Central Arkansas Mitigation Bank, LLC
Mitigation Bank Prospectus

Little Fourche Creek Mitigation Bank

DRAFT

July 15, 2015

Revised September 22, 2016

GBMc & Associates
Strategic Environmental Services

CONTENTS

FIGURES

APPENDICES

1.0 INTRODUCTION

1.1 Project Description

Central Arkansas Mitigation Bank, LLC (CAMB), the Bank Sponsor, proposes to establish the Little Fourche Creek Mitigation Bank in Little Rock, Arkansas. The Bank proposed in this prospectus includes three pieces of property, two contiguous, and one in close proximity to the others along Little Fourche Creek which collectively will be called the Central Arkansas Mitigation Bank (Figure 1). This bank will function as an umbrella bank in the Fourche Creek Watershed, allowing other key properties (with wetland and streams) to be added (contingent on USACE approval) to the bank in the future.

1.2 Project Purpose

The purpose of this Prospectus is to establish guidelines and responsibilities for the establishment, use, operation, and maintenance of the Little Fourche Creek Mitigation Bank under the umbrella of CAMB. The Little Fourche Creek Mitigation Bank (LFCMB) will provide compensatory mitigation for unavoidable adverse impacts to Waters of the United States that result from activities authorized under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act, provided such activities have met all applicable requirements and are authorized by the United States Army Corps of Engineers. The LFCMB will be developed utilizing standards set forth in the Compensatory Mitigation for Losses of Aquatic Resources; Final Rule (DOD & EPA, April 2008) under the guidance of the US Army Corps of Engineers - Little Rock District (USACE) and the Interagency Review Team (IRT).

1.3 Watershed Description

The Little Fourche Creek Watershed is approximately 17 mi^2 in size at the downstream point where it exits this mitigation bank. Little Fourche Creek drains the southern portion of Little Rock and the eastern portion of Mabelvale, Arkansas and is

almost entirely in Pulaski County. The watershed is dominated by forest (47%) and developed urban and suburban (36%) land uses (Figure 2). All three mitigation sites that comprise the bank are in mostly undeveloped (forested) areas of the watershed but are all bordered on at least one boundary by developed areas. The three sites lie mostly in the floodplain of Little Fourche Creek and are dominated by stream corridors and wetlands.

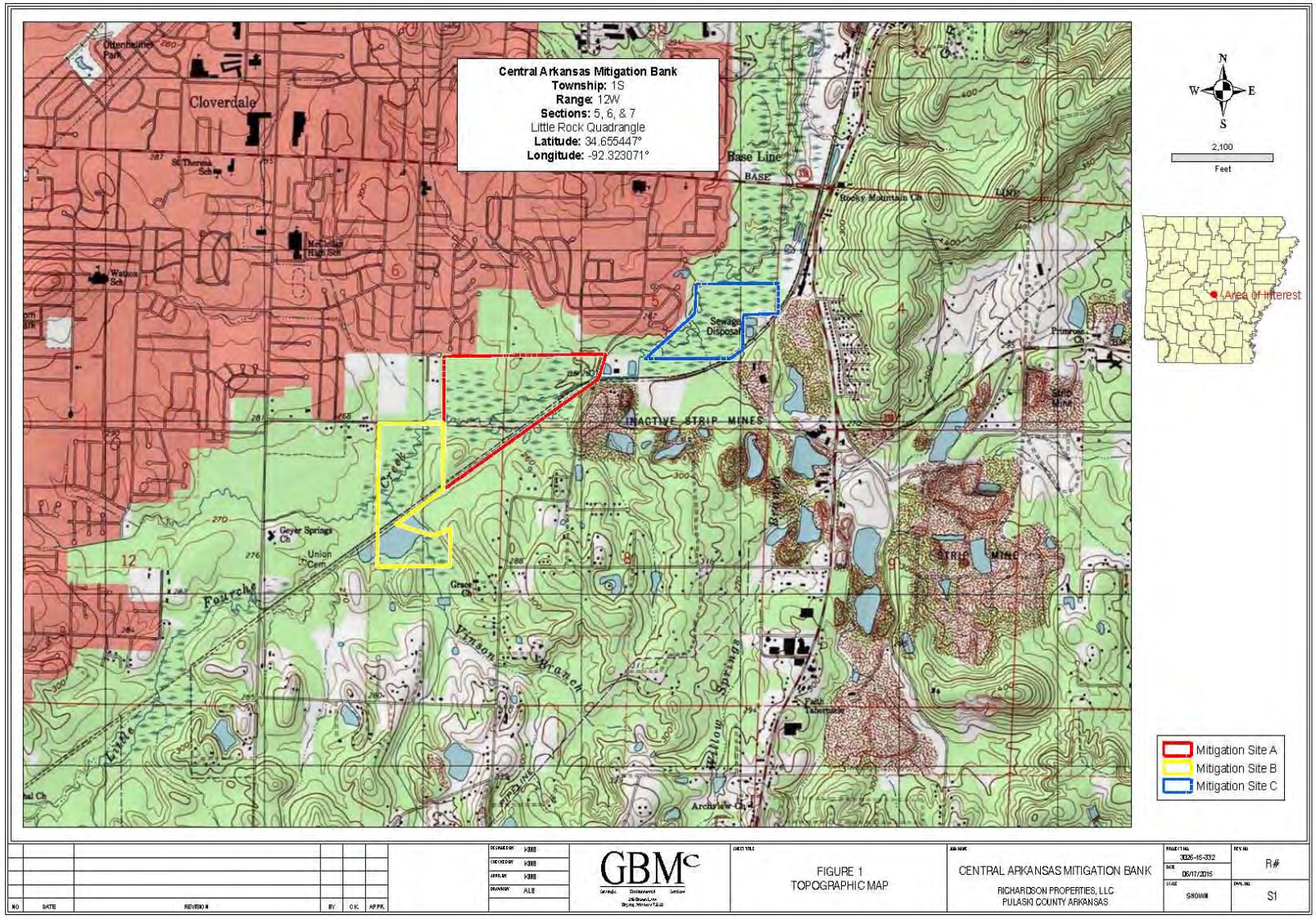


Figure 1. Bank Location in South Little Rock.

