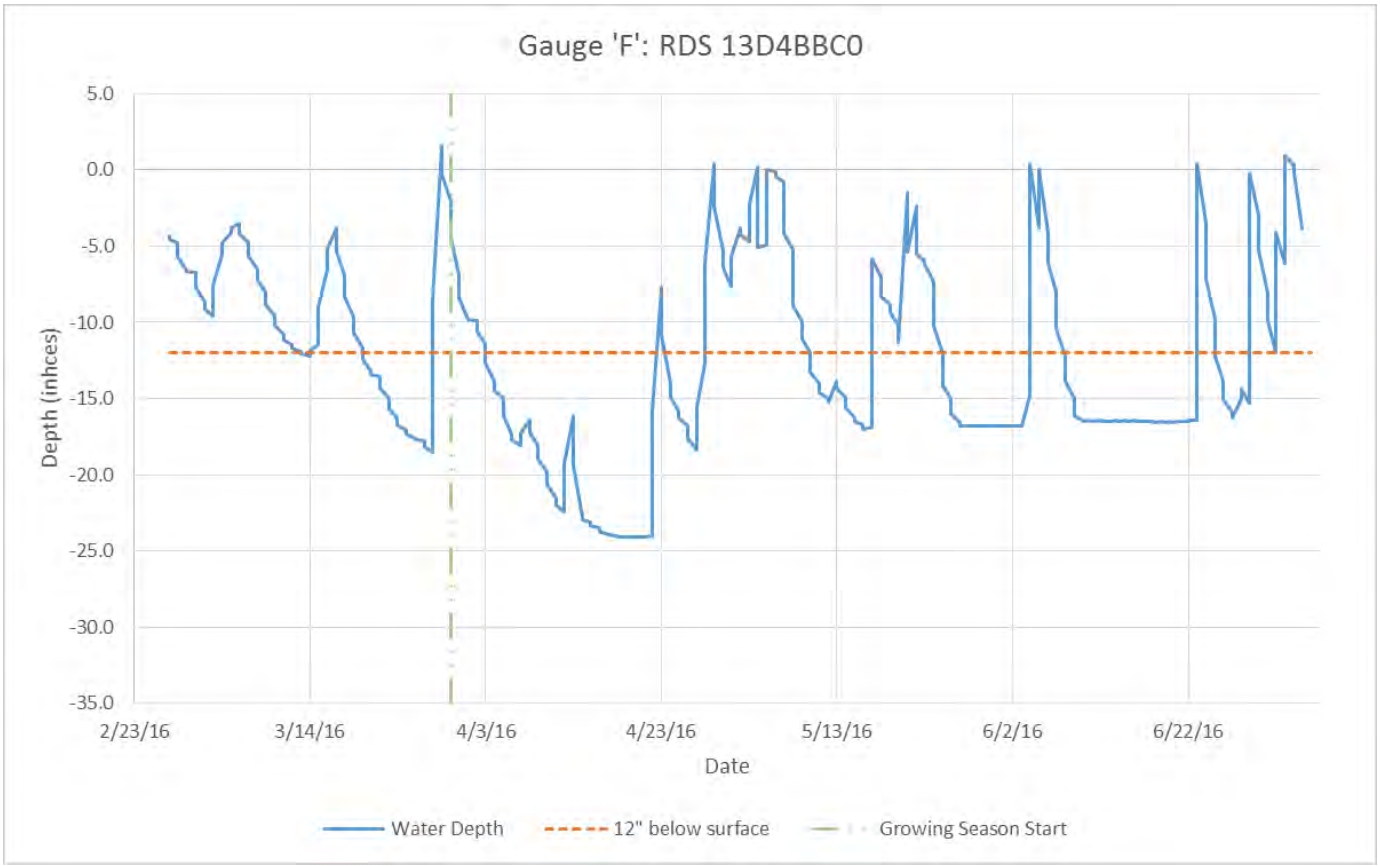

Gauge 'A': RDS 0EBDCFEE
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
Depth (inches)
2/23/16
3/14/16
4/3/16
4/23/16
5/13/16
6/2/16
6/22/16
Date
Water Depth
12" below surface
Growing Season Start

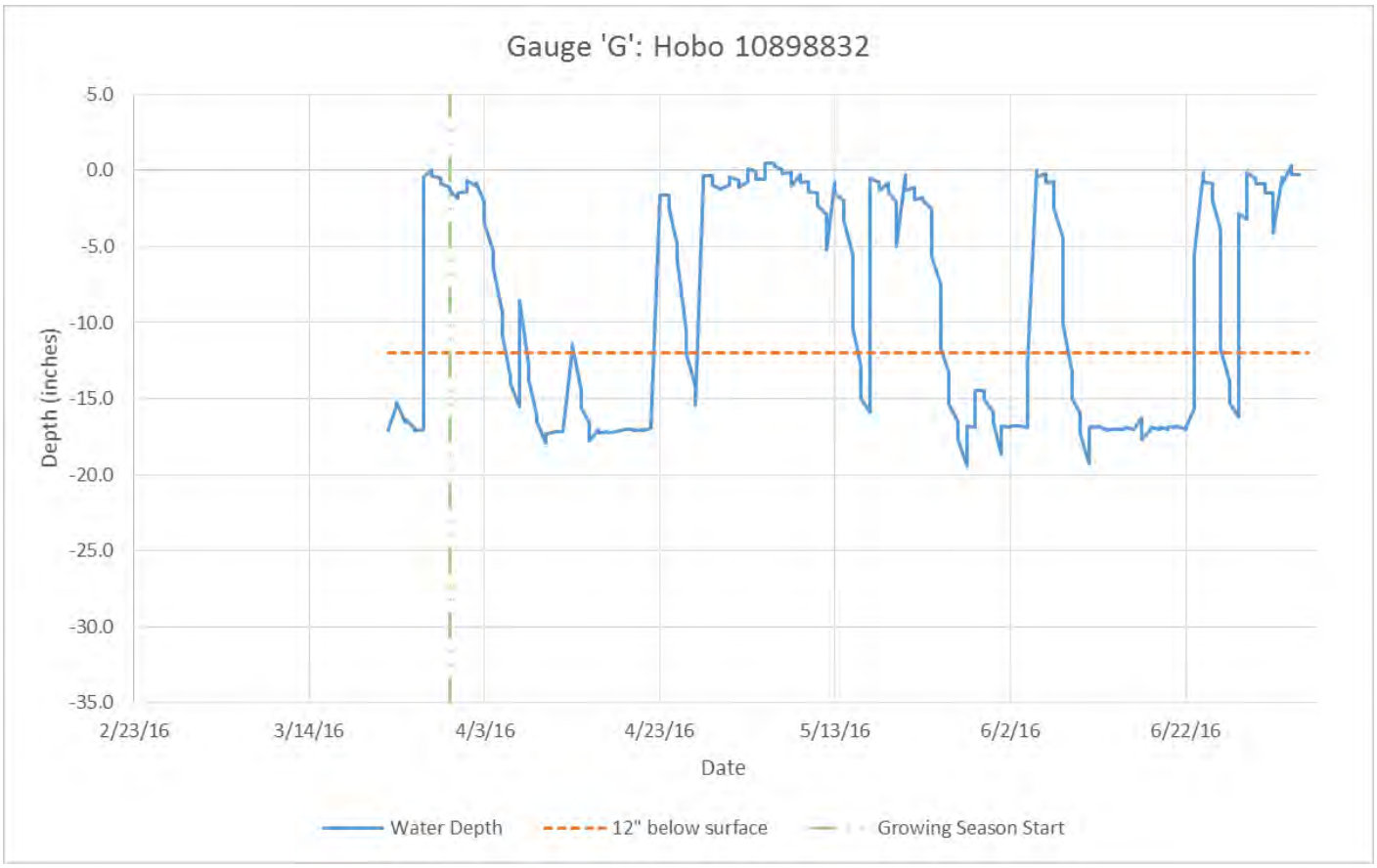

Gauge 'B': Infinities N523B414
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
Depth (inches)
2/23/16
3/14/16
4/3/16
4/23/16
5/13/16
6/2/16
6/22/16
Date
Water Depth
12" below surface
Growing Season Start

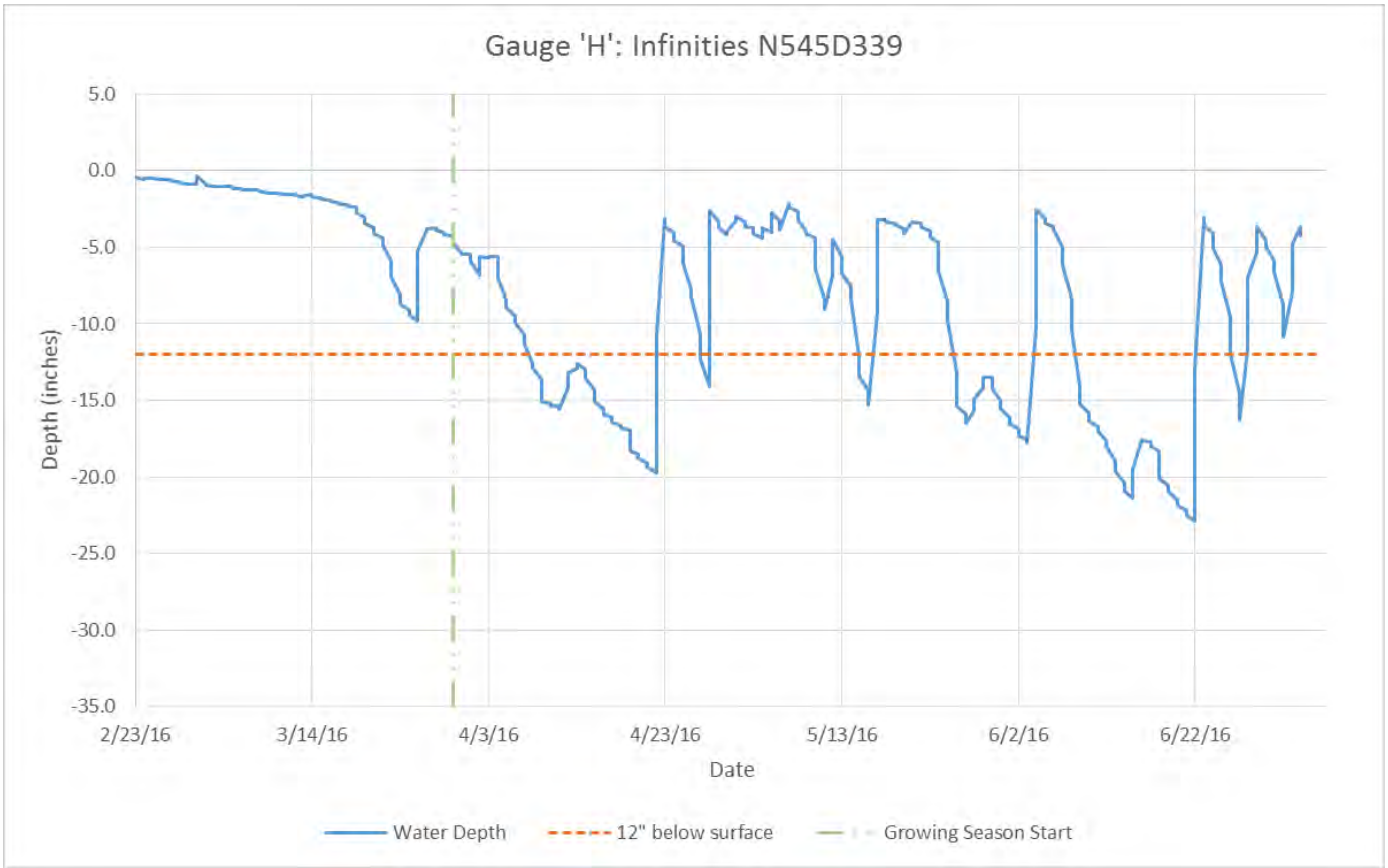

Gage 'C': RDS 13D4CA5C
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
Depth (inches)
2/23/16
3/14/16
4/3/16
4/23/16
5/13/16
6/2/16
6/22/16
Date
Water Depth
12" below surface
Growing Season Start

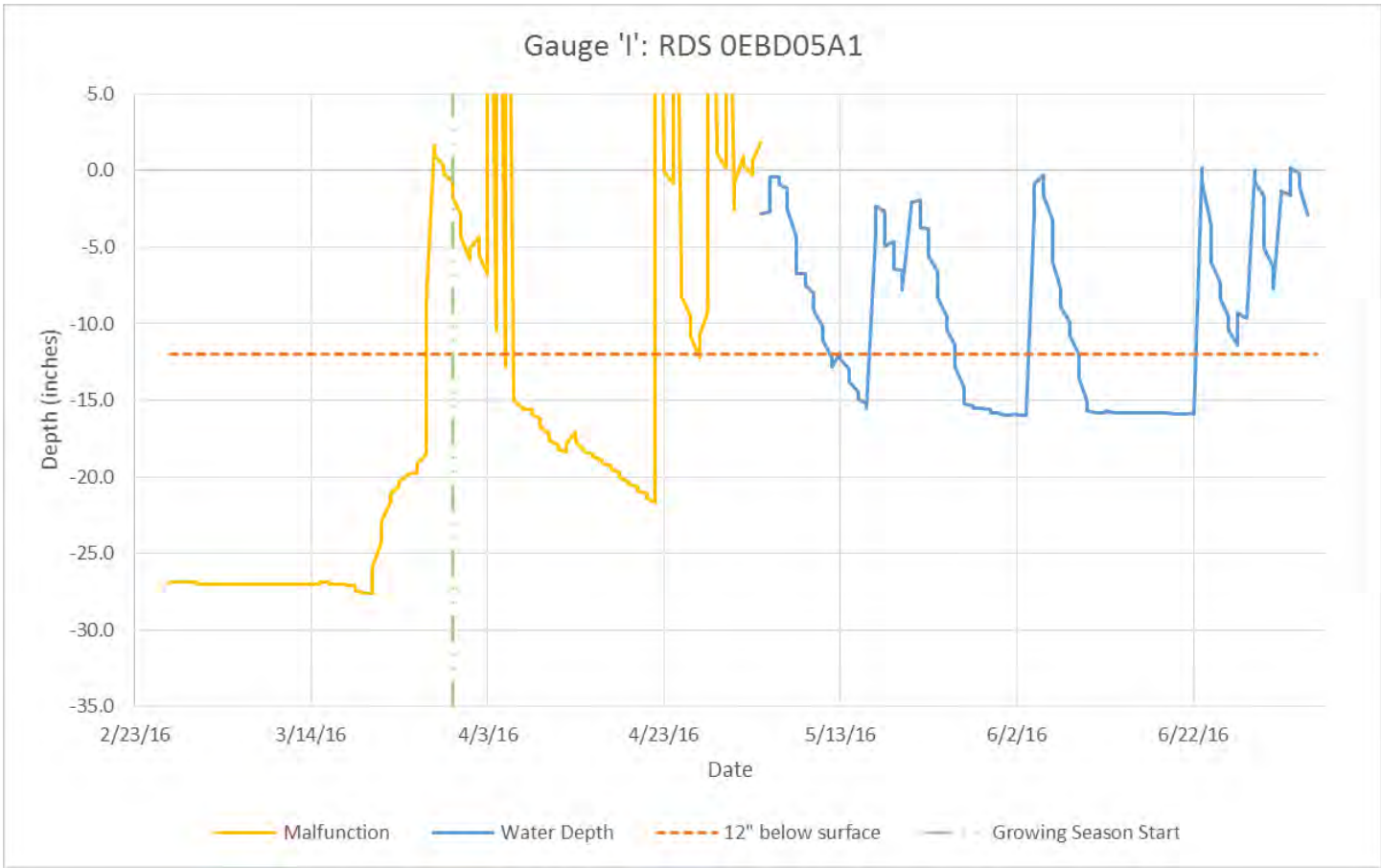

Gauge 'D': Hobo 10898829
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
Depth ((inches)
2/23/16
3/14/16
4/3/16
4/23/16
5/13/16
6/2/16
6/22/16
Date
Water Depth
12" below surface
Growing Season Start

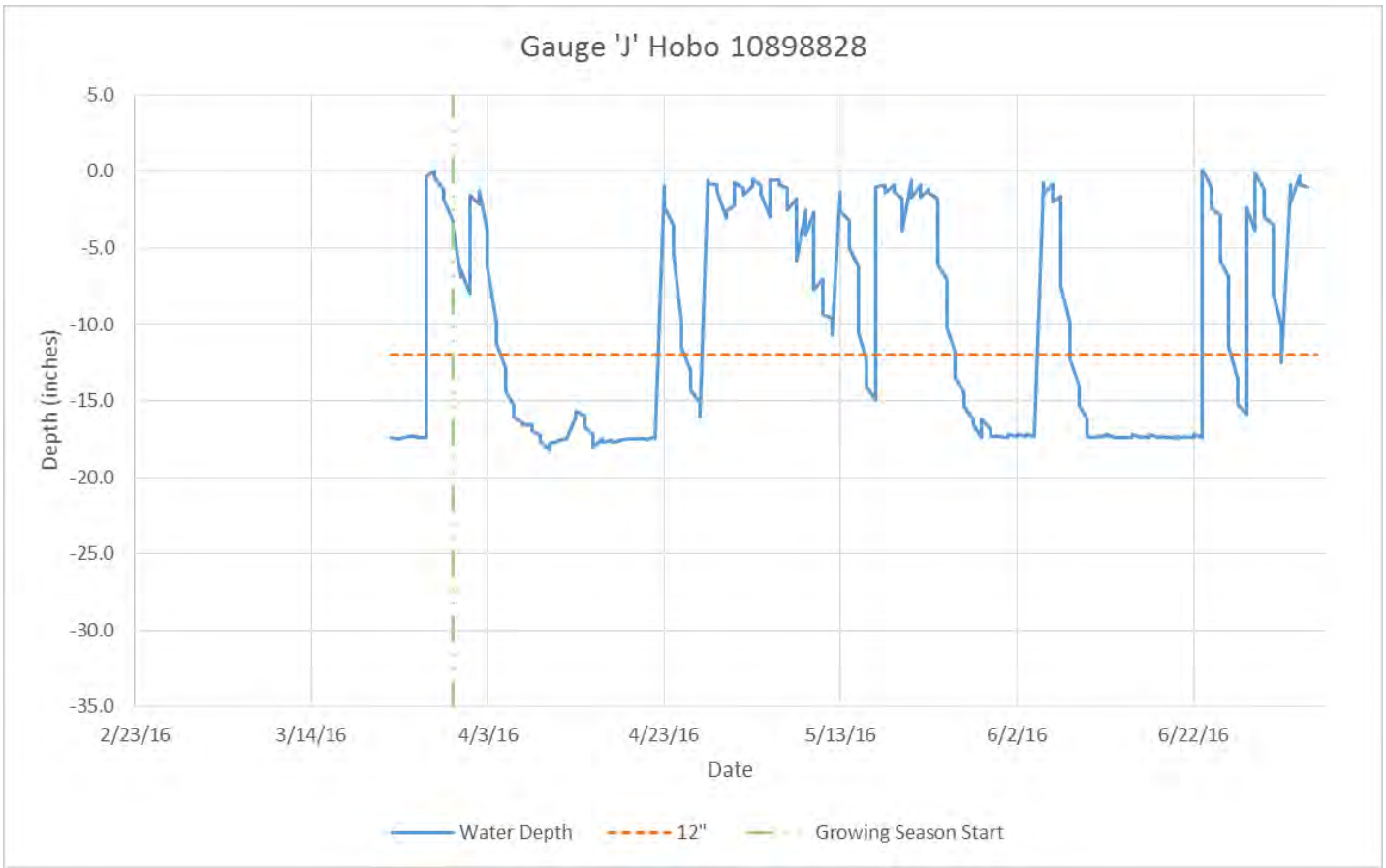

Gauge 'E': RDS 09DF1BC9
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
Depth (inches)
2/23/16
3/14/16
4/3/16
4/23/16
5/13/16
6/2/16
6/22/16
Date
Water Depth
12" below surface
Grwoing Season Start

