

Supplement to the West Montgomery Mitigation Bank Prospectus

Montgomery County, Texas

MARCH 2019

PREPARED FOR
Tranquility Ranch

PREPARED BY
SWCA Environmental Consultants

**SUPPLEMENT TO THE
WEST MONTGOMERY MITIGATION BANK PROSPECTUS
MONTGOMERY COUNTY, TEXAS**

Prepared for

Tranquility Ranch

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SWCA Project No. 37179

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1 GENERAL INFORMATION

This document is intended to provide information concerning potential modifications of the proposed West Montgomery Mitigation Bank (WMMB). The prospectus released on public notice in August 2016 presented a phased mitigation bank approach. Based on the comments received, the sponsor concluded that completion of the bank as a single and complete, unphased project, was preferable. The following supplements the projects August 2016 prospectus.

2 PROPOSED MITIGATION BANK NAME

Mitigation Bank Name:	West Montgomery Mitigation Bank
Name of Sponsor/Owner/Long-term Steward:	Tranquility Ranch, LLC
Mailing Address:	20917 Karen Switch Road Magnolia, Texas 77354
Phone Number:	281-914-1012
Email Address:	ningram123@aol.com
Point of Contact:	Nathan Ingram
Name of Sponsor's Agent:	SWCA Environmental Consultants
Mailing Address:	10245 West Little York Road, Suite 600 Houston, Texas 77040
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3 OBJECTIVES

The goal of WMMB is to provide appropriate compensatory mitigation for unavoidable impacts to wetlands and streams identified as waters of the U.S. and authorized by the U.S. Army Corps of Engineers (USACE) within the Lake Houston watershed and adjacent areas.

The objectives of WMMB are to:

- 1) preserve 331.36 acres of high-functioning palustrine forested (PFO) wetlands,
- 2) preserve 15.18 acres of palustrine scrub-shrub (PSS) wetlands,
- 3) preserve 4.26 acres of palustrine herbaceous wetlands,
- 4) enhance 57.77 acres of partially degraded wetlands,
- 5) restore 274.80 acres which were historically PFO wetlands converted to agricultural use,
- 6) preserve 257.21 acres of adjacent upland buffer area, and
- 7) re-establish 9,050 linear feet of stream with buffers; totaling approximately 41.48 acres and 9,050 linear feet.

Specifically, the WMMB will improve chemical, physical, and biological functions within the West Fork San Jacinto River watershed by implementing a mitigation work plan (MWP) that focuses on managing previously impacted forested areas (enhancement/restoration), preserving those areas that are currently functioning as native riparian zones adjacent to Lake Creek, and re-establishing a relic stream channel that will outfall to Lake Creek within the WMMB easement. Functional increases will be quantified and used to replace functions lost or degraded through permitted impacts to waters of the U.S. within the service area.

4 PROJECT LOCATION

The proposed WMMB is located off Karen Switch Road, 0.6 mile east of Farm-to-Market Road 149. The proposed Bank is approximately 5 miles northeast of Magnolia, Texas in Montgomery County (Figure 1). The Universal Transverse Mercator coordinates for the center of the Bank are North 3350095.59 meters and East 241559.46 meters, which is equivalent to 30.255° North by 95.686° West using the 1983 North American Datum (Zone 15, NAD83). The proposed WMMB would consist of 1,002.31 acres of two adjoining tracts. The two existing tracts total approximately 1,211 acres. The project site is within or adjoining the 100-year floodplain of Lake Creek approximately 10 linear miles west of the creek's confluence with West Fork San Jacinto River, 7.5 miles south of the Lake Conroe Dam. The tract abuts Lake Creek, a significant hydrologic influence on the West Fork San Jacinto system. The site is within the U.S. Geological Survey (USGS) 8-digit Hydrologic Unit Code (HUC) 12040101 (West Fork San Jacinto) (Figure 2).

As described in Ecoregions of Texas (Griffith et al. 2007), the Bank is located in the South Central Plains U.S. Environmental Protection Agency (EPA) Level III Ecoregion near its connections to the East Central Texas Plains, Texas Blackland Prairie, and Western Gulf Coastal Plain ecoregions. In particular, WMMB is situated in the Southern Tertiary Uplands EPA Level IV Ecoregion, just upstream of the Flatwoods EPA Level IV Ecoregion, providing an important transitional habitat between piney woods, oaks, hardwoods, and post oak savannas not seen in other portions of the watershed (Figure 3).

5 BASELINE CONDITIONS

Historical images and current conditions suggest that the Bank site has been impacted by agricultural use since at least the 1930s (Figures 4-1 to 4-11). Channelization of natural waterways, deforestation and conversion to agriculture, soil grading, and subsequent alteration of hydrology have decreased the potential wetland functions, particularly for the eastern portion of the site at present. Despite the presence of soils conducive to wetland establishment, a legacy of farming and ranching on the eastern portion of the site has resulted in the presence of degraded and disturbed wetlands associated with irrigation canals, ditches, and cattle ponds. A USACE verified delineation of waters of the U.S. determined that there are 419.17 acres of jurisdictional wetlands and 19.58 acres of waterbodies on-site (Figure 5). Detailed information on the wetlands and waterbody types and vegetation are described below.

5.1 Historical Land Use

In 1831, the earliest known Anglo-American settlement in Montgomery County established itself between Lake Creek and the West Fork San Jacinto River becoming the Lake Creek Settlement (Searle 2012). This settlement activity attracted early agricultural practices with the accessibility to fresh water. The abundance of timber also provided the opportunity for lumbering. However, the lumbering activity was limited to non-sustaining cut-and-run lumber mills due to the widespread and frequent flooding of Lake

Creek. Unless the clearings were maintained for agricultural use, these sites would reforest within 20 years (Bement et al. 1987).

The earliest known aerial photographs from 1938 (Figure 4-1) demonstrate that the majority of the property was forested, contiguous with the forested riparian areas adjacent to Lake Creek, with only a few portions in the north and east project areas with sustained clearings. The aerial photograph from 1953 (Figure 4-2) indicates an increase in forestation around the margins of these cleared areas. By 1968 (Figure 4-4), significant land clearing is observed throughout the eastern portion of the project area, likely for cattle grazing, leaving only a remnant forested riparian buffer around Lake Creek. The land clearing also revealed the remnants of the natural tributary south of Lake Creek which now, due to the farming and livestock activities, has been disrupted in numerous locations and converted to oversized livestock waterholes/linear depressional wetlands. No other significant changes are observed within the project area up to present day (Figure 4-11).

Agricultural practices undoubtedly caused profound hydrologic alterations to the pre-agriculture ecology of the property. Installation of irrigation ditches and ponds, plowing and tilling, leveling, compaction of soils, installation of berms, livestock trails and hoof damage, and replacement of the vegetation community altered the hydrology, soils, and vegetation community of the site to their present state. Since land clearing began, cattle ranching and other agriculture uses caused the eastern portion of the site to remain relatively free of woody vegetation and consistent hydrology compared to the western portion of the site. The land conversion also reduced the ability of the community to recruit desirable vegetation.

The U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) maps identify many forested broad-leaved deciduous, temporary or seasonally flooded (PFO1A, PFO1C) and a few scrub-shrub seasonally flooded (PSS1C) wetlands within the forested area in the western portion of the site and along Lake Creek. Emergent seasonally flooded (PEM1C) wetlands dominate the wetlands present within the eastern portion of the site (USFWS 2018). The NWI data is consistent with the USACE verified wetland delineation.

5.2 Current Conditions

5.2.1 Vegetation

SWCA conducted an on-site wetland and waterbody delineation from September 1 through November 13, 2015, to determine the presence, location, and extent of potential waters of the U.S. within the Tranquility Ranch property and to assist in determining potential credits for a mitigation bank. A USACE verification of the wetland and waterbody delineation occurred on March 30–31 and April 2, 2017. Supplemental data were collected by the USACE after the initial field verification efforts on December 8, 2016 and April 12, 2017. The USACE verified the wetland delineation and provided a Preliminary Jurisdictional Determination (PJD) of the wetlands in a letter dated June 21, 2018. During these delineations, biologists demarcated six vegetation communities within the planned WMMB site, including three palustrine wetland communities totaling approximately 419.17 acres and three upland communities comprising approximately 677.34 acres (Figure 5).

As shown in Figure 5, PFO wetlands are the most common wetland community on-site comprising approximately 332.73 acres dominated by water hickory (*Carya aquatica*), sugar-berry (*Celtis laevigata*), green ash (*Fraxinus pennsylvanica*), honeylocust (*Gleditsia triacanthos*), planertree (*Planera aquatica*), laurel oak (*Quercus laurifolia*), water oak (*Q. nigra*), and willow oak (*Q. phellos*). PEM wetlands comprise approximately 59.84 acres (Figure 5) consisting primarily of fragrant flatsedge (*Cyperus odoratus*), sand spike-rush (*Eleocharis montevidensis*), ovate false fiddleleaf (*Hydrolea ovata*), common rush (*Juncus effusus*), swamp smartweed (*Persicaria hydropiperoides*), savannah-panic grass

(*Phanopyrum gymnocarpon*), and short-bristle horned beak sedge (*Rhynchospora corniculata*). Cherokee sedge (*Carex cherokeensis*), lizard's-tail (*Saururus cernuus*), and the aforementioned PEM species are also the dominant herbaceous species in PFO wetlands. PSS wetlands are the rarest wetland community comprising approximately 26.60 acres (Figure 5) dominated by sapling and shrub species of sugar-berry, common buttonbush (*Cephalanthus occidentalis*), green ash, dwarf palmetto (*Sabal minor*), poison-bean (*Sesbania drummondii*), and Chinese tallowtree (*Triadica sebifera*). The herbaceous layer contains the same species seen in the PEM wetlands and the herbaceous layer of PFO wetlands.

Herbaceous uplands contain a variety of forb and grass species including perennial ragweed (*Ambrosia psilostachya*), Cherokee sedge, longleaf woodoats (*Chasmanthium sessiliflorum*), Bermuda grass (*Cynodon dactylon*), hairy crab grass (*Digitaria sanguinalis*), annual marsh-elder (*Iva annua*), powderpuff (*Mimosa strigillosa*), beaked panicgrass (*Panicum anceps*), Maria feverfew (*Parthenium hysterophorus*), pull-and-be-damned (*Paspalum denticulatum*), dallisgrass (*P. dilatatum*), bahia grass (*P. notatum*), southern dewberry (*Rubus trivialis*), smut grass (*Sporobolus indicus*), St. Augustine grass (*Stenotaphrum secundatum*), and Brazilian vervain (*Verbena brasiliensis*). Scrub-shrub and forested upland communities are dominated by sapling and shrub growth forms of American beautyberry (*Callicarpa americana*), sugar-berry, deciduous holly (*Ilex decidua*), American holly (*Ilex opaca*), yaupon (*Ilex vomitoria*), sweetgum (*Liquidambar styraciflua*), winged elm (*Ulmus alata*), American elm (*U. americana*), loblolly pine (*Pinus taeda*), post oak (*Quercus stellata*), and black oak (*Q. velutina*). Herbaceous cover in these two communities consists of Cherokee sedge, Indian woodoats (*C. latifolium*), longleaf woodoats, hogwort (*Croton capitatus*), and annual marsh-elder. Southern dewberry, roundleaf greenbrier (*Smilax rotundifolia*), saw greenbrier (*S. bona-nox*), and eastern poison ivy (*Toxicodendron radicans*) are the dominant woody vine species.

The forested wetlands within the proposed WMMB appear to reflect the climax wetland vegetation community historically associated with the Lake Creek and West Fork San Jacinto watersheds. The large, old-growth trees in these communities are primarily dominated by trees native to the watershed and ecoregion. Additionally, these trees provide a generally closed canopy and include relatively little of the invasive Chinese tallowtree that pervades many of the wetlands throughout southeast Texas. Therefore, SWCA asserts that the forested wetlands on the property represent historical, native riparian conditions and constitute a rare and significant resource for the watershed. Other areas of the site are primarily fallow pasture dominated by an upland herbaceous community. The majority of the site is dominated by species common to improved pastures, including bahia grass and dallisgrass, that are ubiquitous on the site.

5.2.2 Soils

WMMB soils vary substantially by topography and proximity to mesic areas. Although hues are typically yellowish red across the site, hillslopes have lighter reddish chromas and values with sand or loam textures whereas low, wet areas have darker chromas and values with clay or loam textures. Substrates of this portion of the Gulf Coastal Plain ecoregion are typically sandy or silty. There are nine soil map units within the property boundary, as shown on Figure 6: Alga fine sand (Ch); Betis fine sand, 0–5 percent slopes (BIC); Betis fine sand, 5–12 percent slopes (BID); Fetzer loamy fine sand, 1–5 percent slopes (WkC); Kaman clay, 0–1 percent slopes, frequently flooded (KanA); Kosse soils, frequently flooded (Ks); Landman fine sand (Ab); Woodville fine sandy loam, 1–5 percent slopes (SuC); and Woodville fine sandy loam, 5 to 12 percent slopes (SuD). KanA, which makes up the majority of the property (78 percent), is the only hydric soil according to the National List of Hydric Soils (NRCS 2017). Each of the remaining soil map units comprise 6 percent or less of the site.

5.2.3 Hydrology

Lake Creek forms the northeast property boundary and most of the Bank lies within the floodway or 100-year floodplain of Lake Creek, with the exception of some perched forested wetlands which lie on the uplands along the western edge of the Bank site, as can be seen Figures 5 and 6. Direct precipitation, overland sheet flow from runoff from uplands, and periodic overbank flooding of Lake Creek are the primary drivers of hydrology for wetlands, streams, and ponds on-site; however, natural springs within the property provide supplemental hydrology in some locations.

The topography of the site, as shown in Figure 7, also influences the hydrology of the site. Rolling hills adjacent to the western boundary of the Bank have maximum elevations approximately 275 to 305 feet above mean sea level (msl). The elevation drops rather quickly from the western uplands toward Lake Creek and its adjacent floodplain (Figure 7). The floodplain then gradually dips from approximately 190 to 160 feet amsl across the site from the toe of the uplands eastward to Lake Creek. Lake Creek itself is incised within its channel and has a stream bed approximately 15 to 20 feet below the adjacent floodplain. This topographic relief provides a relatively stark drainage gradient. Intermittent and ephemeral streams within the Bank boundaries generally form on the eastern slope of the western uplands, or at or just downgradient of the toe of the uplands, and flow generally east and northeast across the floodplain before they outfall to Lake Creek (Figure 7).

SWCA delineated 36 waterbodies on-site consisting of 11 ephemeral streams, 6 intermittent streams, 4 perennial streams including Lake Creek, and 15 ponds. Culverts have been placed in some streams to allow road access across the site. Three streams have been channelized to facilitate drainage of the central portion of the site. As previously stated, most of the streams' hydrology are dependent upon direct precipitation and overland sheet flow; however, the northwest portion of the property has a high water table and contains a seep that empties into an intermittent stream. Thus, there is likely exchange of surface and groundwater discharge, and potential groundwater recharge on-site. The streams in the cleared eastern portion of the Bank boundaries have been modified from agricultural machine and cattle activities into multiple small swales and oversized linear wetlands and currently lack any normal stream flow.

5.2.4 Threatened and Endangered Species

A threatened and endangered species review was conducted by SWCA in 2016. Based on this review, WMMB should have no negative effects on threatened and endangered or otherwise protected species due to the lack of suitable habitat on the property. It is expected that afforestation practices will eventually provide suitable foraging and nesting habitat for the bald eagle (*Haliaeetus leucocephalus*) and the red-cockaded woodpecker (*Picoides borealis*), as well as extend habitat for a wide range of species found within the Lake Creek riparian corridor.

5.2.5 Cultural Resources

SWCA submitted a request for State Historic Preservation Office (SHPO) consultation to the THC on August 20, 2018. In a response dated September 24, 2018, the THC determined that the proposed activities within WMMB would result in NO HISTORIC PROPERTIES AFFECTED and indicated that the project could proceed.