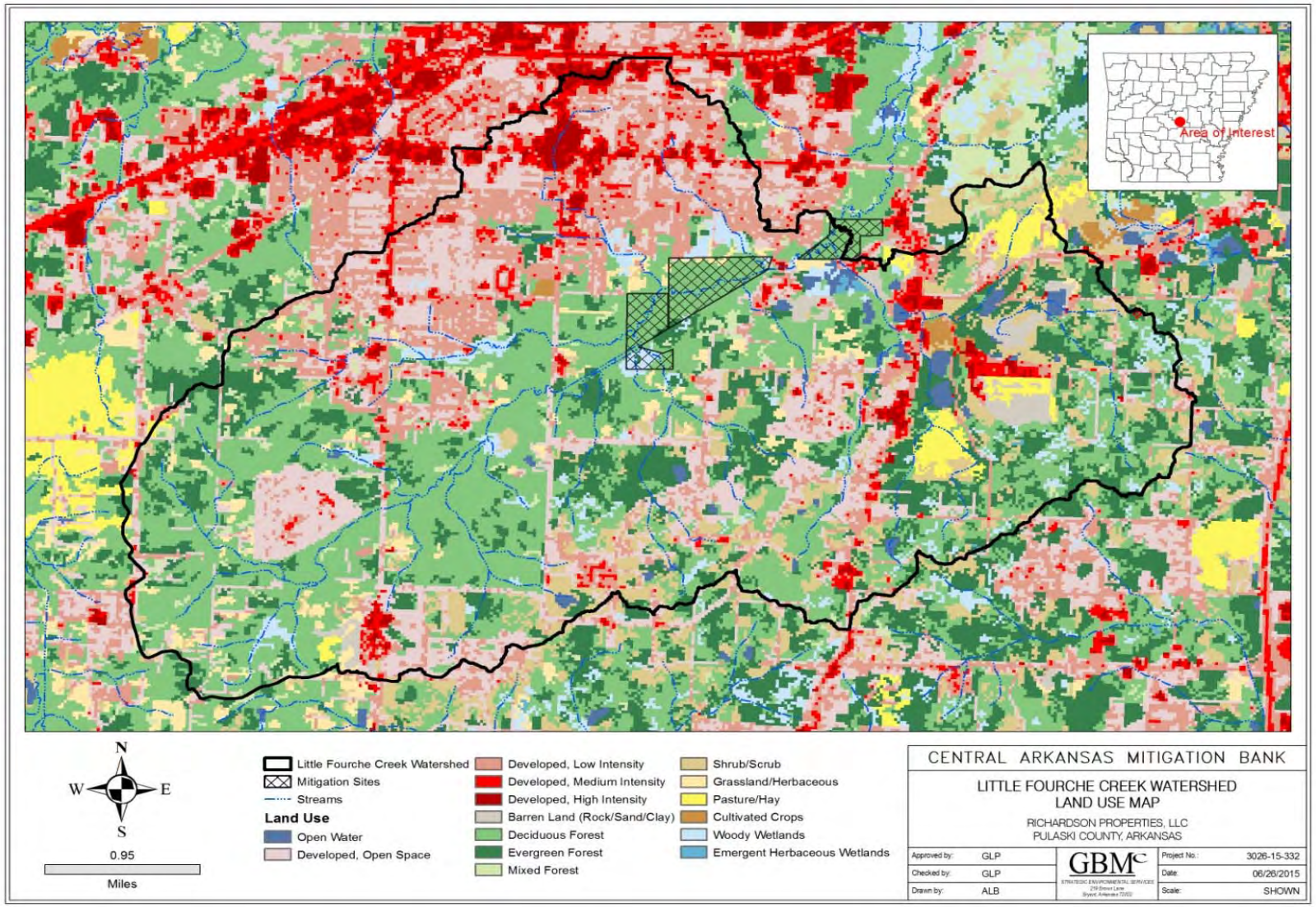


Figure 2. Little Fourche Creek Land Use.

2.0 OBJECTIVES

The goal of the LFCMB is to preserve and enhance wetlands, preserve streams, and to preserve and enhance associated riparian corridors to maximize their form and function. Once completed, the Bank will provide compensatory mitigation alternatives for impairments of streams and wetlands associated with authorized (permitted) impacts within the approved bank service area. The goals of the bank will be met by preservation and enhancement of existing aquatic and riparian resources. Stream channels will be preserved and their riparian buffer corridors will be preserved and enhanced through supplemental planting of native shrubs and trees to improve the diversity and promote wildlife. Wetlands will be preserved and enhanced through supplemental planting of wetland vegetation to enhance the diversity of the system. While the goal is to create ecologically self-sustaining wetlands and stream corridors, a long-term monitoring and maintenance plan will be implemented to promote success of the enhancement efforts.

3.0 ESTABLISHMENT AND OPERATION

3.1 Location

The Little Fourche Creek Stream Mitigation Bank consists of three sites located in south Little Rock, approximately 3/4 mile south of Baseline Road (Figure 3). Specifically, the sites are located in Section 5, Township 1 South, Range 12 West, as mapped on USGS topographic quadrangle Alexander, AR, 7.5-minute series. Little Fourche Creek (twelve digit HUC 111102070203) is a perennial tributary to Fourche Creek and lies within the Lower Arkansas – Maumelle Watershed (eight digit HUC 11110207). Latitude and Longitude coordinates for each site are:

- Site A – N 34.656321/W -92.328054
- Site B – N 34.653145/W -92.335326
- Site C – N 34.660638/W -92.313889

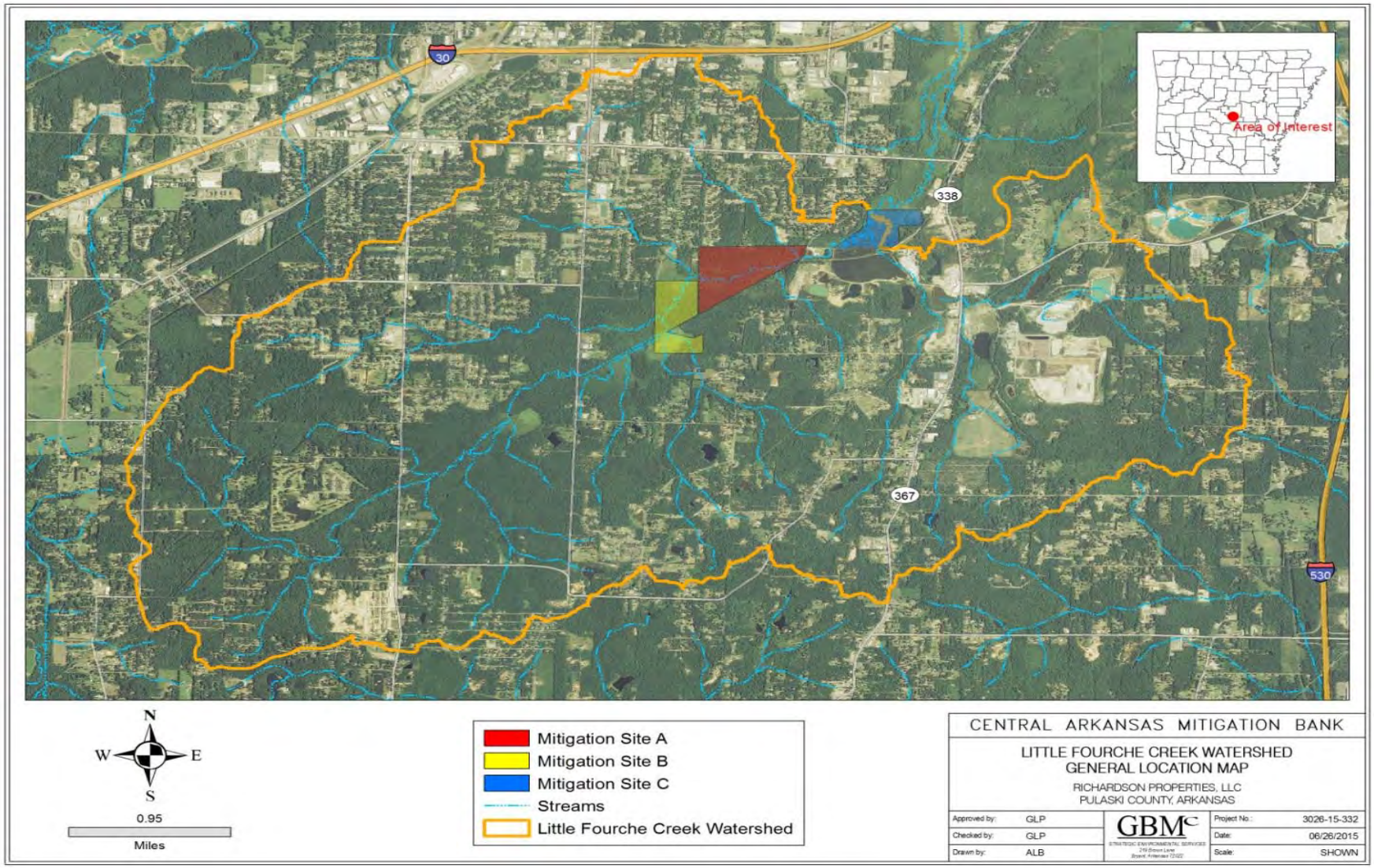


Figure 3. Aerial View of Little Fourche Creek Watershed and Mitigation Sites.

3.2 Type of Mitigation Bank

The Bank will be a commercial use mitigation bank containing wetland and stream credits. The overall bank (CAMB) will serve as an umbrella bank according to provisions as outlined in the 2008 Mitigation Rule (Title 40, Subpart J, 230.98). CAMB will operate in the Fourche Creek Watershed.

3.2.1 Stream Preservation

Little Fourche Creek and its associated riparian buffer will be preserved in perpetuity through the establishment of a conservation easement on the property. Little Fourche Creek is relatively undisturbed throughout these three sites and will not require any channel alterations to maintain a stable dimension, pattern and profile.

3.2.2 Riparian Buffer Enhancement

Riparian buffers will be preserved and enhanced to as great a width as possible beyond the stream channel edge. This will typically be about 100 feet wide and will frequently include wetlands in the riparian buffer area. Supplemental plantings of native tree/shrub or herbaceous vegetation species will be completed, as appropriate to buffer vegetative type, to reach desired diversity and density. Tree and/or shrub planting will be in the form of seedlings and herbaceous plantings will be in the form of plugs or seed.

3.2.3 Wetland Protection and Enhancement

Wetlands that are not part of protected stream riparian buffer corridors will be preserved and enhanced for wetland credits. Supplemental plantings of native species will be completed to reach desired diversity and density. Plantings may be completed using seedlings, plugs, or seeding, as appropriate.

3.2.4 Wetland Buffer Enhancement

Where possible an upland buffer will be preserved and enhanced along the perimeter of the wetlands. Supplemental plantings of native tree/shrub species will be

completed in the upland buffers to promote diversity and wildlife. Tree/shrub plantings will be in the form of seedlings.