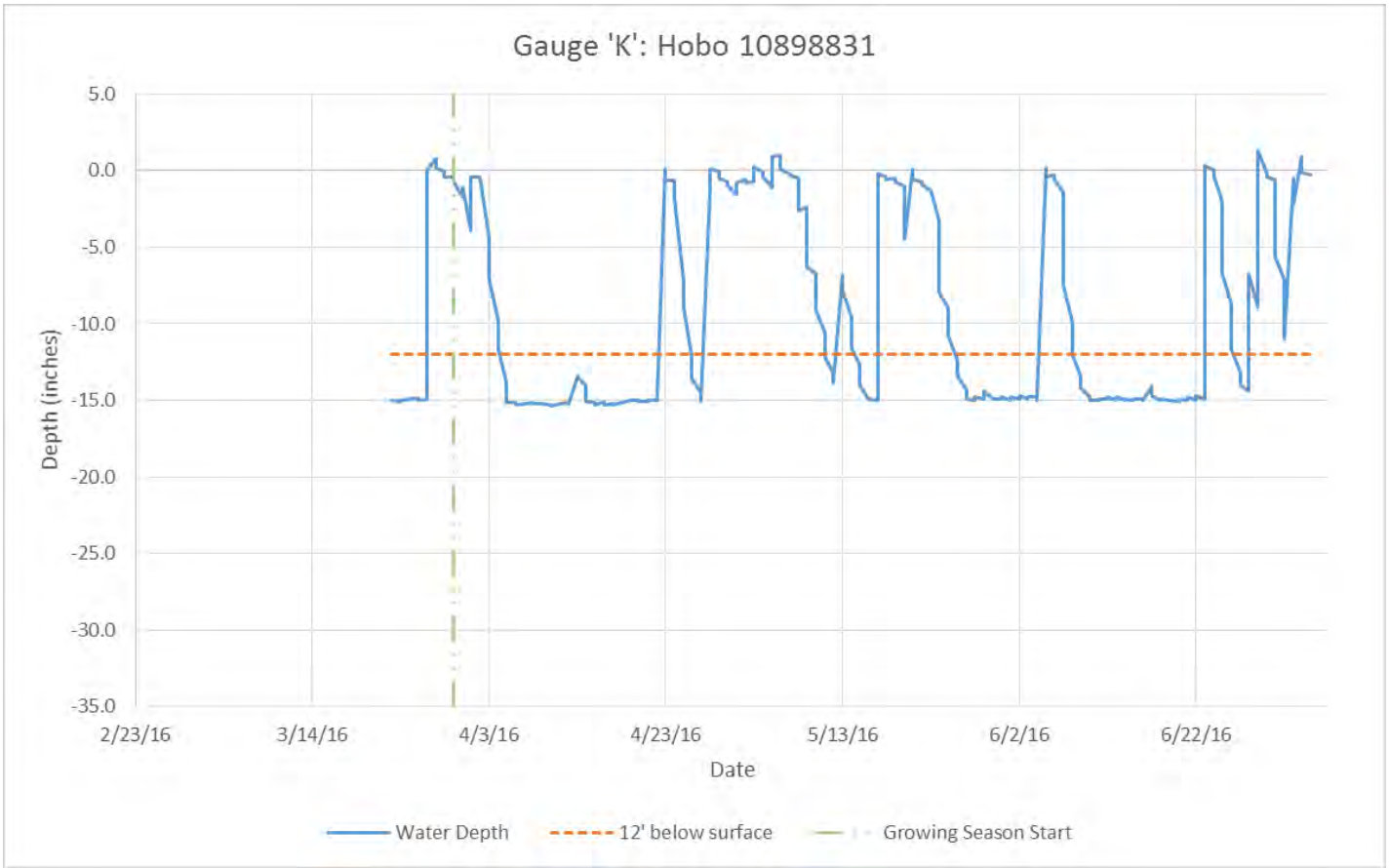

Gauge 'F': RDS 13D4BBC0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
Depth (inhces)
2/23/16
3/14/16
4/3/16
4/23/16
5/13/16
6/2/16
6/22/16
Date
Water Depth
12" below surface
Growing Season Start

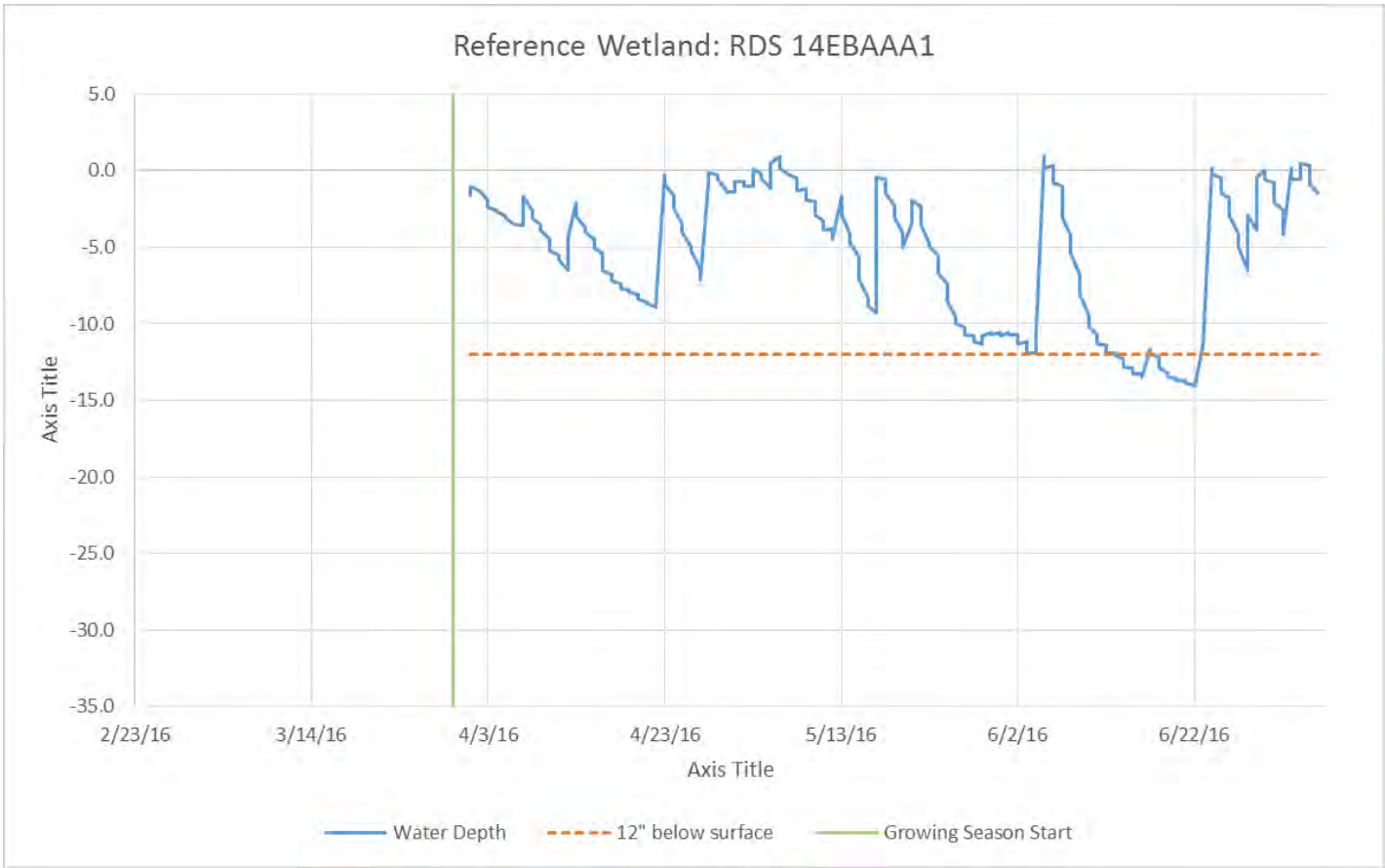

Gauge 'G': Hobo 10898832
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
Depth (inches)
2/23/16
3/14/16
4/3/16
4/23/16
5/13/16
6/2/16
6/22/16
Date
Water Depth
12" below surface
Growing Season Start


Gauge 'H': Infinities N545D339
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
Depth (inches)
2/23/16
3/14/16
4/3/16
4/23/16
5/13/16
6/2/16
6/22/16
Date
Water Depth
12" below surface
Growing Season Start


Gauge 'I': RDS 0EBD05A1
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
Depth (inches)
2/23/16
3/14/16
4/3/16
4/23/16
5/13/16
6/2/16
6/22/16
Date
Malfunction
Water Depth
12" below surface
Growing Season Start


Gauge 'J' Hobo 10898828
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
Depth (inches)
2/23/16
3/14/16
4/3/16
4/23/16
5/13/16
6/2/16
6/22/16
Date
Water Depth
12"
Growing Season Start


Gauge 'K': Hobo 10898831
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
Depth (inches)
2/23/16
3/14/16
4/3/16
4/23/16
5/13/16
6/2/16
6/22/16
Date
Water Depth
12' below surface
Growing Season Start


Reference Wetland: RDS 14EBAAA1
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
Axis Title
2/23/16
3/14/16
4/3/16
4/23/16
5/13/16
6/2/16
6/22/16
Axis Title
Water Depth
12" below surface
Growing Season Start

Appendix 3.

Site Protection Instrument & Survey Plat

FILED in PERSON County, NC
on Sep 26, 2016 at 09:20:46 AM
by: AMANDA W. GARRETT
REGISTER OF DEEDS
Book 933 Page 619

STATE OF NORTH CAROLINA
PERSON COUNTY

DEED OF CONSERVATION EASEMENT AND RIGHT OF ACCESS PROVIDED PURSUANT TO FULL DELIVERY MITIGATION CONTRACT

SPO File Number: SPO File 73-R
DMS Project Number: 97071
Prepared by:
Office of the Attorney General
Property Control Section
Return to: NC Department of Administration
State Property Office
1321 Mail Service Center
Raleigh, NC 27699-1321

THIS DEED OF CONSERVATION EASEMENT AND RIGHT OF ACCESS, made this 26th day of September, 2016, by **ROY N. HUFF** and wife, **JOYCE M. HUFF, "Grantor"**, whose mailing address is; 333 Bunnie Huff Road, Oxford, NC 27565, to the **STATE OF NORTH CAROLINA**, ("**Grantee**"), whose mailing address is; State of North Carolina, Department of Administration, State Property Office, 1321 Mail Service Center, Raleigh, NC 27699-1321. The designations of Grantor and Grantee as used herein shall include said parties, their heirs, successors, and assigns, and shall include singular, plural, masculine, feminine, or neuter as required by context.

WITNESSETH:

WHEREAS, pursuant to the provisions of N.C. Gen. Stat. § 143-214.8 et seq., the State of North Carolina has established the Division of Mitigation Services (formerly known as the Ecosystem Enhancement Program and Wetlands Restoration Program) within the Department of Environmental Quality for the purposes of acquiring, maintaining, restoring, enhancing, creating and preserving wetland and riparian resources that contribute to the protection and improvement of water quality, flood prevention, fisheries, aquatic habitat, wildlife habitat, and recreational opportunities; and

WHEREAS, this Conservation Easement from Grantor to Grantee has been negotiated, arranged and provided for as a condition of a full delivery contract between Mogensen Mitigation, Inc. P.O. Box 690429, Charlotte, NC 28227, and the North Carolina Department of Environmental

Quality, to provide wetland mitigation pursuant to the North Carolina Department of Environmental Quality Purchase and Services Contract Number 6746.

WHEREAS, The State of North Carolina is qualified to be the Grantee of a Conservation Easement pursuant to N.C. Gen. Stat. § 121-35; and

WHEREAS, the Department of Environmental Quality and the United States Army Corps of Engineers, Wilmington District entered into a Memorandum of Understanding, (MOU) duly executed by all parties on November 4, 1998. This MOU recognized that the Wetlands Restoration Program was to provide effective compensatory mitigation for authorized impacts to wetlands, streams and other aquatic resources by restoring, enhancing and preserving the wetland and riparian areas of the State; and

WHEREAS, the Department of Environmental Quality, the North Carolina Department of Transportation and the United States Army Corps of Engineers, Wilmington District entered into a Memorandum of Agreement, (MOA) duly executed by all parties in Greensboro, NC on July 22, 2003, which recognizes that the Division of Mitigation Services (formerly Ecosystem Enhancement Program) is to provide for compensatory mitigation by effective protection of the land, water and natural resources of the State by restoring, enhancing and preserving ecosystem functions; and

WHEREAS, the Department of Environmental Quality, the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, the North Carolina Wildlife Resources Commission, the North Carolina Division of Water Quality, the North Carolina Division of Coastal Management, and the National Marine Fisheries Service entered into an agreement to continue the In-Lieu Fee operations of the Department of Environmental Quality, Division of Mitigation Services, (formerly Ecosystem Enhancement Program) with an effective date of 28 July, 2010, which supersedes and replaces the previously effective MOA and MOU referenced above; and

WHEREAS, the acceptance of this instrument for and on behalf of the State of North Carolina was granted to the Department of Administration by resolution as approved by the Governor and Council of State adopted at a meeting held in the City of Raleigh, North Carolina, on the 8th day of February 2000; and

WHEREAS, the Division of Mitigation Services in the Department of Environmental Quality, which has been delegated the authority authorized by the Governor and Council of State to the Department of Administration, has approved acceptance of this instrument; and

WHEREAS, Grantor owns in fee simple certain real property situated, lying, and being in Oxford Township, Person County, North Carolina (the "**Property**"), and being more particularly described as that certain parcel of land containing approximately 228.34 acres and being a portion of the property conveyed to the Grantor by deed recorded in **Deed Book 302 at Page 041** of the Person County Registry, North Carolina; and

WHEREAS, Grantor is willing to grant a Conservation Easement and Right of Access over the herein described areas of the Property, thereby restricting and limiting the use of the areas of the Property subject to the Conservation Easement to the terms and conditions and purposes hereinafter set forth, and Grantee is willing to accept said Easement and Access Rights. The Conservation Easement shall be for the protection and benefit of the waters of the Tar-Pamlico River.

NOW, THEREFORE, in consideration of the mutual covenants, terms, conditions, and restrictions hereinafter set forth, Grantor unconditionally and irrevocably hereby grants and conveys unto Grantee, its successors and assigns, forever and in perpetuity, a Conservation Easement along with a general Right of Access.

The Conservation Easement Area consists of the following:

Tract "CE-C1" containing a total of 9.98 acres as shown on plat of survey entitled; "Conservation Easement for North Carolina Division of Mitigation Services, Project Name: Tar River Headwaters Wetland Site, SPO File No. **73-R**, DMS Site No. 97071, Property of Roy N. Huff," prepared by Michael T. Brandon, PLS Number L-4922 and recorded in the Person County, North Carolina Register of Deeds in **Plat Book** 16 **Page** 979 **(the "Plat");** together with a perpetual Right of Access over and across the Property in the area depicted on the Plat as "Exist. Farm Road/Access Easement" for the purposes set forth in Article III.

The purposes of this Conservation Easement are to maintain, restore, enhance, construct, create and preserve wetland and/or riparian resources in the Conservation Easement Area that contribute to the protection and improvement of water quality, flood prevention, fisheries, aquatic habitat, wildlife habitat, and recreational opportunities; to maintain permanently the Conservation Easement Area in its natural condition, consistent with these purposes; and to prevent any use of the Easement Area that will significantly impair or interfere with these purposes. To achieve these purposes, the following conditions and restrictions are set forth:

I. DURATION OF EASEMENT

Pursuant to law, including the above referenced statutes, this Conservation Easement and Right of Access shall be perpetual and it shall run with, and be a continuing restriction upon the use of, the Property, and it shall be enforceable by the Grantee against the Grantor and against Grantor's heirs, successors and assigns, personal representatives, agents, lessees, and licensees.

II. GRANTOR RESERVED USES AND RESTRICTED ACTIVITIES

The Conservation Easement Area shall be restricted from any development or usage that would impair or interfere with the purposes of this Conservation Easement. Unless expressly reserved as a compatible use herein, any activity in, or use of, the Conservation Easement Area by the Grantor is prohibited as inconsistent with the purposes of this Conservation Easement. Any rights not expressly reserved hereunder by the Grantor have been acquired by the Grantee. Any rights not expressly reserved hereunder by the Grantor, including the rights to all mitigation credits, including, but not limited to, stream, wetland, and riparian buffer mitigation units,

derived from each site within the area of the Conservation Easement, are conveyed to and belong to the Grantee. Without limiting the generality of the foregoing, the following specific uses are prohibited, restricted, or reserved as indicated:

A. **Recreational Uses.** Grantor expressly reserves the right to undeveloped recreational uses, including hiking, bird watching, hunting and fishing, and access to the Conservation Easement Area for the purposes thereof.