5.2.6 Wetlands

SWCA delineated 100 distinctive communities from 43 wetlands totaling 419.17 acres. These communities include 54 PEM, 14 PSS, and 32 PFO wetland patches (Table 1). By vegetation community

type, the project area's wetlands comprise 59.84 acres of PEM, 26.60 acres of PSS, and 332.73 acres of PFO wetlands. The majority of wetland acreage is associated with the forested areas in the western extent of the project area.

Table 1. Project Area Wetland Attributes and Acreages

Wetland ID	Patch ID	Community Type	Acreage within Project Area*
W01	01	PFO	300.55
W01	02	PEM	1.57
W01	03	PSS	2.54
W01	04	PEM	30.42
W01	05	PSS	0.95
W01	06	PFO	5.61
W01	07	PSS	0.98
W01	08	PSS	0.62
W01	09	PEM	0.37
W01	10	PEM	1.40
W01	11	PSS	1.44
W01	12	PSS	11.46
W01	13	PEM	0.48
W01	14	PEM	0.11
W01	15	PEM	0.18
W01	16	PEM	2.32
W01	17	PFO	0.05
W01	18	PEM	12.26
W01	19	PSS	0.43
W01	20	PEM	0.39
W01	21	PSS	3.35
W01	22	PEM	2.43
W01	23	PSS	0.36
W01	24	PEM	0.04
W01	26	PEM	0.07
W01	27	PEM	0.63
W01	28	PFO	3.82
W01	29	PEM	0.09
W01	30	PEM	0.18
W01	31	PEM	0.06
W01	32	PEM	0.14
W01	33	PEM	0.06
W01	34	PEM	0.12
W01	35	PEM	0.20
W01	36	PFO	0.06

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Wetland ID	Patch ID	Community Type	Acreage within Project Area*
W01	37	PEM	0.23
W01	38	PFO	0.48
W01	39	PSS	0.20
W01	40	PEM	0.09
W02	01	PEM	0.12
W02	02	PSS	2.19
W02	03	PEM	0.13
W02	04	PFO	0.68
W03	-	PEM	0.19
W04	-	PFO	0.06
W05	01	PFO	0.49
W05	02	PEM	0.35
W05	03	PFO	0.42
W06	-	PFO	0.47
W07	-	PFO	0.20
W08	-	PFO	0.06
W09	-	PFO	1.46
W10	-	PFO	0.29
W11	-	PFO	0.92
W12	-	PEM	0.05
W13	-	PEM	0.05
W14	-	PFO	0.20
W15	-	PFO	1.31
W16	01	PSS	1.64
W16	02	PFO	0.09
W17	01	PSS	0.42
W17	02	PEM	0.15
W17	03	PFO	4.28
W17	04	PEM	0.04
W17	05	PEM	0.21
W17	06	PEM	0.05
W18	-	PFO	0.41
W19	01	PFO	1.58
W19	02	PEM	0.14
W19	03	PEM	0.12
W19	04	PEM	0.11
W19	05	PFO	0.21
W20	-	PFO	0.33
W21	01	PEM	0.30
W21	02	PFO	0.32

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Wetland ID	Patch ID	Community Type	Acreage within Project Area*
W22	01	PFO	2.01
W22	02	PEM	0.22
W23	-	PEM	0.02
W24	01	PFO	2.44
W24	02	PEM	0.59
W25	-	PFO	1.01
W26	-	PFO	0.70
W27	-	PSS	0.02
W28	01	PFO	0.38
W28	02	PEM	0.07
W29	-	PEM	0.07
W30	01	PEM	0.07
W30	02	PFO	0.07
W30	03	PEM	0.07
W31	-	PEM	0.08
W32	-	PEM	0.33
W33	-	PEM	0.47
W34	-	PEM	0.06
W35	-	PEM	0.06
W36	-	PEM	0.64
W37	-	PEM	0.06
W39	-	PEM	0.12
W41	-	PEM	0.20
W42	-	PEM	0.86
W43	-	PFO	1.77
<i>PEM Subtotal</i>			<i>59.84</i>
<i>PSS Subtotal</i>			<i>26.60</i>
<i>PFO Subtotal</i>			<i>332.73</i>
Total			419.17

* Acreages were calculated using ESRI ArcMap, and rounded to the nearest 0.01 acre.

SWCA determined that the PEM wetlands in the project area currently exhibit 42.81 physical, 41.85 biological, and 37.34 chemical functional credit units (FCUs). The PSS wetlands in the project area bear 19.52, 19.90, and 17.62 physical, biological, and chemical FCUs, respectively. PFO wetland FCUs are assessed at 161.33, 229.09, and 223.87 for physical, biological, and chemical functions, respectively.

5.2.7 Waterbodies

SWCA delineated 36 waterbodies totaling 19.57 acres within the project area. All waterbodies delineated are non-tidal including 11 ephemeral waterbodies, 8 intermittent waterbodies, and 17 perennial

waterbodies; of these, 15 are ponded waterbodies (Table 2). See Figure 5 for the location of each waterbody within the project area.

Some waterbodies had defined OHWM boundaries that became undefined in low lying areas. Several manmade drainage ditches are present within bottomland hardwood lowlands. During the delineation several man-made earthen dams/ponds that affect natural stream hydrology were observed immediately offsite along both the eastern and southern project area boundaries.

Table 2. Project Area Waterbody Attributes, Lengths, and Acreages

Waterbody ID	Waterbody Name*	Flow/ Permanence	Type	OHWM Width (Feet)	Length (feet)	Acreage*
WB01	—	Perennial	Pond	25	n/a	0.14
WB02-01	—	Perennial	Stream	4	221.83	0.02
WB02-02	—	Perennial	Pond	25	159.73	0.02
WB03	—	Perennial	Pond	10	n/a	0.01
WB04	—	Intermittent	Pond	20	n/a	0.02
WB05	—	Perennial	Pond	40	n/a	0.07
WB06	—	Intermittent	Pond	30	n/a	0.02
WB07	—	Perennial	Pond	150	n/a	1.04
WB08	—	Perennial	Pond	35	n/a	0.07
WB10	—	Perennial	Pond	50	n/a	0.01
WB11	—	Perennial	Stream	8	1006.12	0.19
WB12	—	Ephemeral	Stream	3	372.8	0.03
WB13	—	Intermittent	Stream	4	267.24	0.02
WB14	—	Intermittent	Stream	2	146.84	0.01
WB15	—	Intermittent	Stream	4	2260.2	0.21
WB16	Lake Creek	Perennial	Stream	35	13817.07	12.64
WB17	—	Ephemeral	Stream	3	1252.28	0.07
WB18	—	Ephemeral	Stream	3	1074.31	0.05
WB19	—	Intermittent	Stream	4	2277.28	0.19
WB20	—	Perennial	Stream	2	2631.68	0.20
WB21	—	Perennial	Pond	175	n/a	0.09
WB22	—	Ephemeral	Stream	4	3234.46	0.33
WB23	—	Perennial	Pond	175	n/a	0.25
WB24	—	Ephemeral	Stream	2	210.48	0.01
WB25	—	Ephemeral	Stream	6	332.70	0.04
WB26	—	Perennial	Pond	125	n/a	0.66
WB27	—	Ephemeral	Stream	2	152.96	0.01
WB28-01	—	Intermittent	Stream	6	906.40	0.08
WB28-02	—	Intermittent	Stream	6	297.28	0.03
WB28-03	—	Ephemeral	Stream	2	2102.18	0.10
WB29	—	Perennial	Pond	60	n/a	0.12
WB30	—	Ephemeral	Stream	3	1682.85	0.12
WB31	—	Ephemeral	Stream	2	886.94	0.04

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Waterbody ID	Waterbody Name*	Flow/ Permanence	Type	OHWM Width (Feet)	Length (feet)	Acreage*
WB32	–	Ephemeral	Stream	4	339.19	0.03
WB33	–	Perennial	Pond	105	n/a	0.31
WB34	–	Perennial	Pond	163	n/a	2.33
Total						19.58

* Names listed as depicted on USGS quadrangle maps.

* Acreages were calculated using ESRI ArcMap, and rounded to the nearest 0.01 acre.

The relic channels were not assessed using USACE Galveston District's Level 1 Stream Condition Assessment (SCA) to define the streams' functional values since this assessment method is only valid for channels with an OHWM (USACE 2013). Following the relic channels using topographic maps, SWCA mapped approximately 8,500 linear feet of former stream channel no longer possessing an OHWM. Furthermore, historic USGS topographic maps indicate the presence of a channel flowing west to east into Lake Creek. The extent to which the channels have degenerated will require extensive Priority 1 restoration of dimension, pattern, and profile to return to a properly functioning and stable channel condition.

6 ESTABLISHMENT AND OPERATIONS

6.1 Bank Establishment

The Sponsor will procure the financial resources, planning, and scientific professional services required to successfully enhance and preserve the aquatic resources in the WMMB. The Sponsor will perform all enhancement and preservation activities, provide for financial assurances (per 33 Code of Federal Regulations [CFR] 332.3[n]) and long-term protection mechanisms (per 33 CFR 332.7[a]), administer the sale and accounting of credits, and complete all record-keeping and reporting requirements for the WMMB.

As part of the review process, the Sponsor will draft a Mitigation Banking Instrument (MBI) for review and approval by the USACE and the Interagency Review Team (IRT) in accordance with 33 CFR 332.8(d)(6-8). The MBI shall establish the WMMB and outline its operating agreement. The MBI will detail WMMB's service area, accounting procedures, provisions stating the Sponsor's legal responsibility for providing compensatory mitigation upon secured credits, default and closure provisions, reporting protocols, mitigation plans, credit release schedules, and other information required for inclusion by the USACE.

6.2 Bank Operation

WMMB will be operated by the Sponsor as a commercial wetlands and streams mitigation bank to offset impacts to aquatic resources associated with USACE Galveston District permits issued under Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act. WMMB will operate via credit sales of established, restored, and rehabilitated wetland and stream FCUs. Credits will be released, added, or reduced from the ledger pending verification of FCUs from USACE and implementation of the proposed MBI for the WMMB. The number of credits released for different categories of functional capacity will be in accordance to the credit release schedule. Credit sales are restricted to functional category credit pools. Once credits of the most limited functional category are exhausted no other credits from other functional categories will be sold until additional credits for the exhausted category are released by the USACE and

added to the account. Credit determination for existing and future restored wetlands will be based on their functional assessment.

6.3 Credit Determination

The Sponsor proposes the use of the Interim Hydrogeomorphic Models (HGMi) for Riverine Herbaceous/Shrub and Riverine Forested wetlands to assess and quantify wetland functions being restored, established, and/or enhanced by the WMMB. For preserved wetlands, the Sponsor proposes credits to be determined by conducting a threat analysis (i.e., logging, agriculture, residential development, sand/gravel pits) to determine the functional capacity that may be lost if the site is not preserved in perpetuity. Preservation credits will be calculated based on the difference between existing functional capacities of the wetlands and the functional capacity of those wetlands if the most damaging impacts identified in the threat analysis are implemented. The USACE Galveston District Stream Condition Assessment Standard Operating Procedure (SOP) will be used to assess and quantify stream functions. Alternate functional assessment methodologies may be employed as agreed upon by the USACE and the Sponsor. Specific credit calculations will be provided in the MBI.

WMMB will provide in-kind mitigation on a 1:1 ratio; however, impacts in the secondary service area will be on a 1.5:1 ratio. Out-of-kind impacts or impacts outside WMMB's service area will be permitted only on a case-by-case basis as approved by the USACE in coordination with the IRT.

6.4 Credit Release Schedule

Credit releases are contingent on the attainment of performance standards and fulfillment of administrative requirements specified in the MBI for each wetland assessment area according to the following schedule.

1. *Administrative:* Sponsor may apply for a release of 20% of the 10-year projected available FCUs for the enhanced/restored wetlands, 100% for the preserved wetlands, and 20% for the re-established streams upon the execution of this MBI, filing of the USACE approved Conservation Easement, ceasing all land uses that are not consistent with this MBI, establishment of appropriate USACE-approved financial assurance mechanisms, and establishing a long-term management fund.
2. *Construction/Planting Activities:* Sponsor may apply for a release of 20% FCUs for the enhanced/restored wetlands and re-established streams upon construction of hydrologic improvements (e.g., microtopography), site preparation, and vegetation re-establishment as specified in the MWP, per verification of the as-built report.
3. *Subsequent Credit Releases:* Sponsor may apply for a release of additional enhanced/restored wetland credits based on quantified increases in the functional values of the wetlands within the Bank. Each credit release request will be for the entire Bank. Functional assessments will be conducted on each unit a minimum of six times, at approximately years 1, 3, 5, 7, 10, and 15 following submittal of as-built drawings to the USACE. Release of these credits at years 3, 5, 7, 10, 15 and beyond may be approved following USACE verification of the Sponsor's determination. No more than one credit release per year that necessitates an HGMi verification will be authorized. Additionally, the Sponsor may apply for a release of additional stream credits based on USACE approval for the first bankfull event, second bankfull event, Year 2 monitoring, Year 4 monitoring, and Year 7 monitoring.

Under no circumstances will credits be sold before they are released by the USACE, in coordination with the IRT. If at any time this occurs, WMMB will be immediately suspended. All credit releases shall be contingent on the Sponsor being in compliance with the terms and conditions of the permit and MBI with all associated documents.

7 SERVICE AREA

The service area is the watershed, ecoregion, physiographic province, and/or other geographic area within which the mitigation bank is authorized to provide compensatory mitigation required by USACE permits. Service areas must be appropriately sized for each credit type to ensure that the aquatic resources provided will effectively compensate for adverse environmental impacts across the entire service area.

The service area described herein was developed with consideration of regional watersheds and ecoregions following the guidelines in 33 CFR 332.8(d)(6)(ii)(A) for the establishment of service areas for mitigation banks, as well as CFR 332.3(c) for employing a watershed approach. The WMMB is located in the southwestern extent of the EPA Level 3 South Central Plains and Level 4 Southern Tertiary Uplands Ecoregion as described in Ecoregions of Texas (Griffith et al. 2007) (Figure 8).

The entire service area for WMMB occurs within the limits of the USACE Galveston District (District) and is intended to service mitigation requirements specific to permits issued by the District.

WMMB is intended to provide mitigation credits for impacts to riverine forested, scrub-shrub, and herbaceous wetland habitats within the service area. Compensatory mitigation will be provided in the form of credits assessed using the Riverine Forested and Herbaceous/Shrub Interim HGMi methods (USACE 2010a, b). Additionally, WMMB will provide mitigation credits for impacts to streams located in the same service area. Compensatory mitigation for streams will be provided in the form of credits assessed using the USACE Galveston District's Level 1 Stream Condition Assessment (USACE 2013).

The Bank shall not compensate for any adverse impacts 1) to waters of the U.S. including wetlands that are under tidal influence, 2) to lacustrine habitats, or 3) that occur on barrier islands or peninsulas. The service area excludes all publicly funded National Wildlife Refuges (NWR), National Forests, State Parks, Wildlife Management Areas, and all other lands and facilities owned or managed by the Texas Parks and Wildlife Department (TPWD).

On a case by case basis, the USACE, after coordination with the IRT, may authorize use of the Bank outside the primary and secondary service areas or for out-of-kind mitigation when doing so is appropriate, practicable, and environmentally preferable.

7.1 Primary Service Area

The primary service area for WMMB, as shown on Figure 8, is identified as those lands within the Lake Houston Watershed and the common South Central Plains Level III Ecoregion within which the WMMB site lies, and within the District's jurisdiction, which includes:

- the West Fork of the San Jacinto River watershed USGS 8-digit HUC 12040101,
- the East Fork of the San Jacinto River watershed USGS HUC 12040103, and
- the portion of Spring watershed 8-digit HUC 12040102 within the South Central Plains Level III Ecoregion.

The primary service area includes portions of Harris, Liberty, Montgomery, San Jacinto, Waller, and Walker Counties. Impacts occurring within the primary service area shall be debited on a 1:1 basis.