3.3 Credit Generation

Stream mitigation credits will be calculated utilizing the USACE – Little Rock District Stream Method (USACE-LRD, 2011). Credits will be calculated with the assistance of the USACE and will be approved by the IRT with the Mitigation Banking Instrument (MBI). Wetland credits will be calculated using the Charleston Method (USACE-LRD, 2002) and its more recent addendum. Approximately 75,000 stream credits and 125 wetland credits are anticipated to be generated by the LFCMB.

3.4 Bank Management

The Bank Sponsor shall prepare a MBI that will describe the following features:

1. Mitigation Work Plan
2. Maintenance
3. Monitoring
4. Performance Standards
5. Credit Accounting
6. Long-term management planning
7. Adaptive management

This Instrument will be submitted to the USACE and the IRT for review. Upon approval of the Banking Instrument and the Mitigation Bank itself, the guidelines provided in the Instrument will be used to construct and manage the bank.

4.0 GEOGRAPHIC SERVICE AREA

4.1 Geographic Service Area

The proposed Primary Geographic Service Area includes the Lower Arkansas-Maumelle (11110207) and the Lake Conway – Pointe Remove HUC (11110203) (Figure 4).

4.2 Service Area Rationale

The proposed Geographic Service Area was chosen based on a set of factors including:

- proximity to the site
- position within the watershed
- possible similarity of bank streams and wetlands to those in the service area
- size or extent of previously approved banks within the USACE – Little Rock District.

Figure 4. Proposed Service Area.

5.0 GENERAL NEED AND TECHNICAL FEASIBILITY

The sites for the mitigation bank were selected based on potential need for mitigation credits in the region, land availability, natural area size and potential for maximum stream credits, feasibility for protection and development of wide riparian buffers and quality of streams and wetlands. Little Fourche Creek is part of the greater Fourche Creek Watershed (Figure 5) which is a threatened watershed in central Arkansas. Little Fourche Creek (24 mi^2) has the largest contributing sub-watershed size in the Fourche Creek (167 mi^2) watershed. Fourche Creek (Reach 022 in ADEQ Planning Segment 3C) is listed as an impaired water body due to water quality concerns with dissolved oxygen, siltation and pathogens.

The Fourche Creek watershed is a highly urbanized watershed which drains much of the Little Rock area in central Arkansas. Little Fourche Creek is positioned in the southern portion of the Fourche Creek Watershed which is much more rural but also drains a lot of residential and commercial areas in south Little Rock and Mabelvale. A stream assessment conducted by Audubon Arkansas listed channelization, floodplain encroachment and bank erosion as concerns in the Little Fourche Creek sub-watershed (*Chamberlin and Finefield* 2006). Their recommendations for the overall Fourche Creek Watershed included the preservation and restoration of the riparian buffer, improvement in storm water retention ability and the implementation and enforcement of stronger storm water regulations for construction projects within the watershed. The LFCMB lies within one of the longest semi-rural reaches of Little Fourche Creek. These reaches have the ability for large volumes of flood retention and water quality filtration which are vital to the overall health of Fourche Creek.

Establishment of this bank in the form of an umbrella bank will provide the flexibility to allow other adjacent properties on Little Fourche Creek, as well as other key properties in the Fourche Creek Watershed to be added to the bank. The objective of this endeavor will be to create an avenue by which other wetlands and stream segments in the Fourche Creek Watershed can be protected (and enhanced/restored) through mitigation.

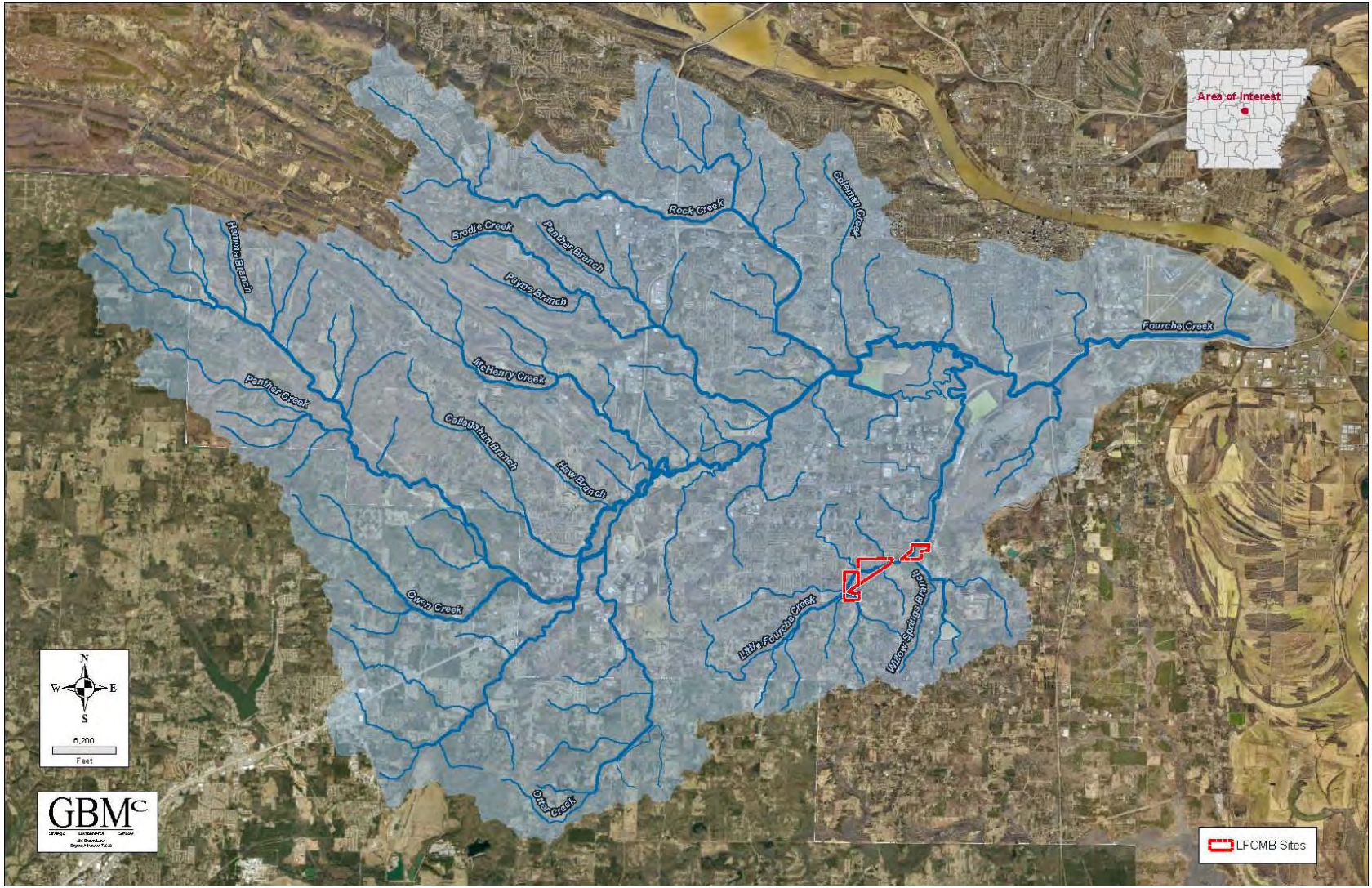


Figure 5. Fourche Creek Watershed.

6.0 OWNERSHIP AND LONG-TERM MANAGEMENT

6.1 Contact Information

Owner and Sponsor of this Bank is, Central Arkansas Mitigation Bank, LLC. Contact person and address is as follows: Danielle Litaker Nall, 9800 Maumelle Blvd, North Little Rock, Arkansas, 72113; Phone number 501-758-2441.

6.2 Site Protection Instrument

The Bank Sponsor will record a restrictive covenant, easement, or similar maintenance agreement for the Bank by amendment. This agreement may also be transferable to an acceptable conservation organization upon fulfillment of project objectives with Bank site ownership remaining with the titled owner. The Sponsor will provide for the perpetual protection and preservation of the mitigation bank through maintenance agreements, restrictive covenants or conservation easements. These provisions will conform to the current USACE - Little Rock District guidance with language to allow for acceptable forestry management practices, utility easements, hike/bike trails, or other recreational activities. Each land-use practice allowed must be approved by the USACE and IRT.

6.3 Long-Term Management

As Sponsor, Central Arkansas Mitigation Bank, LLC, is responsible for all monitoring and long term maintenance of the Bank. The Sponsor will maintain and protect the restored portions of the LFCMB for the operational life of the bank, as well as beyond the operating life if it is not self-sustaining according to the guidelines in the MBI. The sponsor would be responsible for securing additional funds to cover contingency actions in the event of bank default or failure.

