

Loosahatchie River Mitigation Bank
Prospectus

August 2013

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Definitions¹

Adaptive management means the development of a management strategy that anticipates likely 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 requires consideration of the risk, uncertainty, and dynamic nature of compensatory mitigation projects and guides modification of those projects to optimize performance. It includes the selection of appropriate measures that will ensure that 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.

Credit means a unit of measure (e.g., a functional or areal 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 means the manipulation 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 does not result in a gain in aquatic resource area.

Functions means the physical, chemical, and biological processes that occur in ecosystems.
Impact means adverse effect.

Interagency Review Team (IRT) means 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.

MBI means mitigation banking instrument or in-lieu fee program instrument.

Mitigation bank means a site, or suite of sites, where resources (e.g., wetlands, streams, riparian areas) are restored, established, enhanced, and/or preserved for the purpose of providing compensatory mitigation for impacts authorized by DA permits. In general, a mitigation bank sells compensatory mitigation credits to permittees whose obligation to provide compensatory mitigation is then transferred to the mitigation bank sponsor. The operation and use of a mitigation bank are governed by a mitigation banking instrument.
Mitigation banking instrument means the legal document for the establishment, operation, and use of a mitigation bank.

Performance standards are 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 means the removal of a threat to, or preventing the decline of, aquatic resources by an action in or near those aquatic resources. This term includes activities commonly associated with the protection and maintenance of aquatic resources through the implementation of appropriate legal and physical mechanisms. Preservation does not result in a gain of aquatic resource area or functions.

Release of credits means a determination by the district engineer, in consultation with the IRT, that credits associated with an approved mitigation plan are available for sale or transfer, or in the case of an in-lieu fee program, for fulfillment of advance credit sales. A proportion of

¹ Edited and adapted from 33 CFR 332.2, Compensatory Mitigation for Losses of Aquatic Resources; Final Rule.

projected credits for a specific mitigation bank or in-lieu fee project may be released upon approval of the mitigation plan, with additional credits released as milestones specified in the credit release schedule are achieved.

Restoration means the manipulation of the physical, chemical, 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 is divided into two categories: re-establishment and rehabilitation.

Service area means the geographic area within which impacts can be mitigated at a specific mitigation bank or an in-lieu fee program, as designated in its instrument.

Services mean the benefits that human populations receive from functions that occur in ecosystems.

Project Summary

Tennessee FB MB, LLC (the "Bank Sponsor") is pleased to present to the IRT the proposed Loosahatchie River Mitigation Bank project. The Bank Sponsor initially became aware of the site on which this bank is proposed through discussions with the present landowner, Memphis Stone & Gravel. The landowner expressed an interest in yielding its development rights to instead produce an environmentally progressive project on the approximately 405-acre site upon which the proposed project sits. The Bank Sponsor was very pleased to have the opportunity to undertake the restoration of a historical bottomland hardwood wetland for mitigation banking purposes on this prior-converted farmland.

Discussions with the Tennessee Department of Transportation and others have revealed a substantial need for mitigation in the general vicinity of this project. Preliminary discussions regarding this site have already occurred with, among others, representatives of the US Army Corps of Engineers, Memphis District and the Tennessee Department of Environment and Conservation regarding the prospective development of this mitigation bank. It appears to the Bank Sponsor that this project is likely to serve important mitigation needs and is an ideal site for the replication of a historical bottomland hardwood forest system.

What follows is a bank prospectus addressing those components as described in the Federal Mitigation Banking Rule and is being offered for consideration by the IRT. Our team looks forward to working with various members of the IRT in the development of this project.

Introduction

The purpose of this Loosahatchie River Mitigation Bank Prospectus ("Prospectus") is to provide an overview of the proposed Loosahatchie River Mitigation Bank (the "Bank") and to serve as a basis for public and initial IRT comment. The Prospectus is the first step towards the development of the Bank's Mitigation Banking Instrument ("Instrument"), which will establish the guidelines and responsibilities for the establishment, use, operation, and maintenance of the Bank.

