

**MITIGATION BANKING PROSPECTUS
WEST TENNESSEE WETLANDS MITIGATION BANK**

**UNDEVELOPED 282-ACRE PARCEL
BARTLETT, TENNESSEE**

**EnSafe Project Number:
0888814924**

Prepared by:



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September 2016

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Definitions

Adaptive Management — Development of a management strategy that anticipates challenges associated with compensatory mitigation projects, and provides for the implementation of actions to address those challenges as well as unforeseen changes to those projects. It includes the selection of appropriate measures that will ensure the aquatic resource functions are provided, and involves analysis of monitoring results to identify potential problems of a compensatory mitigation project and the identification and implementation of measures to rectify those problems.

ARAP — Tennessee Department of Environment and Conservation (TDEC) Aquatic Resource Alteration Permit; required for alterations (impacts) to jurisdictional streams or wetlands.

Credit — Unit of measure (functional or aerial measure or other suitable metric) representing the accrual or attainment of aquatic functions at a compensatory mitigation site. The measure of aquatic functions is based on the resources restored, established, enhanced, or preserved.

Enhancement — Manipulations of the physical, chemical, or biological characteristics of an aquatic resource to heighten, intensify, or improve a specific aquatic resource function(s). Enhancement results in the gain of selected aquatic resource function(s), but may also lead to a decline in other aquatic resource function(s). Enhancement results in gain in aquatic resource functions but does not result in a gain in aquatic resource area.

Force majeure — Extraordinary event or circumstance beyond the control of the parties, such as a war, strike, riot, crime, or an event described by the legal term *act of God*, that would prevent fulfillment of the terms of the MBI.

Function — The physical, chemical, and biological processes that occur in ecosystems.

Geographic Service Area (GSA) — Geographic area where impacts can be mitigated at a specific mitigation bank as designated in its MBI. Services mean the benefits that human populations receive from functions that occur in ecosystems.

Impact — Adverse effect.

Interagency Review Team (IRT) — An interagency group of federal, tribal, state, and/or local regulatory and resource agency representatives that reviews documentation for, and advises the district engineer on, the establishment and management of a mitigation bank or an in-lieu fee program. Member agencies include the U.S. Army Corps of Engineers (USACE [chair]), TDEC (co-chair), Tennessee Wildlife Resource Agency, United States Fish and Wildlife Services, and United States Environmental Protection Agency.

Mitigation Banking Instrument (MBI) — the legal document for the establishment, operation, and use of the bank.

Mitigation Bank — Site, or multiple sites, where resources (e.g., wetlands, streams, riparian areas, or other habitat types) are restored, established, enhanced, and/or preserved for the purpose of providing compensatory mitigation for impacts authorized by USACE and/or TDEC permits. In general, a mitigation bank provides compensatory mitigation credits to permittees and assumes responsibility for mitigation establishment and success *in perpetuity*. The operation and use of a mitigation bank are governed by an MBI.

Natural Resource Function (Function) — The physical, chemical, and biological processes that occur in ecosystems which include natural resource values such as flood protection/control, wildlife habitat, sediment movement control and prevention, and watershed protection.

Performance Standards — Observable or measurable physical (including hydrological), chemical, and/or biological attributes that are used to determine if a compensatory mitigation project meets its objectives.

Preservation — The protection of wetlands or other aquatic resources through the implementation of appropriate legal and physical mechanisms (i.e. conservation easements, title transfers). Preservation may include the protection of upland areas adjacent to wetlands as necessary to ensure protection or enhancement of the aquatic ecosystem. Preservation does not result in a gain of aquatic resource area or functions.

Release of Credits — The schedule determined by the USACE district engineer, in consultation with the IRT that governs when credits associated with an approved mitigation plan are available for sale or transfer. A proportion of projected credits for a specific mitigation bank may be released upon approval of a mitigation plan and implementation, with additional credits released as milestones specified in the credit release schedule are achieved.

Restoration — The manipulation of the physical, chemical, and/or biological characteristics of a site with the goal of returning natural/historic functions to a former or degraded aquatic resource. For the purpose of tracking net gains in aquatic resource area, restoration can be divided into two categories: Re-establishment and rehabilitation. Restoration results in a gain in aquatic resource functions and a gain in aquatic resource area.

Sponsor — Any public or private entity responsible for establishing and, in most circumstances, operating a mitigation bank or in-lieu fee program.

List of Acronyms

Bank	West Tennessee Wetlands Mitigation Bank
CFR	Code of Federal Regulations
GSA	Geographic service area
HUC	Hydrologic unit code
IRT	Interagency review team
LRR	Land Resource Regions
MBI	Mitigation banking instrument
MLGW	Memphis Light Gas and Water
MLRA	Major Land Resource Areas
PFO	palustrine forested
PSS	scrub-shrub palustrine
SR	Tennessee State Route (highway)
TDEC	Tennessee Department of Environment and Conservation
TDOT	Tennessee Department of Transportation
TWRA	Tennessee Wildlife Resource Agency
USACE	U.S. Army Corps of Engineers
U.S. EPA	United States Environmental Protection Agency
USDA	United States Department of Agriculture

1.0 INTRODUCTION

Portions of an undeveloped 282-acre parcel of property in Bartlett, Tennessee, are scheduled for development as a wetland mitigation bank. Approximately 251.3 acres of the property will be utilized for restoration, enhancement, and preservation to provide a lift in ecological function and overall protection for the area. To accommodate the anticipated need for development while still protecting environmental interests, the U.S. Army Corps of Engineers (USACE) has implemented a regulatory process so that impacted wetlands can be mitigated for a permitted site if they are replaced by wetlands of similar size and ecological function in nearby areas. Establishment of the West Tennessee Wetlands Mitigation Bank (Bank), with its concomitant increase in ecological functional value, will provide the “credits” to future permittees that are required to offset unavoidable impacts to wetlands. The process is overseen by the Interagency Review Team (IRT), chaired by a representative of the Memphis District, USACE.

The purpose of this document is to provide a summary of information regarding the proposed Bank, including objectives, establishment and operation, service area, ecological suitability of the site, credit/debit procedures, and long-term management of the Bank.

The Bank Sponsor will be an entity named West Tennessee Wetlands Mitigation Bank, LLC. EnSafe Inc. and/or its affiliates will own West Tennessee Wetlands Mitigation Bank and will manage and operate this effort in conjunction with formal land acquisition arrangements with Southern Investors Partnership (or its successors), the current owner of the property. The work will be done in consultation with the IRT, which is composed of various natural resource management and regulatory agencies, including the USACE, the United States Environmental Protection Agency (U.S. EPA), the U.S. Fish and Wildlife Service, the Tennessee Wildlife Resources Agency (TWRA), and the Tennessee Department of Environment and Conservation (TDEC). Together, the members of the IRT will endorse plans to develop the Bank in Shelby County, Tennessee, located at the intersection of the Loosahatchie River and Tennessee State Route (SR) 14, as shown on Figure 1.

This prospectus has been prepared following the guidelines set forth in “Compensatory Mitigation for the Losses of Aquatic Resources” (33 Code of Federal Regulations [CFR] 332 and 40 CFR Part 325, effective June 6, 2008). Credits from the Bank will be used to offset aquatic (wetland) impacts that are authorized through USACE permitting procedures in compliance with the Clean Water Act, TDEC’s Aquatic Resource Alteration Permit, and other applicable regulations.

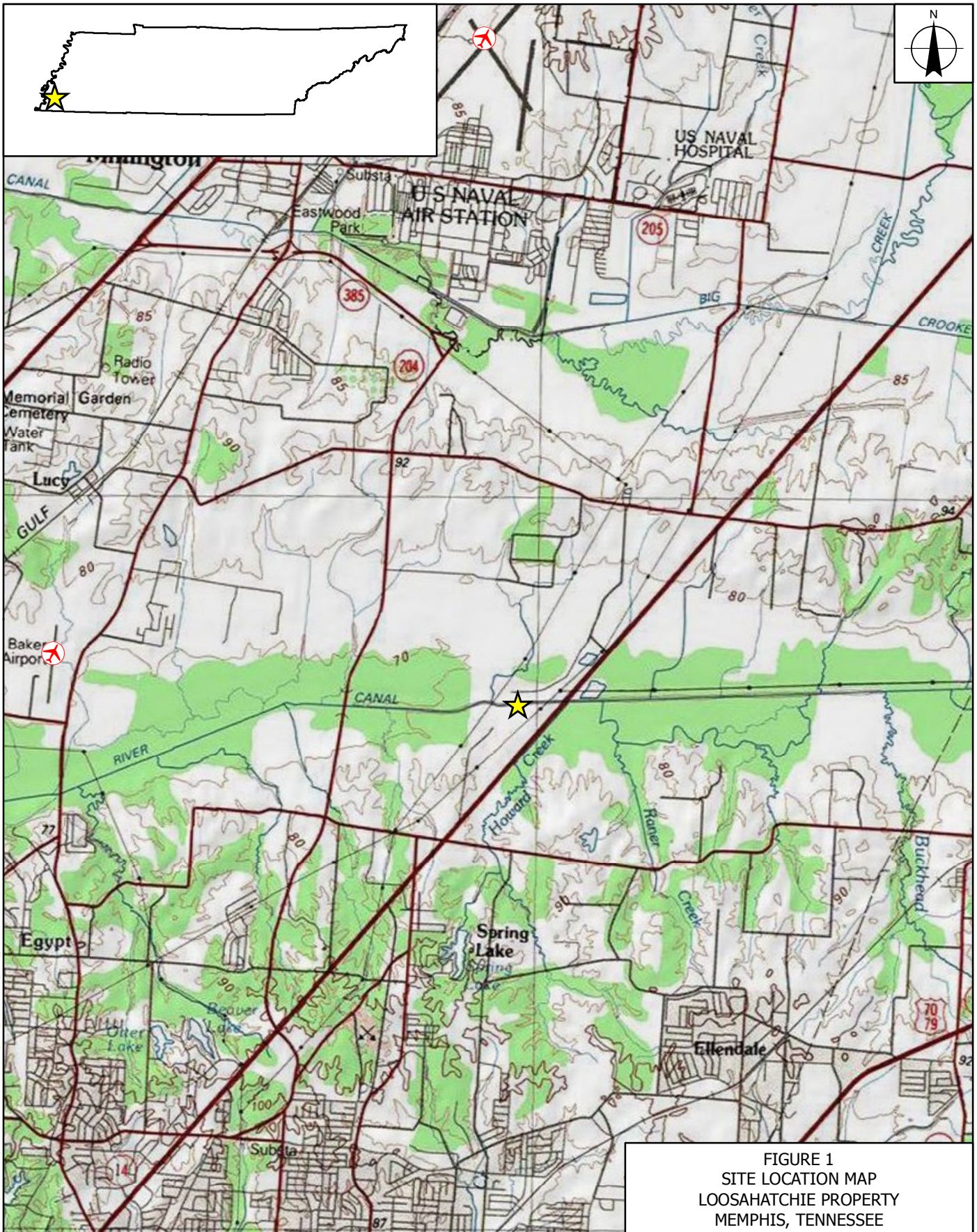


FIGURE 1
 SITE LOCATION MAP
 LOOSAHATCHIE PROPERTY
 MEMPHIS, TENNESSEE

LEGEND
 ★ SITE LOCATION

0 6,000 12,000
 SCALE IN FEET
 COORDINATE SYSTEM: NAD 1983
 STATE PLANE TENNESSEE FEET

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1.1 Purpose and Need

The purpose of the Bank is to establish available wetland mitigation credits that will be used to offset unavoidable impacts to wetlands due to future projects in the Bank's geographic service area (GSA).

The Bank Sponsor foresees a need for a significant quantity of mitigation credits to offset future unavoidable impacts associated with projects that may impact wetlands in the area. These may include roadway, railroad, industrial, housing development, or other project types. Based on the preliminary market analysis of potential end users, there appears to be a significant demand for credits. The demand should follow the trends of infrastructure, residential, and industrial growth within the GSA along with a smaller demand coming from projects outside of the GSA.

1.2 Bank Objectives

The establishment of the Bank will allow project activities to meet the mitigation priorities of implementing rules in 33 CFR 332 and 40 CFR 325 of the Clean Water Act. These regulations give priority to mitigation banking over the "in lieu fee," and offer a preferable option to the permittee responsible for mitigation. More specific bank objectives and improvements are provided in Section 4.0 (Bank Development Plans).

2.0 PROPOSED GEOGRAPHIC SERVICE AREA

The GSA is the geographic and hydrologically-designated area where the Bank can provide appropriate compensatory mitigation for impacts to other aquatic features in the same designated service area (Figure 2). According to the U.S. EPA (Federal Register: November 28, 1995 (Volume 60, Number 228), "The geographic extent of a service area should, to the extent environmentally desirable, be guided by the cataloging unit of the 'Hydrologic Unit map of the United States' (USGS, 1980) and the ecoregion of the 'Ecoregions of the United States' (James M. Omernik, EPA, 1986) or section of the 'Descriptions of the Ecoregions of the United States' (Robert G. Bailey, USDA, 1980).