Long-term monitoring will be necessary to ensure that the Bank ecological form and functions are maintained. The operational life of the bank terminates when

compensatory mitigation credits have been exhausted and the bank is self-sustaining.

The Sponsor will make available, as appropriate and if necessary, adequate financial assurances in the form of a trust, bond, endowment or escrow account with an adequately capitalized, federally insured depository as determined by the sponsor in coordination with the District Engineer.

7.0 SPONSOR QUALIFICATIONS

Principals of the Central Arkansas Mitigation Bank, LLC have been involved in numerous Department of the Army permit actions in several states. They are intimately acquainted with permitting and mitigation procedures, and currently maintain two permittee responsible stream mitigation projects on Brodie Creek in the Fourche Creek Watershed.

Central Arkansas Mitigation Bank, LLC has retained the services of GBM^c & Associates (GBM^c) to assist with development of the Bank. GBM^c has assisted several Arkansas companies develop mitigation projects and has designed and implemented several ecological restoration projects throughout the state including projects on Sager Creek, Mud Cat Creek, Rock Creek, Lake Dupree, Tributaries to Little Maumelle River and large wetland, transitional and upland habitats in the Ouachita River drainage.

The Central Arkansas Mitigation Bank team is well qualified to successfully implement this mitigation bank.

8.0 ECOLOGICAL SUITABILITY

8.1 Description of Aquatic Resources

Site A, B and C combined make up approximately 240 acres of wetland, riparian and upland habitat, most of which will be preserved in the LFCMB. Little Fourche Creek is a perennial tributary to Fourche Creek. This segment has been relatively undisturbed, apart from some utility crossings and a railroad track which has caused some hydrologic impacts to the area. Much of the northern portion of the watershed

has been converted from timber lands into residential and industrial developments. The main channel of Little Fourche Creek on all three sites is a meandering pool system that functions more like a bayou in most areas. Average width of Little Fourche Creek is approximately 28 feet (much wider in some areas) with average depths between 2 and 4 feet. The width of the riparian buffer varies but averages at least 100 feet in most areas. In some instances the main channel comes near to the railroad bed or a property line which will reduce protected riparian widths in these areas. The majority of the other streams that will be protected in this bank are ephemeral in nature and vary in dimension. A summary of stream characteristics is provided in Appendix B.

The Bank consists of approximately 7,200 ft. of stream channel in Site A, 5,400 feet in Site B and approximately 5,300 ft. in site C. All streams will have some level of associated riparian buffers (most with 100 feet of buffer on both sides) totaling over 70 acres of protected stream corridor (See Figures in Appendix A). The three sites combined hold over 100 acres of wetlands. A large portion of these wetlands will be preserved as riparian buffer for the meandering stream system. However, approximately 115 acres of wetlands will remain, outside the protected stream corridor and be accounted for as wetland habitat. Approximately 75,000 stream credits and 125 wetland credits will be associated with this LFCMB project. Wetlands can generally be classified as either Riverine forested or Riverine scrub-shrub. There are some smaller areas that are Riverine emergent, mostly in historical creek channel remnants. Photographs of the streams and wetlands are provided in Appendix C.

8.2 Baseline Conditions

The reaches of Little Fouche Creek and its tributaries on Sites A, B and C are relatively unimpaired, have stable banks, very little incision, and largely intact riparian buffers. The most notable impacts to these streams is from hydrologic alteration caused by the bisecting railroad bed, minor channelization, beaver dams and some utility lines. The railroad bed has the greatest affect by limiting the natural flow of flood waters.

Most of the wetland areas are fully functional and the vegetated communities are

in fairly good condition. However, there is room for diversity to be improved and for additional vegetative wildlife enhancements.

8.3 Regulatory Floodway/Floodplain

The main stream corridor along the Little Fourche Creek has been designated as a regulatory floodway and a 100 year floodplain on Pulaski County's FEMA Flood Insurance Rate Map (FIRM).

8.4 Soils

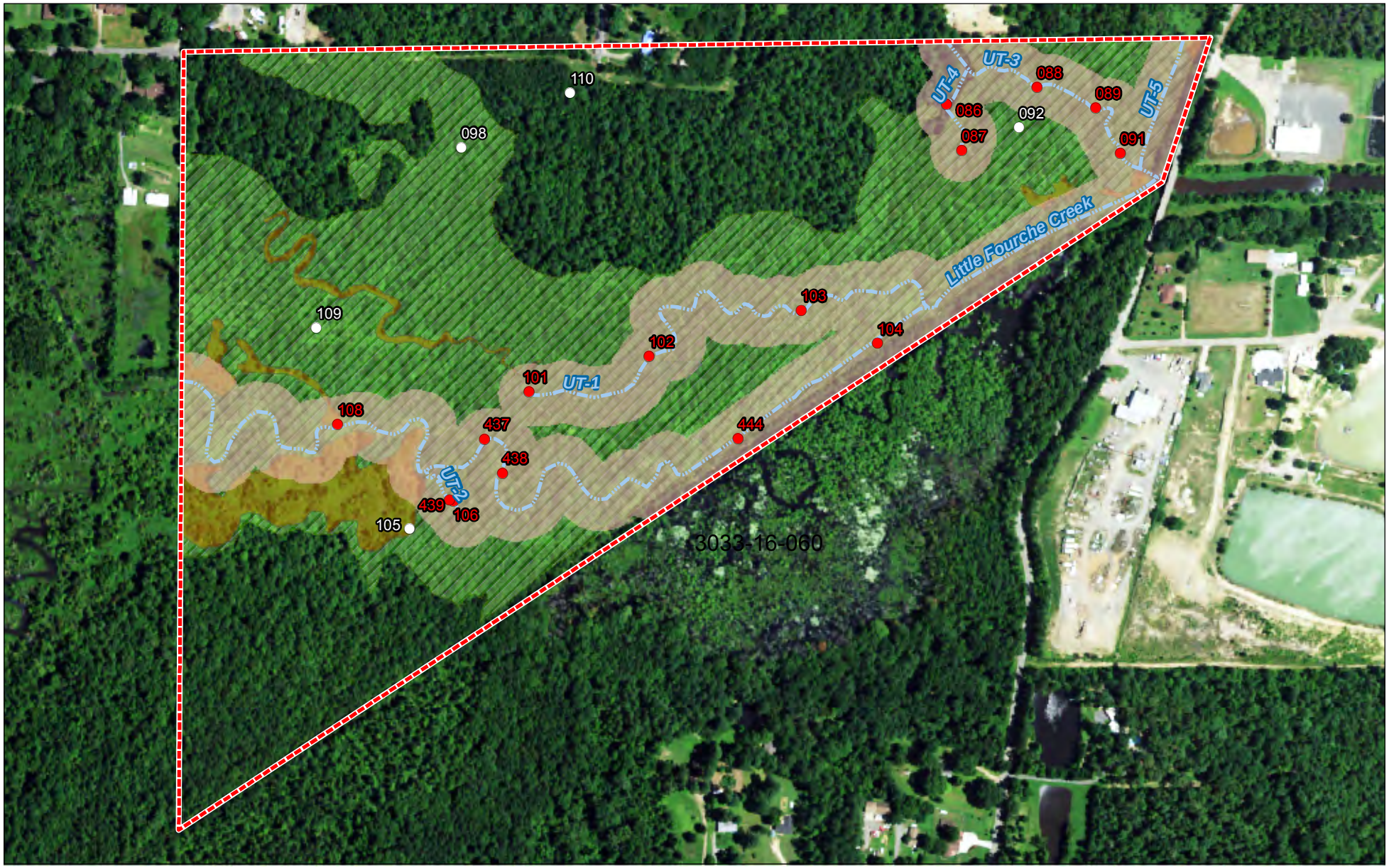
Soils are mapped mostly as Amy silt loam, which is a poorly drained soil most of which are frequently flooded. Amy soils are listed as hydric soils by the USDA.

9.0 ASSURANCE OF SUFFICIENT WATER RIGHTS

Arkansas' water rights are based on a regulated riparian system in which the Arkansas Natural Resources Commission (ANRC) was established to serve as the state's water resources planning and management agency. The ANRC has legislative authority to allocate surface water from streams during times of shortage based on the reasonable use concept, develop a comprehensive groundwater protection program, designate critical groundwater areas, cost-share on the installation of water conservation practices, establish groundwater rights within critical areas, develop an education program and to delegate management powers to regional water districts and conservation districts.

The riparian system attaches water rights to the land adjacent to a water course. All landowners have the right to make reasonable use of the water on or bordering their property. However, the water use cannot unreasonably diminish the quality or quantity of water to neighboring landowners. Therefore, no significant change in flow into the bank areas or out of the bank areas is anticipated.