The Bank intends to sell Credits for compensatory mitigation impacts to waters of the United States authorized under Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act of 1899, provided such activity has met all applicable requirements and is authorized by the appropriate authority. The Compensatory Mitigation for Losses of Aquatic Resources; Final Rule (33 CFR 332.2) states the use of mitigation banks has the highest priority amongst all mitigation options. The Bank will also provide credits for compensatory mitigation for unavoidable impacts to wetland resources as required by the Tennessee Water Quality Control Board through the Aquatic Resource Alteration permit and federal Clean Water Act, Section 401 certification program.

The Bank will occupy up to approximately 405 acres in the floodway² of the Loosahatchie River east of Raleigh-Millington Road in Shelby County, Tennessee. The Bank site is currently ditched and under agricultural cultivation. In the northeastern section of the site is an approximately 3-acre mitigation site. The site is located in the Loosahatchie 8-digit hydrologic unit code ("HUC"), which borders the Wolf, Lower Hatchie, and Lower-Mississippi-Memphis HUCs.

Bank Objectives

Establishment of the Bank will restore and preserve a bottomland hardwood wetland that will improve various wetland functions, including flood control, sediment control, and nutrient

² As determined in a 1994 FEMA flood insurance study.

removal (Richardson). Additionally, the development of the Bank on this site will replace an impending commercial gravel mining operation.

The Bank site is a ditch-drained field that is currently under agricultural cultivation. Reestablishment of approximately 270 acres of forested wetland on what is currently farmland will be accomplished by reestablishing wetland hydrology via filling drainage ditches and the installation of native, hydrophytic species. The remaining approximately 135 acres will be preserved, including a reach that includes both banks of the Loosahatchie River.

From a landscape perspective, the Bank will fit into a larger riparian, bottomland hardwood floodplain along the Loosahatchie River. As this parcel currently seems to be "cut-out" of the forested floodplain, the benefit is that when this site is reestablished into the larger landscape, ecological and biogeochemical synergies will improve the functionality of both the Bank site and surrounding lands. Therefore, this site provides considerable value as a tool for compensatory mitigation for the loss of aquatic resources throughout the Bank's Service Area.

As part of Bank design development, threatened and endangered species will be investigated and if applicable, habitat will be restored, rehabilitated, or enhanced to accommodate these species. If threatened or endangered species habitat is included as part of this project, the Sponsor reserves the right to request conservation mitigation credits.

Bank Establishment and Operation

Establishment Actions

The preliminary framework for actions on site, subject to discussions with the IRT and site survey and engineering, is to first fill the drainage ditches to restore a more consistent wetland hydrology, and then to plant native, hydrophytic vegetation. Due to their status as species with documented association with the site's soils, species considered for establishment include bottomland oaks (*Q. lyrata*, *palustris*, etc.), red maple (*A. rubra*), cottonwood (*P. deltoides*), sweetgum (*L. styraciflua*), green ash (*F. pennsylvanica*), and sycamore (*P. occidentalis*) (Soil Survey, Shelby County Tennessee). No one species will comprise the majority of plantings, spacing will be adequate to ensure early canopy closure, and each species will have good distribution in parts of the site where it is expected to thrive. Natural recruitment from surrounding habitats is also expected.

The entire site will be covered by a conservation easement that will protect it from future development. Inclusion of the entire parcel, including existing forested wetland systems, is important to the overall site functionality. The Enhancement (through invasive species management) or Preservation of the existing bottomland hardwood forest ensures long-term hydrologic, functional, and ecological connectivity to the Loosahatchie River and surrounding habitats on a landscape level.

A financial assurance instrument will be provided for the establishment and post establishment activities of the Bank in a form that may include a letter of credit, a surety bond, or insurance as approved by the IRT for mitigation banks. The form of financial assurance will be in line with the Federal Miscellaneous Receipts Act. The financial assurance will include step-down value ranges as thresholds are met, such as construction completion and the satisfaction of Performance Standards.