B. **Motorized Vehicle Use.** Motorized vehicle use in the Conservation Easement Area is prohibited except within a Crossing Area(s) or Road or Trail as shown on the recorded survey plat.

C. **Educational Uses.** The Grantor reserves the right to engage in and permit others to engage in educational uses in the Conservation Easement Area not inconsistent with this Conservation Easement, and the right of access to the Conservation Easement Area for such purposes including organized educational activities such as site visits and observations. Educational uses of the property shall not alter vegetation, hydrology or topography of the site.

D. **Damage to Vegetation.** Except within Crossing Area(s) as shown on the recorded survey plat and as related to the removal of non-native plants, diseased or damaged trees, or vegetation that destabilizes or renders unsafe the Conservation Easement Area to persons or natural habitat, all cutting, removal, mowing, harming, or destruction of any trees and vegetation in the Conservation Easement Area is prohibited.

E. **Industrial, Residential and Commercial Uses.** All industrial, residential and commercial uses are prohibited in the Conservation Easement Area.

F. **Agricultural Use.** All agricultural uses are prohibited within the Conservation Easement Area including any use for cropland, waste lagoons, or pastureland.

G. **New Construction.** There shall be no building, facility, mobile home, antenna, utility pole, tower, or other structure constructed or placed in the Conservation Easement Area.

H. **Roads and Trails.** There shall be no construction or maintenance of new roads, trails, walkways, or paving in the Conservation Easement.

All existing roads, trails and crossings within the Conservation Easement Area shall be shown on the recorded survey plat.

I. **Signs.** No signs shall be permitted in the Conservation Easement Area except interpretive signs describing restoration activities and the conservation values of the Conservation Easement Area, signs identifying the owner of the Property and the holder of the Conservation Easement, signs giving directions, or signs prescribing rules and regulations for the use of the Conservation Easement Area.

J. Dumping or Storing. Dumping or storage of soil, trash, ashes, garbage, waste, abandoned vehicles, appliances, machinery, or any other material in the Conservation Easement Area is prohibited.

K. Grading, Mineral Use, Excavation, Dredging. There shall be no grading, filling, excavation, dredging, mining, drilling, hydraulic fracturing; removal of topsoil, sand, gravel, rock, peat, minerals, or other materials.

L. Water Quality and Drainage Patterns. There shall be no diking, draining, dredging, channeling, filling, leveling, pumping, impounding or diverting, causing, allowing or permitting the diversion of surface or underground water in the Conservation Easement Area. No altering or tampering with water control structures or devices, or disruption or alteration of the restored, enhanced, or created drainage patterns is allowed. All removal of wetlands, polluting or discharging into waters, springs, seeps, or wetlands, or use of pesticide or biocides in the Conservation Easement Area is prohibited. In the event of an emergency interruption or shortage of all other water sources, water from within the Conservation Easement Area may temporarily be withdrawn for good cause shown as needed for the survival of livestock on the Property.

M. Subdivision and Conveyance. Grantor voluntarily agrees that no further subdivision, partitioning, or dividing of the Conservation Easement Area portion of the Property owned by the Grantor in fee simple ("fee") that is subject to this Conservation Easement is allowed. Any future transfer of the Property shall be subject to this Conservation Easement and Right of Access and to the Grantee's right of unlimited and repeated ingress and egress over and across the Property to the Conservation Easement Area for the purposes set forth herein.

N. Development Rights. All development rights are permanently removed from the Conservation Easement Area and are non-transferrable.

O. Disturbance of Natural Features. Any change, disturbance, alteration or impairment of the natural features of the Conservation Easement Area or any intentional introduction of non-native plants, trees and/or animal species by Grantor is prohibited.

The Grantor may request permission to vary from the above restrictions for good cause shown, provided that any such request is not inconsistent with the purposes of this Conservation Easement, and the Grantor obtains advance written approval from the Division of Mitigation Services, 1652 Mail Services Center, Raleigh, NC 27699-1652.

III. GRANTEE RESERVED USES

A. Right of Access, Construction, and Inspection. The Grantee, its employees and agents, shall have the right to use the Right of Access to the Conservation Easement Area at reasonable times to undertake any activities to restore, construct, manage, maintain, enhance, protect, and monitor the stream, wetland and any other riparian resources in the Conservation Easement Area, in accordance with restoration activities or a long-term management plan. Unless otherwise specifically set forth in this Conservation Easement, the rights granted herein do not include or establish for the public any access rights.

B. Restoration Activities. These activities include planting of trees, shrubs and herbaceous vegetation, installation of monitoring wells, utilization of heavy equipment to grade, fill, and prepare the soil, modification of the hydrology of the site, and installation of natural and manmade materials as needed to direct in-stream, above ground, and subterraneous water flow.

C. Signs. The Grantee, its employees and agents, successors or assigns, shall be permitted to place signs and witness posts on the Property to include any or all of the following: describe the project, prohibited activities within the Conservation Easement, or identify the project boundaries and the holder of the Conservation Easement.

D. Fences. Conservation Easements are purchased to protect the investments by the State (Grantee) in natural resources. Livestock within conservations easements damages the investment and can result in reductions in natural resource value and mitigation credits which would cause financial harm to the State. Therefore, Landowners (Grantor) with livestock are required to restrict livestock access to the Conservation Easement area. Repeated failure to do so may result in the State (Grantee) repairing or installing livestock exclusion devices (fences) within the conservation area for the purpose of restricting livestock access. In such cases, the landowner (Grantor) must provide access to the State (Grantee) to make repairs.

E. Crossing Area(s). The Grantee is not responsible for maintenance of crossing area(s), however, the Grantee, its employees and agents, successors or assigns, reserve the right to repair crossing area(s), at its sole discretion and to recover the cost of such repairs from the Grantor if such repairs are needed as a result of activities of the Grantor, his successors or assigns.

IV. ENFORCEMENT AND REMEDIES

A. Enforcement. To accomplish the purposes of this Conservation Easement, Grantee is allowed to prevent any activity within the Conservation Easement Area that is inconsistent with the purposes of this Conservation Easement and to require the restoration of such areas or features in the Conservation Easement Area that may have been damaged by such unauthorized activity or use. Upon any breach of the terms of this Conservation Easement by Grantor, the Grantee shall, except as provided below, notify the Grantor in writing of such breach and the Grantor shall have ninety (90) days after receipt of such notice to correct the damage caused by such breach. If the breach and damage remains uncured after ninety (90) days, the Grantee may enforce this Conservation Easement by bringing appropriate legal proceedings including an action to recover damages, as well as injunctive and other relief. The Grantee shall also have the power and authority, consistent with its statutory authority: (a) to prevent any impairment of the Conservation Easement Area by acts which may be unlawful or in violation of this Conservation Easement; (b) to otherwise preserve or protect its interest in the Property; or (c) to seek damages from any appropriate person or entity. Notwithstanding the foregoing, the Grantee reserves the immediate right, without notice, to obtain a temporary restraining order, injunctive or other appropriate relief, if the breach is or would irreversibly or otherwise materially impair the benefits to be derived from this Conservation Easement, and the Grantor and Grantee acknowledge that the damage would be irreparable and remedies at law inadequate. The rights and remedies of the Grantee provided hereunder shall be in addition to, and not in lieu of, all other rights and remedies available to Grantee in connection with this Conservation Easement.

B. Inspection. The Grantee, its employees and agents, successors and assigns, have the right, with reasonable notice, to enter the Conservation Easement Area over the Property at reasonable times for the purpose of inspection to determine whether the Grantor is complying with the terms, conditions and restrictions of this Conservation Easement.

C. Acts Beyond Grantor's Control. Nothing contained in this Conservation Easement shall be construed to entitle Grantee to bring any action against Grantor for any injury or change in the Conservation Easement Area caused by third parties, resulting from causes beyond the Grantor's control, including, without limitation, fire, flood, storm, and earth movement, or from any prudent action taken in good faith by the Grantor under emergency conditions to prevent, abate, or mitigate significant injury to life or damage to the Property resulting from such causes.

D. Costs of Enforcement. Beyond regular and typical monitoring expenses, any costs incurred by Grantee in enforcing the terms of this Conservation Easement against Grantor, including, without limitation, any costs of restoration necessitated by Grantor's acts or omissions in violation of the terms of this Conservation Easement, shall be borne by Grantor.

E. No Waiver. Enforcement of this Easement shall be at the discretion of the Grantee and any forbearance, delay or omission by Grantee to exercise its rights hereunder in the event of any breach of any term set forth herein shall not be construed to be a waiver by Grantee.

V. MISCELLANEOUS

A. This instrument sets forth the entire agreement of the parties with respect to the Conservation Easement and supersedes all prior discussions, negotiations, understandings or agreements relating to the Conservation Easement. If any provision is found to be invalid, the remainder of the provisions of the Conservation Easement, and the application of such provision to persons or circumstances other than those as to which it is found to be invalid, shall not be affected thereby.

B. Grantor is responsible for any real estate taxes, assessments, fees, or charges levied upon the Property. Grantee shall not be responsible for any costs or liability of any kind related to the ownership, operation, insurance, upkeep, or maintenance of the Property, except as expressly provided herein. Upkeep of any constructed bridges, fences, or other amenities on the Property are the sole responsibility of the Grantor. Nothing herein shall relieve the Grantor of the obligation to comply with federal, state or local laws, regulations and permits that may apply to the exercise of the Reserved Rights.

C. Any notices shall be sent by registered or certified mail, return receipt requested to the parties at their addresses shown herein or to other addresses as either party establishes in writing upon notification to the other.

D. Grantor shall notify Grantee in writing of the name and address and any party to whom the Property or any part thereof is to be transferred at or prior to the time said transfer is made. Grantor further agrees that any subsequent lease, deed, or other legal instrument by which any interest in the Property is conveyed is subject to the Conservation Easement herein created.

E. The Grantor and Grantee agree that the terms of this Conservation Easement shall survive any merger of the fee and easement interests in the Property or any portion thereof.

F. This Conservation Easement and Right of Access may be amended, but only in writing signed by all parties hereto, or their successors or assigns, if such amendment does not affect the qualification of this Conservation Easement or the status of the Grantee under any applicable laws, and is consistent with the purposes of the Conservation Easement. The owner of the Property shall notify the State Property Office and the U.S. Army Corps of Engineers in writing sixty (60) days prior to the initiation of any transfer of all or any part of the Property or of any request to void or modify this Conservation Easement. Such notifications and modification requests shall be addressed to:

Division of Mitigation Services Program Manager
NC State Property Office
1321 Mail Service Center
Raleigh, NC 27699-1321

and

General Counsel
US Army Corps of Engineers
69 Darlington Avenue
Wilmington, NC 28403

G. The parties recognize and agree that the benefits of this Conservation Easement are in gross and assignable provided, however, that the Grantee hereby covenants and agrees, that in the event it transfers or assigns this Conservation Easement, the organization receiving the interest will be a qualified holder under N.C. Gen. Stat. § 121-34 et seq. and § 170(h) of the Internal Revenue Code, and the Grantee further covenants and agrees that the terms of the transfer or assignment will be such that the transferee or assignee will be required to continue in perpetuity the conservation purposes described in this document.

VI. QUIET ENJOYMENT

Grantor reserves all remaining rights accruing from ownership of the Property, including the right to engage in or permit or invite others to engage in only those uses of the Conservation Easement Area that are expressly reserved herein, not prohibited or restricted herein, and are not inconsistent with the purposes of this Conservation Easement. Without limiting the generality of the foregoing, the Grantor expressly reserves to the Grantor, and the Grantor's invitees and licensees, the right of access to the Conservation Easement Area, and the right of quiet enjoyment of the Conservation Easement Area,

TO HAVE AND TO HOLD, the said rights and easements perpetually unto the State of North Carolina for the aforesaid purposes,

AND Grantor covenants that Grantor is seized of said premises in fee and has the right to convey the permanent Conservation Easement herein granted; that the same is free from encumbrances and that Grantor will warrant and defend title to the same against the claims of all persons whomsoever.

IN TESTIMONY WHEREOF, the Grantor has hereunto set his hand and seal, the day and year first above written.

Signature: **ROY N. HUFF** Date 9-26-16

Signature: **JOYCE M. HUFF** Date 9-26-16

NORTH CAROLINA
COUNTY OF Person

The undersigned, a Notary Public in and for the County and State aforesaid, do hereby certify that Roy N. Huff and Joyce M. Huff, Grantor, personally appeared before me this day and acknowledged the execution of the foregoing instrument.

IN WITNESS WHEREOF, I have hereunto set my hand and Notary Seal this the 26 day of September, 2016.

Notary Public

My commission expires: June 22, 2020

TANIKA Y MCKESSON NOTARY PUBLIC PERSON COUNTY, NC

Document shows proof /acknowledgement before officer authorized to take proof /acknowledgement; acknowledgement includes officer's signature, commission expiration date official seal, if required.

Amanda W. Garrett, Person County Register of Deeds

CERTIFICATE OF EXCEPTION: I(we) hereby certify that I am(we are) the owner(s) of the property shown and described hereon, which was conveyed to me(us) by deed recorded in Book ____ Page ____ and that said property qualifies as an exception to the provisions of the Person County Subdivision Regulations under Section 16-1.

Owner(s) Date

Paul Murphy 9-22-2016
Planning & Zoning Administrator Date
Person Co., N.C.

State of North Carolina
County of Person

I, Paula Murphy, Review Officer of Person Co., certify that the map or plat to which this certificate is affixed meets all statutory requirements for recording.

Paul Murphy 9-22-2016
Review Officer Date

NAD 83/2011 OPUS (Rapid)

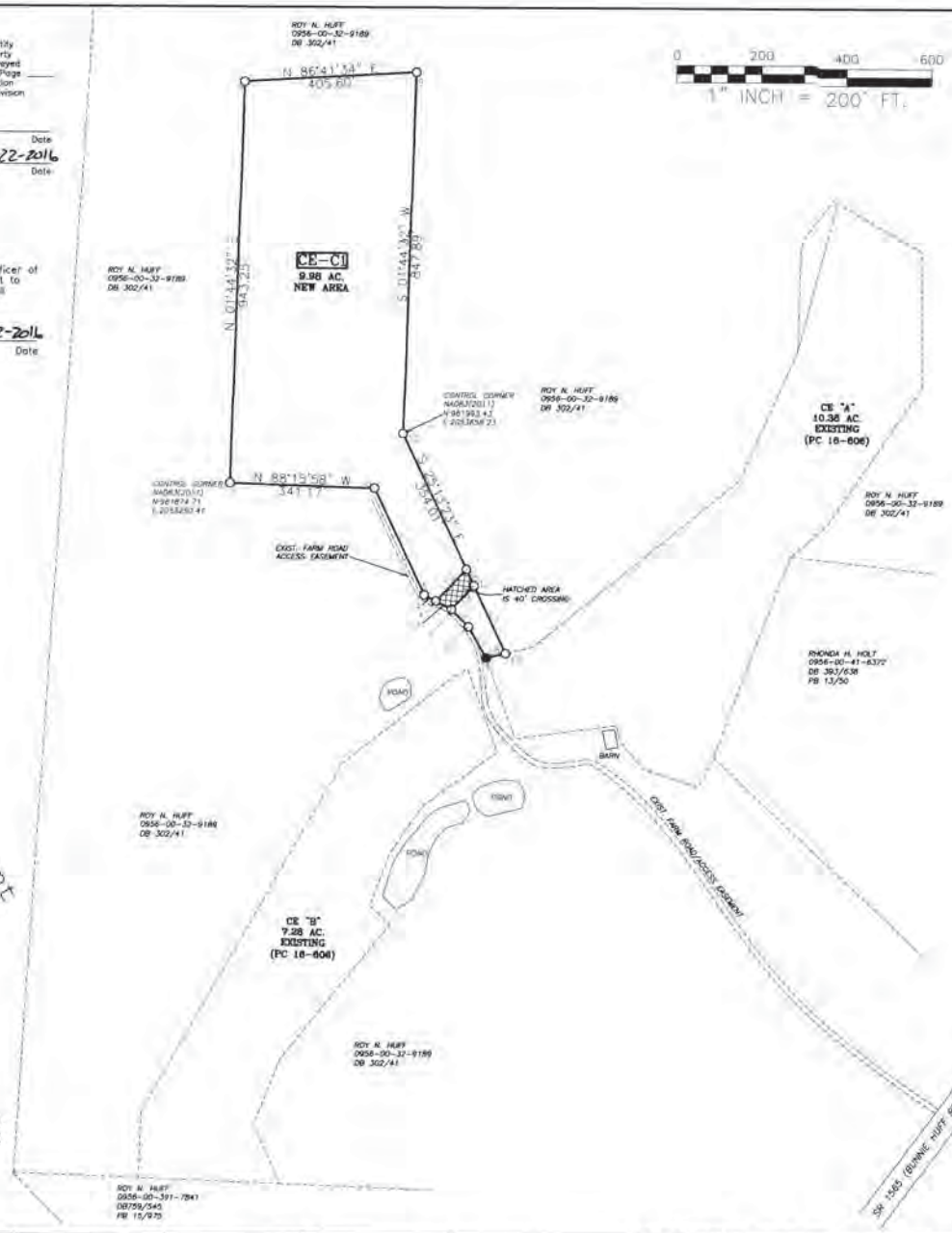
"REFERENCES"
DB 302-41
PC 16-606
PC 13-50

LINE	BEARING	DISTANCE
L1	N 29°41'10" W	84.84
L2	N 44°47'05" W	57.76
L3	N 62°19'56" W	41.47
L4	N 62°19'56" W	31.60
L5	N 25°14'40" W	279.05
L6	S 25°13'23" E	43.08
L7	S 25°13'23" E	176.98
L8	S 76°34'35" W	46.29
L9	S 42°58'24" W	76.74
L10	N 42°58'24" E	103.69

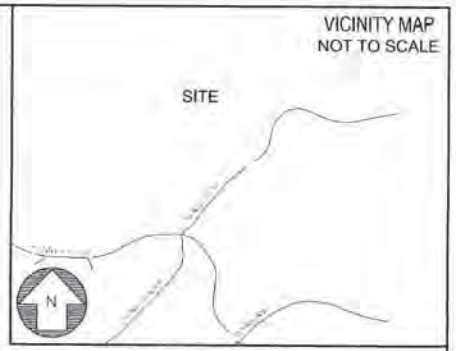
**NOTES:
1) CE "A" AND CE "B" METES AND BOUNDS DESCRIPTION IS SHOWN ON PLAT LOCATED AT THE PERSON COUNTY REGISTER OF DEEDS IN PLAT CABINET 16-606.

