WETLAND MITIGATION BANK PROSPECTUS

SEA BREEZE MITIGATION BANK
SWG-2016-00086
Chambers County, Texas

Prepared for Submittal to:

U.S. Army Corps of Engineers, Galveston District

On Behalf of:

Estate of John Middleton

Prepared By:

Wildwood Environmental Credit Company, LLC

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TABLE OF CONTENTS

TABLE OF TABLES

TABLE OF FIGURES

TABLE OF PHOTOS

ACRONYMS AND ABBREVIATIONS

Corps	U.S. Army Corps of Engineers
CWA	Clean Water Act
DBH	Diameter at Breast Height
GIS	Geographic Information System
IRT	Interagency Review Team
FEMA	Federal Emergency Management Agency
MBI	Mitigation Banking Instrument
NRCS	Natural Resources Conservation Service
PC	Prior-Converted Cropland
PEM	Palustrine Emergent Wetland
PFO	Palustrine Forested Wetland
PAB	Palustrine Aquatic Bed
PUB	Palustrine Unconsolidated Bottom
SH 124	State Highway 124
Sponsor	Estate of John G. Middleton
SSURGO	Soil Survey Geographic
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Service
WAA	Wetland Assessment Area

1 INTRODUCTION

1.1 Project Overview

The estate of John G. Middleton (the "sponsor") proposes to develop an approximately 275-acre wetland mitigation bank in Chambers County, Texas known as the Sea Breeze Wetland Mitigation Bank (the "bank"). The site consists of prior-converted cropland[1], non-wetland cropland, and abandoned cropland (woodland) located along the south bank of Spindletop Bayou, at its intersection with State Highway 124 (SH 124). Implementation of the mitigation plan would result in the restoration and establishment of palustrine emergent and palustrine forested wetlands. The bank will be established and operated in accordance to 33 CFR Part 332, *Compensatory Mitigation for Losses of Aquatic Resources*; Final Rule, dated April 10, 2008 (2008 Rule, 2008).

1.2 Ownership / Sponsorship / Long-term Steward

The sponsor owns the property fee simple and there are no liens or mortgages on the site. The sponsor would be responsible for establishing and operating the bank. The sponsor would be responsible for the implementation, performance, and long-term management of the project (the long-term manager). Wildwood Environmental Credit Company, LLC is acting as the sponsor's agent. Contact information is provided below. Please direct all correspondence to the sponsor's agent.

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1.3 Project Location

The proposed bank site is approximately 275 acres in size located south of the towns of Stowell and Winnie in eastern Chambers County, Texas (**Figure 1**, **Figure 2**). The attributes of the bank's location are provided in **Table 1**. Appendix A contains maps of the project area. Appendix B contains photographs of the site. The site is part of a larger tract of land totaling 1,536.187 acres. The remainder of the tract is located north of Spindletop Bayou opposite the proposed bank site.

[1] Prior converted cropland (PC) is identified for the purpose of implementing the Food Security Act, and refers to wetlands that were converted from a non-agricultural use to cropland prior to 23 December 1985. While a PC area may meet the wetland hydrology criterion, production of an agricultural commodity or maintenance or improvement of drainage systems on the PC area, is exempt from the swampbuster provisions. A certified PC determination made by the Natural Resources Conservation Service (NRCS) remains valid as long as the area is devoted to an agricultural use. If the land changes to a non-agricultural use, the PC determination is no longer applicable and a new wetland determination is required for Clean Water Act (CWA) purposes. (NRCS and U.S. Army Corps of Engineers, 2005)

Table 1. Location of the mitigation bank.

Type	Description
Longitude/Latitude	-94.380840 / 29.751917
UTM	Zone 15; Easting 366484.57; Northing: 3292094.76
USGS Quad	Stowell / Hamshire / Stanolind Reservoir / Whites Ranch
County	Chambers
Driving Location	2.6 road miles south of the town of Stowell, Texas on SH 124
Gate Longitude/Latitude	-94.37377 / 29.75332

The bank consists of two tracts, one west of SH 124 herein called the “west tract” and one east of SH 124 herein called the “east tract” (**Figure 3**). The west tract is approximately 232 acres and is an active rice field. The east tract consists of approximately 43 acres of predominantly forested wetlands that were farmed until abandoned in the 1970s.

Driving Directions to the Bank

Both tracts are located along the south bank of Spindletop Bayou at the bayou’s intersection with SH 124, 2.6 miles south of the community of Stowell, Texas and approximately 5.1 miles south of Interstate 10 in Winnie, Texas (**Figure 2**).

The gate to access the west tract is located immediately south and west of the SH 124 bridge over Spindletop Bayou. The gate to access the east tract is approximately 0.4 miles south of the bridge on the east side of SH 124 (**Figure 3**).

1.4 Project Goals and Objectives

The purpose of the bank would be to sell credits commercially as compensatory mitigation for unavoidable impacts to waters of the United States, including wetlands, which result from activities authorized under Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act of 1899, provided such use has met all applicable requirements and is authorized by the U.S. Army Corps of Engineers (the “Corps”).

The goal of the bank would be to replace the functions of the waters of the U.S. that will be lost or degraded due to impacts authorized under Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act of 1899.

The goal of the bank will be achieved by attaining the following objectives:

1. Re-establish[2] ninety-four (94) acres of palustrine emergent wetlands by retiring prior-converted cropland, reestablishing native emergent wetland vegetation, and breaching a flood control levee;

[2] Re-establishment is the manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former aquatic resource. Re-establishment results in rebuilding a former aquatic resource and results in a net gain in aquatic resource area and functions.

2. Establish[3] one hundred seventeen (117) acres of palustrine emergent wetlands by excavating shallow depressions, reestablishing native emergent wetland vegetation, and breaching a flood control levee with an outfall designed to establish sufficient hydrology throughout the 117 acres;
3. Rehabilitate[4] thirty-four (34) acres of palustrine forested wetlands by breaching a flood control levee, planting native tree and shrub species, and controlling invasive and undesirable species;
4. Ensure long-term viability and sustainability of the site by establishing an approved long-term management plan and long-term funding mechanism to provide for its implementation;
5. Ensure long-term site protection by executing a perpetual conservation easement on the site.

Table 2 contains a summary of the bank's objectives by resource and activity type.

Table 2. Project objectives by resource type and activity type.

	Projected Acres				
Current Resource Type	Not-Credited No Action	Not-Credited Impacted by Setback[5] Levee	PEM[6] Wetland Established	PFO[7] Wetland Rehabilitated	PEM Wetland Re-established
Non-wetland Spoil Bank	13.5				
Non-wetland Forest	7.7				
Non-wetland Cropland		3.8	116.7		2.4
Prior-Converted Cropland (PC)		4.9			92.0
Emergent Wetland (PEM)				0.5	
Forested Wetland (PFO)		0.5		31.0	
Pond/Borrow Pit (PAB/PUB)				2.0	
Total Acres	21.2	9.2	116.7	33.5	94.4
Total Bank Acres					275.0

[3] Establishment means the manipulation of the physical, chemical, or biological characteristics to develop an aquatic resource that did not previously exist at an upland site. Establishment results in a gain in aquatic resource area and functions.
[4] Rehabilitation means the manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a former or degraded aquatic resource. Rehabilitation results in a gain in aquatic resource function, but does not result in a gain in aquatic resource area.
[5] Setback denotes the positioning of the levee or structure in relationship to a stream bank. A setback levee is placed a substantial distance from a stream to allow it to meander without consequences to the levee and to accommodate a floodplain that can store and convey flood flows (Texas Parks and Wildlife, n.d.). In the context of this prospectus a setback levee is a constructed levee surrounding the site that provides adjacent landowners with the same degree of flood protection afforded by the existing spoil bank along Spindletop Bayou.
[6] Palustrine Emergent Wetlands (PEM) are those wetlands characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens that occur in the floodplains of rivers (Cowardin, Carter, Golet, & LaRoe, 1979).
[7] Palustrine Forested Wetlands (PFO) are those wetlands characterized by woody vegetation that is six (6) meters tall or taller that occur in the floodplains of rivers (Cowardin, Carter, Golet, & LaRoe, 1979).

2 ECOLOGICAL SUITABILITY

2.1 Site Selection

The proposed site was selected due to its ability to generate functional uplift with a low risk of failure, and its location in an area of long-term anticipated need for compensatory wetland mitigation credits. Attributes of the site which led to its selection include:

1. The site's location adjacent to Spindletop Bayou; which is separated by a spoil bank thus providing a unique opportunity to reconnect the bayou to its historic floodplain;
2. The presence of prior converted cropland and active cropland, which provides a unique opportunity to create functional uplift by retiring the land from agricultural use;
3. The presence of hydric conditions throughout the site, indicating a high likelihood of success;
4. The presence of native hydrophytic vegetation within the cropland during rest years, indicating a high likelihood of success;
5. The availability of sufficient and suitable acreage at one site for breaching the spoil bank along Spindletop Bayou and constructing a setback dike around the site;
6. The site's location in terms of its ability to adequately mitigate for losses to aquatic resources within an area of limited options for compensatory wetland mitigation.

2.2 Biophysical Location

The site is located within the historic floodplain of Spindletop Bayou and within the 34a Northern Humid Gulf Coastal Prairies portion of the Western Gulf Coastal Plain Ecoregion (Griffeth, Bryce, Omernik, & Rogers, 2007) (**Figure 4**). Table 3 describes this ecoregion in more detail and Table 4 describes the geographic attributes of the site more specifically.

Table 3. Local ecoregion description from **(Griffeth, Bryce, Omernik, & Rogers, 2007)**.

Level IV Ecoregion	**34a. Northern Humid Gulf Coastal Prairies**
Level III Ecoregion	34 Western Gulf Coastal Plain
Total Ecoregion Area (sq. mi.)	9,009
Physiography	Low, flat plains, low gradient rivers and streams (some channelized) with sandy, silty, and clayey substrates.
Elevation / Local Relief (feet)	0-300 / 5-35
Surficial Geology; Bedrock Geology	Late Pleistocene marine sand, silt, and clay. Some salt domes.
Soil Order (Great Groups)	Vertisols (Dystraquerts, Hapluderts), Mollisols (Argiudolls, Argiaquolls, Hapludolls), Alfisols (Epiaqualfs, Hapludalfs, Glossaqualfs, Glossudalfs, Vermaqualfs)
Common Soil Series	Beaumont, Morey, Mocarey, Bernard, Lake Charles, Verland, Edna, Aris, Anahuac, Clodine, Cieno, Nada, Telferner, Dacosta
Soil Temperature / Soil Moisture Regimes	Hyperthermic, Thermic / Aquic, Udic
Mean Annual Precipitation (in.)	37-58
Mean Annual Frost Free Days	260-300
Mean Temperature (F) (Jan. min/max; July min/max)	42/62; 74/92
Vegetation	Prairie grasslands with little bluestem, yellow Indiangrass, brownseed paspalum, gulf muhly, and switchgrass, with some clusters of southern live oak. Riparian forests of water oak, pecan, southern live oak, American elm, cedar elm, and sugar hackberry, as well as some cane brakes.
Land Use and Land Cover	Cropland with rice, soybeans, grain sorghum, cotton, hay and pastureland, urban and industrial, rangeland, oil and gas production, waterfowl hunting.

Table 4. Descriptive geographic information related to the bank site.

Type	Description
Soil Characteristics	
Dominant NRCS Map Units[8]	Beaumont silty clay, 0 - 1 percent slopes, rarely flooded (37%)
	Meaton-Levac complex, 0 - 1 percent slopes, rarely flooded (48%)
NRCS Ecological Site & Historic Climax Plant Community[9]	R150AY526TX - Blackland 24-44" PZ - Native Tallgrass Prairie R150AY740TX - Blackland 44-56" PZ - Native Tallgrass Prairie R150AY741TX - Loamy Prairie 44-56" PZ - Tallgrass Prairie R150AY537TX – Lowland 35-56" PZ – Mid/Tallgrass/Sedge
Hydrologic Characteristics	
Associated Named Streams	Spindletop Ditch (adjacent to site)
Local Watershed (HUC 12)	Spindletop Ditch - 120402020300
Local Watershed (HUC 10)	Spindletop Ditch - 1204020203
Sub-basin (HUC 8)	East Galveston Bay - 12040202
Basin (HUC 6)	Galveston Bay – Sabine Lake 120402
Ecoregion Characteristics	
Omernik Level IV[10]	34a: Northern Humid Gulf Coastal Prairies
Omernik Level III	34: Western Gulf Coastal Plain
Major Land Resource Area	150A: Gulf Coast Prairies
Geologic Characteristics	
USGS 250k Geology Map Types[11]	Qb-Beaumont Formation (predominantly mapped as "dominantly clay and mud")
Annual Precipitation Onsite (2003 – 2016)[12]	51.97 inches (average) (range 27.1 – 78.4 inches)

[8] (Soil Survey Staff, n.d.)
[9] (Natural Resources Conservation Service, n.d.)
[10] (Griffeth, Bryce, Omernik, & Rogers, 2007)
[11] Geologic Atlas of Texas: Houston Sheet. Revised 1982. Obtained from Texas Natural Resources Information System.
[12] (Jefferson County Drainage District No. 6, n.d.)

2.3 Site History

The following is an abbreviated history of the site and the surrounding area:

1899	Gulf & Interstate Railway Company of Texas (G&I RR) constructed a railroad through the site (**Photo 9**)
1928	Historic map indicates rice farming was not occurring at the site (**Figure 6**)
1931	State Highway 124 and a powerline are constructed through the site adjacent and parallel to the railroad bed
1933	Gulf Intracoastal Waterway (GIWW) dredged through Jefferson County
1938	Sun Oil Company constructed a pipeline immediately south of the west tract
1940	A two-acre borrow pit was excavated on the east tract to a depth of three feet by the Texas Department of Transportation for improvements to SH 124 (**Figure 7**, **Photo 10**)
1941	Aerial photography indicates that rice farming was occurring on the west tract (**Figure 7**)
1951	Permanent drainage ditch installed by Trinity Bay Conservation District along west and south boundaries of west tract (**Photo 2** and **Photo 5**)
1953	Spindletop Bayou channelized by Trinity Bay Conservation District and spoil material cast to form a flood protection levee
1953	Salt water barrier installed by Trinity Bay Conservation District on Spindletop Bayou 5.5 miles east of site allowing reliable irrigation from Spindletop Bayou
1950's	Sometime in this period a dirt airplane runway was constructed on the west tract to further facilitate rice cultivation on the farm (**Photo 6**)
1960	Aerial photography indicates entire site was under rice production at that time (**Figure 8**)
1970 – 1987	Sometime in this period farming ceases on the east tract and it reforested naturally
1979	Property acquired by John G. Middleton
2008	Hurricane Ike inundates site with salt water and destroys Spindletop Weir preventing irrigated farming from occurring on west tract
2009	Mayhaw Diversion Channel constructed two miles downstream from tract
2009 – 2010	Landowner flushes salt water from west tract using pumps
2013	Property transferred to the Estate of John G. Middleton upon his death
2014	Spindletop Weir repaired by Trinity Bay Conservation District allowing rice production to continue at the site

2.4 Vegetation

Historic Vegetation

The NRCS characterizes the site as historically being a midgrass-tallgrass prairie community complex. On the loamy prairie/higher portions of the site, tallgrasses likely made up over 60% plant community, midgrasses approximately 30-35%, and other associated grasses, forbs, shrubs, and trees comprised the remainder. Occasional motts of live oak or loblolly pine may have been present (Soil Survey Staff, 2016). The 1928 map of the site indicates a wooded area adjacent to Spindletop Bayou was present at or immediately upstream from the site. During wet cycles, lowlands at the site would have had as much as 50% of production associated with midgrasses, flat sedges, and sedges whereas during dry cycles this would transition to tallgrasses (Soil Survey Staff, n.d.). Bison grazing was intermittent and fires were both frequent (3 to 8 years) and intense (Lehmann, 1965). Historic accounts place fire frequencies as annual to biannual (late summer, late winter) (Soil Survey Staff, n.d.). Throughout southeast Texas, this plant community was extensively heavily grazed by livestock by the late 1800's; which was exacerbated by the introduction of barbed wire and water development. Overgrazing resulted in a shift in species composition and reduced productivity (Soil Survey Staff, 2016).

Current Vegetation

There are three predominant vegetation communities present on the site: rice field, spoil banks / levees, and forested wetlands. The most recent aerial photograph, from 2015, is provided as **Figure 5**.

The forested wetland is relatively homogenous, being dominated, for the most part, by an overstory of green ash (*Fraxinus pennsylvannica*) and Chinese tallow (*Triadica sebifera*) with occasional red maple (*Acer rubrum*), sugarberry (*Celtis laevigata*), loblolly pine (*Pinus taeda*), slippery elm (*Ulmus rubra*), bald cypress (*Taxodium distichum*), and live oak (*Quercus virginiana*) (**Photo 11**, **Photo 15**). The understory is relatively dense with Chinese tallow, Chinese privet (*Ligustrum sinense*), and yaupon (*Ilex vomitoria*) with dense branched blackberry (*Rubus suus*) in most areas that are not ponded for significant duration (**Photo 14**). The spoil bank was shredded in 2015 and 2016 by the Trinity Bay Conservation District (**Photo 3**). The edges of the tract have significant amounts of Chinese privet and eastern baccharis (*Baccharis halimifolia*) (**Photo 9**, **Photo 12**)

Spoil banks and levees on the west tract contain a mix of johnsongrass (*Sorghum halepense*), barnyard grass (*Echinochloa crusgalli*), Bermuda grass (*Cynodon dactylon*), tallow, sugarberry, cedar elm (*Ulmus crassifolia*), Chinese privet, water oak (*Quercus nigra*), and eastern baccharis (*Baccharis halimifolia*), among other pioneer species. **Photo 2** and **Photo 6** are representative photos of spoil banks and levees on the tract that do not have the woody component.

The west tract is an active rice field. When cropped, the field is dominated by rice (*Oyrza* sp.) with limited amounts of poisonbean (*Sesbania drummondii*), deep-rooted sedge (*Cyperus entrerianus*), coffeeweed (*Aeschynomene virginica*), and other typical pioneer wetland plants including species of *Juncus*, *Cyperus*, *Eleocharis*, *Persicaria*, *Secale*, *Oryza*, *Ludwigia*, and others (**Photo 1**, **Photo 5**). In 2015 the field was farmed in organic rice (**Photo 8**). Despite being prepped in early 2016 there was too much precipitation to farm the field in rice in 2016. In April of 2016 Horizon Environmental Services installed seventeen plots as part of the jurisdictional delineation process. **Table 5** contains a summary of the data found during that survey. The data indicate that the site rapidly recolonizes with native species when not plowed and planted in rice. It also indicates what invasive species of concern are onsite.

Table 5. Species observed on seventeen plots sampled in April 2016 with wetland indicator status and absolute percent cover.

Status	Common Name	Scientific Name	Indicator Status	Absolute % Cover[1]
Native				
	Carolina foxtail	*Alopecurus carolinianus*	FACW	4
	green flatsedge	*Cyperus virens*	FACW	7
	dwarf spikerush	*Eleocharis parvula*	OBL	16
	Gulf Coast spikerush	*Eleocharis cellulosa*	OBL	9
	sand spikerush	*Eleocharis montevidensis*	FACW	16
	squarestem spikerush	*Eleocharis quadrangulata*	OBL	5
	largeleaf pennywort	*Hydrocotyle bonariensis*	FACW	0
	annual marsh elder	*Iva annua*	FAC	0
	Tapertip rush	*Juncus acuminatus*	OBL	1
	whiteroot rush	*Juncus brachycarpus*	FACW	13
	common rush	*Juncus effusus*	OBL	1
	rice cutgrass	*Leersia oryzoides*	OBL	7
	swamp smartweed	*Polygonum hydropiperoides*	OBL	1
	Pennsylvania smartweed	*Polygonum pensylvanicum*	FACW	0
	marsh mermaidweed	*Proserpinaca palustris*	OBL	0
			Subtotal	81
Non-Native				
	rice	*Oryza sativa*	OBL	13
	little quaking grass	*Briza minor*	FAC	0
	Bermuda grass	*Cynodon dactylon*	FACU	1
	floating primrose-willow	*Ludwigia peploides*	OBL	2
	alligatorweed	*Alternanthera philoxeroides*	OBL	6
	curly dock	*Rumex crispus*	FAC	1
	common dandelion	*Taraxacum officinale*	FACU	1
			Subtotal	23

[1] Note that reported percentages are for absolute cover which accounts for overlapping vegetation therefore may add up to more than 100 percent cover.

Designed Post-Project Vegetation

The mitigation work plan in Sections 3.1 and 3.2 as well as Appendix J describe the proposed plan in detail. Reference vegetation communities will be used to determine the potential species composition and coverage levels at the site. A map of these reference sites can be found in **Figure 25**.

West Tract Vegetation

The west tract will consist of emergent wetland vegetation being predominantly a mid/tallgrass/sedge lowland community intermixed on higher areas with a loamy, midgrass-tallgrass, prairie community. The historical composition of these communities has been characterized for southeast Texas by the NRCS (Soil Survey Staff, n.d.). Vegetation within this community type shifts from year to year and within each year due to plant physiology, precipitation patters, and flooding. After completion of the mitigation work plan it can be expected that vegetation on the west tract would be like that summarized in **Table 5**

(Strader & Stinson, 2005). As described later in the mitigation work plan, treatments will be made regularly to reduce the coverage of non-native species. Over the long-term, changes in hydrology because of cessation of rice farming will cause the site to stratify into different vegetation communities across the hydrologic gradient, from a prairie community on the driest portions to a lowland emergent / submergent community in the wettest areas.

Across the bayou from the proposed bank site is an area that has been intermittently grazed but not farmed in rice for several decades. This area will serve as a reference site and potential seed source for the portions of the west tract subject to shorter duration flooding or ponding (e.g. most of the establishment area). Horizon Environmental installed four sample plots within the wetland portion of this field in April 2016. The data from the four plots area summarized in **Table 6**.

Table 6. Species observed on four plots installed in April 2016 within the wet coastal prairie reference site with wetland indicator status an absolute percent cover.

Status	Common Name	Scientific Name	Indicator Status	Absolute % Cover[1]
Native				
	Virginia buttonweed	*Diodia virginiana*	FACW	3
	Gulf Coast spikerush	*Eleocharis cellulosa*	OBL	65
	annual marsh elder	*Iva annua*	FAC	2
	Tapertip rush	*Juncus acuminatus*	OBL	13
	common rush	*Juncus effusus*	OBL	14
	swamp smartweed	*Polygonum hydropiperoides*	OBL	1
	Narrow plumegrass	*Saccharum strictum*	OBL	4
	Gould little bluestem	*Schizachyrium scoparium divergens*	NL	9
			Subtotal	109
Non-native				
	floating primrose-willow	*Ludwigia peploides*	OBL	2
	curly dock	*Rumex crispus*	FAC	1
	dallisgrass	*Paspalum dilatatum*	FAC	2
	woodrush flatsedge	*Cyperus entrerianus*	FACW	3
			Subtotal	8

[1] Note that reported percentages are for absolute cover which accounts for overlapping vegetation therefore may add up to more than 100 percent cover.

The wetter portions of the site such as the shallow depressions and lowlands would include native floating aquatics (lilies *(Lilium spp)*), emergents (arrowheads *(Sagittaria platyphlla)*, pickerelweed *(Pontederia cordata)*, etc.), and shallow submergents (southern naiad *(Najas guadalupensis)*, etc). Reference sites for wetter areas would come from a site south of Monroe City and northeast of Double Bayou. A map showing the location of this site can be found in **Figure 25**. This site would also be a suitable site for obtaining plant materials for propagation. Quantitative documentation of this site will be included in the draft Mitigation Banking Instrument. Based on site visits made by Wildwood's staff to both this site and the excavated depressions at Sheldon Lake State Park it appears the plant communities would be like those found within the Sheldon Lake State Park depressions.

East Tract Vegetation

Target vegetation on the east tract would consist of the same species currently observed on the site, including water oak, American elm, baldcypress, sweetgum, red maple, sugarberry, green ash, live oak, and pecan (*Carya illinoisensis*).

2.5 Soils

As shown in Table 7 and **Figure 14**, soils at the site are mapped by the Natural Resources Conservation Service (the "NRCS") as clayey and loamy (the Meaton-Levac complex contains silt loam soils) (Soil Survey Staff 2016). The most dominant series on site are Beaumont, League, Meaton, and Levac. These soils have a dark matrix with values ranging from 3 to 6 and a chroma range from 1 to 2 within the upper 24 inches of the soil profile (Soil Survey Staff, 2016). All soil map units within the bank site contain hydric soil series components.

Aerial photography from 1938 and 1960 indicates the Meaton-Levac complex was historically composed of gilgai topography (**Figure 7** and **Figure 8**). The Meaton series is considered hydric, whereas the Levac series consists of truncated pimple mounds. Approximately 62 percent of the 132 acres of Meaton-Levac complex may have been hydric in the past. Undisturbed Beaumont and League soils also had gilgai microrelief and microknolls six to fifteen inches higher than the depression. Based on the 1970 aerial photograph, it appears that over 99% of the site has at one time been subject to soil disturbance in the form of rice farming, and to a more limited extent dredged spoil disposal along Spindletop Bayou (**Figure 9**). Repeated plowing and periodic land leveling associated with rice farming has redistributed and mixed soils throughout the site. During the 1970's farming ceased on the east unit of the site. Row crop agriculture continues on the west tract.

Table 7. NRCS SSURGO soil map units present within the proposed bank site (Soil Survey Staff 2016).

Map Unit Symbol	Map Unit Name	Acres	Percent of Site	Percent Hydric	Drainage Class
BebA	Beaumont silty clay, 0 to 1 percent slopes, rarely flooded	103	37	90	Poorly Drained
LegA	League clay, 0 to 1 percent slopes, rarely flooded	34	12	10	Somewhat Poorly Drained
MelA	Meaton-Levac complex, 0-1 percent slopes, rarely flooded	132	48	62	"
SimA	Simelake clay, 0 to 1 percent slopes, frequently flooded	7	3	98	"
Total		275			

2.6 Hydrology

Historical Hydrology Impacts

Historically, wetland hydrology was driven by precipitation, and overbank flooding from Spindletop Bayou that occurred every 1 to 2 years on average. The mean overbank flood return interval was likely every 1.5 years (Leopold, Wolman, & Miller, 1964). The site's hydrology was an open system with high variability depending on local precipitation patterns as well as precipitation patterns further up the watershed. Throughout the site ponding would occur for brief to long periods during the growing season on micro-lows of gilgai and on lowlands such as relic stream meander depressions (Soil Survey Staff, n.d.). These features had a depth of six to fifteen or eighteen inches (Soil Survey Staff, n.d.). The site shared a direct connection to Spindletop Marsh which is located immediately east of the site, which formed the headwaters of the Salt Bayou watershed (Salt Bayou Marsh Workgroup, 2013) (**Figure 6**).

In 1899 the Gulf & Interstate Railroad was constructed. The railroad bed bisects the floodplain of Spindletop Bayou and the site. In 1930 this impediment was expanded with the construction of the SH 124 roadbed adjacent to the railroad. When SH 124 was expanded in 1940 a two acre borrow pit was excavated on the east tract to approximately three feet deep. In 1933 the Gulf Intracoastal Waterway was dredged through Jefferson County, severing the connection with the Salt Bayou Watershed (Salt Bayou Marsh Workgroup, 2013).

In the early 1950's Spindletop Bayou was channelized, a salt water barrier in the form of a weir was installed 5.5 miles downstream, and ditches were installed adjacent to the site by the Trinity Bay Conservation District. A stipulation of the channel easement stated that dredged material had to be placed so as to form a continuous flood protection levee between the east and west tracts and the bayou (**Photo 3**). Also at this time a 30 foot wide drainage ditch was dug by the Trinity Bay Conservation District along the west and south boundaries of the west tract and the spoil cast to form an additional levee (**Photo 2** and **Photo 5**). Culverts with flashboard risers were placed in these levees to facilitate rice farming (**Photo 7**). A crop duster runway was constructed through the west tract during this period that also acts as a levee separating the west tract into two fields (**Photo 6**). The levee is no longer used as a runway.

In 2009 the Mayhaw Diversion Channel was constructed two miles downstream from the site. The Mayhaw diversion is 13,000 feet long, 10 feet deep, and has a 50-foot wide bottom. The diversion connects Spindletop Bayou to Mayhaw Bayou and allows floodwaters from Mayhaw Bayou to bypass the South Fork of Taylor Bayou and ultimately circumvent the Port Arthur area. It was constructed as part of the Taylor Bayou Flood Relief Project.

<u>Current Hydrology</u>

Due to the spoil bank, precipitation is the dominant natural source of water into the site, averaging 52 inches per year. The spoil bank along the length of Spindletop Bayou prohibits flooding of the site up to the 4-5-year flood event based on the data in Table 8, although the east tract is partially open to Spindletop Bayou in two narrow (<20-foot-wide) breaches (**Photo 4**). A pump located on the bank of Spindletop Bayou is used to irrigate the west tract for rice cultivation. A series of flashboard riser water control structures allows water levels to be manipulated within the west unit (**Photo 7**). The former borrow pit on the east tract is semi-permanently flooded (**Photo 10**).

The site currently does not store a significant amount of floodwater. Water control structures and culverts on the west tract allow floodwaters to drain after they enter the site. On the east tract, the two narrow levee breaches allow floodwaters to drain from the site. Shallow ponding occurs after flood events but this is primarily supplied by precipitation prior to the flood event.

A rain and flood gauge operated by Jefferson County Drainage District #6 has been in continuous operation at the site since November 2002 (Jefferson County Drainage District No. 6, n.d.). A summary of the data can be found in Table 8. A photograph taken of the northeast corner of the west tract is available as **Photo 16**. This photo was taken on December 4, 2016 at 9:45 AM when the gage was at approximately 13.9 feet, after peaking at 14.0 feet (the 2.7 return interval event).

Table 8. Historic precipitation and water levels at Spindletop Bayou and SH 124.

Year	Annual Precipitation (in)	Maximum Water Stage (ft)	Return Interval (yr)
‘02 (Nov-Dec)	7.76	14.6	5.3
2003	59.02	13.6	1.8
2004	53.27	13.9	2.3
2005	43.11	9.2	1.1
2006	64.17	15.7	8.0
2007	70.55	14.3	4.0
2008	43.94	16.2	16.0
2009	44.13	14.1	3.2
2010	40.35	10.1	1.2
2011	27.05	5.9	1.1
2012	44.52	11.0	1.5
2013	42.32	11.1	1.6
2014	44.22	10.7	1.3
2015	72.57	13.8	2.0
2016	78.39	14.0	2.7
Average 2003 - 2016	51.97		

Over half of the site is mapped by the Federal Emergency Management Agency (FEMA) as being within the 100-year floodplain (**Figure 18**). The 100-year flood elevations at the site range from 15 feet at the bridge to 16 and 17 feet at the north end of the site (**Figure 19**). The highest elevation within the interior of the west tract is approximately 15 to 15.5 feet (**Figure 3**). The spoil bank on Spindletop Bayou would prevent the west tract from being flooded by the 100-year flood elevation except for a short ~100-foot section near the bridge. The east tract is cutoff from the 100-year floodplain except for two narrow (<20 foot) breaches on the east end of the spoil bank. Note that the 100-year flood elevations projected by FEMA were exceeded in 2006 and 2008 based on the data in Table 8. This implies that the site likely receives flooding less frequently than the 4-5-year flood.

Designed Post-Project Hydrology

The mitigation work plan in Sections 3.1 and 3.2 as well as Appendix J describe the proposed plan in more detail. The mitigation plan will restore a flood recurrence interval of 1.76 years to the site versus the current interval of 4.0 to 5.0 years. Flood duration would be for an average of 1.2 days per event. Precipitation and overland sheet flow inputs will remain unchanged. During the 1.76-year flood, more than 156 acres of the 275-acre site (57 percent) would be inundated with floodwater. After floodwaters receded, over 138 acres of the site (50 percent) would be ponded with floodwater, 113 acres of which would persist for over 14 consecutive days. When at capacity, the mean depth of flooded areas would be approximately six inches with water. A detailed description of flooding and ponding may be found in Section 4, **Table 11**.

Precipitation would cause 158 acres (57 percent) of the site to pond annually. Some of the ponded areas would not be flooded by the 1.76-year flood and would be primarily precipitation driven. Of the 158 acres ponded annually by precipitation, 130 acres (47 percent) of the site would be ponded for over 14 consecutive days annually. When at capacity, the mean depth of ponded areas would be approximately six inches with water.

On the west tract, the site's ponding capacity would be filled to 86 percent capacity by precipitation each time the average flood event occurred. When the average flood event occurred over 112 acres (52 percent) of the tract will already be ponded by precipitation. The flood would then fill the tract with an additional 10 acre-feet of water across 22 additional acres to bring the total flooded area to 134 acres.