7.2 Secondary Service Area

The secondary service area for WMMB, as shown on Figure 8, is identified as those lands within the Spring watershed USGS 8-digit HUC 12040102 that lie outside of the South Central Plains Level III Ecoregion but within the Western Gulf Coastal Plain Level III Ecoregion. Excluded from this secondary service area are those lands that lie south and west of U.S. Highway 290, which have been designated by the District as unacceptable as service areas for any impacts except those that occur in the Addicks and Barker Reservoir watershed and the basin overflow zone of Cypress Creek (defined as those lands that lie south and west of U.S. Highway 290). The secondary service area includes portions of Harris, Montgomery, and Waller Counties. Impacts occurring within the secondary service area shall be debited on a 1.5:1 basis.

8 GENERAL NEED AND TECHNICAL FEASIBILITY

8.1 Watershed Threats

The USGS defines Lake Creek's watershed as HUC 1204010103. Lake Creek itself winds its way through eastern Grimes County and western Montgomery County before discharging into the West Fork San Jacinto River just south of the city of Conroe, Texas (Figure 8). Lake Creek's watershed measures 213,168 acres and constitutes approximately 31 percent of the West Fork San Jacinto River watershed (692,760 acres). The West Fork San Jacinto River is a significant tributary to Lake Houston, a major water supply servicing the greater Houston area.

The greater Houston area has one of the largest urban and suburban populations in the country. Sustained residential and business growth near Conroe and The Woodlands and the expansion of major roadways in Montgomery County (e.g., Interstate 45, Interstate 69, State Highway 249, and State Highway 105 corridors) have led to increasing development pressure throughout the watershed of West Fork San Jacinto River. The Houston-Galveston Area Council (H-GAC 2018) estimates that between 2000 and 2017, population has grown approximately 32 percent in the eight counties constituting the Houston metropolitan area. Montgomery County in particular has experienced exceptionally high population growth, increasing by nearly 92 percent during that same timespan (H-GAC 2018).

With the County's population projected to increase by an additional 50 percent in the next 20 years, infrastructure and real estate development projects will likely continue to impact wetlands, streams, and other aquatic resources, especially in undeveloped portions of the County. Typical land uses in Montgomery County include farmland, agriculture, and suburban residential development, though anticipated growth will center around residential subdivisions and associated commercial development (Theis and Pulsinelli 2015). In fact, the properties to the west and south of WMMB are being converted into subdivisions. As development in Montgomery County's watersheds increases, runoff rates to streams are likely to increase dramatically (Paul and Meyer 2001). Considering the Lake Houston system's history of water quality concerns documented in the most recent 303(d) list (Texas Commission on Environmental Quality [TCEQ] 2015), increasing runoff threatens to further degrade turbidity, nutrient loads, bacterial and chemical pollutant discharges, as well as in-stream erosion for the tributaries to the West Fork San Jacinto River, Lake Houston, and Galveston Bay. The West Fork San Jacinto River, in particular, has demonstrated high concentrations of bacteria (TCEQ 2016) and is heavily exploited for sand and gravel used in construction and industrial applications. Approximately 9 miles downstream of WMMB on Lake Creek near the confluence of the West Fork San Jacinto River is a sand mining operation owned by Hunt Global Resources Inc. There are also sand and gravel mines on the outskirts of Conroe near Loop 336.

8.2 Site-specific Threats

There are several property uses that could be realized instead of mitigation banking. Firstly, real estate development pressures in the area make the property attractive for development. Development impacts to wetlands and streams on the property would likely require a Clean Water Act (Section 404) permit from the USACE and require mitigation. However, forested wetlands within the property could be converted to marketable real estate or storm detention areas. Such a scenario would lead to a marked decrease in the biological value of these wetlands.

A more pressing use of the property is in implementation of silviculture operations or developing the property for agriculture use. Silvicultural practices would cause the reduction in biodiversity of the vegetation as well as the loss of old-growth timber within the wetlands, thereby decreasing their ecological value. Alternatively, as with the adjoining property the Sponsor purchased to the east of WMMB (a potential Phase II), the forested wetlands could be cleared, and the land converted to agriculture for hay farming and/or pasture land. Based on previously proffered timber harvest bids, the timber sale of these trees would create a favorable margin and subsequent agricultural use would make the property economically valuable. However, the impact to wetland functions would be extensive and detrimental to the watershed.

Finally, the Sponsor has received an offer from a mining operation that is interested in harvesting sand and gravel from the site. Developing the surface minerals from the property would certainly have a significant impact on the biological, chemical, and physical functions of the wetlands and would be detrimental to Lake Creek and West Fork San Jacinto River. However, extraction of surface minerals would be permissible through an aggregate production operation (APO) registration with the TCEQ. Furthermore, sand and gravel mining operations can be implemented without violation of Section 404 of the Clean Water Act. Therefore, sand and gravel operations may alter wetlands substantially without triggering the need for mitigation.

Although preserving the existing high quality forested wetlands and enhancing the lower quality wetlands might be the highest ecological function of the property, there are several economically viable options for the property owner.

8.3 Watershed Benefits

The Gulf-Houston Regional Conservation Plan is a collection of current and potential environmental and recreation projects in eight counties involving government, private, and non-governmental organizations. The plan involves thousands of acres of land acquisition, restoration, and recreational development divided among ecologically significant areas. Lake Creek is among the waterbodies of the Headwaters to Baywaters Initiative of the plan, which involves land acquisition, land easements and restoration, and development of recreational trail miles. Within this framework, WMMB's objectives are valuable to larger conservation efforts at a regional and watershed scale.

The Lake Creek Greenway Project, a cooperative endeavor between Keep Montgomery County Beautiful, the East 1488 Community Association, Montgomery County Precinct 2, the Lake Creek Greenway Partnership, and collaborators of the Gulf-Houston Regional Conservation Plan aims to create a nature preserve along the Lake Creek riparian corridor for recreational use, flood control, and ecosystem services (e.g., water quality enhancement, climate change). This project is intended to integrate with the watershed protection plan for Lake Creek and the Upper West Fork of the San Jacinto River watersheds (TCEQ 2016). Approximately 620 acres are already preserved under easements or court orders with additional efforts focused on the eastern segment of Lake Creek. The terminus of the intended project is Goodrich

Jones State Forest. WMMB is located on the western edge of the potential greenway and would provide a large, valuable, contiguous upstream tract with goals congruent with those of the Lake Creek Greenway project (Figure 2).

Neighboring properties to the north of the proposed WMMB are dominated by conservation areas that are under restrictive easements to that effect; however, residential and commercial developments abut the site to the east, west, and south. The conservation easements adjacent to the north side of Lake Creek comprise 5,650 acres and are owned by Cooks Branch Conservancy, LP and the Cynthia and George Mitchell Foundation (Figure 2). These properties, combined with the proposed WMMB property, represent more than 3 percent of the Lake Creek watershed. Establishment of the WMMB will expand the contiguous conservation footprint of these adjacent properties, increasing beneficial watershed functions such as flood flow attenuation, pollutant transformation, sediment trapping, and wildlife habitat.

In addition, the Mitchell family has spent 25 years transforming their properties from clear-cut and overgrazed landscapes to piney wood and bottomland forest dedicated to restoring and conserving natural resources. Furthermore, the foundation has expressed interest in participating in restoration and preservation of the Lake Creek riparian corridor. This foundation may also provide valuable insight into the successful restoration activities which resulted in national and state recognition of conservation of natural resources and establishment of bald eagles, red-cockaded woodpeckers, eastern turkey (*Meleagris gallopavo*), and bobwhite quail (*Colinus virginianus*) populations on their sites. Although not an expressed goal, WMMB may help to expand wildlife habitat for state and federally protected species on the adjacent conservation easements through the preservation of the Lake Creek riparian corridor.

8.4 Technical Feasibility

The proposed improvements for the site include: 1) wetland hydrologic improvements, 2) stream restoration, and 3) vegetation management and planting (Figure 9).

To establish compensatory mitigation credits, hydrological improvements will be made that 1) regulate the duration of inundation and saturation suited to hydrologic requirements of wetland vegetation and the criterion of a functional wetland according to the USACE, 2) increase wetland/aquatic habitat diversity, and 3) restore site topography and typical floodplain relief within the site.

Stream restoration/re-establishment of three small stream converging tributaries on the eastern section of the Lake Creek floodplain (Figure 9) will re-create a fully functioning and connected stream/floodplain system in this area very similar to what existed there prior to clearing and pasturing.

After completing the wetland hydrological and stream restoration improvements, a forestation, re-vegetation, and subsequent vegetation management processes will re-establish bottomland hardwood forested wetland communities consistent with the historical floodplain adjacent to Lake Creek on all wetland enhancement and restoration areas and in the re-established stream riparian buffers.

9 EASEMENTS AND ENCUMBRANCES

There are no known easements or encumbrances restricting the use of the land. However, should any be found, no credits will be sought for portions of WMMB mitigation sites that are subjected to any easement or encumbrance. Should any easements be relinquished, the Sponsor may seek USACE approval to receive additional credits for restoration of aquatic resources within former rights-of-way.

10 OWNERSHIP AND LONG-TERM MANAGEMENT

As a property owned in fee simple by the Sponsor, the Sponsor intends to own and operate WMMB through a wholly-owned limited liability corporation (LLC). This corporation will operate at the direction of the Sponsor and will be the entity responsible for executing all aspects of the MBI including meeting the performance standards and providing for all financial considerations for maintenance and management of the property.

The WMMB will be self-sustaining with long-term management activities limited primarily to items such as inspections, controlling invasive species, and boundary maintenance. The financial obligations required for the initial implementation and ongoing management of the property will be specified in the MBI.

11 QUALIFICATION OF SPONSOR

The Sponsor has owned the property intended for inclusion in WMMB since 2003 and has actively managed it for wildlife through a white-tailed deer (*Odocoileus virginianus*) management plan since 2005. This wildlife management plan details herd management goals for the property in cooperation with the State of Texas. Therefore, although WMMB represents the Sponsor's first bank, the Sponsor is accustomed to working on ecological projects with agency requirements.

To assist the Sponsor, SWCA has been contracted to be WMMB's environmental consultant. SWCA staff includes professional wetland scientists, certified wildlife biologists, and scientists with extensive wetland and stream mitigation experience. SWCA staff have more than 20 years of experience in wetland and stream mitigation, including the development of multiple USACE-approved mitigation banks and permittee-responsible mitigation plans in Galveston and other USACE Districts.

12 ECOLOGICAL SUITABILITY OF THE SITE

The ecological services and values provided by the WMMB site extend beyond compensatory mitigation for unavoidable impacts to waters of the U.S. The site would provide important physical, chemical, and biological functions for the Lake Houston watershed. The heavily forested bottomlands will aid in sequestering sediments, nutrients, and pollutants from upstream impaired waters. Likewise, the forests mitigate flooding events by slowing flood flows and increasing water storage capacity. Biodiversity would be augmented via extension of preserved high-quality wildlife habitat present on adjacent conservation easements. Preservation and restoration of the WMMB site would contribute to the ecological initiatives of the local and regional riparian conservation projects. Given the contamination threats in multiple stream segments of the Lake Houston watershed, it is important to conserve the remaining unimpaired waters and protect them from future development that surrounds the site. The site already supports significant wetland resources of value to the watershed that will be preserved and enhanced to provide on-going ecological value to the Lake Houston watershed.

13 WATER RIGHTS

WMMB does not propose restoration activities within any water of the state and will derive all necessary hydrology from precipitation and overbank flooding. Based on previous discussions with TCEQ, water rights do not need to be secured for work completed outside the bounds of a water of the State. Therefore, securing water rights is not a requirement for this bank.

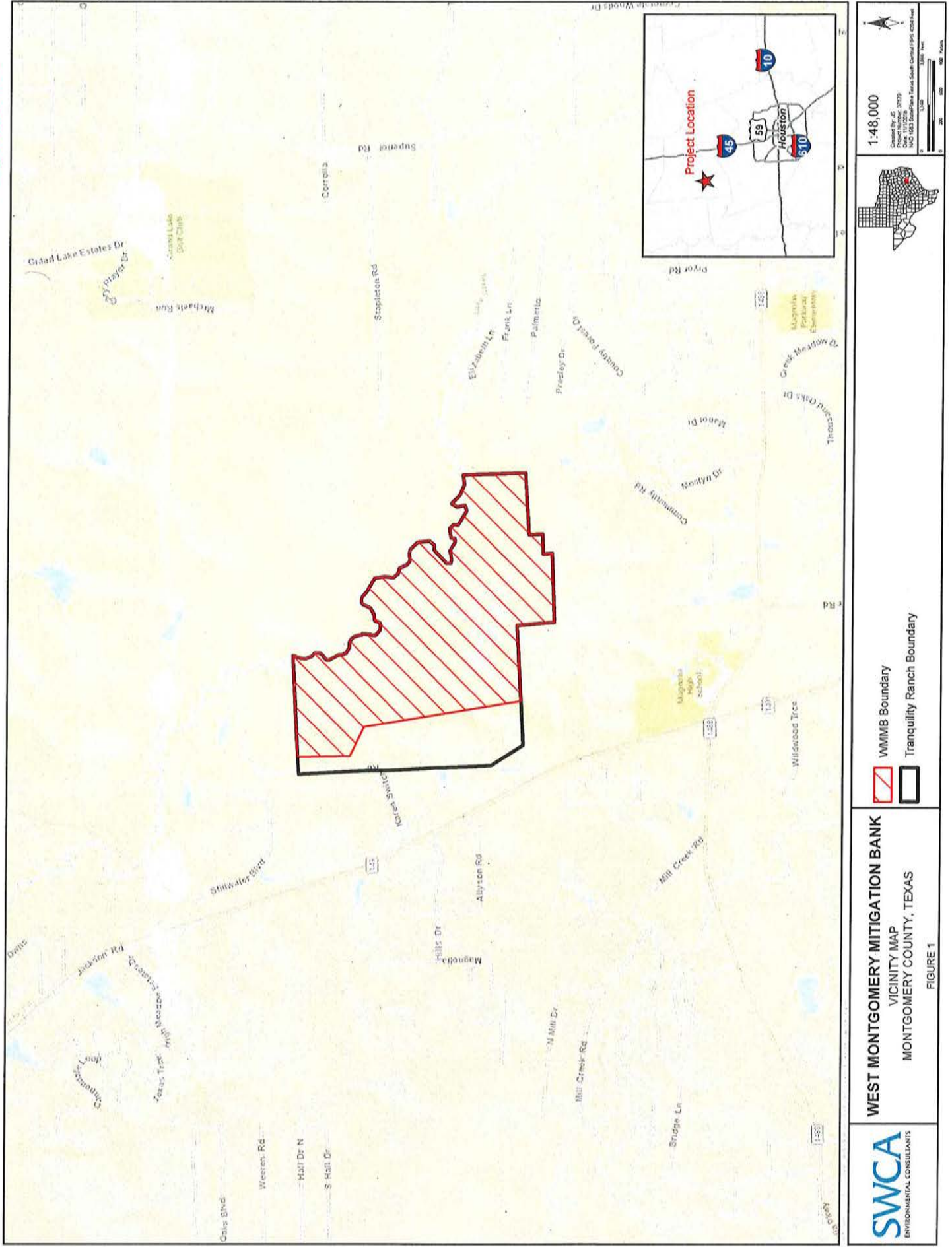
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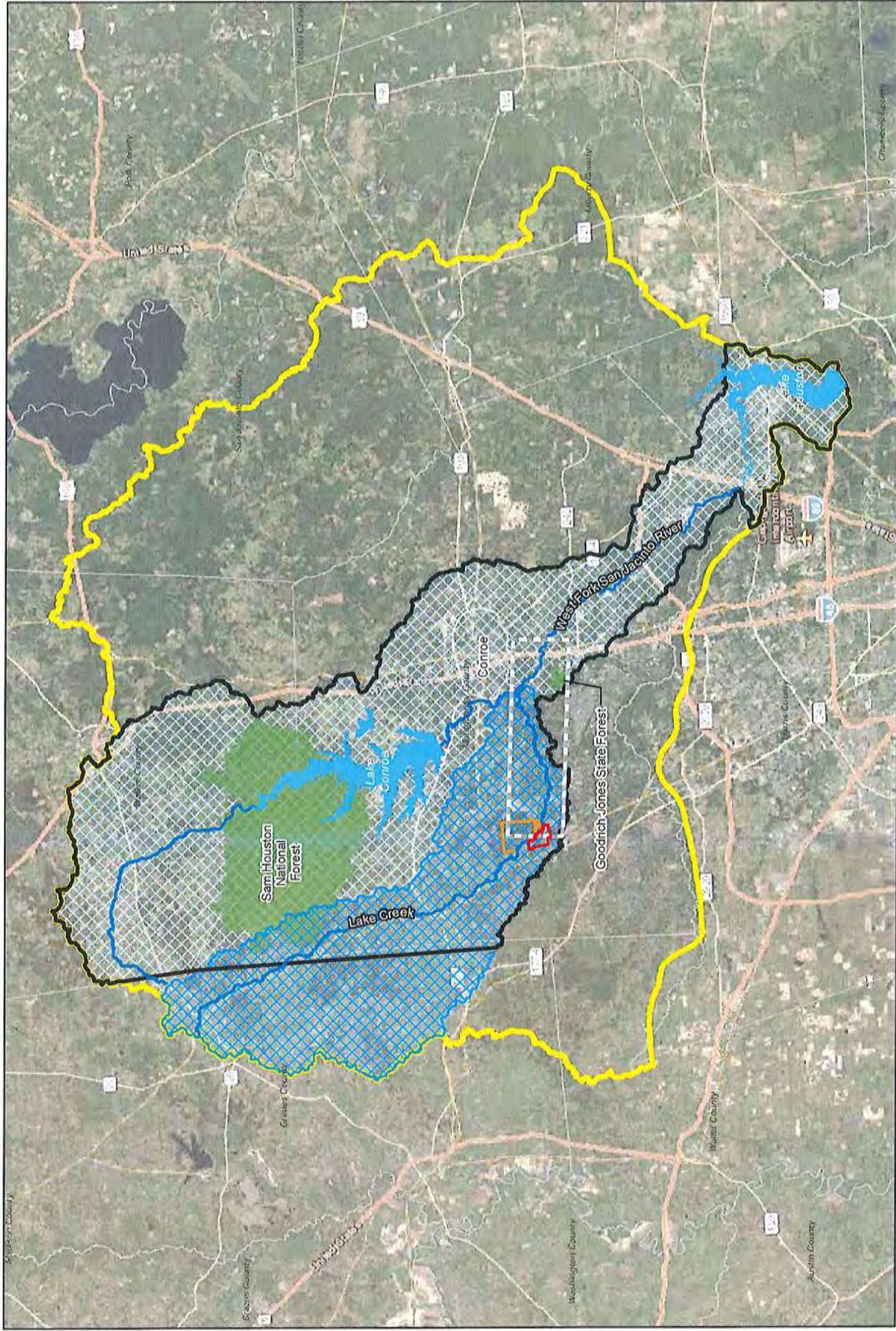
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FIGURES