Post Establishment Actions

In collaboration with the IRT, Performance Standards governing the performance of the site will be determined associated with the credit release schedule. The basis for Performance Standards will be derived from the 1987 US Army Corps of Engineers Wetlands Delineation Manual and the 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region, collectively (the "Delineation Guidance"). The

Performance Standards are likely to include measurement thresholds for wetland hydrology, hydric soils, and hydrophytic vegetation.

The Sponsor will work with a qualified biologist to implement regular surveys to ensure the Bank is meeting its Performance Standards as delineated in the final MBI utilizing methodology from the Delineation Guidance. Monitoring reports will be generated and submitted regularly to the IRT from these surveys, and will in turn affect the credit release schedule by the IRT and site maintenance or adaptive management activities by the Sponsor.

Upon the termination of the establishment period of the Bank, long-term stewardship of the Bank will be transferred along, with adequate funding, to an institution such as a not-for-profit environmental group, land trust, or municipality, in order to fulfill the long-term management plan as defined in the MBI.

Operation

The purpose of the Bank is to generate Credits to satisfy requirements for compensatory mitigation compliant with the Clean Water Act (40 CFR 404) and the Tennessee Water Quality Act. The estimated credit yield of the Bank is approximately 334.5 Credits from wetland Restoration (267 Credits, 1:1 ratio) and Enhancement (67.5 Credits, 2:1 ratio), should the entire bank be permitted for use at one time. This calculation takes into account the existing restoration on site.

The Credit Release Schedule is defined with performance standard thresholds during the establishment period of the Bank. They are proposed to be no less than as follows:

- 25% release upon execution of the MBI, recordation of the conservation easement, issuance of the financial assurance, and construction permit approval,
- 25% release upon IRT acceptance of the as-built report,
- Remaining 50% upon meeting Performance Standards during the establishment period of the Bank.

The Sponsor will submit each approved Credit transaction to Corps. The Sponsor will also maintain and regularly submit to the IRT a ledger of Credit sales, including a running balance of Credits available, sold, and released.

The Bank may sell Credits within the Bank's Service Area and outside the Service Area at the discretion of the responsible regulatory agencies. Of note, Tennessee Aquatic Resource Alterations Rule 1200-4-7 establishes a minimum compensatory mitigation ratio, which increases when the project requiring compensatory mitigation is located outside the defined Service Area.

Service Area

The proposed Service Area for the Bank is the Loosahatchie HUC as well as the adjacent Wolf, Lower Hatchie, and Lower-Mississippi-Memphis HUCs. Any and all wetland types occurring in western Tennessee or the Service Area may be compensated for via Bank credits.

General Need and Technical Feasibility

Credit Market

Initial discussions with potential end users indicate significant demand and credits are expected to sell out as they are released. Demand is expected to be driven by infrastructure growth within the Service Area. It is further expected that other private and public sector needs will necessitate the use of the bank in future years.

Feasibility and Ecological Suitability

Currently, two thirds of the site is cultivated for agriculture, while the remaining third is typical bottomland hardwood forest containing an approximately 2,000 foot, straightened reach of the Loosahatchie River. The topography of the site is generally very flat, sloping slightly towards the river. In addition to secondary ditches throughout this site, there is an approximately 10-foot deep ditch that begins in the center of the parcel and flows southwest. The site is subject to flooding by the Loosahatchie River, but tends to drain more quickly than the surrounding area due to these significant drainage ditches. Crayfish burrows, a secondary hydrology indicator, have been identified in the bottom of these ditches.

One major hydrology feature of note is the Loosahatchie River, which transects the southeastern corner of the site. Therefore, site and river are linked vis-a-vis water quality and hydrology (temporal and flow). Understanding the nature of the river is therefore important. Located about 16 miles upstream from the site is the closest USGS gauge station: 07030240, Loosahatchie River Near Arlington, TN (Figure 1). Although the gauge is a distance from the site, the homogeneity of the river still makes this gauge relevant to the bank site.