On the east tract, ponding duration would be improved by levelling the two narrow v-notch levee breaches that are eroding into the wetland (**Photo 4**). Flood frequency would be improved by largely degrading the levee to allow increased duration of flooding and increased volume of water to enter the site during a flood event. LiDAR data indicate that during a 1.76-year flood event, approximately 22 acres (51 percent) of the east tract would be inundated. Ponding would occur on over 33 percent of the east tract following the flood. Ponding would persist for over 14 consecutive days on over 28 percent (12 acres) of the east tract. Ponding values would be the same for precipitation as for flooding.

2.7 Jurisdictional Determination

Jurisdictional delineations and determinations for the east tract and west tract are currently under review by the U.S. Army Corps of Engineers under number SWG-2016-00086.

A jurisdictional delineation and determination was performed on the east tract by Horizon Environmental Services, Inc. in November 2015. A jurisdictional delineation verification request for the east tract was submitted to the U.S. Army Corps of Engineers on January 15, 2016 and received on January 20, 2016. A copy of Horizon's report for the east tract is attached as Appendix C.

On the west tract, the Natural Resources Conservation Service (NRCS) had previously completed a certified wetland determination/delineation on January 23, 1992. This was submitted to the U.S. Army Corps of Engineers for review on January 15, 2016. In early March, 2016 the U.S. Army Corps of Engineers indicated that the 1992 Certified Wetland Determination made by the NRCS was too old to be considered valid by the U.S. Army Corps of Engineers relative to a Section 404 jurisdictional determination. On April 6, 2016, Horizon Environmental Services performed a field reconnaissance of the site and a reference wetland site on the opposite side of Spindletop Bayou. Upon review of these data the NRCS updated its certified wetland determination/delineation of the west tract on September 13, 2016. This was submitted to the U.S. Army Corps of Engineers on September 20, 2016. A copy of Horizon's submittal for the west tract is attached as Appendix D.

Table 9 contains a summary of the waters of the U.S. located on the site. A map of the resources is shown in **Figure 20**.

Table 9. Jurisdictional wetlands at the site.

Resource Type	Acres in Project Area
West Tract	
Prior Converted Wetland	99.3
Forested Wetland	4.3
Subtotal	103.6
East Tract	
Herbaceous Wetland	0.5
Forested Wetland	27.3
Open Water Pond	2.0
Subtotal	29.8
Total	
Prior Converted Wetland	99.3
Herbaceous Wetland	0.5
Forested Wetland	31.6
Open Water Pond	2.0
Total	133.4

2.8 Hydrogeomorphic Functional Assessment

The tract has been separated into four general Wetland Assessment Areas (WAAs): 1) Prior Converted (PC) and forested wetlands on the west tract; 2) Historic non-wetland areas on the west tract; 3) forested and herbaceous wetlands on the east tract; and 4) the two acre borrow pit (open water pond) located on the east tract. A map of the WAAs may be found as **Figure 21**. The following discussions are based on the general ability of the wetlands onsite to function relative to the U.S. Army Corps of Engineer's iHGM assessment methods.[13] WAAs 1 and 2 will be assessed using the Riverine Herbaceous/Shrub iHGM, and WAAs 3 and 4 will be assessed using the Riverine Forested iHGM. **Appendix E** contains a baseline iHGM assessment for each WAA showing the current baseline and projected subindex scores 1, 3, 5, and 7 years' post-construction and revegetation. Final iHGM submetric values for WAA 3 will be submitted with the draft mitigation banking instrument. The values for basal area, trees per acre, and species richness, etc. currently provided for WAA 3 are based on several pedestrian surveys of the site.

Current Functional Capacity of the Site

WAA 1 – PC and forested wetlands on the west tract

WAA 1 is located on the west tract and consists of an active rice field, of which 94.4 acres are Prior Converted (PC) wetland and 4.3 acres are forested wetlands adjacent to the spoil bank on Spindletop Bayou. The PC wetland status allows farming and draining activities to continue as long as the site is used for agriculture and it is not abandoned.

[13] For Riverine Herbaceous/Shrub iHGM:
http://www.swg.usace.army.mil/Portals/26/docs/regulatory/functional%20Assessment/SWGRiverineHerbaceousiHGM.pdf
For Riverine Forested iHGM see:
http://www.swg.usace.army.mil/Portals/26/docs/regulatory/functional%20Assessment/SWGRiverineForestediHGM.pdf

WAA 1 is currently functioning poorly to temporarily store and detain floodwaters. The site is isolated from routine floodwaters by the spoil bank along Spindletop Bayou (**Photo 16**). Gage data indicates that the WAA receives floodwater from Spindletop Bayou less than 2 out of 5 years. Existing culverts and water control structures along the perimeter of the site allow water to drain out shortly after flood events (less than 7 days) (**Photo 7**). Decades of rice farming has reduced micro and macro topography to create a gently undulating area.

The WAA also has decreased function for removing and sequestering elements and compounds compared to the reference community, a mid/tallgrass/sedge lowland community (Soil Survey Staff, n.d.). Regular plowing of the site temporarily eliminates herbaceous cover and mixes the O- and A-horizons. Harvesting of the site also reduces herbaceous cover during cropping years. In non-crop years the site is grazed which further inhibits herbaceous cover. Coupled with the limitations on the topography, flood frequency, and flood duration, these factors lead to decreased function for the WAA to remove and sequester elements and compounds.

The WAA's functionality to maintain plant and animal communities is reduced by the periodic disturbances from cropping and to a more limited extent from grazing when compared to the mid/tallgrass/sedge reference community. Cropping periodically eliminates herbaceous, litter, and midstory coverage, breaks up and turns the soil, and replaces vegetation with a near-monoculture of a single species, rice. Grazing reduces herbaceous cover and, when improperly applied, can undesirably shift species composition.

WAA 2 – Historic non-wetland areas on the west tract

WAA 2 consists of 116.7 acres of non-jurisdictional wetland cropland. This WAA currently exhibits indicators of hydric soils, vegetation, and hydrology because of rice farming. The soil series comprising most of this WAA is considered by the NRCS soil survey to be 62 percent hydric (**Table 7**). The WAA shares many of the same attributes with WAA 1 except it has a higher landscape position, slightly coarser textured soils (clay loam), and historically had greater microtopography (gilgai relief) as indicated by historic aerial photography (**Figure 7**) and soil series descriptions.

For many of the same reasons as WAA 1, WAA 2 functions poorly for temporary storage and detention of floodwater, maintenance of plant and animal communities, and removal and sequestration of elements and compounds. The primary functional difference between WAA 1 and 2 is the hydrology. WAA 1 generally falls between 13 and 14 foot of elevation above mean sea level and WAA 2 between 14 and 15 feet of elevation. Gage and elevation data indicate the spoil bank along Spindletop Bayou limits flooding of the WAA to less than less than 2 out of 5 years. WAA 2 receives overbank floodwaters once every four to five years and the entire site is inundated once every 7 to 8 years. Given the relatively higher landform position of WAA 2 and the spoil bank elevation along Spindletop Bayou, this water recedes back into the bayou as its stage decreases. Over time historic gilgai relief has been levelled by rice cultivation creating a gently undulating surface.

The reference plant community would consist of a mix of loamy, tallgrass, prairie community (Soil Survey Staff, 2016) with a majority being a mid/tallgrass/sedge lowland community type like WAA 1 (Soil Survey Staff, n.d.). The WAA's functionality to maintain plant and animal communities is reduced by the periodic disturbances from cropping and to a more limited extent from grazing when compared to the reference community. Like WAA 1, cropping of WAA 2 periodically eliminates herbaceous, litter, and midstory coverage, breaks up and turns the soil, and replaces vegetation with a near-monoculture of a single species, rice. Grazing reduces herbaceous cover and, when improperly applied, can undesirably shift species composition.

WAA 3 – Forested and herbaceous wetlands on the east tract

WAA 3 is 26.7 acres of forested and 0.5 acres of emergent wetlands. The WAA was briefly farmed for rice over 40-years ago, and then abandoned and allowed to reforest. The following is based on several pedestrian surveys of the site and LiDAR data. A forest inventory will be conducted to establish baseline conditions prior to submittal of the draft mitigation banking instrument.

The WAA is currently functioning poorly to temporarily store and detain floodwaters. The spoil bank along Spindletop Bayou prohibits flooding in the same manner as it does on the west tract except two narrow v-shaped breaches allow floodwaters to enter the WAA on the north-east portion of the site which act to drain the site following flood events (**Photo 4**). Based on pedestrian surveys after rain events, approximately 25 – 50% of the site ponds following overbank flood events for at least 7 consecutive days (**Photo 11** and **Photo 13**). Coarse woody debris is sparse across the site due to the early successional nature of the forest. The WAA functions poor to slightly-moderate in terms of removal and sequestration of elements and compounds for the same reasons.

From the standpoint of maintenance of plant and animal communities the WAA is functioning in a poor to slightly-moderate condition. This is due to low species diversity, poor species composition, poor stand structure, and the general early successional nature of the forest (**Photo 15**). The WAA has a significant amount of Chinese privet and tallow present, and is dominated by sapling and tree sized green ash.

WAA 4 – Former borrow pit on the east tract

When it was created the two-acre former borrow pit was excavated to a depth of approximately three feet. The area is devoid of trees and shrubs and is covered by emergent and submergent vegetation sporadically, depending on annual rainfall patterns. The pit has been abandoned for as long as the surrounding rice field but has not converted to a forested or shrub-scrub wetlands. Currently the wetland functions poorly for all functions. It is devoid of tree and midstory cover (**Photo 10**). In large areas, emergent and submergent herbaceous cover is absent in most years. Flood frequency is limited by the presence of the spoil bank along Spindletop Bayou and a minor, ~1 foot, berm that surrounds the WAA.

<u>Anticipated Function Following Restoration</u>

WAA 1 – PC and forested wetlands on the west tract

Establishment of the bank will improve wetland functions within this WAA by removing 94.4 acres from PC status and ceasing agriculture. Temporarily storage and detention of floodwaters would be improved by increasing flood frequency, topography, and the duration of flooding.

Flood duration would be improved by removing the culverts and water control structures that drain the site following flood events and by maintaining a downstream levee breach 6-inches to 1-foot above grade of the lowest portion of the WAA. Over 80 percent of the WAA would be ponded for over 14 consecutive days by the proposed restoration plan. Excavation of shallow depressions within the WAA as part of construction would establish macrotopography and further improve the duration of flooding.

Flood frequency would be improved by lowering the spoil bank such that the site receives overbank flooding 3 out of 5 years. By revegetating the site with desirable native vegetation and ceasing agriculture production the site's ability to maintain native plant and animal communities will improve.

WAA 2 – Historic non-wetland areas on the west tract

The restoration plan would benefit WAA 2 in the same manner as WAA 1. Complete inundation of the site would be once every five to seven years, but most the WAA would be partially flooded or ponded once every 3 out of 5 years based on the levee breach design. The extent of flooding and ponding would be less than that of WAA 1, approximately 50-79 percent, but would be for at least seven consecutive days. This would partially be the result of the downstream breach having a higher elevation than the upstream breach which would temporarily retain precipitation and floodwater and inundate parts of the site for a longer duration. Topographic features would be higher than WAA 1 due to borrow material used to construct depressions on the higher elevation portions of the WAA.

WAA 3 – Forested and herbaceous wetlands on the east tract

Rehabilitating the site by improving flood frequency and duration would improve the ability of the site to function as a forested wetland to a moderate level. Flood frequency would be improved by degrading the levee, increasing flood frequency throughout the site. Flood duration would be slightly improved by stabilizing the existing two levee breaches, but the goal is to not markedly change flood duration such that it impacts the survival of the existing forest canopy. Given the propensity of invasive species such as Chinese tallow and privet to occupy disturbances within floodplain forested wetlands, limited activities to improve species composition and forest structure, such as individual stem injection of herbicides or aerial applications of selective herbicides would be best suited for this site.

WAA 4 – Former borrow pit on the east tract

Given the severely disturbed nature of the WAA and the limited options available to rehabilitate the WAA it has been proposed that it be converted to an open baldcypress swamp. Breaching the spoil bank and planting large, bare root, potted, or "ball and burlap" baldcypress within the pit would improve all functions by establishing structural diversity and woody vegetation while improving the frequency which the site is flooded. The duration of flooding would be unchanged.

2.9 Threatened and Endangered Species

No observations have been made of threatened or endangered species during the site visits conducted to date. An official species list of federally listed threatened and endangered species was obtained from the U.S. Fish and Wildlife for the area subject to this project (Appendix F). This project is not expected to result in an adverse impact to these listed species.

2.10 Cultural Resources

The proposed bank site has not been formally surveyed for the presence of historic or prehistoric cultural resources. No previously recorded prehistoric or historic sites are currently known to be located within or within the vicinity of the bank boundaries. A cultural resources survey will be conducted prior to submittal of the draft Mitigation Banking Instrument.

2.11 Existing and Known Proposed Airports

To comply with FAA Advisory Circular (AC) 150/5200-33B a Geographic Information System (GIS) was used to determine the presence of known or proposed private or commercial airports located or proposed to be located within five miles of the proposed project. No proposed or existing airports occur within a five-mile radius of the project site. The nearest airport is the Chambers County-Winnie Stowell airport located just over five miles from the site.

2.12 General Need

The proposed service area will include the East Galveston Bay and Sabine Lake subbasins. Historically, these areas have been underserved by mitigation bank credits. Currently there are no mitigation banks servicing the Sabine Lake subbasin with emergent / scrub-shrub credits types and only one mitigation bank, the Gulf Coastal Plains Mitigation Bank, servicing the East Galveston Bay subbasin with that type. Forested wetland mitigation credits are only available from one mitigation bank, Daisetta Swamp Wetland Mitigation Bank. This bank services the area on a secondary basis but is located outside of the 6-digit HUC basin. This bank has sold-out of credits from time to time.

Within this service area there is an anticipated need for compensatory wetland mitigation bank credits. The area between Galveston Bay and Sabine Lake is a major corridor for pipelines connecting the region's refining capacity. This corridor also includes Interstate 10 and the major cities and associated ports of Beaumont and Port Arthur. Several historic oil and gas fields are also present such as the Willow Slough, Sea Breeze, North Willow, Oyster Bayou, Fannett, and Big Hill oil fields. These factors combine to create a long-term need for compensatory mitigation credits that have been developed in advance of future impacts.

Forested wetland credits are in need as demonstrated by the fact that the only permitted forested wetland bank occasionally sells out of credits and by the recent public notices for individual permits requiring extensive off-site, permittee-responsible, forested wetland mitigation.[14] Non-tidal emergent/shrub credits are currently not available for the Sabine Lake area. Within this area there is a long-term anticipated need for this credit type as evidenced by recent public notices involving impacts to emergent/scrub-shrub wetlands.[15]

Authorization of the mitigation bank would permit the consolidation of compensatory mitigation projects into one site where significant functional uplift can occur at less risk and with greater accountability rather than at multiple small and scattered permittee-responsible mitigation projects.

2.13 Technical Feasibility

The conceptual mitigation plan is described in Section 3.1 and a map of the conceptual mitigation plan is included as **Figure 23**. The proposed activities are routine and feasible, and not unlike those described as

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[14] For example refer to public notices for SWG-2014-00661 and SWG-2014-00398.
[15] For example refer to public notices for SWG-2004-02118 and SWG-2014-00710.

"Scenario 7" in the NRCS' "Scenarios for Wetland Restoration" (Natural Resources Conservation Service, 2011). They include construction of a setback levee or dike using fill material excavated from within the perimeter of the dike and from the existing spoil bank along Spindletop Bayou. The purpose of the setback levee is to accommodate flood flows from Spindletop Bayou and provide adjacent landowners with the same degree of flood protection afforded by the existing spoil bank along Spindletop Bayou. The setback levee would surround the site, except for the portion that abuts Spindletop Bayou as shown on **Figure 23**. Construction activities would be followed by planting of trees and reseeding and/or transplanting of native coastal prairie vegetation as needed. The construction activities are not dissimilar from those commonly used in this area to construct, level, and maintain rice fields and moist soil management units (Locke, et al., n.d.).

If undertaken, artificial revegetation (supplemental planting and seeding) activities on the west tract would be like those employed at Sheldon Lake State Park as part of their wetland restoration program (Texas Coastal Watershed Program, 2013). Areas of wet coastal prairie surrounding depressions and lowlands will be seeded with a local seed mix and seed source, which was done in part at the Sheldon Lake State Park project on the prairie surrounding the excavated depressions (Llosa, 2016). Within lowlands and depressions any transplanting would be conducted using local plant materials collected from within 50-miles of the site, and planted as densely as feasible in late winter once migratory birds are offsite (Wetland Restoration Team, 2011). This project will use different methods to restore hydrology and topography than what was done at Sheldon Lake State Park because it does not propose to restore mima mounds and associated depressions. In addition, lowlands and depressions at this site may be revegetated at a lower planting density depending on the response of the seed bank. The site has demonstrated that it will rapidly revegetate with desirable hydric vegetation once farming ceases (**Table 5**). Literature indicates that in most cases, seeds of preferred moist-soil plants remain abundant in the soil, even following years of intensive agricultural activity, so intensive revegetation of these wetter areas may not be necessary at this site (Strader & Stinson, 2005).

The wetland delineation indicates that the east tract is currently a forested wetland. No adverse change to hydrology and subsequently wetland extent will result from implementation of the mitigation work plan on the east tract. The project will improve the hydrologic connection between the east tract and Spindletop Bayou by reducing the spoil bank and improving flood frequency from a 4-5-year return interval to a 1.76-year return interval (3 out of 5 years). As it relates to the duration of ponding or flooding on the east tract, the goal would be to only prevent the rapid drainage of the site since massive changes in duration may affect the current vegetation community.

The west tract is an active rice field and indicators of hydric soils, vegetation, and hydrology are currently present throughout the site. The history of successful rice farming demonstrates that through appropriate hydrologic modification the entire site can support hydric soils, vegetation, and hydrology. Prior to conversion to rice production, approximately 104 acres of the west tract was wetland as indicated by the wetland delineation. Based on the current hydric state of the tract and the fact that historically wetlands existed at the site prior to farming it would be feasible to reestablish and establish jurisdictional wetlands on the west tract.

2.14 Mortgages, Easements, and Encumbrances

There is one easement present on the site. It is held by the Trinity Bay Conservation District. A copy of the easement is attached as Appendix G. The easement grants Trinity Bay Conservation District the right to construct and maintain the channel of the now straightened Spindletop Bayou. The easement is one hundred eighty-foot-wide and centered along the centerline of Spindletop Bayou down the entire length of the proposed bank site. It allows Trinity Bay Conservation District the right to deposit spoil on both sides of the bayou within the easement area. The easement stipulates that spoil material must be placed to act as a flood control levee protecting neighboring properties (the bank site) from overbank flood events from Spindletop Bayou. Trinity Bay Conservation District has stated that the landowner owns the spoil along Spindletop Bayou and may use it, including excavating out large portions of the spoil bank (Shadden, 2015).

Trinity Bay Conservation District has agreed to work with the sponsor to accommodate any long-term modifications of this spoil bank which may be required for the development and operation of the mitigation bank. See Appendix H for a draft copy of the easement modification proposed to be filed in the Chambers County Courthouse. Following modification Trinity Bay Conservation District would not have the right to modify the levee breaches as specified within the final mitigation banking instrument. Trinity Bay Conservation District would also not have the right to place

There are no other encumbrances, including mortgages, present on the site. The project will be designed around the existing drainage and powerline easements that bound the west tract to prevent any potential future conflicts with the operation of the mitigation bank. On the west tract, a powerline easement will bound the east side of the project, and two Trinity Bay Conservation District drainage easements will bound the west and south lines of the project. A map showing the location of the Trinity Bay Conservation District easement on Spindletop as well as the adjacent easements is shown in **Figure 22**. Appendix I contains a copy of a recent title review that included a review of a title policy issued for the site when it was purchased in 1980. Since that time no additional easements have been conveyed on the portions of the overall property that fall within the proposed mitigation bank.

2.15 Current Site Risks

The sponsor does not foresee any hindrances in rehabilitating the site by breaching and degrading the spoil bank along Spindletop Bayou provided a proper setback levee is constructed commensurate to the existing spoil bank's function. The purpose and location of the setback levee is described in Section 3.1.

The sponsor does not foresee any adverse impacts to the bank from the continuation of neighboring land uses. The tracts are currently hydrologically isolated during most years from the neighboring tracts due to active and historic rice field levees and ditches as well as active drainage ditches maintained by Trinity Bay Conservation District and Texas Department of Transportation. These features disrupt and divert normal sheet flow from off-site. Construction of the bank setback levee would not change that.

The use of the upstream and downstream breach on the west tract may have elevated risk due to the potential for high-velocity floodwater flowing into the site from upstream (Natural Resources Conservation Service, 2011). This risk was considered as part of the design process and is addressed in Appendix J and in the design of the project using larger rock size at the downstream breach.

Continued use of onsite and adjacent Trinity Bay Conservation District easements will also not further degrade the site provided the Trinity Bay Conservation District easement is modified as indicated by Appendix H. Such modification removes the right of Trinity Bay Conservation District to modify the spoil bank breaches as designed in the approved mitigation banking instrument. The third-party conservation easement holder would be tasked with defending the conservation easement, including the persistence and function of the levee breaches, per the terms of the conservation easement, the mitigation banking instrument, and its associated mitigation work plan.

In the absence of the bank the sponsor expects to continue to farm the west tract as rice.

3 BANK ESTABLISHMENT & OPERATION

3.1 Conceptual Mitigation Plan – West Tract

Figure 23 and **Figure 24** is an illustration of the conceptual mitigation plan showing the location of proposed levee breaches, the setback levee, macrotopography (shallow depressions), wetland assessment areas, and the extent of flooding as defined by LiDAR data.

Appendix J describes the hydraulic and hydrologic basis of design performed by HydroGeo Designs, LLC. Appendix J describes in more detail the data, methods, and assumptions used to determine: 1) the hydraulically optimal size of the proposed levee breaches, 2) the flood recurrence interval for the proposed levee breaches, 3) the duration of flooding when it occurs, 4) the recommended height of the outer berm (setback levee), and 5) the design parameters necessary to prevent erosion at the levee breach sites.

Section 4 describes the water budget for the west tract prepared by Wildwood Environmental Credit Company, LLC. The water budget incorporates daily precipitation data gathered from the site since 2002, the site's soils, the site's topography obtained from LiDAR data, and local evaporation data obtained from the Texas Water Development Board. These data were used to model mean water depth by month for an average weather year and the extent and duration of ponding.

The west tract consists of two wetland assessment areas (WAA 1 and WAA 2). The design plan is to improve the frequency that the west tract receives flood waters from Spindletop Bayou by placing a breach flush with the flood plain at the upstream end of the project area. The design also seeks to improve the duration of ponding by disabling all existing culverts and water control structures. The downstream breach will retain approximately six inches of water across 53 percent of the tract after a flood event or normal precipitation events. This design does not require a water use permit from the Texas Commission on Environmental Quality (TCEQ) (see Section 4).

The following describes the construction methods, timing and sequence, grading plan, and soil management and erosion control measures on a step by step basis:

<u>Step 1 – Invasive Plant Control</u>

Prior to construction, invasive plants would be controlled by ground or spot applied herbicide to minimize the spread of invasive or noxious weeds. Construction equipment will be required to be cleaned prior to entering the site to minimize the spread of invasive or noxious weeds.

<u>Step 2 – Removal of Rice Field Features</u>

Following invasive plant control the site would be plowed to remove former rice field levees and dikes which would impede the flow of water across the site.

<u>Step 3 – Topsoil / Seedbank Preservation</u>

Immediately after plowing, any area within the wetland proposed for excavation would have approximately six inches of topsoil removed and stockpiled after Step 2. Later this material would be placed in a layer of approximately six inches' thick back onto excavated depressions or levelled dikes and canals to promote rapid recolonization of the site with native plant materials.

Step 4 – Setback Levee

The setback levee would be installed concurrent with Steps 2, 3, and 5. A setback levee, also known as a flood retention berm or a ring levee, will be constructed around the perimeter, less the frontage along Spindletop Bayou. A setback levee is an outer berm, or flood retention berm, designed to prevent the movement of floodwater offsite. The purpose of the setback levee is to ensure that flood protection of neighboring tracts is equivalent to, or better than, the existing conditions.

The setback levee would have an elevation of 16.5 feet NAVD 88. This is 0.3 feet higher than the highest elevation recorded at the gage during its 14 years of operations. The top of the set-back levee would have a width of eight feet to provide accessibility and maintenance. The set-back levee would raise ground elevations 0.5 to 2 feet depending on existing ground elevations. The levee would have side slopes of approximately 10:1 to reduce erosion and long-term maintenance costs (Locke, et al., n.d.). Final levee side slope would be determined based on ongoing studies of cut/fill requirements of the site.

Construction of the setback levee would result in wetland impacts to approximately 0.09 acres of forested wetlands and 4.85 acres of prior converted cropland currently under agricultural production. These impacts will be compensated for by reducing bank credits.

Step 5 - Establishing Topographic Features

The topographic features would be installed concurrent with Step 4 and the material utilized to construct part of the setback levee. This levelling and excavation would benefit the site by creating a diversity in the duration and depth of water on the site. The irrigation canals near the northwest corner would also be removed and/or levelled in this step to allow water from the upstream breach to filter through the site. The dike bisecting the tract would likewise be levelled or removed.

The set-back levee would primarily be constructed from fill obtained from shallow depressions excavated from within the site. Shallow depressions would mimic historic lowlands and create diversity in the duration and depth of water on the site. Slopes on depressions will be gradual, more than 20:1 to 30:1. Maximum depression depth would be eighteen inches from grade within the establishment area (WAA 2). Within the re-establishment area (WAA 1) they will be no deeper than 12.6 feet NAVD 88 so that max depth will not exceed eighteen inches after a flood event. Shallow depressions would occupy 5% to 15% of the area on the west tract and would be dependent on the amount of fill needed for the setback levee once the breaches had been made. Depressions within the wetland establishment area would be placed on the highest elevations.

As mentioned in Step 3, there would be a stockpile of topsoil removed from these areas prior to excavation. A six-inch layer of this topsoil will be placed on the surface of excavated features. This layer would contain the seed bank that previously existed at the site and would help ensure rapid recolonization of the site with desirable vegetation following construction.

Step 6 – Spoil Bank / Levee Breaches along Spindletop Bayou

The levee breaches would be installed concurrent with Step 4 and 5. The goal of the levee-breach design is to increase flood frequency and duration as much as possible. This could be achieved by a two-breach approach and by locating the breaches at the opposite end of the project area. The invert elevation (base) of the upstream breach would be 13.8 feet NAVD 88 (1.72-year flood return interval). The design flow of the breach is 14.2 feet NAVD 88. Design flow assumes a 0.4-foot head would be necessary to achieve flow into the site. The 14.2 feet NAVD 88 design flow corresponds to 13.26 feet NAVD 88 elevation at the bridge accounting for the hydraulic grade line through the reach. At the bridge 13.26 feet has a recurrence interval of 1.76 years (3 out of 5 years). Inundation during the 1.76-year flood event will be approximately 1.2 days per event.

On the downstream side of the west tract the levee breach will be made to a height of 14.1 feet NAVD 88 (3.2-year recurrence interval). At this grade, approximately 72 acre-feet of water (124 acres) would be held behind the breach at max pool with an average depth of six inches. Most of this water (86 percent) would be provided by precipitation prior to a flood event. When a typical flood occurs over 112 acres (over 52 percent) of the tract would already be ponded by precipitation.

Based on preliminary modeling described in Appendix J, both breaches would be 280 feet wide at their base, for a combined total of 560 feet in breach width for flood events larger than the 3.2-year flood. Appendix J contains the calculations used to determine that the 280-foot upstream breach width is sufficient, with a safety factor of two, to allow 72 acre-feet of water to inundate the maximum potential area at the site, assuming the site were dry and no precipitation had fallen. As previously mentioned, normal precipitation would have already filled the site with 62 acre-feet of water at the time of the normal flood, so the 280-foot breach provides more than adequate floodwater to the site. When a typical flood event occurs then, ten acre-feet of the initial flow would fill the site to capacity while the remaining would filter through the site with the rise and fall of the hydrograph. The 280-foot single breach size corresponds to the channel width of the bayou at flood stage. Additional modeling of breach size using survey data collected from onsite will be conducted prior to submittal of the draft mitigation banking instrument.

Material excavated for the breaches would be utilized to construct the setback levee. Side-slopes on the breach will be gentle, 8 to 1 foot slopes, to allow vehicle access along the bayou and to prevent erosion. The breaches would be stabilized with rock to prevent erosion from water passing through the breaches. The calculations of rock size for the breaches are included in Appendix J.

Step 7 - Post-Construction Revegetation

During late winter following construction, the site will be revegetated. If construction is completed in advance of the planting season a temporary cover crop may be used until planting conditions are appropriate to prevent erosion or establishment of undesirable species. Site preparation would vary depending on site conditions post-construction. The establishment area would be seeded, preferably drilled, with a coastal prairie seed mix, such as that obtained from Native American Seed (http://www.seedsource.com/)[16] or a mix harvested and spread from the reference site opposite side of Spindletop Bayou (see **Table 6** for species list). The purpose of the seeding would be to ensure adequate seed coverage of a diversity of species suited to a variety of hydroperiods and water regimes. This is necessary because the hydroperiod and regime of the restored site will be a mosaic and different in some areas from the homogenous hydroperiod and regime that currently exists at the site.

In addition to seeding/drilling prairie species, natural recruitment of native species following construction is expected to be significant based on observations of the site during years the field is rested (**Table 5**). This is consistent with the literature on establishing moist-soil management units. In most cases seeds remain abundant in the soil, even following years of intensive agricultural activity (Strader & Stinson, 2005). It can be expected that these species, in addition to whatever is seeded or transplanted, would recolonize the site depending on water depth and duration.

Constructed shallow depressions or the deeper parts of the flooded depression may be hand-planted with transplants of native floating aquatics (lilies *(Lilium spp)*), emergents (arrowheads *(Sagittaria platyphlla)*, pickerelweed *(Pontederia cordata)*, etc.), and shallow submergents (southern naiad *(Najas guadalupensis)*, etc.) depending upon natural recruitment. Transplant planting would occur in late winter once migratory birds are offsite. It is anticipated that plant materials for shallow depressions would be obtained from reference wetlands south of Monroe City, Texas or a closer location. A map of reference sites showing this location may be found in **Figure 25**.

Step 8 – Post-project Monitoring and Maintenance

Bank monitoring, reporting, and long-term management is discussed in Sections 3.4, 3.5, and 3.6.

3.2 Conceptual Mitigation Plan – East Tract

Figure 23 and **Figure 24** is an illustration of the conceptual mitigation plan showing the location of proposed levee breach, the setback levee, and the wetland assessment areas.

Appendix J describes the hydraulic and hydrologic basis of design performed by HydroGeo Designs, LLC. Appendix J describes in more detail the data, methods, and assumptions used to determine: 1) the hydraulically optimal size of the proposed levee breaches, 2) the flood recurrence interval for the proposed levee breaches, 3) the duration of flooding when it occurs, 4) the height of the outer berm (setback levee), and 5) the design parameters necessary to prevent erosion at the levee breach sites.

Step 1 – Clearing the Setback Levee Site

The first step would be to clear and prepare the footprint of the proposed setback levee around the perimeter of the site. This would likely happen in early summer once conditions were dry enough to operate heavy equipment. Currently the perimeter of the site is difficult to access, so this will be necessary to facilitate the remaining steps.

[16] See http://www.seedsource.com/catalog/detail.asp?product_id=2801 for the detailed species list associated with the mix. For new-field projects the recommended rate is 17 to 18 pounds per acre.

Step 2 – Invasive Plant Control

Invasive plants would be controlled by herbicide to minimize the spread of invasive or noxious weeds. Construction equipment will be required to be cleaned prior to entering the site to minimize the spread of invasive or noxious weeds. Invasive control would happen in late summer to early winter following completion of Step 1.

Step 3 - Levee Degradation & Setback Levee

Immediately following Step 1, the existing levee would be degraded flush with the floodplain along as much Spindletop Bayou as possible, beginning with the downstream portion of the site and depending on cut-fill requirements for the setback levee. Excavated material would be used to construct a setback levee surrounding the site (less frontage along Spindletop Bayou), identical in function to the setback levee on the west tract, which is discussed in greater detail in the previous section. Flood duration would be improved by filling, flush to the floodplain, and then stabilizing, the two existing v-notch breaches within the spoil bank (see **Photo 4** in Appendix B). Appendix J contains a grading plan and drawings of the activities.