2) COORDINATE DATA IS TAKEN FROM A RAPID STATIC GPS OBSERVATION PERFORMED ON 4/4/2016, AND DOWNLOADED TO THE NGS OPUS SITE. THE DATUM IS NAD 83/2011. THE COMBINED GRID FACTOR IS 1.00004346.

3) CORNERS ARE MONUMENTED WITH 3 1/4" ALUMINUM CAPS WITH THE STATE OF NC LOGO.



VICINITY MAP
NOT TO SCALE



I HEREBY CERTIFY THAT THIS PLAT IS OF THE FOLLOWING TYPE:

G.S. 47-30 (F)(11)(C)(1). THIS SURVEY IS OF AN EXISTING PARCEL OR PARCELS OF LAND AND DOES NOT CREATE A NEW STREET OR CHANGE AN EXISTING STREET.

--AND--

"I, MICHAEL T. BRANDON, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION (DEED DESCRIPTION RECORDED IN BOOK 302, PAGE 41, ETC.); THAT THE BOUNDARIES NOT SURVEYED ARE CLEARLY INDICATED AS DRAWN FROM INFORMATION FOUND IN (SEE "REFERENCES"); THAT THE RATIO OF PRECISION AS CALCULATED IS 1:10,000; THAT THIS PLAT WAS PREPARED IN ACCORDANCE WITH G.S. 47-30 AS AMENDED. WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER AND SEAL THIS 6TH DAY OF JUNE, A.D., 2016

NORTH CAROLINA PROFESSIONAL SEAL L-4922 LAND SURVEYOR MICHAEL T. BRANDON

Michael T. Brandon
PROFESSIONAL LAND SURVEYOR REG. NUMBER L-4922

The undersigned owner of the property lying within the attached plat and subdivision hereby certifies that he ordered the work of surveying and platting done and that all public and private streets, easements and other areas so designated upon said plat are hereby dedicated for such use.

Roy N. Huff Joyce M Huff 9-26-16
Owner Date

NORTH CAROLINA, Person COUNTY
I, Tanika Y McKesson Notary Public, do hereby certify that Roy N. Huff, Joyce M. Huff personally appeared before me this day and acknowledged the due execution of the foregoing plat. Witness my hand and seal this 26th day of Sept., 2016.
My commission expires June 23, 2020
Tanika Y. McKesson
Notary Public

TANIKA Y MCKESSON NOTARY PUBLIC PERSON COUNTY, NC

FILED in PERSON County, NC
on Sep 28, 2016 at 09:20:45 AM
by AMANDA W. GARRETT
REGISTER OF DEEDS
Book 16 Page 979

Amanda W Garrett

MICHAEL T. BRANDON
PROFESSIONAL LAND SURVEYOR L-4922
1437 BROOKS DAIRY RD.
ROXBORO, N.C. 27574
PHONE: 919-358-6432
www.michaelbrandonpls.com

OWNER ADDRESS:
ROY HUFF
P.O. BOX 679
ROXBORO, N.C. 27573

PARCEL DATA

SPO:	SPO FILE 73-R
PIN:	0956-00-32-9189
PROJECT:	20160052
DRAWN BY:	MTB
REVIEWED:	MTB
REVISED:	

LEGEND
- IRON ROD OR PIPE SET
- EXISTING MONUMENT FOUND
- MATHEMATICAL POINT
- PROPERTY LINE
- TIE LINE
- EASEMENT LINE
- RIGHT OF WAY
- LINES FROM REFERENCE MATERIAL (NOT SURVEYED)

CONSERVATION EASEMENT FOR STATE OF NORTH CAROLINA, DIVISION OF MITIGATION SERVICES

PROJECT NAME: TAR RIVER HEADWATERS WETLAND SITE
SPO FILE NO. 73-R, DMS SITE NO. 97071
PROPERTY OF ROY N. HUFF
ALLENSVILLE TWP., PERSON CO., NORTH CAROLINA
FIELD WORK PERFORMED APRIL-JULY 2016
PROPERTY AS DESCRIBED IN DB 302-41

16 979

Appendix 4.

Project Milestones & Payment Schedule

Project Milestones and Payment Schedule for TRHWR Project		
Task #	**Project Milestone Description**	**Payment % Contract Value ***
1	Categorical Exclusion Document	5
2	Submit Recorded Conservation Easement on the Site	20
3	Mitigation Plan (Final Draft) and Financial Assurance	15
4	Mitigation Site Earthwork completed	15
5	Mitigation Site Planting and Installation of Monitoring Devices	10
6	Baseline Monitoring Report (including As-Built Drawings)	10
7	Submit Monitoring Report #1 to NCDMS (meets success criteria*)	5
8	Submit Monitoring Report #2 to NCDMS (meets success criteria*)	2
9	Submit Monitoring Report #3 to NCDMS (meets success criteria*)	2
10	Submit Monitoring Report #4 to NCDMS (meets success criteria*)	2
11	Submit Monitoring Report #5 to NCDMS (meets success criteria*)	2
12	Submit Monitoring Report #6 to NCDMS (meets success criteria*)	2
13	Submit Monitoring Report #7 and complete Closeout process	10
	TOTAL	100

Project Milestones and Payment Schedule as specified in NCDMS RFP # 16-006476.

* Offeror is only eligible for payment after NCDMS has approved the task/deliverable. If site fails to meet success criteria, as indicated in any monitoring report, payment of the monitoring task may be made if a suitable contingency plan is submitted to and accepted by the NCDMS.

Appendix 5:

Maintenance Plan

Maintenance Plan

The site shall be monitored on a regular basis by MMI staff and a physical inspection of the site

shall be conducted a minimum of once every other month throughout the post-construction monitoring period until performance standards are met. These site inspections may identify site components and features that require routine maintenance. Routine maintenance should be expected most often in the first two years following site construction and may include items listed below. Specific component/feature maintenance will be conducted through project close-out as follows:

Connector Ditch
Routine channel maintenance and repair activities may include minor repairs to fencing, and supplemental installations of live stakes and other target vegetation along the channel. Areas where storm water and floodplain flows intercept the channel may also require maintenance to prevent bank failures and head-cutting.

Wetlands
Routine site walks will be conducted to identify and document potential areas of concern, such as, but not limited to areas of low stem density or poor plant vigor, invasive species, encroachments, and livestock access. Maintenance will follow procedures as described below under the vegetation and site boundary components.

Vegetation
Vegetation shall be maintained to ensure the health and vigor of the targeted communities. Routine vegetation maintenance and repair activities may include supplemental planting, pruning, mulching, and fertilizing. Exotic invasive plant species shall be controlled by mechanical and/or chemical methods. Any vegetation control requiring herbicide application will be performed in accordance with NC Department of Agriculture (NCDA) rules and regulations.

Site Boundary
Site boundaries shall be identified in the field to ensure clear distinction between the mitigation site and adjacent properties. Boundaries may be identified by fence, marker, bollard, post, tree-blazing, or other means as allowed by site conditions and/or conservation easement. Boundary markers disturbed, damaged, or destroyed will be repaired and/or replaced on an as-needed basis.

Ford and Culvert Crossings
Ford crossings within the site may be maintained only as allowed by Conservation Easement or existing easement, or corridor agreements.

Beaver/Wildlife Management
If beaver dams are observed on site, MMI will remove the dams and attempt to remove the beavers from the site. If wildlife herbivory becomes a problem for the plantings, MMI will take measures to manage wildlife on the site.

Appendix 6:

Approved Preliminary USACE JD Letter & Wetland Data Sheets

U.S. ARMY CORPS OF ENGINEERS
WILMINGTON DISTRICT

Action Id. **SAW-2012-02073** County: **Person** U.S.G.S. Quad: **NC-TRIPLE SPRINGS**

NOTIFICATION OF JURISDICTIONAL DETERMINATION

Property Owners: Roy N. and Joyce Huff
Address: 155 Old Durham Road
Roxboro, NC27573
Telephone Number: (336) 599-0394

Size (acres) **27** Nearest Town
Nearest Waterway **Shelton Creek** River Basin **Upper Tar**
USGS HUC **03020101** Coordinates Latitude: **36.393** Longitude: **78.816**
Location description: Proposed Tar River Headwaters Stream Mitigation Bank: 333 Bunnie Huff Road, 27 acre easement on 228-acre Tract No. 8094, 1,500 feet northwest of Bunny Huff Road, and 2,500 feet north of Dennys Store Road, east of Roxboro, NC.

Indicate Which of the Following Apply:

A. Preliminary Determination

X Based on preliminary information, there may be waters of the U.S. including wetlands on the above described project area. We strongly suggest you have this property inspected to determine the extent of Department of the Army (DA) jurisdiction. To be considered final, a jurisdictional determination must be verified by the Corps. This preliminary determination is not an appealable action under the Regulatory Program Administrative Appeal Process (Reference 33 CFR Part 331). If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also, you may provide new information for further consideration by the Corps to reevaluate the JD.

B. Approved Determination

_ 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.

_ There are waters of the U.S. including wetlands on 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.

_ We strongly suggest you have the waters of the U.S. including wetlands on your project area delineated. Due to the size of your property and/or our present workload, the Corps may not be able to accomplish this wetland delineation in a timely manner. For a more timely delineation, you may wish to obtain a consultant. To be considered final, any delineation must be verified by the Corps.

_ The waters of the U.S. including wetlands on your project area have been delineated and the delineation has been verified by the Corps. We strongly suggest you have this delineation surveyed. Upon completion, this survey should be reviewed and verified by the Corps. Once verified, this survey will provide an accurate depiction of all areas subject to CWA jurisdiction on your property which, provided there is no change in the law or our published regulations, may be relied upon for a period not to exceed five years.

_ The waters of the U.S. including wetlands have been delineated and surveyed and are accurately depicted on the plat signed by the Corps Regulatory Official identified below on _____. 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.

_ There are no waters of the U.S., to include wetlands, present on the above described project area which are subject to the permit requirements of Section 404 of the Clean Water Act (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.

Action Id. **SAW-2012-02073**

Placement of dredged or fill material within waters of the US and/or wetlands without a Department of the Army permit may constitute a violation of Section 301 of the Clean Water Act (33 USC § 1311). If you have any questions regarding this determination and/or the Corps regulatory program, please contact **Eric Alsmeyer** at **919-554-4884, extension 23, or Eric.C.Alsmeyer@usace.army.mil.**

C. Basis For Determination: The project area contains jurisdictional waters of the US, the headwaters of the Tar River and a tributary, with ordinary high water marks, and adjacent wetlands. The Tar River is a Traditional Navigable Water downstream of the project.

D. Remarks: This JD was confirmed by field inspection on 7/6/2016. The drawings on the attached figures, "EXISTING JURSIDCITIONAL WETLANDS IN THE STREAM MITIGATION BANK, TAR RIVER HEADWATERS STREAM MITIGATION BANK", submitted by e-mail on 8/8/2016, generally depict the approximate boundaries and locations of potential jurisdictional waters of the US within the subject project easement. There are other waters of the US on the property outside of the easement that are not depicted on the figures.

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.

It is not necessary to submit the attached request for appeal form to the Division Office if you do not object to the determination in this correspondence.

Corps Regulatory Official: Eric C. Alsmeyer Digitally signed by ALSMEYER.ERIC.C.1087624486 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=ALSMEYER.ERIC.C.1087624486 Date: 2016.08.24 11:35:02 -04'00'

Date: **August 24, 2016** Expiration Date: **N/A**

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 our Customer Satisfaction Survey, located online at http://regulatory.usacesurvey.com/.

Copy furnished (Bank Sponsor):

Mogensen Mitigation, Inc.
Gerald Pottern
104 East Chestnut Avenue
Wake Forest, NC 27587
919.556.8845

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Property Owners: Roy N. Huff & Joyce Huff	File Number: **SAW-2012-02073**	Date: **August 24, 2016**

Attached is:	See Section below
☐ INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
☐ PROFFERED PERMIT (Standard Permit or Letter of permission)	B
☐ PERMIT DENIAL	C
☐ APPROVED JURISDICTIONAL DETERMINATION	D
☒ PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/Missions/CivilWorks/RegulatoryProgramandPermits.aspx or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the district engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT		
REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)		
ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.		
POINT OF CONTACT FOR QUESTIONS OR INFORMATION:		
If you have questions regarding this decision and/or the appeal process you may contact: **District Engineer, Wilmington Regulatory Division, Attn: Eric Alsmeyer** **US Army Corps of Engineers, Wilmington District** **Raleigh Regulatory Field Office** **3331 Heritage Trade Drive, Suite 105** **Wake Forest, NC 27587**	If you only have questions regarding the appeal process you may also contact: Mr. Jason Steele, Administrative Appeal Review Officer CESAD-PDO U.S. Army Corps of Engineers, South Atlantic Division 60 Forsyth Street, Room 10M15 Atlanta, Georgia 30303-8801 Phone: (404) 562-5137	
RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.		
_____ Signature of appellant or agent.	Date:	Telephone number:

For appeals on Initial Proffered Permits send this form to:

District Engineer, Wilmington Regulatory Division, **Attn: Eric Alsmeyer, 69 Darlington Avenue, Wilmington, North Carolina 28403**

EXISTING JURISDICTIONAL WETLANDS IN THE PROPOSED WETLAND RESTORATION AREA
TAR RIVER HEADWATERS
WETLAND RESTORATION SITE

PERSON COUNTY
NORTH CAROLINA

Environmental Quality

MOGENSEN MITIGATION, INC

Mogensen Mitigation, Inc.
P. O. Box 690429
Charlotte, NC 28227
(704) 576-1111

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

A-wet

Project/Site: Tar River Headwaters Wetland Restoration City/County: Roxboro, Person County Sampling Date: 4 May 2016

Applicant/Owner: Mogensen Mitigation Inc., Richard K. Mogensen State: NC Sampling Point: A wet

Investigator(s): Gerald Pottern, Ryan Elliott, MMI-RJGA Section, Township, Range:

Landform (hillslope, terrace, etc.): headwater flat Local relief (concave, convex, none): flat with depressions Slope (%): 0-2

Subregion (LRR or MLRA): P-136 Lat: 36.3942 Long: -78.8185 Datum: NAD88

Soil Map Unit Name: Iredell (IdA) (on websoilssurvey); Orange (OnA) (on printed soil map) NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation x, Soil _____, or Hydrology x significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X

Are Vegetation _____, Soil _____, or Hydrology x naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** **Yes X** **No**
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	

Remarks:

This headwater flat wetland was cleared, ditched, and converted to pasture in 1940s. Perched hydrology on dense subsoil is a natural condition for this wetland type. The shallow ditches effectively drain a relatively wide area, due to hydrology being perched. Groundwater gauge data (late March to early July, 2016) indicate that the water table fluctuates frequently above and below 12" depth.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- X Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- X Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No _____ Depth (inches): 0-1

Water Table Present? Yes X No _____ Depth (inches): 3

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): 0

Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Water table was 3" below surface on sampling date (May 4). Data from the two nearest monitoring wells indicates 17 consecutive days of saturation above 12" at Well-H to the north, and 40 consecutive days of saturation at Well-E to the south during March 30 to July 5. Rainfall during this period was higher than normal.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: A wet

Tree Stratum (Plot size: 30 ft diam)	Absolute % Cover	Dominant Species?	Indicator Status
1. none			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 30 ft diam)			
1. none			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	= Total Cover		
Herb Stratum (Plot size: 30 ft diam)			
1. Juncus effusus	15	N	FACW
2. Eleocharis obtusa	5	N	OBL
3. Ranunculus hispidus	5	N	FAC
4. Grasses (unknown)	50	Y	N/A
5. Vernonia noveboracensis	3	N	FACW
6. Diospyros virginiana	5	N	FAC
7. Campsis radicans	5	N	FAC
8. Toxicodendron radicans	3	N	FAC
9. Solidago gigantea	3	N	FACW
10. Rosa palustris	3	N	OBL
11. Veronica officinalis	3	N	FACU
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size:)			
1. none			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: N/A (A)

Total Number of Dominant Species Across All Strata: N/A (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: N/A (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	8	x 1 =	8
FACW species	21	x 2 =	42
FAC species	18	x 3 =	54
FACU species	3	x 4 =	12
UPL species	0	x 5 =	0
Column Totals:	50 (A)		116 (B)

Prevalence Index = B/A = 2.32

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** x **No**

Remarks: (Include photo numbers here or on a separate sheet.)

Grazed pasture grasses lack features required for species identification. Hydrophytic status is based on other species.

SOIL

Sampling Point: A wet

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	2.5Y 5/3	100					clay loam	
2-10	2.5Y 6/2	90	10YR 5/8	10	C	M	clay loam	
10-23	2.5Y 5/1	80	2.5Y 5/6	20	C	M	clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- x Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:

Depth (inches):

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Soil meets hydric indicator F3.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

B-wet

Project/Site: Tar River Headwaters Wetland Restoration City/County: Roxboro, Person County Sampling Date: 4 May 2016

Applicant/Owner: Mogensen Mitigation Inc., Richard K. Mogensen State: NC Sampling Point: B wet

Investigator(s): Gerald Pottern, Ryan Elliott, MMI-RJGA Section, Township, Range:

Landform (hillslope, terrace, etc.): headwater flat Local relief (concave, convex, none): flat with depressions Slope (%): 0-2

Subregion (LRR or MLRA): P-136 Lat: 36.3929 Long: -78.8189 Datum: NAD88

Soil Map Unit Name: Iredell (IdA) (on websoilssurvey); Orange (OnA) (on printed soil map) NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation x, Soil _____, or Hydrology x significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X

Are Vegetation _____, Soil _____, or Hydrology x naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** **Yes X** **No**
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	

Remarks:

This headwater flat wetland was cleared, ditched, and converted to pasture in 1940s. Perched hydrology on dense subsoil is a natural condition for this wetland type. The shallow ditches effectively drain a relatively wide area, due to hydrology being perched. Groundwater gauge data (late March to early July, 2016) indicate that the water table fluctuates frequently above and below 12" depth.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- x Surface Water (A1)
- x High Water Table (A2)
- x Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- X Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- X Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes x	No _____	Depth (inches):	0-1
Water Table Present?	Yes x	No _____	Depth (inches):	0
Saturation Present? (includes capillary fringe)	Yes x	No _____	Depth (inches):	0

Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Water table was at ground surface on May 4. Data from the closest monitoring well, Well-A indicates 31 consecutive days of saturation above 12" during March 30 to July 5. Rainfall during this period was higher than normal.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: B wet

Tree Stratum (Plot size: 30 ft diam)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 30 ft diam)			
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	= Total Cover		
Herb Stratum (Plot size: 30 ft diam)			
1. Juncus effusus	15	Y	FACW
2. Eleocharis obtusa	5	N	OBL
3. Ranunculus hispidus	5	N	FAC
4. Grasses (unknown)	45	Y	N/A
5. Diospyros virginiana	5	N	FAC
6. Campsis radicans	5	N	FAC
7. Toxicodendron radicans	5	N	FAC
8. Solidago gigantea	5	N	FACW
9. Rosa palustris	5	N	OBL
10. Veronica officinalis	5	N	FACU
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft diam)			
1. N/A			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: N/A (A)

Total Number of Dominant Species Across All Strata: N/A (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: N/A (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
FACW species	20	x 2 =	40
FAC species	20	x 3 =	60
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	55 (A)		130 (B)

Prevalence Index = B/A = 2.36

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** x **No**

Remarks: (Include photo numbers here or on a separate sheet.)