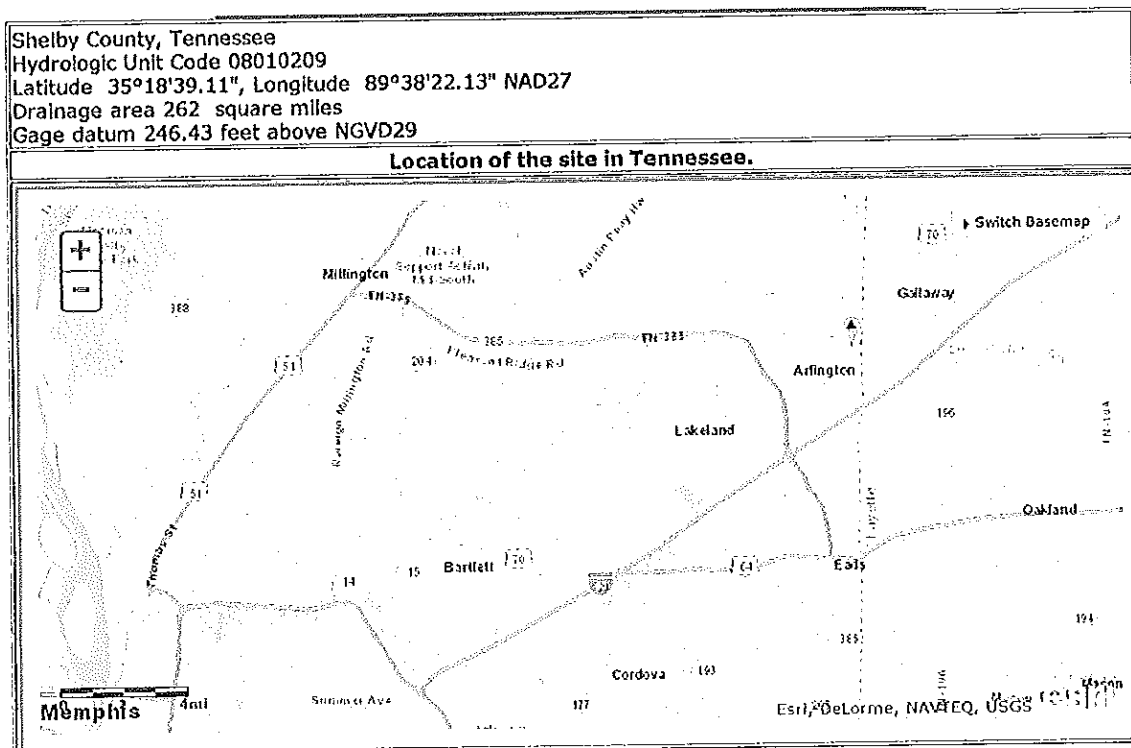


Figure 1: Nearest USGS hydrology discharge gauge on the Loosahatchie River (United States Geologic Service).

The homogeneity of the river stems from the fact that the river is heavily straightened from Lakeland, Tennessee to Highway 51 near Woodstock, Tennessee. This straightening has profound effect on the river's aquatic and riparian habitat. The river is flashier—water enters and leaves the river much faster than it would if natural meanders were regular features of the river. In the river, the flashier hydrology dramatically changes habitat, increases erosion and sedimentation, and decreases natural processes leading to nutrient phyto remediation. On the riparian corridor, wetlands can be dewatered from previous states, flooding is reduced (and therefore concomitant sediment and nutrient deposition), and floodwater storage is decreased.

Table 1 shows basic hydrodology statistics and Figure 2 is a mean discharge hydrograph for the Loosahatchie River at Gauge Station 07030240, as published by the USGS. The hydrograph

shows the rapid ebb and wane of flow of the river as would be expected in a straightened channel.

Table 1: Summary hydrology statistics for nearest USGS gauge station (U.S. Geological Survey).