The GSAs for the Bank were selected based on U.S. EPA guidance and were selected based upon hydrologic connectivity and watershed ecological characteristics. The GSAs will include the following 8-digit watersheds:

- **Loosahatchie River**, hydrologic unit code (HUC) 08010209
- **Mississippi River**, HUC 08010100

In addition to the Loosahatchie River and Mississippi River watersheds, several 10-digit watersheds were included due to similar ecologic and hydrologic characteristics. These three watersheds are adjacent to the Loosahatchie River watershed and contain channelized streams and an expanding urban interface. These additional watersheds include the following 10-digit HUCs:

- **Indian Creek**, HUC 0801020806
- **Cane Creek**, HUC 0801020807

Designation of the service area was based on consideration of hydrologic and biotic criteria as determined and mapped by the United States Geological Survey, Natural Resource Conservation Service, U.S. Department of Agriculture, and U.S. EPA. The GSA was specifically chosen due to similar ecological characteristics and hydrologic connectivity based on the Hydrologic Unit Map of the United States. The GSA is part of the same basin included within the Lower Mississippi Region and contains or is abutting the Bank. These two 8-digit watersheds and two 10-digit watersheds flow directly to the Mississippi River in southwest Tennessee.

Land Resource Regions (LRR) have been established by the United States Geological Survey and are geographical areas made up of an aggregation of Major Land Resource Areas (MLRA) with similar characteristics. The GSA is contained within the same LRR (P-South Atlantic and Gulf Slope Cash Crops, Forest, and Livestock Region). The region consists of generally smooth Atlantic and

Gulf Coast marine terraces and the hilly piedmont area. Abundant moisture and a long growing season favor agricultural production with a hot and humid climate. The native vegetation is predominantly oak-pine forests.

A component of the LRR, the MLRA has been determined by the Natural Resource Conservation Service and U.S. Department of Agriculture. The MLRA is geographic area that is characterized by a particular pattern of soils, climate, water resources, land uses, and type of farming. The GSA is contained within the same MLRA (134 — Southern Mississippi Valley Loess) indicating similar physical properties. The GSA is also contained within the same ecoregion (74b — Loess Plain) within the Level V Ecoregions of Tennessee as published by the U.S. EPA. Ecoregions denote areas of general similarity in ecosystems and in the type, quality, and quantity of environmental resources; they are designed to serve as a spatial framework for the research, assessment, management, and monitoring of ecosystems and ecosystem components.

Ecoregions are directly applicable to the immediate needs of state agencies, such as TDEC, for selecting regional stream reference sites and identifying high-quality waters, developing ecoregion-specific chemical and biological water quality criteria and standards, and augmenting TDEC's watershed management approach. The approach used to compile the ecoregion maps is based on the premise that ecological regions can be identified through the analysis of the patterns and the composition of biotic and abiotic phenomena that affect or reflect differences in ecosystem quality and integrity. These phenomena include geology, physiography, vegetation, climate, soils, land use, wildlife, and hydrology.

The Description of the Ecoregions of the United States was compiled by Robert G. Bailey in March 1995. This system was developed as a comprehensive system for classifying ecosystems as an aid to achieving quality land management. The publication subdivides the United States into domain, divisions, provinces, and subdivisions by similarities in land-surface form, climate, vegetation, soils, and fauna. The GSA is a component in the Humid Temperate Domain (200), Subtropical Division (230), Southeastern Mixed Forest Province (231), and Coastal Plains-Middle Section (231B). The Coastal Plains-Middle Section subdivision is characterized by varying topography landscape of marine-deposited sediments ranging from sands to clay. Vegetation includes oak-pine, loblolly-shortleaf pine, or oak-hickory types.

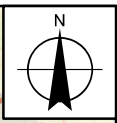
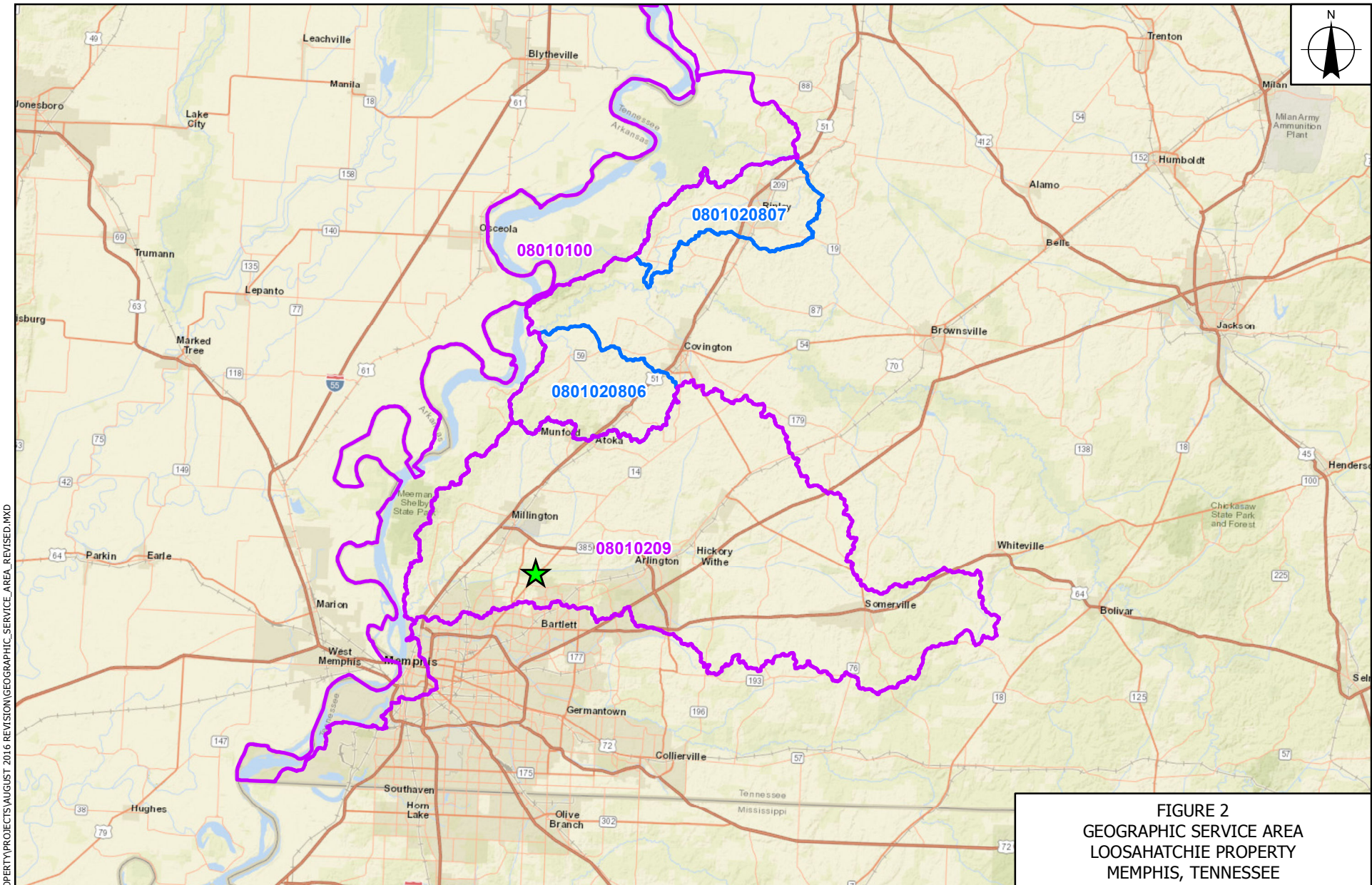
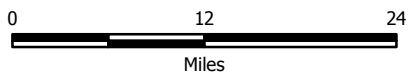


FIGURE 2
GEOGRAPHIC SERVICE AREA
LOOSAHATCHIE PROPERTY
MEMPHIS, TENNESSEE

LEGEND

- SITE LOCATION**
- PRIMARY 8 - DIGIT HUC BOUNDARY**

- PRIMARY 10 - DIGIT HUC BOUNDARY**



COORDINATE SYSTEM: NAD 1983
 STATE PLANE TENNESSEE FEET

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DATA SOURCES: SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P CORP, NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI (THAILAND), MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY

Each watershed is directly adjacent to and hydrologically connected with the Loosahatchie River watershed. The larger service area is justified by the lack of established mitigation banks within each of the watersheds and similar site physical, chemical, and biological characteristics. As shown in Table 1, 16 of the established 19 (84%) wetland mitigation banks within Tennessee are comprised of multiple watersheds within the GSA.

Name	Bank Status	Number of HUCs Within GSA
Bakers Crossroads Wetland Mitigation Bank	Approved	1
Beech River Canal Mitigation Bank	Pending	2
Beech River Wetland Mitigation Bank (TWRA)	Pending	2
Gilmers Creek Wetland Mitigation Bank	Approved	2
Harpeth	Sold-Out	12
Hatchie River	Approved	1
Lick Creek Wetland Bank #1	Approved	8
Lick Creek Wetland Bank #2	Approved	8
Madison County	Approved	11
Mt. Tena Creek Mitigation Bank	Approved	1
Obion	Approved	5
Sequatchie Valley Wetland Mitigation Bank	Approved	3
Shady Valley I Orchard Bog	Sold-Out	14
Shady Valley II Orchard Bog II Pennington Addition	Approved	5
Shady Valley I Quarry Bog	Approved	5
Shady Valley II Landore & Plummer	Approved	5
Swamp Road Wetland Mitigation Bank	Approved	4
Swamp Road Wetland Mitigation Bank II (SRWMB II)	Approved	3
Wolf River	Approved	2

The Bank will provide the necessary credits to fill the gap due to lack of mitigation banks in the area and offset impacts to wetlands/other waters within the GSA. Therefore, the designated geographic area has been based upon agency derived data to ensure the Bank can reasonably be expected to provide appropriate compensatory mitigation for unavoidable impacts to wetlands and other aquatic resources. In addition, regulations established by the U.S. EPA were utilized to ensure the area established as the GSA contained similar ecological and landscape characteristics. The area included within the GSA is within the same 6-digit HUC (080102) and the watersheds are contiguous. In addition, the GSA is within the same LRR (P-South Atlantic and Gulf Slope Cash Crops, Forest, and Livestock Region), MLRA (134 — Southern Mississippi Valley Loess), while also containing similar ecological characteristics being a component of mapped ecoregions 231B (Coastal Plains-Middle Section) and 74b (Loess Plain). The service area has been appropriately sized to ensure that the aquatic resources provided will effectively compensate for adverse environmental impacts across the entire service area.

3.0 SITE DESCRIPTION

3.1 Historical Land Use

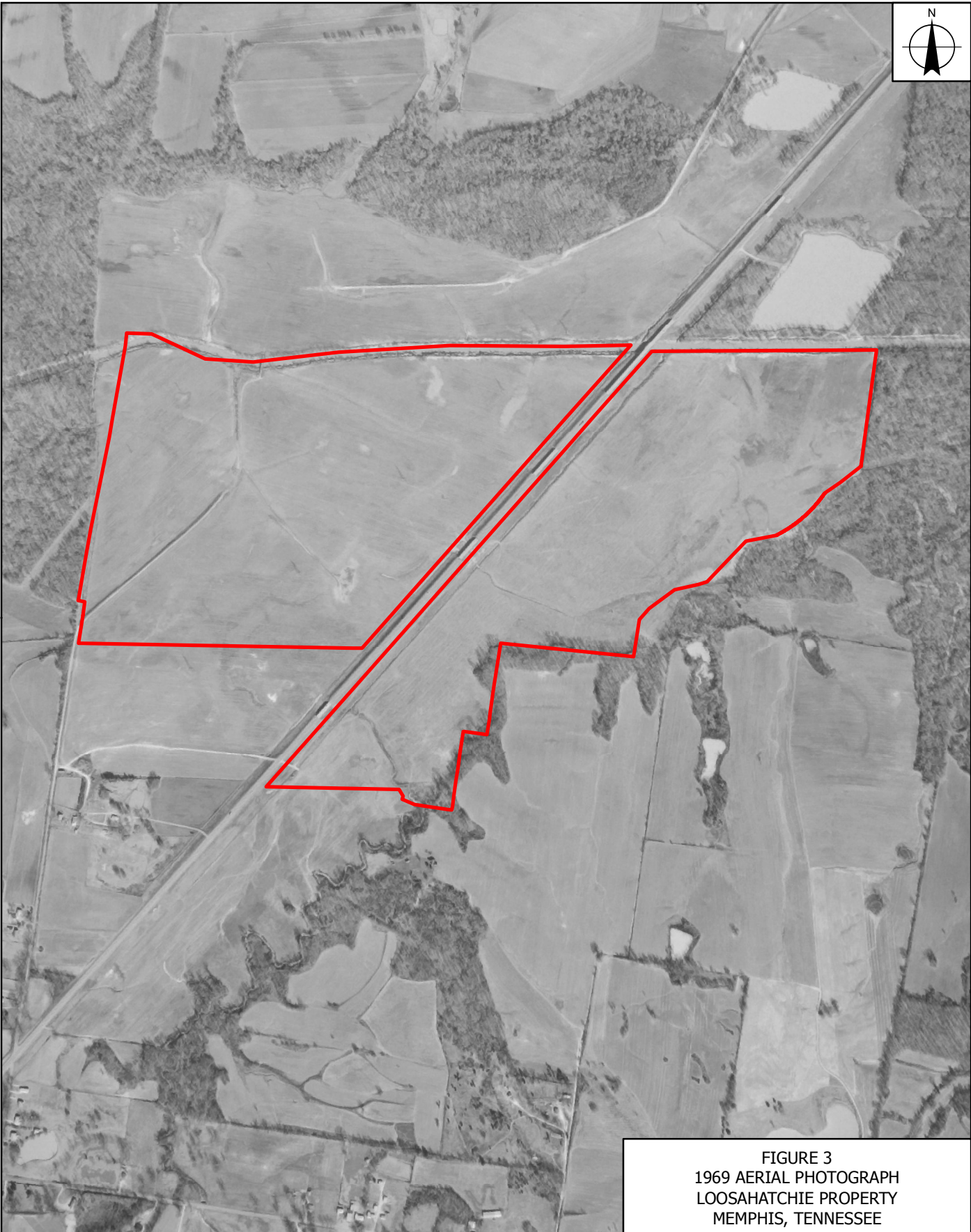
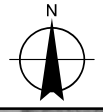
The site is ecologically suitable for development as a bank to achieve the objective to restore, enhance, and preserve bottomland hardwood wetlands adjacent to the Loosahatchie River. The property is in an increasingly developing area in the northwest corner of Bartlett, Tennessee. The majority of land on the west side of SR 14 has historically been used for farming. Aerial photographs and other documents examined for this project do not show a change in property use except for the installation of a power line on the west portion of the proposed Bank.