Grazed pasture grasses lack features required for species identification. Hydrophytic status is based on other species.

SOIL

Sampling Point: B wet

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 4/1	100					clay loam	
2-5	10YR 4/1	100					clay loam	
5-10	10YR 4/1	90	10YR 5/6	10	C	M	clay	
11-16	2.5YR 4/2	90	2.5Y 5/6	10	C	M	clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- X Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:

Depth (inches):

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Soil meets hydric indicator F3. Hardpan at 18-20"

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

A/B non-wet

Project/Site: Tar River Headwaters Wetland Restoration City/County: Roxboro, Person County Sampling Date: 4 May 2016

Applicant/Owner: Mogensen Mitigation Inc., Richard K. Mogensen State: NC Sampling Point: A/B non-

Investigator(s): Gerald Pottern, Ryan Elliott, MMI-RJGA Section, Township, Range:

Landform (hillslope, terrace, etc.): headwater flat Local relief (concave, convex, none): flat with depressions Slope (%): 0-2

Subregion (LRR or MLRA): P-136 Lat: 36.3931 Long: -78.8183 Datum: WGS84

Soil Map Unit Name: Iredell (IdA) (on websoilssurvey); Orange (OnA) (on printed soil map) NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation X, Soil _____, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X

Are Vegetation _____, Soil _____, or Hydrology X naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes _____ No X	

Remarks:

This inter-drainage headwater flat wetland was cleared, ditched, and converted to pasture in 1940s. Perched hydrology on dense subsoil is a natural condition for this wetland type. The shallow ditches effectively drain a relatively wide area, due to hydrology being perched. Preliminary groundwater gauge data (late March to early May, 2016) indicate that the water table fluctuates frequently above and below 12" depth; prolonged saturation above 12" is lacking.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches):
Water Table Present?	Yes X	No _____	Depth (inches): 8
Saturation Present? (includes capillary fringe)	Yes X	No _____	Depth (inches): 5

Wetland Hydrology Present? Yes X No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Soil saturation was 5" below surface on May 4 after recent heavy rain, but data from the closest monitoring well, Well-B indicates only 12 consecutive days of saturation above 12" during March 30 to June 30. Rainfall during this period was higher than normal, and wetland hydrology duration was not met.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: A/B non-wet

Tree Stratum (Plot size: 30 ft diam)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 30 ft diam)			
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	= Total Cover		
Herb Stratum (Plot size: 30 ft diam)			
1. Juncus effusus	10	N	FACW
2. Ranunculus hispidus	10	N	FAC
3. Grasses (unknown)	70	Y	N/A
4. Campsis radicans	5	N	FAC
5. Toxicodendron radicans	5	N	FAC
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft diam)			
1. N/A			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: N/A (A)

Total Number of Dominant Species Across All Strata: N/A (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: N/A (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	20	x 3 =	60
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	30 (A)		80 (B)

Prevalence Index = B/A = 2.67

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** x **No**

Remarks: (Include photo numbers here or on a separate sheet.)

Grazed pasture grasses lack features required for species identification. Hydrophytic status is based on other species.

SOIL

Sampling Point: A/B non-wet

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	2.5YR 3/2	100					clay loam	
1-9	2.5Y 5/1	90	10YR 5/6	10	C	M	clay loam	
9-16	2.5Y 4/2	90	2.5Y 5/8	10	C	M	clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- x Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:

Depth (inches):

Hydric Soil Present? **Yes** X **No**

Remarks:

Soil meets indicator F3; may be a relict hydric soil. Well data indicates that the drainage ditches have apparently lowered the water table depth and reduced the duration of shallow saturation.

Appendix 7:

Approved FHWA Categorical Exclusion Form

Appendix A -- Categorical Exclusion Form for Ecosystem Enhancement Program Projects -- version 1.4 (Aug 2005)

Note: Appendix A should to be submitted (along with any supporting documentation) as the environmental document.

Part 1: General Project Information	
Project Name:	Tar River Headwaters Wetland Restoration Site (TRHWR)
County Name:	Person Co
EEP Number:	16-006476
Project Sponsor:	Mogensen Mitigation Inc
Project Contact Name:	Richard Mogensen
Project Contact Address:	P.O. Box 690429, Charlotte NC 28227
Project Contact E-mail:	rich@mogmit.com, gpottern@rjgacarolina.com
EEP Project Manager:	Lindsay Crocker

Project Description

The TRHWR project site is currently a cattle pasture with drainage ditches, located in a former headwater depression wetland in eastern Person County, USGS HUC # 03020101-010010. The project site comprises about 8 acres and is adjacent to a stream and buffer restoration project (about 19 acres), both of which are on a 240 acre parcel owned by Roy and Joyce Huff. The wetland project will include plugging the drainage ditches, installing level spreaders to redistribute flow across the restoration areas, livestock exclusion fencing, weed treatment, and replanting the pasture with native trees, shrubs and herbs.

For Official Use Only

Reviewed By: LINDSAY CROCKER

5/26/2016
Date

LCrocker
EEP Project Manager

Conditional Approved By:

Date

For Division Administrator
FHWA

☐ **Check this box if there are outstanding issues**

Final Approval By:

5-27-16
Date

For Division Administrator
FHWA

Part 2: All Projects Regulation/Question	Response
Coastal Zone Management Act (CZMA)	
1. Is the project located in a CAMA county?	☐ Yes ☒ No
2. Does the project involve ground-disturbing activities within a CAMA Area of Environmental Concern (AEC)?	☐ Yes ☐ No ☒ N/A
3. Has a CAMA permit been secured?	☐ Yes ☐ No ☒ N/A
4. Has NCDCM agreed that the project is consistent with the NC Coastal Management Program?	☐ Yes ☐ No ☒ N/A
Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)	
1. Is this a "full-delivery" project?	☒ Yes ☐ No
2. Has the zoning/land use of the subject property and adjacent properties ever been designated as commercial or industrial? **Forest and pasture are the only known uses**.	☐ Yes ☒ No ☐ N/A
3. As a result of a limited Phase I Site Assessment, are there known or potential hazardous waste sites within or adjacent to the project area? **see attached report**	☐ Yes ☒ No ☐ N/A
4. As a result of a Phase I Site Assessment, are there known or potential hazardous waste sites within or adjacent to the project area?	☐ Yes ☐ No ☒ N/A
5. As a result of a Phase II Site Assessment, are there known or potential hazardous waste sites within the project area?	☐ Yes ☐ No ☒ N/A
6. Is there an approved hazardous mitigation plan?	☐ Yes ☐ No ☒ N/A
National Historic Preservation Act (Section 106)	
1. Are there properties listed on, or eligible for listing on, the National Register of Historic Places in the project area?	☐ Yes ☒ No
2. Does the project affect such properties and does the SHPO/THPO concur? **Property is a cattle pasture with no structures; was forest prior to 1940s.** **SHPO clearance letter is attached.**	☐ Yes ☐ No ☒ N/A
3. If the effects are adverse, have they been resolved?	☐ Yes ☐ No ☒ N/A
Uniform Relocation Assistance and Real Property Acquisition Policies Act (Uniform Act)	
1. Is this a "full-delivery" project?	☒ Yes ☐ No
2. Does the project require the acquisition of real estate? **Property will remain in private ownership, protected by conservation easement.**	☒ Yes ☐ No ☐ N/A
3. Was the property acquisition completed prior to the intent to use federal funds?	☒ Yes ☐ No ☐ N/A
4. Has the owner of the property been informed: * prior to making an offer that the agency does not have condemnation authority; and * what the fair market value is believed to be? **see attached letter from Mr. Huff**	☒ Yes ☐ No ☐ N/A

Part 3: Ground-Disturbing Activities Regulation/Question	Response
American Indian Religious Freedom Act (AIRFA)	
1. Is the project located in a county claimed as "territory" by the Eastern Band of Cherokee Indians?	☐ Yes ☒ No
2. Is the site of religious importance to American Indians?	☐ Yes ☐ No ☒ N/A
3. Is the project listed on, or eligible for listing on, the National Register of Historic Places?	☐ Yes ☐ No ☒ N/A
4. Have the effects of the project on this site been considered?	☐ Yes ☐ No ☒ N/A
Antiquities Act (AA)	
1. Is the project located on Federal lands?	☐ Yes ☒ No
2. Will there be loss or destruction of historic or prehistoric ruins, monuments or objects of antiquity?	☐ Yes ☒ No ☐ N/A
3. Will a permit from the appropriate Federal agency be required?	☐ Yes ☒ No ☐ N/A
4. Has a permit been obtained?	☐ Yes ☐ No ☒ N/A
Archaeological Resources Protection Act (ARPA)	
1. Is the project located on federal or Indian lands (reservation)?	☐ Yes ☒ No
2. Will there be a loss or destruction of archaeological resources? **SHPO clearance letter is attached.**	☐ Yes ☒ No ☐ N/A
3. Will a permit from the appropriate Federal agency be required?	☐ Yes ☒ No ☐ N/A
4. Has a permit been obtained?	☐ Yes ☐ No ☒ N/A
Endangered Species Act (ESA)	
1. Are federal Threatened and Endangered species and/or Designated Critical Habitat listed for the county?	☒ Yes ☐ No
2. Is Designated Critical Habitat or suitable habitat present for listed species? **Tar River several miles downstream of the project supports Dwarf Wedgemussel, but the project site has no suitable habitat.**	☐ Yes ☒ No ☐ N/A
3. Are T&E species present or is the project being conducted in Designated Critical Habitat?	☐ Yes ☒ No ☐ N/A
4. Is the project "likely to adversely affect" the specie and/or "likely to adversely modify" Designated Critical Habitat? **US-FWS clearance letter is attached.**	☐ Yes ☒ No ☐ N/A
5. Does the USFWS/NOAA-Fisheries concur in the effects determination?	☐ Yes ☐ No ☒ N/A
6. Has the USFWS/NOAA-Fisheries rendered a "jeopardy" determination?	☐ Yes ☐ No ☒ N/A

Executive Order 13007 (Indian Sacred Sites)	
1. Is the project located on Federal lands that are within a county claimed as "territory" by the EBCI?	☐ Yes ☒ No
2. Has the EBCI indicated that Indian sacred sites may be impacted by the proposed project?	☐ Yes ☐ No ☒ N/A
3. Have accommodations been made for access to and ceremonial use of Indian sacred sites?	☐ Yes ☐ No ☒ N/A
Farmland Protection Policy Act (FPPA)	
1. Will real estate be acquired?	☒ Yes ☐ No
2. Has NRCS determined that the project contains prime, unique, statewide or locally important farmland? **Iredell loam (IdA) is a statewide important farmland.**	☒ Yes ☐ No ☐ N/A
3. Has the completed Form AD-1006 been submitted to NRCS? **The completed Farmland Impact Form is attached.**	☒ Yes ☐ No ☐ N/A
Fish and Wildlife Coordination Act (FWCA)	
1. Will the project impound, divert, channel deepen, or otherwise control/modify any water body? **The ditches to be plugged are not regulated water bodies**.	☐ Yes ☒ No
2. Have the USFWS and the NCWRC been consulted? **Travis Wilson from NCWRC visited the site with MMI staff, USACE, DWR and DMS on 26 Feb 2016**.	☒ Yes ☐ No ☐ N/A
Land and Water Conservation Fund Act (Section 6(f))	
1. Will the project require the conversion of such property to a use other than public, outdoor recreation?	☐ Yes ☒ No
2. Has the NPS approved of the conversion?	☐ Yes ☐ No ☒ N/A
Magnuson-Stevens Fishery Conservation and Management Act (Essential Fish Habitat)	
1. Is the project located in an estuarine system?	☐ Yes ☒ No
2. Is suitable habitat present for EFH-protected species?	☐ Yes ☒ No ☐ N/A
3. Is sufficient design information available to make a determination of the effect of the project on EFH?	☐ Yes ☐ No ☒ N/A
4. Will the project adversely affect EFH?	☐ Yes ☐ No ☒ N/A
5. Has consultation with NOAA-Fisheries occurred?	☐ Yes ☐ No ☒ N/A
Migratory Bird Treaty Act (MBTA)	
1. Does the USFWS have any recommendations with the project relative to the MBTA?	☐ Yes ☒ No
2. Have the USFWS recommendations been incorporated? **The proposed site work (ditch plugging, flow diversion, planting) is not likely to affect migratory birds.**	☐ Yes ☐ No ☒ N/A
Wilderness Act	
1. Is the project in a Wilderness area?	☐ Yes ☒ No
2. Has a special use permit and/or easement been obtained from the maintaining federal agency?	☐ Yes ☐ No ☒ N/A

A search of available environmental records was conducted by Envirosite Corporation. The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for all Appropriate inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13) or custom requirements developed from the evaluation of environmental risks associated with a parcel of real estate. Executive Summary does not include a summary of report findings related to the selected Map Layers, this information is contained in the Map Findings section as well as being displayed on appropriate maps.

SUBJECT PROPERTY INFORMATION:

ADDRESS:

Tar River Headwaters Wetlands Restoration
333 Bunnie Huff Road
Oxford, NC 27565

COORDINATES:

Latitude (North):	36.394050 - 36° 23' 38.6"
Longitude (West):	-78.818152 - -78° 49' 5.3"
Universal Transverse Mercator:	Zone 17N
UTM X (Meters):	695675.98
UTM Y (Meters):	4029867.03
Elevation:	577.428 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH SUBJECT PROPERTY:

Subject Property Map: 36078d7 TRIPLE SPRINGS, NC
Most Recent Revision: 2013

SUBJECT PROPERTY SEARCH RESULTS:

The subject property was not listed in any of the databases searched by Envirosite Corporation.

DATABASE(S) WITH NO MAPPED SITES:

No mapped sites were found in Envirosite Corporation's Search of available ("Reasonable ascertainable") government records either on the subject property or within the search radius around the subject property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

FEDERAL RCRA NON-CORRACTS TSD FACILITIES LIST

ARCHIVED RCRA TSDF	Archived Resource Conservation and Recovery Act: Treatment Storage and Disposal Facilities
RCRA_TSDF	Resource Conservation and Recovery Act: Treatment Storage and Disposal Facilities

FEDERAL CERCLIS LIST

CERCLIS	Comprehensive Environmental Response Compensation and Liability Act
CERCLIS NFRAP	Comprehensive Environmental Response Compensation and Liability Act No Further Remedial Action Planned
FEDERAL FACILITY	Federal Facility sites
SEMS_8R_ACTIVE SITES	Sites on SEMS Active Site Inventory
SEMS_8R_ARCHIVED SITES	Sites on SEMS Archived Site Inventory

FEDERAL RCRA CORRACTS FACILITIES LIST

CORRACTS	Hazardous Waste Corrective Action

FEDERAL DELISTED NPL SITE LIST

DELISTED NPL	Delisted National Priority List
DELISTED PROPOSED NPL	Delisted proposed National Priority List
SEMS_DELETED NPL	Sites Deleted from National Priorities List

FEDERAL ERNS LIST

ERNS	Emergency Response Notification System

FEDERAL INSTITUTIONAL CONTROLS / ENGINEERING CONTROLS REGISTRIES

FED E C	Engineering Controls
FED I C	Institutional Controls
FED-PUBLISHED INSTITUTIONAL CONTROLS	Published Institutional Controls
RCRA IC_EC	RCRA sites with Institutional and Engineering Controls
I C - NC	Institutional Controls

FEDERAL NPL SITE LIST

NPL	National Priority List
NPL LIENS	National Priority List Liens
PART NPL	Part National Priority List
PROPOSED NPL	Proposed National Priority List
SEMS_FINAL NPL	Sites included on the Final National Priorities List
SEMS_PROPOSED NPL	Sites Proposed to be Added to the National Priorities List

STANDARD ENVIRONMENTAL RECORDS *(cont.)*

FEDERAL RCRA GENERATORS LIST

RCRA_CESQG	Resource Conservation and Recovery Act_Conditionally Exempt Small Quantity Generators
RCRA_LQG	Resource Conservation and Recovery Act_ Large Quantity Generators
RCRA_NONGEN	Resource Conservation and Recovery Act_Non Generators
RCRA_SQG	Resource Conservation and Recovery Act_Small Quantity Generators

STATE AND TRIBAL REGISTERED STORAGE TANK LISTS

FEMA UST	FEMA Underground Storage Tanks
INDIAN UST R1	Underground Storage Tanks on Indian Land in EPA Region 1
INDIAN UST R10	Underground Storage Tanks on Indian Land in EPA Region 10
INDIAN UST R2	Underground Storage Tanks on Indian Land in EPA Region 2
INDIAN UST R4	Underground Storage Tanks on Indian Land in EPA Region 4
INDIAN UST R5	Underground Storage Tanks on Indian Land in EPA Region 5
INDIAN UST R6	Underground Storage Tanks on Indian Land in EPA Region 6
INDIAN UST R7	Underground Storage Tanks on Indian Land in EPA Region 7
INDIAN UST R8	Underground Storage Tanks on Indian Land in EPA Region 8
INDIAN UST R9	Underground Storage Tanks on Indian Land in EPA Region 9
AST - NC	Aboveground Storage Tanks
UST - NC	Underground Storage Tanks