A narrower levee with steeper slopes may be installed on the east tract to avoid and minimize impacts to existing jurisdictional wetlands. The setback levee on the east tract would result in impacts to approximately 0.45 acres of forested wetlands assuming a narrow levee with 3:1 slopes. These impacts would be compensated for by reducing bank credits from the initial credit release.

Step 4 - Forest Enhancement (WAA 3)

Herbicide applications would be made to control invasive and undesirable species, specifically Chinese tallow within the forested wetland area. These activities will also increase structural diversity, coarse woody debris, and species composition of the forest. After site preparation, areas of low stocking, including the existing emergent wetland, would be planted with desirable species, specifically species such as water oak, pecan (*Carya illinoisensis*), and baldcypress which already occur onsite naturally. Planted trees would be obtained from local commercial nurseries. Planting would occur in late winter following completion of Step 1. Herbicide activities would occur in late summer and early winter following completion of Step 1.

Step 5 - Forest Rehabilitation (WAA 4)

The former borrow pit will be planted with large, bare root, potted, or “ball and burlap” baldcypress and water tupelo (*Nyssa aquatica*) to establish and open baldcypress-tupelo swamp type similar in density and composition to what would naturally exist along a former oxbow of Spindletop Bayou. A reference oxbow or slough along Spindletop Bayou would be identified and sampled to determine target trees per acre etc. for the planting design. These activities would occur in the late winter following completion of Step 1.

Step 6 - Post-Project Monitoring and Maintenance

Bank monitoring, reporting, and long-term management is discussed in Sections 3.4, 3.5, and 3.6.

3.3 Determination of Credits

The bank would be developed using the Galveston Corps Districts' Riverine Herbaceous/Shrub and Riverine Forested iHGM functional assessments.[17] Credit yield will be determined by comparing current, baseline, conditions to those which will result from the proposed activities over an estimated 1, 3, 5, and 7-year timeframe following construction and revegetation. For WAA 1 the credit yield will also consider the retirement of the rice field from prior converted wetland status. A credit release schedule would be constructed for each wetland assessment area (WAA).

Data obtained from the reference sites mentioned in 2.4 would be used to determine the ultimate ecological lift anticipated from the site. A map of these reference sites can be found in **Figure 25**. A vegetation reference site for the proposed wet prairie on the west tract exists adjacent to and immediately northeast of the site on the opposite bank of Spindletop Bayou adjacent to SH 124. Data from that site is contained in **Table 6**. Reference sites for excavated depressions and lowlands would be used from a site on the sponsor's lands south of Monroe City and northeast of Double Bayou. These sites will be quantified in the spring of 2017. Quantitative documentation of reference sites will be included in the draft Mitigation Banking Instrument.

Conceptual Credit Release Schedule

There will be two credit release schedules. One for rehabilitation / re-establishment areas (WAAs 1, 3, and 4) and one for the establishment area (WAA 2). A separate credit leger would be maintained for each wetland assessment area (WAA). Credit types are discussed in more detail in Section 5.1.

WAA's 1, 3, and 4, would have a credit release schedule that includes the use of advance credits. Advance credits would be based on an estimate comparing current conditions to those which will result from the proposed activities over an estimated 1, 3, 5, and 7-year timeframe following construction and revegetation. Appendix E contains estimates of total credit yield for each WAA. A baseline of zero would be used for the prior converted cropland within WAA 1 since the restoration consists of retiring the active prior converted cropland. An initial credit release of 15% the 7-year projected functional capacity units would be awarded upon signature of the mitigation banking instrument and establishment of a conservation easement and financial assurance. An additional 20% would be released upon completion of construction of hydrologic improvements (levee breach, setback levee, shallow depressions, etc.). Subsequent credit releases within WAAs 1, 3, and 4 would be based on further demonstrated increases in functional capacity using the appropriate iHGM and field measurements.

No advanced credits would be requested for the emergent wetland establishment area (WAA 2). Credit releases would occur upon demonstration that jurisdictional wetlands exist at the site following construction (levee breaches, setback levee, and shallow depressions) using the routine method of wetland delineation and upon the lift in functional capacity over the baseline as assessed by the Riverine Herbaceous/Shrub iHGM. Subsequent credit releases within the establishment area would be based on

[17] For Riverine Herbaceous/Shrub iHGM:
http://www.swg.usace.army.mil/Portals/26/docs/regulatory/functional%20Assessment/SWGRiverineHerbaceousiHGM.pdf
For Riverine Forested iHGM see:
http://www.swg.usace.army.mil/Portals/26/docs/regulatory/functional%20Assessment/SWGRiverineForestediHGM.pdf

further demonstrated increases in functional capacity using the Riverine Herbaceous/Shrub iHGM and field measurements.

Additional detail on credit releases will be provided in the draft Mitigation Banking Instrument following completion of iHGM assessments of the site. Credit releases will be associated with performance standard milestones as well as demonstration of functional lift using the appropriate iHGM models.

3.4 Monitoring

Monitoring of the site prior to the final release of credits would occur at a minimum quarterly and last for a minimum of seven years after the last planting. Monitoring would include an inspection of the site, in particular for invasive species listed on TexasInvasives.org (Texas Invasive Plant & Pest Council, n.d.). Monitoring would also include an inspection of levee breaches, setback levees, etc. Long-term monitoring of the site would occur quarterly.

Quantitative monitoring parameters specific to credit releases would include those required for an iHGM analysis and jurisdictional delineation of the site, such as herbaceous and midstory cover by species, trees per acre, basal area per acre, etc. These will be monitored through a series of permanent square and circular plots established post-construction and reported in the as-built report. Wetland establishment areas will be monitored for the presence of regionally appropriate wetland indicators outlined in the Gulf Coastal Plains Regional Supplement (U.S. Army Corps of Engineers, 2010) supplemented, if necessary, by data from shallow groundwater monitoring wells. Specific monitoring protocols will be addressed in the draft mitigation banking instrument. Each credit release following the initial credit release will include the results of quantitative monitoring, a current iHGM assessment, and documentation of wetland indicators.

3.5 Reporting

Reporting of activities and monitoring would occur on an annual basis in an "annual monitoring report". Annual monitoring would be general. Each monitoring report would be based on Regulatory Guidance Letter 08-03. Annual reports would be submitted to the U.S. Army Corps of Engineers and the Interagency Review Team by January 31 of each year until the final credit release has been made. Upon the release of all credits the sponsor would request from the U.S. Army Corps of Engineers written confirmation stating that all performance standards have been met and that additional reporting is no longer required. Reporting associated with a credit release would include the quantitative monitoring parameters specified above.

An as-built report would be submitted to the U.S. Army Corps of Engineers within sixty (60) days following completion of all work required to establish, re-establish, and rehabilitate wetland hydrology and vegetative species. The as-built report will describe in detail the work performed and provide a list of species planted and the number of each species. No deviation from the mitigation work plan would occur without prior approval from the U.S. Army Corps of Engineers. For any approved deviation, the as-built report would include a discussion of the coordination with the U.S. Army Corps of Engineers, as well as a description of the change in work plans. The as-built report would provide a survey showing finished grades and plantings and survey data collected from the continuous monitoring plots.

A credit ledger would be included with each monitoring report. Credit ledgers would be submitted annually to the U.S. Army Corps of Engineers until the bank's credits are completely sold out and the bank is closed.

3.6 Long-Term Management

The long-term owner and manager of the bank would be the sponsor. The sponsor will act as the long-term site manager through its agent, but at any time may choose to assign this role to a Corps-approved entity.

Implementation of long-term management practices would be necessary to maintain the bank as a native coastal prairie and forested wetland ecosystem once restoration activities have occurred. A long-term management plan will be included in the draft mitigation banking instrument. Anticipated long-term management needs include invasive plant control using chemical and mechanical means on a biennial basis, prescribed burning approximately once every two to four years, posting of the boundary as needed, nuisance wildlife control, periodic maintenance of the setback levee, mowing or shredding of the setback levee and the remnants of the Trinity Bay Conservation District's levee along Spindletop Bayou, monitoring, and coordination by the site manager.

The long-term management plan will be funded by a non-wasting endowment or trust that will be funded incrementally as a prerequisite to credit releases that occur after the initial credit release. The endowment or trust would be 100 percent funded prior to the final release of credits. Funding of the endowment would include provisions to address inflationary adjustments and cost contingencies.

3.7 Site Protection

Prior to the release of credits the sponsor would protect the bank site in perpetuity using an appropriate, U.S. Army Corps of Engineers-approved, conservation easement held by a third party. The sponsor proposes to use the Texas Land Conservancy as the third-party easement holder. Texas Land Conservancy is one of the largest and oldest land trusts in Texas. Texas Land Conservancy is an accredited land trust by the Land Trust Accreditation Commission and is a member of the Texas Land Trust Council and the Land Trust Alliance.

3.8 Bank Expansion

The proposed bank is located on a larger tract of land with compensatory mitigation banking potential. Additional phases may be added to the bank after its approval. Development of additional phases will follow the procedures described in 33 CFR Part 332.8 (g)(1). Additional phases, while not specifically identified now, would be on the opposite side of Spindletop Bayou.

4 ASSURANCE OF SUFFICIENT WATER RIGHTS

The sponsor has coordinated with the Texas Commission of Environmental Quality (TCEQ) to determine if the project would require a water rights permit. The TCEQ Surface Water Availability Team has indicated that as designed, the project will not require a water rights permit. Additional consultation will be obtained prior to submittal of the draft mitigation banking instrument. A copy of communications with TCEQ is included with Appendix K.

A summary of upstream and downstream water rights users is included in **Table 10**. There is one water rights holder in the basin that has rights senior to the sponsor. The senior water right holder's diversion point is located upstream.

Table 10. Summary of upstream and downstream water rights holders in relation to the proposed bank site.

Location	Water Rights Owner Name	Acre Feet	Reservoir Cap	Priority Year
Up Stream				
	JERRY DEVILLIER ET AL	317		1929
	SPINDLETOP BAYOU FARM INC	706	480	1904
Bank Site				
	ESTATE OF JOHN G MIDDLETON	750	649	1921
Down Stream				
	WINZER FAMILY TRUST ET AL	320.975		1982
	WINZER FAMILY TRUST	115.258		1982
	WINZER FAMILY TRUST	118		1938
	J. MATTHEWS JR ET AL & EDITH S. HEBERT	134.2		1954
	J. MATTHEWS JR ET AL & EDITH S. HEBERT	366.8		1983
	DEATON-PIPKIN PARTNERSHIP	2315	750	1939
	JOHNNY FAYE ACKEL	277		1939
	JOHN M BLACKWELL	250	411	1985
	JEFFERSON CO. DRAINAGE DISTRICT NO 6	25.9		2007

Long-term sustainability of hydrology at the site would be achieved by both precipitation and overbank flooding, however precipitation is the most important source of hydrology for the wetlands at the bank to be sustainable. Wetlands would primarily be episaturated, saturated soils would overlie an unsaturated soil horizon. The NRCS soil series description does describe endosaturation as being near the soil surface for the Meaton / Levac soil series but not for 14 consecutive days during the growing season. The source of hydrology would either be precipitation, or overbank flooding, since the site is disconnected from sheet flow or overland runoff from adjacent properties. Precipitation would be the primary source of hydrology given that overbank flooding would not occur annually and the site receives 52 inches of precipitation annually.

Daily water budgets were constructed for the site to determine the water level during an average precipitation year. For this simulation it was assumed that no overbank flooding would occur. Water budgets were constructed for the three proposed shallow depressions within the establishment area, and for the large ponded area subject to regular overbank flooding from Spindletop Bayou. A water budget was also constructed for the east tract. Water budgets were created in the USDA Soil-Plant-Air-Water (SPAW) model using daily precipitation data from the onsite gage and local evaporation data (quadrangle 813) from the Texas Water Development Board.[18] Simulations were run for the available period of record (November 2002 to January 1, 2016).

The model shows that 57 percent (158 acres) of the site would pond annually due to precipitation. Of that over 130 acres would be ponded for over 14 consecutive days. Over 62 percent (144 acres) of the west tract would be ponded, of which 118 acres would be for 14 consecutive days. Areas not ponded for 14 consecutive days would be within less than one foot of elevation from the ponded water surface on both tracts. On the east tract 14 acres would pond on average annually of which 12 acres would be ponded for over 14 consecutive days on average. A summary of the data is in **Table 11**, which includes the acreage of each tract that would be covered by floodwater and the areas that would be ponded afterwards.

Table 11. Summary of ponding and flooding for east tract and portions of the west tract.

Area	Acres Ponded (14 Consecutive Days)	Acres Ponded	Flooded During (1.76 Yr Event)	Dominant Source
Depression A	4.5	5.4	0	Precipitation
Depression B	1.7	2.1	0	"
Depression C	11	12.1	0	"
Lowland	101	124	134	Precip. / Overbank
West Tract Subtotal:	118	144	134	
East Tract Acres	12	14	22	Precip. / Overbank
Total Acres	130	158	156	
% of West Tract's 232 acres	51%	62%	58%	
% of East Tract's 43 acres	28%	33%	51%	
% of Entire Site's 275 acres	47%	57%	57%	

A detailed summary of the results for the lowland subject to flooding on the west tract is provided in **Table 12**. The detailed results for the shallow depressions on the establishment area (WAA 2) indicates that they would be full with precipitation at least one day every other year (**Table 13**), and ponded for 14 consecutive days at a depth of approximately 1 foot.

Long-term hydrology on the east tract would be like that on the west tract, but there are no plans to excavate additional macrotopography, or significantly change the duration of ponding on the east tract. Flood frequency and flood duration will be improved. Degradation of the duration of ponding will be prevented by stabilizing the v-notch levee breaches on the west tract (**Photo 4**). The detailed summary for ponding on the east tract is provided in **Table 14**.

[18] See http://hydrolab.arsusda.gov/SPAW/SPAWDownload.html for information on the SPAW model.

Table 12. Wetland growing season depth-duration and percentage of years' pond depth is greater than given depth for 14 consecutive days during the growing season for the 124-acre lowland on the west tract.

INUNDATION PERIODS — DAYS INUNDATED — WETLAND GROWING SEASON DEPTH-DURATION SUMMARY (Feb 6 TO Dec 17)

YEAR	BEGIN	END	TOTAL	GROWING SEASON	DAYS POND DEPTH GREATER THAN GIVEN DEPTHS (10% INCREMENTS): DRY	0.19	0.38	0.57	0.76	0.95	1.14	1.33	1.52	1.71	1.90
2002	Dec 3	Dec 31	29	15	15	14	14	14	14	14	14	6	0	0	0
2003	Jan 1	Dec 31	365	315	315	315	315	315	315	307	269	221	198	120	8
2004	Jan 1	Dec 31	366	316	316	316	316	316	306	280	263	237	203	75	5
2005	Jan 1	Dec 31	365	315	315	315	315	315	305	293	280	261	155	67	0
2006	Jan 1	Dec 31	365	315	315	315	315	315	314	286	253	232	204	114	10
2007	Jan 1	Dec 31	365	315	315	315	315	315	315	315	315	315	292	230	23
2008	Jan 1	Dec 31	366	316	316	316	316	305	285	269	249	234	158	95	5
2009	Jan 1	Dec 31	365	315	315	300	279	262	239	173	136	124	103	76	3
2010	Jan 1	Dec 31	365	315	315	315	310	284	236	163	116	83	66	49	3
2011	Jan 1	Nov 19	322	286	286	248	210	163	119	89	52	0	0	0	0
	Dec 25	Dec 31	7	0	0	0	0	0	0	0	0	0	0	0	0
2012	Jan 1	Dec 31	366	316	316	316	313	283	263	234	219	177	125	63	2
2013	Jan 1	Dec 31	365	315	315	315	315	314	287	227	196	154	58	20	0
2014	Jan 1	Dec 31	365	315	315	315	294	278	248	193	134	113	49	9	0
2015	Jan 1	Dec 31	365	315	315	315	315	315	315	315	315	298	260	205	20
2016	Jan 1	Nov 30	366	316	316	316	316	316	316	316	316	305	272	217	27

PERCENTAGE OF YEARS POND DEPTH GREATER THAN GIVEN DEPTHS (10% INTERVALS)
FOR 14 CONSECUTIVE DAYS DURING THE WETLAND GROWING SEASON: Feb 6 TO Dec 17

DEPTH	(FT)	:	DRY	0.19	0.38	0.57	0.76	0.95	1.14	1.33	1.52	1.71	1.90
AREA	(AC)	:	0.00	0.19	0.80	2.37	7.42	23.45	44.42	59.61	80.46	100.52	123.80
YEARS	(%)	:	100%	100%	100%	100%	100%	100%	100%	87%	87%	80%	0%

Table 13. Wetland growing season depth-duration and percentage of years' pond depth is greater than given depth for 14 consecutive days during the growing season for the 12-acre shallow depression on the west tract.

INUNDATION PERIODS — DAYS INUNDATED — WETLAND GROWING SEASON DEPTH-DURATION SUMMARY (Feb 6 TO Dec 17)

YEAR	BEGIN	END	TOTAL	GROWING SEASON	DAYS POND DEPTH GREATER THAN GIVEN DEPTHS (10% INCREMENTS): DRY	0.15	0.30	0.45	0.60	0.75	0.90	1.05	1.20	1.35	1.50
2002	Dec 4	Dec 31	28	14	14	6	0	0	0	0	0	0	0	0	0
2003	Jan 1	May 16	135	99	99	86	67	9	0	0	0	0	0	0	0
	Jun 17	Jul 3	16	16	16	0	0	0	0	0	0	0	0	0	0
	Aug 31	Dec 31	123	109	109	109	109	109	108	108	100	97	72	27	1
2004	Jan 1	Dec 31	366	316	316	316	316	314	287	264	195	178	108	53	4
2005	Jan 1	Jul 5	185	149	149	138	127	115	97	71	53	0	0	0	0
	Jul 15	Sep 19	66	66	66	46	13	0	0	0	0	0	0	0	0
	Sep 24	Oct 9	15	15	15	0	0	0	0	0	0	0	0	0	0
	Nov 26	Dec 13	17	17	17	0	0	0	0	0	0	0	0	0	0
	Dec 15	Dec 31	17	3	3	3	0	0	0	0	0	0	0	0	0
2006	Jan 1	Jan 30	29	0	0	0	0	0	0	0	0	0	0	0	0
	Jun 1	Jun 6	5	5	5	0	0	0	0	0	0	0	0	0	0
	Jun 19	Dec 31	196	182	182	182	173	166	145	102	79	63	49	28	1
2007	Jan 1	Dec 31	365	315	315	315	315	315	315	315	315	298	264	193	19
2008	Jan 1	Dec 31	366	316	316	316	305	281	267	204	151	113	73	49	2
2009	Jan 1	Jul 8	188	152	152	141	110	48	13	2	0	0	0	0	0
	Oct 13	Dec 31	80	66	66	66	66	53	3	0	0	0	0	0	0
2010	Jan 1	Jul 4	184	148	148	129	105	80	67	54	26	0	0	0	0
	Jul 19	Jul 25	6	6	6	0	0	0	0	0	0	0	0	0	0
	Nov 2	Nov 4	2	2	2	0	0	0	0	0	0	0	0	0	0
	Dec 30	Dec 31	2	0	0	0	0	0	0	0	0	0	0	0	0
2011	Jan 1	Jan 14	13	0	0	0	0	0	0	0	0	0	0	0	0
	Jan 17	Feb 28	42	22	22	0	0	0	0	0	0	0	0	0	0
	Jul 19	Aug 5	17	17	17	0	0	0	0	0	0	0	0	0	0
2012	Jan 26	Jul 7	163	152	152	138	88	18	0	0	0	0	0	0	0
	Jul 10	Jul 31	21	21	21	8	0	0	0	0	0	0	0	0	0
	Dec 27	Dec 31	5	0	0	0	0	0	0	0	0	0	0	0	0
2013	Jan 1	Apr 9	98	62	62	44	26	0	0	0	0	0	0	0	0
	May 11	May 16	5	5	5	0	0	0	0	0	0	0	0	0	0
	Aug 26	Sep 7	12	12	12	0	0	0	0	0	0	0	0	0	0
	Oct 31	Dec 19	49	48	48	5	0	0	0	0	0	0	0	0	0
2014	Jul 5	Jul 6	1	1	1	0	0	0	0	0	0	0	0	0	0
	Jul 7	Jul 12	5	5	5	0	0	0	0	0	0	0	0	0	0
	Jul 18	Aug 13	26	26	26	10	0	0	0	0	0	0	0	0	0
	Sep 16	Nov 11	56	56	56	36	6	0	0	0	0	0	0	0	0
	Dec 20	Dec 31	12	0	0	0	0	0	0	0	0	0	0	0	0
2015	Jan 1	Dec 31	365	315	315	315	283	272	272	269	232	174	144	104	9
2016	Jan 1	Nov 30	366	316	316	316	316	316	316	316	304	280	244	161	23

PERCENTAGE OF YEARS POND DEPTH GREATER THAN GIVEN DEPTHS (10% INTERVALS)
FOR 14 CONSECUTIVE DAYS DURING THE WETLAND GROWING SEASON: Feb 6 TO Dec 17

DEPTH	(FT)	:	DRY	0.15	0.30	0.45	0.60	0.75	0.90	1.05	1.20	1.35	1.50
AREA	(AC)	:	0.00	9.69	9.96	10.23	10.49	10.76	11.03	11.30	11.56	11.83	12.10
YEARS	(%)	:	100%	87%	80%	73%	60%	60%	60%	47%	47%	40%	0%

Table 14. Wetland growing season depth-duration and percentage of years' pond depth is greater than given depth for 14 consecutive days during the growing season for the east tract's ponded area.

INUNDATION PERIODS — DAYS INUNDATED — WETLAND GROWING SEASON DEPTH-DURATION SUMMARY (Feb 6 TO Dec 17)

YEAR	BEGIN	END	TOTAL	GROWING SEASON	DAYS POND DEPTH GREATER THAN GIVEN DEPTHS (10% INCREMENTS) DRY	0.16	0.32	0.48	0.64	0.80	0.96	1.12	1.28	1.44	1.60
2002	Dec 4	Dec 31	28	14	14	14	14	14	14	14	10	5	0	0	0
2003	Jan 1	Dec 31	365	315	315	315	315	315	315	310	284	238	192	115	14
2004	Jan 1	Dec 31	366	316	316	316	316	316	310	280	250	229	187	112	7
2005	Jan 1	Dec 31	365	315	315	315	315	310	299	287	276	259	197	112	9
2006	Jan 1	Dec 31	365	315	315	315	315	315	313	300	266	229	189	110	15
2007	Jan 1	Dec 31	365	315	315	315	315	315	315	315	315	313	288	238	27
2008	Jan 1	Dec 31	366	316	316	316	316	298	280	266	245	224	161	91	7
2009	Jan 1	Dec 31	365	315	315	294	275	256	233	195	139	123	109	86	9
2010	Jan 1	Dec 31	365	315	315	315	315	315	307	275	185	86	62	48	4
2011	Jan 1	Dec 31	365	315	315	277	254	212	177	134	93	61	45	11	0
2012	Jan 1	Dec 31	366	316	316	316	316	293	268	243	225	196	135	71	3
2013	Jan 1	Dec 31	365	315	315	315	315	315	315	302	263	202	130	70	3
2014	Jan 1	Dec 31	365	315	315	315	315	315	315	290	261	211	104	39	5
2015	Jan 1	Dec 31	365	315	315	315	315	315	315	315	309	294	262	208	25
2016	Jan 1	Nov 30	366	316	316	316	316	316	316	316	311	295	265	212	32

PERCENTAGE OF YEARS POND DEPTH GREATER THAN GIVEN DEPTHS (10% INTERVALS)
FOR 14 CONSECUTIVE DAYS DURING THE WETLAND GROWING SEASON: Feb 6 TO Dec 17

DEPTH (FT) :	DRY	0.16	0.32	0.48	0.64	0.80	0.96	1.12	1.28	1.44	1.60
AREA (AC) :	1.00	1.44	2.24	3.36	4.34	5.40	6.74	8.22	9.98	11.92	14.00
YEARS (%) :	100%	100%	100%	100%	100%	100%	93%	93%	93%	87%	0%

On the west tract overbank flooding is also sufficient to maintain wetland conditions within the 124-acre depression and its surrounding wetland fringe. This is due to the restored frequency of the overbank event and the increased duration of ponding afterwards. An overbank flood event would occur every 1.76 years on average, or every one to two years. The average duration of the floodwater would be 1.2 days per event. A 1.76-year flood event with no associated precipitation would result in 53 percent of the site being ponded and the remainder of the site being within one foot vertical from the ponded water surface. The levee breach widths have been designed such that a sufficient volume of water would enter the site to fill all lowlands and shallow depressions below the 14.1 foot NAVD 88 elevation mark during the average flood event, assuming the site was completely dry at the time of the flood.

Overbank flooding would also be sufficient to maintain wetland hydrology on the east tract. All ponded areas are also within the floodplain of the 1.76-year flood. The flood occurring every 1 to 2 years would fill the same areas that would otherwise be ponded by precipitation. They would likely already be at or near capacity by precipitation though, so as is the case with the west tract, precipitation is the most important source of hydrology from a wetland sustainability standpoint.

5 PROPOSED SERVICE AREA

5.1 Credit Types and Use

The bank will have two credit types: Riverine Forested and Riverine Herbaceous/Shrub.

Riverine Forested credits would be used as mitigation for impacts to non-tidal wetlands which support a forested wetland community in their natural and/or undisturbed state. Examples of wetlands in this category (like-kind) include wetlands in bottomland pastures/agricultural fields, silviculturally altered sites, forested wetlands, constructed ponds or reservoirs that may exist as a different aquatic resource type (e.g. pond or reservoir), or vegetative community (e.g. non-forested) as a result of disturbance (e.g. timber harvesting, pasture maintenance/cattle grazing, reservoir construction, tornadoes, insect spots, beaver ponds, fire, etc.), that are not likely to persist as non-forested land cover types over time.

Riverine Herbaceous/Shrub credits would be used as mitigation for impacts to non-tidal wetlands which support an emergent/scrub-shrub wetland community in their current, natural, and/or undisturbed state. Examples of wetlands in this category (like-kind) include wet prairies, wet pastures/agricultural fields, scrub-shrub wetlands, constructed ponds or reservoirs that may exist as a different aquatic resource type (e.g. pond or reservoir), or vegetative community (e.g. tallow dominated) because of a lack of disturbance (e.g. fire suppression), or due to a previous disturbance.

Credits from the bank may be used for impacts to out-of-kind habitats within the service area only when authorized by the U.S. Army Corps of Engineers on a case-by-case basis. Examples of out-of-kind habitats include tidal wetlands and wetlands on Bolivar Peninsula west of Rollover Pass and Galveston Island.

5.2 Service Area Extent

A map of the proposed service area is contained as Figure 26. The service area consists of portions of HUCs 12040201 and 12040202 within the State of Texas, the Galveston District of the U.S. Army Corps of Engineers, and the Level IV Ecoregions 34a and 34g as defined by (Griffeth, Bryce, Omernik, & Rogers, 2007). Such extent excludes wetlands on Galveston Island and on Bolivar Peninsula west of Rollover Pass. This service area would cover portions of Chambers, Jefferson, Liberty, and Orange Counties. All Texas Parks and Wildlife Department (TPWD) lands and facilities would be excluded from the service area. All tidally influenced wetlands would be excluded from the service area.

<u>Primary Service Area</u>

The primary service area is proposed as the East Galveston Bay Subbasin (HUC 12040202) excluding that portion of the Bolivar Peninsula west of Rollover Pass. Unavoidable impacts to wetlands within the primary service area will be replaced at a 1:1 ratio.

<u>Secondary Service Area</u>

The secondary service area will encompass that portion of the Sabine Lake Subbasin (HUC 12040201) that falls within the state of Texas. Unavoidable impacts to wetlands within the primary service area will be replaced at a 1:1.5 ratio.

Special Condition Area

Within the Texas-Louisiana Coastal Marshes Ecoregion - Ecoregion 34g (Griffeth, Bryce, Omernik, & Rogers, 2007), the bank may not be used for impacts to tidally influenced wetlands, impacts to forested wetlands, and may only be used for impacts to in-kind palustrine emergent habitat types (e.g. wet coastal prairies). Use of the bank within this area is subject to the same service area ratios previously mentioned and as colored on Figure 26.

The proposed service area descriptions and the proposed ratios are shown below in Table 15.

Table 15. Wetland and stream service area descriptions and credit ratios.

Service Area	Ratio	HUC / Ecoregion Number	HUC / Ecoregion Name
Primary	1:1	12040202	East Galveston Bay Subbasin
Secondary	1.5:1	12040201	Sabine Lake Subbasin
Special Condition Area:		34g	Texas-Louisiana Coastal Marshes Ecoregion

[1] Level IV Ecoregion as defined by (Griffeth, Bryce, Omernik, & Rogers, 2007).

The sponsor proposes that in exceptional cases the Corps would consider, and may approve, the use of the bank for compensatory mitigation for impacts located outside the Primary and Secondary service areas but within the regulatory boundary of the Corps' Galveston District, or for out-of-kind impacts such as tidal wetlands.

5.3 Service Area Rationale

The service area includes portions of two adjacent 8-digit HUCs and two Level IV ecoregions, all located within the Level III ecoregion, 6-digit Basin, state, and U.S. Army Corps district that the proposed bank site falls within.

The service area excludes tidal wetlands as well as wetlands on Galveston Island and on Bolivar Peninsula west of Rollover Pass. The service area also excludes all Texas Parks and Wildlife Department (TPWD) lands and facilities.

Biological Rationale (Plant and Animal Communities)

In terms of wildlife habitat and biological processes, wetland habitats in-kind to those restored at the project site are similar within the proposed service area. The entire service area is within forty miles of the project site, which is within the fifty miles considered appropriate for transferring local plant materials (Texas Coastal Watershed Program, 2013). The site is located within the area defined as the Northern Humid Gulf Coastal Prairies (Griffeth, Bryce, Omernik, & Rogers, 2007) (**Figure 4**). This narrow strip of historic prairies spans the upper half of the Texas Gulf Coast, straddling Galveston Bay, and is characteristically different from coastal prairies southwest of Port Lavaca, Texas. The service area falls entirely within that portion of the Northern Humid Gulf Coastal Prairies that has been characterized as the Chenier Plain Initiative of the North American Waterfowl Management Plan (Esslinger & Wilson, 2001). The Northern Humid Gulf Coastal Prairies in this area are immediately inland to, and intermixed with, the coastal marshes known as the "Texas-Louisiana Coastal Marshes" ecoregion (Griffeth, Bryce, Omernik, & Rogers, 2007). Thus, in-kind habitats of wet coastal prairie occur intermixed within portions of this seaward related ecoregion.

Physical Rationale (Temporary Storage and Detention of Stormwater)

The site shares a physical hydrologic connection with Spindletop Bayou and with adjacent watersheds that span both the East Galveston Bay and Sabine Lake Subbasins (8-digit HUCs). Watershed delineation within the Western Gulf Coastal Plain is problematic due to the flat terrain and the extensive ditching and canal construction that has occurred over the past 100 years. Based on the high-resolution National Hydrography Dataset and the Watershed Boundary Dataset, a total of twenty-three stream, ditch, and canal segments cross from Spindletop Bayou watershed and connect with streams in the Taylor Bayou watershed. An additional fifty-one segments connect with the East Double Fork Bayou Watershed and Cane Bayou watershed to the west (**Figure 27**). A significant connection was established between the Spindletop Bayou watershed and Taylor Bayou watershed to the east in 2009 when the Jefferson County Drainage District 6 completed the Mayhaw Diversion two miles downstream of the proposed bank site. The diversion connects Spindletop Bayou with the Mayhaw Bayou, a tributary of Taylor Bayou. The purpose of this connection was to alleviate flooding along Taylor Bayou near Port Arthur, Texas. It was completed as part of the Taylor Bayou Flood Relief Project.

Currently Spindletop Bayou drains into the Gulf Intracoastal Waterway approximately fourteen river miles downstream. This confluence and the spoil bank along Spindletop Ditch also serves as the HUC boundary between the East Galveston Bay and Sabine Lake subbasins. This confluence is approximately eighteen river miles from Sabine Lake and twenty river miles from East Bay. Historically Spindletop Bayou was the headwaters to Salt Bayou which drains into Sabine Lake (Salt Bayou Marsh Workgroup, 2013). This connection is illustrated on the 1928 U.S. Army Corps of Engineers Tactical Map (**Figure 6**). Efforts have been underway for decades to restore this hydrologic connection by one day installing siphons under the Gulf Intracoastal Waterway in several locations, in particular, the area near the confluence of Spindletop Ditch and the Intracoastal (State of Texas, 2014).