The portion of the site on the east side of SR 14 now encompasses a scrub-shrub swamp receiving floodwaters from the adjacent Loosahatchie River and several small tributaries. Aerial photographs from 1969 (Figure 3) and 1973 indicate the land was planted in row crops but has since reverted to wetland conditions. Following the agriculture production, the land was left fallow and has since reverted to wetland conditions predominantly comprised of open water with fringe trees and shrubs. Historically, the site has been surrounded by agricultural areas to the south and bottomland hardwood floodplain to the east and west.

3.2 Current Site Conditions

This 282-acre property is comprised of two distinct habitat types (Figure 4 and Attachment A). The portion of the property on the west side of SR 14 is currently farmed and has been used for growing soybeans. The agricultural area is interspersed with several small riparian areas and is bound by the Loosahatchie River to the north. Existing water resources, including emergent wetlands and wet weather conveyances, were documented on the west side of SR 14 during a site visit on May 23, 2016, and can be seen in Figure 4. Wetland and hydrologic determination datasheets are available upon request.

The portion of the site on the east side of SR 14 is currently a scrub-shrub swamp that borders and receives flood waters from the Loosahatchie River and several small creeks and tributaries. Changes in depth, duration, and frequency of inundation due to beaver activity have impaired the natural function and flow of water within this area. Increases in water depth and duration have enabled the conversion of the area from bottomland hardwood to open water interspersed with black willow (*Salix nigra*) trees and shrubs. Recently, agricultural areas southeast of the forested wetlands have been developed as residential properties. Tennessee Department of Transportation (TDOT) has begun construction on the widening of SR 14 to accommodate increased vehicular traffic. The proposed project will entail the widening of SR 14 from Singleton Parkway eventually to the Tipton County line.



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FIGURE 3
1969 AERIAL PHOTOGRAPH
LOOSAHATCHIE PROPERTY
MEMPHIS, TENNESSEE

LEGEND

 PARCEL BOUNDARY

0 1,000 2,000

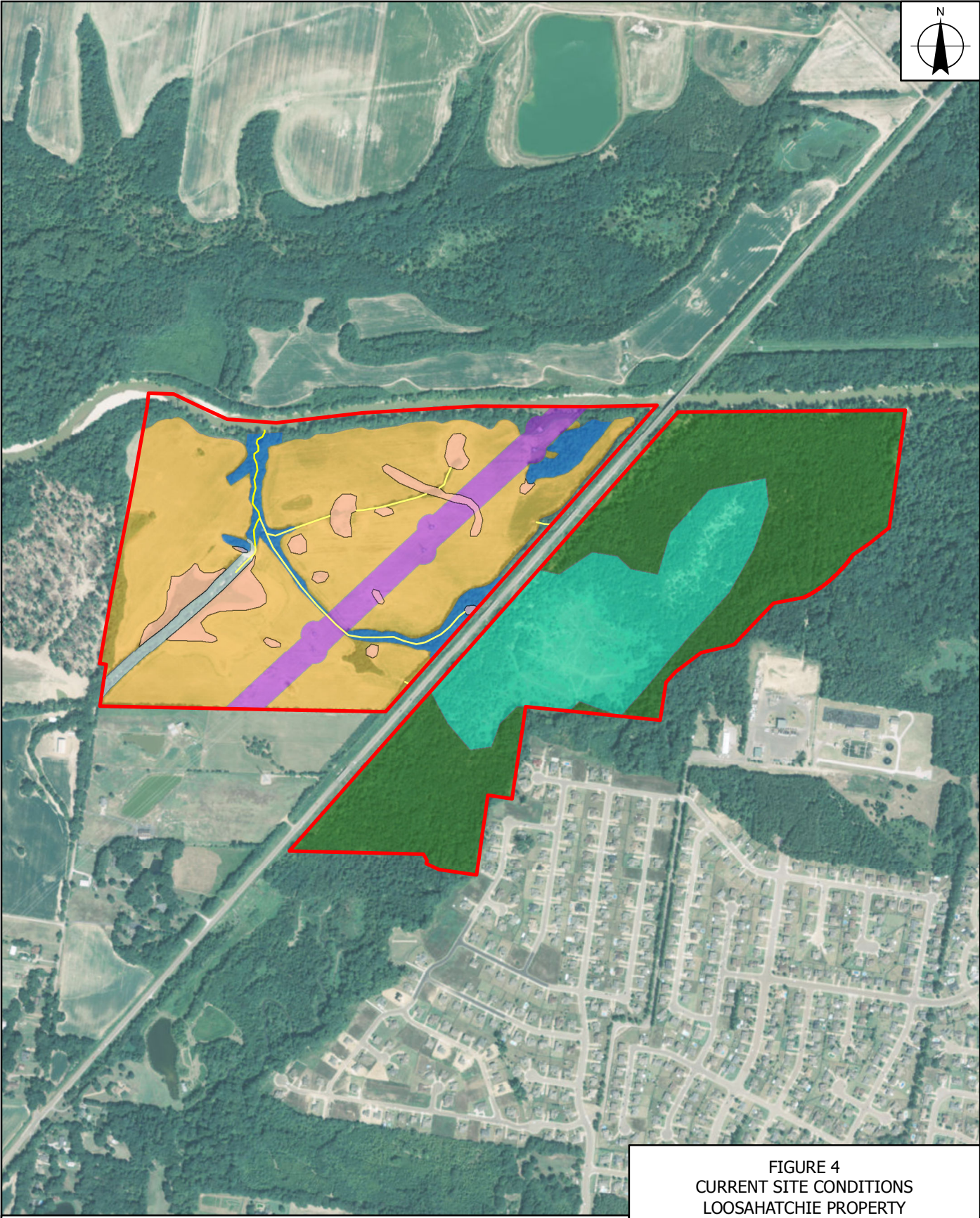
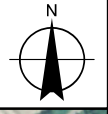


SCALE IN FEET

COORDINATE SYSTEM: NAD 1983
STATE PLANE TENNESSEE FEET

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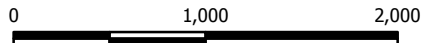
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Legend

- WET WEATHER CONVEYANCE
- FOREST
- PARCEL BOUNDARY
- RIGHT OF WAY
- EXISTING WETLAND
- RIPARIAN
- ACCESS ROAD
- SWAMP
- AGRICULTURE



SCALE IN FEET

COORDINATE SYSTEM: NAD 1983
STATE PLANE TENNESSEE FEET

FIGURE 4
CURRENT SITE CONDITIONS
LOOSAHATCHIE PROPERTY
MEMPHIS, TENNESSEE

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PROJECT:	0888814924



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DATA SOURCES: SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEX, GETMAPPING, AEROGRIID, IGN, IGP, SWISSTOPO, AND THE GIS USER COMMUNITY; PARCEL BOUNDARIES ARE FROM THE SHELBY COUNTY GOVERNMENT

3.3 Soils

The majority of the restoration area has been mapped as Waverly silt loam while the preservation area is predominantly Waverly silt loam with Falaya silt loam located along the eastern perimeter. The following section discusses the specific soil type mapped at the project site. Site-specific soil descriptions are included with the soil types illustrated in Figure 5.

3.3.1 Waverly Silt Loam

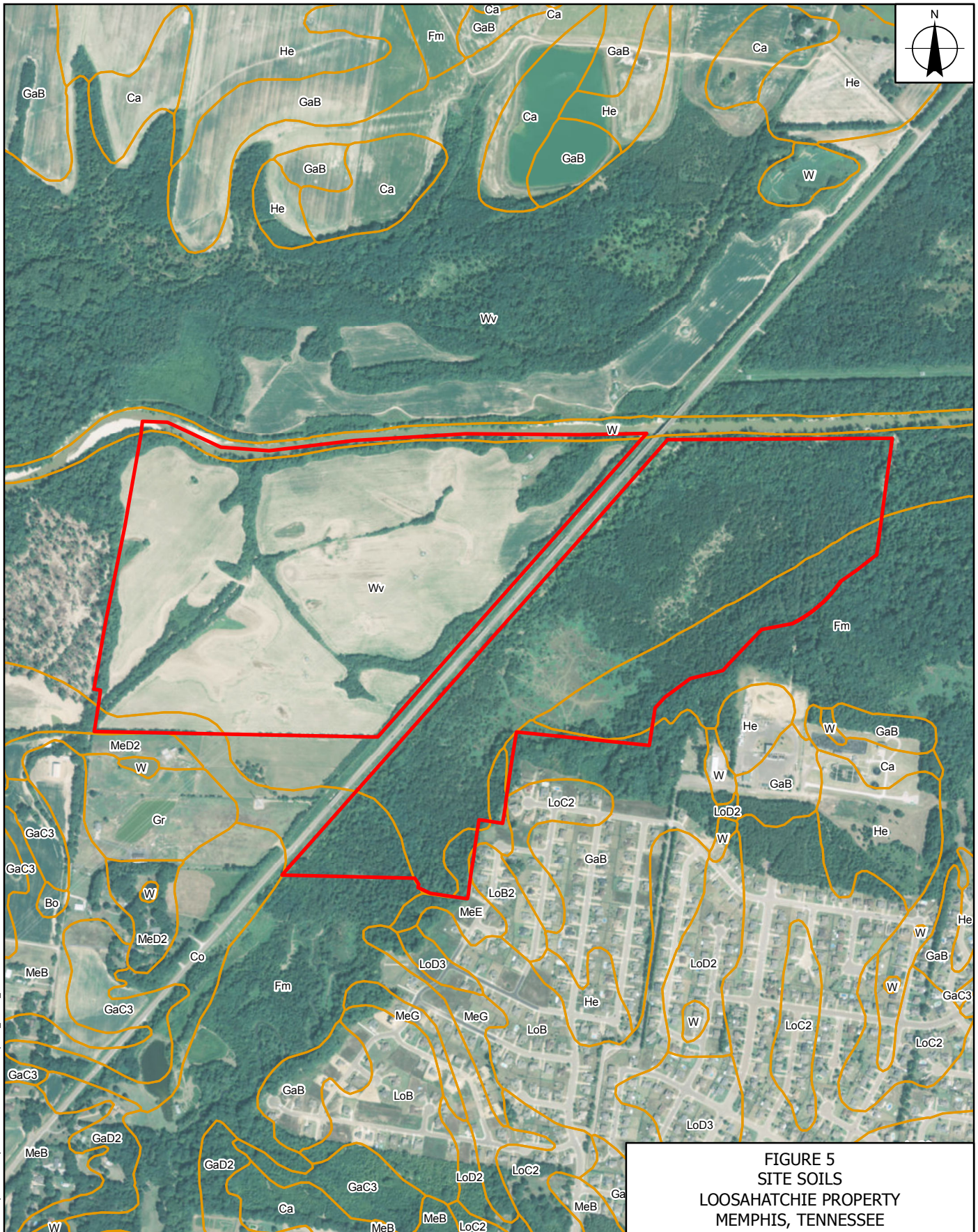
Waverly silt loam is thermic Fluvaquentic Endoaquept within the Inceptisol order. This soil occurs in floodplain areas with a parent material of silty alluvium. Slopes are generally 0 to 2 percent. The soil is poorly drained and described as having a depth to saturation of between 6 and 12 inches. This soil type is also described as having occasional flooding with a very high water capacity. In winter and spring, the water table is seldom more than a foot below ground surface. Silt loam extends to at least 60 inches below ground surface. Waverly silt loam has been classified as hydric on the "Hydric Soils of the United States" with a component representative percentage of 100. This classification is based upon a hydric criterion of 2, the saturation criteria. The Shelby County Soil Survey also lists Waverly silt loam as hydric with a capability unit of IIIw-1. Unit IIIw-1 is poorly drained, nearly level, silty soil.