SUMMARY STATISTICS						
	Calendar Year 2010		Water Year 2011		Water Years 1970 - 2011	
Annual total	159,109		166,092		395	
Annual mean	436		455		769	
Highest annual mean					154	
Lowest annual mean					1989	
Highest daily mean	26,000	May 2	18,600	Apr 28	26,000	May 2, 2010
Lowest daily mean	87	Aug 27	86	Sep 2	66	Apr 7, 1974
Annual seven-day minimum	89	Aug 23	88	Aug 28	68	Nov 5, 1982
Maximum peak flow			22,700	Apr 28	29,600	May 2, 2010
Maximum peak stage			23.87	Apr 28	25.44	May 2, 2010
Instantaneous low flow					66	Apr 6, 1974
Annual runoff (cfs)	1.66		1.74		1.51	
Annual runoff (inches)	22.59		23.58		20.46	
10 percent exceeds	608		606		609	
50 percent exceeds	124		111		123	
90 percent exceeds	94		94		87	

^a Also occurred Aug. 29.

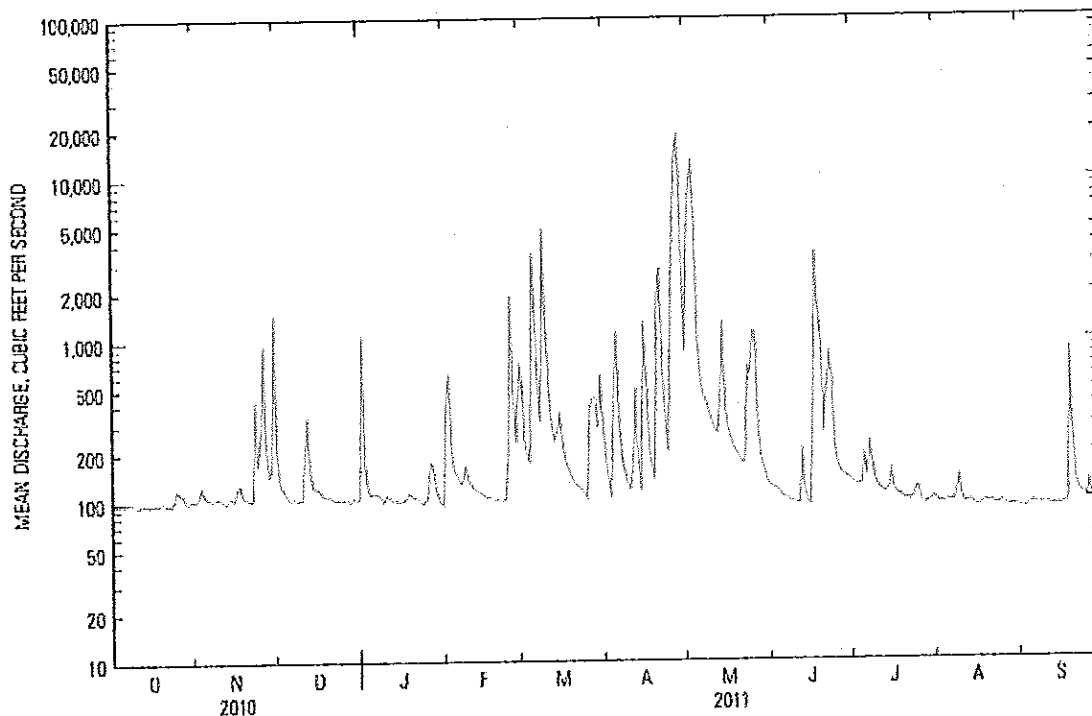


Figure 2: Flow at the nearest USGS gauge on the Loosahatchie River (U.S. Geological Survey).

Although it is beyond the scope of the project to alter the channel of the Loosahatchie River, the work done as part of the development of this bank will have great ecological and physical benefits to the river. By slowing down the hydrology on the site, while ensuring that all drainage is positive (to ensure there are no fish traps as flood waters draw down after overbank events) will have some positive effect on the flashiness of the river. The land use change away from agriculture will not only cease the applications of agricultural chemicals, but the slow, positive drainage pattern on the restored site will promote better water quality flowing through the site into the Loosahatchie River.