By breaching the levee along Spindletop Bayou and establishing macrotopography within the site, the proposed bank will provide a valuable service to the area in terms of temporary stormwater storage and detention. This benefit accrues not only to the Spindletop Bayou watershed but to adjacent watersheds that share a physical connection during storm events. The proposed service area only spans the two subbasins that share this direct physical connection.

Chemical Rationale (Removal and Sequestration of Elements & Compounds)

Coastal prairie depression and pothole wetlands, in particular those located within the floodplains of rivers, provide unique functions in terms of removal and sequestration of elements and compounds. By breaching the levee the project will have a more frequent connection to Spindletop Bayou. In the case of removal of elements and compounds from floodwaters, the benefit of this activity will accrue to the watersheds and waterways that share a direct connection to Spindletop Bayou. In terms of nutrient cycling and sequestration, establishing macrotopography, removing the ongoing impacts from agriculture, and reestablishing a native coastal prairie community will improve the functional capacity of the wetland, and replace the functional capacity lost by impacted in-kind wetlands within the same ecoregion setting.

6 QUALIFICATIONS OF THE SPONSOR

The sponsor has engaged with Wildwood Environmental Credit Company, LLC to manage the implementation, performance, and long-term management of the project. Wildwood manages three compensatory mitigation banks and two permittee-responsible mitigation sites in Texas and Oklahoma. These include the 19,079 acre Pineywoods Mitigation Bank (SWF-2004-00458) that is in its final year of monitoring, the 2,478 acre Burleson Wetlands Mitigation Bank (SWF-2009-00189) that is currently during enhancement, and the 2,337-acre American Burying Beetle Conservation Bank (2014-F-0455) that is currently under long-term management. Permittee-responsible mitigation sites include the 12.4-mile stream mitigation site associated with SWF-2006-00251 that is in its fourth year of monitoring and the 876-acre Keystone McAlester Conservation Area associated with U.S. Fish and Wildlife permit number TE80492A-0 that is in its third year of monitoring. All projects are in, and have always been in, compliance with the appropriate regulatory agencies. In addition to this project Wildwood is in the permitting phase on two prospective mitigation banks in the U.S. Army Corps of Engineers' Fort Worth District, the Flat Creek Mitigation Bank (SWF-2014-00105) and in late 2016 Wildwood began working on the XS Ranch Mitigation Bank (SWF-2008-00281).

Cliff Sunda is the project manager and point of contact for the project. Mr. Sunda is a certified forester and professional wetlands scientist. He has completed level IV of Dave Rosgen's stream coursework. He has nine years of experience working with compensatory mitigation projects and is the Vice President of Operations at Wildwood and the senior project manager.

Horizon Environmental Services, Inc. is the primary ecological services provider for the project. Horizon's responsibilities include wetland delineation and jurisdictional determination, cultural resources and threatened and endangered species surveys, hydrogeomorphic assessment, as well providing technical review of the restoration and revegetation plan and all regulatory submittals. Horizon has over 27 years of experience providing these services along the Texas Gulf Coast. Lee Sherrod is responsible for the work conducted by Horizon and he conducted the jurisdictional determinations at the site. Mr. Sherrod is a professional wetland scientist with over 38 years of experience.

HydroGeo Designs, LLC is the project engineer. HydroGeo specializes in stream restoration, hydrology, hydraulic engineering, and construction management services. HydroGeo will be responsible for designing the setback dike, shallow water excavations, and the spoil bank breeches along Spindletop Bayou. HydroGeo will be responsible for overseeing the construction of the project. Brett Jordan PhD, PE is the engineer assigned to the project. Dr. Jordan has over 15 years of experience in hydrology, fluvial geomorphology, open channel hydraulics, storm water management, erosion control, sediment transport, and stream restoration design.

A summary of the key personnel's qualifications is included as Appendix L.

7 CONCLUSION

In conclusion, the bank has high potential for rehabilitating, re-establishing, and establishing approximately 245 acres of emergent and forested wetlands adjacent to Spindletop Bayou and State Highway 124 in Chambers County, Texas. The site consists of active prior converted cropland, active cropland, and abandoned cropland that has converted to forested wetland. Implementation of the mitigation plan would result in the restoration and establishment of palustrine emergent and palustrine forested wetlands. The bank will be established and operated in accordance to 33 CFR Part 332, *Compensatory Mitigation for Losses of Aquatic Resources*; Final Rule, dated April 10, 2008 (2008 Rule, 2008). Additional details will be provided in the draft Mitigation Banking Instrument.

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APPENDIX A - PROJECT MAPS

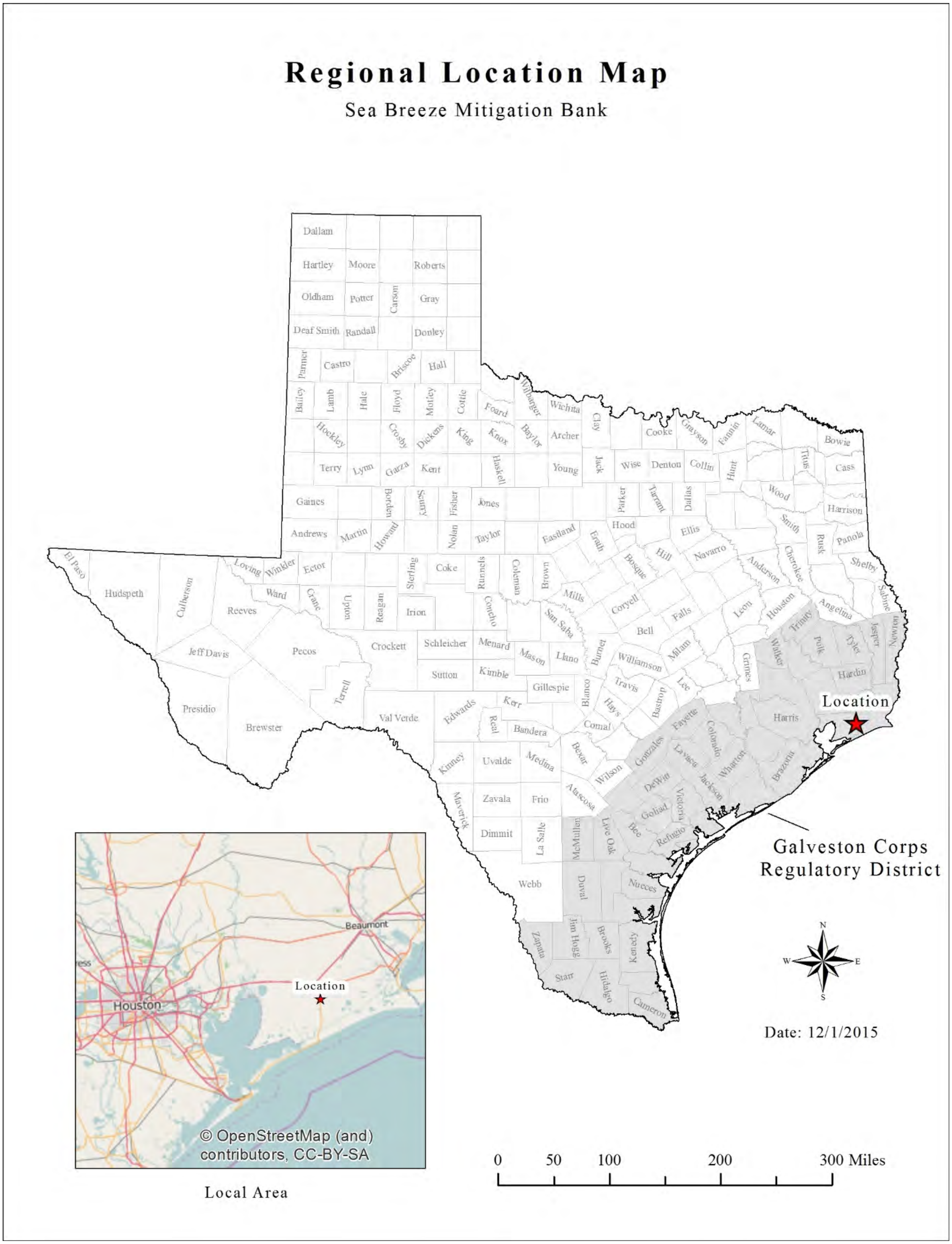


Figure 1. Regional location map.

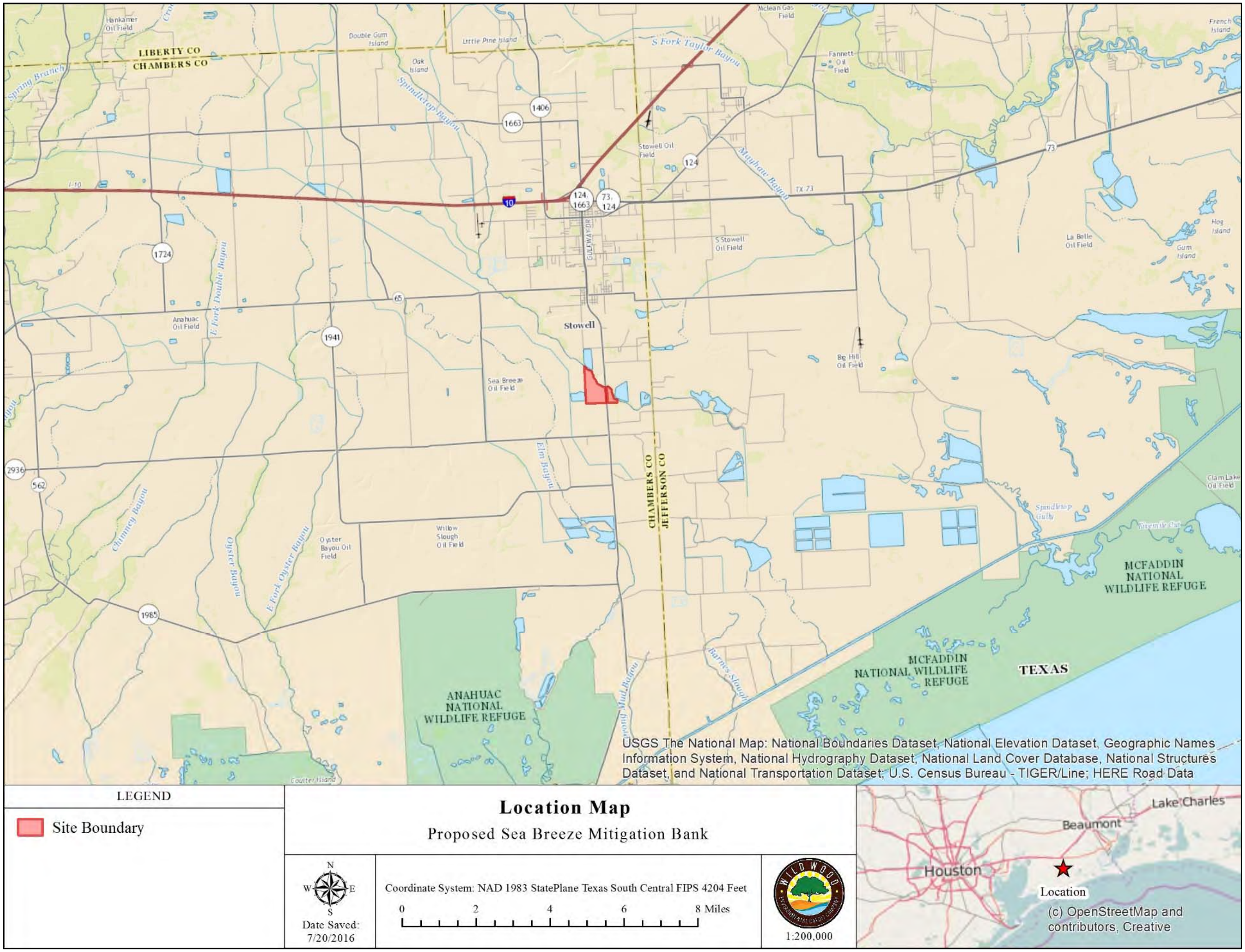


Figure 2. Project location map.

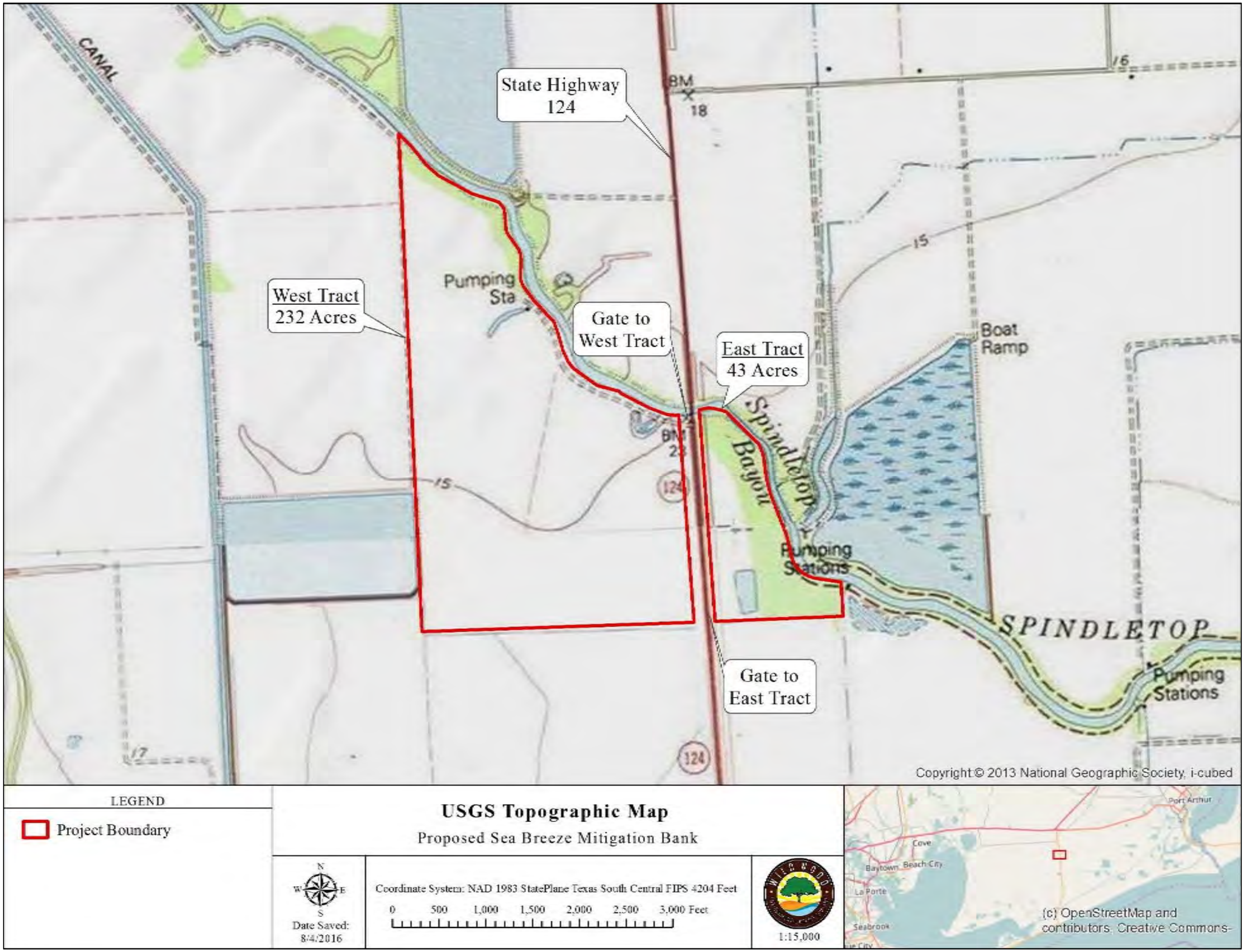


Figure 3. USGS topographic map, location of west tract and east tract, and access points.

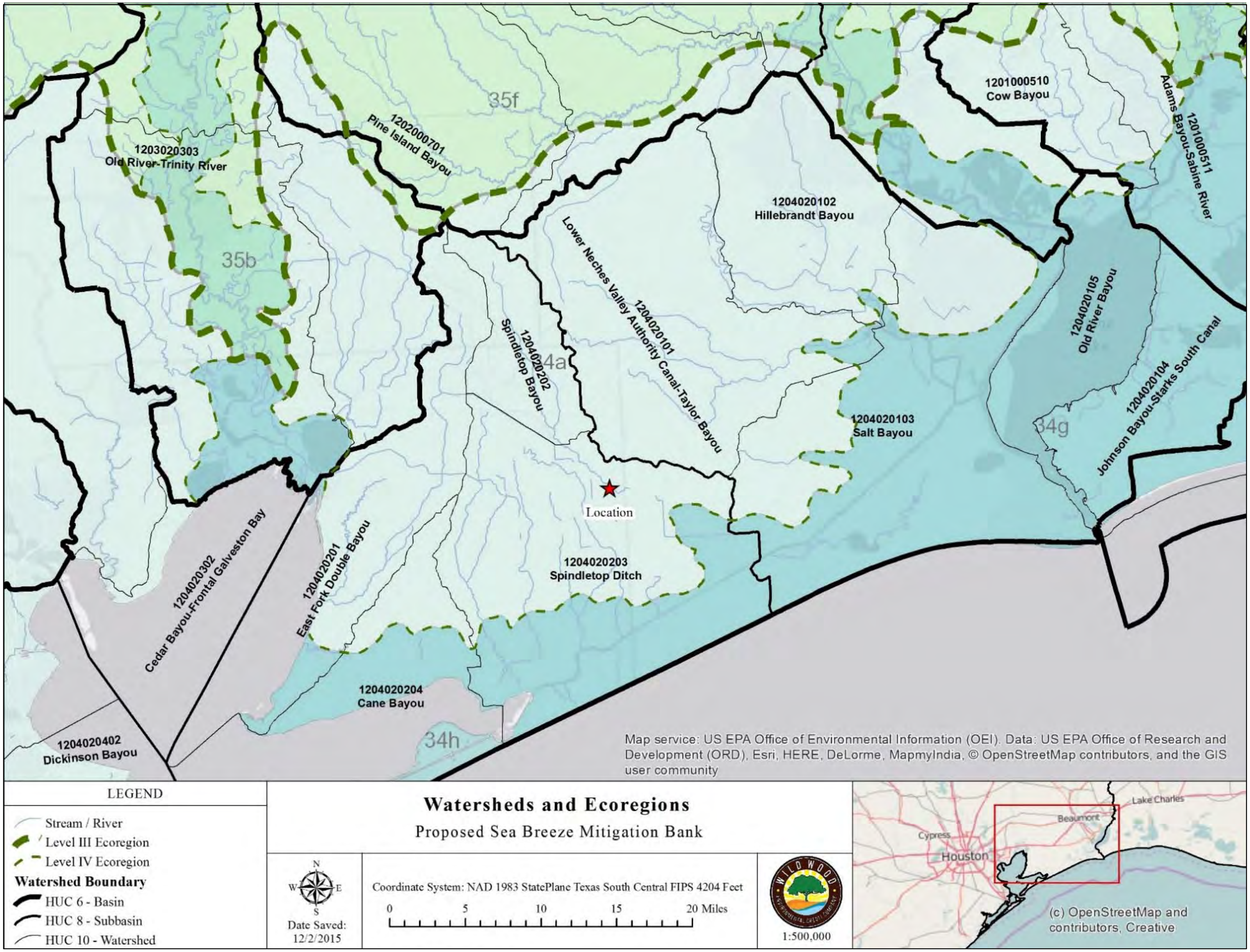


Figure 4. Watersheds and ecoregions map.

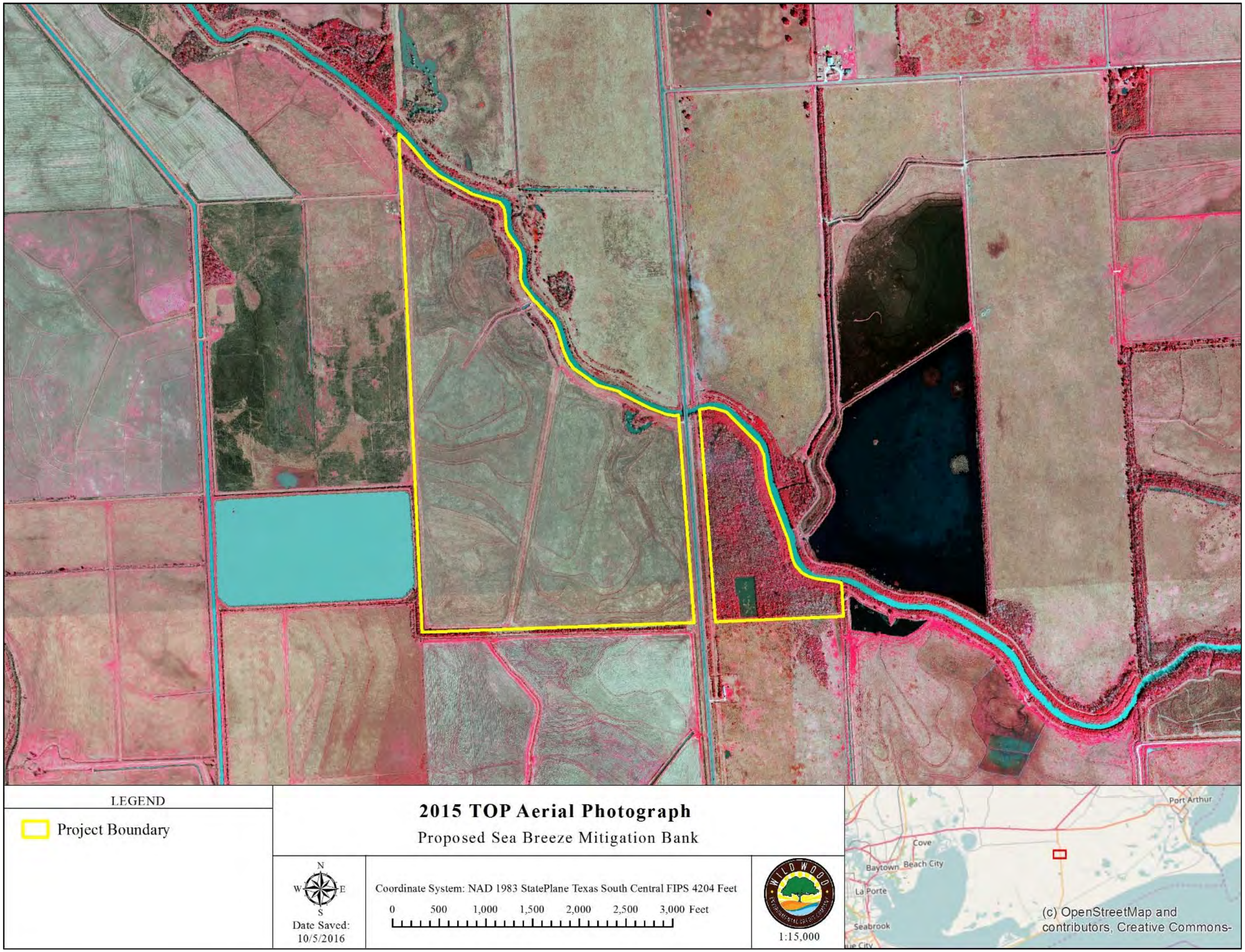


Figure 5. 2015 TOP aerial photograph.

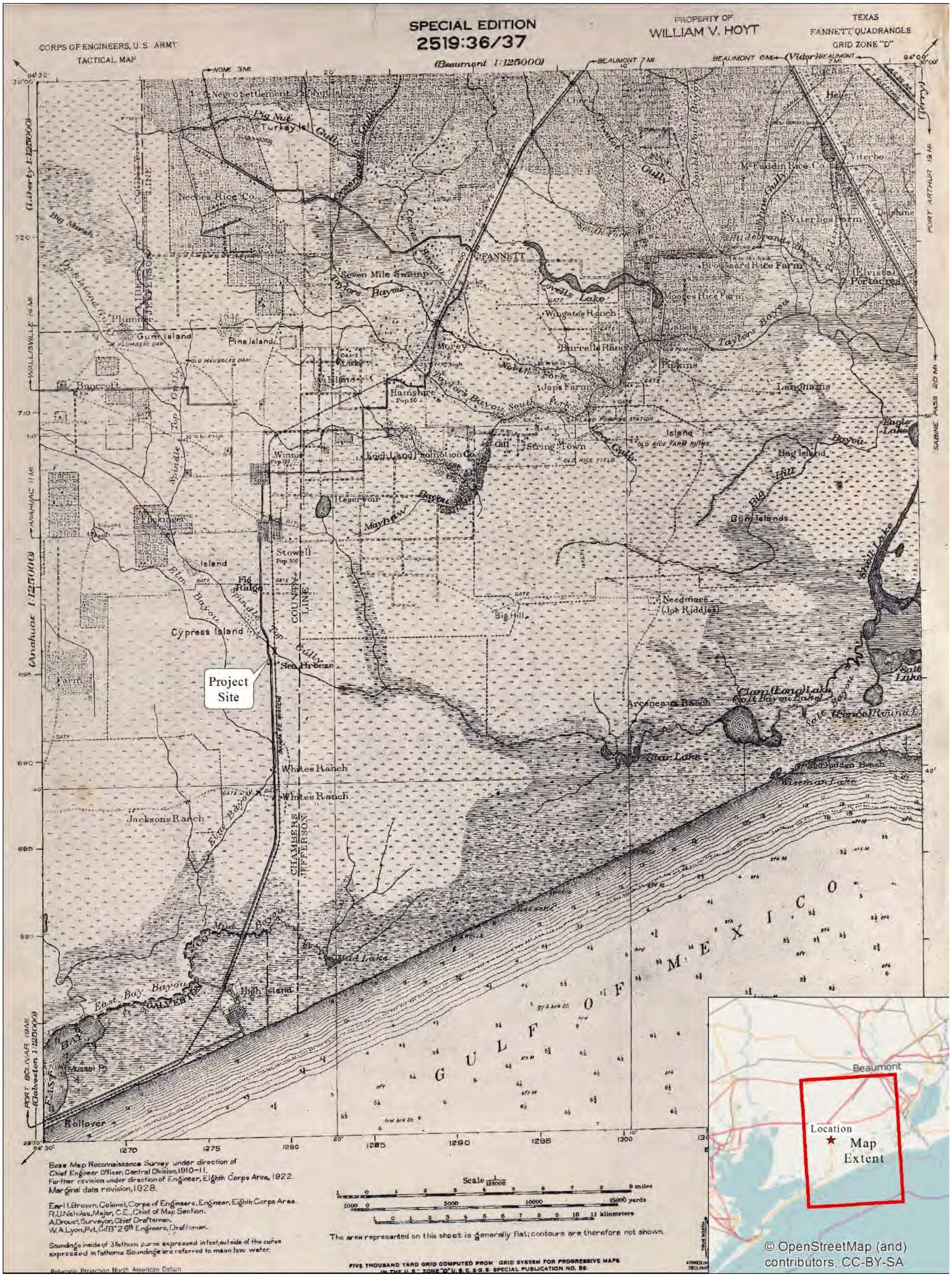


Figure 6. U.S. Army Corps of Engineers Tactical Map: Fannett Quad 1928.

LEGEND

Project Boundary

1938 Aerial Photograph

Proposed Sea Breeze Mitigation Bank

N W E S

Date Saved: 7/20/2016

Coordinate System: NAD 1983 StatePlane Texas South Central FIPS 4204 Feet

0 500 1,000 1,500 2,000 2,500 3,000 Feet

1:15,000

Figure 7. 1938 aerial photograph

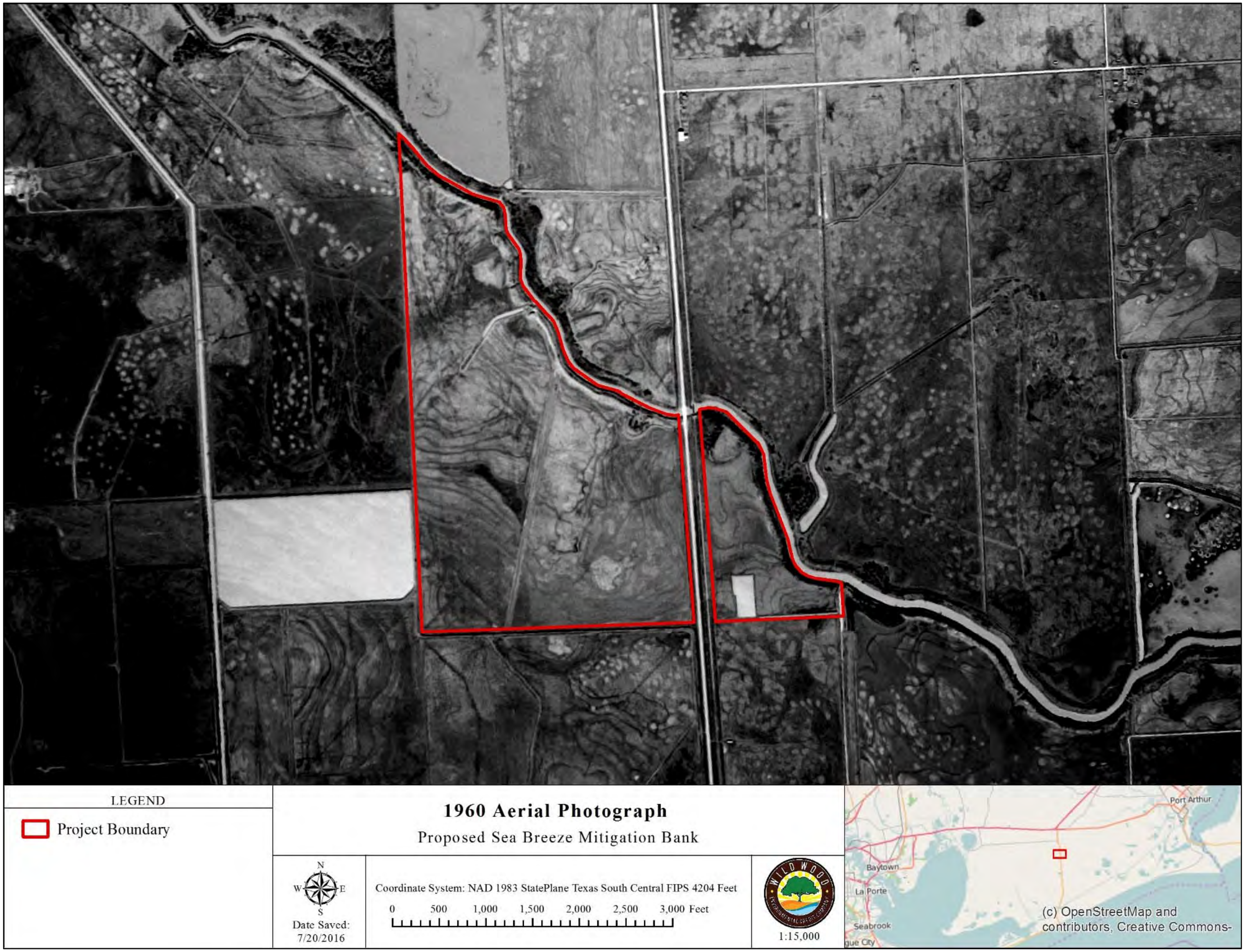


Figure 8. 1960 aerial photograph.