RECORDS OF EMERGENCY RELEASE REPORTS

HMIRS (DOT)	Hazardous Materials Information Reporting Systems

STATE AND TRIBAL LEAKING STORAGE TANK LISTS

INDIAN LUST R1	Leaking Underground Storage Tanks on Indian Land in EPA Region 1
INDIAN LUST R10	Leaking Underground Storage Tanks on Indian Land in EPA Region 10
INDIAN LUST R2	Leaking Underground Storage Tanks on Indian Land in EPA Region 2
INDIAN LUST R4	Leaking Underground Storage Tanks on Indian Land in EPA Region 4
INDIAN LUST R5	Leaking Underground Storage Tanks on Indian Land in EPA Region 5
INDIAN LUST R6	Leaking Underground Storage Tanks on Indian Land in EPA Region 6
INDIAN LUST R7	Leaking Underground Storage Tanks on Indian Land in EPA Region 7
INDIAN LUST R8	Leaking Underground Storage Tanks on Indian Land in EPA Region 8
INDIAN LUST R9	Leaking Underground Storage Tanks on Indian Land in EPA Region 9
LAST - NC	Leaking Aboveground Storage Tanks
LUST - NC	Leaking Underground Storage Tanks
LUST TRUST - NC	Leaking Underground Storage Tanks: Trust

STATE- AND TRIBAL - EQUIVALENT CERCLIS

HSDS - NC	Hazardous Substance Disposal Sites
HWS - NC	Hazadous Waste Sites

STATE AND TRIBAL LANDFILL AND/OR SOLID WASTE DISPOSAL SITE LISTS

PRLF - NC	Pre-Regulatory Landfill Sites
SWF/LF - NC	Solid Waste Facilities Landfills

OTHER ASCERTAINABLE RECORDS

CORRECTIVE ACTIONS_2020	Wastes - Hazardous Waste - Corrective Action
RCRA_FULL_DETAIL	Resource Conservation and Recovery Act_Full detail

ADDITIONAL ENVIRONMENTAL RECORDS

LOCAL LISTS OF LANDFILL / SOLID WASTE DISPOSAL SITES

DEBRIS REGION 9	Torres Martinez Reservation Illegal Dump Sites
INDIAN ODI R8	Open Dump Inventory
ODI	Open Dump Inventory
TRIBAL ODI	Indian Open Dump Inventory Sites

LOCAL LISTS OF HAZARDOUS WASTE / CONTAMINATED SITES

FED CDL	DOJ Clandestine Drug Labs
US HIST CDL	Historical Clandestine Drug Labs

LOCAL BROWNFIELD LISTS

FED BROWNFIELDS	Federal Brownfields
TRIBAL BROWNFIELDS	Tribal Brownfields
BROWNFIELDS - NC	Brownfield

LOCAL LAND RECORDS

LIENS 2	CERCLA Lien Information

LOCAL LISTS OF HAZARDOUS WASTE / CONTAMINATED SITES

INACTIVE HWS - NC	Inacitve Hazardous Waste Sites

OTHER ASCERTAINABLE RECORDS

AFS	Air Facility Systems
BRS	Biennial Reporting Systems
CDC HAZDAT	Hazardous Substance Release and Health Effects Information
CDC HAZDAT GIS	Hazardous Substance Release/Health Effects Database GIS Information
COAL ASH DOE	Coal Ash: Department of Energy
COAL ASH EPA	Coal Ash: Environmental Protection Agency
COAL GAS	Coal Gas Plants
CONSENT (DECREES)	Superfund Consent Decree
DIGITAL OBSTACLE	Obstacles of interest to aviation users
DOD	Department of Defense
DOT OPS	Department of Transportation Office of Pipeline Safety
ECHO	Air Facility Systems
ENOI	Electronic Notice of Intent
FA HWF	Financial Assurance for Hazardous Waste Facilities
FEDLAND	Federal Lands
FRS	Facility Index Systems
FTTS	FIFRA/TSCA Tracking System
FTTS INSP	FIFRA/TSCA Tracking System: Inspections
FUDS	Formerly Used Defense Sites
ICIS	Integrated Compliance Information System
INDIAN RESERVATION	Indian Reservations
LEAD_SMELTER	Lead Smelter Sites
LUCIS	Land Use Control Information Systems
MINES	Mines
MLTS	Material Licensing Tracking Systems
OSHA	Occupational Safety & Health Administration
PADS	PCB Activity Database Systems
PCB TRANSFORMER	Polychlorinated Biphenyls Transformers
RAATS	RCRA Administrative Action Tracking Systems

ADDITIONAL ENVIRONMENTAL RECORDS *(cont.)*

OTHER ASCERTAINABLE RECORDS (cont.)

RADINFO	Radiation Information Systems
RMP	Risk Management Plans
ROD	Record of Decision
SCRD DRYCLEANERS	SCRD Drycleaners
SEMS_SMELTER	Sites on SEMS Potential Smelter Activity
SSTS	Section 7 Tracking Systems
TOSCA-CHEMICAL	Toxic Substance Control Act: Chemicals
TOSCA-PLANT	Toxic Substance Control Act: Plants
TRANSMISSIONS	Transmission & Gathering facilities
TRIS	Toxic Release Inventory Systems
UMTRA	Uranium Mill Tailing Sites
COAL ASH - NC	Coal Ash sites
DAYCARE - NC	Daycare Facility
DRYCLEANERS - NC	Drycleaners
IMD - NC	Incident Management Database
MGP - NC	Manufactured Gas Plant Sites
OLI - NC	Old Landfill Inventory
UIC - NC	Underground Injection Controls

SURROUNDING SITES: SEARCH RESULTS:

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative equal to or higher than the subject property have been differentiated below from sites with an elevation lower than the subject property.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

Following sites were unable to be mapped.

SITE NAME:	DATABASE(S):
ARRONTE TRUCKING DIESEL FUEL RELEASE	LAST - NC
BEREA MINI-MART	IMD - NC
BEREA MINI-MART	LUST - NC
BLUE SKY AUTO CARRIERS RELEASE	LAST - NC
BRIDGE TERMINAL TRANSPORT	LAST - NC
Cityof Oxford LF	HSDS - NC, PRLF - NC
CROWDER LOGGING	LAST - NC
DEAN & PARROTT SERVICE STATION	IMD - NC
DEAN & PARROTT SERVICE STATION	LUST - NC
ESTES EXPRESS SPILL	LAST - NC
GRISSOM GROCERY	LAST - NC
HIGHWAY EXPRESS SPILL	LAST - NC
I-85N @ MILE MARKER 196	LAST - NC

SITE NAME:	DATABASE(S):
KEARNEY TRUCKING SPILL	LAST - NC
MCFALLS TRUCKING ACCIDENT	LAST - NC
Oxford Dump	HSDS - NC, PRLF - NC
PLANT MARKETING DIESEL FUEL RELEASE	LAST - NC
RUAN TRANSPORTATION	LAST - NC
YANCEY TRUCKING	LAST - NC

North Carolina Department of Natural and Cultural Resources

State Historic Preservation Office

Ramona M. Bartos, Administrator

Governor Pat McCrory
Secretary Susan Kluttz

Office of Archives and History
Deputy Secretary Kevin Cherry

May 5, 2016

Richard Mogensen
Mogensen Mitigation, Inc.
PO Box 690429
Charlotte, NC 28227

Re: Tar River Headwaters Wetland Restoration Site, 333 Bunnie Huff Road, Oxford, Person County, ER 16-0610

Dear Mr. Mogensen:

Thank you for your letter of March 31, 2016, concerning the above project.

We have conducted a review of the project and are aware of no historic resources which would be affected by the project. Therefore, we have no comment on the project as proposed.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, contact Renee Gledhill-Earley, environmental review coordinator, at 919-807-6579 or environmental.review@ncdcr.gov. In all future communication concerning this project, please cite the above referenced tracking number.

Sincerely,

Renee Gledhill-Earley

for Ramona M. Bartos

Location: 109 East Jones Street, Raleigh NC 27601 **Mailing Address**: 4617 Mail Service Center, Raleigh NC 27699-4617 **Telephone/Fax**: (919) 807-6570/807-6599

MOGENSEN MITIGATION, INC

August 28, 2015

Roy N. & Joyce M. Huff
333 Bunnie Huff Road
Oxford, NC 27565

Dear Mr. & Mrs. Huff:

In regards to the current wetland proposal on your property we must conform with the federal Uniform Relocation Assistance and Real Estate Acquisition Policies Act. This law requires us to notify you that your participation in this project with my company is voluntary and your property cannot be condemned for the environmental restoration project. In addition, we have offered to pay you a "fair market value" for your property.

Please acknowledge your receipt and agreement with this letter by signing below. This does not need to be notarized.

Please sign this letter and keep one copy for your records and mail one back to me in the self-addressed stamped envelope.

Thank you for your participation and your prompt response.

Sincerely,

Richard K. Mogensen
President, MMI

Cc: Gerald Pottern, MMI

ROY N. HUFF

JOYCE M. HUFF

MOGENSEN MITIGATION, INC

March 31, 2016

US Fish & Wildlife Services Raleigh Field Office
PO Box 33726
Raleigh, NC 27636-3726

Attn: Mr. Dale Suiter, Endangered Species Coordinator
Mr. Pete Benjamin

RE: Tar River Headwaters Wetland Restoration Site – Section 7 ESA Clearance Request

Dear Mr. Suiter:
Mogensen Mitigation, Inc. (MMI), pursuant to Section 7 of the Endangered Species Act, is requesting concurrence that the Tar River Headwaters Wetlands Restoration Project will not impact any listed species or species of concern. The site is located on the Huff Family Farm at 333 Bunnie Huff Road, Oxford, NC 27565 in Person County and is on the same property that is the subject of the Tar River Headwaters Stream Mitigation Bank. That project was cleared by a letter dated 4-9-13 from the NC Wildlife Resources Commission through a Public Notice from the US Army Corps of Engineers (letter attached).

The new area is on the same parcel as the stream project (see the attached mapping). The project will entail filling in artificially created ditches and fencing out livestock.

The only federally-listed species in Person County, NC is the Dwarf wedgemussel *(Alasmidonta heterodon*) which must live in perennial streams (USFWS Species Report By County Report attached).

No direct stream impacts are proposed so no impacts to any freshwater mussel species are expected. The site will be planted with native bottomland hardwood trees and shrubs and monitored for at least seven years. The project is being developed under contract to the NC Division of Mitigation Services using the “Full-Delivery” bid process. MMI has been awarded the contract and is beginning the design and approval process.

Your prompt concurrence with this request would be greatly appreciated.

Sincerely,

Richard K. Mogensen
President, MMI

Cc: Gerald Pottern, MMI
Lindsay Crocker, NCDMS

P.O. Box 690429 Charlotte, NC 28227 704-576-1111p

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Raleigh ES Field Office
Post Office Box 33726
Raleigh, North Carolina 27636-3726

April 29, 2016

Richard Mogensen
Mogensen Mitigation Inc.
PO Box 690429
Charlotte, NC 28227

Re: Tar River Headwaters Wetland Restoration Site – Person County, NC

Dear Mr. Mogensen:

This letter is to inform you that a list of all federally-protected endangered and threatened species with known occurrences in North Carolina is now available on the U.S. Fish and Wildlife Service's (Service) web page at http://www.fws.gov/raleigh. Therefore, if you have projects that occur within the Raleigh Field Office's area of responsibility (see attached county list), you no longer need to contact the Raleigh Field Office for a list of federally-protected species.

Our web page contains a complete and frequently updated list of all endangered and threatened species protected by the provisions of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.)(Act), and a list of federal species of concern[1] that are known to occur in each county in North Carolina.

Section 7 of the Act requires that all federal agencies (or their designated non-federal representative), in consultation with the Service, insure that any action federally authorized, funded, or carried out by such agencies is not likely to jeopardize the continued existence of any federally-listed endangered or threatened species. A biological assessment or evaluation may be prepared to fulfill that requirement and in determining whether additional consultation with the Service is necessary. In addition to the federally-protected species list, information on the species' life histories and habitats and information on completing a biological assessment or evaluation and can be found on our web page at http://www.fws.gov/raleigh. Please check the web site often for updated information or changes.

[1] The term "federal species of concern" refers to those species which the Service believes might be in need of concentrated conservation actions. Federal species of concern receive no legal protection and their designation does not necessarily imply that the species will eventually be proposed for listing as a federally endangered or threatened species. However, we recommend that all practicable measures be taken to avoid or minimize adverse impacts to federal species of concern.

If your project contains suitable habitat for any of the federally-listed species known to be present within the county where your project occurs, the proposed action has the potential to adversely affect those species. As such, we recommend that surveys be conducted to determine the species' presence or absence within the project area. The use of North Carolina Natural Heritage program data should not be substituted for actual field surveys.

If you determine that the proposed action may affect (i.e., likely to adversely affect or not likely to adversely affect) a federally-protected species, you should notify this office with your determination, the results of your surveys, survey methodologies, and an analysis of the effects of the action on listed species, including consideration of direct, indirect, and cumulative effects, before conducting any activities that might affect the species. If you determine that the proposed action will have no effect (i.e., no beneficial or adverse, direct or indirect effect) on federally listed species, then you are not required to contact our office for concurrence (unless an Environmental Impact Statement is prepared). However, you should maintain a complete record of the assessment, including steps leading to your determination of effect, the qualified personnel conducting the assessment, habitat conditions, site photographs, and any other related articles.

With regard to the above-referenced project, we offer the following remarks. Our comments are submitted pursuant to, and in accordance with, provisions of the Endangered Species Act.

Based on the information provided and other information available, it appears that the proposed action is not likely to adversely affect any federally-listed endangered or threatened species, their formally designated critical habitat, or species currently proposed for listing under the Act at these sites. We believe that the requirements of section 7(a)(2) of the Act have been satisfied for your project. Please remember that obligations under section 7 consultation must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered; (2) this action is subsequently modified in a manner that was not considered in this review; or, (3) a new species is listed or critical habitat determined that may be affected by the identified action.

However, the Service is concerned about the potential impacts the proposed action might have on aquatic species. Aquatic resources are highly susceptible to sedimentation. Therefore, we recommend that all practicable measures be taken to avoid adverse impacts to aquatic species, including implementing directional boring methods and stringent sediment and erosion control measures. An erosion and sedimentation control plan should be submitted to and approved by the North Carolina Division of Land Resources, Land Quality Section prior to construction. Erosion and sedimentation controls should be installed and maintained between the construction site and any nearby down-gradient surface waters. In addition, we recommend maintaining natural, vegetated buffers on all streams and creeks adjacent to the project site.

The North Carolina Wildlife Resources Commission has developed a Guidance Memorandum (a copy can be found on our website at (http://www.fws.gov/raleigh) to address and mitigate secondary and cumulative impacts to aquatic and terrestrial wildlife resources and water quality. We recommend that you consider this document in the development of your projects and in completing an initiation package for consultation (if necessary).

We hope you find our web page useful and informative and that following the process described above will reduce the time required, and eliminate the need, for general correspondence for species' lists. If you have any questions or comments, please contact John Ellis of this office at (919) 856-4520 ext. 26.

Sincerely,

Kathy H. Matthews

for Pete Benjamin
Field Supervisor

Natural Resources
Conservation Service

North Carolina
State Office

4407 Bland Road
Suite 117
Raleigh, NC 27609
Voice 919-873-2171
Fax 844-325-6833

May 23, 2016

Mr. Gerald Pottern
Mogensen Mitigation Inc - Raleigh office
MMI-RJGA Environmental Consultants.
1221 Corporation Parkway, Suite 100
Raleigh, NC 27610

Dear Mr. Pottern

Thank you for your letter dated May 18, 2016, Subject: Request for Comments – for the Tar River Headwaters Wetland Mitigation Site located at 333 Bunnie Huff Rd, Roxboro NC. The following guidance is provided for your information.

Projects are subject to the Farmland Protection Policy Act (FPPA) requirements if they may irreversibly convert farmland (directly or indirectly) to non-agricultural use and are completed by a federal agency or with assistance from a federal agency. Farmland means prime or unique farmlands as defined in section 1540(c)(1) of the FPPA or farmland that is determined by the appropriate state or unit of local government agency or agencies with concurrence of the Secretary of Agriculture to be farmland of statewide local importance.

For the purpose of FPPA, farmland includes prime farmland, unique farmland, and land of statewide or local importance. Farmland subject to FPPA requirements does not have to be currently used for cropland. It can be forestland, pastureland, cropland, or other land, but not water or urban built-up land.

Farmland does not include land already in or committed to urban development or water storage. Farmland *already in* urban development or water storage includes all such land with a density of 30 structures per 40-acre area. Farmland already in urban development also includes lands identified as *urbanized area* (UA) on the Census Bureau Map, or as urban area mapped with a *tint overprint* on the United States Geological Survey (USGS) topographical maps, or as *urban-built-up* on the United States Department of Agriculture (USDA) Important Farmland Maps.

The area in question meets one or more of the above criteria for Farmland. Farmland area will be affected or converted. Enclosed is the Farmland Conversion Impact Rating form AD1006 with PARTS II, IV and V completed by NRCS. The corresponding agency will need to complete the evaluation, according to the Code of Federal Regulation 7CFR 658, Farmland Protection Policy Act.

If you have any questions, please contact Milton Cortes, Assistant State Soil Scientist at 919-873-2171 or by email: milton.cortes@nc.usda.gov.

Again, thank you for inquiry. If we can be of further assistance, please do not hesitate to contact us.