3.3.2 Falaya Silt Loam

Falaya silt loam is thermic Aeric Fluvaquent within the Inceptisol order. This soil consists of very deep, somewhat poorly drained, moderately permeable soils that formed in silty alluvium from loess. Slopes range from 0 to 2 percent. The soils are subject to flooding and are saturated with water at 1 to 2 feet during wetter periods. In winter and early spring, the water table is often within a foot of the surface. Falaya silt loam has been classified on the "Hydric Soils of the United States" with a component representative percentage of 9 in floodplains. The Shelby County Soil Survey also lists Falaya silt loam as containing hydric inclusions with a capability unit of IIw-1. Unit IIw-1 is somewhat poorly drained, nearly level soils that have a silty or clayey surface layer and a silty or loamy subsoil.

3.3.3 Soil Summary

Waverly silt loam is the prevailing mapped soil located within the restoration area and it is listed as hydric for Shelby County, Tennessee, and on the "Hydric Soils of the United States." This serves as an ideal restoration consideration, which combined with increased hydrologic conditions at the site, will support hydrophytic vegetation and increase wetland functionality. Waverly silt loam and Falaya silt loam are located within the preservation area and should function adequately over time.



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FIGURE 5
SITE SOILS
LOOSAHATCHIE PROPERTY
MEMPHIS, TENNESSEE

LEGEND
 PARCEL BOUNDARY
 SOIL BOUNDARY

0 1,000 2,000
 SCALE IN FEET

COORDINATE SYSTEM: NAD 1983
 STATE PLANE TENNESSEE FEET

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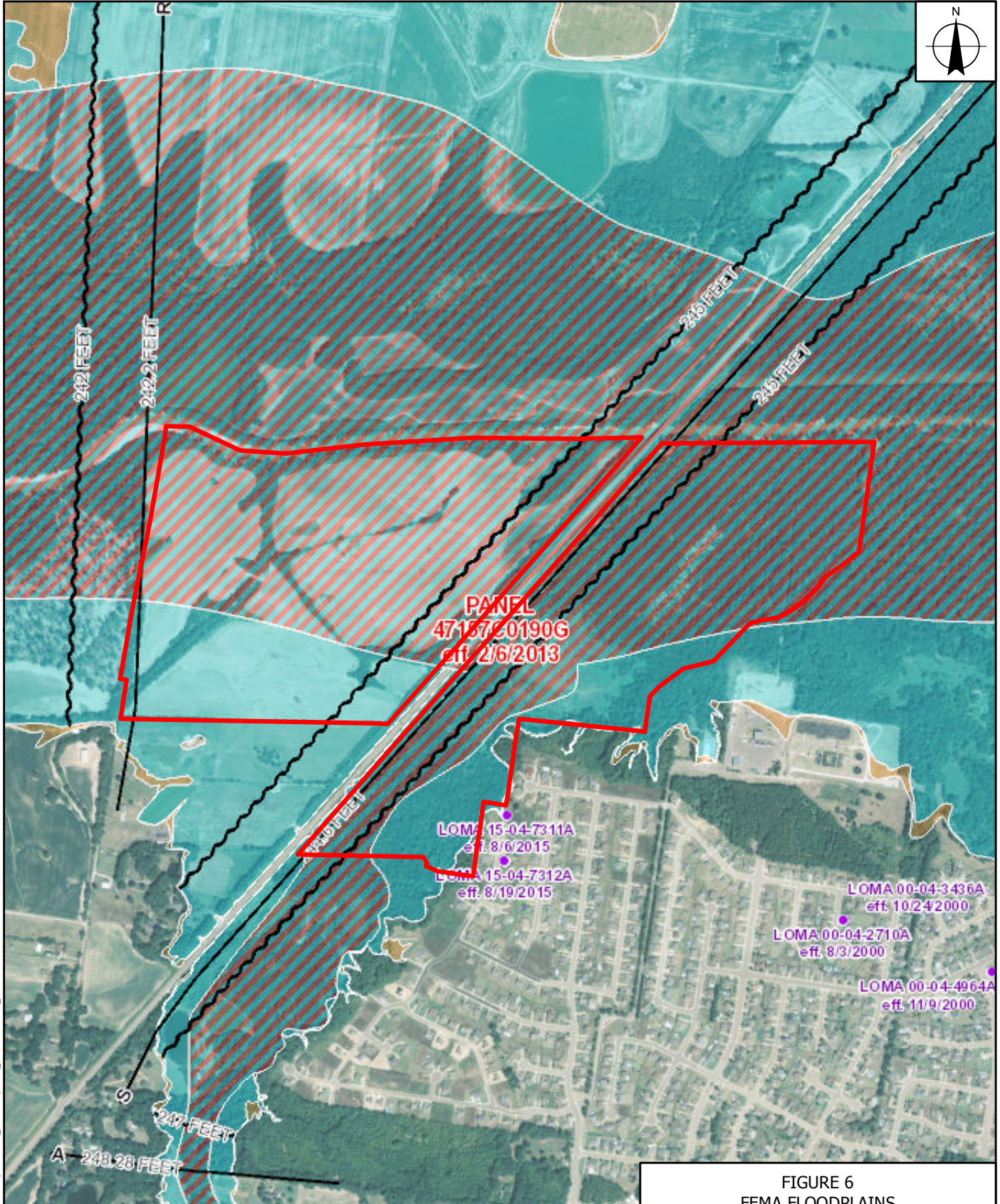
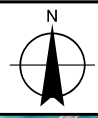
DATA SOURCES: SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEX, GETMAPPING, AERGRID, IGN, IGP, SWISSTOPO, AND THE GIS USER COMMUNITY; SOIL SURVEY GEOGRAPHIC DATABASE (SSURGO 2.2) IS FROM THE U.S. DEPARTMENT OF AGRICULTURE, NATURAL RESOURCES CONSERVATION SERVICE DOWNLOADED THROUGH THE USDA/NRCS - NATIONAL GEOSPATIAL CENTER OF EXCELLENCE. PARCEL BOUNDARIES ARE FROM THE SHELBY COUNTY GOVERNMENT.

3.4 Hydrology

Much of the site consists of relatively flat terrain, resulting in flooding potential from the Loosahatchie River (Figure 6), retention of precipitation, and groundwater inputs. Loosahatchie River gauge data was acquired from RiverGages.com for the gauge LE111 near Brunswick, Tennessee, located at the crossing of Brunswick Road. The gauge is the closest in proximity to the site, approximately 5 miles upstream from the Bank, and the river possesses similar morphological characteristics. According to this gauge, and utilizing the established flood stage of 23 feet, the Loosahatchie River exceeded the flood stage 14 times from 2010 through 2016 (Table 2). This includes 7 days in 2011; 1 day each in 2013, 2014, and 2015; and 4 times in 2016. Twelve of the 14 events occurred during the growing season and the flood stage was exceeded in 5 out of the previous 6 years. Therefore, it is anticipated that flooding from the Loosahatchie River will provide surface water to the site every year or every second year.

Date	Elevation (feet)	Stage Elevation (feet)
April 27, 2011	251.64	24.39
April 28, 2011	253.08	25.83
April 29, 2011	250.50	23.25
May 2, 2011	250.50	23.25
May 3, 2011	252.20	24.95
May 4, 2011	250.51	23.26
December 6, 2011	250.52	23.27
May 22, 2013	250.57	23.32
September 12, 2014	250.91	23.66
February 22, 2015	250.52	23.27
March 10, 2016	251.33	24.08
March 11, 2016	253.14	25.89
March 12, 2016	250.55	23.30
April 1, 2016	250.67	23.42

Surface water drains toward various field drainage ditches, which in turn flow toward to the Loosahatchie River (Figure 7). Based on field observations, Howard Creek, located east of SR 14, appears to flood consistently, likely exacerbated by beaver impoundments. These flood waters are directed either into a roadside ditch parallel to SR 14 and discharge to the Loosahatchie River or enter the project site flowing from east to west, eventually entering a channel that discharges into the Loosahatchie River near the western border of the property. Several small drains located throughout the property have been created to assist in surface drainage off the site for farming. All surface water within the restoration area ultimately flows to the main drainage feature before being discharged to the Loosahatchie River. The large channel providing drainage for the entire parcel has breached the levee parallel to the Loosahatchie River.



X:\LOOSAHATCHIE_PROPERTY\PROJECTS\UPDATED_REPORT\FEMA_FLOODPLAINS_REVISED.MXD

Legend

- Parcel Boundary
- 1% Annual Chance Flood Hazard
- 0.2% Annual Chance Flood Hazard
- Area of Undetermined Flood Hazard
- Regulatory Floodway
- Special Floodway
- Future Conditions 1% Annual Chance Flood Hazard
- Area with Reduced Risk Due to Levee

0 1,000 2,000
 SCALE IN FEET

COORDINATE SYSTEM: NAD 1983
 STATE PLANE TENNESSEE FEET

FIGURE 6
FEMA FLOODPLAINS
LOOSAHATCHIE PROPERTY
MEMPHIS, TENNESSEE

REQUESTED BY:	BY:
DRAWN BY:	BL
DATE:	8/16/2016
PROJECT:	0888814924

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DATA SOURCES: SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEX, GETMAPPING, AEROGRIID, IGN, IGP, SWISSTOPO, AND THE GIS USER COMMUNITY; FLOOD DATA ARE FROM FEMA; PARCEL BOUNDARIES ARE FROM THE SHELBY COUNTY GOVERNMENT.

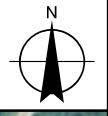


FIGURE 7
SURFACE FLOW PATTERNS
LOOSAHATCHIE PROPERTY
MEMPHIS, TENNESSEE

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LEGEND

-  Surface Flow
-  Overland Flow
-  Parcel Boundary

0 1,000 2,000

SCALE IN FEET

COORDINATE SYSTEM: NAD 1983
STATE PLANE TENNESSEE FEET

REQUESTED BY:	BY
DRAWN BY:	BL
DATE:	8/16/2016
PROJECT:	0888814924

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Due to soil physical properties, groundwater will provide additional hydrology to the mitigation site. Waverly silt loam possesses aquic conditions including saturation, reduction, and redoximorphic features, including a gleyed matrix between 5 and 30 inches deep. Areas in depressions are ponded during wet seasons and the depth to groundwater is at or within 1 foot of the surface during winter and spring seasons.

3.5 Prior Converted Croplands Determination

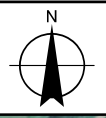
Previously converted croplands are wetlands that were drained, dredged, filled, leveled, or otherwise manipulated, including the removal of woody vegetation, before December 23, 1985, to make production of an agricultural commodity possible, and that do not meet specific hydrologic criteria, have had an agricultural commodity planted or produced at least once prior to December 23, 1985, and have not since been abandoned.

The 282-acre parcel of land was evaluated by the National Resources Conservation Service in 1988 and again in 1990 to determine if prior converted conditions exist. As shown in Attachment B, the determinations were conducted on Farm Number 1561 and Tract Number T-1022. Field Numbers 3, 4, and 5 were each determined to be prior converted croplands that have undergone such physical alteration that wetland characteristics would not return to the site in the event cropping of the area was halted. The most ecologically sound approach to wetland restoration is to restore degraded, formerly drained wetlands by systematically undoing the activities that were done to alter them.

3.6 National Wetlands Inventory

Based on review of the National Wetlands Inventory mapping, there are several inclusions of mapped wetlands within the project property (Figure 8). These include:

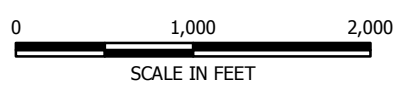
- PEM1A — persistently emergent palustrine (PEM1) wetland system that is temporarily flooded (A). The area mapped as PEM1A includes several small inclusions west of SR 14 and south of the Loosahatchie River, and a larger area along the southern boundary of the property along the east side of SR 14.
- PEM1C — (PEM1) wetland system that is seasonally flooded (C). The area mapped as PEM1C includes several small inclusions west of SR 14 and south of the Loosahatchie River.



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LEGEND

- PARCEL BOUNDARY
- FRESHWATER EMERGENT WETLAND
- FRESHWATER FORESTED/SHRUB WETLAND
- FRESHWATER POND
- LAKE
- RIVERINE



COORDINATE SYSTEM: NAD 1983
STATE PLANE TENNESSEE FEET

FIGURE 8
NWI WETLANDS
LOOSAHATCHIE PROPERTY
MEMPHIS, TENNESSEE

REQUESTED BY:	BY
DRAWN BY:	BL
DATE:	8/26/2016
PROJECT:	0888814924

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DATA SOURCES: SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEX, GETMAPPING, AERGRID, IGN, IGP, SWISSTOPO, AND THE GIS USER COMMUNITY; NWI WETLANDS ARE FROM FWS.GOV. PARCEL BOUNDARIES ARE FROM THE SHELBY COUNTY GOVERNMENT.