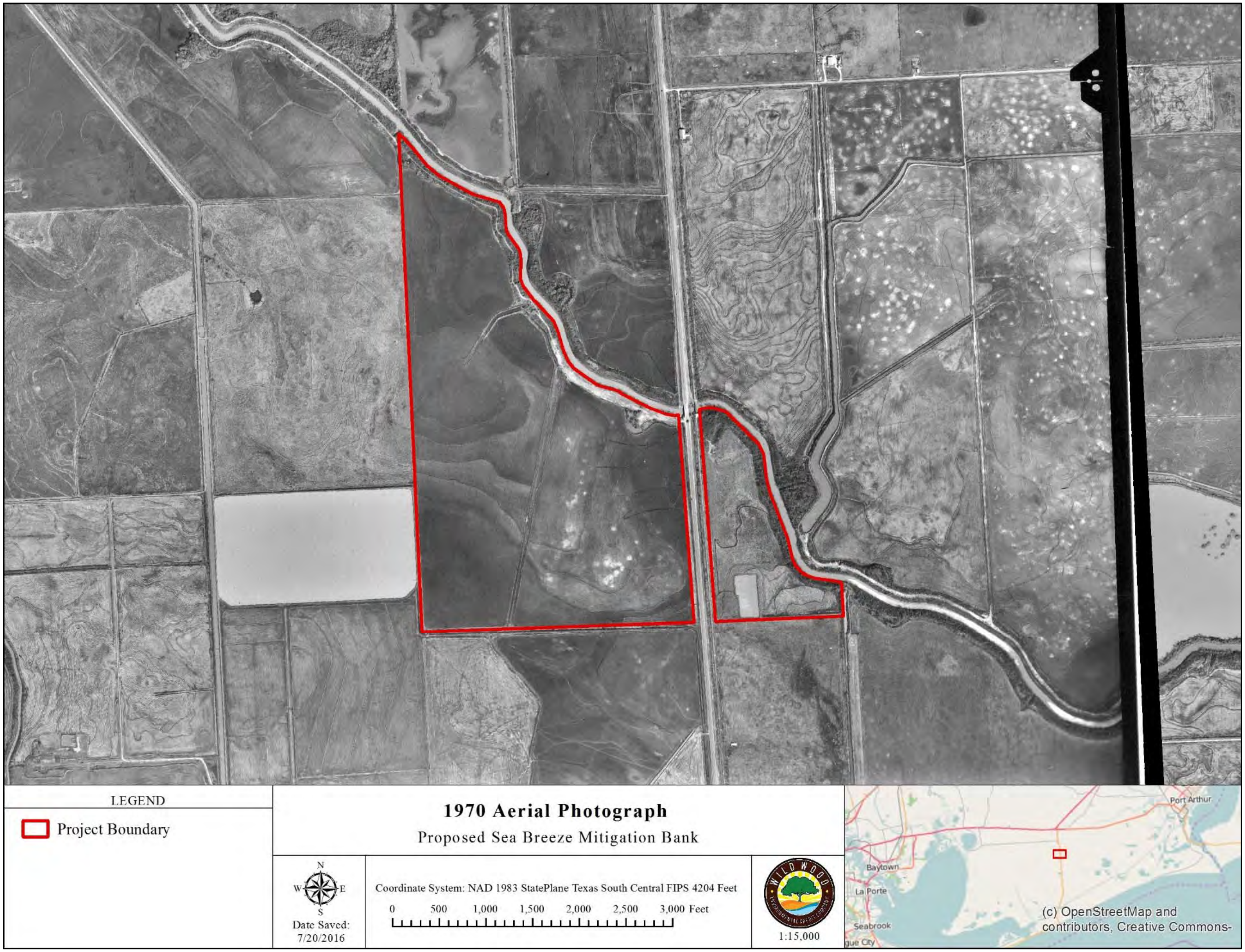


Figure 9. 1970 aerial photograph.

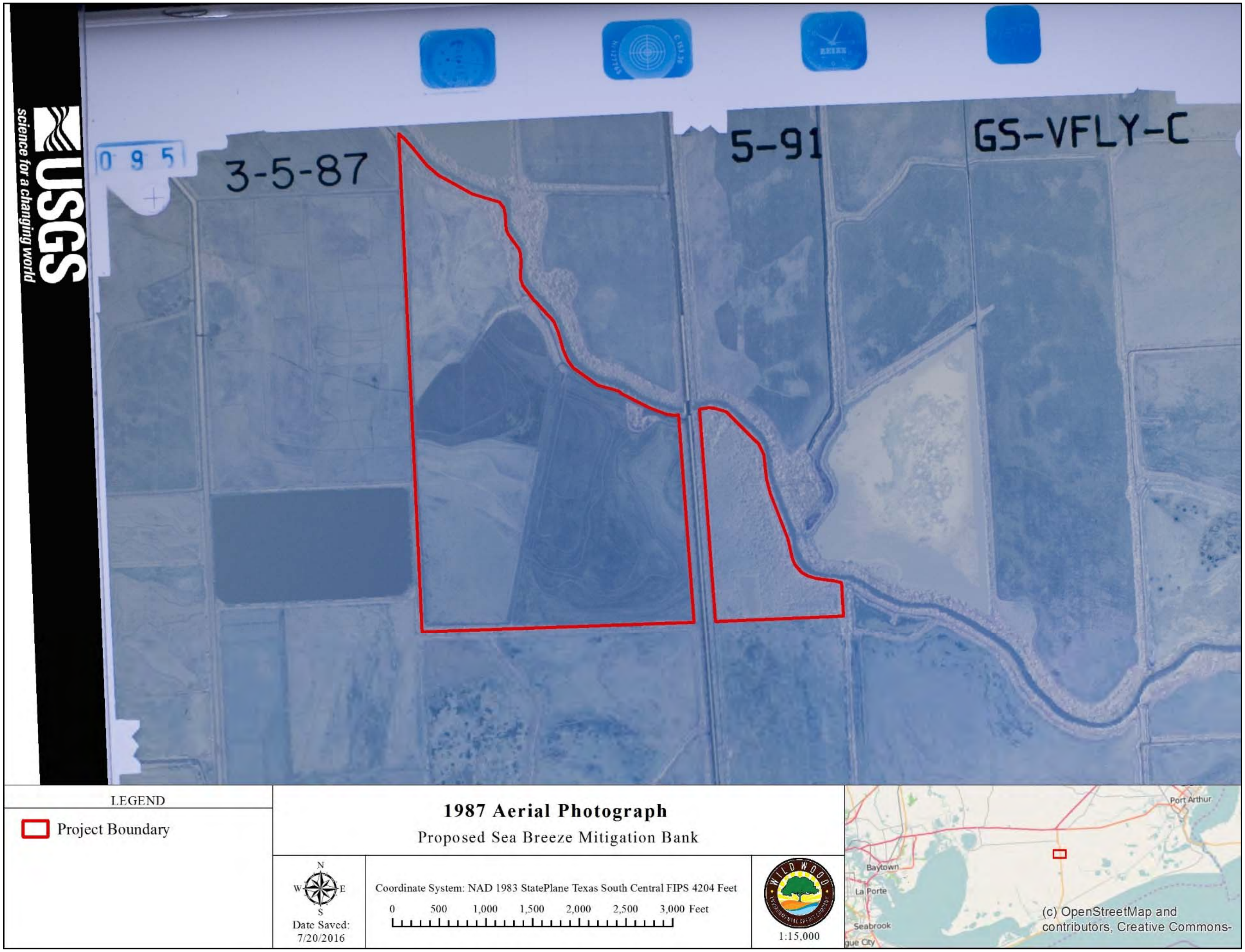


Figure 10. 1989 aerial photograph.

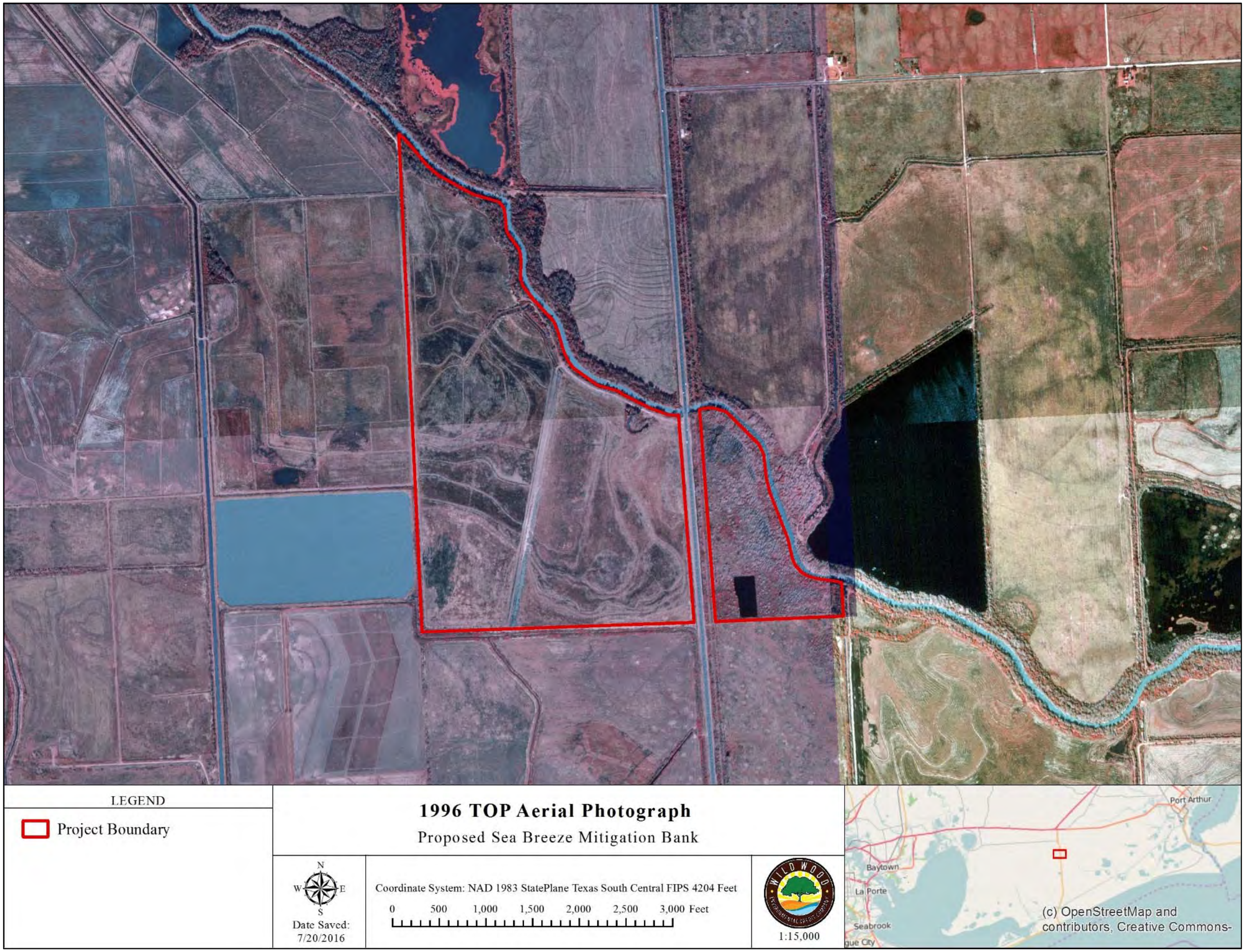


Figure 11. 1995 aerial photograph.

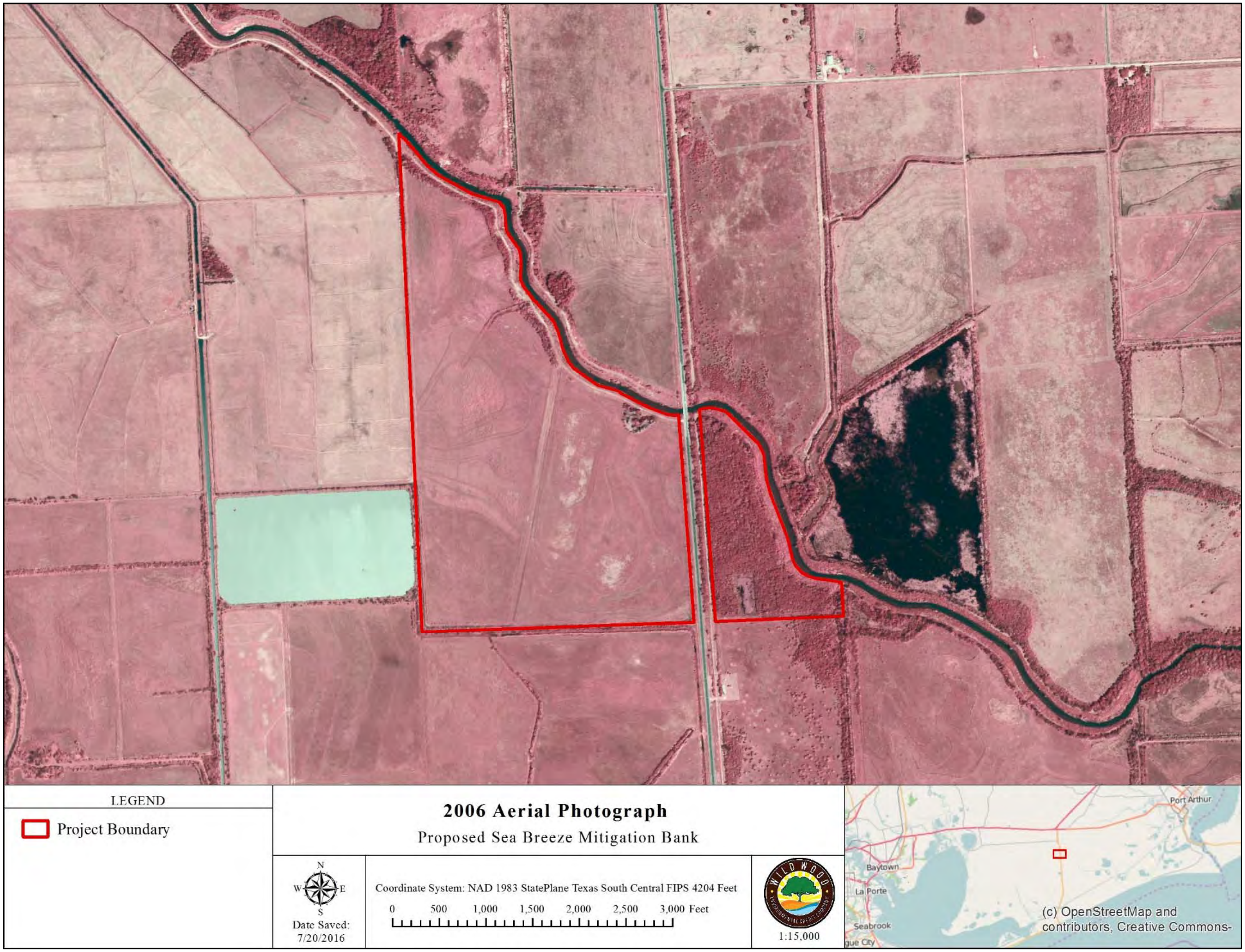


Figure 12. 2006 aerial photograph.

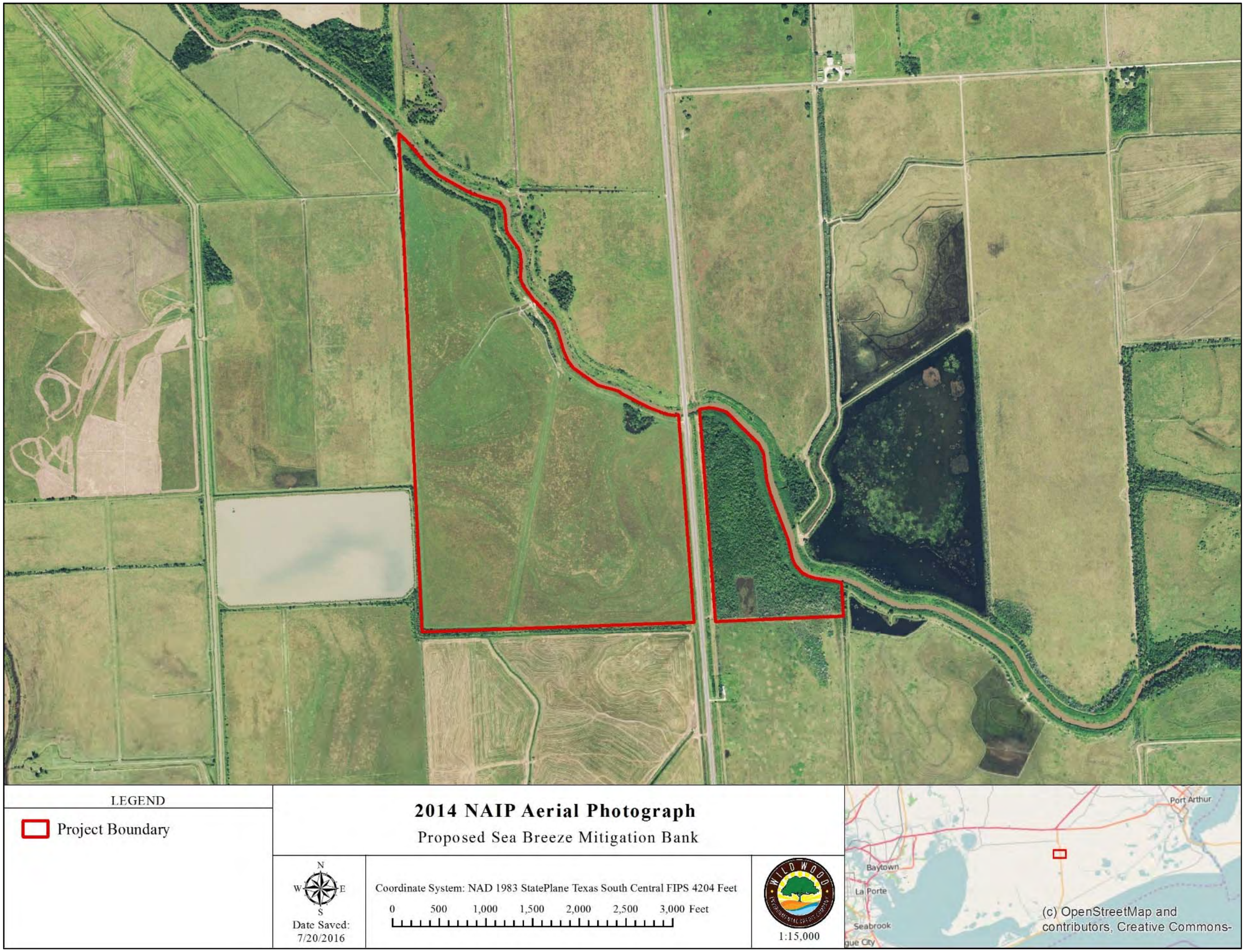


Figure 13. 2014 NAIP aerial photograph.

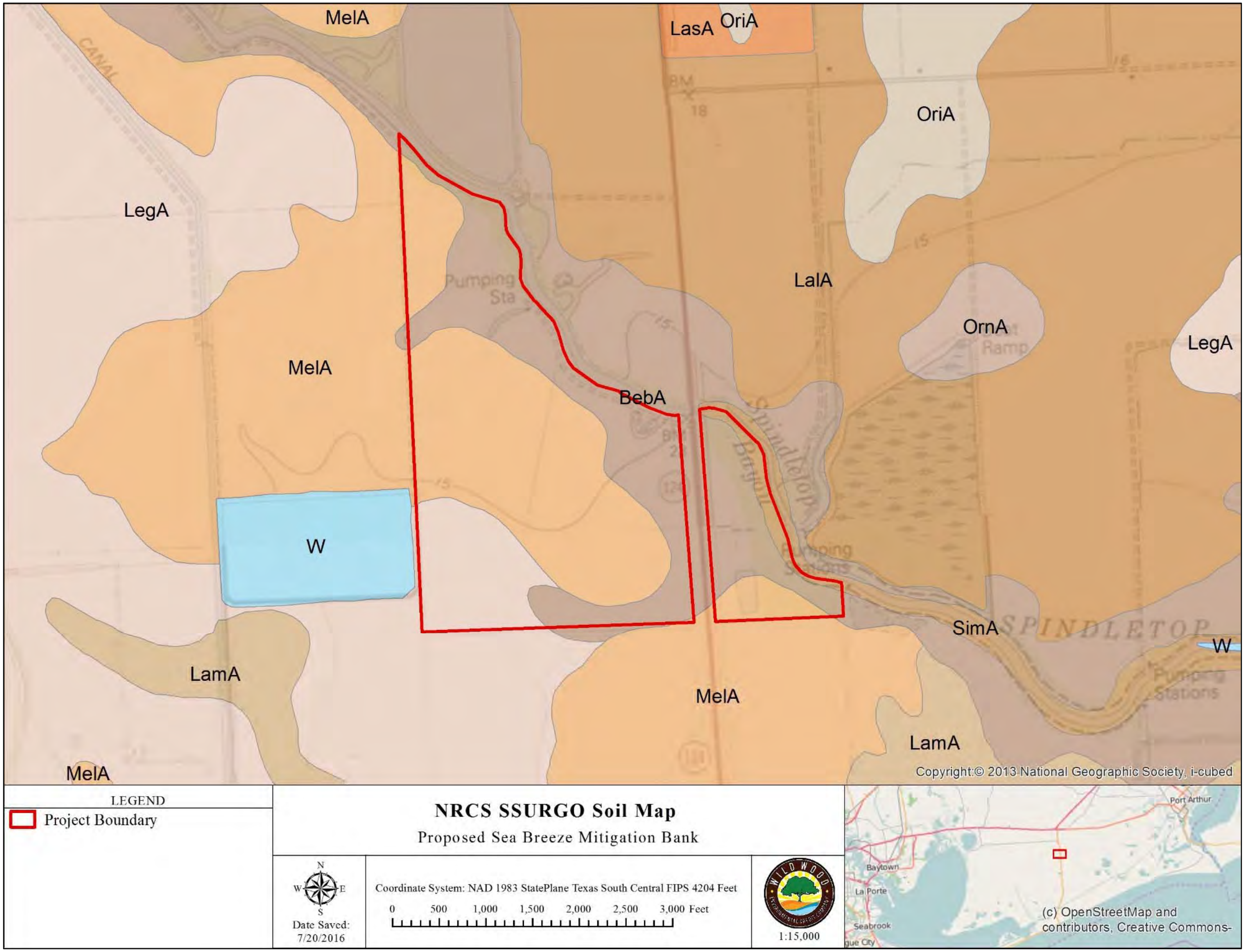


Figure 14. NRCS SSURGO map.

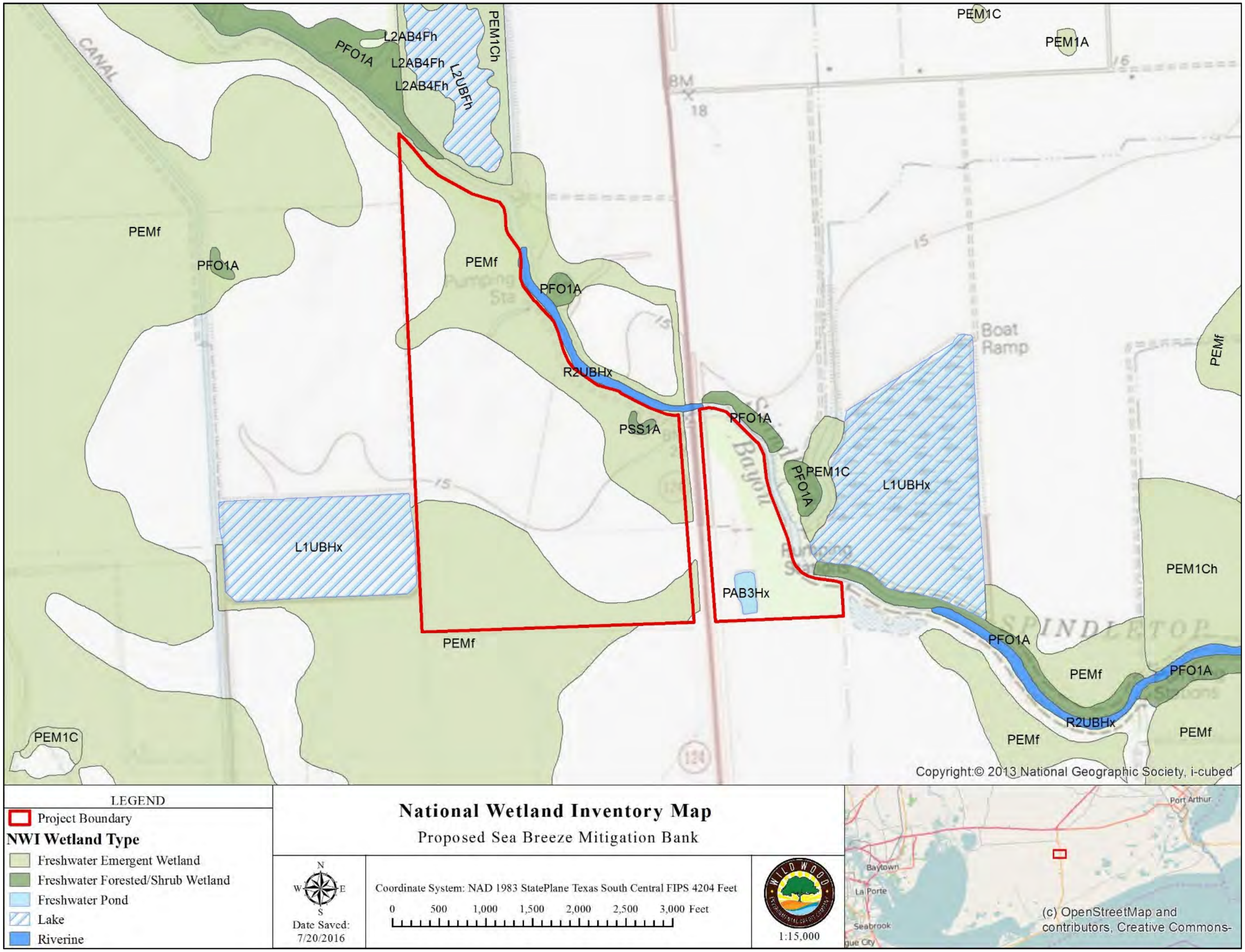


Figure 15. National Wetlands Inventory map.

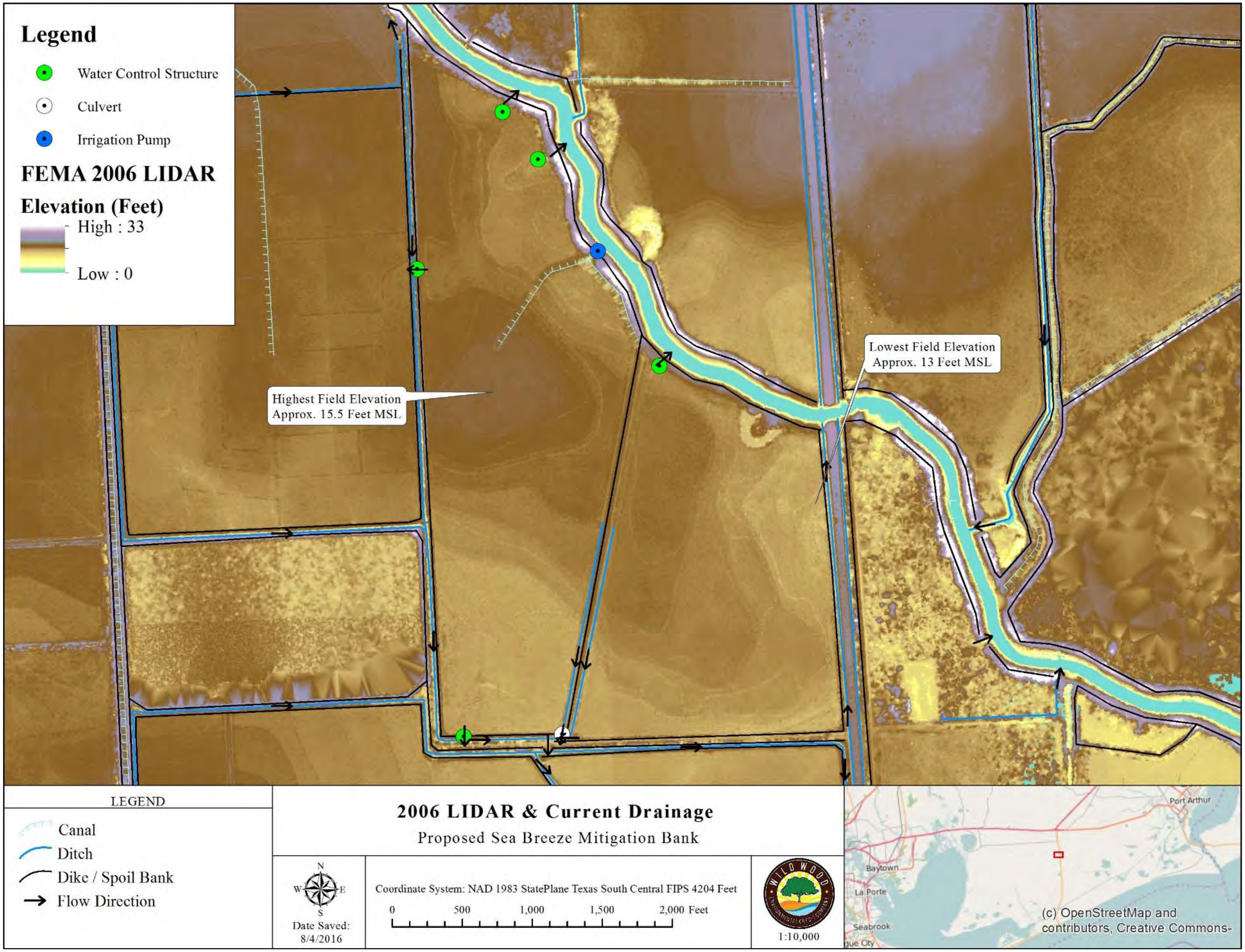


Figure 16. 2006 LIDAR and map of current drainage network.

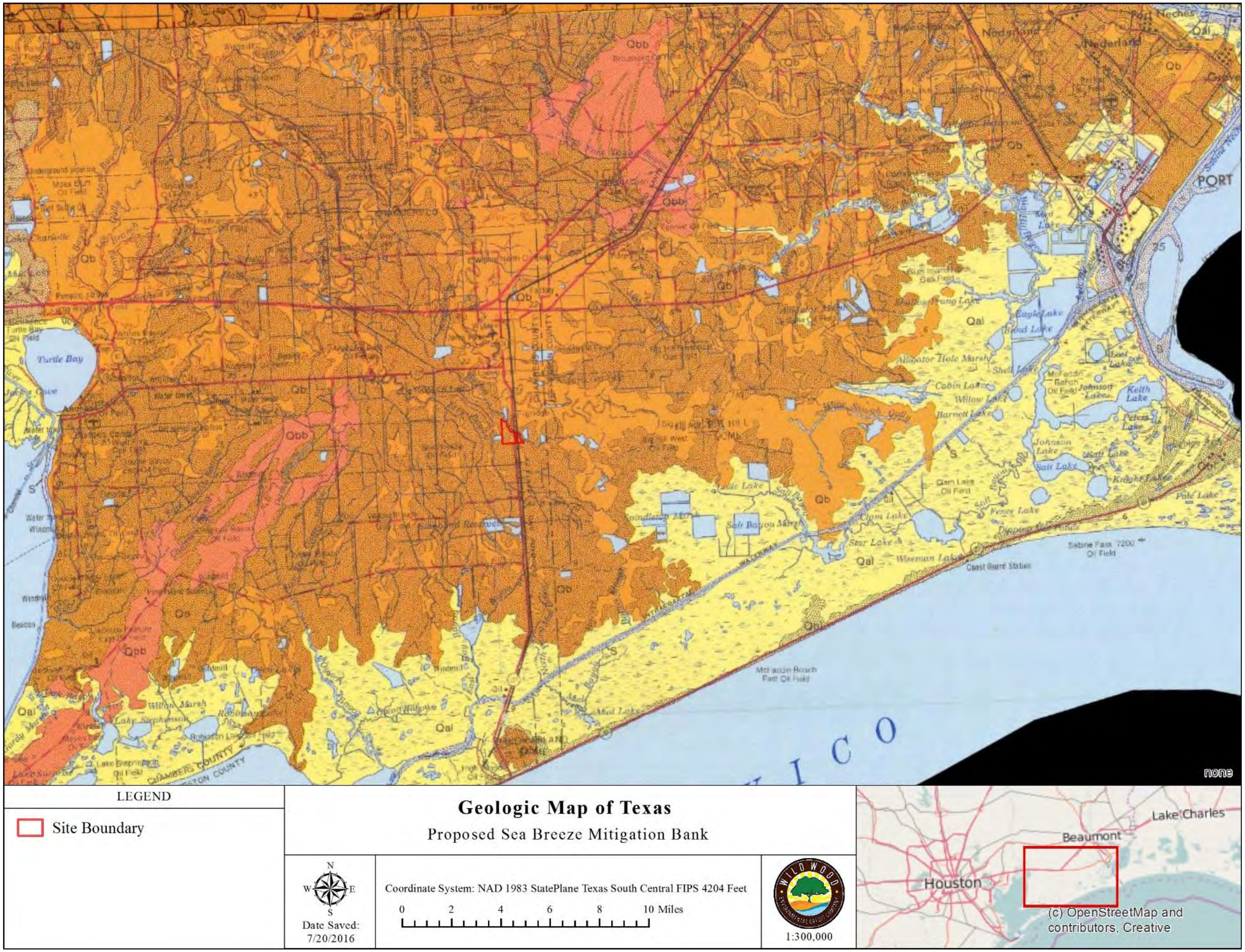


Figure 17. Geologic Atlas of Texas geologic map.