Sincerely,

MILTON CORTES

Digitally signed by MILTON CORTES
DN: c=US, o=U.S. Government, ou=Department of Agriculture, cn=MILTON CORTES, 0.9.2342.19200300.100.1.1=12001000080173
Date: 2016.05.22 18:04:28 -04'00'

Milton Cortes
Assistant State Soil Scientist

cc:
Kent Clary, State Soil Scientist, NRCS, Raleigh, NC

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*	Date Of Land Evaluation Request 17 May 2016
Name of Project Tar River Headwaters Wetland Site	Federal Agency Involved NCDOT + NCDMS
Proposed Land Use Wetland Restoration	County and State Person Co, NC
PART II *(To be completed by NRCS)*	Date Request Received By NRCS / Person Completing Form: Milton Cortes NRCS NC

Does the site contain Prime, Unique, Statewide or Local Important Farmland? *(If no, the FPPA does not apply - do not complete additional parts of this form)*	YES ☑ NO ☐	Acres Irrigated: None	Average Farm Size: 241 acres
Major Crop(s): CORN	Farmable Land In Govt. Jurisdiction — Acres: 84 % 217, 344 acres	Amount of Farmland As Defined in FPPA — Acres: 72 % 177, 608 acres	
Name of Land Evaluation System Used: Person Co. LESA	Name of State or Local Site Assessment System: None	Date Land Evaluation Returned by NRCS: May 23, 2016 by email	

PART III *(To be completed by Federal Agency)*	Alternative Site Rating			
	Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly	8.9			
B. Total Acres To Be Converted Indirectly	0			
C. Total Acres In Site	8.9			
PART IV *(To be completed by NRCS)* Land Evaluation Information				
A. Total Acres Prime And Unique Farmland	0			
B. Total Acres Statewide Important or Local Important Farmland	8.9			
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted	0.0050			
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value	59			
PART V (To be completed by NRCS) Land Evaluation Criterion Relative Value of Farmland To Be Converted (Scale of 0 to 100 Points)	73			

PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(Criteria are explained in 7 CFR 658.5 b. For Corridor project use form NRCS-CPA-106)*	**Maximum Points**	Site A	Site B	Site C	Site D
1. Area In Non-urban Use	(15)	15			
2. Perimeter In Non-urban Use	(10)	10			
3. Percent Of Site Being Farmed	(20)	0			
4. Protection Provided By State and Local Government	(20)	0			
5. Distance From Urban Built-up Area	(15)	15			
6. Distance To Urban Support Services	(15)	0			
7. Size Of Present Farm Unit Compared To Average	(10)	10			
8. Creation Of Non-farmable Farmland	(10)	0			
9. Availability Of Farm Support Services	(5)	5			
10. On-Farm Investments	(20)	10			
11. Effects Of Conversion On Farm Support Services	(10)	0			
12. Compatibility With Existing Agricultural Use	(10)	1			
TOTAL SITE ASSESSMENT POINTS	160	66	0	0	0
PART VII ***(To be completed by Federal Agency)***					
Relative Value Of Farmland *(From Part V)*	100	73	0	0	0
Total Site Assessment *(From Part VI above or local site assessment)*	160	66	0	0	0
TOTAL POINTS ***(Total of above 2 lines)***	260	139	0	0	0

Site Selected:	Date Of Selection	Was A Local Site Assessment Used? YES ☐ NO ☐

Reason For Selection:

This site has hydric soil field indicators suitable for wetland restoration, and will be used as a mitigation site for NC-DMS. It was ditched and drained in the 1940s, according to owners Roy & Joyce Huff.

Name of Federal agency representative completing this form:	Date:

(See Instructions on reverse side) **Form AD-1006 (03-02)**

STEPS IN THE PROCESSING THE FARMLAND AND CONVERSION IMPACT RATING FORM

Step 1 - Federal agencies (or Federally funded projects) involved in proposed projects that may convert farmland, as defined in the Farmland Protection Policy Act (FPPA) to nonagricultural uses, will initially complete Parts I and III of the form. For Corridor type projects, the Federal agency shall use form NRCS-CPA-106 in place of form AD-1006. The Land Evaluation and Site Assessment (LESA) process may also be accessed by visiting the FPPA website, http://fppa.nrcs.usda.gov/lesa/.

Step 2 - Originator (Federal Agency) will send one original copy of the form together with appropriate scaled maps indicating location(s)of project site(s), to the Natural Resources Conservation Service (NRCS) local Field Office or USDA Service Center and retain a copy for their files. (NRCS has offices in most counties in the U.S. The USDA Office Information Locator may be found at http://offices.usda.gov/scripts/ndISAPI.dll/oip_public/USA_map**,** or the offices can usually be found in the Phone Book under U.S. Government, Department of Agriculture. A list of field offices is available from the NRCS State Conservationist and State Office in each State.)

Step 3 - NRCS will, within 10 working days after receipt of the completed form, make a determination as to whether the site(s) of the proposed project contains prime, unique, statewide or local important farmland. (When a site visit or land evaluation system design is needed, NRCS will respond within 30 working days.

Step 4 - For sites where farmland covered by the FPPA will be converted by the proposed project, NRCS will complete Parts II, IV and V of the form.

Step 5 - NRCS will return the original copy of the form to the Federal agency involved in the project, and retain a file copy for NRCS records.

Step 6 - The Federal agency involved in the proposed project will complete Parts VI and VII of the form and return the form with the final selected site to the servicing NRCS office.

Step 7 - The Federal agency providing financial or technical assistance to the proposed project will make a determination as to whether the proposed conversion is consistent with the FPPA.

INSTRUCTIONS FOR COMPLETING THE FARMLAND CONVERSION IMPACT RATING FORM

(For Federal Agency)

Part I: When completing the "County and State" questions, list all the local governments that are responsible for local land use controls where site(s) are to be evaluated.

Part III: When completing item B (Total Acres To Be Converted Indirectly), include the following:

1. Acres not being directly converted but that would no longer be capable of being farmed after the conversion, because the conversion would restrict access to them or other major change in the ability to use the land for agriculture.
2. Acres planned to receive services from an infrastructure project as indicated in the project justification (e.g. highways, utilities planned build out capacity) that will cause a direct conversion.

Part VI: Do not complete Part VI using the standard format if a State or Local site assessment is used. With local and NRCS assistance, use the local Land Evaluation and Site Assessment (LESA).

1. Assign the maximum points for each site assessment criterion as shown in § 658.5(b) of CFR. In cases of corridor-type project such as transportation, power line and flood control, criteria #5 and #6 will not apply and will, be weighted zero, however, criterion #8 will be weighed a maximum of 25 points and criterion #11 a maximum of 25 points.

2. Federal agencies may assign relative weights among the 12 site assessment criteria other than those shown on the FPPA rule after submitting individual agency FPPA policy for review and comment to NRCS. In all cases where other weights are assigned, relative adjustments must be made to maintain the maximum total points at 160. For project sites where the total points equal or exceed 160, consider alternative actions, as appropriate, that could reduce adverse impacts (e.g. Alternative Sites, Modifications or Mitigation).

Part VII: In computing the "Total Site Assessment Points" where a State or local site assessment is used and the total maximum number of points is other than 160, convert the site assessment points to a base of 160.
Example: if the Site Assessment maximum is 200 points, and the alternative Site "A" is rated 180 points:

$$\frac{\text{Total points assigned Site A}}{\text{Maximum points possible}} = \frac{180}{200} \times 160 = 144 \text{ points for Site A}$$

For assistance in completing this form or FPPA process, contact the local NRCS Field Office or USDA Service Center.

NRCS employees, consult the FPPA Manual and/or policy for additional instructions to complete the AD-1006 form.

Appendix 8:

Soils Report

Hydric Soils Evaluation

Tar River Headwater Wetland

Person County, NC

September 3, 2015

Prepared for

MOGENSEN MITIGATION INC.

By

1151 SE Cary Parkway
Cary, NC 27518

Heather C. Smith
NC Licensed Soil Scientist #1336

INTRODUCTION

At the request of Mogensen Mitigation Inc. (MMI), Ecological Engineering performed a soils evaluation on the Tar River Headwater Wetland Site shown on the attached hydric soil delineation figure. The site is immediately upstream of the Tar River Headwaters Bank, located off of Bunnie Huff Rd. near Oxford, NC. The site is located in LRR P, MLRA 136, located in the uplands of the Southern Piedmont.

The site evaluation was for the purpose of determining if hydric soils are in the proposed wetland restoration project areas offered, in response to RFP #16-006476 from the NC Department of Environment and Natural Resources, Division of Mitigation Services.

SITE DESCRIPTION

Tar River Headwater Wetland is a fairly flat open pasture with a gentle slope towards a jurisdictional stream, UT to Tar River. There are a few trees scattered throughout with one main ditch and two lateral ditches. The site has been heavily grazed by livestock over the past 50 years: as evidenced by the compacted layers within the soil profile.

METHODS

A two-inch Dutch auger was used to hand bore 17 holes. An auger and shovel were used to dig five (5) soil pits for detailed soil description, labeled SB 1-5(See attached descriptions, photos and Figure 1). The 22 locations were used to determine extent of hydric soils shown on Figure 1. This determination for the presence of hydric soil indicators is described in the manual *Field Indicators of Hydric Soils in the United States, 2010*, USDA Natural Resources Conservation Service.

Hydric indicator utilized on this site:

F3: Depleted Matrix: A layer that has a depleted matrix with 60 percent or more chroma of 2 or less and that has a minimum thickness of either:

a. 5 cm (2 inches) if the 5 cm is entirely within the upper 15 cm (6 inches) of the soil, or
b. 15 cm (6 inches), starting within 25 cm (10 inches) of the soil surface

Notes: A depleted matrix requires a value of 4 or more and chroma of 2 or less. Redox concentrations, including soft iron-manganese masses and/or pore linings, are required in soils with matrix colors of 4/1, 4/2, or 5/2.

The soils were evaluated under moist conditions.

RESULTS

Borings were performed at 17 locations and pits were dug at 5 locations as shown on the attached figure; see the five (5) soil pit sheets.

1. The hydric indicator F3 was met in nine of the 17 auger borings starting within the top six (6) inches.

2. Two of the auger borings started the layer meeting the indicator at 10 inches.

3. The remaining six auger borings didn't show hydric soils within the upper 16 inches.

4. All five (5) of the shovel dug soil pits started the layer meeting the F3 indicator within six (6) inches of the surface.

5. Most of the borings have a dark brown loam A horizon averaging 2 inches deep; then a silty clay loam/clay B horizon with brown colors and distinct/prominent redox features. The B horizon extended throughout the holes to boring termination. The clay is sticky and plastic.

6. These borings are different than the mapped soil of Orange. These soils are closer to a Wehadkee soil mapping unit.

CONCLUSION

It is my professional opinion the Tar River Headwater Wetland Site exhibits evidence of hydric indicators in the upper 16 inches, consistent with Wehadkee soils, throughout most of the area evaluated. Wehadkee soils are considered hydric by the USDA Natural Resources Conservation Service.

Disclaimer: Design plans and strategies for this project area have yet to be determined. Ecological Engineering, LLP has not evaluated the design approach, design hydroperiod, or other methodologies necessary to determine the likelihood of meeting regulatory success criteria.

REFERENCES

Schoeneberger, P.J., D.A. Wysocki, E.C. Benham, and Soil Survey Staff. 2012. Field book for describing and sampling soils, Version 3.0. Natural Resources Conservation Service, National Soil Survey Center, Lincoln, NE.

United States Department of Agriculture, Natural Resources Conservation Service. 2010. Field Indicators of Hydric Soils in the United States V. 7.0. L.M. Vasilas, G.W. Hurt, and C.V. Noble (eds.). USDA, NRCS in cooperation with the National Technical Committee for Hydric Soils

Sincerely,

Heather C. Smith
NC Licensed Soil Scientist #1336

9-3-2015

Soil Pit Photos

SB-1 F3 Indicator Met, Boring Depth 23”

SB-2 F3 Indicator Met, Boring Depth 15”

SB-3 F3 Indicator Met, Boring Depth 16”

SB-4 F3 Indicator Met, Boring Depth 15”

SB-5 F3 Indicator Met, Boring Depth 16”

ECOLOGICAL ENGINEERING
1151 SE Cary Parkway, Suite 101 - Cary NC 27518

Soil Profile Description

Client	MMI			**Date**	8-26-2015
Project Name	Tar Pam Headwaters Wetland			**EE Project #**	30815-003
County	Person			**State**	NC
Location	Bunnie Huff Road			**Boring ID**	SB-1
Soil Series	Mapped Orange, Actual Wehadkee				
Soil Classification	Fine –loamy, mixed, active, nonacid, thermic Fluvaquentic Endoaquepts				
Actual WT	>23"			**Slope**	0-2 %
Vegetation	Pasture	**Drainage**	V. Poor. Drain	**Latitude**	36.394926
Boring Depth	23"	**Reason**	Indicator Met	**Longitude**	-78.818059

Horizon	Depth (in)	Matrix Color	Mottles	Texture[1]	Structure[2]	Consistence[3]	Boundary[4]	Notes
A	0-2	2.5Y 5/3	N/A	l	1fgr	mvfr	cs	many fine roots
Bg1	2-10	2.5Y 6/2	10YR 5/8	sicl	1msbk	mfr	cs	many, coarse, prominent mottles
Bg2	10-23	2.5Y 5/1	2.5Y 5/6	c	2msbk	mfr		many, coarse, prominent mottles

Comments: Compacted layer around 10", sunny skies

LSS Seal and Signature:

Date: 9-3-2015

ECOLOGICAL ENGINEERING
1151 SE Cary Parkway, Suite 101 - Cary NC 27518

Soil Profile Description

Client	MMI			**Date**	8-26-2015
Project Name	Tar Pam Headwaters Wetland			**EE Project #**	30815-003
County	Person			**State**	NC
Location	Bunnie Huff Road			**Boring ID**	SB-2
Soil Series	Mapped Orange, Actual Wehadkee				
Soil Classification	Fine –loamy, mixed, active, nonacid, thermic Fluvaquentic Endoaquepts				
Actual WT	>15"			**Slope**	0-2 %
Vegetation	Pasture	**Drainage**	V. Poor. Drain	**Latitude**	36.394267
Boring Depth	15"	**Reason**	Indicator Met	**Longitude**	-78.818264

Horizon	Depth (in)	Matrix Color	Mottles	Texture	Structure	Consistence	Boundary	Notes
A	0-3	2.5Y 5/2	N/A	l	1fgr	mvfr	cs	many fine roots
Bg1	3-7	2.5Y 5/2	10YR 5/8	sicl	1msbk	mfr	cs	common, medium prominent mottles
Bg2	7-12	10YR 4/1	2.5Y 5/4	sicl	2msbk	mfr	cs	common, medium, prominent mottles
Bg3	12-15	10YR 4/1	2.5Y 5/6	c	2msbk	mfi		common, coarse, prominent mottles

Comments: Hardpan around 15", sunny skies

LSS Seal and Signature:

Date: 9-3-2015

ECOLOGICAL ENGINEERING
1151 SE Cary Parkway, Suite 101 - Cary NC 27518

Soil Profile Description

Client	MMI			**Date**	8-26-2015
Project Name	Tar Pam Headwaters Wetland			**EE Project #**	30815-003
County	Person			**State**	NC
Location	Bunnie Huff Road			**Boring ID**	SB-3
Soil Series	Mapped Orange, Actual Wehadkee				
Soil Classification	Fine –loamy, mixed, active, nonacid, thermic Fluvaquentic Endoaquepts				
Actual WT	>16"			**Slope**	0-2 %
Vegetation	Pasture	**Drainage**	V. Poor. Drain	**Latitude**	36.392656
Boring Depth	16"	**Reason**	Indicator Met	**Longitude**	-78.818084

Horizon	Depth (in)	Matrix Color	Mottles	Texture	Structure	Consistence	Boundary	Notes
A	0-3	2.5Y 5/2	N/A	l	1fgr	mvfr	cs	many fine roots
BA	3-6	10YR 4/1	10YR 5/6	sicl	1tnsbk	mvfr	cs	few fine roots and few, fine, prominent mottles
Bg1	6-11	10YR 4/1	10YR 5/6	sicl	2msbk	mfi	cs	common, fine, prominent mottles
Bg3	11-16	2.5Y 4/2	2.5Y 5/6	c	2msbk	mfi		common, medium, prominent mottles

Comments: Cloudy skies

LSS Seal and Signature:

Date: 9-3-15

ECOLOGICAL ENGINEERING
1151 SE Cary Parkway, Suite 101 - Cary NC 27518

Soil Profile Description

Client	MMI			**Date**	8-26-2015
Project Name	Tar Pam Headwaters Wetland			**EE Project #**	30815-003
County	Person			**State**	NC
Location	Bunnie Huff Road			**Boring ID**	SB-4
Soil Series	Mapped Orange, Actual Wehadkee				
Soil Classification	Fine –loamy, mixed, active, nonacid, thermic Fluvaquentic Endoaquepts				
Actual WT	>15"			**Slope**	0-2 %
Vegetation	Pasture	**Drainage**	V. Poor. Drain	**Latitude**	36.393722
Boring Depth	15"	**Reason**	Indicator Met	**Longitude**	-78.817827

Horizon	Depth (in)	Matrix Color	Mottles	Texture	Structure	Consistence	Boundary	Notes
A	0-2	10YR 4/1	N/A	l	1fgr	mvfr	cs	many fine roots
BA	2-5	10YR 4/1	N/A	sicl	1tnsbk	mvfr	cs	few fine roots
Bg1	5-10	10YR 4/1	10YR 5/6	c	2msbk	mvfi	cs	common, fine, prominent mottles
Bg3	11-16	2.5Y 4/2	2.5Y 5/6	c	2msbk	mvfi		common, medium, prominent mottles

Comments: Cloudy skies

LSS Seal and Signature:

