JOINT PUBLIC NOTICE

December 7, 2020

United States Army
Corps of Engineers
New Orleans District
Regulatory Branch
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New Orleans, La. 70118-3651

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Permit Application Number
MVN-2019-01285-MG

State of Louisiana
Department of Environmental Quality
Post Office Box 4313
Baton Rouge, La. 70821-4313
Attn: Water Quality Certifications

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Elizabeth.Hill@la.gov
Project Manager
Elizabeth Hill
WQC Application Number
WQC # 201201-01

Interested parties are hereby notified that a permit application has been received by the New Orleans District of the U.S. Army Corps of Engineers pursuant to: [ ] Section 10 of the Rivers and Harbors Act of March 3, 1899 (30 Stat. 1151; 33 USC 403); and/or [X] Section 404 of the Clean Water Act (86 Stat. 816; 33 USC 1344).

Application has also been made to the Louisiana Department of Environmental Quality, for a Water Quality Certification (WQC) in accordance with statutory authority contained in Louisiana Revised Statutes of 1950, Title 30, Chapter 11, Part IV, Section 2074 A(3) and provisions of Section 401 of the Clean Water Act (P.L.95-17).

EDWINA MITIGATION BANK IN LAFOURCHE PARISH

NAME OF APPLICANT: Natural Resource Professionals, L.L.C.., obo Stand Up Triple, L.L.C.; Attn: Gregg Fell; 7330 Highland Road, Suite B-1, Baton Rouge, Louisiana 70808.

LOCATION OF WORK: The 206.4 acre site is located approximately 4 miles to the northwest of Thibodeaux, Louisiana within Sections 60, 61, and 62, Township 14 South, and Range 16 East in Lafourche Parish, as shown on attached drawings.

Center of Location: Latitude: 29.848384 ° N, Longitude: 90.850823° W.
Hydrologic Unit Code: 08090301 – East Central Louisiana Coastal.

CHARACTER OF WORK: Stand Up Triple, L.L.C., is proposing the re-establishment and rehabilitation of existing farmed wetlands, and the enhancement and preservation of existing bottomland hardwood forest for the development of Edwina Mitigation Bank. Site restoration activities will consist of removal of agricultural levees, land contouring, backfilling and plugging of drainage features, and planting of desirable vegetation. Of the 206.4 acres proposed for Edwina Mitigation Bank, 8.3 acres are bottomland hardwood enhancement, 32.3 acres are bottomland hardwood re-establishment, 99.5 acres are bottomland hardwood rehabilitation, 23.5 acres are bottomland hardwood preservation, 31.1 acres are cypress/tupelo swamp rehabilitation, and 1.2 acres are upland buffer.

The comment period for the Department of the Army Permit and the Louisiana Department of Environmental Quality WQC will close **30 days** from the date of this joint public notice. Written comments, including suggestions for modifications or objections to the proposed work, stating reasons thereof, are being solicited from anyone having interest in this permit and/or this WQC request and must be mailed so as to be received before or by the last day of the comment period. Letters concerning the Corps of Engineers permit application must reference the applicant's name and the Permit Application Number, and be mailed to the Corps of Engineers at the address above, ATTENTION: REGULATORY BRANCH. Similar letters concerning the Water Quality Certification must reference the applicant's name and the WQC Application number and be mailed to the Louisiana Department of Environmental Quality at the address above.

The application for this proposed project is on file with the Louisiana Department of Environmental Quality and may be examined during weekdays between 8:00 a.m. and 4:30 p.m. Copies may be obtained upon payment of costs of reproduction.

Corps of Engineers Permit Criteria

The decision whether to issue a permit will be based on an evaluation of the probable impacts, including cumulative impacts of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefit which reasonably may be expected to accrue from the proposal must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the proposal will be considered including the cumulative effects thereof; among those are conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership and, in general, the needs and welfare of the people.

The U.S. Army Corps of Engineers is soliciting comments from the public, federal, state, and local agencies and officials, Indian Tribes, and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the U.S. Army Corps of Engineers to determine whether to make, modify, condition, or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

The New Orleans District is unaware of properties listed on the National Register of Historic Places near the proposed work. The possibility exists that the proposed work may damage or destroy presently unknown archeological, scientific, prehistorical, historical sites, or data. Issuance of this public notice solicits input from the State Archeologist and State Historic Preservation Officer regarding potential impacts to cultural resources. After receipt of comments from this public notice the Corps will evaluate potential impacts and consult with the State Historic Preservation Officer and Native American Tribes in accordance with Section 106 of the national Historic Preservation Act, as appropriate.