- PFO1A — palustrine forested (PFO) wetland with broad-leaved deciduous plants (1) that is temporarily flooded (A). The area mapped as PFO1A includes a small portion of the western site boundary that is east of SR 14.
- PFO1C — PFO wetland with broad-leaved deciduous plants (1) that is seasonally flooded (C). The area mapped as PFO1C includes a small portion of the eastern property boundary that is east of SR 14.
- PFO1F —PFO wetland with broad-leaved deciduous plants (1) that is semi-permanently flooded (A). The area mapped as PFO1C includes a small portion of the eastern site boundary that is east of SR 14.
- PSS1A — scrub-shrub palustrine (PSS) system with broad-leaved deciduous plants (1) that is temporarily flooded (A). The area mapped as PSS1A includes a large portion of the beaver impounded area east of SR 14 and south of the Loosahatchie River.
- PSS1C —PSS system with broad-leaved deciduous plants (1) that is seasonally flooded (C). The area mapped as PSS1C includes a portion of the area east of SR 14.
- PSS1F —PSS system with broad-leaved deciduous plants (1) that is semi permanently flooded (F). The area mapped as PSS1F includes a small area east of SR 14 bordering the wetland designated as PEM1A.
- PUBF — palustrine (P) wetland system with an unconsolidated bottom (UB) that is semi-permanently (F) flooded. The area mapped as PUBF includes a small area along the eastern boundary of the site east of SR 14.
- R2USC — defined as a lower perennial riverine (R2) system with an unconsolidated shore (US); seasonally flooded (C). The area mapped as R2USC includes the Loosahatchie River channel, which flows east-west and bisects the site.

4.0 BANK DEVELOPMENT PLANS

4.1 Goals and Objectives

Specific Bank objectives are:

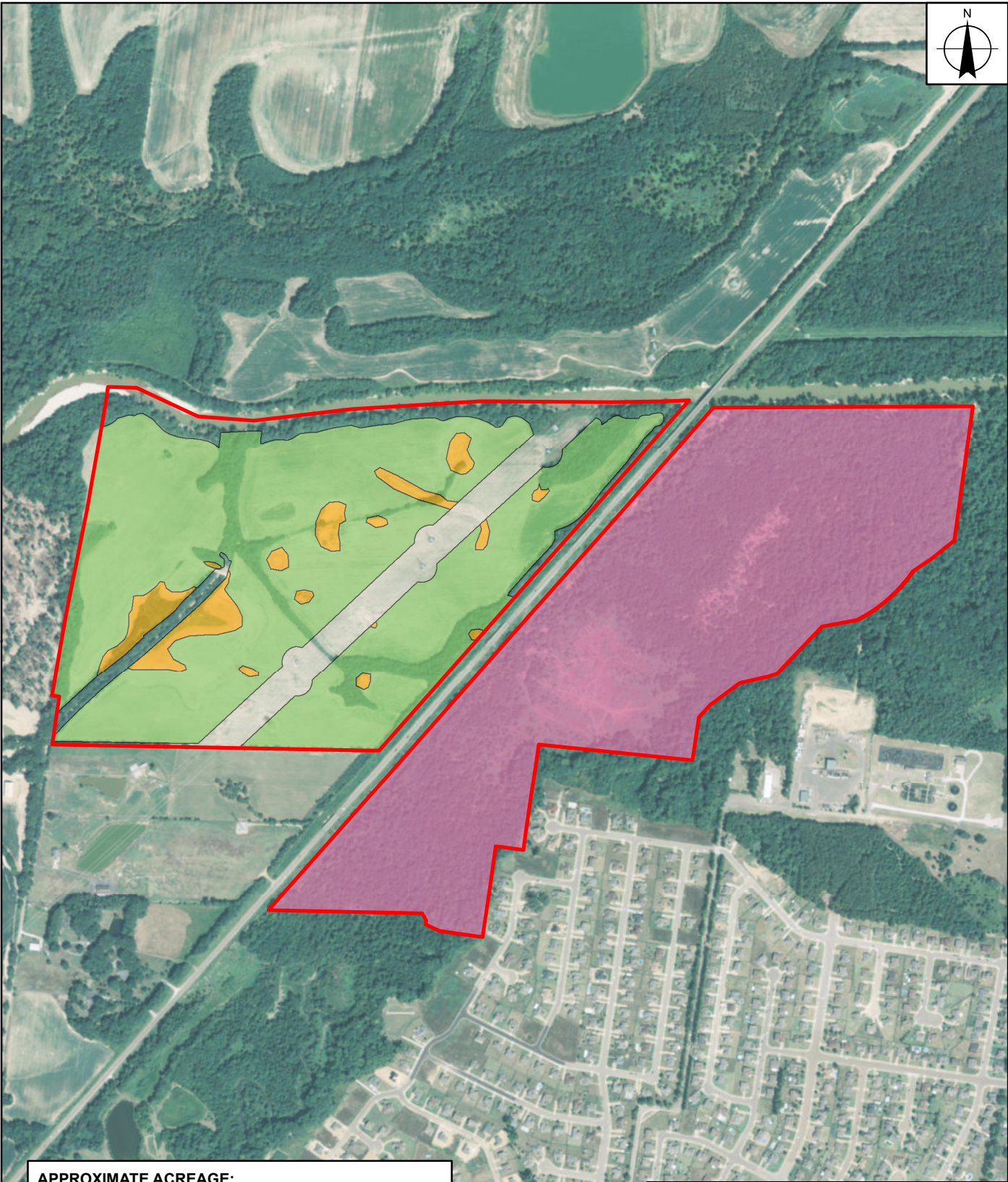
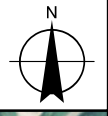
- Restoration of approximately 110.7 acres of the property west of SR 14
- Preservation of approximately 130.9 acres of the site on the east side of SR 14
- Enhancement of approximately 9.7 acres of the property west of SR 14

4.2 Mitigation Work Plan

The mitigation work plan includes actions that are intended to achieve the Bank objectives of restoring and preserving impaired and current wetland ecological functions at the site. The ecological improvement plan will be based on current conditions as well as future planted conditions (Figure 9).





4.2.1 Hydrology

Restoration efforts on 110.79 acres at the site will be achieved through improvements to both hydrology and vegetation. South of the Loosahatchie River and west of SR 14, the site predominantly drains from east to west, augmented by periodic backwater flood events from the Loosahatchie River and Howard Creek from the east. Due to past farming practices and other historic modifications to the site, water is quickly conveyed to the large drainage ditch that discharges to the Loosahatchie River. Essentially all water from the site is discharged to the Loosahatchie River via this drain; therefore, hydrology modifications are focused on the area near the large drainage ditch. A U-shaped earthen berm will be installed at the northeastern end of the access road, upstream of the large drainage ditch. This berm will act as a diversion berm, dispersing runoff to adjacent fields and away from the large drainage ditch. This berm will be constructed of compacted earthen material and will be seeded and mulched to propagate vegetation (Figure 10). A similar earthen berm will be installed along the western and northern boundary of the parcel west of SR 14. This berm will be constructed similar to the diversion berm, but will act as a containment berm to help retain surface water on the site to the maximum extent possible. An access road with a width up to 25 feet will be placed from the southwest corner of the west parcel and will run along the south boundary to the east side of the Memphis Light, Gas and Water (MLGW) ROW. This access road will provide MLGW access to their transmission line. In addition, this access road will also function as a berm to help retain water onsite.



APPROXIMATE ACREAGE:	
RESTORATION:	110.7
PRESERVATION:	130.9
ENHANCEMENT:	9.7

FIGURE 9
PROPOSED PLANTING PLAN
LOOSAHATCHIE PROPERTY
MEMPHIS, TENNESSEE

	PARCEL BOUNDARY		ENHANCEMENT
	RESTORATION		PRESERVATION



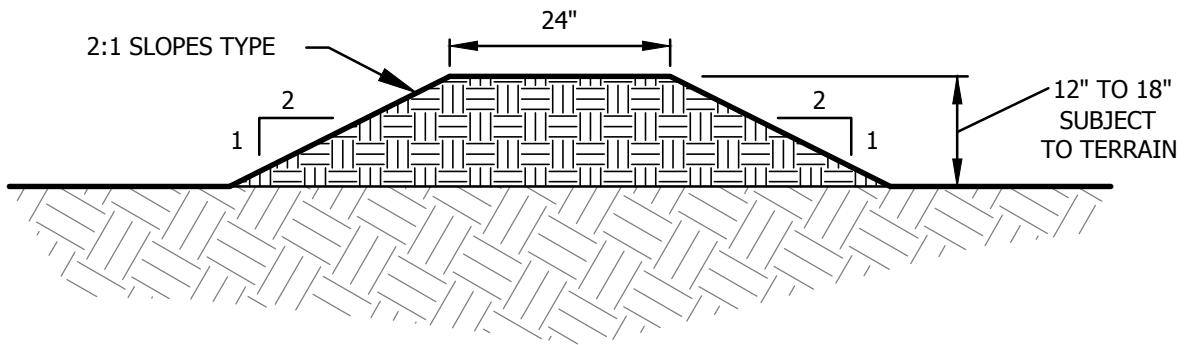
COORDINATE SYSTEM: NAD 1983
 STATE PLANE TENNESSEE FEET

REQUESTED BY:	CG
DRAWN BY:	CG
DATE:	8/26/2016
PROJECT:	0888814924

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X:\LOOSAHATCHIE_PROPERTY\PROJECTS\AUGUST 2016 REVISION\PROPOSED_PLANTING_PLAN_EXISTINGWETLANDS.MXD

DATA SOURCES: SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEX, GETMAPPING, AEROGRIID, IGN, IGP, SWISSTOPO, AND THE GIS USER COMMUNITY



PROPOSED WETLAND CONTAINMENT BERM SECTION

NOT TO SCALE

FIGURE 10
 PROPOSED WETLAND CONTAINMENT
 BERM SECTION LOOSAHATCHIE
 PROPERTY
 MEMPHIS, TENNESSEE

REQUESTED BY: C.GROW

DRAWN BY: W.MAREK

DWG DATE: 09/01/16

DWG NO: 0888814924

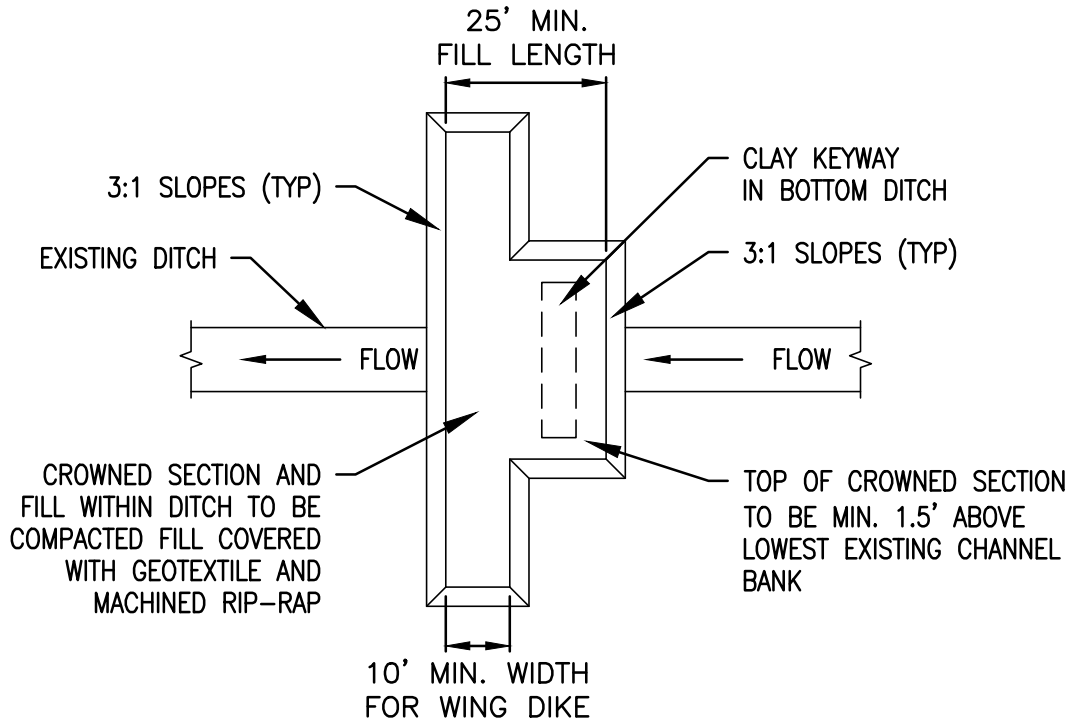


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The two culverts located along the access road near the center of the property will be removed and portions of the channel at the culvert location backfilled with clean earthen material. Additional drainages on the site are also present. These receive surface waters from the adjacent waterways and ultimately drain via the large channel to the Loosahatchie River. These drainages will be plugged with ditch plugs to decrease surface velocities and further retain surface water on the site. The ditch plugs will be placed in strategic locations within the existing channels in order to supplement the diversion berm shown in Figure 10. As shown in Figure 11, these plugs will consist of compacted backfill, covered with a layer of geotextile and machined riprap. Each plug will be approximately 25 feet long. A supplemental wing dike will also be installed at each plug in order to prevent washout during storm events. Note that the ditch plug design is similar to one referenced in the National Resources Conservation Service-Georgia document *Engineering Job Sheet — Ditch Plug*, dated June 2005. These improvements will result in improved hydrology at the site (Figure 12).