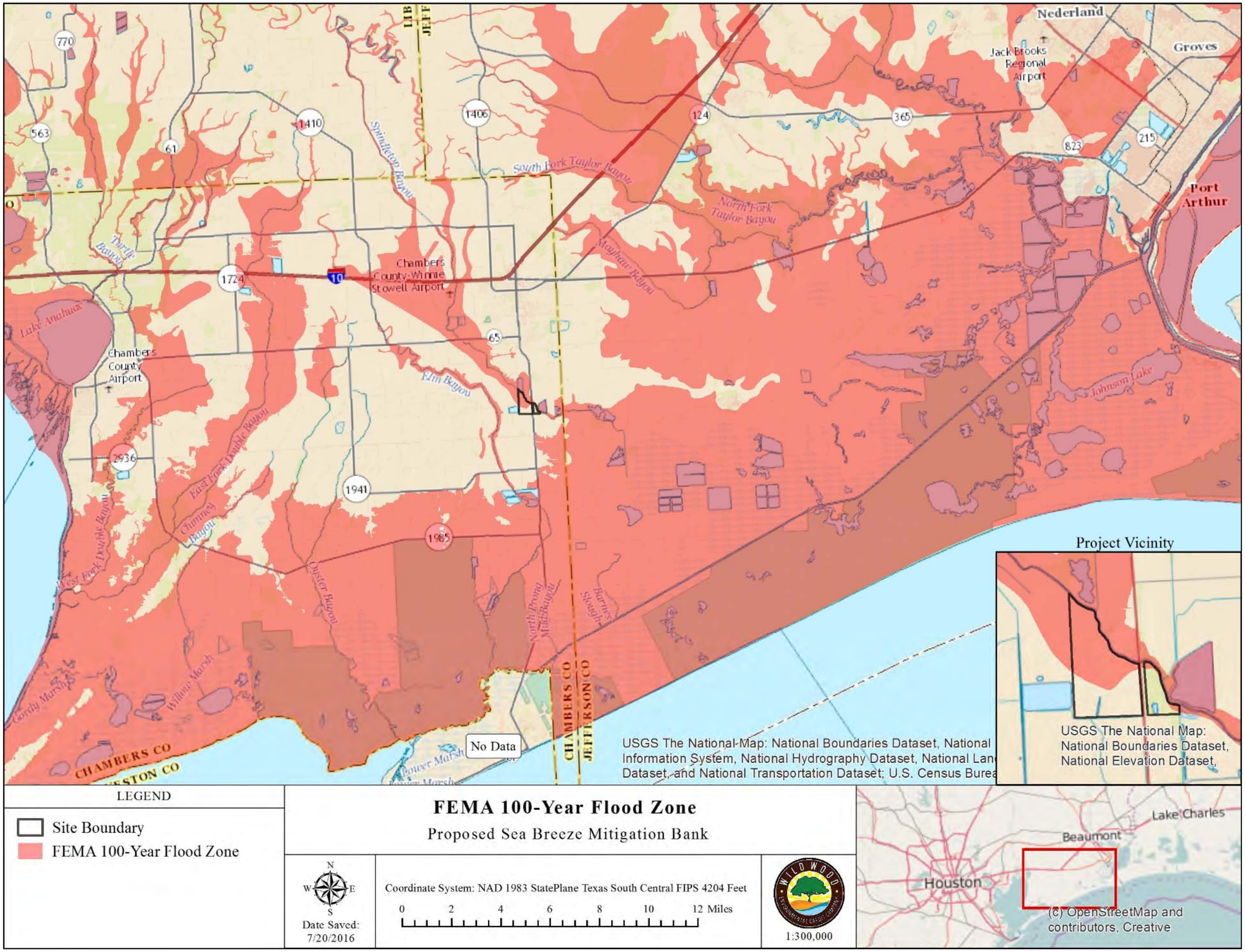
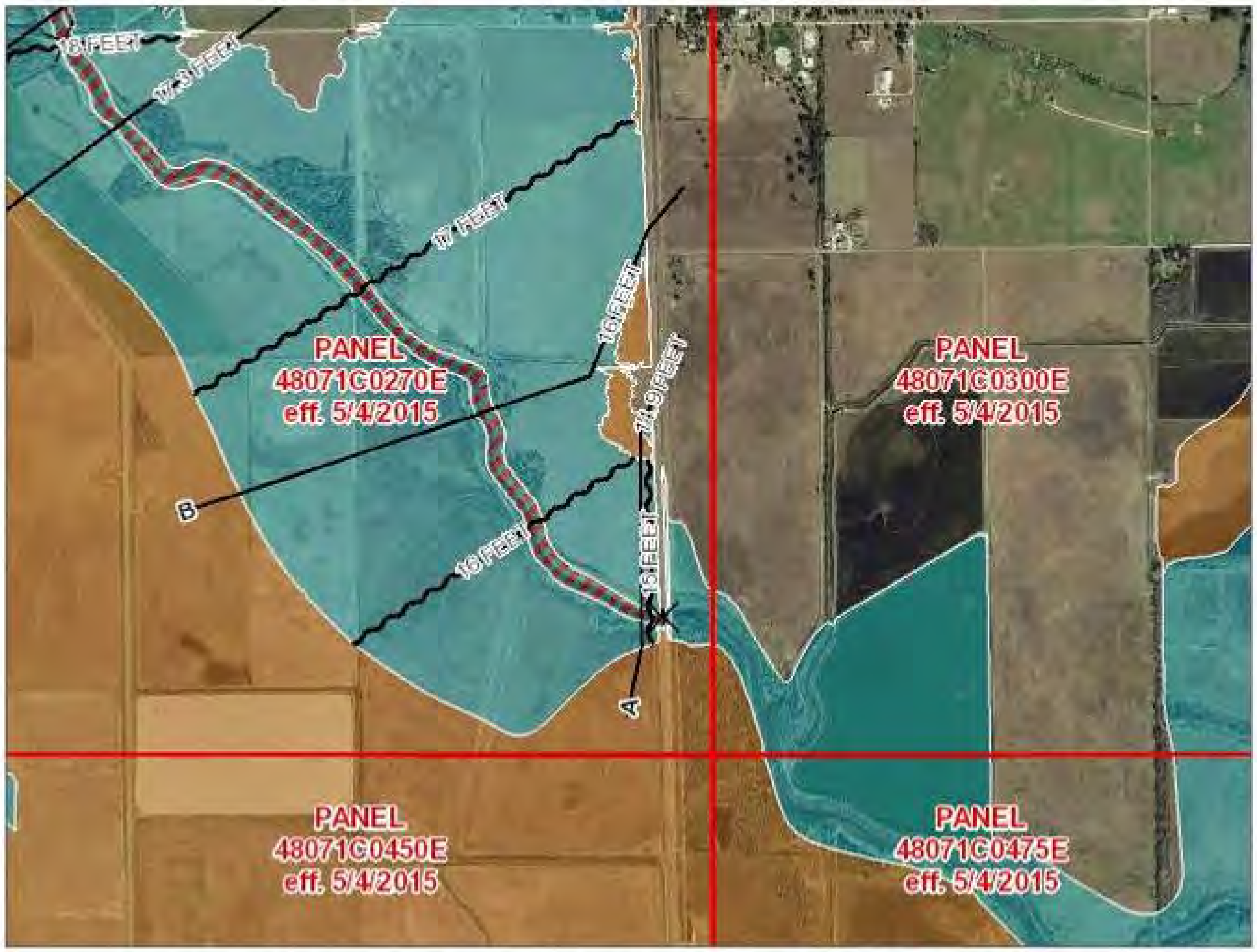


Figure 18. FEMA 100-Year Flood Zone.

7/26/2016 FEMA's National Flood Hazard Layer (Official)

FEMA's National Flood Hazard Layer (Official)

Data from Flood Insurance Rate Maps (FIRMs) where available digitally. New NFHL FIRMette Print app available: http://tinyurl.com/j4xwp5e



National Geospatial-Intelligence Agency (NGA); Delta State University; Esri | scott.mcafee@fema.dhs.gov

Figure 19. Official FEMA National Flood Hazard Layer for the site showing base flood elevations.

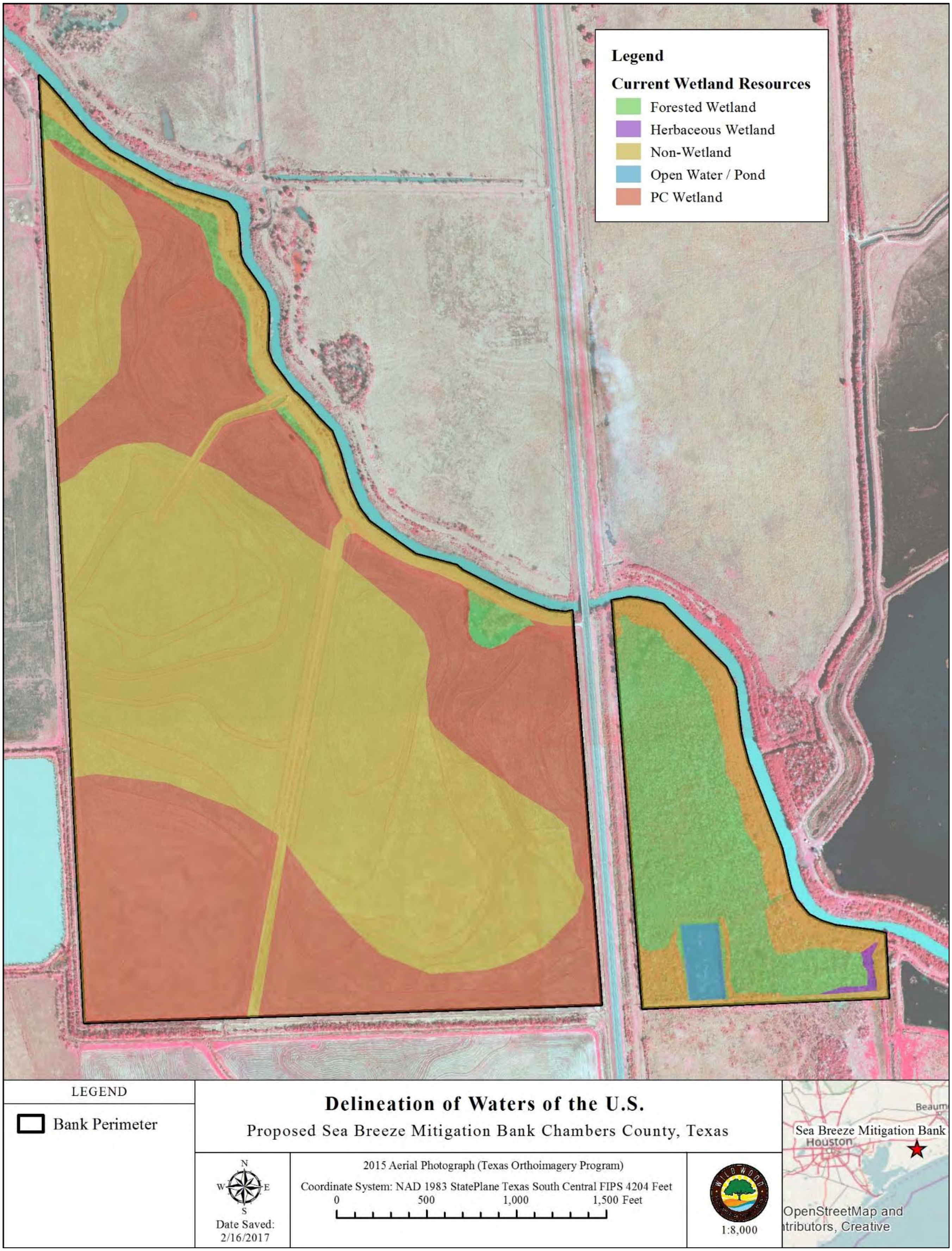


Figure 20. Current disposition of Waters of the U.S.

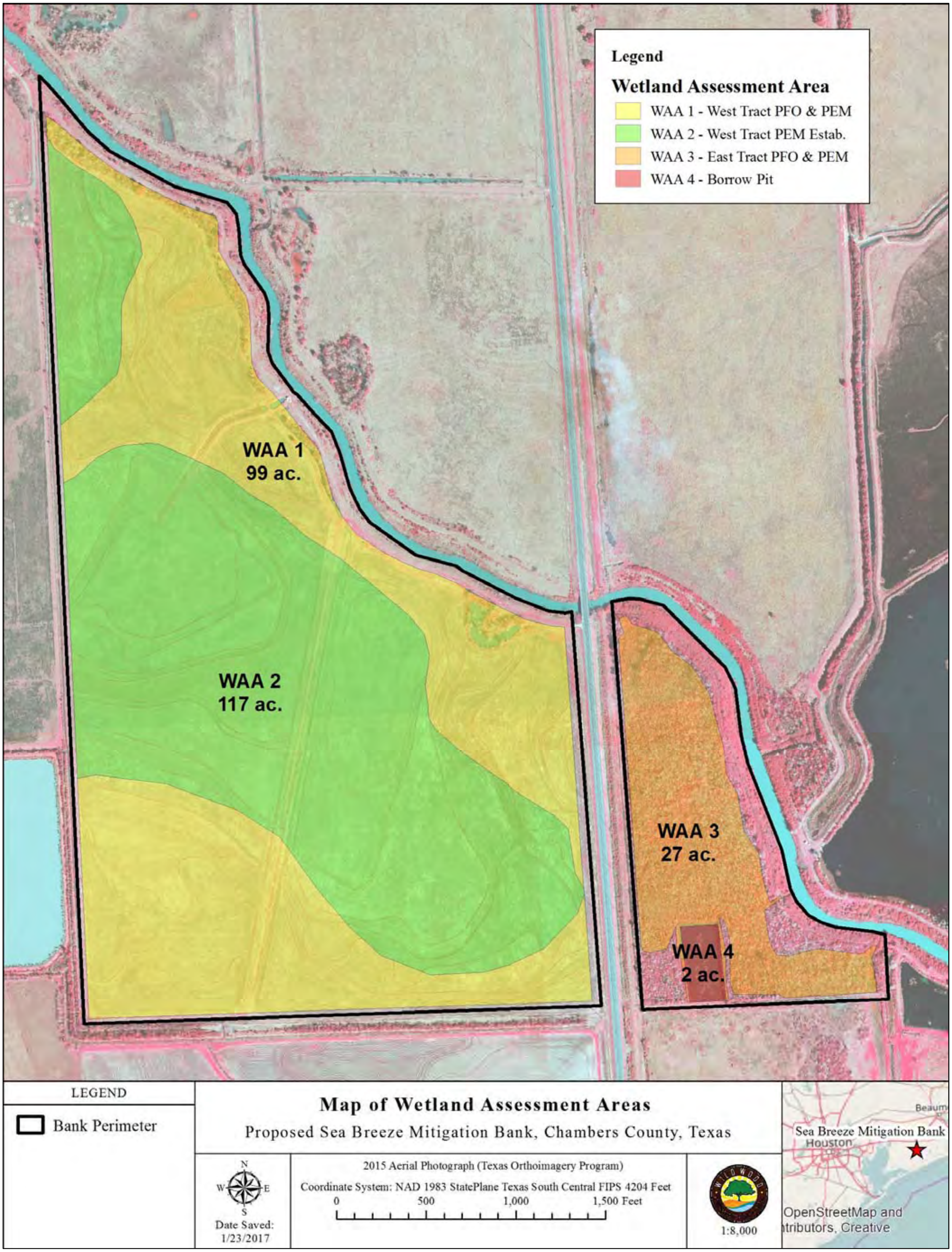


Figure 21. Map of wetland assessment areas used for discussion and credit calculation.

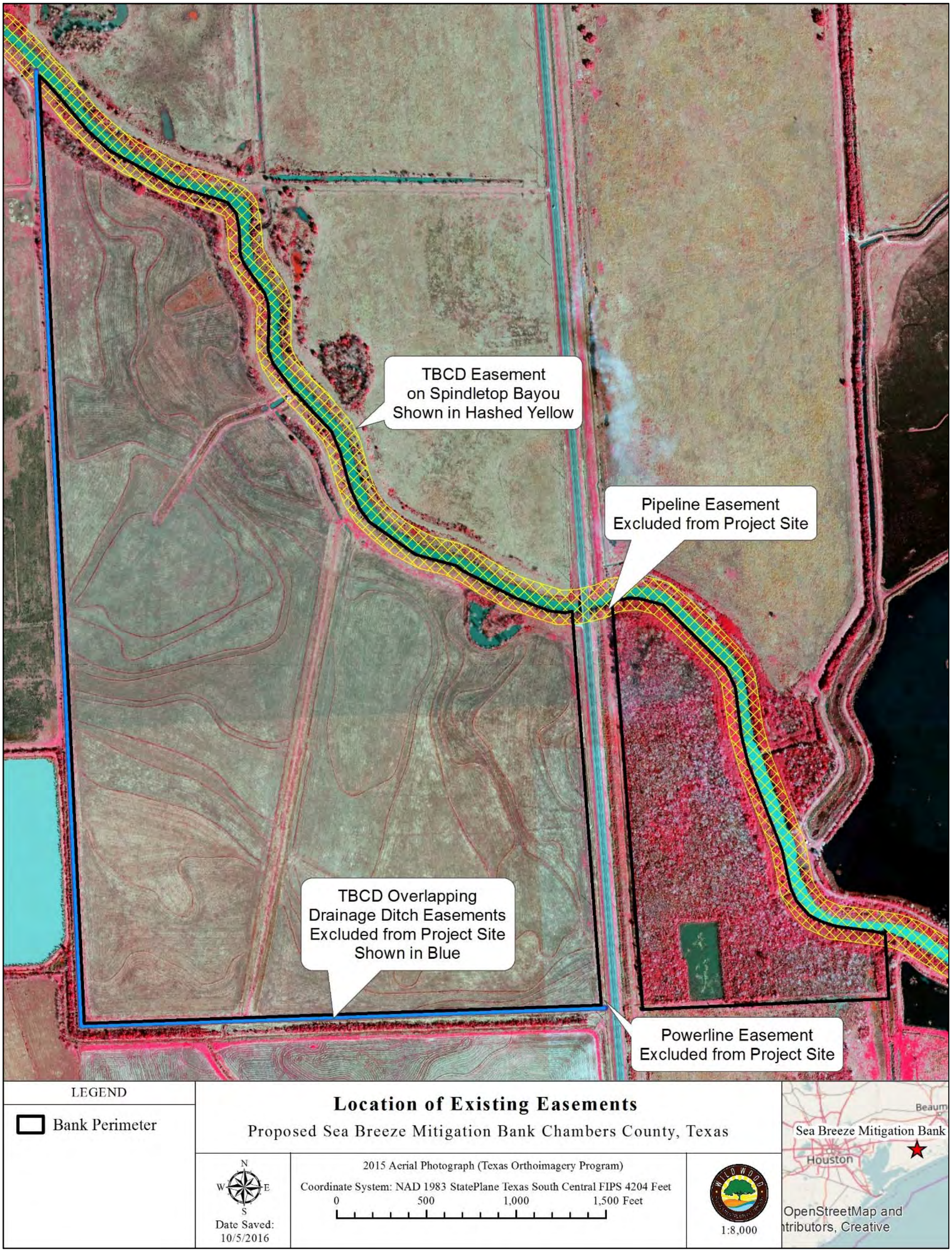


Figure 22. Location of existing and adjacent easements.

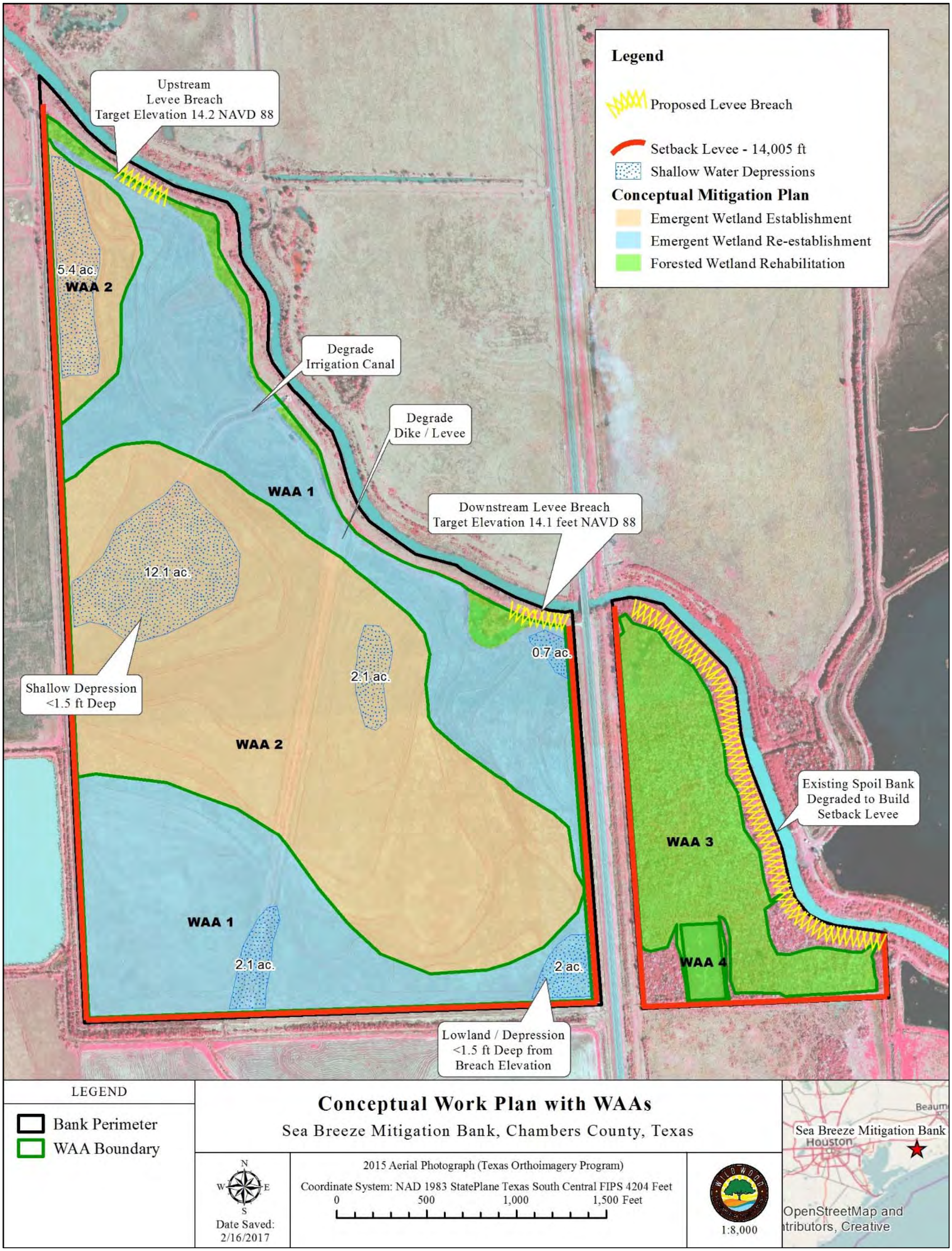


Figure 23. Conceptual Site Development Plan.

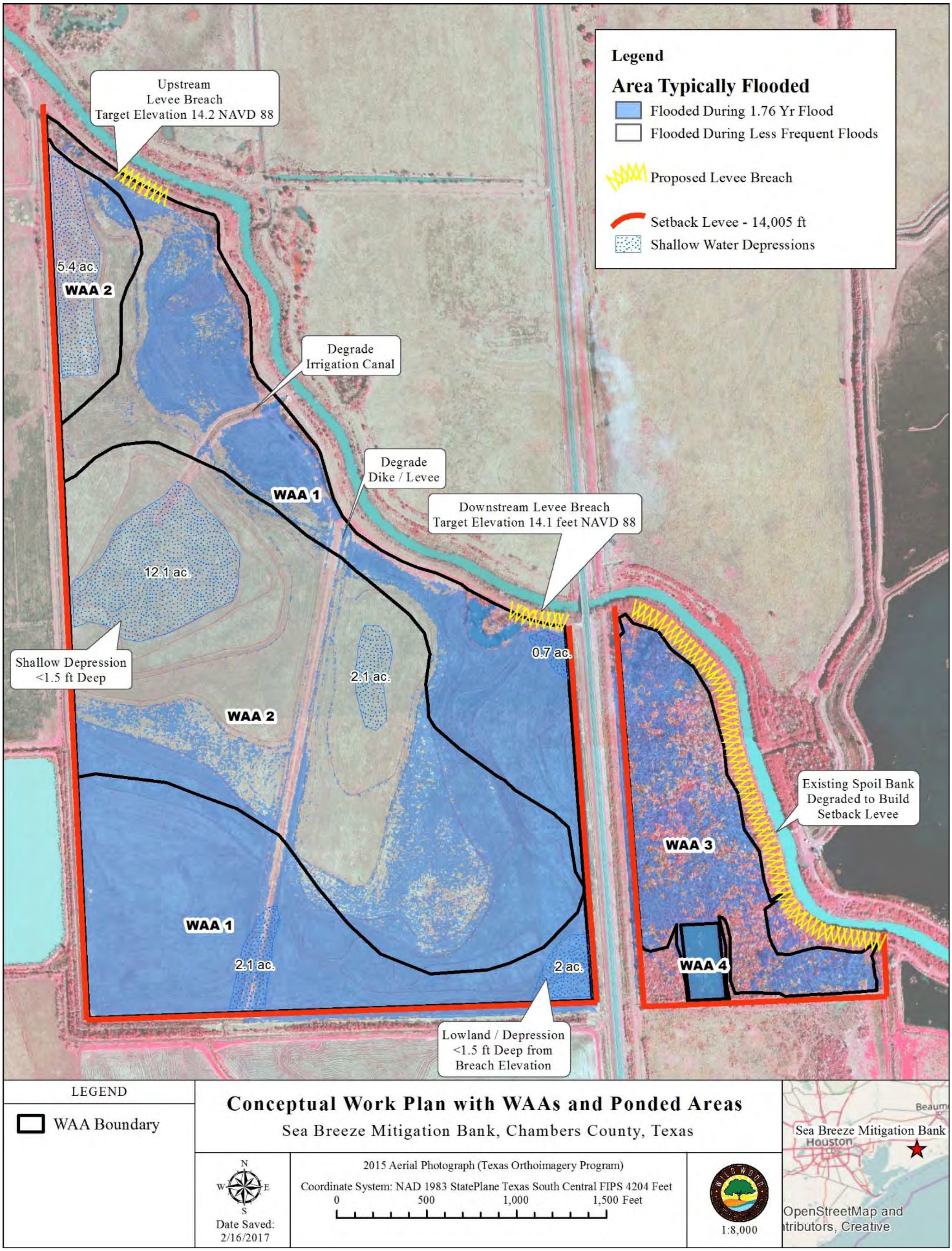


Figure 24. Conceptual mitigation work plan showing the location of WAAs, flooded areas, and ponded areas.

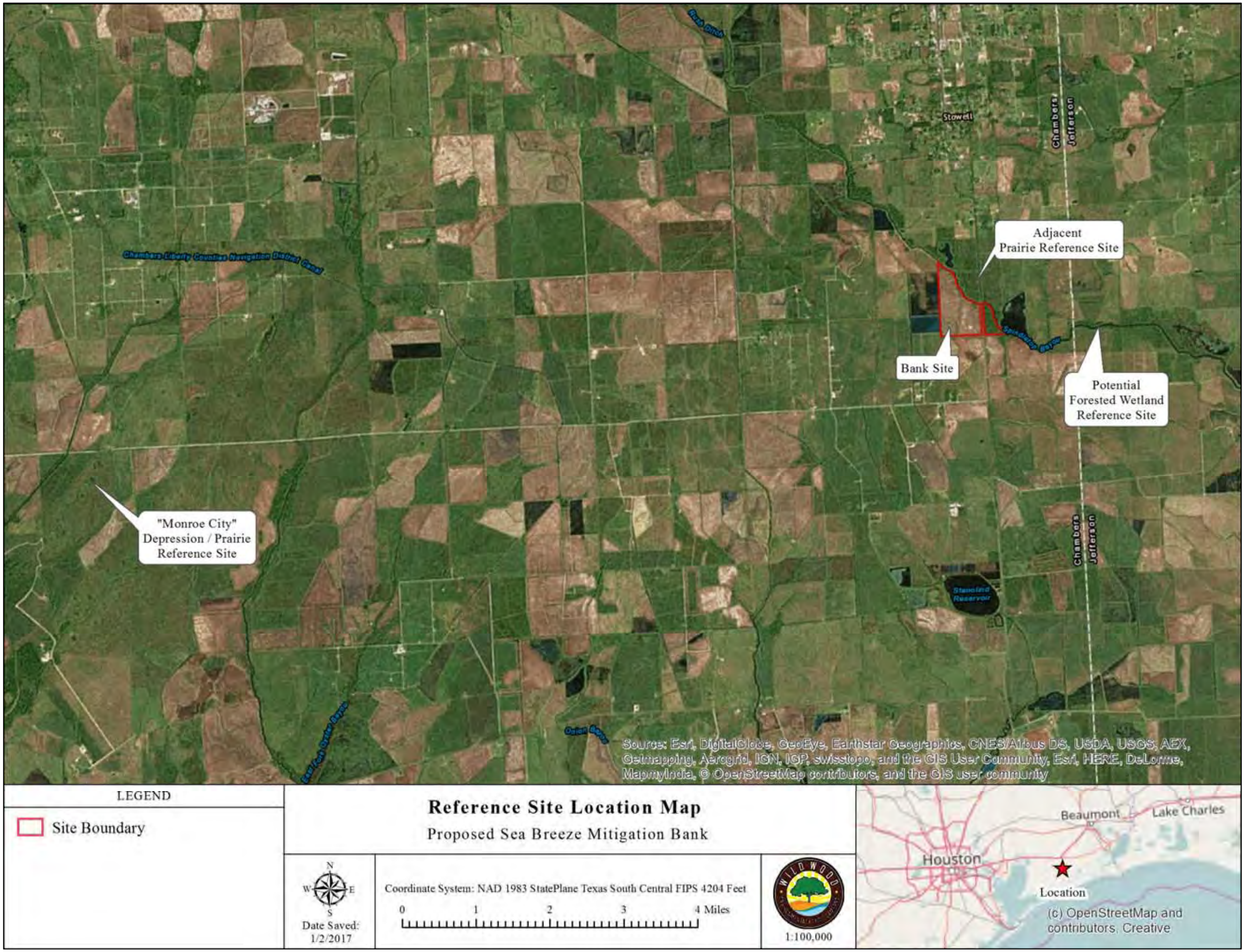


Figure 25. Location map of reference wetlands.

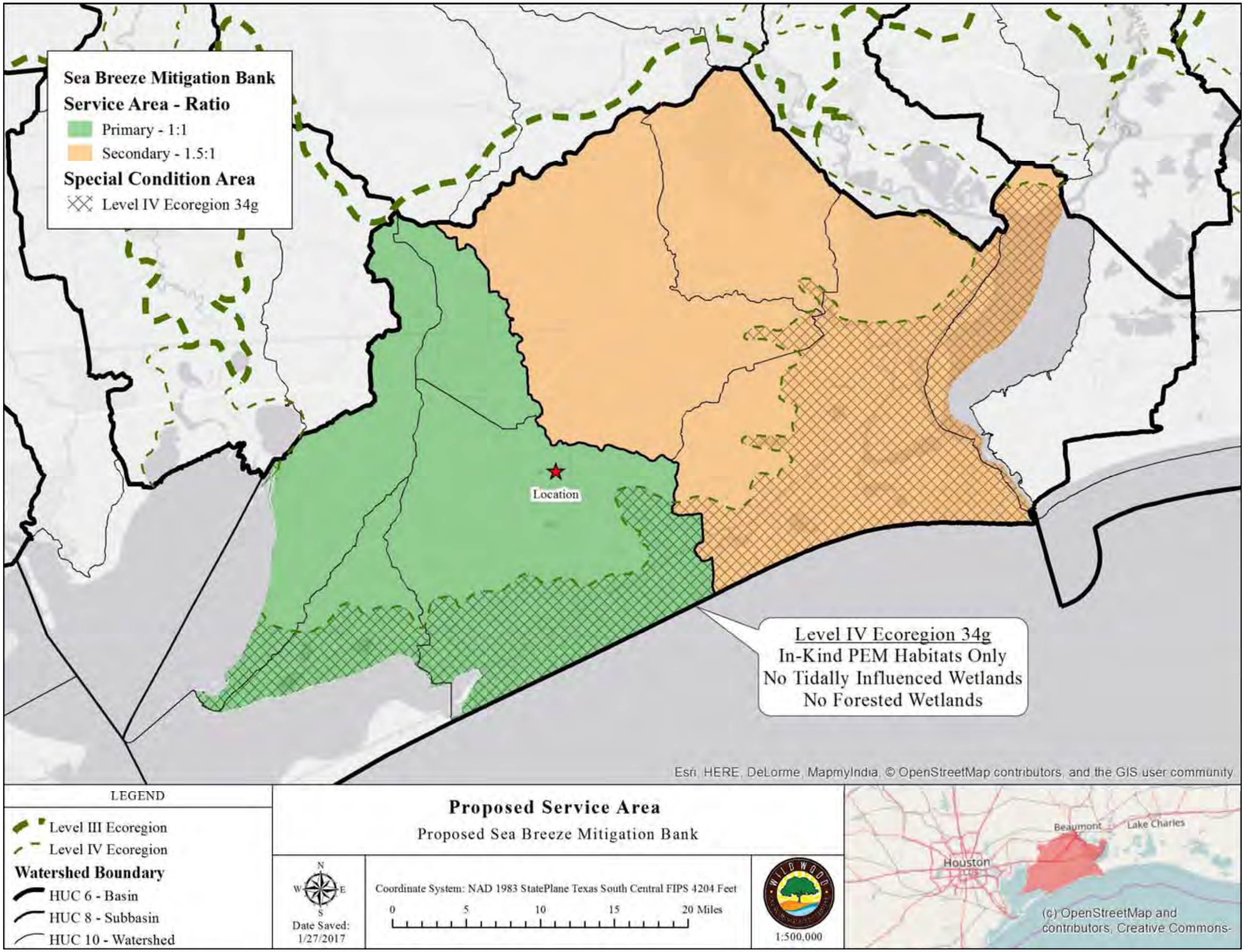


Figure 26. Proposed service area map.