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- Figure 2: Watershed Map
- Figure 3: Ecoregions Map
- Figure 4: Historic Aerial Photographs
- Figure 5: Jurisdictional Areas Map
- Figure 6: Soils and Floodplain Map
- Figure 7: Topographic Map
- Figure 8: Service Area Map
- Figure 9: Mitigation Plan Maps





SWCA
ENVIRONMENTAL CONSULTANTS

WEST MONTGOMERY MITIGATION BANK
LAKE CREEK WATERSHED MAP
MONTGOMERY COUNTY, TEXAS

FIGURE 2

Legend

- Project Boundary
- Watershed
- Government Land
- Lake Creek Greenway Project Area
- Cooda Branch and Mitchell Foundation Conservancies

NHD

- West Fork San Jacinto Watershed (HUC 12040101)
- Lake Creek Watershed (HUC 1204010103)
- HUC 12040101
- Lake Houston Watershed Within Level III Ecoregion

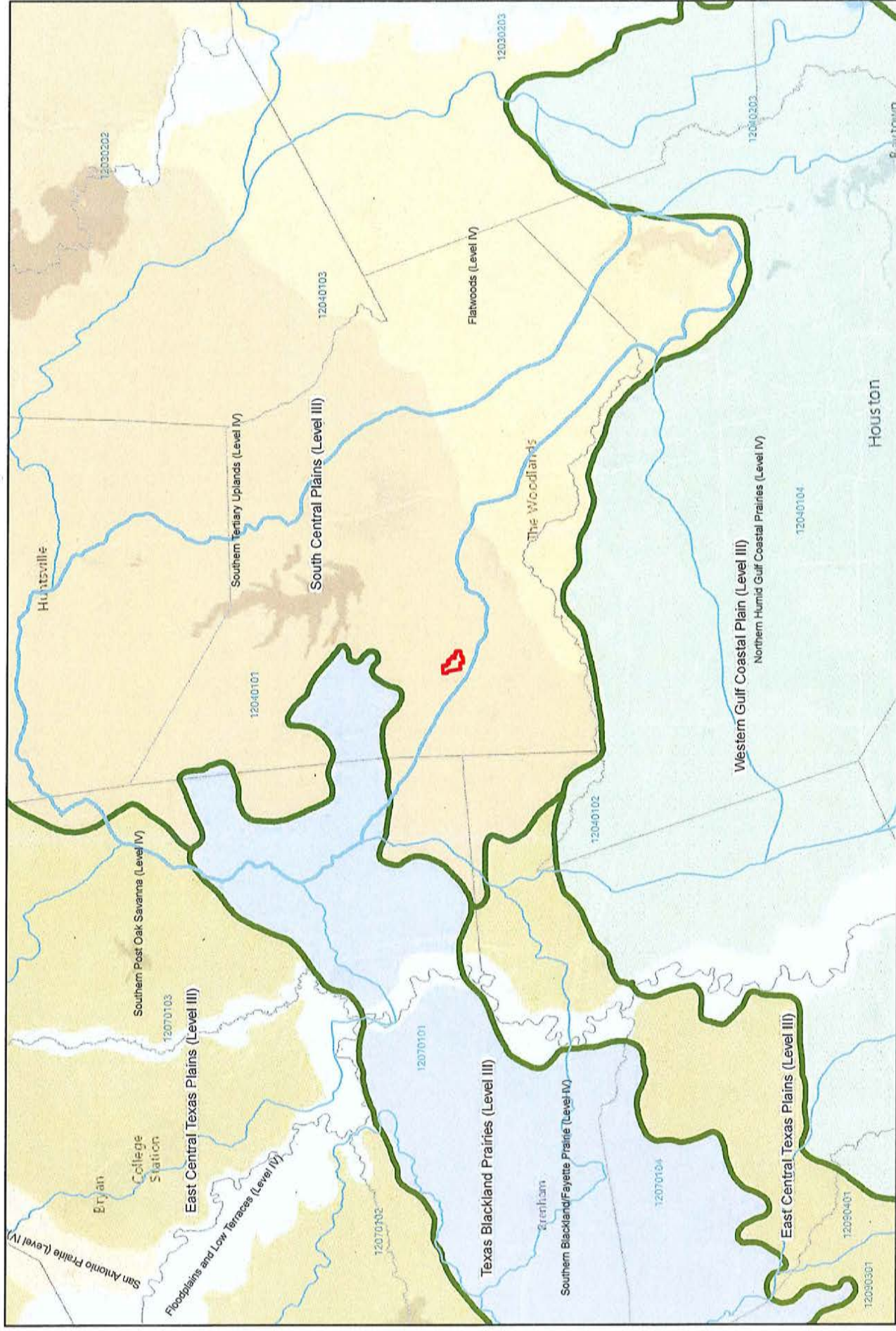
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Metadata

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Scale: 1:600,000
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Data Date: 2016-06-16
Data Projection: NAD 83
Data Units: Feet
Data Source: USGS National Hydrography Dataset (NHD)
Data Date: 2016-06-16
Data Projection: NAD 83
Data Units: Feet





WEST MONTGOMERY MITIGATION BANK
ECO-REGIONS & 8-DIGIT HUC MAP
MONTGOMERY COUNTY, TEXAS

FIGURE 3

Legend

- Project Boundary (Red outline)
- County Boundary (Thin black line)
- HUC (Blue outline)
- Ecoregion Level III Boundary (Thick green outline)

Ecoregion Level IV

- Flatwoods
- Floodplains and Low Terraces
- Northern Humid Gulf Coastal Prairies
- San Antonio Plains

Ecoregion Level III

- Southern Blackland/Fayette Prairie
- Southern Post Oak Savanna
- Southern Tertiary Uplands
- Texas-Louisiana Coastal Marshes

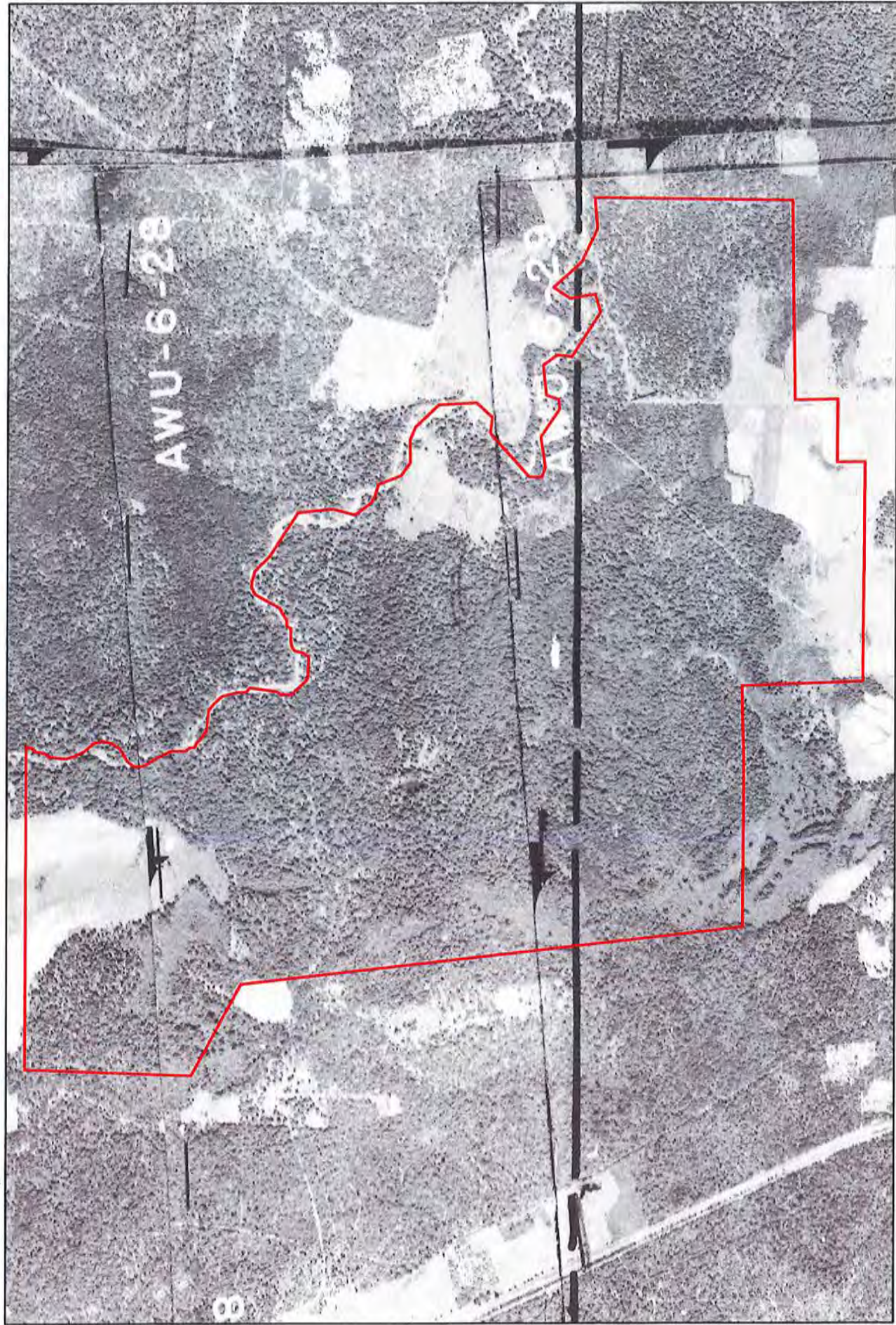
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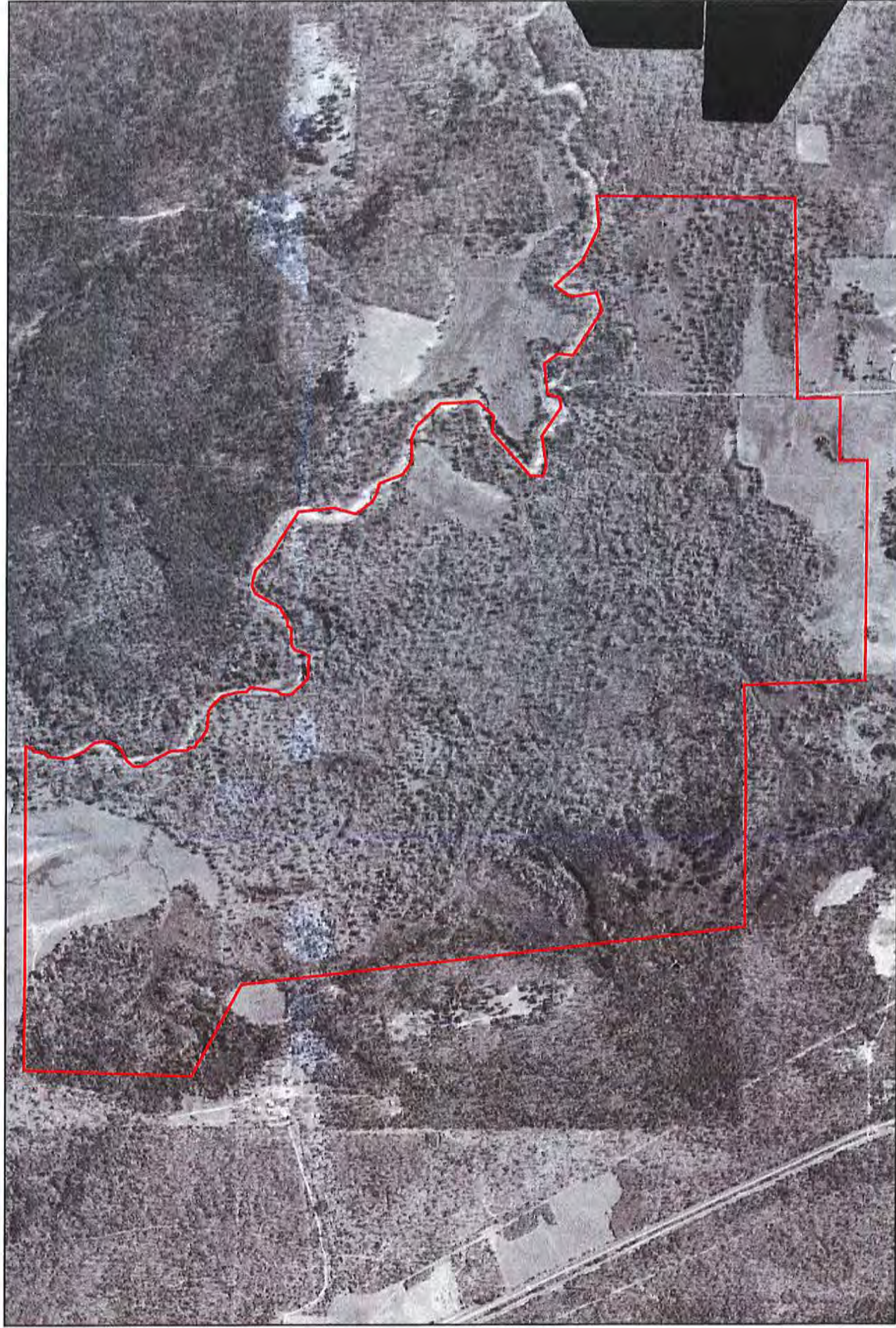
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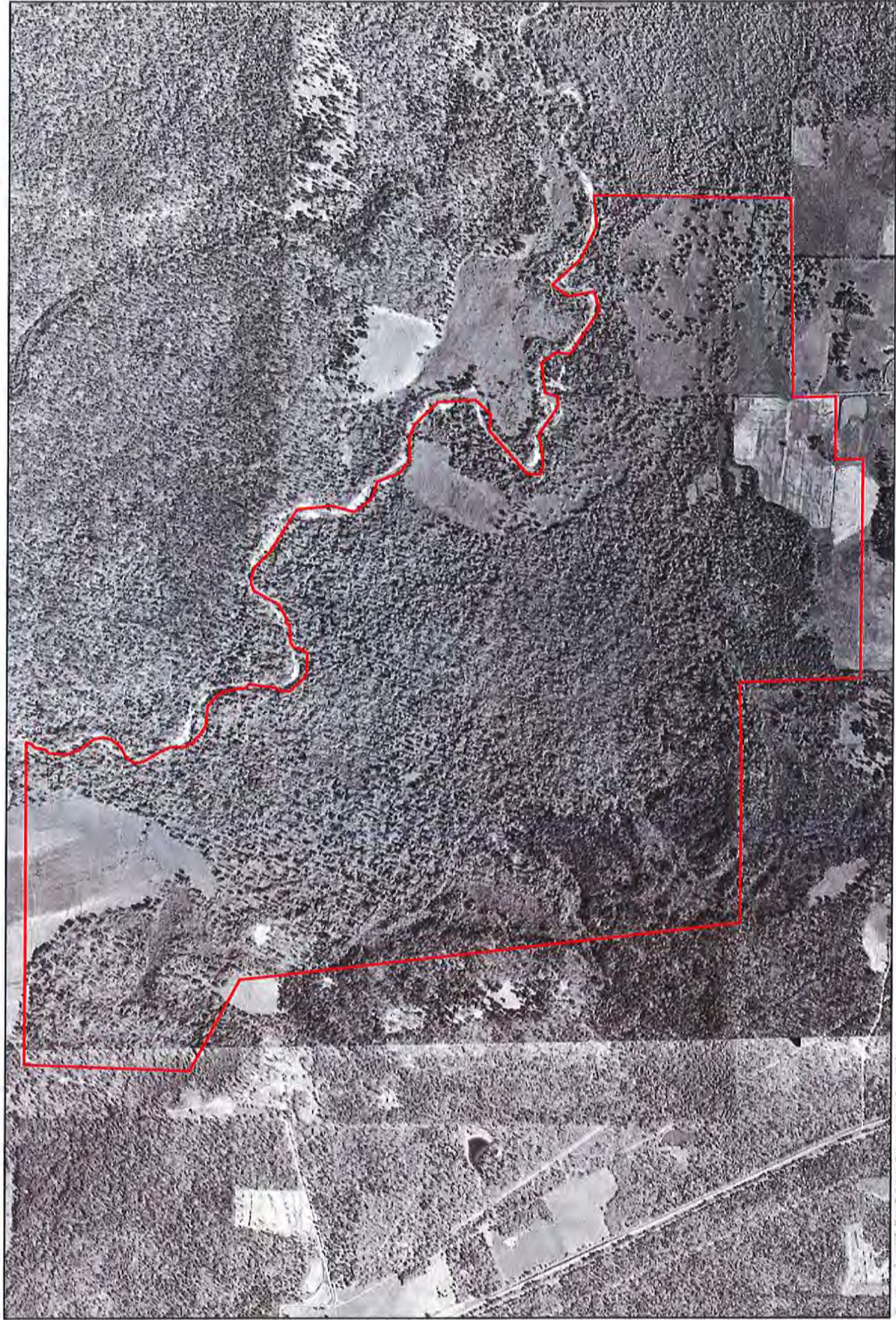
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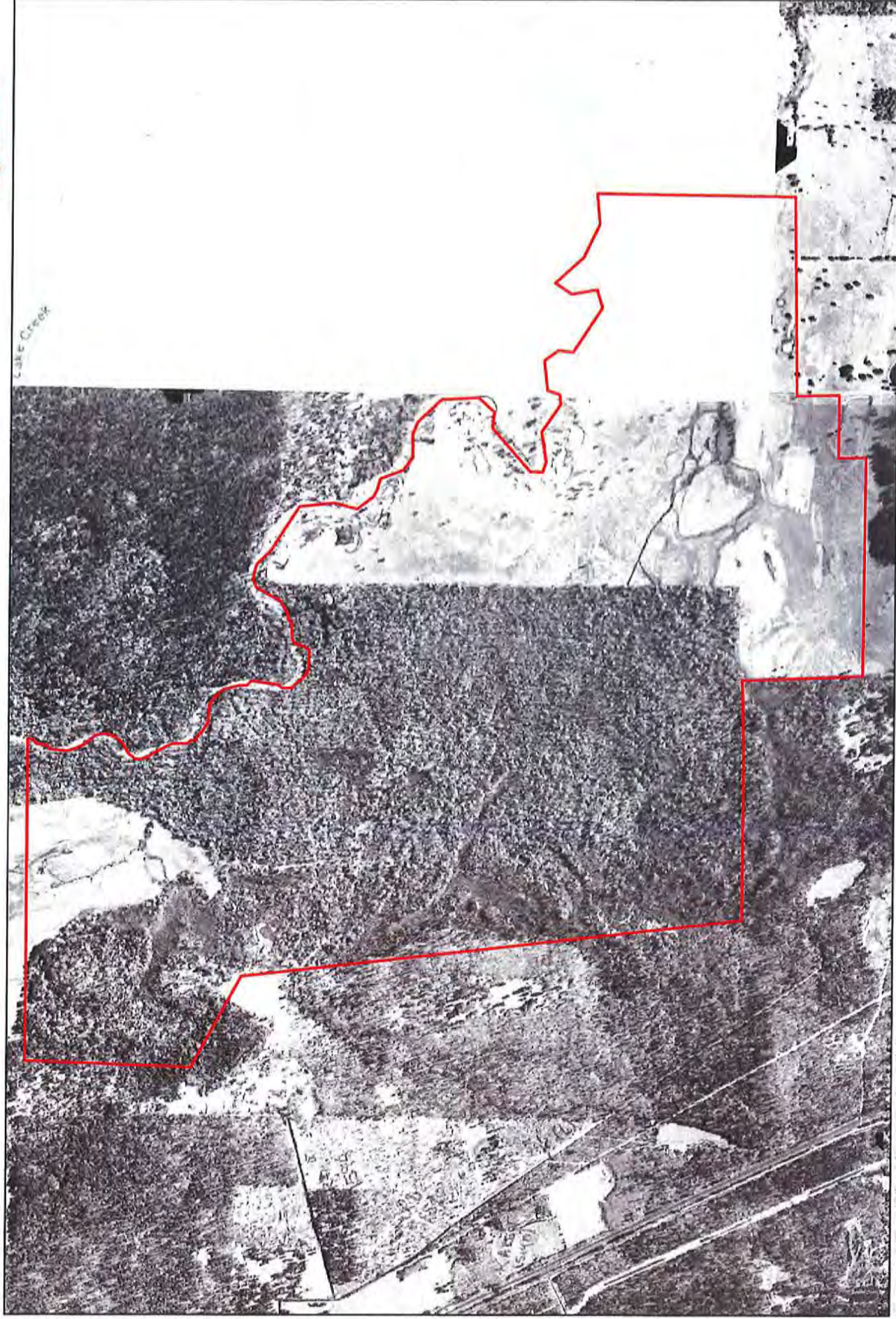
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FIGURE 4 - SHEET 2