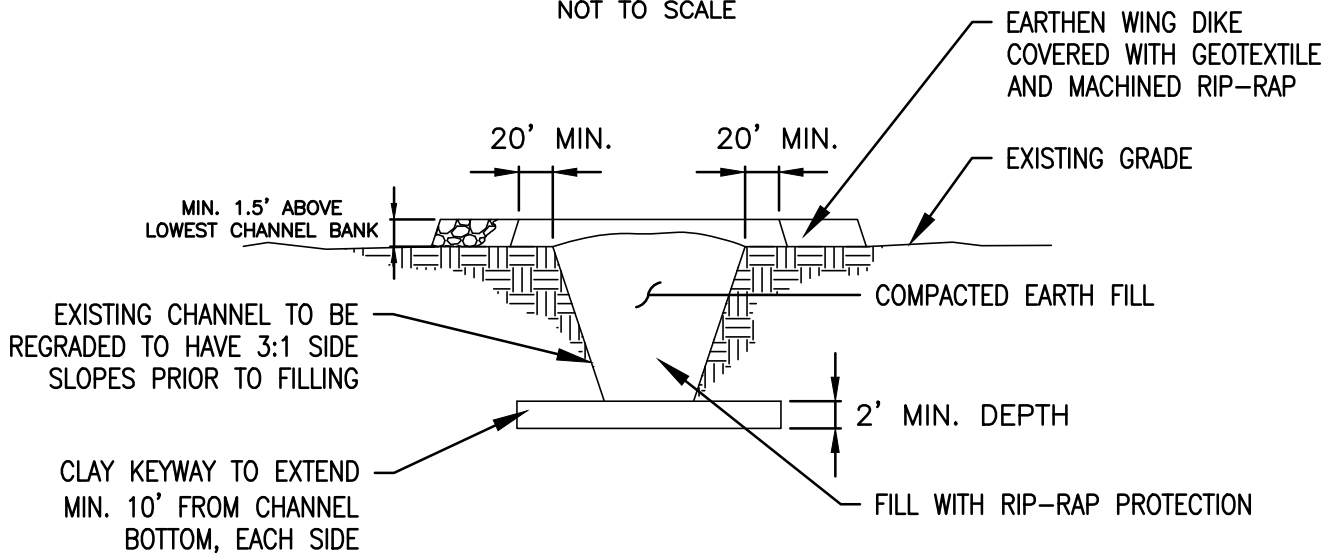
Preservation efforts on 130.9 acres east of SR 14 will be achieved without the need for further physical modifications or alterations. The majority of the area has been converted from agriculture to bottomland hardwood to scrub-shrub wetlands; the latter due to beaver impoundments altering the depth and duration of inundation. A deed restriction will be put in place, incorporating the parcel east of SR 14, to restrict future development of the preserved area. Enhancement efforts on 9.7 acres west of SR 14 will be achieved through similar means as the restoration and preservation efforts. The 9.7 acres encompass previously delineated wetlands currently onsite (Figure 4 and Figure 9).

Portions of the current access road will be removed to provide hydrological equilibrium within the site. Dirt removed from these areas will be reused in berm installation at other locations within the site.



PLAN VIEW

NOT TO SCALE



SECTION

NOT TO SCALE

FIGURE 11
 PROPOSED DITCH PLUG DETAIL
 LOOSAHATCHIE PROPERTY
 MEMPHIS, TENNESSEE

REQUESTED BY: B. MARTIN
 DRAWN BY: C. CORLEONE
 DWG DATE: 1/21/2016
 DWG NO: 14924_C001

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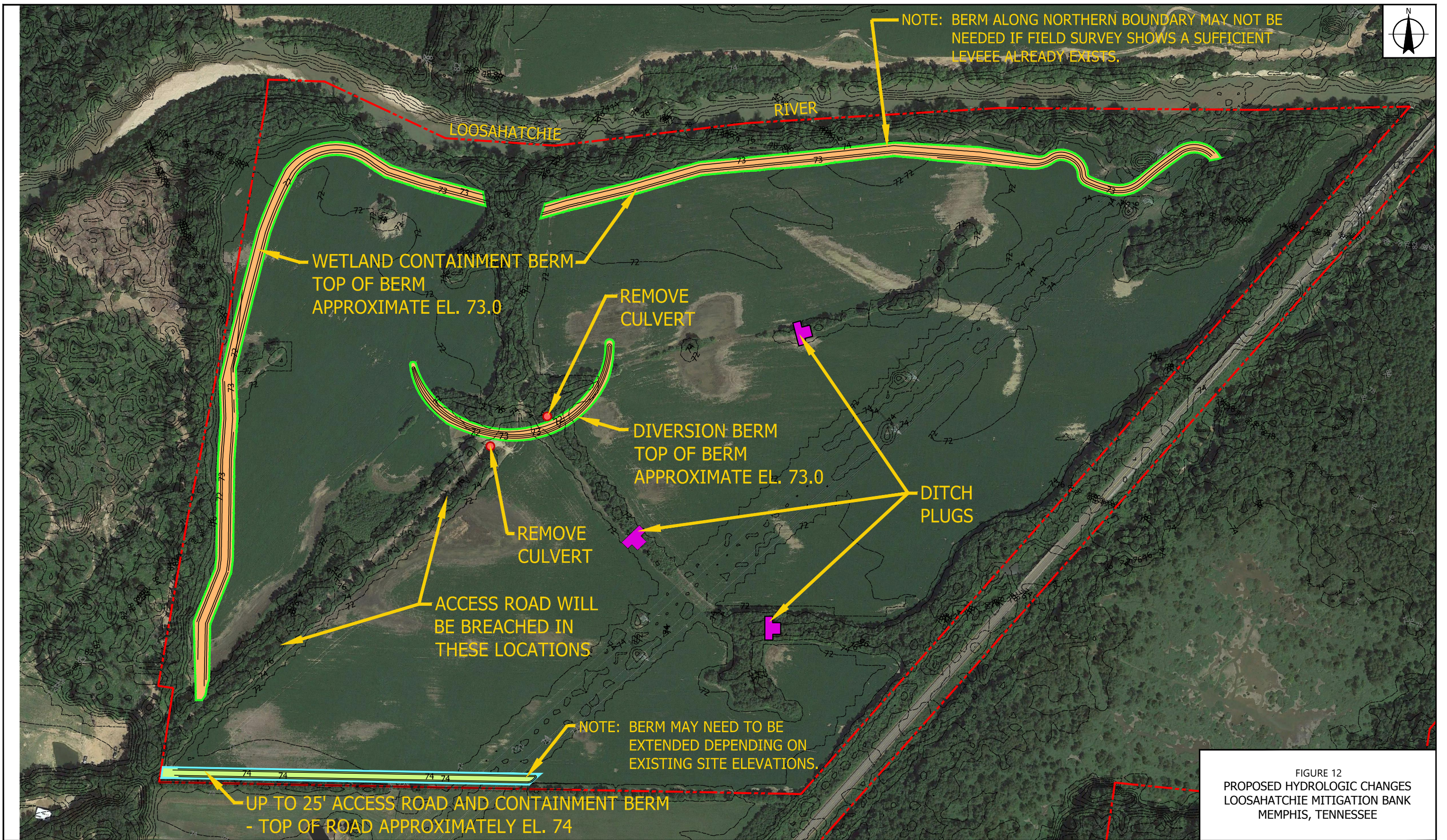
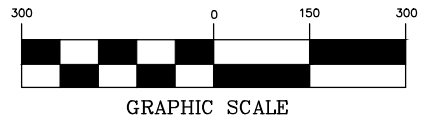


FIGURE 12
 PROPOSED HYDROLOGIC CHANGES
 LOOSAATCHIE MITIGATION BANK
 MEMPHIS, TENNESSEE



NOTE: BERM DESIGN ELEVATIONS BASED OFF LIDAR DATA AND REPRESENT DESIGN CONCEPT ONLY. BERM ELEVATIONS FOR CONSTRUCTION WILL BE BASED OFF FIELD SURVEY INFORMATION.

COORDINATE SYSTEM: NAD 1983
 STATE PLANE TENNESSEE FEET

REQUESTED BY:	CG	
DRAWN BY:	WM	
DATE:	09/01/2016	
PROJECT:	0888814924	

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DATA SOURCES: Lidar Data Taken January 23, 2012, Memphis, Tennessee

4.2.2 Vegetation

Vegetation improvements for the restoration portion of the project will consist of re-forestation and re-establishment of a bottomland hardwood ecotype. A mix of woody, mast-producing, and other suitable hydrophytic species from those presented in Table 3 will be planted on the open, agricultural portions of the site. Native bottomland hardwood seedlings from the table will be planted on 10-foot centers within the entire restoration area (110.7 acres). Bareroot (1-year old) seedlings will be hand planted using a 10- to 12-inch dibble planting bar or tractor based planting attachment. At least six species from Table 3 will be planted using a nominal spacing of 10 feet by 10 feet with a resulting density of approximately 436 trees per acre. No single species will comprise more than 25% of the total trees planted to achieve diversity and promote patch dynamics within the assigned mitigation site. Seedlings/saplings will be planted between late November and March. The restoration will encourage native hydrophytic seed sources in place to re-establish sufficient plant coverage and diversity through natural recruitment and colonization.

Table 3 Potential Woody Vegetation Proposed for the Mitigation Area		
Common Name	Scientific Name	Regional Wetland Indicator Status
Bald Cypress	<i>Taxodium distichum</i>	OBL
Cherrybark oak	<i>Quercus pagoda</i>	FAC
Common buttonbush	<i>Cephalanthus occidentalis</i>	OBL
Nuttall oak	<i>Quercus nuttallii</i>	OBL
Overcup oak	<i>Quercus lyrata</i>	OBL
Persimmon	<i>Diospyros virginiana</i>	FAC
Pin oak	<i>Quercus palustris</i>	FACW
Red maple/Drummond's maple	<i>Acer rubrum var. drummondii or trilobum</i>	OBL
Shellbark hickory	<i>Carya laciniosa</i>	FACW
Shumard oak	<i>Quercus shumardii</i>	FACW
Silver maple	<i>Acer saccharinum</i>	FACW
Swamp chestnut oak	<i>Quercus michauxii</i>	FACW
Water hickory	<i>Carya aquatica</i>	OBL
Water oak	<i>Quercus nigra</i>	FAC
Water tupelo	<i>Nyssa aquatica</i>	OBL
Willow oak	<i>Quercus phellos</i>	FACW

Notes:

- ¹ Vegetation to be planted in the mitigation area will be based on availability, appropriateness of habitat, and approval of the IRT.
- OBL = Obligate wetland species. Occurs almost always (estimated probability of 99 percent) under natural conditions in wetlands.
 - FACW = Facultative wetland species. Usually occurs in wetlands (estimated probability 67 to 99 percent). Occasionally found in non-wetlands.
 - FAC = Facultative species. Equally likely to occur in wetlands or non-wetlands (estimated probability 34 to 66 percent).

Areas within the power line right-of-way and access road will not be planted and have been excluded from the mitigation bank. Consultation with Memphis Light Gas and Water was initiated and discussions with Mr. Ronnie Alberson, MLGW Property Management Specialist, occurred on April 21, 2015. Mr. Alberson is responsible for the management of MLGW's transmission right-of-way and stated the agency will not have aversion to the project if earthwork is not being conducted within the power line right-of-way.

The initial right-of-way was established by the Tennessee Valley Authority at 150 feet in width but an additional 25-foot right-of-way was subsequently added to each side of the easement. The easement was transferred from the Tennessee Valley Authority to MLGW in the mid-1950s and remains under their purview. The total width of the right-of-way remains at 200 feet and no trees or earthwork will be conducted within the easement.

An additional 100-foot buffer will be established around each power line support structure to provide a secondary layer of protection for the power lines. Access rights from the roadway to the power line easement will be provided to MLGW through an access road, up to 25 feet wide, along the southern boundary of the site. Mr. Alberson stated that access would be sufficient and MLGW would just need an access to the right-of-way. This proposed access road will be excluded from the mitigation bank.

The Bank Sponsor reserves the right to incorporate these areas into the mitigation bank as an herbaceous, scrub-shrub, or bottomland hardwood should the power line or right-of-way be abandoned or altered.

As previously noted, preservation activities for approximately 130.86 acres east of SR 14 will not require any physical modifications or alterations. A deed restriction will be put in place, incorporating the parcel east of SR 14, to restrict future development of the preserved area.