Our initial finding is that the proposed work would neither affect any species listed as endangered, nor affect any habitat designated as critical to the survival and recovery of any endangered species listed by the U.S. Department of Commerce, Utilizing Information and Planning Consultation for Endangered Species in Louisiana (IPaC), dated January 27, 2020, between the U.S. Army Corps of Engineers, New Orleans and U.S. Fish and Wildlife Service, Ecological Services Office, the Corps has determined that the proposed activity would have no effect on any species listed as endangered by the U.S. Department of the Interior.

This notice initiates the Essential Fish Habitat (EFH) consultation requirements of the Magnuson-Stevens Fishery Conservation and Management Act. The applicant's proposal would result in the destruction or alteration of N/A acre(s) of EFH utilized by various life stages of red drum and penaeid shrimp. Our initial determination is that the proposed action would not have a substantial adverse impact on EFH or federally managed fisheries in the Gulf of Mexico. Our final determination relative to project impacts and the need for mitigation measures is subject to review by and coordination with the National Marine Fisheries Service.

If the proposed work involves deposits of dredged or fill material into navigable waters, the evaluation of the probable impacts will include the application of guidelines established by the Administrator of the Environmental Protection Agency. Also, a certification that the proposed activity will not violate applicable water quality standards will be required from the Department of Environmental Quality, before a permit is issued.

Any person may request, in writing, within the comment period specified in this notice, that a public hearing be held to consider this application. Requests for public hearings shall state, with particularity, the reasons for holding a public hearing.

The applicant has certified that the proposed activity described in the application complies with and will be conducted in a manner that is consistent with the Louisiana Coastal Resources Program. The Department of the Army permit will not be issued unless the applicant received approval or a waiver of the Coastal Use Permit by the Department of Natural Resources.

You are requested to communicate the information contained in this notice to any other parties whom you deem likely to have interested in the matter.

for Martin S. Mayer
Chief, Regulatory Branch

Enclosure

Final Prospectus
Edwina Mitigation Bank

Lafourche Parish, Louisiana

November 16, 2020

Sponsor:

Stand Up Triple, LLC
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Agent:

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1.0 Introduction

Stand Up Triple, LLC (Sponsor), submits this Prospectus to the US Army Corps of Engineers, New Orleans District (CEMVN), Louisiana Department of Natural Resources (DNR), and the Interagency Review Team (IRT), to initiate evaluation of the proposed Edwina Mitigation Bank (Bank) in accordance with 33 CFR §332.8 (d)(2) and LAC 43:724. The 206.4-acre Bank will provide compensatory mitigation for unavoidable, permitted impacts to "Waters of the United States" and coastal wetlands if deemed appropriate per 33 CFR §332.3(1) (a) and 33 CFR §332.3 (1) (b) and LAC 43:724. The details pertaining to the use of this site as a mitigation bank will be specified in the subsequent Mitigation Banking Instrument (MBI).

The 206.4-acre Bank is located near Grand Bayou in the Louisiana Coastal Zone and Louisiana Coastal Wetland Conservation Plan Area. It is located upstream of Thibodaux along Bayou Lafourche in Lafourche Parish, LA. It is within the Louisiana Department of Environmental Quality (DEQ) Barataria River Basin and the United States Geological Survey (USGS) Hydrologic Unit Code #08090301 (USGS 2014).

1.1 Site Location and General Description

The 206.4-acre Bank is located approximately four miles to the northwest of Thibodaux, Louisiana, Lafourche Parish (Appendix A-Figures 1-2). The Bank is located at -90.850823 W and 29.848384 N (Approximate Centroid) and within Sections 60, 61, and 62, Township 14 South, and Range 16 East. The Bank is approximately 3,400 feet wide and 3,000 feet long and rectangular in shape. The southernmost boundary of the bank is located approximately 2.5 miles from LA 308 and the northernmost boundary is the 80-Arpent Canal. Portions of the eastern and southern boundary are contiguous with the existing Greenwood Plantation Mitigation Bank.

The entire Bank was historically a bottomland hardwood/forested wetland ecosystem prior to being converted to agriculture as early as 1932. It represents some of the lowest surface elevations on the slope of these cultivated fields along Bayou Lafourche. Typical natural elevations within the site range from nearly 0 feet to 5 feet NAVD 88, with artificial spoil banks ranging from 6 feet to over 10 feet NAVD 88. The Bank is underlain entirely by hydric soils as mapped by the Natural Resources Conservation Service and confirmed in the field.

The Bank currently consists of artificial fresh marsh/herbaceous wetland habitat, forested wetland and non-wetland areas, crawfish ponds, and a recreational fishing pond that also provides a water supply for the crawfish farming operations. Hydrology within the site is almost entirely controlled by a series of artificial internal/perimeter spoil banks and a pumping system. As a result, the Bank is hydrologically isolated from the surrounding watershed. While there are channels within the limits of the Bank, these essentially acts as "flow through channels," due to the presence of the artificial spoil banks that disrupt natural hydrology. The 80 Arpent Canal is located along the northern boundary of the Bank and is the primary source of drainage for the project area, in addition to showing minor tidal signatures and hydrology connectivity to Lake Des Allemands and the lower Barataria Basin.