The soils of this site are mostly hydric with large areas of Falaya silt loam and Waverly silt loam (shown in Soils Map), and smaller areas of Callaway silt loam and Henry site loam in the northwestern section of the site. The existence of these hydric soils indicates that the site is a good candidate for restoration as the site was likely a healthy wetland before drainage and conversion into an agricultural field. Upland areas in the north and northwest section of the site will likely be graded to expand wetland area, and microtopography throughout the site will be encouraged in the design and construction processes to maximize habitat and wetland function.

Additionally, some watercourses and wetlands were identified by the Tennessee Department of Environment and Conservation and the landowner was notified of these determinations in a December 12, 2001 letter. These watercourses include a stream in the western portion of the site, an abandoned stream bed containing jurisdictional wetlands, and a wet weather conveyance that obtains stream characteristics about 1200 feet downstream of a culvert. As part of the due diligence for this project, these features will be reviewed and incorporated into the overall project design. If these streams are improved as part of this project, the Sponsor may request stream mitigation credit.

As the site is in soybean cultivation and drained via ditching most of the year, hydrophytic vegetation is minimal. However, there are some areas along the ditches in the field that have their own marginal riparian areas, although the ditches are dry much of the year. There are often some areas of standing water in the field.

Existing Restoration Site

A 3.06-acre mitigation project (Heineke & Associates, Inc.), referenced by §404 Permit Loosahatchie River 99-074, State of Tennessee Application M 99-04, was built on site in 1999 and completed its monitoring period in 2005 (Heineke & Associates, Inc.). This site will be used as reference site for bank design and incorporated into the larger bank design for ecological consistency. Using the existing mitigation as a template, planted species and natural recruitment species will be considered and improved upon in the bank planting palette. Hydric soil development within this existing mitigation site is of particular interest, as both Waverly and Falaya soil series are present on this site and were successful. These factors demonstrate the feasibility of bank success in this location.

Ownership and Stewardship

The site is comprised of a two Shelby County, Tennessee parcels, identified by number D0136 00273 and D0136 00274. Memphis Stone & Gravel Company owns the properties fee simple, including all mineral rights.

Upon termination of the Bank establishment period, the long-term stewardship will be passed to a third party who will receive an endowment to execute the long-term management plan in perpetuity. This third party steward will be identified at a later date, but will likely be a not-for-profit organization, land trust, or municipality.

Assurance of sufficient water rights

Water rights in Tennessee are governed by common law.

Landscape Considerations

The Bank lies in the riparian corridor of the Loosahatchie River and surrounding lands are mostly bottomland hardwood forests. These adjacent forests have very low populations of red oak tree species that provide fodder for most waterfowl. The project design would try to match

these existing stand populations, as they serve as reference sites. The current land use of the site provides a large source of waterfowl fodder, i.e. soybeans and some wild millet (weed). Additionally, the site currently has some areas of negative drainage or dead water storage which attracts wading waterfowl such as egrets and herons; both of which have been seen on site). These reasons, among others, have led an ornithologist from the University of Memphis to conclude that the development of a bottomland hardwood forest wetland system on this site would definitively reduce the waterfowl population. Additionally, the waterfowl flyway is located across the Mississippi River from the Bank site, and the constructed Bank would not draw waterfowl from this proven flyway as the site currently may. This is of particular interest in regards to the nearby Charles W. Baker Airport.

Sponsor Qualifications

Tennessee FB MB, LLC is a limited liability corporation who's principal, Bob Sokolove, has been involved in the development of mitigation bank projects around the country since the inception of mitigation banking in the early 1990's. Since that time, Bob and his companies have been involved in over 30 mitigation bank projects either as the sponsor, primary consultant, or in other material development respects. His prior company was initially involved in the pursuit of the initial phase of the Wolf River Mitigation Bank and has worked as a consultant with other entities in Tennessee in the development of or on matters related to mitigation banking over the years. Members of our organization have testified at Congressional hearings on mitigation banking, worked closely with the regulatory community in the development of the 2008 Federal Mitigation Banking Rule, and have presented seminars on mitigation banking over the last 20 years. As the initial treasurer of the National Mitigation Bankers Association, Bob and his team are thoroughly engaged and familiar with all components of mitigation banking throughout the United States.