4.3 Financial Assurance

For the initial release of Credits, the Sponsor agrees to provide adequate Financial Assurances in an amount approved by the IRT to ensure that aquatic functions will be restored, established, or maintained on the Bank. The amount of the Financial Assurance will be sufficient to acquire replacement compensatory mitigation sufficient to offset the initial release of credits through an approved bank or in-lieu fee program in the event of a default. Documentation of the estimated amount may be required, and the final amount requires approval by the IRT. Release of funds pursuant to this Financial Assurance will be recommended by the IRT, acting through the Chair(s),

after it has reviewed and approved the annual monitoring report, if the IRT concludes that success criteria have been met for the wetland credits previously released. Such amount is not expected to exceed \$100,000. Complete satisfaction and release of the Financial Assurance may only occur if the submitted report demonstrates, and the IRT is satisfied, that specific success criteria (as stated herein) for a sufficient portion of the Bank have been met to offset the initial release of Credits. The Sponsor shall provide notice to the IRT through the Chair(s) at least 120 days in advance of any planned termination or revocation any Financial Assurance. Financial Assurance must be maintained, renewed, extended or replaced, and approved by the IRT so that it remains effective until the IRT certifies that satisfaction has been met and the Financial Assurance can be released.

Long-term (past 10 years) maintenance requirements will be determined on a site-specific basis. However, any such activities shall be the responsibility of the Long-Term Steward. The Financial Assurances shall provide funding sources for any maintenance requirements or for repairs necessitated by catastrophic events or natural disasters.

4.4 Post-Establishment Actions

Maintenance of the site may be necessary to ensure the appropriate vegetation establishment and hydrologic stability. If invasive/non-native species are identified, they will be controlled by spot applications of aquatic-labeled herbicides or by removal. Herbicidal and/or selective cut/mowing will continue until native wetland species have become established and are self-sustaining/self-regenerating. This maintenance schedule will be the responsibility of the Sponsor.

4.5 Qualifications of Sponsor

EnSafe, part of the Mitigation Bank Sponsor team, will have primary responsibility for Bank establishment and is a nationally-recognized environmental consulting firm with wetland ecologists who are experienced in delineating wetlands, permitting unavoidable impacts, and design/installation of compensatory mitigation to offset unavoidable impacts. Their ecology team has worked in the Memphis and surrounding areas as consultants and in the industry for more than 25 years. They have a strong working relationship with and are recognized wetland professionals by the USACE, TDEC, TWRA, TDOT, and other regulatory agencies. The Memphis team also has access to a network of support ecologists with wetland banking experience throughout the United States.

4.6 Establishment and Operation

The Sponsor will develop and operate the Bank pursuant to 33 CFR Part 332, "Compensatory Mitigation for Losses of Aquatic Resources." The Bank will be established through a MBI pursuant to the federal rules. The MBI will include the following: A description of the GSA, accounting procedures, default and closure provisions, reporting protocols, mitigation plan(s), and a credit release schedule. The Sponsor will use a combination of restoration and enhancement of wetlands to generate mitigation credits for use as a public bank in the GSA.

Upon approval of the MBI, credits will be released from the Bank consistent with the schedule of credit availability outlined in the MBI. The Sponsor will be responsible for credit/debit accounting for credits pursuant to the procedures outlined in the MBI. The eligibility of a project seeking to use credits from the Bank will be determined by the applicable regulatory and resource agencies on a project-by-project basis.

The Sponsor will operate the Bank until all credits are dispersed or until banking activity is voluntarily terminated after written notice by the Sponsor to the IRT and with the approval of the IRT. The Sponsor will submit to USACE and the IRT a ledger report showing the beginning and ending balance of available credits and permitted impacts by resource type and the monitoring report for the Bank. Both of these will be prepared pursuant to the specific mitigation plan outlined in the MBI. The Sponsor will identify and implement appropriate remedial action for the Bank in coordination with the IRT in the event the site fails to achieve the success criteria specified in the final MBI.

4.7 Performance Standards

The restoration of the mitigation area will be measured by analyzing hydrology and planted/transplanted/naturally re-established vegetation. The hydrological standard of success will be 14 or more consecutive days of flooding or ponding, or a water table 12 inches (30 cm) or less below the soil surface, during the growing season at a minimum frequency of 5 out of 10 years. According to the Shelby County Soil Survey, the growing season on average is 238 days beginning on March 20 and ending on November 12. The successful restoration of wetland hydrology to the site will be assessed, in part, with the installation of three shallow groundwater wells throughout the restored area (west of SR 14). Prior to the initiation of hydrological restoration activities, data will be collected from the wells and used as a baseline for comparisons following restoration activities. As the site progresses, well data will be used to determine the extent of groundwater influence on the development of wetland characteristics. The permanent location of the wells will be documented using a GPS unit and shown on a site map. The presence of primary and secondary indicators of hydrology will also be documented to determine if the hydrological standard is being met.



Additionally, IRIS tubes will be installed throughout the west side of SR 14 to monitor for reducing soil conditions and will follow Rabenhorst's 2008 *Protocol for Using and Interpreting IRIS Tubes*.

The success of the vegetative restoration and enhancement will be measured by the number of stems per acre. This target stocking level has been set at 300 stems per acre (75 percent survival) with no more than 25% made up of a single species. If the success criteria of stems per acre or percentage of dominant species is not met, a consultation with the IRT will be required to determine the appropriate corrective measures. These measures may include planting an appropriate number of additional trees from Table 3 to meet the target stocking level, or vegetative and/or mechanical control of species that exceed 25% of the total stems found in the mitigation area. In addition, the mitigation area vegetation must achieve a 50% or higher areal coverage of facultative, facultative wetland, and/or obligate wetland species by the end of the required monitoring program. At the end of the monitoring period, upon satisfaction of the performance standards, the Sponsor will request that the USACE issue a written Site Closure Certification.

5.0 CREDITING AND DEBITING PROCEDURES

5.1 Generation of Credits

The estimated credit yield of the Bank is approximately 127 credits: 110.7 from wetland restoration (1:1 ratio), 3.2 from enhancement (3:1 ratio), and 13.1 from preservation of existing wetlands (10:1 ratio). The number of wetland credits available from the Bank will reflect the difference between current site conditions and post-project site conditions as determined by the USACE and the IRT. Generation of credits will be based on state and federal guidelines, including any minimum ratio requirements in accordance with Part 332, "Compensatory Mitigation for Losses of Aquatic Resources."

Forested, scrub-shrub, and emergent wetland impacts may be mitigated at the Bank. The use of credits to mitigate wetland impacts other than emergent, scrub-shrub, and forested may be allowed on a case-by-case basis after coordination with USACE and the IRT. Decisions regarding out-of-kind wetland mitigation will consider the availability and practicability of in-kind mitigation, as well as the existing condition and landscape function of the impacted wetlands and the Bank's wetlands and availability of credits.

5.2 Credit Release

Credits generated through development of the Bank will be used to offset wetland impacts as authorized by a Section 401/404 or TDEC's Aquatic Resource Alteration Permit within the Bank's service area. The USACE and/or TDEC will make the determination of the number and type of credits needed to mitigate specific project impacts. Upon purchase of wetland mitigation credits by a permitted project owner, the Bank/Sponsor becomes responsible for the wetland mitigation requirements of the permit. Credits debited from the Bank may be used to satisfy the environmental requirements of multiple agencies if it is for the same project activity and the agencies have approved purchase of credits to fulfill mitigation requirements.

In consideration of the ecological suitability of the site, the proposed low-risk restoration approach, and the perpetual protection provision, the Sponsor requests the IRT approval of a pre-credit release of 20% of the total credits expected at the site upon signature of the MBI and filing of restrictive covenants; an additional 30% release after completion of site preparation and reestablishment of target vegetation, and completion of hydrological modifications as reflected in MBI; a 10% release of the credits at the end of Years 2, 3, 5, and 7 of the Bank; and release of the remaining 10% of the credits once the performance standards specified in the MBI have been met (Table 4).



Percent Release	Release Schedule	Credits Released
20	Upon signature of MBI and filing of restrictive covenants	25.4
30	Completion of vegetation and hydrological modifications	38.1
10	2 nd annual monitoring report	12.7
10	3 rd annual monitoring report	12.7
10	5 th annual monitoring report	12.7
10	7 th annual monitoring report	12.7
10	Completion of monitoring and successful documentation	12.7
Total Credits		127

6.0 LONG-TERM MANAGEMENT

Maintenance of the site may be necessary to ensure the appropriate vegetation establishment and hydrologic stability. Maintenance will include reasonable actions to deter trespassing (i.e., mark property boundaries and post "No Trespassing" signs), control of invasive or noxious plants, beaver control, and re-planting, if necessary. If any of the above problems are observed and jeopardize the integrity of the natural wetland system, the Sponsor will notify appropriate regulatory agencies (i.e., USACE and TDEC).

A perpetual declaration of restrictive covenants will be placed on the mitigation site by filing the *Notice of Land Use Restrictions* Form with the deed to the property. This document will be recorded with the county registrar's office. A copy of the recorded deed restrictions will be provided to the Corps and TDEC within 30 days of being recorded (Attachment C). The restrictions will include, but are not limited to: future development, agricultural, or silvicultural practices detrimental to the health of the restored wetland as well as any alteration to or manipulation intended to disrupt or otherwise impound or prolong the restored hydrologic regime of the restored wetland. Only non-invasive, low-impact public recreational purposes such as hiking, wildlife viewing, hunting, or educational uses such as ecological research or outdoor classrooms will be allowed.

The long-term ownership arrangements for this property will include the conveyance of the entire mitigation parcel (282 acres) by the Bank Sponsor to an approved land management agency. To ensure long-term protection of all lands included within the Bank, the approved land management agency will be responsible for maintaining and protecting lands contained within the mitigation parcel. It is anticipated the property will be conveyed to TWRA, Ducks Unlimited, The Nature Conservancy, or similar entity for perpetual management.

Attachment A
Site Photographs

**West Tennessee Wetlands Mitigation Bank
Shelby County, Tennessee
September 2016**



Photo 1: Displays the southern portion of the mitigation site and surface hydrology present. View is from gravel road looking east.



Photo 2: Large drift deposits (Primary indicator B3) indicating recent inundation and flowing water up to 4 feet in depth. View is from the road crossing looking west across mitigation site. Diversion berm will be placed in this area

**West Tennessee Wetlands Mitigation Bank
Shelby County, Tennessee
September 2016**



Photo 3: Another view of the southern agriculture field with large areas of surface water (A1). Hydrology will be restored by blocking the drains flowing from these areas. View is facing south.



Photo 4: A view of the central drain across the existing access road at the culvert. The culvert will be removed at this location and the drain will be plugged.

**West Tennessee Wetlands Mitigation Bank
Shelby County, Tennessee
September 2016**



Photo 5: View of the agriculture area and treeline along the southern boundary. View is facing east. A 25 foot corridor will not be planted and will remain for access to the powerline right-of-way.



Photo 6: Large drainage from the mitigation site south of the Loosahatchie River.

Attachment B
Prior Converted Determinations

**HIGHLY ERODIBLE LAND AND WETLAND
CONSERVATION DETERMINATION**

1. Name and Address of Person

Bruce Tolley
Rt. 1 Box 477A
Drummonds, TN 38023

2. Date of Request

1-19-89

3. County

Shelby

4. Name of USDA Agency or Person Requesting Determination

ASCS

5. Farm No. and Tract No.

1561 T-1022

SECTION I - HIGHLY ERODIBLE LAND

6. Is soil survey now available for making a highly erodible land determination?	Yes	No	Field No.(s)	Total Acres
	✓			
7. Are there highly erodible soil map units on this farm?	✓			
8. List highly erodible fields that, according to ASCS records, were used to produce an agricultural commodity in any crop year during 1981-1985.				
9. List highly erodible fields that have been or will be converted for the production of agricultural commodities and, according to ASCS records, were not used for this purpose in any crop year during 1981-1985; and were not enrolled in a USDA set-aside or diversion program.				

10. This Highly Erodible Land determination was completed in the: Office Field

NOTE: If you have highly erodible cropland fields, you may need to have a conservation plan developed for these fields. For further information, contact the local office of the Soil Conservation Service.

SECTION II - WETLAND

11. Are there hydric soils on this farm?	Yes	No	Field No.(s)	Total Wetland Acres
	✓			
List field numbers and acres, where appropriate, for the following :				
12. Wetlands (W), including abandoned wetlands, or Farmed Wetlands (FW). Wetlands may be farmed under natural conditions. Farmed Wetlands may be farmed and maintained in the same manner as they were prior to December 23, 1985, as long as they are not abandoned.			UN, 2a	174
13. Prior Converted Wetlands (PC) - The use, management, drainage, and alteration of prior converted wetlands (PC) are not subject to FSA unless the area reverts to wetland as a result of abandonment. You should inform SCS of any area to be used to produce an agricultural commodity that has not been cropped, managed, or maintained for 5 years or more.			1,2,3,4,5	
14. Artificial Wetlands (AW) - Artificial Wetlands includes irrigation induced wetlands. These Wetlands are not subject to FSA.				
15. Minimal Effect Wetlands (MW) - These wetlands are to be farmed according to the minimal effect agreement signed at the time the minimal effect determination was made.				
16. Converted Wetlands (CW) - In any year that an agricultural commodity is planted on these Converted Wetlands, you will be ineligible for USDA benefits. If you believe that the conversion was commenced before December 23, 1985, or that the conversion was caused by a third party, contact the ASCS office to request a commenced or third party determination.				