Appendix A
Mitigation Tables and Maps



N
W E
S

560
Feet

- Mitigation Site A
- Stream Data Points
- Wetland Data Points
- Streams (≈7200 feet)
- 100 foot Riparian Buffer (33 acres)
- PEM (6.1 acres)
- PFO (63 acres)

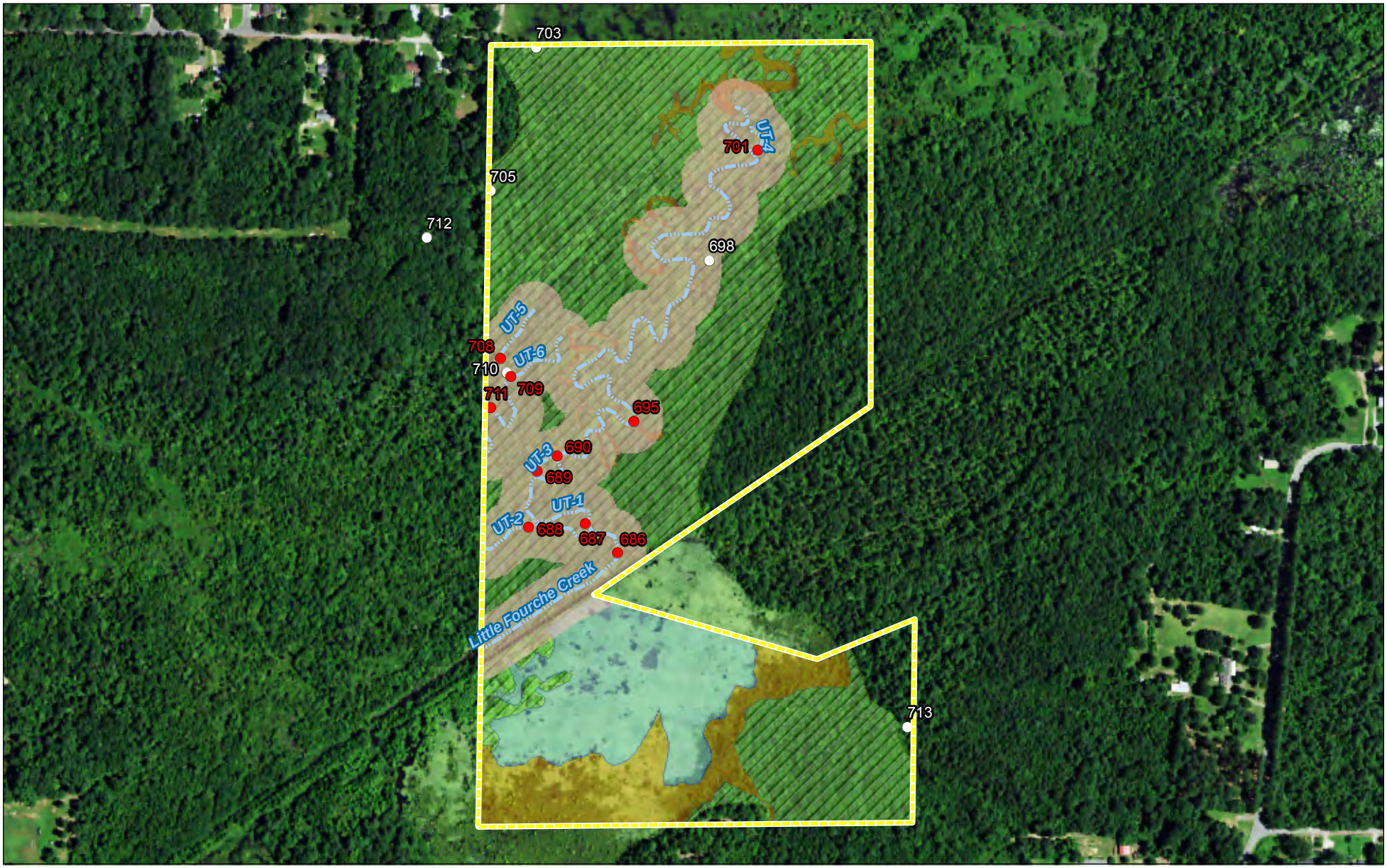
MITIGATION SITE A

CENTRAL ARKANSAS MITIGATION BANK

RICHARDSON PROPERTIES, LLC
PULASKI COUNTY, ARKANSAS

Approved by:	GLP	Project No.:	3026-15-332
Checked by:	GLP	Date:	08/12/2016
Drawn by:	ALB	Scale:	SHOWN

GBMc
STRATEGIC ENVIRONMENTAL SERVICES
219 Brown Lane
Bryant, Arkansas 72022



N
W E
S

600
Feet

- Mitigation Site B
- Stream Data Points
- Wetland Data Points
- Streams (≈5400 feet)
- 100 foot Riparian Buffer (20 acres)
- Open Water (8.4 acres)
- PEM (8.0 acres)
- PFO (48 acres)

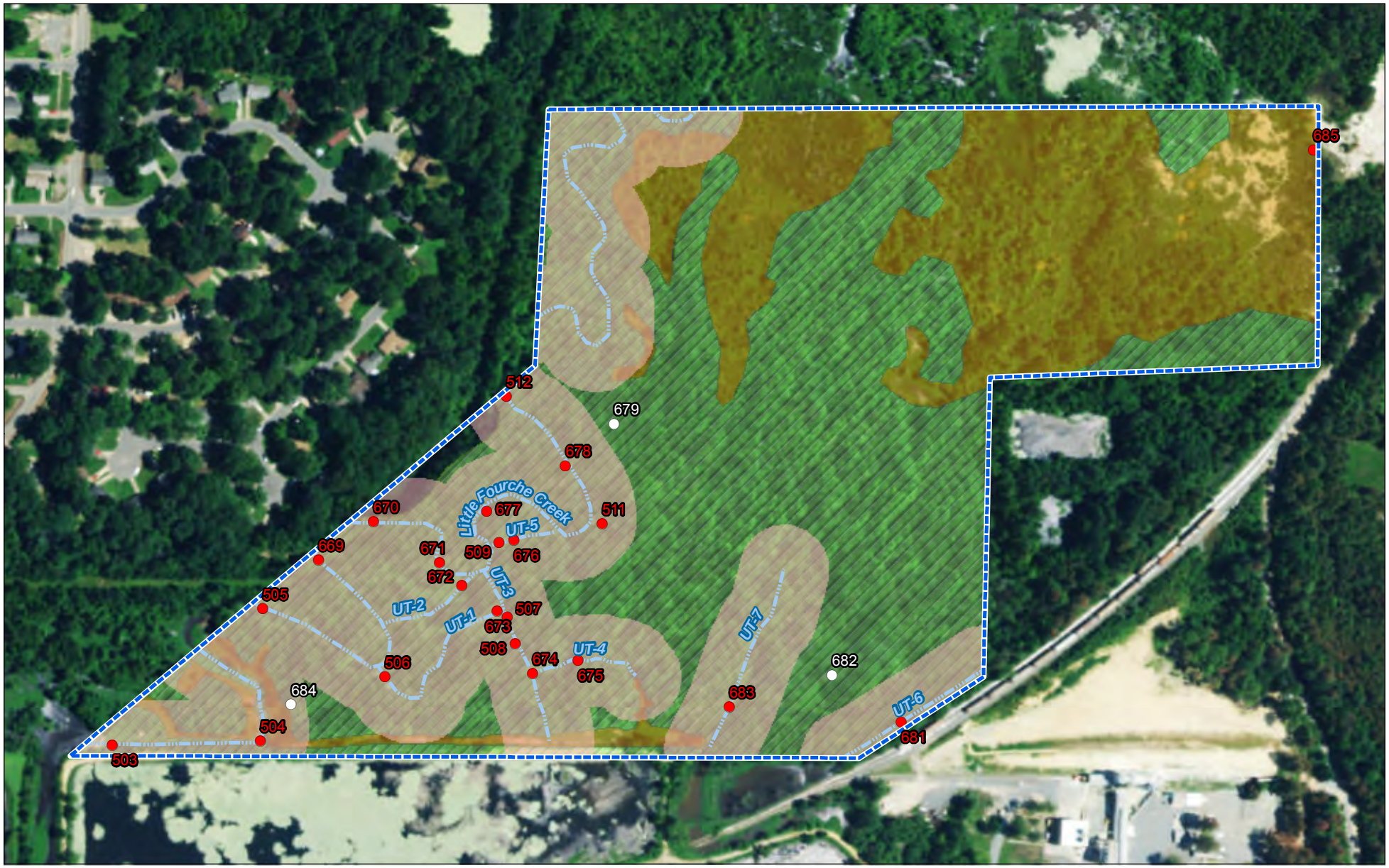
MITIGATION SITE B

CENTRAL ARKANSAS MITIGATION BANK

RICHARDSON PROPERTIES, LLC
PULASKI COUNTY, ARKANSAS

Approved by:	GLP	Project No.:	3026-15-332
Checked by:	GLP	Date:	08/12/2016
Drawn by:	ALB	Scale:	SHOWN