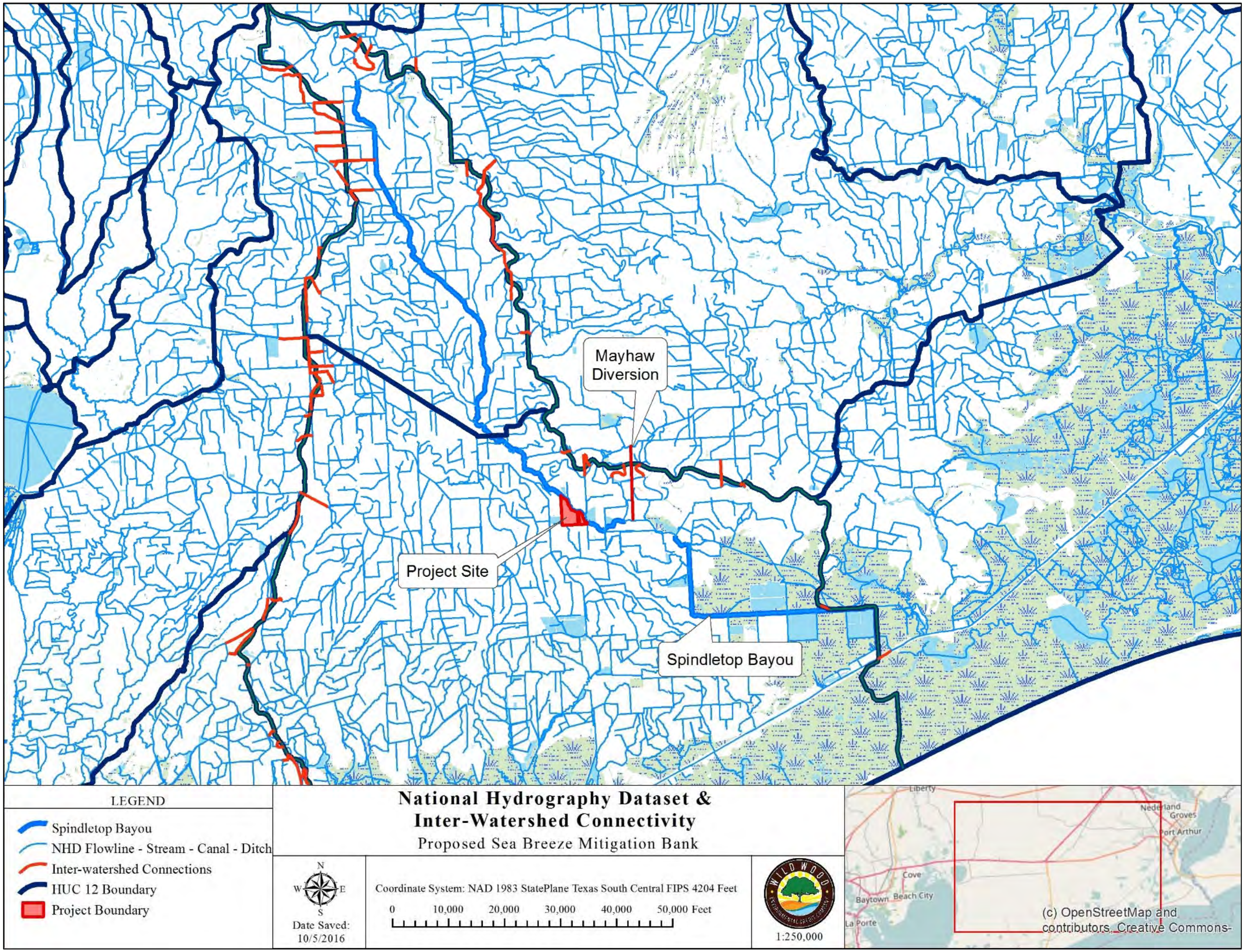


Figure 27. National Hydrography and Watershed Boundary Datasets showing Spindletop Bayou and inter-watershed connection points.

APPENDIX B - SELECTED PHOTOGRAPHS

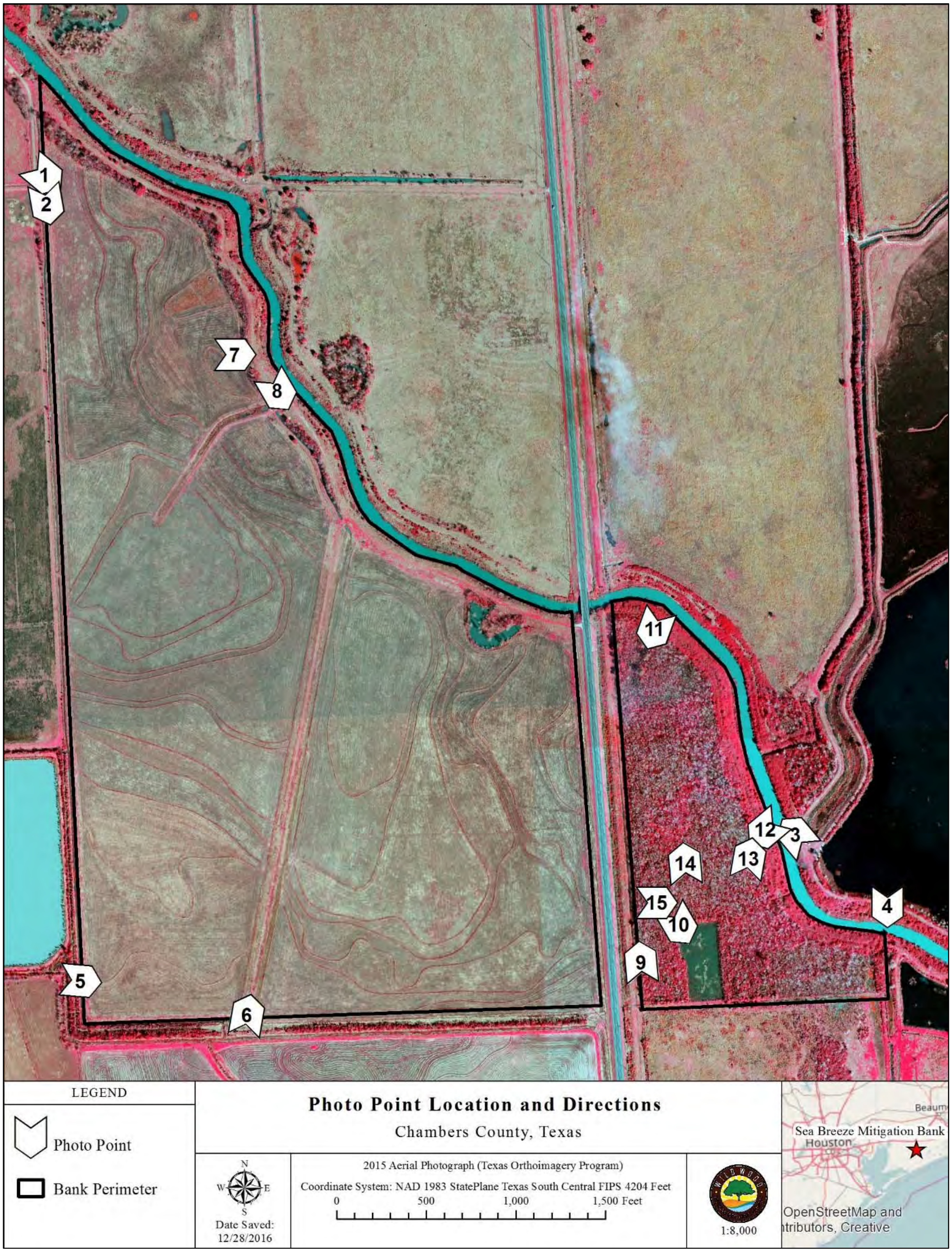


Figure 28. Map of photo locations.

Photo 1. View of west tract from midway down the west boundary line facing east (October 2015).

Photo 2. View looking south down western boundary of west tract. Note TBCD ditch on right (October 2015).

Photo 3. Offsite view of spoil bank “levee” on east tract taken from north bank facing upstream (September 2015).

Photo 4. View from across Spindletop of current breach in levee on northeast corner of east tract (September 2015).

Photo 5. View from southwest corner of west tract looking east towards SH 124 (October 2015).

Photo 6. View from south line of west tract looking northeast up former runway (October 2015).

Photo 7. Water control structure in spoil bank levee along Spindletop Bayou in west tract (October 2015).

Photo 8. West tract view looking southeast from Spindletop Bayou spoil bank (note rice field levees) (June 2015).

Photo 9. East tract view north up former railroad bed showing west boundary of tract (Nov. 2016).

Photo 10. East tract view looking southeast across former borrow pit (November 2016).

Photo 11. Former Spindletop Bayou channel remnant on east tract that is now a rookery (November 2016).

Photo 12. Typical view from spoil bank on east tract looking into the tract (November 2016).

Photo 13. Panoramic view of forested wetland along edge of spoil bank showing ponding against spoil bank following rain event (November 2016).

Photo 14. Chinese privet, yaupon, and Rubus spp. within canopy gap on east tract.

Photo 15. Typical dense sapling stand of green ash (Fraxinus pennsylvanica) on the east tract (November 2016).

Photo 16. December 4, 2016 9:45 AM photo take from north side of bridge across Spindletop Bayou looking at northeast corner of west tract. The gage was at approximately 13.9 feet when this photograph was taken.

APPENDIX C – JURISDICTIONAL DETERMINATION SUBMITTAL EAST TRACT

Horizon
Environmental Services, Inc.

15 January 2016

Mr. Kenny Jaynes
Chief, Compliance Section
U.S. Army Corps of Engineers,
Galveston District, Regulatory Branch
P.O. Box 1229
Galveston, Texas 77553-1229

RE: **Proposed Seabreeze Mitigation Bank, 40-Acre Parcel**
Chambers County, Texas
Section 404 Jurisdictional Determination
HJN 150158 WD

Dear Mr. Jaynes,

Horizon Environmental Services, Inc. (Horizon) has evaluated the referenced site for potential areas subject to jurisdiction under Section 404 of the Clean Water Act and regulated by the US Army Corps of Engineers (USACE) (wetlands and other "waters of the U.S."). This letter and attachments provide the results of our investigation. We respectfully request a verification of jurisdictional areas on the subject tract sufficient for mitigation bank development. The 40-acre parcel is a portion of the proposed Seabreeze Mitigation Bank. We will be requesting a verification of "PC" on the remainder of the proposed bank (existing rice farm) in a separate transmittal.

Project Location and General Description

The subject Property consists of an approximately 40-acre tract of undeveloped forested land approximately located 2.5 miles south of Stowell, Texas, at the southeast corner of the SH 124 Bridge over Spindletop Bayou, Chambers County, Texas (see Figure 1). It is bounded on the north and east by Spindletop Bayou, on the west by SH 124 and pipeline easements, and on the south by undeveloped land. Current and historical use of the Property appears to have included historical rice farming and cattle grazing activities. The Global Positioning System (GPS) location is approximately 29.750013°Latitude and -94.374739°Longitude.

The Property`s vegetation is relatively homogeneous, being dominated, for the most part, by an overstory of green ash (*Fraxinus pennsylvanica*) and Chinese tallow (*Triadica sebifera*) with occasional red maple (*Acer rubrum*), sugarberry (*Celtis laevigata*), loblolly pine (*Pinus taeda*), slippery elm (*Ulmus rubra*), bald cypress (*Taxodium distichum*), and live oak (*Quercus virginiana*).

CORPORATE HEADQUARTERS
1507 S Interstate 35 ★ Austin, Texas 78741-2502 ★ 512.328.2430 ★ www.horizon-esi.com
Certified WBE/HUB/DBE/SBE

Horizon
Environmental Services, Inc.

The site contains a relatively dense understory of Chinese tallow, Chinese privet (*Ligustrum sinense*), and yaupon (*Ilex vomitoria*) with dense branched blackberry (*Rubus suus*) in most areas. The Property is within the FEMA 100-year floodplain (Map Panels # 48071C0270E, 48071C0300, 48071C0450 and 48071C0475, Date May 4, 2015).

Jurisdictional Determination

This determination of jurisdiction under Section 404 of the Clean Water Act for wetlands and other water features consisted of a pre-field literature review and a site assessment conducted according to the general methodologies prescribed by the 1987 USACE *Wetlands Delineation Manual* and Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (Version 2.0), and USACE Regulatory Guidance Letter (RGL) No. 05-05 (7 December 2005). The determination of jurisdiction was made in conformance with the 2008 Clean Water Act Jurisdictional Determination Guidance (Rapanos Guidance) pending final judicial resolution of the status and validity of the 2015 Rule on Section 404 Jurisdiction. The Routine Method was chosen based on the study area size and relatively homogeneous vegetation composition.

Pre-field Evaluation

The literature evaluation included a review of the following sources of information:

1. US Geological Survey (USGS) topographic maps (Hamshire, Texas, 1994, Stanolind Reservoir, Texas, 1994, Stowell, 1993, Texas, and Whites Ranch, 1993),
2. Federal Emergency Management Agency (FEMA) flood hazard maps, (Map Panels # 48071C0270E, 48071C0300, 48071C0450 and 48071C0475, Date May 4, 2015)
3. Department of the Interior, U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) map (Wetland mapper accessed 3 November 2015),
4. Black and white and color historic aerial photography (General Land Office (31 December 1937 and 31 December 1969, 31 December 2008), USGS (21 February 1995), US Department of Agriculture (USDA) Farm Service Agency (27 June 2005), and Google Earth (3 October 2014),
5. US Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) soil survey information (Web Soil Survey, accessed 3 November 2015).

The above mentioned documents were utilized to evaluate the subject site for potential wetlands or other "waters of the U.S." that would require further assessment during the field investigation. The literature evaluation determined that there was a potential for wetland areas within the Property. Specifically, the FEMA maps indicated that the property was within the 100-year floodplain of Spindletop Bayou. NRCS Soil maps indicate the predominant soil present within the property is Beaumont clay, which is included in the List of Hydric Soils of Texas. Historic and current aerial photographs indicated potential wetlands associated with an old meander of Spindletop Bayou and an open water area.

Field Reconnaissance

Horizon personnel conducted a field investigation on 4 and 5 November 2015 to assess the site for potential wetlands and other water features. In addition, Horizon personnel determined which features, if any, met the USACE criteria to be classified as jurisdictional and subject to regulation under Section 404 of the Clean Water Act. A total of 21 sample points were performed along transects within the referenced Property (Figure 2). Copies of the Field Data Sheets are included with this letter for your review and records.

The site was found to contain wetlands and non-wetlands. Wetland areas were dominated for the most part by Chinese tallow, green ash, and branched blackberry, along with sugarberry, and red maple. Spindletop Bayou is located along the north and east boundaries of the Property and receives drainage from the site via two small drainage outlets. At the time of the field investigation a portion of the Property was inundated due to poor drainage. Evidence of surface saturation and/or shallow ground water table was also observed (water marks, stained leaves, sediment deposits). Soils were predominantly found to meet the Beaumont clay profile. Hydric soils indicators consisting of depleted matrix (F3) were observed within the data points inside the wetland areas. Non-wetlands were dominated by live oak, yaupon, and Chinese privet and did not exhibit evidence of wetland hydrology.

Based on the field investigation, and current USACE guidance, Horizon determined the majority of the subject Property to meet the requisite criteria (hydrophytic vegetation, hydrology, and hydric soils) to be classified as wetlands. A small portion of the southwestern part of the Property exhibited non-wetland characteristics.

Jurisdictional Determination

The subject Property is located within the FEMA 100-year flood plain. The Property`s natural drainage was historically via overland sheet flow to Spindletop Bayou located along the northern and eastern boundary of the Property, but channelization of Spindletop Bayou many years ago for flood control resulted in large levees along the bayou and only minimal provision for site drainage via two small man-made cuts in the levee. Site drainage is now seriously impaired by the berms along Spindletop Bayou.

Spindletop Bayou adjacent to the site is a Relatively Permanent Water (RPW) of the United States in accordance with 33 CFR §328.3(a)(5). It later becomes a Traditional Navigable Water (TNW) downstream of a man-made saltwater barrier located below Stowell and discharges into the Gulf Intracoastal Waterway, also a TNW in accordance with 33 CFR §328.3(a)(1). The water features

Horizon
Environmental Services, Inc.

Mr. Kenny Jaynes
HJN 150158 WD
15 January 2016
Page 4

identified within the Property were determined to be adjacent to Spindletop Bayou by virtue of being located within the FEMA 100-year flood plain. Therefore, the water features are waters of the United States pursuant to 33 CFR §328.3(a)(6). The boundaries of the water features were identified utilizing Garmin hand held GPS receivers. Figure 2 shows the location and boundaries of the water features.

Summary

Based on the pre-field literature review, field investigation and current USACE guidance, Horizon determined that there exists on the site one jurisdictional forested wetland encompassing approximately 27 acres, one herbaceous wetland that is 0.47 acre, and one excavated, open water pond that is 2.0 acres. Total jurisdictional area on the property is 29.8 acres.

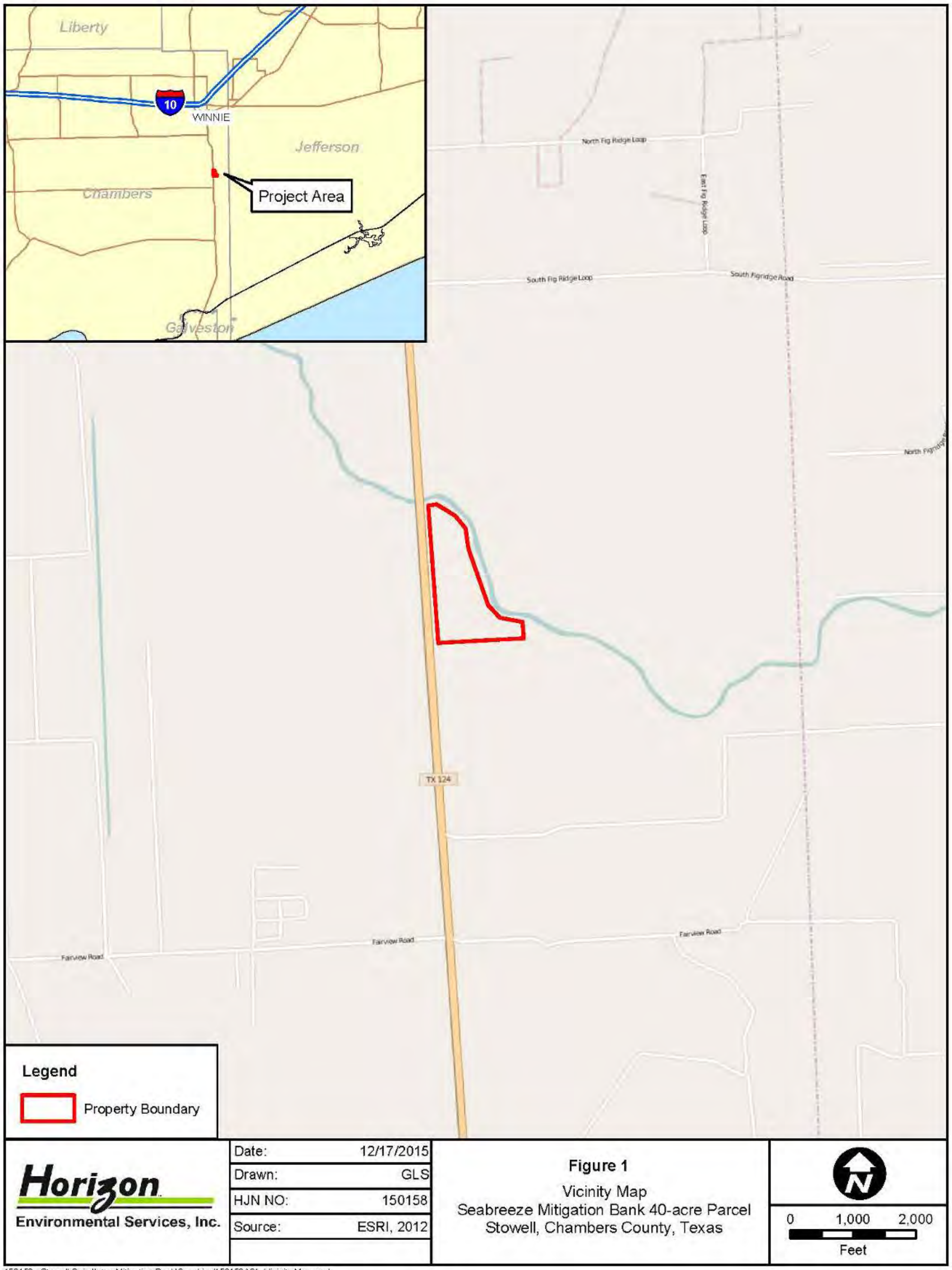
If you have any questions or require additional information please contact me at 512-328-2430.

Sincerely,

C. Lee Sherrod

C. Lee Sherrod
Vice President

Seabreeze MB 40-ac AJD.draft.doc



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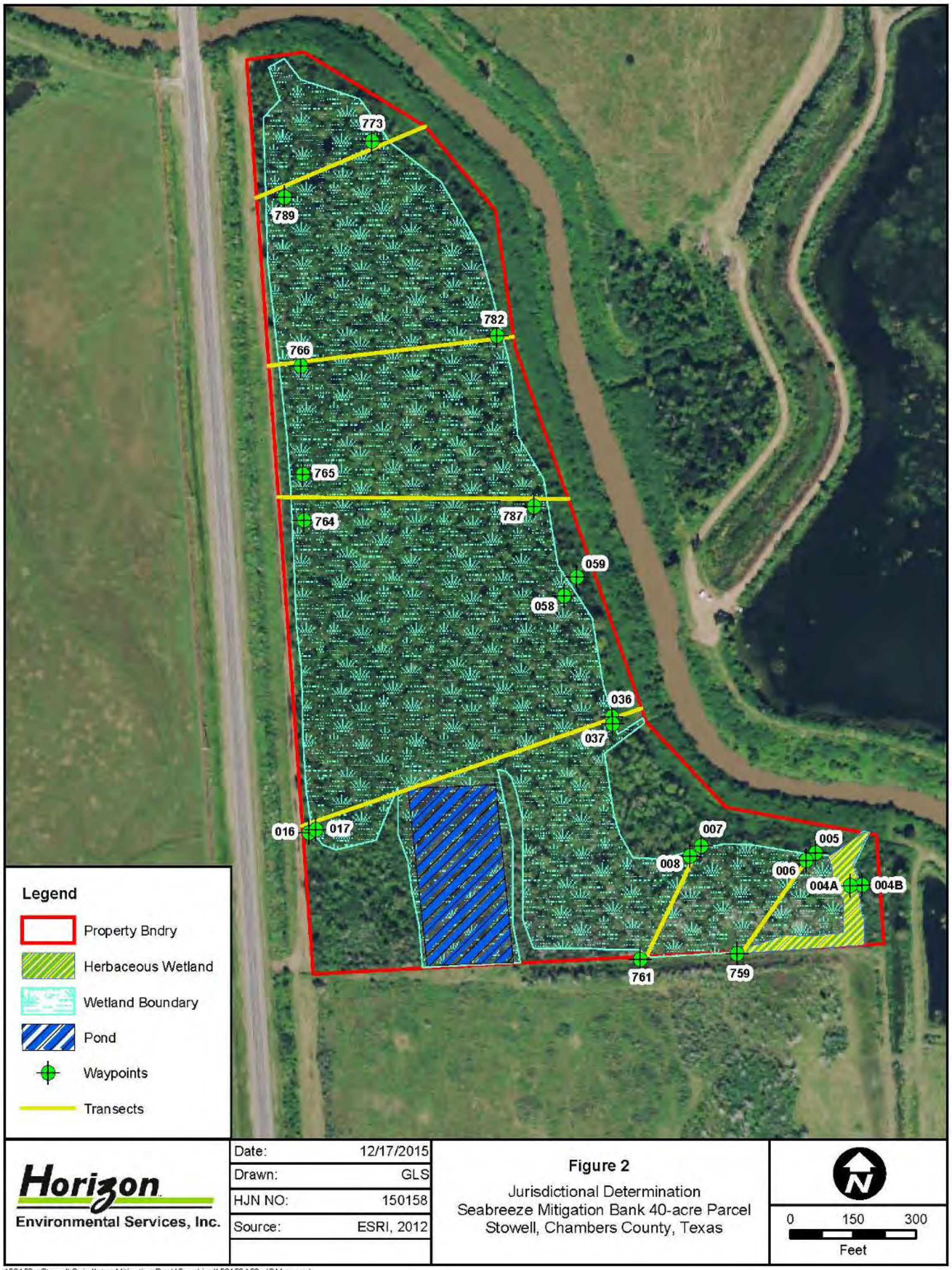
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Herbaceous Wetland
Wetland Boundary
Pond
Waypoints
Transects
Horizon
Environmental Services, Inc.
Date: 12/17/2015
Drawn: GLS
HJN NO: 150158
Source: ESRI, 2012
Figure 2
Jurisdictional Determination
Seabreeze Mitigation Bank 40-acre Parcel
Stowell, Chambers County, Texas
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Feet
150158 - Stowell-Spindletop Mitigation Bank\Graphics\150158A02_JDMap.mxd

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Seabreeze Mitigation Bank 40-acre Parcel City/County: Chambers County Sampling Date: 4 Nov 2015

Applicant/Owner: Wildwood Environmental Credit Company, LLC State: Texas Sampling Point: DP4A

Investigator(s): Lee Sherrod and Tony Vazquez Section, Township, Range:

Landform (hillslope, terrace, etc.): flood plain Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR or MLRA): LRR T, MLRA 150A Lat: 29.747909° Long: -94.371667° Datum:

Soil Map Unit Name: Beaumont silty clay, 0 to 1 percent slopes, rarely flooded NWI classification: None

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

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

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

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

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

Remarks:

Berm on property boundary.

HYDROLOGY

Wetland Hydrology Indicators:

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

- [X] Surface Water (A1)
- [X] High Water Table (A2)
- [X] Saturation (A3)
- [X] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [X] Aquatic Fauna (B13)
- [ ] Marl Deposits (B15) **(LRR U)**
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- [ ] Surface Soil Cracks (B6)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [X] Drainage Patterns (B10)
- [ ] Moss Trim Lines (B16)
- [ ] Dry-Season Water Table (C2)
- [ ] Crayfish Burrows (C8)
- [X] Saturation Visible on Aerial Imagery (C9)
- [ ] Geomorphic Position (D2)
- [ ] Shallow Aquitard (D3)
- [ ] FAC-Neutral Test (D5)
- [ ] Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes [X] No [ ]	Depth (inches): 2-3	
Water Table Present?	Yes [X] No [ ]	Depth (inches): Surface	
Saturation Present? (includes capillary fringe)	Yes [X] No [ ]	Depth (inches): Surface	**Wetland Hydrology Present? Yes [X] No [ ]**

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

Remarks:

Sample point located at wetland edge.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: DP4A

Tree Stratum (Plot size: ______)

	Absolute % Cover	Dominant Species?	Indicator Status
1. Quercus laurifolia	8	Yes	FACW
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	8%	= Total Cover	

50% of total cover: 4% 20% of total cover: 2%

Sapling/Shrub Stratum (Plot size: ______)

	Absolute % Cover	Dominant Species?	Indicator Status
1. Ligustrum sinense	10	Yes	FAC
2. Triadica sebifera	5	Yes	FAC
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	15%	= Total Cover	

50% of total cover: 8% 20% of total cover: 3%

Herb Stratum (Plot size: ______)

	Absolute % Cover	Dominant Species?	Indicator Status
1. Eleocharis palustris	90	Yes	OBL
2. Mikania scandens	3	No	FACW
3. Ludwigia palustris	3	No	OBL
4. Rhyncospora corniculata	1	No	OBL
5. Ludwigia decurrens	2	No	OBL
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	99%	= Total Cover	

50% of total cover: 50% 20% of total cover: 20%

Woody Vine Stratum (Plot size: ______)

	Absolute % Cover	Dominant Species?	Indicator Status
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
	0%	= Total Cover	

50% of total cover: 0% 20% of total cover: 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: (If observed, list morphological adaptations below).

US Army Corps of Engineers Atlantic and Gulf Coastal Plain Region – Version 2.0

SOIL

Sampling Point: DP4A

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
2	10YR 4/2	100			-	-	clay	
4	10YR 4/1	100			-	-	clay	
6	10YR 5/1		7.5YR 5/6	10	C	M	clay	
8	10YR 5/2		7.5YR 5/6	15	C	M	clay	
12 - 20	10YR 5/2		7.5YR 5/6	15	C	M	clay	
					-	-		
					-	-		

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: __________

Depth (inches): __________

Hydric Soil Present? Yes ☒ No ☐

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Seabreeze Mitigation Bank 40-acre Parcel City/County: Chambers County Sampling Date: 4 Nov 2015

Applicant/Owner: Wildwood Environmental Credit Company, LLC State: Texas Sampling Point: DP4B

Investigator(s): Lee Sherrod and Tony Vazquez Section, Township, Range: ____

Landform (hillslope, terrace, etc.): Berm slope Local relief (concave, convex, none): Convex Slope (%): 33

Subregion (LRR or MLRA): LRR T, MLRA 150A Lat: 29.747909° Long: -94.371667° Datum: ____

Soil Map Unit Name: Beaumont silty clay, 0 to 1 percent slopes, rarely flooded NWI classification: None

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

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

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

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

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

Remarks:

Berm on property boundary.

HYDROLOGY

Wetland Hydrology Indicators:

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

- [ ] Surface Water (A1)
- [ ] High Water Table (A2)
- [ ] Saturation (A3)
- [ ] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Aquatic Fauna (B13)
- [ ] Marl Deposits (B15) **(LRR U)**
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- [ ] Surface Soil Cracks (B6)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [ ] Drainage Patterns (B10)
- [ ] Moss Trim Lines (B16)
- [ ] Dry-Season Water Table (C2)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Geomorphic Position (D2)
- [ ] Shallow Aquitard (D3)
- [ ] FAC-Neutral Test (D5)
- [ ] Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes [ ] No [X]	Depth (inches): ____	
Water Table Present?	Yes [ ] No [X]	Depth (inches): ____	
Saturation Present? (includes capillary fringe)	Yes [ ] No [X]	Depth (inches): ____	**Wetland Hydrology Present?** Yes [ ] No [X]

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

Remarks:

Sample point located on slope of ~4-foot high berm adjacent to wetland. Area very well drained.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: DP4B

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Quercus laurifolia	5	Yes	FACW
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	5% = Total Cover		
50% of total cover: 3%	20% of total cover: 1%		

Sapling/Shrub Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Ligustrum sinense	100	Yes	FAC
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	100% = Total Cover		
50% of total cover: 50%	20% of total cover: 20%		

Herb Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	0% = Total Cover		
50% of total cover: 0%	20% of total cover: 0%		

Woody Vine Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
	0% = Total Cover		
50% of total cover: 0%	20% of total cover: 0%		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: (If observed, list morphological adaptations below).

Site completely covered by Chinese privet. Laurel oak located just inside wetland boundary at 14 - 15 feet from sample point.