2.0 Project Goals and Objectives

The goal of the project is to provide compensatory mitigation for unavoidable impacts to wetlands authorized by the Section 404 and/or Coastal-Use Permitting by providing the following proposed Bottomland Hardwood (BLH) and Baldcypress Swamp (SW) mitigation credit types (Appendix A-Figure 3):

Table 1 – Edwina Mitigation Bank Mitigation Features

Habitat Type	Mitigation Credit Type	Acreage
Bottomland Hardwood	Re-establishment	32.3 acres
Bottomland Hardwood	Rehabilitation	99.5 acres
Bottomland Hardwood	Enhancement	8.3 acres
Bottomland Hardwood	Preservation	23.5 acres
Baldcypress Swamp	Rehabilitation	31.1 acres
Total Mitigation Features		***194.7 Acres***

Additionally, the Sponsor proposes to incorporate 0.3 acres of restored upland buffer and 1.3 acres of preserved upland buffer. Other non-mitigation features include 13.1 acres of open water, 0.4 acres of access/road areas, and 75-foot buffer from the centerline of the 80 Arpent Canal.

2.1 Aquatic Resource Functions and Values

As defined by *The Natural Communities of Louisiana* published in 2009 by the Louisiana Department of Wildlife and Fisheries (LDWF) and the Louisiana Natural Heritage program (LNHP), BLH forests are forested, alluvial wetlands occupying broad floodplain areas that flank large river systems. BLH forests may be called fluctuating water level ecosystems characterized and maintained by a natural hydrologic regime of alternating wet and dry periods. These forests support distinct assemblages of plants and animals associated with particular landforms, soils, and hydrologic regimes. They are important natural communities for maintenance of water quality, providing a very productive habitat for a variety of fish and wildlife, and are important in regulation of flooding and stream recharge.

As defined by *The Natural Communities of Louisiana*, Baldcypress (*Taxodium distichum*) Swamps are forested, alluvial swamps growing on intermittently exposed soils. The soils are inundated or saturated by surface water or groundwater on a nearly permanent basis throughout the growing season except during periods of extreme drought. Bayous commonly intersect these wetlands. There is a low floristic diversity. Baldcypress is the dominant overstory species. Many aquatic food webs depend on the input of allochthonous material in the form of leaf litter or other organic debris that the wetland forest provides. Net primary productivity of swamp forests seems to be increased by periodic flooding or increased water flow and decreased by slow water movement or stagnation.

This project will provide improved wetland functions and values following the proposed mitigation activities. The restored and enhanced BLH and SW will regulate the movement of water within the watershed as well as in the global water cycle (Richardson 1994; Mitsch and Gosselink 1993). Wetlands store precipitation and surface water and then slowly release the water into associated surface water resources, groundwater, and the atmosphere (Taylor et al 1990). Following the proposed surface hydrology improvements and the removal/modification of artificial impediments (levees/channels) in certain areas, sheet flow and stormwater retention associated with rainfall events will be improved, along with improved interaction with Grand Bayou, Lake Des Allemands and the larger Barataria Basin. Improved and maintained hydrology will allow chemical functions such as organic compound breakdown, decomposition, nutrient assimilation, oxidation/reduction potential, and denitrification to be more representative of natural BLH and SW habitats.

The planting of BLH and SW species within the Bank will provide improved habitat, structure, and nesting/breeding grounds for a variety of wildlife species. Planting SW species will also provide a seed source that will aid in natural regeneration during low water growing seasons. Following the implementation of the vegetation work plan, these habitats, along with existing wetland habitat will be protected under a perpetual conservation servitude. Furthermore, the Bank will be adjacent/contiguous to the existing Greenwood Mitigation Bank and proposed Family Farms Mitigation Bank, resulting in a large expanse of preserved and protected wetland habitat.

The wetland values that will be provided will occur at the following three levels (Mitsch and Gosselink, 2000):

- Population – Animals harvested for pelts and/or food; wildlife observation/recreation; endangered/threatened species habitat
- Ecosystem – Flood mitigation; storm abatement; aquifer recharge, water quality improvement; aesthetics
- Biosphere – Nitrogen cycle; sulfur cycle; carbon cycle; phosphorus cycle

To meet these goals and improve the aquatic resource area, functions, and values of this BLH and SW ecosystem, the Sponsor will meet the following objectives:

- Restore and improve historic/natural surface hydrology and increase wetland areas through removing/cutting artificial spoil banks/levees and artificial ridges, filling artificial channels, and installing earthen plugs in remnant agricultural drains,
- Conduct vegetative plantings of BLH and SW species,
- Ensure initial, interim, and long-term success through the implementation of a monitoring, management, and maintenance program,
- Establish appropriate financial mechanisms to ensure the successful completion of the proposed construction, establishment, and long-term management activities, and
- Ensure long-term protection through the execution of a perpetual conservation servitude in accordance with 33 CFR §332.7.