GBMC
STRATEGIC ENVIRONMENTAL SERVICES
219 Brown Lane
Bryant, Arkansas 72022



N
W E
S

380
Feet

- Mitigation Site C
- Stream Data Points
- Wetland Data Points
- Streams (≈5300 feet)
- 100 foot Riparian Buffer (20 acres)
- PEM (15 acres)
- PFO (37 acres)

MITIGATION SITE C

CENTRAL ARKANSAS MITIGATION BANK

RICHARDSON PROPERTIES, LLC
PULASKI COUNTY, ARKANSAS

Approved by:	GLP	Project No.:	3026-15-332
Checked by:	GLP	Date:	08/12/2016
Drawn by:	ALB	Scale:	SHOWN

GBMC
STRATEGIC ENVIRONMENTAL SERVICES
219 Brown Lane
Bryant, Arkansas 72022

In-Stream Work Stream Channel / Stream Restoration or Enhancement and Relocation Worksheet

	Ephemeral	Intermittent	Perennial Stream (OHWM Width)				
			<15'	15-30'	30-50'	>50'	
Stream type	0.05	0.4	0.4	0.6	0.8	1	
	Tertiary	Secondary	Primary				
Priority Area	0.05	0.2	0.4				
	Not Applicable	Functionally Impaired	Moderately Impaired				
Existing Condition	0	0.4	0.05				
	Stream Relocation	Stream Preservation		Stream Channel Restoration / Stream Enhancement			
Net Benefit		Moderately Functional	Fully Functional	Relocated Stream w/ In-Stream Features	Moderate	Good	Excellent
	0.1	0.5	1	0.5	1.5	2.5	4
	Level I	Level II	Level III				
Monitoring/Contingency	0.05	0.3	0.5				
	Deed Restriction / Restrictive Covenant			Third party Easement and Monitoring			
Site Protection	0.1			0.4			
	Schedule 1		Schedule 2		Schedule 3		
Timing	0.3		0.1		0		

	Net Benefit				
	LFC-Perennial	Intermittant	Ephemeral		
Stream Type	0.6	0.4	0.05		
Priority Area	0.2	0.2	0.2		
Existing Condition	0	0	0		
Net Benefit	1	1	1		
Monitoring / Contingency	0.05	0.05	0.05		
Site Protection	0.1	0.1	0.1		
Timing	0.3	0.3	0.3		
Sum Factors (M)	2.25	2.05	1.7	0	0
Stream length in Reach (LF)	12430	2466	2975		
Credits (C)= (M) X (LF)	27967.5	5055.3	5057.5	0	0
Mitigation Factor (MF) = 0.5 or 1	1	1	1	1	1
Total Credits Generated (C) X (MF)	27967.5	5055.3	5057.5	0	0
Total Channel Restoration/Relocation Credits Generated					38080.3

Riparian Buffer Creation, Enhancement, Restoration and Preservation Worksheet

Stream Type	Ephemeral	Intermittent	Perennial	
	0.05	0.2	0.4	
Priority Area	Tertiary	Secondary	Primary	
	0.05	0.2	0.4	
Net Benefit (for each side of stream)	Livestock (select values from Table 1 times 1.2 multiplier)	Riparian Creation, Enhancement, Restoration, and Preservation Factors (select values from Table 1) (MBW = 25' + 2' per 1% slope)		
Monitoring / Contingency (for each side of stream)	Level I	Level II	Level III	
	0.05	0.15	0.25	
Site Protection	Deed Restriction/ Restrictive Covenant		Third Party Easement & Monitoring	
	0.05		0.2	
Timing (for each side of stream)	Schedule 1	Schedule 2	Schedule 3	
	0.15	0.05	0	
Temporal Lag (Years)	>20	10-20	5-10	0-5
	-0.3	-0.2	-0.1	0

Factors		Net Benefit					
		LFC-100ft	LFC-75ft	Intermitant-100ft	Intermitant-75ft	Ephemeral-100ft	Ephemeral-75ft
Stream Type		0.4	0.4	0.2	0.2	0.05	0.05
Priority Area		0.2	0.2	0.2	0.2	0.2	0.2
Net Benefit (each side of stream)	Stream Side A	0.8	0.6	0.8	0.6	0.8	0.6
	Stream Side B	0.8	0.6	0.8	0.6	0.8	0.6
Monitoring / Contingency (each side of stream)	Stream Side A	0.05	0.05	0.05	0.05	0.05	0.05
	Stream Side B	0.05	0.05	0.05	0.05	0.05	0.05
Site Protection		0.05	0.05	0.05	0.05	0.05	0.05
Timing (for each side of stream)	Stream Side A	0.15	0.15	0.15	0.15	0.15	0.15
	Stream Side B	0.15	0.15	0.15	0.15	0.15	0.15
Temporal Lag		-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Sum Factors (M)		2.55	2.15	2.35	1.95	2.2	1.8
Linear Feet of Stream Buffer (LF) (don't count each		9300	3130	1850	616	2230	745
Credits (C)= (M) X (LF)		23715	6729.5	4347.5	1201.2	4906	1341
Mitigation Factor: Use (MF) = .5 or 1		1	1	1	1	1	1
Total Credits Generated (C) X (MF)		23715	6729.5	4347.5	1201.2	4906	1341
Total Riparian Restoration Credits Generated							42240.2

Wetland Enhancement Credits

	Net Benefit				
	SiteA	SiteB	SiteC		
Net Improvement	0.5	0.5	0.5		
Control	0.1	0.1	0.1		
Temporal lag	0	0	0		
Credit Schedule	0	0	0		
Kind	0.3	0.3	0.3		
Location	0.3	0.3	0.3		
Sum Factors (M)	1.2	1.2	1.2	0	0
Acres of Wetland	36	36	32		
Credits (C)= (M) X (LF)	43.2	43.2	38.4	0	0
Mitigation Factor (MF) = 0.5 or 1	1	1	1	1	1
Total Credits Generated (C) X (MF)	43.2	43.2	38.4	0	0
Total Wetland Enhancement Credits					124.8

Appendix B
Existing Stream and Wetland Characteristics

Mitigation Site A

Streams

One perennial, one intermittent and four ephemeral streams were identified within Mitigation Site A (Attachment 1, Figure 2A). Photographs of the streams are included in the photo log in Attachment 2.

Each stream was assigned an identification name or number (Table 1). Stream dimensions and stream type were characterized to aid in the determination of its jurisdictional status. Ordinary high water widths and depths (OHWW and OHWD, respectively), latitude/longitude coordinates, stream type, and length on the property are tabularized in Table 1. Multiple measurements of OHWW and OHWD were collected to provide a representative value for the entire stream reach. Those additional measurements were then averaged to represent the values summarized in Table 1. Approximately 1,943 feet of ephemeral streams, approximately 1,795 feet of intermittent stream, and approximately 4,732 feet of perennial stream are located within the property boundary. The larger stream, Little Fourche Creek (LFC) is a perennial stream that meanders across the property from west to east until it reaches the former rail road track bed along the south boundary and exits to the east. LFC is a fourth order perennial stream with a meandering pool dominated morphology. Unnamed Tributary 1 (UT-1) is an intermittent stream that begins at a historical abandoned stream channel which is now converted to emergent wetlands, and runs from west to east until it confluences with LFC. UT-1 is a first order intermittent stream that shares morphology with LFC and is likely a historic channel of LFC. Unnamed Tributary 2 (UT-2) is a first order ephemeral stream that transports water north to LFC. Unnamed Tributary 3 (UT-3) and Unnamed Tributary 4 (UT-4) are first order, ephemeral unnamed tributaries at the north east corner of the site that transport water south to LFC and adjacent wetlands. Unnamed Tributary 5 (UT-5) is an ephemeral stream that transports water south to LFC in the north east corner of the site, which includes runoff from the Hilaro Springs Road ditch. Substrate in all streams was predominately silt.

These streams are currently serving a variety of functions, such as providing seasonal refugia for aquatic life, transporting storm water runoff, sediment transport and sequestration within the watershed and nutrient cycling. LFC and UT-1 appear to contain water all year long and have many deep pools. These areas would be expected to contain several warm water fishery game species, including crappie, sunfish and largemouth bass.