17. The planned alteration measures on wetlands in fields _____ are considered maintenance and are in compliance with FSA.

18. The planned alteration measures on wetlands in fields _____ are not considered to be maintenance and if installed will cause the area to become a Converted Wetland (CW). See item 16 for information on CW.

19. This wetland determination was completed in the: Office Field

20. This determination was: Delivered Mailed To the Person on Date: 2-1-90

NOTE: If you do not agree with this determination, you may request a reconsideration from the person that signed this form in Block 22 below. The reconsideration is a prerequisite for any further appeal. The request for the reconsideration must be in writing and must state your reasons for the request. The request must be mailed or delivered within 15 days after this determination is mailed to or otherwise made available to you. Please see reverse side of the producer's copy of this form for more information on appeals procedure.

NOTE: If you intend to convert additional land to cropland or alter any wetlands, you must initiate another Form AD-1026 at the local office of ASCS. Abandonment is where land has not been cropped, managed, or maintained for 5 years or more. You should inform SCS if you plan to produce an agricultural commodity on abandoned wetlands.

21. Remarks

22. Signature of SCS District Conservationist

Mike Hubbs

23. Date

2-1-90

HIGHLY ERODIBLE LAND AND WETLAND CONSERVATION DETERMINATION

1. NAME OF USDA AGENCY OR PRODUCER REQUESTING DETERMINATION: FNHAX ASCS

2. DATE OF REPORT: _____

3. NAME AND ADDRESS OF PRODUCER: Richard Reed

4. FARM NO.: 1561
T-102 Non Hel
T-1035 HEL

5. COUNTY: Shelby

6. Is a soil survey now available for making a highly erodible land determination? YES NO

7. Are highly erodible soil map units on this farm? YES NO

8. 1. List highly erodible fields that, according to ASCS records, were used to produce an agricultural commodity in any crop year during 1981-1985. T-1035 1 2

b. Is an approved conservation plan being actively applied on all of these fields? If "no," list the fields (from the ASCS records) on which a plan is not being applied.

9. 1. List highly erodible fields that, according to ASCS records, have been converted for the production of agricultural commodities, were not used for this purpose in any crop year during 1981-1985, and were not enrolled in a USDA set-aside or diversion program.

b. Is an approved conservation system being used on these fields? If "no," list the fields (from the ASCS records) on which a system is not being used.

10. Are there other fields that (1) have highly erodible map units, (2) were not used to produce an agricultural commodity in any crop year after 1980, and (3) were not enrolled in a USDA set-aside or diversion program in any crop year during 1981-1985?

11. CERTIFICATION: The conservation plan and system(s) were approved by the _____ Conservation District on _____, 19____, and conform with the technical requirements of the SCS field office technical guide for the _____ District.

12. Are hydric soils on this farm? If "yes," list the fields (from the ASCS records) in which they occur. 1,2,3 4,5

13. Are wetlands on this farm? If "yes," list the fields, outline the wetland areas within fields on the ASCS photograph(s), and mark with "w". (w)

14. Are converted wetlands on this farm that have been converted since December 23, 1985? If "yes," list the fields, outline converted wetlands on the ASCS photograph(s), and mark with "cw".

15. Are converted wetlands covered by exemptions? If "yes," list those fields, outline the exempt converted wetlands on the ASCS photograph(s), and mark with "cew". Note the exemptions for each area:

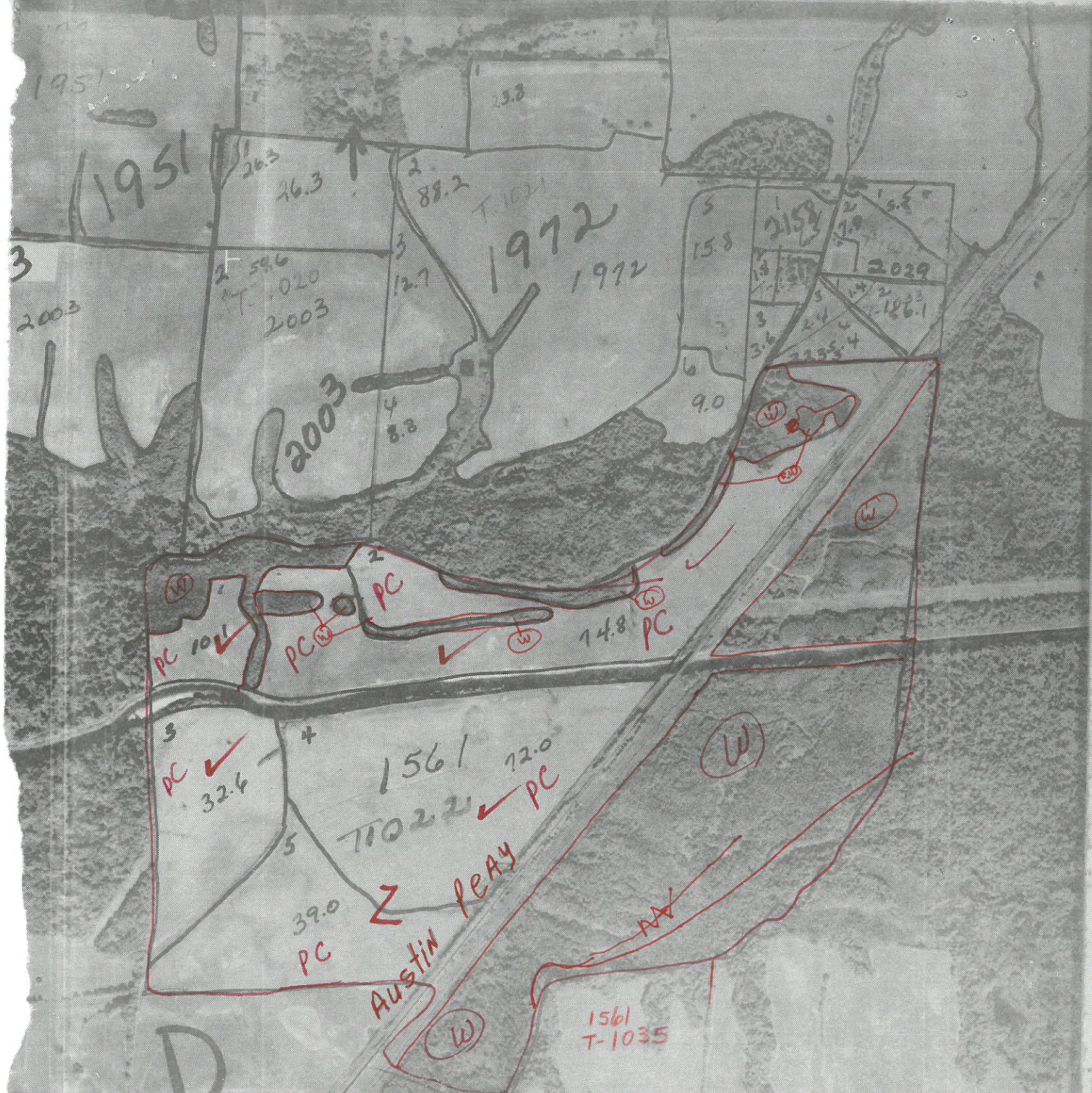
1. Field No. 1033 c. Field No. 45
b. Exemption PC d. Exemption P.C

16. The wetland determination was done in the office field .

17. This determination was hand delivered mailed to the producer on 4-1-88 (DATE)

Any producer who does not agree with this determination may request reconsideration from the person making the determination. This request is a prerequisite for any further appeal. The request must be in writing and must set forth reasons for the request. It must be received by SCS within 15 days after the producer receives the determination.

18. REMARKS: Wetland & HEL determinations were according to Shelby Co. Soil Survey



Attachment C
Notice of Land Use Restrictions

This instrument was prepared by:
Tennessee Department of Environment and Conservation
Division of Water Pollution Control
7th Floor Annex, 401 Church Street
Nashville, TN 37243-1538

NOTICE OF LAND USE RESTRICTIONS

Notice is hereby given that pursuant to Tennessee Code Annotated (T.C.A.) Section 68-212-225, the Commissioner of the Tennessee Department of Environment and Conservation (“TDEC”) has determined that land use restrictions are an appropriate remedial action at the below-described property. Pursuant to T.C.A. Section 68-212-225(d) the register of deeds shall record this Notice and index it in the grantor index under the names of the owners of the property.

WITNESSETH:

WHEREAS, _____ (Grantor), is the owner of the real property described in a Deed of record with the _____ County Register of Deeds, Book ____, Page ____, herein after referred to as the “Property”; and,

WHEREAS, on or about _____ the Commissioner of the Department of Environment and Conservation (TDEC) issued Aquatic Resource Alteration Permit (ARAP) Number _____ to Grantor; and,

WHEREAS, the referenced ARAP requires that certain uses of the Property be restricted.

NOW, THEREFORE, in consideration of the foregoing, the Grantor hereby declares that the Property should be held, sold, and conveyed subject to the following land use restrictions. Said land use restrictions shall run with the land and shall be binding on all parties having any right, title, or interest in the Property or any part thereof, their heirs, successors, successors-in-title, and assigns, and shall inure to the benefit of each owner thereof and to TDEC and the respective successors and assigns of such parties:

Land Use Restrictions:

- A. (Vegetation) There shall be no removal, destruction, cutting, trimming, mowing, alteration or spraying with biocides of any vegetation, nor any disturbance or change in the natural habitat in any manner, except to control invasive exotic vegetation. Control of exotic invasive vegetation can only be conducted with approval of the Division of Water Pollution Control. There shall be no planting or introduction any vegetation other than that described in the Aquatic Resource Alteration Permit NRS # _____ for this project/Notice of Violation dated _____. (Pick one)
- B. (Uses) There shall be no agricultural, commercial, or industrial activity undertaken or allowed; nor shall any right of passage across or upon the Protected Property be allowed or granted if that right of passage is used in conjunction with agricultural, commercial activity.

- C. (Animals) No dogs, cats, or other domestic or exotic animals be raised on the Protected Property.
- D. (Topography) There shall be no filling, excavating, dredging, mining, or drilling; no removal of topsoil, sand, gravel, rock, minerals or other materials, nor any dumping of ashes, trash, garbage, or of any other material, and no changing of the topography of the land in any manner.
- E. (Building) There shall be no construction or placing of buildings, mobile homes, advertising signs, billboards, or other structures.
- F. (Roads) There shall be no building of new roads or any other rights of way nor widening of existing roads.
- G. (Waters) There shall be no disruption of flow pattern by damming, dredging or construction in any free flowing water body, nor construction of any weirs, groins nor dikes in any marshland, nor any manipulation or alteration of natural water courses, fresh water lake and pond shores, marshes, or other water bodies nor any activities or uses detrimental to water purity.
- H. (Vehicles) There shall be no operation of dune buggies, motorcycles, all terrain vehicles, or any other types of motorized vehicles.
- I. (Construction) There shall be no construction or placing of temporary or permanent buildings, docks, bridges, piers or other structures.

Enforcement:

Any owner of the land or any unit of local government having jurisdiction over any part of the subject property may enforce this Notice of Land Use Restrictions by means of a civil action. The Commissioner of TDEC may enforce this Notice of Land Use Restrictions through the issuance of an Administrative Order or by means of a civil action, including one to obtain an injunction against present or threatened violations of the restriction. Pursuant to T.C.A. Section 68-212-213, any person who fails, neglects or refuses to comply with a land use restriction commits a Class B misdemeanor and is subject to the assessment of a civil penalty of up to ten thousand dollars (\$10,000) per day.

Term:

This Notice of Land Use Restrictions shall run with and bind the Property unless/until this Declaration shall be made less stringent or canceled as set forth under the paragraph entitled "Amendment and Termination."

Amendment and Termination:

This Notice of Land Use Restrictions may be waived, amended, modified, or terminated at any time by the Commissioner of TDEC for cause. No amendment to of this Notice of Land Use Restrictions shall be effective until such amendment or instrument terminating

this Notice of Land Use Restrictions is recorded in the Register's Office for _____ County, Tennessee.

Severability:

Invalidation of any of these covenants or restrictions by judgment or court order shall in no way affect any other provisions, which shall remain in full force and effect.

IN WITNESS WHEREOF, the undersigned has executed this instrument this _____ day of _____, 200__.

Grantor

STATE OF TENNESSEE

Personally appeared before me, the undersigned, a Notary Public having authority within the State aforesaid, _____ with whom I am personally acquitted, and who acknowledged that he executed this instrument for the purposes herein contained, and that he is authorized to execute this instrument.

WITNESS my hand, at office, this _____ day of _____, 200__.

Notary Public

My Commission Expires: _____