3.0 Ecological Suitability of the Site/Baseline Conditions

3.1 Land Use

3.1.1 Historical Land Use

Louisiana

Native Americans probably first inhabited portions of Louisiana 10,000-12,000 years ago (Kniffen et al. 1987) with the original inhabitants of Lafourche Parish being members of the Chitmach, Washa, and Chawash Native American Tribes (SCS 1984). The natural levee ridges offered the highest and best-drained ground for building homes and fields (McKenzie et al. 1995), and with the abundance of food found along the natural levees and back swamps, populations were strongly concentrated along these waterways (Kniffen and Hilliard 1988).

Europeans came to live in Louisiana in approximately 1700. They used the same Native American water highways and trails along levee ridges, and their towns grew on the sites of or near Native American villages located on the natural levees (McKenzie et al. 1995). Throughout early settlement of Louisiana, land plots were established perpendicular to the shoreline of the River creating “pie shaped” plots. These lots extended back 40 or more arpents (192 feet) onto the heavy clay soils of the poorly drained swamp. Land was cleared, timber was sold, and parallel ditches were then dug the length of the property from levee to back swamp (McKenzie et al. 1995).

Lafourche Parish

Lafourche Parish was founded in 1807 as one of the original nineteen parishes in the state. With fertile land and a navigable bayou, there was little difficulty in attracting settlers who arrived in the 1700’s from Germany, France, Spanish, and Acadia (ULL 2017). The soils of Lafourche Parish have always been used for farming even during Native American habitation. Trappers and traders likely came to the region first, but farmers soon followed. Cotton, corn, and sweet potatoes were grown on the natural levees even before 1700 with indigo also being an important crop for a short time. Cotton was the main crop for many years; however, sugarcane increased significantly in 1794 after sugar granulation procedures were successfully developed. By 1861, sugarcane became the principal crop in the Lafourche Parish (SCS 1984), particularly within the immediate vicinity of the Bank.

Edwina Mitigation Bank

The 1892 USGS topo map (Appendix A-Figure 4) depicts the Bank as undeveloped forested wetlands. No evidence of clearing or draining is shown; however, agriculture/development is seen in the higher elevations along Bayou Lafourche.

The 1932 topographic map 1932 (Appendix A-Figure 5) illustrates that the Bank had been cleared and drained for agricultural purposes. Two unimproved roads are shown. One traverses the Bank from the SW to NE, the other runs from the south to the north and intersects with the other road. Multiple drains are also depicted, some of which are lined with woody vegetation, and portions of the property appear to be reverting back to forested habitat.

The 1940 aerial photograph (Appendix A-Figure 6) shows the majority of the bank developed for agricultural row crops (sugar cane). A triangle-shaped area of the Bank in the northern portion is forested. However, it appears as it had previously been cut and used for agriculture. The northwestern portion of the Bank also appears as though it had been cut and used for agriculture but is beginning to be forested again. The drains and roads are still visible, and one structure is visible close to the center of the bank.

The 1957 aerial photograph (Appendix A-Figure 7) shows some change from the 1940 photo. A drain running north-south has been constructed. It does not bisect the property, but abruptly ends near the 80-Arpent Canal. The northwestern portion and triangular piece of the bank appear to have some growth of woody vegetation. A sliver of land in the northeastern corner and a portion of the western section of the bank have also become forested. The structure is still visible near the center of the bank.

The 1980 aerial photograph (Appendix A-Figure 8) shows that the row crops are no longer in place. The same areas still contain woody vegetation, which is also evident in some areas that were previously utilized as fields. Portions of the site appear to be intentionally flooded. Based on conversations with the former landowners' land manager, areas of the site were used as a settling basin for adjacent Greenwood Plantation Sugar Mill's sugarcane processing water. This activity may be represented in this photograph.

The 1998 color infrared map (Appendix A-Figure 9) shows the same areas as forested and cleared. Crawfish farming operations are clearly visible. The drainage ditch which runs east west on the southern portion of the bank appears to have been improved. Evidence of a culvert is visible on the southern border near the road enters the bank.

3.1.2 Existing/Current Land Use

Appendix A-Figure 10 illustrates existing site conditions. All herbaceous habitat is surrounded by perimeter/internal levees, which facilitates crawfish farming and recreational fishing. There is existing forested habitat on the western and northeast portions of the site. The triangular portion was cleared sometime after 1998.