The streams flow in a south-southeast direction into LFC, thence to Fourche Creek and eventually into the Arkansas River. Given that the drainages on site flow into tributaries of jurisdictional waters, it is likely that significant connectivity (a nexus) exists and all streams on the property may be considered jurisdictional WOUS by the USACE (Rapanos v. United States, 2006)

Mitigation Site A. Summary of Stream Measurements – October 2014.

Map ID*	Latitude	Longitude	OHWW (ft)	OHWD (ft)	Length (ft)	Stream Type
LFC	34.655269	-92.331349	28.4	3.5	4732	Perennial
UT-1	34.655797	-92.327971	9.3	0.6	1795	Intermittent
UT-2	34.654516	-92.330101	3.5	0.5	233	Ephemeral
UT-3	34.658183	-92.323745	5.0	0.8	956	Ephemeral
UT-4	34.658038	-92.324729	6.0	0.6	308	Ephemeral
UT-5	34.657636	-92.322647	15.0	3.5	446	Ephemeral

*UT= Unnamed Tributary

Wetlands

The overall topography of the area is marked by low gradient floodplains, dominated by wetlands. A significant amount of the area displayed all three wetland characteristics, hydrology, hydrophytic vegetation, and hydric soils, which would designate them as wetlands. Characteristics of these areas are summarized in Table 2. Maps showing the locations of each of the wetlands, wetland determination points, and corresponding upland points are provided in Attachment 1, Figure 2A, while photographs and descriptions are provided in Attachment 2. Wetland determination forms are included in Attachment 3.

Mitigation Site A. Summary of Wetland Data Points – October 2014.

Map ID	Latitude	Longitude	Wetland Hydrology	Hydric Soils	Hydrophytic Vegetation	Wetland Type*
92	34.657825	-92.323946	Y	Y	Y	PFO
98	34.657681	-92.329989	Y	Y	Y	PFO
105	34.654268	-92.330577	Y	Y	Y	PEM
109	34.656075	-92.331574	Y	Y	Y	PEM

*PFO: Palustrine Forested, PEM: Palustrine Emergent.

Wetlands across Mitigation Site A are situated on the central portion of the property. Water levels in the wetland are regulated by beaver dams and flooding of LFC. The wetland is located in a depressional and floodplain area, and comprises approximately 69.2 acres (Table 2). Approximately 6.1 acres are palustrine emergent (PEM) and approximately 63.1 acres are palustrine forested (PFO) wetland habitat. During the field investigation the wetland exhibited wetland hydrology characteristics of surface water, high water table, saturated soils, water stained leaves, drainage patterns, positive FAC-Neutral Test (see USACE Atlantic and Gulf Coastal Plain Regional Supplement), and a low geomorphic position. Dominant vegetation in the forested wetlands consist of lizard's-tail (*Saururus cernuus*), southern waxy sedge (*Carex glaucescens*), small-spike false nettle (*Boehmeria cylindrica*), black willow (*Salix nigra*), red maple (*Acer rubrum*), silver maple (*Acer saccharinum*), common persimmon (*Diospyros virginiana*), sweet-gum (*Liquidambar styraciflua*), and willow oak (*Quercus phellos*). Dominant vegetation in the emergent wetlands consists of pinkweed (*Persicaria pensylvanica*), common buttonbush (*Cephalanthus occidentalis*) and cottongrass bulrush (*Scirpus cyperinus*). The NRCS web soil survey indicates that soils in the wetland contains an Amy silt loam, which is predominately hydric. Likewise, the field investigation revealed that the soil had characteristics of a depleted matrix, which is an indicator for hydric soils.

Mitigation Site B

Streams

One perennial, one intermittent and five ephemeral streams were identified within Mitigation Site B (Attachment 1, Figure 2B). Photographs of the streams are included in the photo log in Attachment 2. Stream characteristics are tabularized in Table 3.

Approximately 978 feet of ephemeral streams, approximately 671 feet of intermittent stream, and approximately 4,182 feet of perennial stream (LFC) are located within the property boundary. LFC is a fourth order perennial stream with a meandering pool dominated morphology that meanders across the property from south to north. Unnamed Tributary 6 (UT-6) is an intermittent stream that begins at the western edge of the property and flows northeast until its confluence with LFC. UT-1, UT-2, UT-3, UT-4 and UT-5 are first order ephemeral streams that transport water to LFC, and adjacent wetlands. Substrates in all streams are predominately silt and sand.

These streams are currently serving a variety of functions, such as providing seasonal refugia for aquatic life, transporting storm water runoff, sediment transport and sequestration within the watershed and nutrient cycling. LFC and UT-6 have many deep pools and contain water all year long. These areas would be expected to contain several warm water fishery game species, including crappie, sunfish and largemouth bass.

The streams flow in a north-northeast direction into LFC, thence to Fourche Creek and eventually into the Arkansas River. Given that the drainages on site flow into tributaries of jurisdictional waters, it is likely that significant connectivity exists and all streams on the property may be considered jurisdictional WOUS by the USACE.

Mitigation Site B. Summary of Stream Measurements – June 2015.

Map ID*	Latitude	Longitude	OHWW (ft)	OHWD (ft)	Length (ft)	Stream Type
LFC	34.651437	-92.335882	25.0	2.3	4182	Perennial
UT-1	34.65046	-92.336453	18.0	1.0	263	Ephemeral
UT-2	34.65043	-92.337111	17.0	1.0	216	Ephemeral
UT-3	34.650963	-92.33701	14.3	0.8	103	Ephemeral
UT-4	34.654026	-92.334423	6.0	0.8	112	Ephemeral
UT-5	34.652052	-92.337426	8.5	0.3	284	Ephemeral
UT-6	34.651576	-92.337542	13.3	2.0	671	Intermittent

*UT= Unnamed Tributary

Wetlands

The overall topography of the area is marked by low gradient floodplains, dominated by wetlands. A significant amount of the area displayed all three wetland characteristics, hydrology, hydrophytic vegetation, and hydric soils, which would designate them as wetlands. Characteristics of these areas are summarized in Table 4. Maps showing the locations of each

of the wetlands, wetland determination points, and corresponding upland points are provided in Attachment 1, Figure 2B, while photographs and descriptions are provided in Attachment 2. Wetland determination forms are included in Attachment 3.

Mitigation Site B. Summary of Wetland Data Points – June 2015.

Map ID	Latitude	Longitude	Wetland Hydrology	Hydric Soils	Hydrophytic Vegetation	Wetland Type*
698	34.652973	-92.334995	Y	Y	Y	PFO
703	34.655026	-92.336985	Y	Y	Y	PFO
705	34.653652	-92.337524	Y	Y	Y	PFO
710	34.651911	-92.337347	Y	Y	Y	PFO

*PFO: Palustrine Forested.

Wetlands dominate the landscape of Mitigation Site B. Water in the wetland is regulated by beaver dams and flooding of LFC. Wetlands are located in a depressional and floodplain area, and comprise approximately 64.8 acres (Table 4). Approximately 8 acres are palustrine emergent, approximately 48.4 acres are palustrine forested wetland habitat, and approximately 8.4 acres is open water habitat. During the field investigation the wetland exhibited wetland hydrology characteristics of surface water, high water table, saturated soils, water marks, drift deposits, water stained leaves, crayfish burrows, positive FAC-Neutral Test (see USACE Atlantic and Gulf Coastal Plain Regional Supplement), and a low geomorphic position. Dominant vegetation in the wetland consists of lizard's-tail, common buttonbush, red maple, sweet-gum, willow oak, horsebrier (*Smilax rotundifolia*), slender wood-oats (*Chasmanthium laxum*), American hornbeam (*Carpinus caroliniana*), water tupelo (*Nyssa aquatic*a), water oak (*Quercus nigra*), sensitive fern (*Onoclea sensibilis*), green ash (*Fraxinus pennsylvanica*), and sweet-bay (*Magnolia virginiana*). Dominant vegetation in emergent wetland consist of pinkweed and lizard's-tail. The NRCS web soil survey indicates that soils in the weltand contains an Amy silt loam, frequently flooded, which is predominately hydric. Likewise, the field investigation revealed that the soil had characteristics of a depleted matrix, which is an indicator for hydric soils.

Mitigation Site C

Streams

One perennial, and seven ephemeral streams were identified within Mitigation Site B (Attachment 1, Figure 2C). Photographs of the streams are included in the photo log in Attachment 2. Stream characteristics are tabularized in Table 5.