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SOIL

Sampling Point: DP4B

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
2	10YR 3/1	100				-	clay	
4-20	10YR 4/2	100			-	-	clay	
					-	-		
					-	-		
					-	-		
					-	-		
					-	-		

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ☐ No ☒

Remarks:

Sample point on slope of berm resulting from disposal of excavated material from adjacent Spindletop Bayou.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Seabreeze Mitigation Bank 40-acre Parcel City/County: Chambers County Sampling Date: 4 Nov 2015

Applicant/Owner: Wildwood Environmental Credit Company, LLC State: Texas Sampling Point: DP5

Investigator(s): Lee Sherrod and Tony Vazquez Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Berm slope Local relief (concave, convex, none): Convex Slope (%): ~3

Subregion (LRR or MLRA): LRR T, MLRA 150A Lat: 29.748126° Long: -94.372011° Datum: ______

Soil Map Unit Name: Beaumont silty clay, 0 to 1 percent slopes, rarely flooded NWI classification: None

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

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

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

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

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

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- [ ] Surface Water (A1)
- [ ] High Water Table (A2)
- [ ] Saturation (A3)
- [ ] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Aquatic Fauna (B13)
- [ ] Marl Deposits (B15) **(LRR U)**
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- [ ] Surface Soil Cracks (B6)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [ ] Drainage Patterns (B10)
- [ ] Moss Trim Lines (B16)
- [ ] Dry-Season Water Table (C2)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Geomorphic Position (D2)
- [ ] Shallow Aquitard (D3)
- [ ] FAC-Neutral Test (D5)
- [ ] Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes [ ]	No [X]	Depth (inches): ______
Water Table Present?	Yes [ ]	No [X]	Depth (inches): ______
Saturation Present? (includes capillary fringe)	Yes [ ]	No [X]	Depth (inches): ______

Wetland Hydrology Present? Yes [ ] No [X]

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

Remarks:

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VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: DP5

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	0%	= Total Cover	
50% of total cover: 0%	20% of total cover: 0%		

Sapling/Shrub Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. Ligustrum sinense	90	Yes	FAC
2. Triadica sebifera	5	No	FAC
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	95%	= Total Cover	
50% of total cover: 48%	20% of total cover: 19%		

Herb Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. Rubus suus	5	Yes	FAC
2. Rubus trivialis	5	Yes	FACU
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	10%	= Total Cover	
50% of total cover: 5%	20% of total cover: 2%		

Woody Vine Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
	0%	= Total Cover	
50% of total cover: 0%	20% of total cover: 0%		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: (If observed, list morphological adaptations below).

Site completely covered by Chinese privet.

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SOIL

Sampling Point: DP5

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
1-20	10YR 3/1	100				-	clay	
					-	-		
					-	-		
					-	-		
					-	-		
					-	-		
					-	-		

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ☐ No ☒

Remarks:

US Army Corps of Engineers — Atlantic and Gulf Coastal Plain Region – Version 2.0

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Seabreeze Mitigation Bank 40-acre Parcel City/County: Chambers County Sampling Date: 4 Nov 2015
Applicant/Owner: Wildwood Environmental Credit Company, LLC State: Texas Sampling Point: DP6
Investigator(s): Lee Sherrod and Tony Vazquez Section, Township, Range:
Landform (hillslope, terrace, etc.): flood plain Local relief (concave, convex, none): none Slope (%): 0
Subregion (LRR or MLRA): LRR T, MLRA 150A Lat: 29.748082° Long: -94.372084° Datum:
Soil Map Unit Name: Beaumont silty clay, 0 to 1 percent slopes, rarely flooded NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes [X] No [ ] (If no, explain in Remarks.)
Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes [X] No [ ]
Are Vegetation [ ], Soil [ ], or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- [X] Surface Water (A1)
- [X] High Water Table (A2)
- [X] Saturation (A3)
- [X] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Aquatic Fauna (B13)
- [ ] Marl Deposits (B15) **(LRR U)**
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- [ ] Surface Soil Cracks (B6)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [X] Drainage Patterns (B10)
- [ ] Moss Trim Lines (B16)
- [ ] Dry-Season Water Table (C2)
- [ ] Crayfish Burrows (C8)
- [X] Saturation Visible on Aerial Imagery (C9)
- [ ] Geomorphic Position (D2)
- [ ] Shallow Aquitard (D3)
- [ ] FAC-Neutral Test (D5)
- [ ] Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes [X] No [ ]	Depth (inches): 2 - 3	
Water Table Present?	Yes [X] No [ ]	Depth (inches): Surface	
Saturation Present? (includes capillary fringe)	Yes [X] No [ ]	Depth (inches): Surface	**Wetland Hydrology Present? Yes [X] No [ ]**

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

Remarks:

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VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP6

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus pennsylvanica	10	Yes	FACW
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	10% = Total Cover		
50% of total cover: 5%	20% of total cover: 2%		

Sapling/Shrub Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Ligustrum sinense	10	Yes	FAC
2. Triadica sebifera	10	Yes	FAC
3. Acer rubrum	5	Yes	FAC
4. Celtis laevigata	1	No	FAC
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	26% = Total Cover		
50% of total cover: 13%	20% of total cover: 5%		

Herb Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Eleocharis palustris	50	Yes	OBL
2. Mikania scandens	2	No	FACW
3. Ludwigia palustris	3	No	OBL
4. Rhyncospora coeniculata	5	No	OBL
5. Ludwigia decurrens	2	No	OBL
6. Cyperus ochraceus	2	No	FACW
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	64% = Total Cover		
50% of total cover: 32%	20% of total cover: 13%		

Woody Vine Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Rubus suus	40	Yes	FAC
2.		-	-
3.		-	-
4.		-	-
5.		-	-
	40% = Total Cover		
50% of total cover: 20%	20% of total cover: 8%		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: (If observed, list morphological adaptations below).

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SOIL

Sampling Point: DP6

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
2	10YR 3/1	100			-	-	clay	
4	10YR 3/1	100			-	-	clay	
6	10YR 4/1	90	7.5YR 5/6	10	C	M	clay	
8	10YR 5/1	85	7.5YR 5/6	15	C	M	clay	
12 - 20	10YR 5/1	85	7.5YR 5/6	15	C	M	clay	
					-	-		
					-	-		

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: ________

Depth (inches): ________

Hydric Soil Present? Yes ☒ No ☐

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Seabreeze Mitigation Bank 40-acre Parcel City/County: Chambers County Sampling Date: 4 Nov 2015

Applicant/Owner: Wildwood Environmental Credit Company, LLC State: Texas Sampling Point: DP7

Investigator(s): Lee Sherrod and Tony Vazquez Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Man-made Levee Local relief (concave, convex, none): Convex Slope (%): 2

Subregion (LRR or MLRA): LRR T, MLRA 150A Lat: 29.748198° Long: -94.372871° Datum: ______

Soil Map Unit Name: Beaumont silty clay, 0 to 1 percent slopes, rarely flooded NWI classification: None

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

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

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

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

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

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- [ ] Surface Water (A1)
- [ ] High Water Table (A2)
- [ ] Saturation (A3)
- [ ] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Aquatic Fauna (B13)
- [ ] Marl Deposits (B15) **(LRR U)**
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- [ ] Surface Soil Cracks (B6)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [ ] Drainage Patterns (B10)
- [ ] Moss Trim Lines (B16)
- [ ] Dry-Season Water Table (C2)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Geomorphic Position (D2)
- [ ] Shallow Aquitard (D3)
- [ ] FAC-Neutral Test (D5)
- [ ] Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes [ ] No [X] Depth (inches): ______

Water Table Present? Yes [ ] No [X] Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes [ ] No [X] Depth (inches): ______

Wetland Hydrology Present? Yes [ ] No [X]

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

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP7

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	0%	= Total Cover	
50% of total cover: 0%		20% of total cover: 0%	

Sapling/Shrub Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Ligustrum sinense	100	Yes	FAC
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	100%	= Total Cover	
50% of total cover: 50%		20% of total cover: 20%	

Herb Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	0%	= Total Cover	
50% of total cover: 0%		20% of total cover: 0%	

Woody Vine Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
	0%	= Total Cover	
50% of total cover: 0%		20% of total cover: 0%	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: (If observed, list morphological adaptations below).

Site completely covered by Chinese privet.

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SOIL

Sampling Point: DP7

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
1-20	10YR 3/1	100				-	clay	
					-	-		
					-	-		
					-	-		
					-	-		
					-	-		
					-	-		

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: ________

Depth (inches): ________

Hydric Soil Present? Yes ☐ No ☒

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Seabreeze Mitigation Bank 40-acre Parcel City/County: Chambers County Sampling Date: 4 Nov 2015

Applicant/Owner: Wildwood Environmental Credit Company, LLC State: Texas Sampling Point: DP8

Investigator(s): Lee Sherrod and Tony Vazquez Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Flood plain Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR or MLRA): LRR T, MLRA 150A Lat: 29.748135° Long: -94.372955° Datum: ______

Soil Map Unit Name: Beaumont silty clay, 0 to 1 percent slopes, rarely flooded NWI classification: None

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

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

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

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

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

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- [ ] Surface Water (A1)
- [ ] High Water Table (A2)
- [X] Saturation (A3)
- [ ] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Aquatic Fauna (B13)
- [ ] Marl Deposits (B15) **(LRR U)**
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- [ ] Surface Soil Cracks (B6)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [X] Drainage Patterns (B10)
- [ ] Moss Trim Lines (B16)
- [ ] Dry-Season Water Table (C2)
- [ ] Crayfish Burrows (C8)
- [X] Saturation Visible on Aerial Imagery (C9)
- [ ] Geomorphic Position (D2)
- [ ] Shallow Aquitard (D3)
- [ ] FAC-Neutral Test (D5)
- [ ] Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes [ ]	No [X]	Depth (inches): ______
Water Table Present?	Yes [ ]	No [X]	Depth (inches): ______
Saturation Present? (includes capillary fringe)	Yes [X]	No [ ]	Depth (inches): Surface

Wetland Hydrology Present? Yes [X] No [ ]

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

Remarks:

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VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP8

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus pennsylvanica	20	Yes	FACW
2. Triadica sebifera	10	Yes	FAC
3. Celtis laevigata	5	No	FAC
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	35% = Total Cover		
50% of total cover: 18%	20% of total cover: 7%		

Sapling/Shrub Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Ligustrum sinense	10	Yes	FAC
2. Triadica sebifera	5	Yes	FAC
3. Acer rubrum	5	Yes	FAC
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	20% = Total Cover		
50% of total cover: 10%	20% of total cover: 4%		

Herb Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Rubus suus	30	Yes	FAC
2. Rubus bushii	30	Yes	FACW
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	60% = Total Cover		
50% of total cover: 30%	20% of total cover: 12%		

Woody Vine Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
	0% = Total Cover		
50% of total cover: 0%	20% of total cover: 0%		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species	35	x 2 = 70
FAC species	95	x 3 = 285
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	130 (A)	355 (B)

Prevalence Index = B/A = 2.7

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: (If observed, list morphological adaptations below).

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Atlantic and Gulf Coastal Plain Region – Version 2.0

SOIL Sampling Point: DP8

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
2	10YR 3/1	100			-	-	clay	
4	10YR 3/2	95	7.5YR 5/6	5	C	M	clay	
6	10YR 4/1	90	7.5YR 5/6	10	C	M	clay	
8	10YR 5/1	85	7.5YR 5/6	15	C	M	clay	
12 - 20	10YR 5/1	85	7.5YR 5/6	15	C	M	clay	
					-	-		
					-	-		

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ☒ No ☐

Remarks:

US Army Corps of Engineers — Atlantic and Gulf Coastal Plain Region – Version 2.0

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Seabreeze Mitigation Bank 40-acre Parcel City/County: Chambers County Sampling Date: 5 Nov 2015

Applicant/Owner: Wildwood Environmental Credit Company, LLC State: Texas Sampling Point: DP16

Investigator(s): Lee Sherrod and Tony Vazquez Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Roadside Berm slope Local relief (concave, convex, none): Convex Slope (%): 1

Subregion (LRR or MLRA): LRR T, MLRA 150A Lat: 29.748370° Long: -94.375809° Datum: ______

Soil Map Unit Name: Beaumont silty clay, 0 to 1 percent slopes, rarely flooded NWI classification: None

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

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

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

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

Hydrophytic Vegetation Present?	Yes [X]	No [ ]
Hydric Soil Present?	Yes [ ]	No [X]
Wetland Hydrology Present?	Yes [ ]	No [X]

Is the Sampled Area within a Wetland? Yes [ ] No [X]

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- [ ] Surface Water (A1)
- [ ] High Water Table (A2)
- [ ] Saturation (A3)
- [ ] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Aquatic Fauna (B13)
- [ ] Marl Deposits (B15) **(LRR U)**
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- [ ] Surface Soil Cracks (B6)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [ ] Drainage Patterns (B10)
- [ ] Moss Trim Lines (B16)
- [ ] Dry-Season Water Table (C2)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Geomorphic Position (D2)
- [ ] Shallow Aquitard (D3)
- [ ] FAC-Neutral Test (D5)
- [ ] Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes [ ]	No [X]	Depth (inches): ______
Water Table Present?	Yes [ ]	No [X]	Depth (inches): ______
Saturation Present? (includes capillary fringe)	Yes [ ]	No [X]	Depth (inches): ______

Wetland Hydrology Present? Yes [ ] No [X]

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

Remarks:

US Army Corps of Engineers Atlantic and Gulf Coastal Plain Region – Version 2.0

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP16

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Quercus virginiana	10	Yes	FACU
2. Triadica sebifera	10	Yes	FAC
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	20%	= Total Cover	
50% of total cover: 10%	20% of total cover: 4%		

Sapling/Shrub Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Ligustrum sinense	15	Yes	FAC
2. Ilex vomitoria	10	Yes	FAC
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	25%	= Total Cover	
50% of total cover: 13%	20% of total cover: 5%		

Herb Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	0%	= Total Cover	
50% of total cover: 0%	20% of total cover: 0%		

Woody Vine Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Rubus trivialis	5	Yes	FACU
2. Rubus argutus	5	Yes	FAC
3. Rubus bushii	5	Yes	FACW
4.		-	-
5.		-	-
	15%	= Total Cover	
50% of total cover: 8%	20% of total cover: 3%		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: (If observed, list morphological adaptations below).

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SOIL

Sampling Point: DP16

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
2	10YR 3/1	100				-	clay	
4	10YR 3/2	100			-	-	clay	
6-12	10YR 4/2	100			-	-	clay	
12-20	10YR 5/2	100			-	-	clay	
					-	-		
					-	-		
					-	-		

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ☐ No ☒

Remarks:

US Army Corps of Engineers — Atlantic and Gulf Coastal Plain Region – Version 2.0

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Seabreeze Mitigation Bank 40-acre Parcel City/County: Chambers County Sampling Date: 5 Nov 2015

Applicant/Owner: Wildwood Environmental Credit Company, LLC State: Texas Sampling Point: DP17

Investigator(s): Lee Sherrod and Tony Vazquez Section, Township, Range: ______

Landform (hillslope, terrace, etc.): flood plain Local relief (concave, convex, none): Flat Slope (%): 0

Subregion (LRR or MLRA): LRR T, MLRA 150A Lat: 29.748389° Long: -94.375757° Datum: ______

Soil Map Unit Name: Beaumont silty clay, 0 to 1 percent slopes, rarely flooded NWI classification: None

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

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

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

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

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

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- [X] Surface Water (A1)
- [X] High Water Table (A2)
- [X] Saturation (A3)
- [ ] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Aquatic Fauna (B13)
- [ ] Marl Deposits (B15) **(LRR U)**
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- [ ] Surface Soil Cracks (B6)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [X] Drainage Patterns (B10)
- [ ] Moss Trim Lines (B16)
- [ ] Dry-Season Water Table (C2)
- [ ] Crayfish Burrows (C8)
- [X] Saturation Visible on Aerial Imagery (C9)
- [ ] Geomorphic Position (D2)
- [ ] Shallow Aquitard (D3)
- [ ] FAC-Neutral Test (D5)
- [ ] Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes [X] No [ ]	Depth (inches): 2	
Water Table Present?	Yes [X] No [ ]	Depth (inches): surface	
Saturation Present? (includes capillary fringe)	Yes [X] No [ ]	Depth (inches): Surface	**Wetland Hydrology Present? Yes [X] No [ ]**

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

Remarks:

US Army Corps of Engineers Atlantic and Gulf Coastal Plain Region – Version 2.0

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP17

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus pennsylvanica	20	Yes	FACW
2. Triadica sebifera	5	No	FAC
3. Quercus laurifolia	5	No	FACW
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	30% = Total Cover		
50% of total cover: 15%	20% of total cover: 6%		

Sapling/Shrub Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	5	Yes	FAC
2. Triadica sebifera	5	Yes	FAC
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	10% = Total Cover		
50% of total cover: 5%	20% of total cover: 2%		

Herb Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Rubus suus	40	Yes	FAC
2. Rubus bushii	30	Yes	FACW
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	70% = Total Cover		
50% of total cover: 35%	20% of total cover: 14%		

Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Parthenocissus quinquefolia	1	Yes	FACU
2.		-	-
3.		-	-
4.		-	-
5.		-	-
	1% = Total Cover		
50% of total cover: 1%	20% of total cover: 0%		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 83% (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: (If observed, list morphological adaptations below).

US Army Corps of Engineers — Atlantic and Gulf Coastal Plain Region – Version 2.0

SOIL

Sampling Point: DP17

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
2	10YR 3/1	100			-	-	clay	
4	10YR 3/1	95	7.5YR 5/6	5	C	M	clay	
6	10YR 4/2	90	7.5YR 5/6	10	C	M	clay	
8	10YR 5/1	85	7.5YR 5/6	15	C	M	clay	
12 - 20	10YR 5/1	85	7.5YR 5/6	15	C	M	clay	
					-	-		
					-	-		

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ☒ No ☐

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Seabreeze Mitigation Bank 40-acre Parcel City/County: Chambers County Sampling Date: 5 Nov 2015
Applicant/Owner: Wildwood Environmental Credit Company, LLC State: Texas Sampling Point: DP36
Investigator(s): Lee Sherrod and Tony Vazquez Section, Township, Range: ______
Landform (hillslope, terrace, etc.): man-made levee Local relief (concave, convex, none): Convex Slope (%): 2
Subregion (LRR or MLRA): LRR T, MLRA 150A Lat: 29.748882° Long: -94.373736° Datum: ______
Soil Map Unit Name: Beaumont silty clay, 0 to 1 percent slopes, rarely flooded NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes [X] No [ ] (If no, explain in Remarks.)
Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes [X] No [ ]
Are Vegetation [ ], Soil [ ], or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- [ ] Surface Water (A1)
- [ ] High Water Table (A2)
- [ ] Saturation (A3)
- [ ] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Aquatic Fauna (B13)
- [ ] Marl Deposits (B15) **(LRR U)**
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- [ ] Surface Soil Cracks (B6)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [ ] Drainage Patterns (B10)
- [ ] Moss Trim Lines (B16)
- [ ] Dry-Season Water Table (C2)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Geomorphic Position (D2)
- [ ] Shallow Aquitard (D3)
- [ ] FAC-Neutral Test (D5)
- [ ] Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes [ ] No [X]	Depth (inches): ______	
Water Table Present?	Yes [ ] No [X]	Depth (inches): ______	
Saturation Present? (includes capillary fringe)	Yes [ ] No [X]	Depth (inches): ______	**Wetland Hydrology Present? Yes [ ] No [X]**

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

Remarks:

US Army Corps of Engineers Atlantic and Gulf Coastal Plain Region – Version 2.0

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP36

Tree Stratum (Plot size:)

	Absolute % Cover	Dominant Species?	Indicator Status
1. Triadica sebifera	15	Yes	FAC
2. Fraxinus pennsylvanica	5	Yes	FACW
3. Celtis laevigata	5	Yes	FAC
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	25% = Total Cover		

50% of total cover: 13% 20% of total cover: 5%

Sapling/Shrub Stratum (Plot size:)

	Absolute % Cover	Dominant Species?	Indicator Status
1. Ligustrum sinense	60	Yes	FAC
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	60% = Total Cover		

50% of total cover: 30% 20% of total cover: 12%

Herb Stratum (Plot size:)

	Absolute % Cover	Dominant Species?	Indicator Status
1. Rubus trivialis	10	Yes	FACU
2. Rubus suus	5	Yes	FAC
3. Rubus bushii	5	Yes	FACW
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	20% = Total Cover		

50% of total cover: 10% 20% of total cover: 4%

Woody Vine Stratum (Plot size:)

	Absolute % Cover	Dominant Species?	Indicator Status
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
	0% = Total Cover		

50% of total cover: 0% 20% of total cover: 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 86% (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: (If observed, list morphological adaptations below).

Site completely covered by Chinese privet.

SOIL

Sampling Point: DP36

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
1-20	10YR 3/1	100				-	clay	
					-	-		
					-	-		
					-	-		
					-	-		
					-	-		
					-	-		

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ☐ No ☒

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Seabreeze Mitigation Bank 40-acre Parcel City/County: Chambers County Sampling Date: 5 Nov 2015

Applicant/Owner: Wildwood Environmental Credit Company, LLC State: Texas Sampling Point: DP37

Investigator(s): Lee Sherrod and Tony Vazquez Section, Township, Range: ____

Landform (hillslope, terrace, etc.): flood plain Local relief (concave, convex, none): Flat Slope (%): 0

Subregion (LRR or MLRA): LRR T, MLRA 150A Lat: 29.748389° Long: -94.375757° Datum: ____

Soil Map Unit Name: Beaumont silty clay, 0 to 1 percent slopes, rarely flooded NWI classification: None

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

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

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

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

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

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- [X] Surface Water (A1)
- [X] High Water Table (A2)
- [X] Saturation (A3)
- [ ] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Aquatic Fauna (B13)
- [ ] Marl Deposits (B15) **(LRR U)**
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- [ ] Surface Soil Cracks (B6)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [X] Drainage Patterns (B10)
- [ ] Moss Trim Lines (B16)
- [ ] Dry-Season Water Table (C2)
- [ ] Crayfish Burrows (C8)
- [X] Saturation Visible on Aerial Imagery (C9)
- [ ] Geomorphic Position (D2)
- [ ] Shallow Aquitard (D3)
- [ ] FAC-Neutral Test (D5)
- [ ] Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes [X] No [ ]	Depth (inches): 2	
Water Table Present?	Yes [X] No [ ]	Depth (inches): surface	
Saturation Present? (includes capillary fringe)	Yes [X] No [ ]	Depth (inches): Surface	**Wetland Hydrology Present? Yes [X] No [ ]**

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

Remarks:

US Army Corps of Engineers Atlantic and Gulf Coastal Plain Region – Version 2.0

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP37

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus pennsylvanica	20	Yes	FACW
2. Triadica sebifera	5	No	FAC
3. Ulmus crassifolia	5	No	FACW
4. Acer rubrum	5	-	-
5.	-	-	-
6.	-	-	-
7.	-	-	-
8.	-	-	-
	35%	= Total Cover	
50% of total cover: 18%	20% of total cover: 7%		

Sapling/Shrub Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	5	Yes	FAC
2. Triadica sebifera	5	Yes	FAC
3.	-	-	-
4.	-	-	-
5.	-	-	-
6.	-	-	-
7.	-	-	-
8.	-	-	-
	10%	= Total Cover	
50% of total cover: 5%	20% of total cover: 2%		

Herb Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Rubus suus	40	Yes	FAC
2. Rubus bushii	30	Yes	FACW
3. Cyperus ochraceus	2	No	FACW
4.	-	-	-
5.	-	-	-
6.	-	-	-
7.	-	-	-
8.	-	-	-
9.	-	-	-
10.	-	-	-
11.	-	-	-
12.	-	-	-
	72%	= Total Cover	
50% of total cover: 36%	20% of total cover: 14%		

Woody Vine Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. smilax bona-nox	1	Yes	FAC
2.	-	-	-
3.	-	-	-
4.	-	-	-
5.	-	-	-
	1%	= Total Cover	
50% of total cover: 1%	20% of total cover: 0%		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: (If observed, list morphological adaptations below).

US Army Corps of Engineers — Atlantic and Gulf Coastal Plain Region – Version 2.0

SOIL Sampling Point: DP37

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
2	10YR 3/1	100			-	-	clay	
4	10YR 3/1	95	7.5YR 5/6	5	C	M	clay	
6	10YR 4/2	90	7.5YR 5/6	10	C	M	clay	
8	10YR 5/1	85	7.5YR 5/6	15	C	M	clay	
12 - 20	10YR 5/1	85	7.5YR 5/6	15	C	M	clay	
					-	-		
					-	-		

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ☒ No ☐

Remarks:

US Army Corps of Engineers — Atlantic and Gulf Coastal Plain Region – Version 2.0

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Seabreeze Mitigation Bank 40-acre Parcel City/County: Chambers County Sampling Date: 5 Nov 2015

Applicant/Owner: Wildwood Environmental Credit Company, LLC State: Texas Sampling Point: DP58

Investigator(s): Lee Sherrod and Tony Vazquez Section, Township, Range:

Landform (hillslope, terrace, etc.): Flood Plain Local relief (concave, convex, none): flat Slope (%): 0

Subregion (LRR or MLRA): LRR T, MLRA 150A Lat: 29.749961° Long: -94.373819° Datum:

Soil Map Unit Name: Beaumont silty clay, 0 to 1 percent slopes, rarely flooded NWI classification: None

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

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

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

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

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

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- [X] Surface Water (A1)
- [X] High Water Table (A2)
- [X] Saturation (A3)
- [ ] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Aquatic Fauna (B13)
- [ ] Marl Deposits (B15) **(LRR U)**
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- [ ] Surface Soil Cracks (B6)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [X] Drainage Patterns (B10)
- [ ] Moss Trim Lines (B16)
- [ ] Dry-Season Water Table (C2)
- [ ] Crayfish Burrows (C8)
- [X] Saturation Visible on Aerial Imagery (C9)
- [ ] Geomorphic Position (D2)
- [ ] Shallow Aquitard (D3)
- [ ] FAC-Neutral Test (D5)
- [ ] Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes [X] No [ ] Depth (inches): 2

Water Table Present? Yes [X] No [ ] Depth (inches): surface

Saturation Present? (includes capillary fringe) Yes [X] No [ ] Depth (inches): Surface

Wetland Hydrology Present? Yes [X] No [ ]

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

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: DP58

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus pennsylvanica	30	Yes	FACW
2. Triadica sebifera	5	No	FAC
3. Ulmus crassifolia	10	Yes	FACW
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	45% = Total Cover		
50% of total cover: 23%	20% of total cover: 9%		

Sapling/Shrub Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	5	Yes	FAC
2. Triadica sebifera	5	Yes	FAC
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	10% = Total Cover		
50% of total cover: 5%	20% of total cover: 2%		

Herb Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Rubus suus	50	Yes	FAC
2. Rubus bushii	20	Yes	FACW
3. Cyperus ochraceus	2	No	FACW
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	72% = Total Cover		
50% of total cover: 36%	20% of total cover: 14%		

Woody Vine Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. smilax bona-nox	1	Yes	FAC
2.		-	-
3.		-	-
4.		-	-
5.		-	-
	1% = Total Cover		
50% of total cover: 1%	20% of total cover: 0%		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: (If observed, list morphological adaptations below).

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SOIL Sampling Point: DP58

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
2	10YR 3/1	100			-	-	clay	
4	10YR 3/1	90	7.5YR 5/6	10	C	M	clay	
6	10YR 4/2	90	7.5YR 5/6	10	C	M	clay	
8	10YR 5/1	85	7.5YR 5/6	15	C	M	clay	
12 - 20	10YR 5/1	80	7.5YR 5/6	20	C	M	clay	
					-	-		
					-	-		

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ☒ No ☐

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Seabreeze Mitigation Bank 40-acre Parcel City/County: Chambers County Sampling Date: 5 Nov 2015

Applicant/Owner: Wildwood Environmental Credit Company, LLC State: Texas Sampling Point: DP59

Investigator(s): Lee Sherrod and Tony Vazquez Section, Township, Range: ____

Landform (hillslope, terrace, etc.): Berm slope Local relief (concave, convex, none): Slope Slope (%): 3

Subregion (LRR or MLRA): LRR T, MLRA 150A Lat: 29.749984° Long: -94.373736° Datum: ____

Soil Map Unit Name: Beaumont silty clay, 0 to 1 percent slopes, rarely flooded NWI classification: None

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

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

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

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

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

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- [ ] Surface Water (A1)
- [ ] High Water Table (A2)
- [ ] Saturation (A3)
- [ ] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Aquatic Fauna (B13)
- [ ] Marl Deposits (B15) **(LRR U)**
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- [ ] Surface Soil Cracks (B6)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [ ] Drainage Patterns (B10)
- [ ] Moss Trim Lines (B16)
- [ ] Dry-Season Water Table (C2)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Geomorphic Position (D2)
- [ ] Shallow Aquitard (D3)
- [ ] FAC-Neutral Test (D5)
- [ ] Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes [ ]	No [X]	Depth (inches): ____
Water Table Present?	Yes [ ]	No [X]	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes [ ]	No [X]	Depth (inches): ____

Wetland Hydrology Present? Yes [ ] No [X]

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

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: DP59

Tree Stratum (Plot size: ________)	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus pennsylvanica	5	Yes	FACW
2.	-	-	-
3.	-	-	-
4.	-	-	-
5.	-	-	-
6.	-	-	-
7.	-	-	-
8.	-	-	-
	5%	= Total Cover	
50% of total cover: 3%		20% of total cover: 1%	

Sapling/Shrub Stratum (Plot size: ________)	Absolute % Cover	Dominant Species?	Indicator Status
1. Ligustrum sinense	90	Yes	FAC
2.	-	-	-
3.	-	-	-
4.	-	-	-
5.	-	-	-
6.	-	-	-
7.	-	-	-
8.	-	-	-
	90%	= Total Cover	
50% of total cover: 45%		20% of total cover: 18%	

Herb Stratum (Plot size: ________)	Absolute % Cover	Dominant Species?	Indicator Status
1. Rubus trivialis	5	Yes	FACU
2. Rubus argutus	5	Yes	FAC
3.	-	-	-
4.	-	-	-
5.	-	-	-
6.	-	-	-
7.	-	-	-
8.	-	-	-
9.	-	-	-
10.	-	-	-
11.	-	-	-
12.	-	-	-
	10%	= Total Cover	
50% of total cover: 5%		20% of total cover: 2%	

Woody Vine Stratum (Plot size: ________)	Absolute % Cover	Dominant Species?	Indicator Status
1. Smilax bona-nox	1	Yes	FAC
2.	-	-	-
3.	-	-	-
4.	-	-	-
5.	-	-	-
	1%	= Total Cover	
50% of total cover: 1%		20% of total cover: 0%	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80% (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: (If observed, list morphological adaptations below).

Site completely covered by Chinese privet.

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SOIL Sampling Point: DP59

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
1-20	10YR 3/2	100				-	clay	
					-	-		
					-	-		
					-	-		
					-	-		
					-	-		
					-	-		

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☒

Remarks:

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WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Seabreeze Mitigation Bank 40-acre Parcel City/County: Chambers County Sampling Date: 4 Nov 2015

Applicant/Owner: Wildwood Environmental Credit Company, LLC State: Texas Sampling Point: DP759

Investigator(s): Lee Sherrod and Tony Vazquez Section, Township, Range:

Landform (hillslope, terrace, etc.): flood plain Local relief (concave, convex, none): flat Slope (%): 0

Subregion (LRR or MLRA): LRR T, MLRA 150A Lat: 29.747486° Long: -94.372625° Datum:

Soil Map Unit Name: Beaumont silty clay, 0 to 1 percent slopes, rarely flooded NWI classification: None

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

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

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

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

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

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- [X] Surface Water (A1)
- [X] High Water Table (A2)
- [X] Saturation (A3)
- [ ] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Aquatic Fauna (B13)
- [ ] Marl Deposits (B15) **(LRR U)**
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- [ ] Surface Soil Cracks (B6)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [ ] Drainage Patterns (B10)
- [ ] Moss Trim Lines (B16)
- [ ] Dry-Season Water Table (C2)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Geomorphic Position (D2)
- [ ] Shallow Aquitard (D3)
- [ ] FAC-Neutral Test (D5)
- [ ] Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes [X] No [ ]	Depth (inches): 0 - 6	
Water Table Present?	Yes [X] No [ ]	Depth (inches): Surface	
Saturation Present? (includes capillary fringe)	Yes [X] No [ ]	Depth (inches): Surface	**Wetland Hydrology Present?** Yes [X] No [ ]

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

Remarks:

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VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP759

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix nigra	10	Yes	OBL
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	10%	= Total Cover	
50% of total cover: 5%		20% of total cover: 2%	

Sapling/Shrub Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. Triadica sebifera	15	Yes	FAC
2. Acer rubrum	5	No	FAC
3. Fraxinus pennsylvanica	25	Yes	FACW
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	45%	= Total Cover	
50% of total cover: 23%		20% of total cover: 9%	

Herb Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. Saururus cernuus	25	Yes	OBL
2. Mikania scandens	35	Yes	FACW
3. Fimbristilys	5	No	FACW
4. Eleocharis cellulosa	10	No	OBL
5. Hibiscus moscheutus	10	No	OBL
6. Rubus suus	10	No	FAC
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	95%	= Total Cover	
50% of total cover: 48%		20% of total cover: 19%	

Woody Vine Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
	0%	= Total Cover	
50% of total cover: 0%		20% of total cover: 0%	

Remarks: (If observed, list morphological adaptations below).

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ☒ No ☐

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