Appendix A-Figure 11 illustrates surrounding land use within 1 mile of the site, which includes the following:

- Agriculture (32.3%)
- Forested Areas (57.2%)
- Residential Areas (8.9%)
- Open Water (1.6%)

The Bank is also adjacent and contiguous to the existing/approved Greenwood Plantation Mitigation Bank to the east and south and the proposed Family Farms Mitigation Bank to the west.

3.2 Soils

Soils mapped within the project area include: Fausse-Schriever association (FA), Schriever clay, 0-1% slopes (Sk), and Schriever clay, 0-1% slopes, occasionally flooded (Sr) (Web Soil Survey 2019). All soils are listed as hydric according to the NRCS (Appendix A-Figure 12). Hydric soils encountered during the field investigation met the depleted matrix (F3 and/or F7) criterion for hydric soils.

3.3 Hydrology

The project area is located in the East Central Louisiana Coastal Watershed within the USGS Hydrologic Unit Code (HUC) 08090301 (Appendix A-Figure 13). This area is also referred to as the Barataria River Basin.

3.3.1 Historical Hydrology and Drainage Patterns

The Bank is located near Bayou Lafourche within the Barataria Basin, an inter-distributary estuarine-wetland system located between the natural levees of the active Mississippi River and the abandoned Bayou Lafourche distributary (Conner and Day 1987). The wide natural levees of Bayou Lafourche indicate that the bayou was once a channel of the Mississippi River (SCS 1984). By the early 1800's, Bayou Lafourche was 15-20 feet deep and 200 yards wide and carried roughly 12% of the total Mississippi River Discharge (Lafourche Parish Game and Fish Commission). During this time, the Mississippi River and historic Bayou Lafourche would periodically overflow its banks, depositing sediments, nutrients, and freshwater throughout the Barataria Basin, including the lands within the Bank.

Human induced activities greatly affected the hydrologic regime of the Barataria Basin. Beginning in 1814, Andrew Jackson ordered the obstruction of Bayou Lafourche by cutting shoreline trees in various locations to prevent access by British troops. These obstructions increased siltation and reduced water depths of the Bayou. In 1904, the local levee district constructed an earthen dam across Bayou Lafourche at the Mississippi River in Donaldsonville for flood protection (Lafourche Parish Fish and Game Commission), which was followed by the completion of the modern Mississippi River Levee System in the 1930-1940's (Conner and Day 1987). Following this series of events, sedimentation and riverine flooding within the Barataria Basin was essentially eliminated, with rain, runoff from the Bayou Lafourche shoreline, and tides being the primary sources of water for the Basin and lands within the Bank. Appendix A-Figure 14 illustrates the historic/natural Barataria Basin Hydrology within the vicinity of the Bank.

3.3.2 Current Bank Elevations

A topographic survey of the Bank was conducted in August 2020 by Charles L. McDonald Land Surveyor, Inc. Collected data includes natural ground elevations, elevations of groundwater monitoring wells, and multiple transects of each channel (Appendix A-Figure 15). Differences were then calculated between the surveyed natural ground elevations and the spatially overlapping elevations from the USGS 1-meter LIDAR. Once the differences were determined, corrected surface elevations were generated using either the Empirical Bayesian Kriging or Inverse Distance Weighted spatial interpolation methods in ArcGIS. This surface was added to the original LIDAR to produce a corrected DEM in NAVD 88, which shows that site elevations within the property range from 0 feet to over 10 feet NAVD 88. Appendix A-Figure 16 shows the corrected DEM and Appendix A-Figure 17 shows areas above 5 feet NAVD 88.

3.3.3 Current Bank Hydrology – Overview

The Bank is located at the base of the natural levee formed by Bayou Lafourche, approximately 2.5 miles north of the bayou and 4 miles northwest of Thibodaux. The northeastern boundary of the property is adjacent to the 80 Arpent Canal, a major drainage feature that conveys water to the east, eventually connecting to the tidal waters of Lakes Des Allemands and Salvador, Barataria Bay, and the Gulf of Mexico. Other major waterways in the area include Bayou Onion, St James Canal, Grand Bayou, Bayou Boeuf, and Lake Boeuf.

The Bank is hydrologically isolated from the watershed by perimeter and interior levees/spoil banks creating multiple impounded areas, some of which are currently used for crawfish farming. Artificial pumping from a fishing pond further manipulates hydrologic conditions within these impoundments.

From the south/southwest, five artificial drainage channels enter the Bank and connect to the 80 Arpent Canal. These channels extend to the bank of Bayou Lafourche and collect precipitation deposited upslope from the Bank. These channels represent “flow through channels” due to the artificial berms/spoil banks which impede overbank flooding. Water bypasses the site and flows directly into the 80 Arpent Canal through these channels.