	WEST MONTGOMERY MITIGATION BANK HISTORIC IMAGERY MAP (1958) MONTGOMERY COUNTY, TEXAS	 Project Boundary	1:16,000 Created By: J2 Date: 11/10/2016 Scale: 1"=160' (1:20,000) North Arrow 0 500 1000 Feet 
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FIGURE 4 - SHEET 3



WEST MONTGOMERY MITIGATION BANK
HISTORIC IMAGERY MAP (1988)
MONTGOMERY COUNTY, TEXAS

FIGURE 4 - SHEET 4

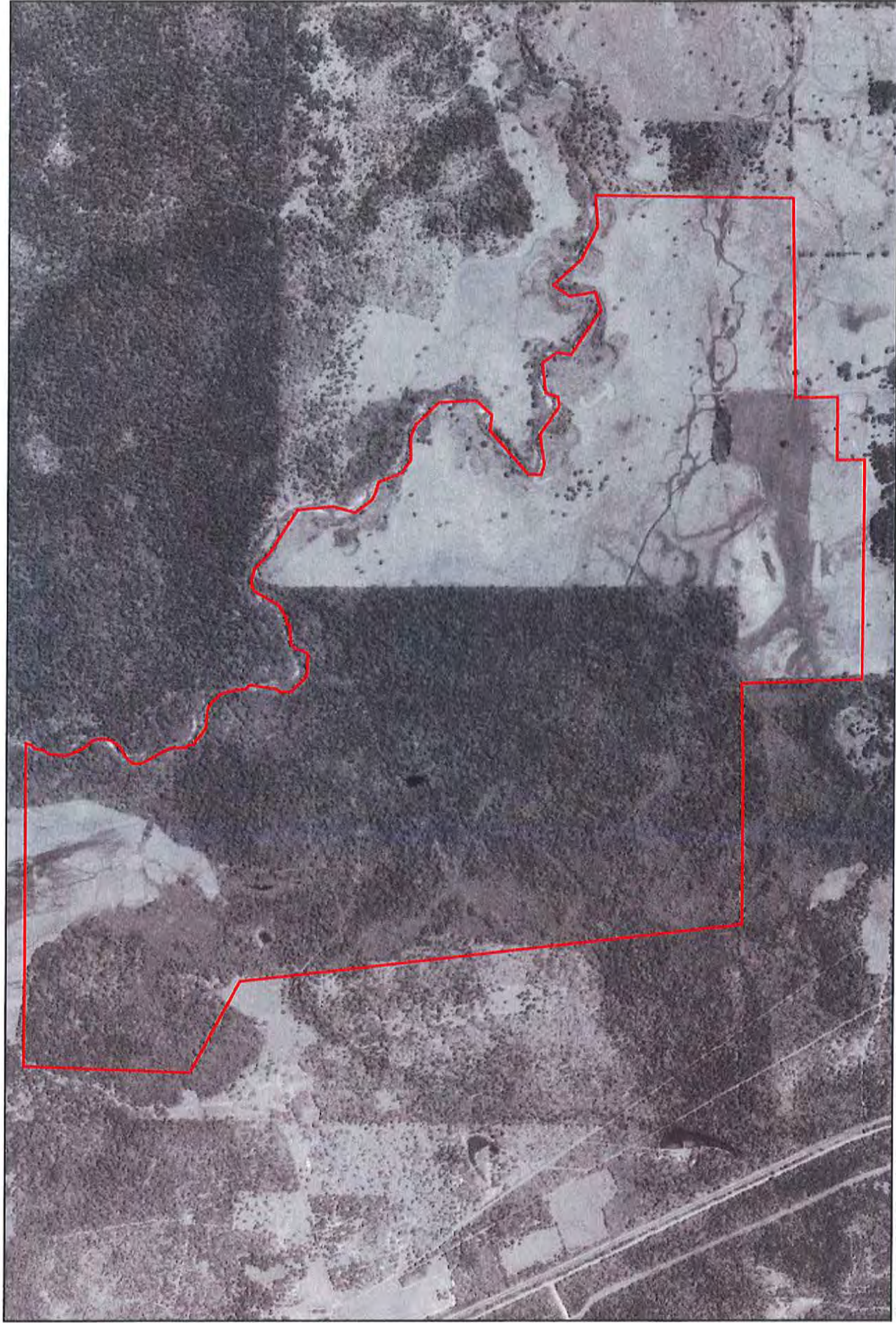
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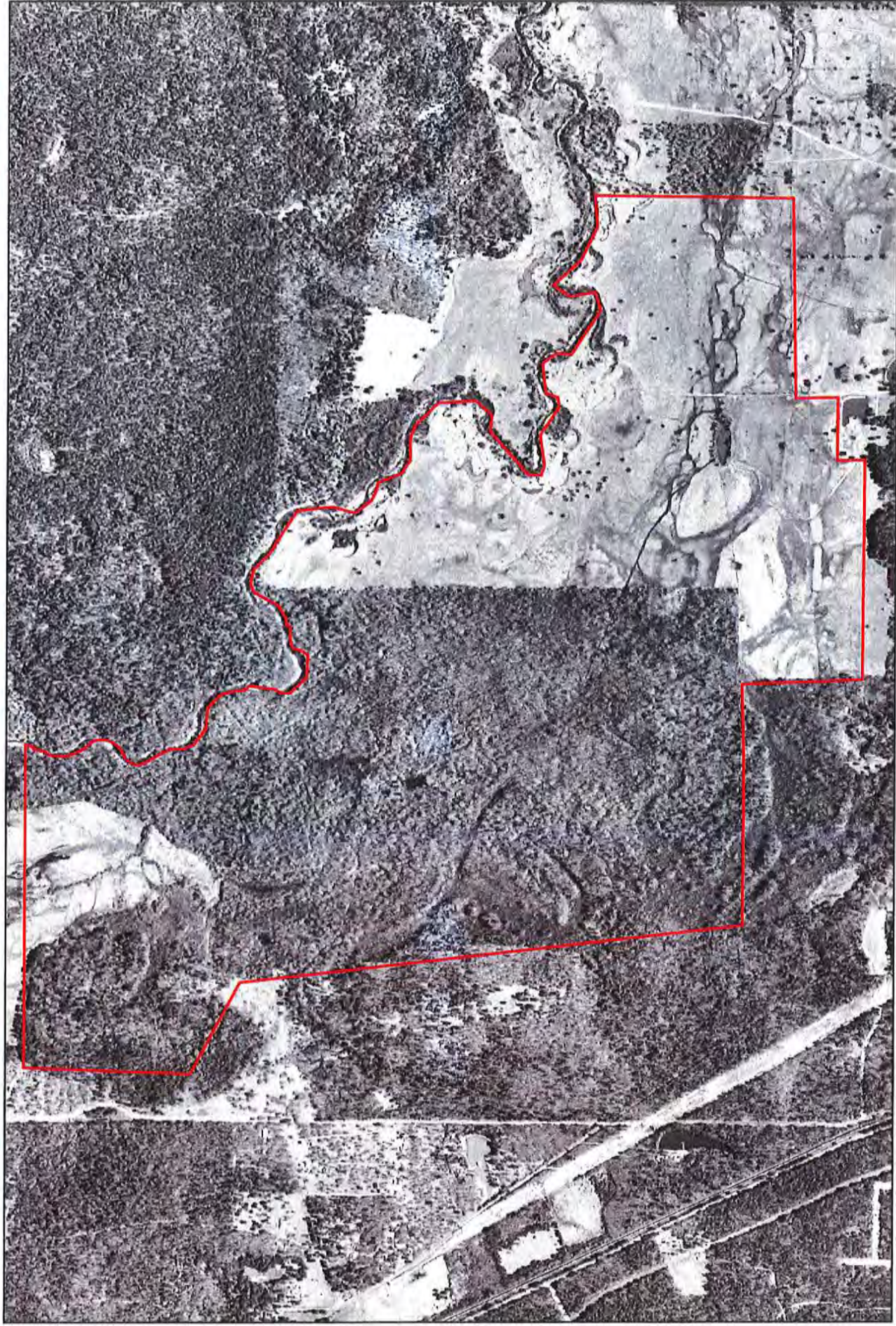
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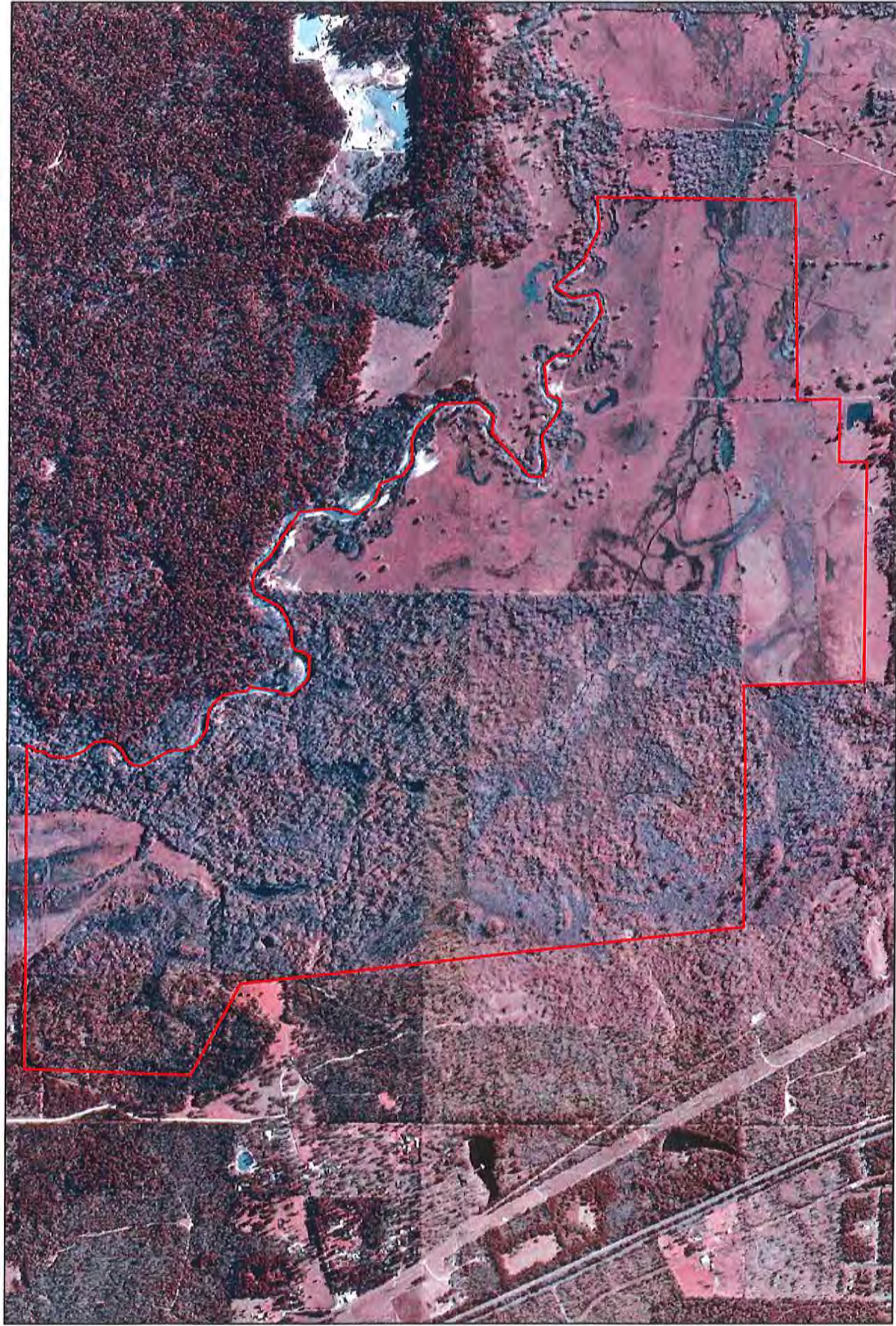
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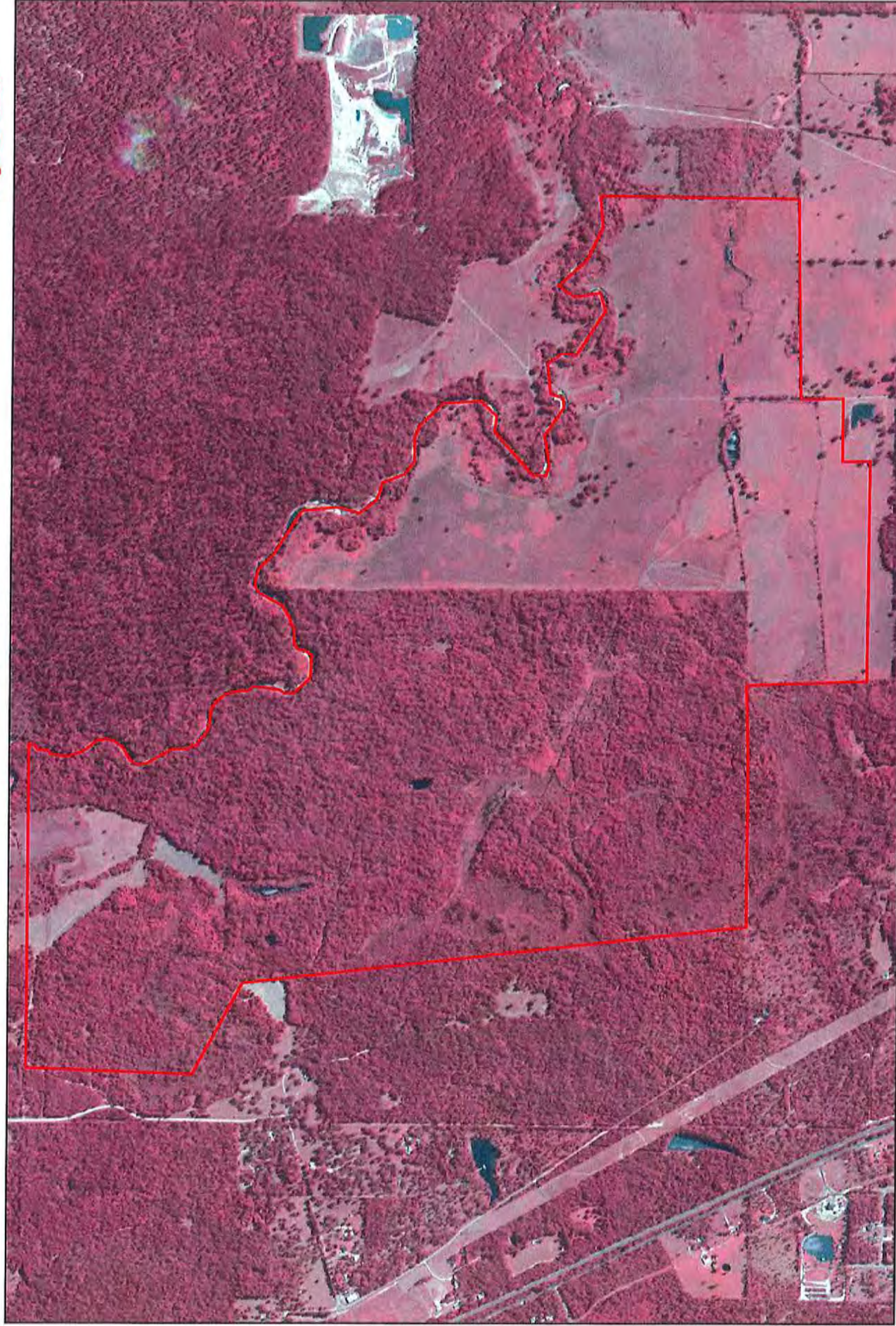
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FIGURE 4 - SHEET 6