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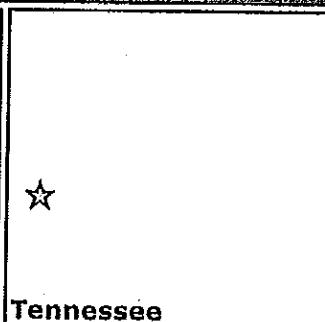
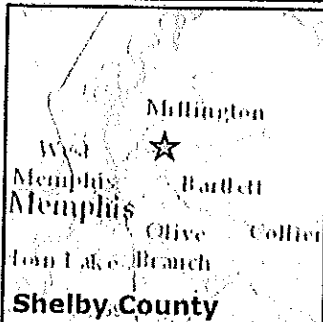
United States Geologic Service. National Water Information System. 8 July 2013. 8 July 2013
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Aerial Map

Soils Map

Topography

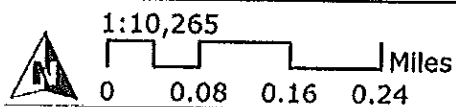
Memphis Bank Project



Legend

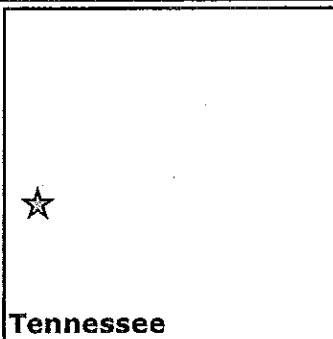
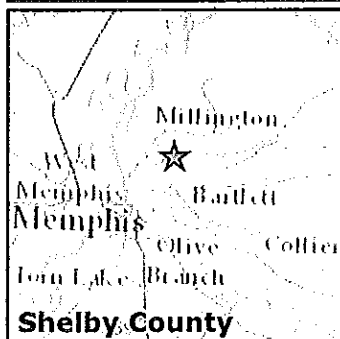
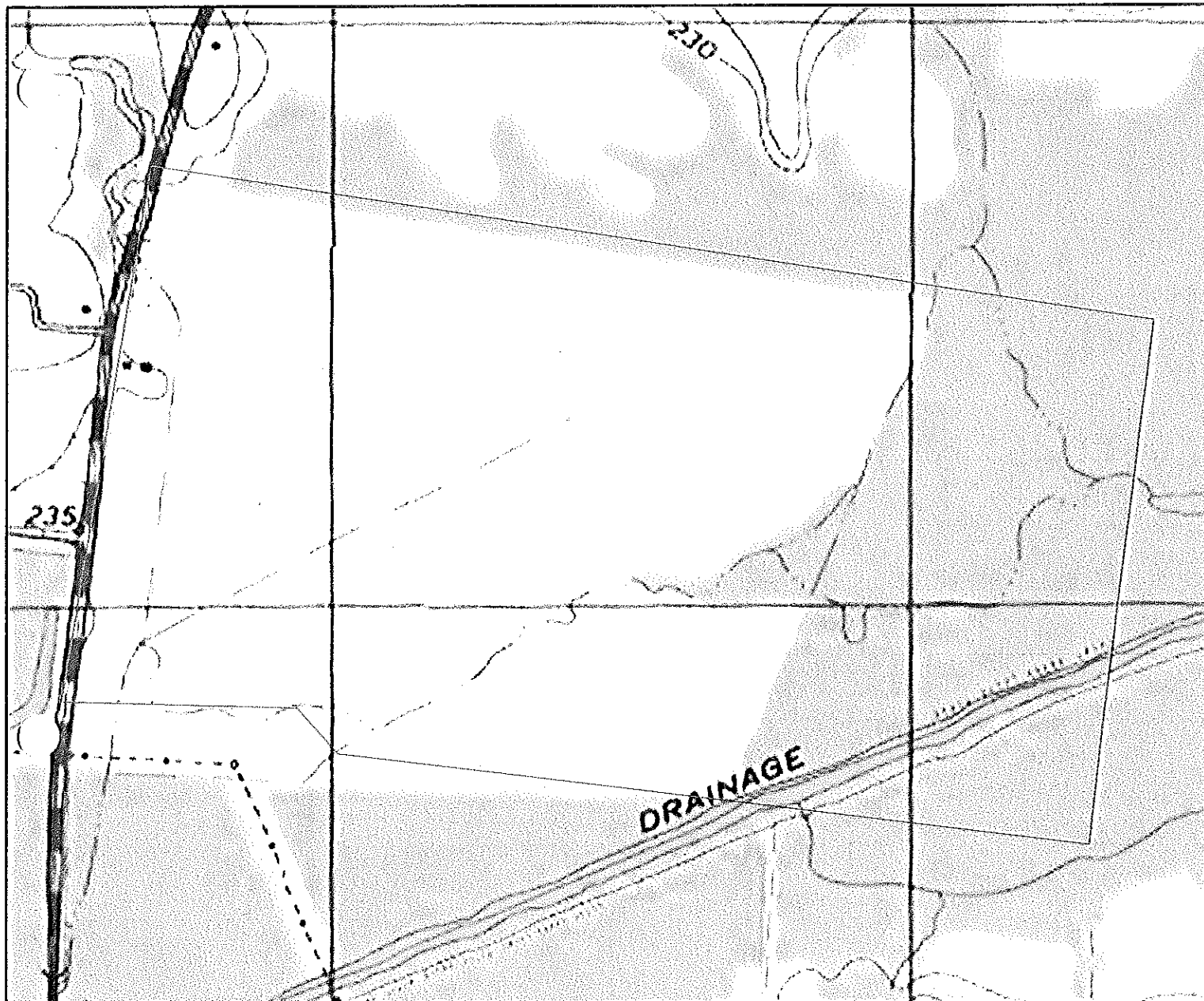
- Parcel Boundary (405.19 ac)
- ★ Project Location