Approximately 2,230 feet of ephemeral streams, and approximately 3,516 feet of perennial stream (LFC) are located within the property boundary. LFC is a fourth order perennial stream with a meandering pool dominated morphology that meanders across the property from south to north. UT-1, UT-2, UT-3, UT-4 UT-5, UT-6 and UT-7 are first order ephemeral streams that transport water to LFC, and adjacent wetlands. Substrates in all streams are predominately silt.

These streams are currently serving a variety of functions, such as providing seasonal refugia for aquatic life, transporting storm water runoff, sediment transport and sequestration within the watershed and nutrient cycling. LFC contains water all year long and has many deep pools.

These areas would be expected to contain several warm water fishery game species, including crappie, sunfish and largemouth bass.

The streams flow in a north-northeast direction into LFC, thence to Fourche Creek and eventually into the Arkansas River. Given that the drainages on site flow into tributaries of jurisdictional waters, it is likely that significant connectivity exists and all streams on the property may be considered jurisdictional WOUS by the USACE.

Mitigation Site C. Summary of Stream Measurements – March & June 2015.

Map ID*	Latitude	Longitude	OHWW (ft)	OHWD (ft)	Length (ft)	Stream Type
LFC	34.659519	-92.316441	23.0	2.1	3516	Perennial
UT-1	34.658829	-92.316848	9.5	1.3	415	Ephemeral
UT-2	34.659381	-92.31628	15.0	1.5	232	Ephemeral
UT-3	34.659024	-92.315889	10.7	1.8	404	Ephemeral
UT-4	34.65892	-92.315429	10.0	1.0	249	Ephemeral
UT-5	34.659654	-92.315895	8.8	1.3	142	Ephemeral
UT-6	34.658517	-92.31306	20.0	1.5	359	Ephemeral
UT-7	34.658633	-92.314322	15.5	1.5	429	Ephemeral

*UT= Unnamed Tributary

Wetlands

The overall topography of the area is marked by low gradient floodplains, dominated by wetlands. A significant amount of the area displayed all three wetland characteristics, hydrology, hydrophytic vegetation, and hydric soils, which would designate them as wetlands. Characteristics of these areas are summarized in Table 4. Maps showing the locations of each of the wetlands, wetland determination points, and corresponding upland points are provided in Attachment 1, Figure 2C, while photographs and descriptions are provided in Attachment 2. Wetland determination forms are included in Attachment 3.

Mitigation Site C. Summary of Wetland Data Points – March & June 2015.

Map ID	Latitude	Longitude	Wetland Hydrology	Hydric Soils	Hydrophytic Vegetation	Wetland Type*
679	34.660353	-92.315154	Y	Y	Y	PFO
682	34.658821	-92.313568	Y	Y	Y	PFO
684	34.658665	-92.317537	Y	Y	Y	PFO
685	34.661984	-92.310013	Y	Y	Y	PEM

*PFO: Palustrine Forested, PEM: Palustrine Emergent

Wetlands across Mitigation Site C are situated across the entire property. Water levels in the wetland are regulated by beaver dams, flooding on LFC, and overflow from adjacent ponds to the south. The wetland is located in a depressional and floodplain area, and comprises approximately 51.5 acres (Table 6). Approximately 14.8 acres are palustrine emergent and approximately 36.7 acres are palustrine forested wetland habitat. During the field investigation the wetland exhibited wetland hydrology characteristics of surface water, high water table,

saturated soils, water marks, drift deposits, crayfish burrows, drainage patterns, water stained leaves, positive FAC-Neutral Test (see USACE Atlantic and Gulf Coastal Plain Regional Supplement), and a low geomorphic position. Dominant vegetation in the wetland consists of lizard's-tail, sensitive fern, red maple, sweet-gum, willow oak, American hornbeam, water tupelo, water oak, and river birch (*Betula nigra*). Dominant vegetation in the emergent wetlands consists of cottongrass bulrush, common buttonbush, southern bayberry (*Morella cerifera*), and broad-leaf cat-tail (*Typha latifolia*), The NRCS web soil survey indicates that soils in the wetland contains an Amy silt loam, frequently flooded, which is predominately hydric. Likewise, the field investigation revealed that the soil had characteristics of a depleted matrix, which is an indicator for hydric soils.

Appendix C

Photographs of the Streams and Wetlands

Photo Log - Mitigation Site A

Little Fourche Creek (LFC) at Waypoint 437 viewing west.

LFC at Waypoint 438 viewing north.

UT-1 at Waypoint 102 viewing east.

UT-2 at Waypoint 106 viewing northwest.

UT-3 at Waypoint 89 viewing east.

UT-4 at Waypoint 86 viewing north.

UT-5 at Waypoint 91 viewing north.

View of wetland data point 92 viewing north.

View of *Carex glaucescens* at wetland data point 98 viewing south.

View of *Persicaria pennsylvanicum* at wetland data point 105 viewing south.

View of wetland data point 109 viewing east.

Photo Log - Mitigation Site B

View of LFC at Waypoint 695 viewing north.

View of LFC at Waypoint 686 viewing north.

View of UT-1 at Waypoint 687 viewing north.

View of UT-2 at Waypoint 688 viewing west.

View of UT-3 at Waypoint 689 viewing north.

View of UT-4 at Waypoint 701 viewing north.

View of UT-5 at Waypoint 708 viewing northeast.

View of UT-6 at Waypoint 709 viewing northeast.

View of wetland data point 698 viewing south.

View of *Juncus effusus* at wetland data point 703 viewing north.

View of wetland data point 705 viewing south.

View of wetland data point 710 viewing southeast.

View of upland data point 712 viewing east.

Photo Log - Mitigation Site C

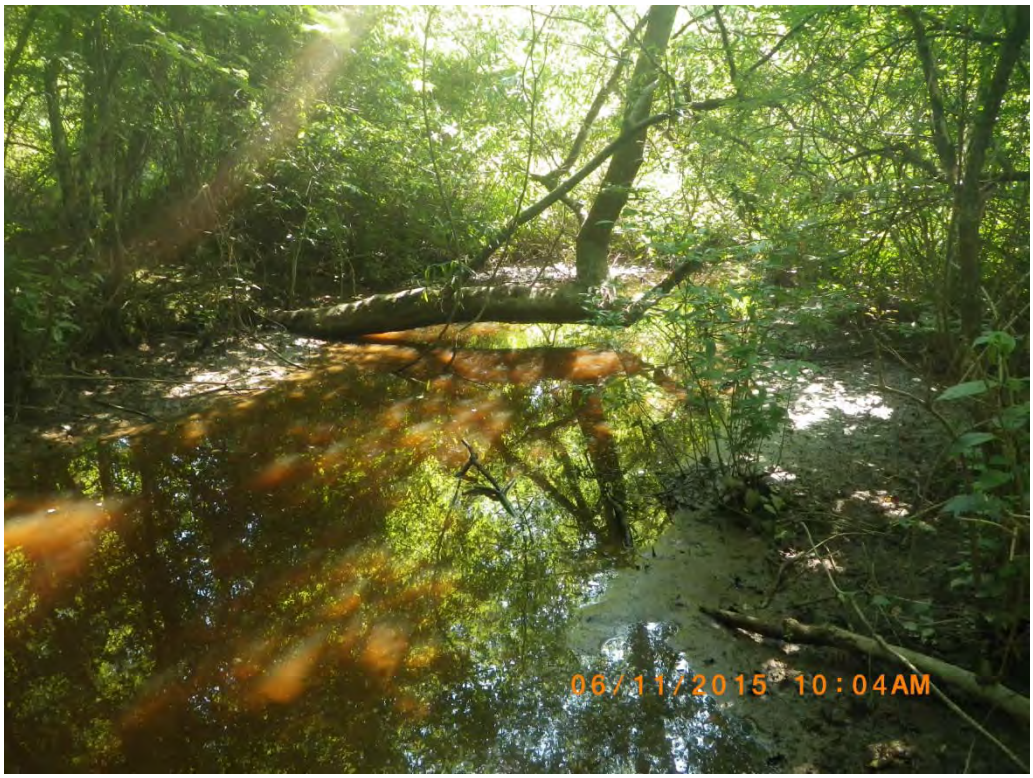
View of LFC at Waypoint 504 viewing west.

View of LFC at Waypoint 677 viewing northeast.

View of UT-1 at Waypoint 506 viewing east.

View of UT-2 at Waypoint 672 viewing southwest.

View of UT-3 at Waypoint 673/507 viewing south.



View of UT-4 at Waypoint 675 viewing east.

View of UT-5 at Waypoint 676/509 viewing east.

View of UT-6 at Waypoint 681 viewing northeast.

View of UT-7 at Waypoint 683 viewing north.

View of *Saururus cernuus* and surface water at wetland data point 682 viewing west.