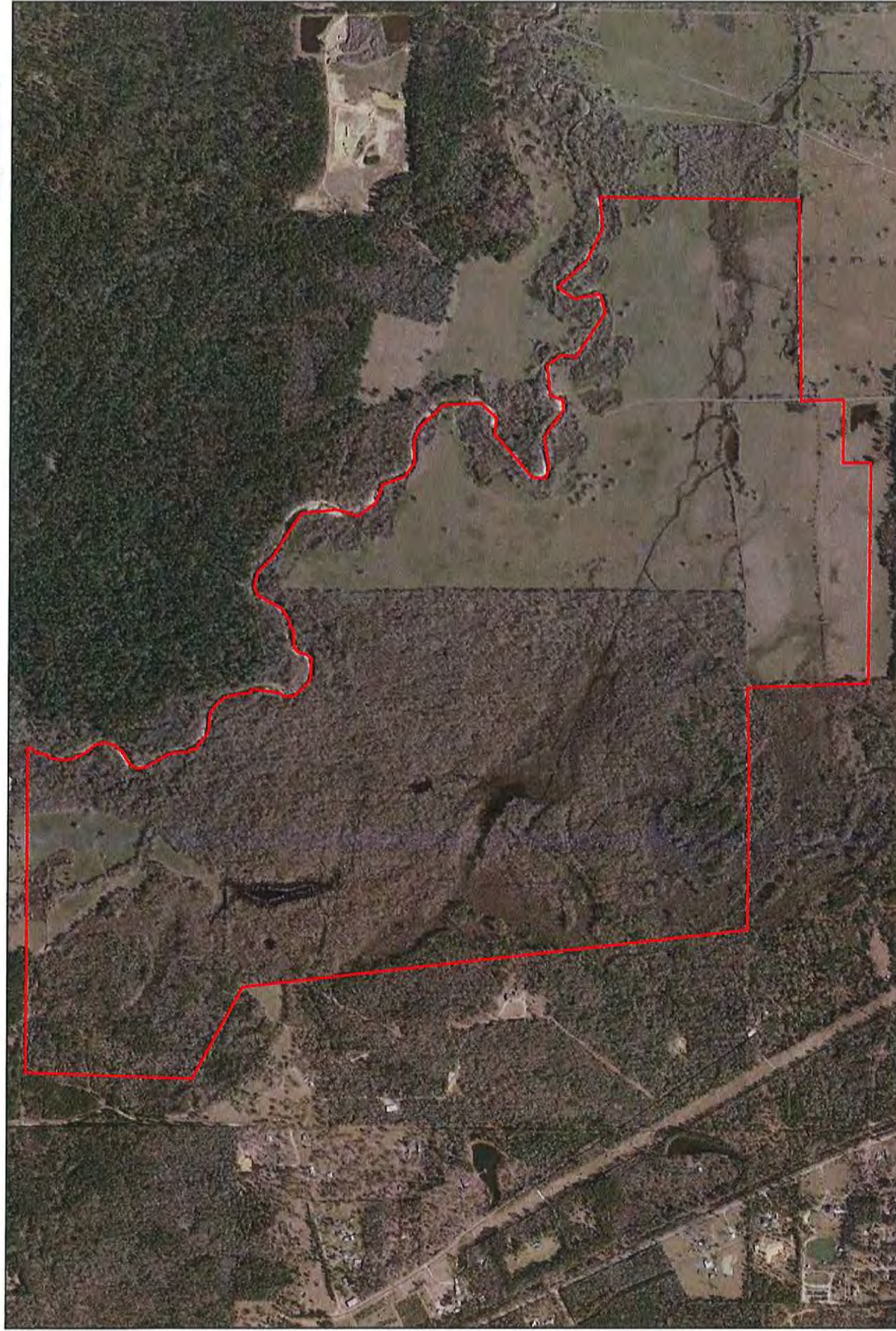


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FIGURE 4 - SHEET 7

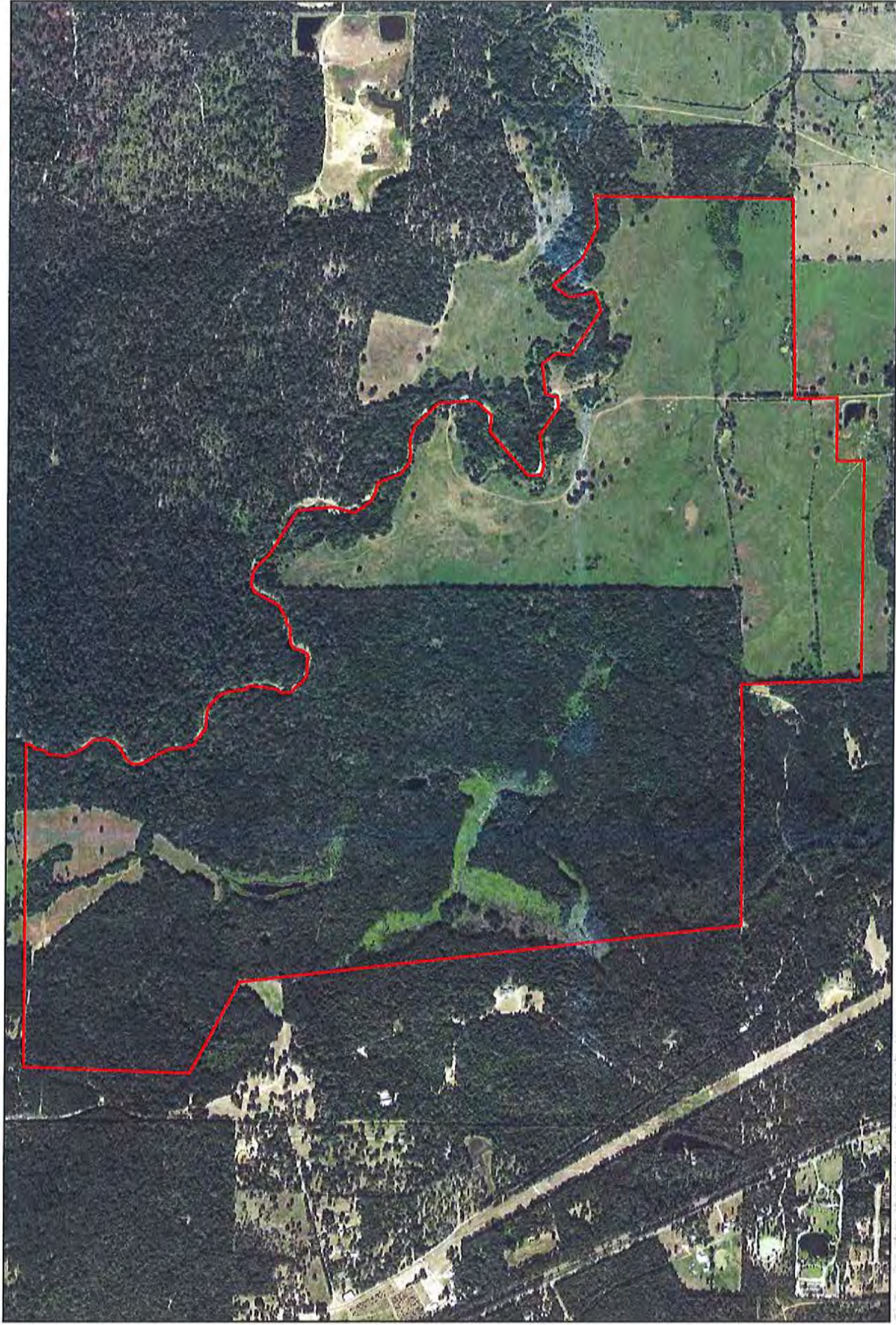


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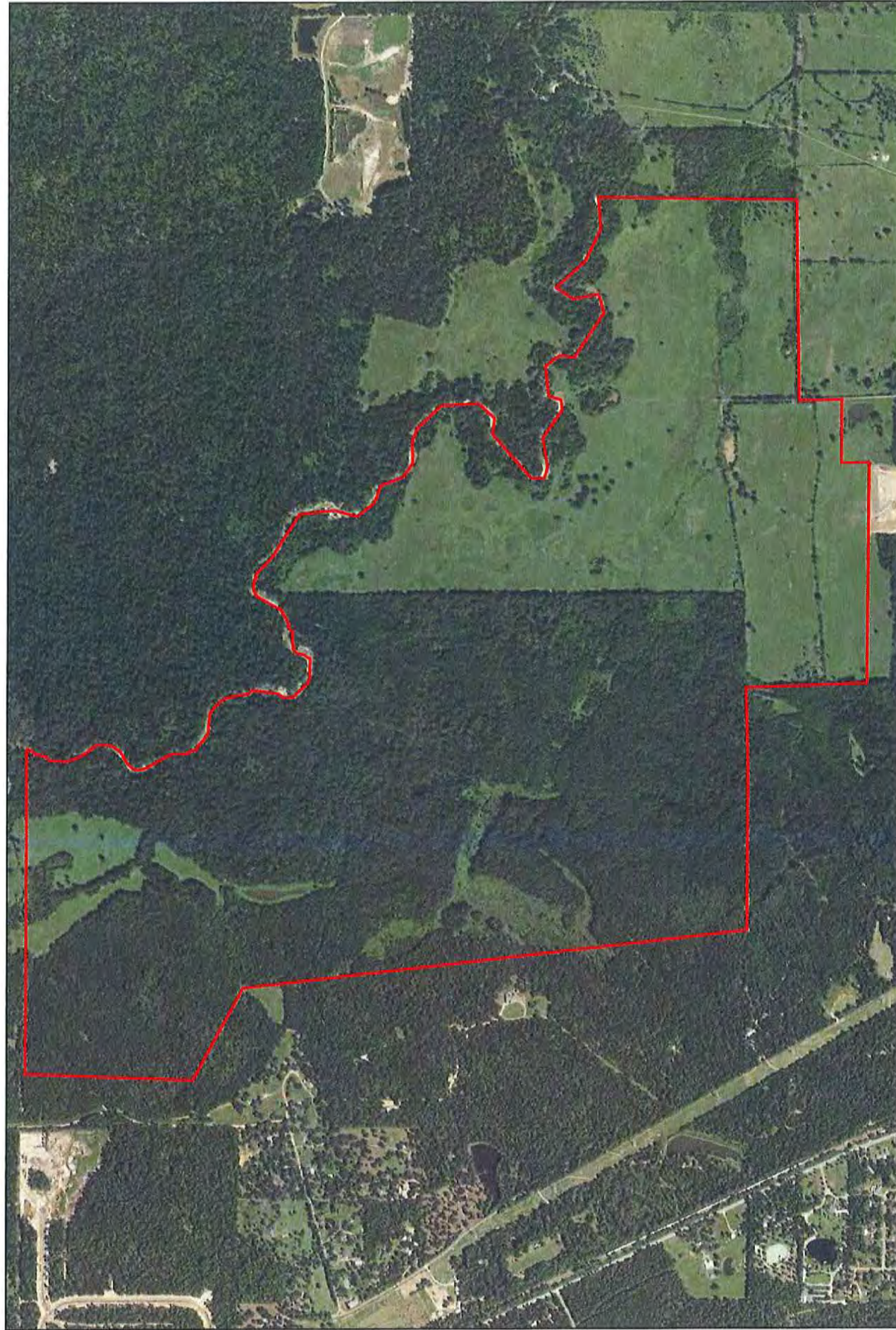