Lat: 35° 16", Long: 89° 55'



NAD 1983 UTM Zone 16N
Transverse Mercator
North American 1983
Jan 2012

Memphis Bank Project

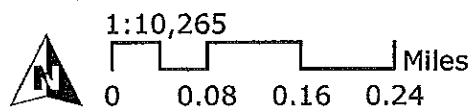


Legend

□ Parcel Boundary (405.19 ac)

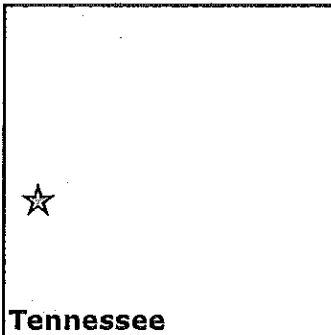
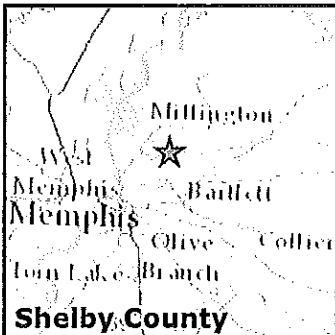
★ Project Location

Lat: 35° 16", Long: 89° 55'



NAD 1983 UTM Zone 16N
Transverse Mercator
North American 1983
Jan 2012

Memphis Bank Project



Lat: 35° 16", Long: 89° 55'

Legend

□ Parcel Boundary (405.19 ac)

MUSYM

■ Callaway silt loam

■ Falaya silt loam

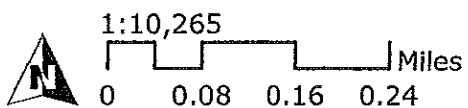
■ Grenada silt loam

■ Henry silt loam

■ Waverly silt loam

■ Loosahatchie River

★ Project Location



NAD 1983 UTM Zone 16N
Transverse Mercator
North American 1983
Jan 2012