Precipitation is abundant within the Bank and surrounding area. According to the National Oceanic and Atmospheric Administration (NOAA), between 1990-2019 the average annual precipitation at the Thibodaux 4 SE weather station was 72.4 inches/year.

The forested western portion of the property still contains remnants of agricultural ditches common to sugarcane farming. These features facilitate drainage from the upper portion of this area. In combination with artificial spoil banks that reduce water input into this area, the southern portion of this habitat does not currently exhibit wetland hydrology. The northern portion of this habitat does contain wetlands due to relatively lower elevations and connection to the 80 Arpent Canal. Additionally, two smaller “triangular” portions of the property along the 80 Arpent Canal that are hydrologically isolated due to the presence of the artificial spoil banks; a former forested wetland in the northeast corner of the site and a forested wetland in in the northwestern portion of the site.

Appendix A-Figure 18 illustrates the general Bank hydrology.

An analysis of continuously monitored water levels within the 80 Arpent Canal show 24- and 26-hour tidal periods and small daily tidal fluctuations in the absence of rain events but they appear to only modify water levels by 0.5 to 1.5 inches on average. Although the 80 Arpent Canal at this location is hydrologically connected to Lake Des Allemands and the lower Barataria Basin, it is receives greater hydrologic influence from upstream drainage. Therefore, precipitation runoff likely eclipses any influences of tide on water levels at this location. However, based on the natural surface elevations (excluding artificial levees/spoil banks) being below 5 feet NAVD 88 and the location of the Bank within the designated coastal zone and conservation plan boundary, the Bank is certainly influenced by coastal processes. Appendix B contains a document analyzing the tidal influence on the Bank.

3.3.4 Water Budget Analysis

A critical step in the design of any wetland mitigation site is to understand the inputs and outputs of water throughout the year under a range of climate conditions, in order to ensure both that sufficient wetland hydrology is achieved and that any hydrologic alterations to the site do not cause increased flooding on adjacent properties. The change in water storage S in a given area over a given time is described by the water budget equation, $S = P + R + Gi - ET - D - Go$, where P represents direct precipitation onto the area, R represents surface runoff into the area from elsewhere within the watershed, Gi represents groundwater input into the area, ET represents the combined effects of direct evaporation and transpiration through plants, D represents surface runoff and/or drainage out of the site, and Go represents infiltration of surface water into the soil (Hornsberger et al 1998). To evaluate the water budget in terms of depth, these components are conventionally represented as inches of water per unit time. To calculate discharges (volume per unit time), the changes in depth are multiplied by the area of the site. This analysis will provide estimates for some of these parameters based on available data.

Data Sources

The Sponsor is currently operating two data collection stations on the property: one groundwater well installed in the non-wetland forested area in the southwest portion of the property, and one surface water meter located at the northern boundary in the 80 Arpent Canal into which the property drains (Figure 1). The currently available data from these stations run from February through September 2020. Using surveyed elevations of the mounting structures for the continuous monitoring stations and measured distances between the surveyed point and the HOBO sensor, a correction factor was applied to the existing data. All hydrographs, previously represented as height above sensor, now reflect the elevation of the water surface relative to NAVD88.

Figure 1: Location of Groundwater Well and 80-Arpent Canal Surface Water Meter

Long term meteorological data are available from the NOAA Applied Climate Information System (agacis.rcc-acis.org) for the NWS Thibodaux 4 SE station, which is the nearest station with available data, 8.4 miles to the southeast of the project site (Figure 2). The data used for this report include daily and monthly measurements as well as multi-decade statistical summaries of precipitation and temperature. Conventionally, climate datasets for wetland mitigation planning include the three previous complete decades (Pierce 2015). However, the time-period currently meeting this criterion (1981-2010) excludes multiple notable years during the 2010's that may better represent future conditions; therefore, the most recent 30 years (1990-2019) were considered for this report.

Figure 2: Location of weather station relative to the project area

Elevation data were downloaded from the USGS 1-m Digital Elevation Map derived from the "LA SoTerrebonne-GI" and "LA UpperDeltaPlain" LIDAR surveys conducted in 2015 and 2017, respectively. Land use data were derived from the USGS GAP/LANDFIRE National Terrestrial Ecosystems 2011 dataset. Soil data were obtained from the USDA Natural Resources Conservation Service Web Soil Survey. These data include the spatial distribution of soil series, as well as detailed reports on the hydrology and geology of each series.