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FIGURE 4 - SHEET 9

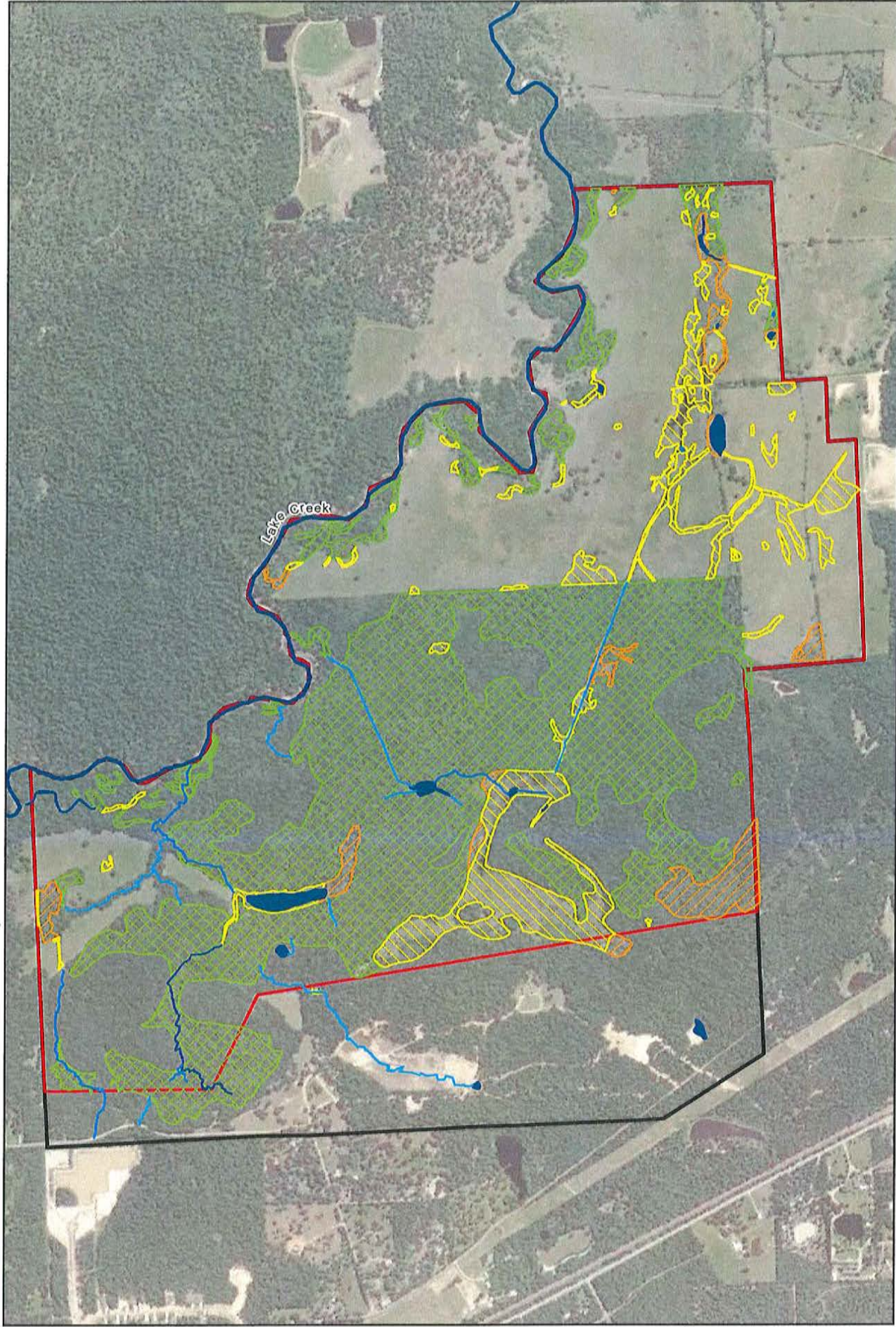


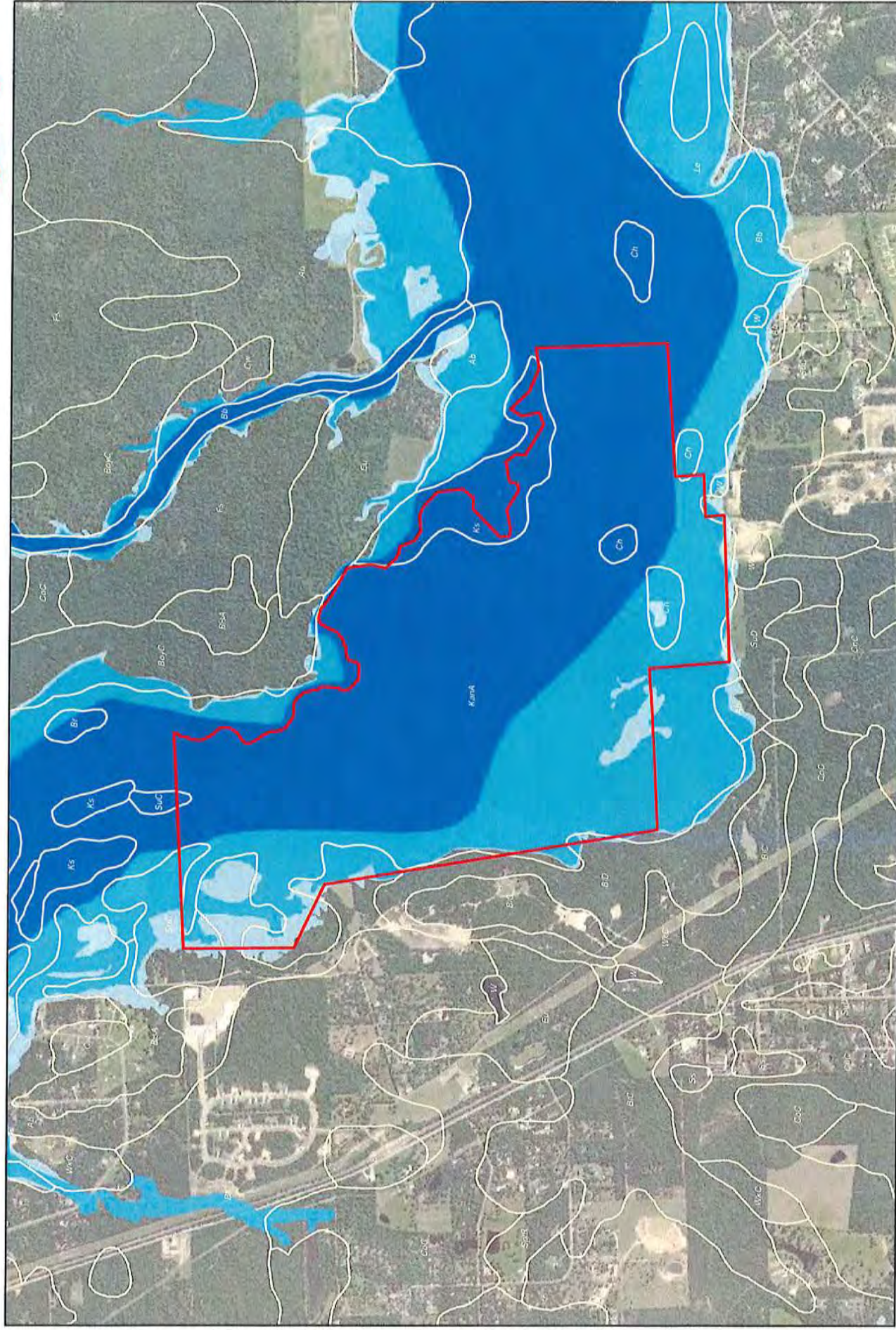
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	WEST MONTGOMERY MITIGATION BANK HISTORIC IMAGERY MAP (2016) MONTGOMERY COUNTY, TEXAS	Project Boundary	1:16,000 Created By: JZ Date: 11/17/2016 Scale: 1 inch = 1333.33 feet 0 100 200 300 Feet
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FIGURE 4 - SHEET 11







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**WEST MONTGOMERY MITIGATION BANK
FLOODPLAIN AND SOILS MAP
MONTGOMERY COUNTY, TEXAS**

 Project Boundary

 100-Year Floodplain (Floodway)

 100-Year Floodplain

 500-Year Floodplain

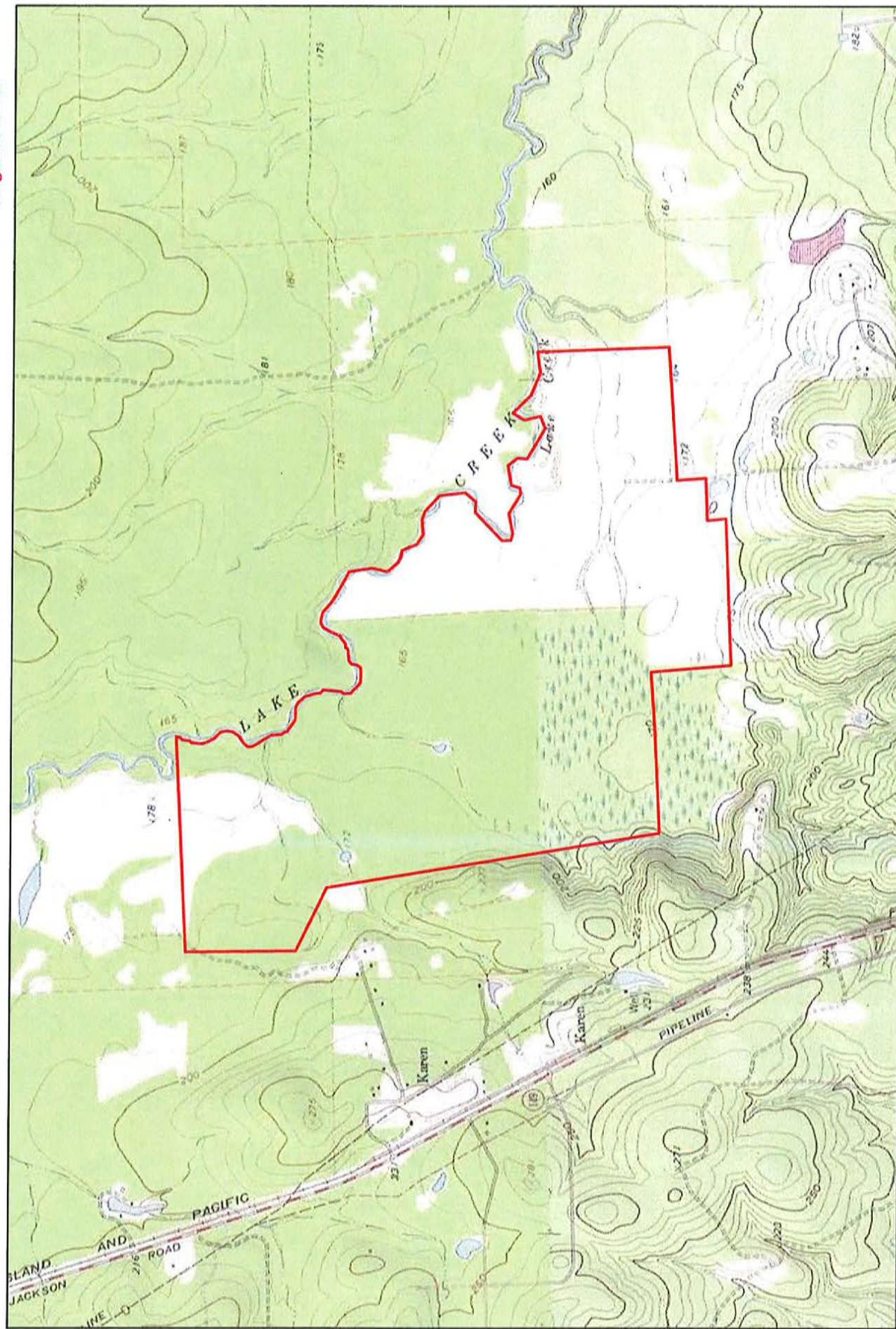
 Soil Map Units



1:24,000

Scale: 1" = 2000 feet
North Arrow

FIGURE 6

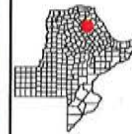


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WEST MONTGOMERY MITIGATION BANK
TOPOGRAPHIC MAP
MONTGOMERY COUNTY, TEXAS