Date: 9-3-2015

ECOLOGICAL ENGINEERING
1151 SE Cary Parkway, Suite 101 - Cary NC 27518

Soil Profile Description

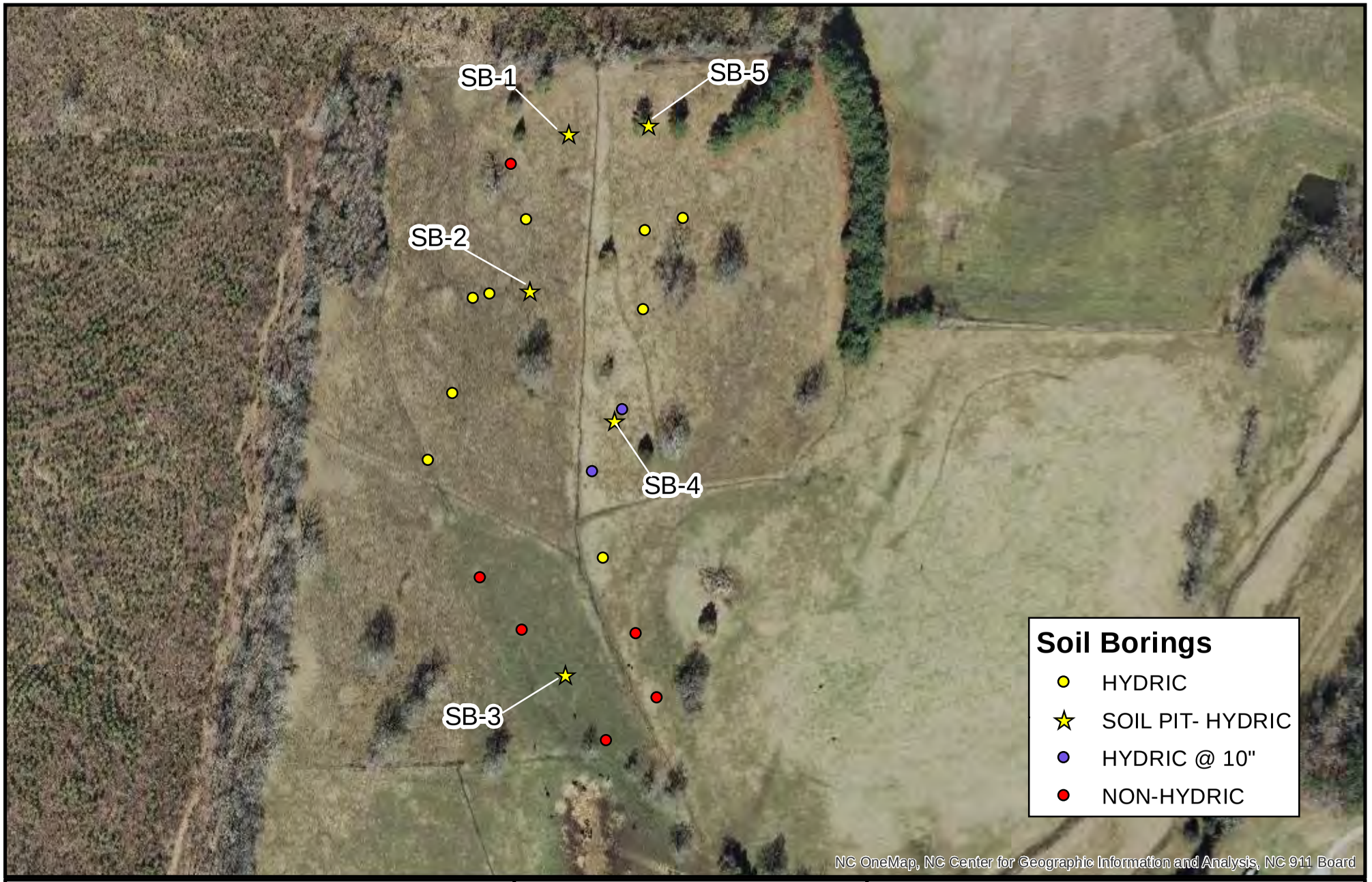
Client	MMI			**Date**	8-26-2015
Project Name	Tar Pam Headwaters Wetland			**EE Project #**	30815-003
County	Person			**State**	NC
Location	Bunnie Huff Road			**Boring ID**	SB-5
Soil Series	Mapped Orange, Actual Wehadkee				
Soil Classification	Fine –loamy, mixed, active, nonacid, thermic Fluvaquentic Endoaquepts				
Actual WT	>16"			**Slope**	0-2 %
Vegetation	Pasture	**Drainage**	V. Poor. Drain	**Latitude**	36.394962
Boring Depth	16"	**Reason**	Indicator Met	**Longitude**	-78.817646

Horizon	Depth (in)	Matrix Color	Mottles	Texture	Structure	Consistence	Boundary	Notes
A	0-1	10YR 3/2	N/A	l	1fgr	mvfr	cs	many fine roots
Bg1	1-9	2.5Y 5/1	10YR 5/6	sicl	1msbk	mvfi	cs	common, medium, prominent mottles and few fine roots
Bg2	9-16	2.5Y 4/2	10YR 5/8	c	2msbk	mvfi		common, medium, prominent mottles

Comments: Cloudy skies, just rained

LSS Seal and Signature:

Date: 9-3-2015



Prepared By:

ECOLOGICAL ENGINEERING
1151 SE Cary Parkway, Suite 101 · Cary NC 27518

FIGURE 1
Tar Pam Headwater Wetland
Hydric Soils Delineatin Map
Person County, NC

0 100 200
1" = 200'

N
W E
S

Predictive

Soil Report

Mehlich-3 Extraction

Client: Richard Mogensen
7400 Feathers Pl
Charlotte, NC 28213

Sampled County : Person

Advisor:

Sampled: 09/01/2016 **Received:** 09/07/2016 **Completed:** 09/16/2016 **Farm:** Bunnie Huff Farm

Links to Helpful Information

Sample ID: 1

Lime History:

Recommendations: Crop	Lime (tons/acre)	Nutrients (lb/acre) N	P_2O_5	K_2O	Mg	S	Mn	Zn	Cu	B	More Information
1 - Hardwood, M	1.0	80-120	50	0	0			0	0	0	Note: 11
2 - Small Grain (SG)	0.0	80-100	110	20	0	0		0	0	0	Note: 3

Test Results [units - W/V in g/cm³; CEC and Na in meq/100 cm³; NO_3-N in mg/dm³]: **Soil Class:** Mineral

HM%	W/V	CEC	BS%	Ac	pH	P-I	K-I	Ca%	Mg%	S-I	Mn-I	Mn-AI1	Mn-AI2	Zn-I	Zn-AI	Cu-I	Na	ESP	SS-I	NO_3-N
0.36	1.12	8.8	78	1.9	5.4	13	65	50	25	55	821		503	81	81	98	0.1	1		

Sample ID: 2

Lime History:

Recommendations: Crop	Lime (tons/acre)	Nutrients (lb/acre) N	P_2O_5	K_2O	Mg	S	Mn	Zn	Cu	B	More Information
1 - Hardwood, M	0.0	80-120	70	30	0			$	0	0	Note: 11
2 - Small Grain (SG)	0.0	80-100	130	100	0	0		6	0	0	Note: 3

Test Results [units - W/V in g/cm³; CEC and Na in meq/100 cm³; NO_3-N in mg/dm³]: **Soil Class:** Mineral

HM%	W/V	CEC	BS%	Ac	pH	P-I	K-I	Ca%	Mg%	S-I	Mn-I	Mn-AI1	Mn-AI2	Zn-I	Zn-AI	Cu-I	Na	ESP	SS-I	NO_3-N
0.60	1.12	13.4	90	1.3	6.1	5	21	56	33	26	325		204	24	24	121	0.2	1		

North Carolina Tobacco Trust Fund Commission

Reprogramming of the laboratory-information-management system that makes this report possible is being funded through a grant from the North Carolina Tobacco Trust Fund Commission.

Thank you for using agronomic services to manage nutrients and safeguard environmental quality.

- *Steve Trox*

Understanding the Soil Report: explanation of measurements, abbreviations and units

Recommendations

Lime

If testing finds that soil pH is too low for the crop(s) indicated, a ***lime recommendation*** will be given in units of either ton/acre or lb/1000 sq ft. For best results, mix the lime into the top 6 to 8 inches of soil several months before planting. For no-till or established plantings where this is not possible, apply no more than 1 to 1.5 ton/acre (50 lb/1000 sq ft) at one time, even if the report recommends more. You can apply the rest in similar increments every six months until the full rate is applied. If MG is recommended and lime is needed, use dolomitric lime.

Fertilizer

Recommendations ***for field crops or other large areas*** are listed separately for each nutrient to be added (in units of lb/acre unless otherwise specified). Recommendations for N (and sometimes for B) are based on research/field studies for the crop being grown, not on soil test results. K-I and P-I values are based on test results and should be > 50. If they are not, follow the fertilizer recommendations given. If Mg is needed and no lime is recommended, 0-0-22 (11.5% Mg) is an excellent source; 175 to 250 lb per acre alone or in a fertilizer blend will usually satisfy crop needs, SS-I levels appear only on reports for greenhouse soil or problem samples.

Farmers and other commercial producers should pay special attention to ***micronutrient levels***. If *$*, *pH$*, *$pH*, *C* or *Z* notations appear on the soil report, refer to *$Note: Secondary Nutrients and Micronutrients*. In general, homeowners do not need to be concerned about micronutrients. Various crop notes also address lime fertilizer needs; visit ncagr.gov/agronomi/pubs.htm.

Recommendations ***for small areas, such as home lawns/gardens,*** are listed in units of lb/1000 sq ft . If you cannot find the exact fertilizer grade recommended on the report, visit *www.ncagr.gov/agronomi/obpart4.htm#fs* to find information that may help you choose a comparable alternate. For more information, read *A Homeowner's Guide to Fertilizer.*

Test Results

The first seven values [soil class, HM%, W/V, CEC, BS%, Ac and pH] describe the soil and its degree of acidity. The remaining 16 [P-I, K-I, Ca%, Mg%, Mn-I, Mn-AI1, Mn-AI2, Zn-I, Zn-AI, Cu-I, S-I, SS-I, Na, ESP, SS-I, NO_3-N (not routinely available)] indicate levels of plant nutrients or other fertility measurement. Visit *www.ncagr.gov/agronomi/uyrst.htm*

Report Abbreviations

Ac	exchangeable acidity
B	boron
BS%	% CEC occupied by basic cations
Ca%	% CEC occupied by calcium
CEC	cation exchange capacity
Cu-I	copper index
ESP	exchangeable sodium percent
HM%	percent humic matter
K-I	potassium index
K_2O	potash
Mg%	% CEC occupied by magnesium
MIN	mineral soil class
Mn	manganese
Mn-AI1	Mn-availability index for crop 1
Mn-AI2	Mn-availability index for crop 2
Mn-I	manganese index
M-O	mineral-organic soil class
N	nitrogen
Na	sodium
NO_3-N	nitrate nitrogen
ORG	organic soil class
pH	current soil pH
P-I	phosphorus index
P_2O_5	phosphate
S-I	sulfur index
SS-I	soluble salt index
W/V	weight per volume
Zn-AI	zinc availability index
Zn-I	zinc index

DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
69 DARLINGTON AVENUE
WILMINGTON, NORTH CAROLINA 28403-1343

REPLY TO
ATTENTION OF:

CESAW-RG/Hughes December 5, 2016

MEMORANDUM FOR RECORD

SUBJECT: Tar River Headwater Wetland Restoration Site - NCIRT Comments during 30-day Mitigation Plan Review

PURPOSE: The comments listed below were posted to the NCDMS Mitigation Plan Review Portal during the 30-day comment period in accordance with Section 332.8(g) of the 2008 Mitigation Rule.

NCDMS Project Name: Tar River Headwaters Wetland Restoration Site, Person County, NC

USACE AID#: SAW-2016-01101

NCDMS #: 97071

30-Day Comment Deadline: December 2, 2016

Mac Haupt, NCDWR, November 22, 2016:

1. Section 6.1 and 6.2-(Conceptual Approach and Wetland Design) - DWR agrees in principle with the conceptual approach outlined in the draft Mitigation Plan. Given the jurisdictional call by the Raleigh office of the Corps of Engineers, DWR agrees with the amount of wetland re-establishment and rehabilitation proposed. The site has 3 relatively shallow ditches that drain surface water from the site. The hydrology and soil characteristics on site are driven by episaturation rather than endosaturation found in most high clayey soils in the Piedmont and upper Coastal Plain of NC.

   The Mitigation Plan states the soils on the site are more Wedhakee like than the mapped Iredell. DWR believes that will these soils do show hydric soil indicators and likely will continue or develop more indicators; however, DWR believes the series is more like a wetter version of the Iredell given the heavy, dense clays found on site.

   DWR recommends that gauge placement be representative of the site, from an elevation standpoint and that there are a couple of gauges in the rehabilitation areas.

2. Section 6.3-Hydroperiod Justification- DWR concurs with the target hydroperiod of 10% for the re-establishment gauges.

3. Section 7.2-Performance Standards- DWR concurs with the Performance Standards listed in Table 4.

Andrea Hughes, USACE, December 2, 2016

1. Page 21, Table 3: Please confirm the acreage amounts in the table. Section 1.0 states the site is approximately 9.98 acres. Table 3 indicates the site, including uplands, is 8.92 acres. Page 7 indicates the 1.12 acre non-hydric area in the southeast corner of the project site does not exhibit redoximorphic features and questions whether this area was hydric in the past. Table 3 indicates the upland area (in the southeast corner) is 1.27 acres and page 4 indicates the upland area is approximately 1.4 acres. According to table 3, the wetland rehabilitation areas in the center and southwest corner total 1.12 acres.

2. Page 21, Section 7.1: Please provide a map of proposed monitoring locations for vegetation plots.

3. Page 21, Section 7.1: The plan states that groundwater gauges (11) will be removed during construction and replaced after restoration activities are completed. The table on page 22 states 8 gauges will be monitored post construction. Since 3 gauges are outside the mitigation site boundaries, we assume that 8 gauges will be replaced and monitored. Please correct this section for consistency.

4. Page 22, Table 4: How were the growing season dates determined?

5. Page 22, Table 4: Vegetation performance standards are 320 stems/acre at year 3, 260 stems/acre at year 5, and 210 stems/acre at Year 7. Please remove the reference to no bare or low-density areas greater than 0.25 acre.

6. Page 22, Section 8.2: The long term management plan must identify the long term manager for the site. Also, the plan states that funding will be supplied by the responsible party until such time an endowment is established? Please provide additional details including identification of the "responsible party", the amount of funding that will be provided, the party receiving the funding, and the timing of the proposed transfer of funds.

7. Other: The mitigation plan does not address financial assurances. The plan must provide a statement as to the party responsible for default and the mechanism to address the deficiency.

Andrea Hughes
Mitigation Project Manager
Regulatory Division

MOGENSEN MITIGATION, INC

December 6, 2016

Department of the Army
Wilmington District, Corps of Engineers
Raleigh Regulatory Field Office
3331 Heritage Trade Drive, Suite 107
Wake Forest, NC 27587

Attn: Ms. Andrea Hughes, Project Manager

Re: Tar River Headwaters Wetland Restoration Site, Person County, NC - Response to FINAL Comments on Draft Mitigation Plan (25 Oct 2016).

USACE AID#: SAW-2016-01101, Person County
NCDMS #: 97071

Dear Ms. Hughes:

Thank you for the most recent final comments. We have revised the Wetland Mitigation Plan per all comments. The following letter explains how we have addressed each comment.

Comments from: ***Mac Haupt, NCDWR, November 22, 2016*:**

1. Section 6.1 and 6.2- (Conceptual Approach and Wetland Design) - DWR agrees in principle with the conceptual approach outlined in the draft Mitigation Plan. Given the jurisdictional call by the Raleigh office of the Corps of Engineers, DWR agrees with the amount of wetland re-establishment and rehabilitation proposed. The site has 3 relatively shallow ditches that drain surface water from the site. The hydrology and soil characteristics on site are driven by episaturation rather than endosaturation found in most high clayey soils in the Piedmont and upper Coastal Plain of NC.

The Mitigation Plan states the soils on the site are more Wedhakee like than the mapped Iredell. DWR believes that will these soils do show hydric soil indicators and likely will continue or develop more indicators; however, DWR believes the series is more like a wetter version of the Iredell given the heavy, dense clays found on site. DWR recommends that gauge placement be representative of the site, from an elevation standpoint and that there are a couple of gauges in the rehabilitation areas.

MMI Response: The 11 existing groundwater gauges in the project area will be reinstalled after construction to achieve optimal representation of all wetland rehabilitation and re-establishment areas and landscape features across the project site. See the new Figure 8 for approximate groundwater gauge and vegetation plot locations.

2. Section 6.3-Hydroperiod Justification- DWR concurs with the target hydroperiod of 10% for the re-establishment gauges. **(No response required)**

3. Section 7.2-Performance Standards- DWR concurs with the Performance Standards listed in Table 4. **(No response required)**

Comments from: *Andrea Hughes, USACE, December 2, 2016*

1. Page 21, Table 3: Please confirm the acreage amounts in the table. Section 1.0 states the site is approximately 9.98 acres. Table 3 indicates the site, including uplands, is 8.92 acres. Page 7 indicates the 1.12 acre non-hydric area in the southeast corner of the project site does not exhibit redoximorphic features and questions whether this area was hydric in the past. Table 3 indicates the upland area (in the southeast corner) is 1.27 acres and page 4 indicates the upland area is approximately 1.4 acres. According to table 3, the wetland rehabilitation areas in the center and southwest corner total 1.12 acres. **MMI Response**: The component acreages throughout the plan text and tables have been revised for consistency. The as-built plan will record acreages to the nearest thousandth.

2. Page 21, Section 7.1: Please provide a map of proposed monitoring locations for vegetation plots. **MMI Response**: We have added Figure 8 after the Performance Standards which shows the approximate (proposed) vegetation plot locations and the approximate groundwater gauge locations.

3. Page 21, Section 7.1: The plan states that groundwater gauges (11) will be removed during construction and replaced after restoration activities are completed. The table on page 22 states 8 gauges will be monitored post construction. Since 3 gauges are outside the mitigation site boundaries, we assume that 8 gauges will be replaced and monitored. Please correct this section for consistency. **MMI Response**: The eleven (11) existing gauges will be removed during construction and all will be reinstalled in the approximate locations shown on the new Figure 8.

4. Page 22, Table 4: How were the growing season dates determined? **MMI Response**: Language has been added below Table 4 explaining the growing season duration rationale.

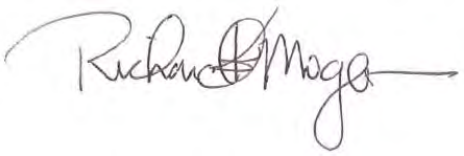
5. Page 22, Table 4: Vegetation performance standards are 320 stems/acre at year 3, 260 stems/acre at year 5, and 210 stems/acre at Year 7. Please remove the reference to no bare or low-density areas greater than 0.25 acre. **MMI Response**: The Table 4 Performance Standards have been updated using the stem density requirements indicated, and the last sentence was removed.

6. Page 22, Section 8.2: The long term management plan must identify the long term manager for the site. Also, the plan states that funding will be supplied by the responsible party until such time an endowment is established? Please provide additional details including identification of the "responsible party", the amount of funding that will be provided, the party receiving the funding, and the timing of the proposed transfer of funds. **MMI Response:** The verbiage is template language developed by the Corps and DMS for Full-Delivery mitigation projects and has <u>not</u> been revised.

7. Other: The mitigation plan does not address financial assurances. The plan must provide a statement as to the party responsible for default and the mechanism to address the deficiency.
Response: This mitigation site is a full-delivery project with the State of North Carolina (NC DMS contract DEQ #6746). Performance bonding financial assurance is provided to the State of North Carolina as a contractual requirement.

I hope these responses clearly explain the revisions and changes we have made to the Final Mitigation Plan.

Sincerely,



Richard K. Mogensen
President, MMI

CC: Gerald Pottern, MMI
Heather Smith, EE
Lindsay Crocker, NC DMS
Mac Haupt, NCDEQ-DWR

P.O. Box 690429 Charlotte, NC 28227 704-576-1111p