Precipitation

Between 1990-2019, the average annual precipitation at the Thibodaux 4 SE weather station was 72.4 inches/yr. Characteristic median precipitation years include 1993, 1995, and 1996. For the purposes of this report, characteristic "dry" and "wet" years are defined by the 30th and 70th percentiles of total rainfall (Pierce 2015). Dry years (e.g. 1999, 2005) received 66 in or less, while wet years (e.g. 1998, 2017) received 78 inches or more. Precipitation was consistently greater during summer months for all categories, although some of the wet years included peaks during winter or fall months.

Runoff/Contributing Watershed

Although the project area is currently hydrologically isolated by levees from the surrounding watershed, the future mitigation bank will receive surface water inputs from precipitation events onto the land between Bayou Lafourche and the 80 Arpent Canal. Runoff is controlled by the intensity of individual rainfall events, the area of the contributing watershed, and the permeability of the contributing watershed (Pierce 2015).

The overall watershed containing the Bank was determined by processing the one-meter LIDAR of the surrounding area using the “Fill Sinks” module in QGIS/SAGA-GIS (Wang & Liu 2006). Within this 16,921.7-acre basin, rainfall north and east of Bayou Lafourche is conveyed into the 80 Arpent Canal via parallel agricultural drains. Therefore, it is assumed that the Bank is only subject to direct runoff from a 1,345.7-acre region between Bayou Lafourche and the 80 Arpent Canal (Figure 3).

Figure 3: The calculated watershed containing the project area is shaded black in the left image. The area assumed to contribute runoff to the project area is shaded in blue.

Runoff was estimated using the TR-55 (Urban Hydrology for Small Watersheds) method (USDA 1986), as recommended by Pierce (2015). Based on the relative proportions of land use categories and underlying soil series throughout the contributing watershed, the procedure calculates a runoff curve number that determines the depth of runoff produced for a given 24-hour precipitation event, as well as the minimum daily precipitation required to produce runoff. If it is assumed that all runoff generated in the contributing watershed enters the project area, the cumulative change in water depth in the project area due to runoff can be calculated from the acreages of the contributing watershed and the project area. The runoff contributing watershed to the Bank was found to have a curve number of 85, indicating that runoff is generated from rainfall of 0.45 inches or more within a 24-hour period. The selected dry years had an average of 38 runoff events, the median years 47, and the wet years 51. A 24-hour

rainfall event of 2.27 inches would produce one inch of runoff in the contributing watershed, corresponding to the addition of 6.4 inches of water within the project area.

The largest increases in water levels in the 80 Arpent Canal (Figure 4) correspond with rain events above the threshold, while many smaller events have less of an impact.