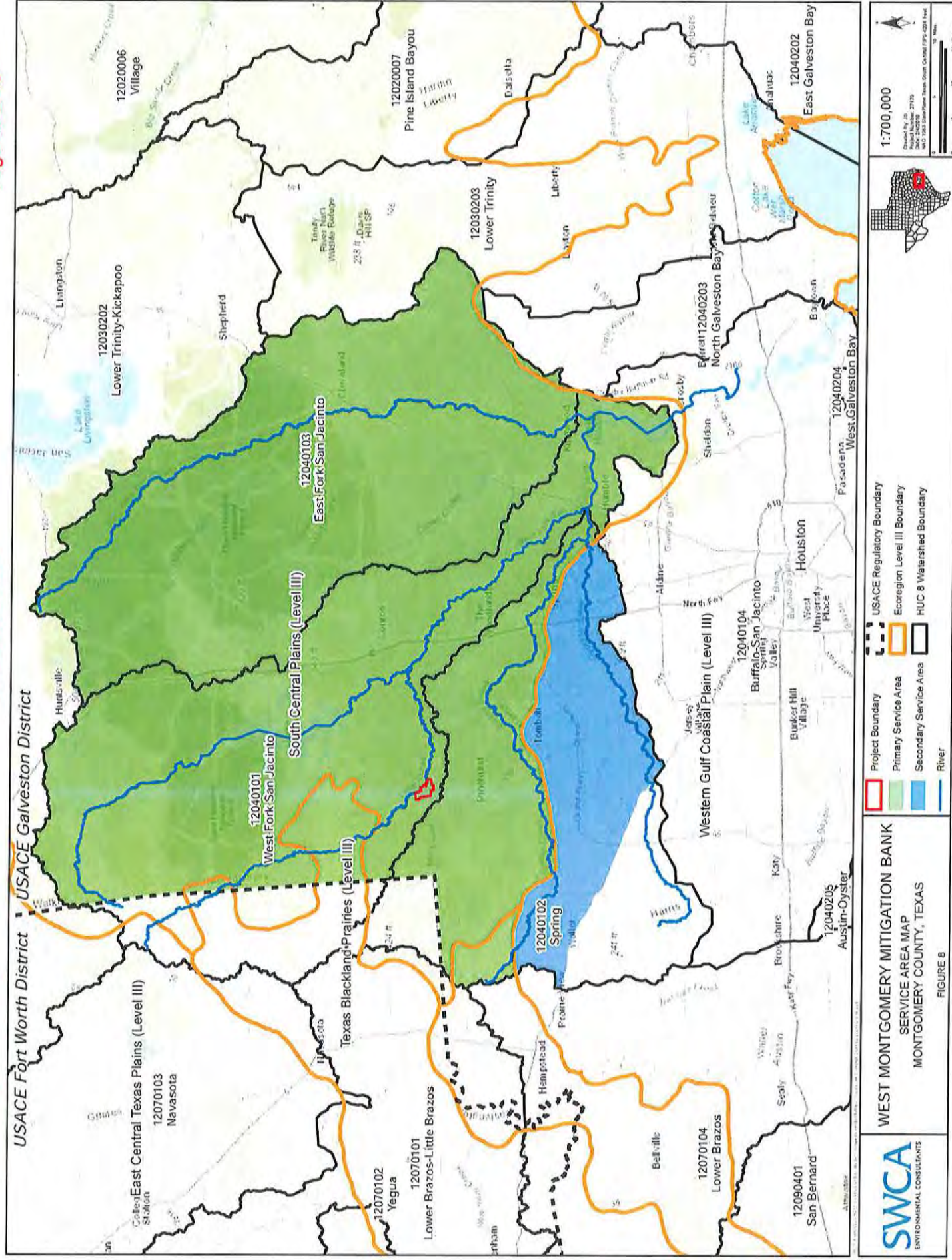
FIGURE 7

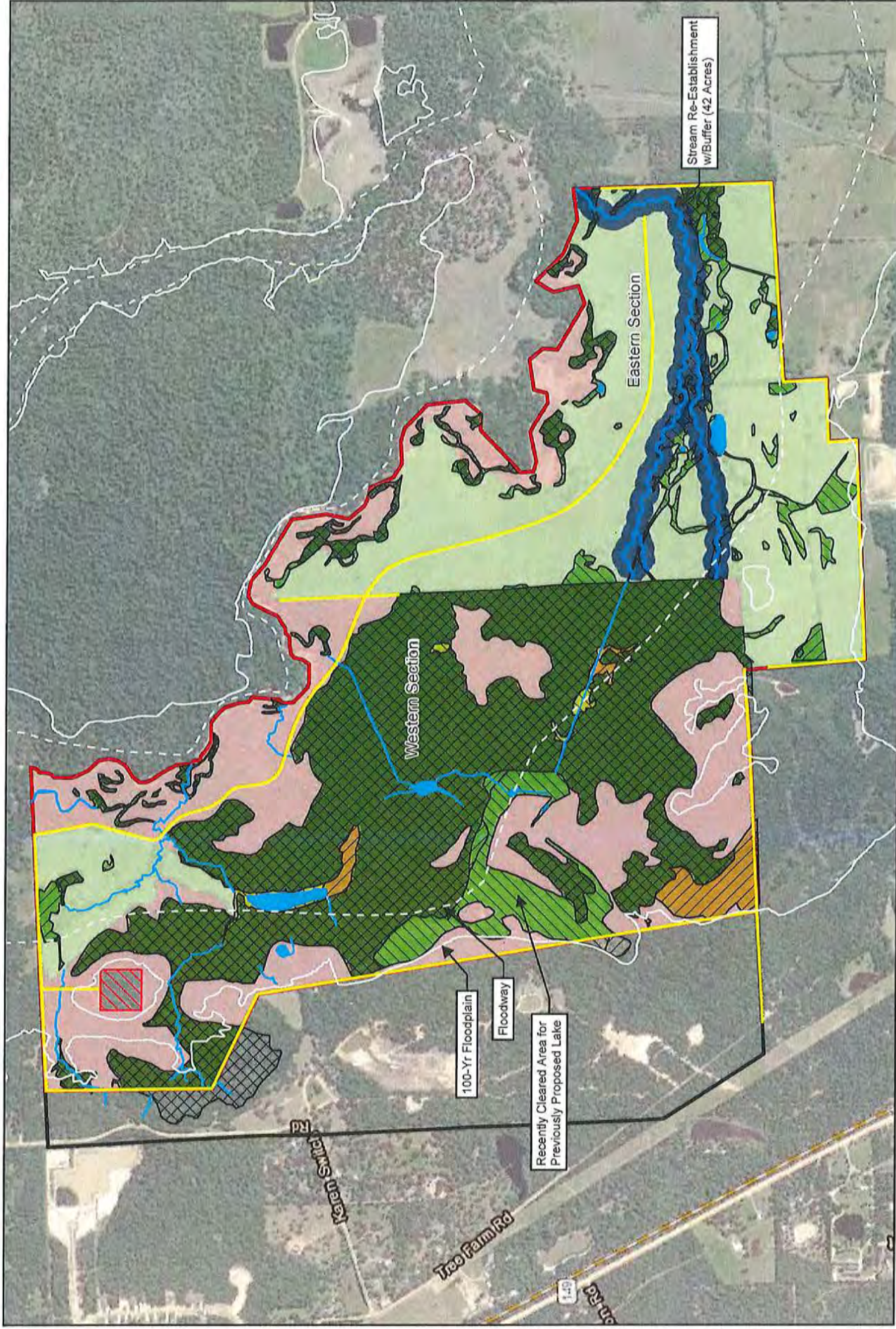
WMMB Boundary



1:24,000

Created By: J
Project No.: 27179
Date: 10/1/2016
Scale: 1:24,000
North Arrow
Scale Bar
0 100 200 300 400 500 Feet





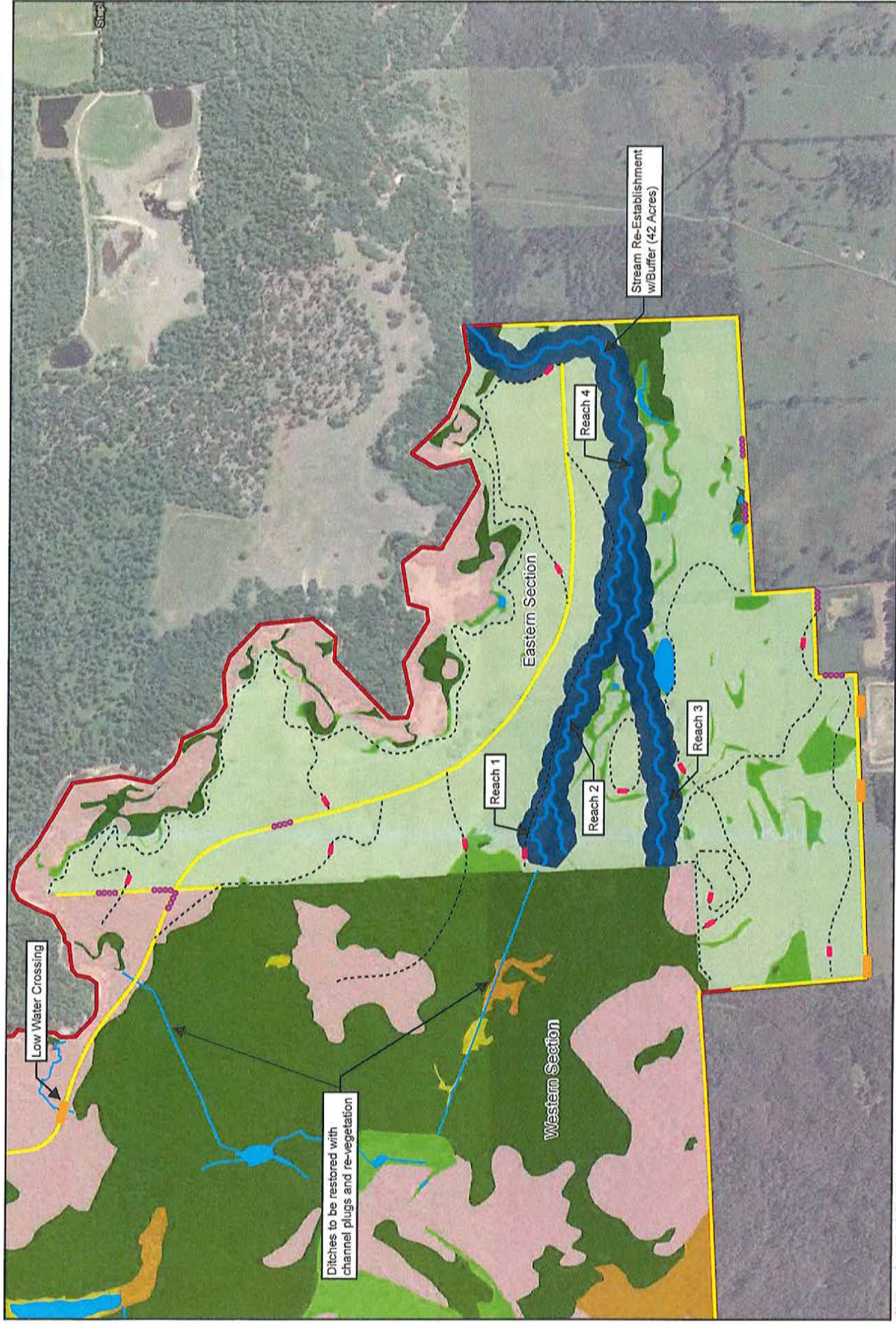
WEST MONTGOMERY MITIGATION BANK
OVERALL SITE MITIGATION PLAN
MONTGOMERY COUNTY, TEXAS

FIGURE 9 - SHEET 1

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1:16,000
Created By: J2 2016
Date: 11/02/2016
Scale: 1 inch = 1320 feet
North Arrow

	WMMB Boundary		Upland Buffer		Scrub-Shrub Wetland
	Tranquility Ranch Boundary		100-Year Floodplain		Mineral Management Area
	Waterbody		Floodway		Access Road
	Stream Re-establishment		Emergent Wetland		
	Stream Re-establishment Buffer		Forested Wetland		
	Enhanced Wetlands				
	Restored Wetlands				
	Preserved PFO Wetlands				
	Preserved PEM Wetlands				
	Preserved PSS Wetlands				



WEST MONTGOMERY MITIGATION BANK
EASTERN SECTION MITIGATION PLAN
 MONTGOMERY COUNTY, TEXAS

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1:11,500

Drawn By: JG 2/17/19
 Date: 11/20/2018
 File: 10012018-00616-001.dwg

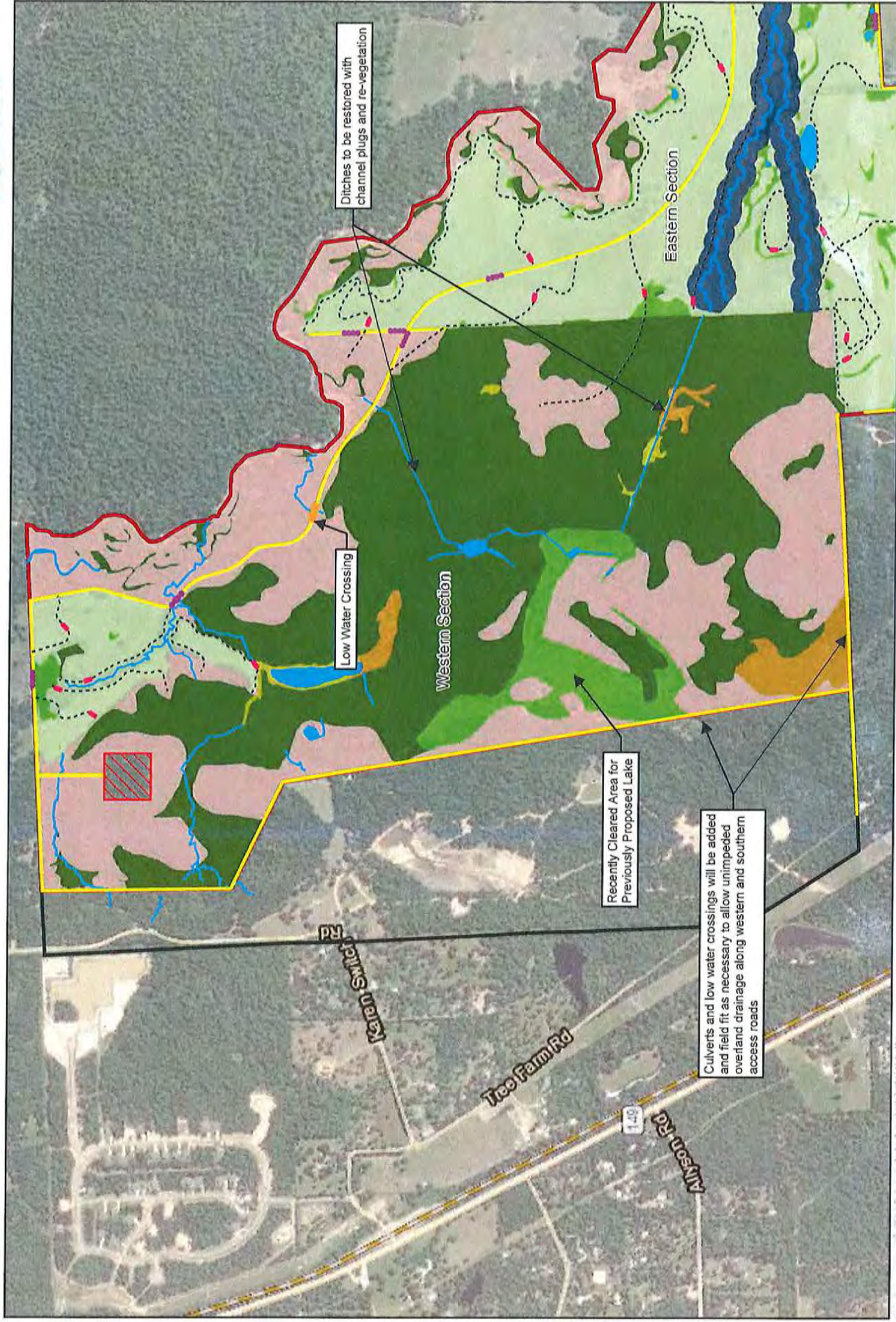
North Arrow

Scale: 1" = 11,500'

Legend:

- WMB Boundary
- Tranquility Ranch Boundary
- Waterbody
- Stream Re-establishment
- Stream Re-establishment Buffer
- Enhanced Wetlands
- Restored Wetlands
- Preserved PFO Wetlands
- Preserved PEM Wetlands
- Preserved PSS Wetlands
- Upland Buffer
- Mineral Management Area
- Low Water Crossing
- Passive Outlet Control Structure
- Access Road
- Culvert
- Wetland Terrace Berm

FIGURE 9 - SHEET 2



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WEST MONTGOMERY MITIGATION BANK
WESTERN SECTION MITIGATION PLAN
MONTGOMERY COUNTY, TEXAS

FIGURE 9 - SHEET 3

1:14,000

Scale: 1" = 14,000'

Project By: JF 2/17/19

Date: 11/15/2018

Map: 100% Accuracy, Texas State Plane, NAD 83, Zone 14N

Legend

	WMIB Boundary		Enhanced Wetlands		Upland Buffer		Culvert
	Tranquility Ranch Boundary		Restored Wetlands		Mineral Management Area		Wetland Terrace Berm
	Waterbody		Preserved PFO Wetlands		Low Water Crossing		
	Stream Re-establishment		Preserved PEM Wetlands		Passive Outlet Control Structure		
	Stream Re-establishment Buffer		Preserved PSS Wetlands		Access Road		