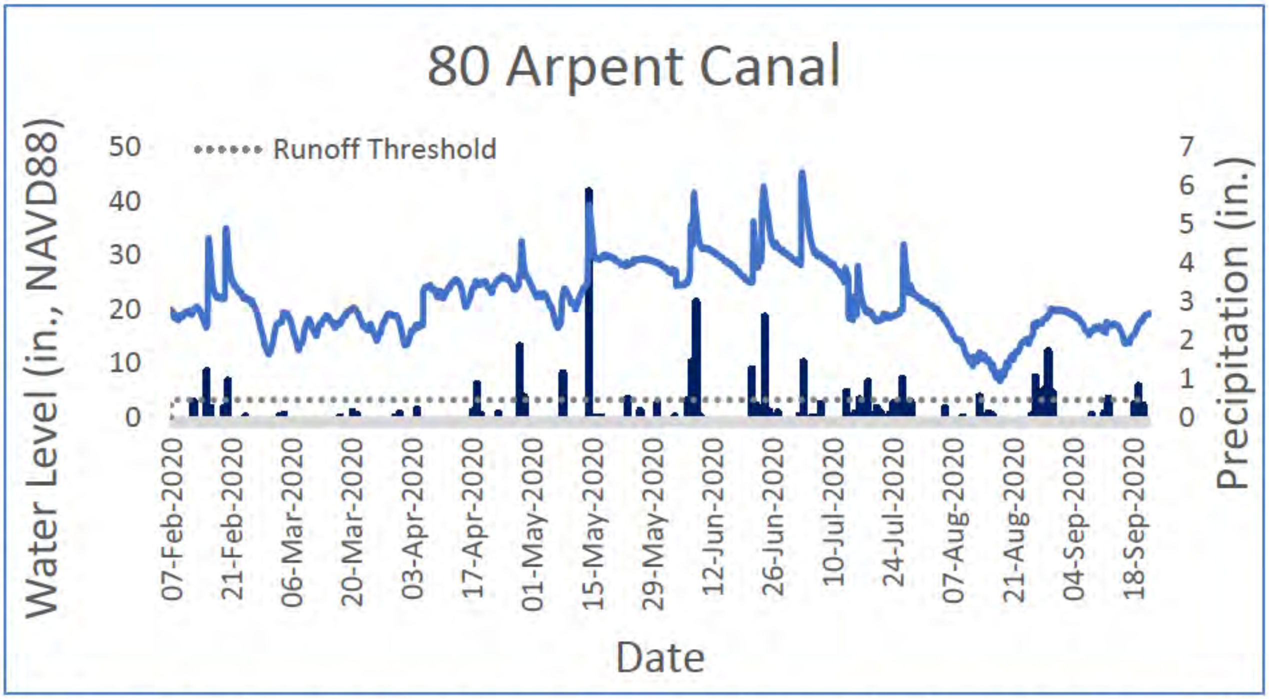

Figure 4: Water levels recorded in the 80 Arpent Canal and daily precipitation totals recorded at Thibodaux 4 SE.

The above water level data in the 80 Arpent Canal was also analyzed to determine mean high water and mean low water levels, shown in Figure 5 below.

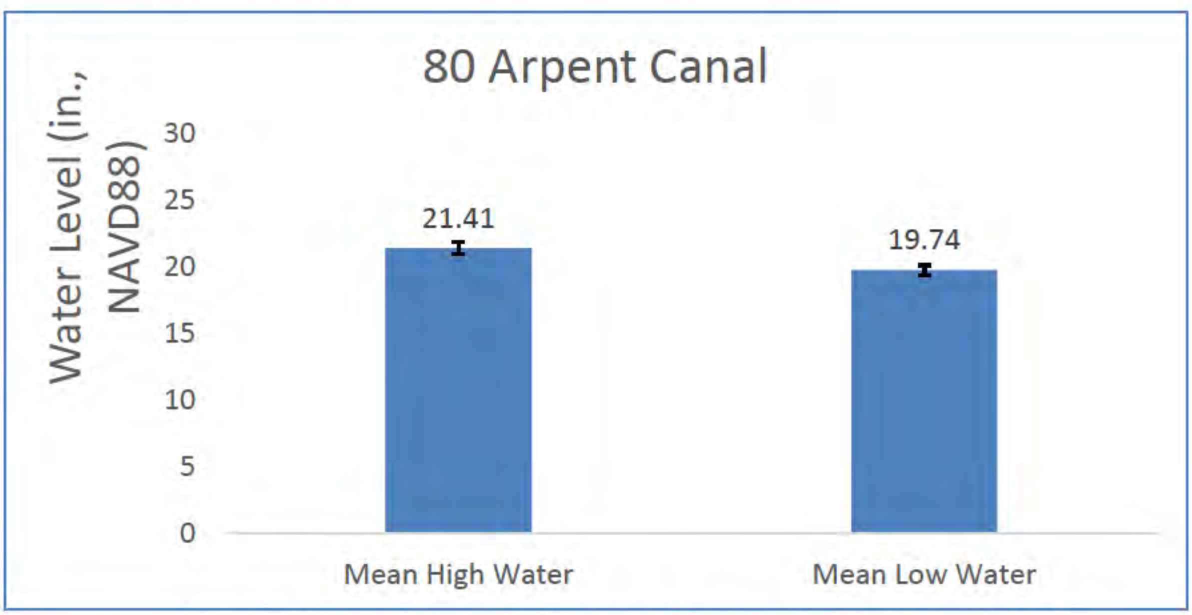

Figure 5: Mean High Water and Mean Low Water Levels in the 80 Arpent Canal

Evapotranspiration

Total water loss to the atmosphere is impossible to accurately measure or predict on a landscape scale, due to spatial and seasonal variations in vegetation. As recommended by Pierce (2015), this analysis utilizes the Thornwaithe and Mather (1955) method for estimating potential evapotranspiration with the Dunne and Leopold (1978) correction factors. These formulas are based only on average monthly temperatures recorded at Thibodaux 4 SE, and the latitude of the project site. Note that the term "potential" assumes permanent soil saturation, so actual ET rates will be lower during drier months.

Groundwater

During the period of record of the onsite monitoring well (February 7 – October 2, 2020), water levels persisted within 12 inches of the soil surface from February 7 until mid-March, in addition to 4 instances from June 7 to August 4 (Figure 6). The well) is located on Schriever clay (Sk), as is 97% of the project acreage. According to USDA documentation, a perched water table exists between the soil surface and up to 24 inches below, from December through April. This soil is classified in group 'D,' indicating a very low infiltration rate when saturated. The maximum hydraulic conductivity listed is 0.42 micrometers/sec, equivalent to 0.7 inches per month. This is the maximum rate of water transmission through soil when saturated. If prolonged dry soil conditions exist during the summer, the soil can form cracks leading to increased infiltration rates; however, evapotranspiration and surface runoff would likely be the dominant mechanisms of water removal.

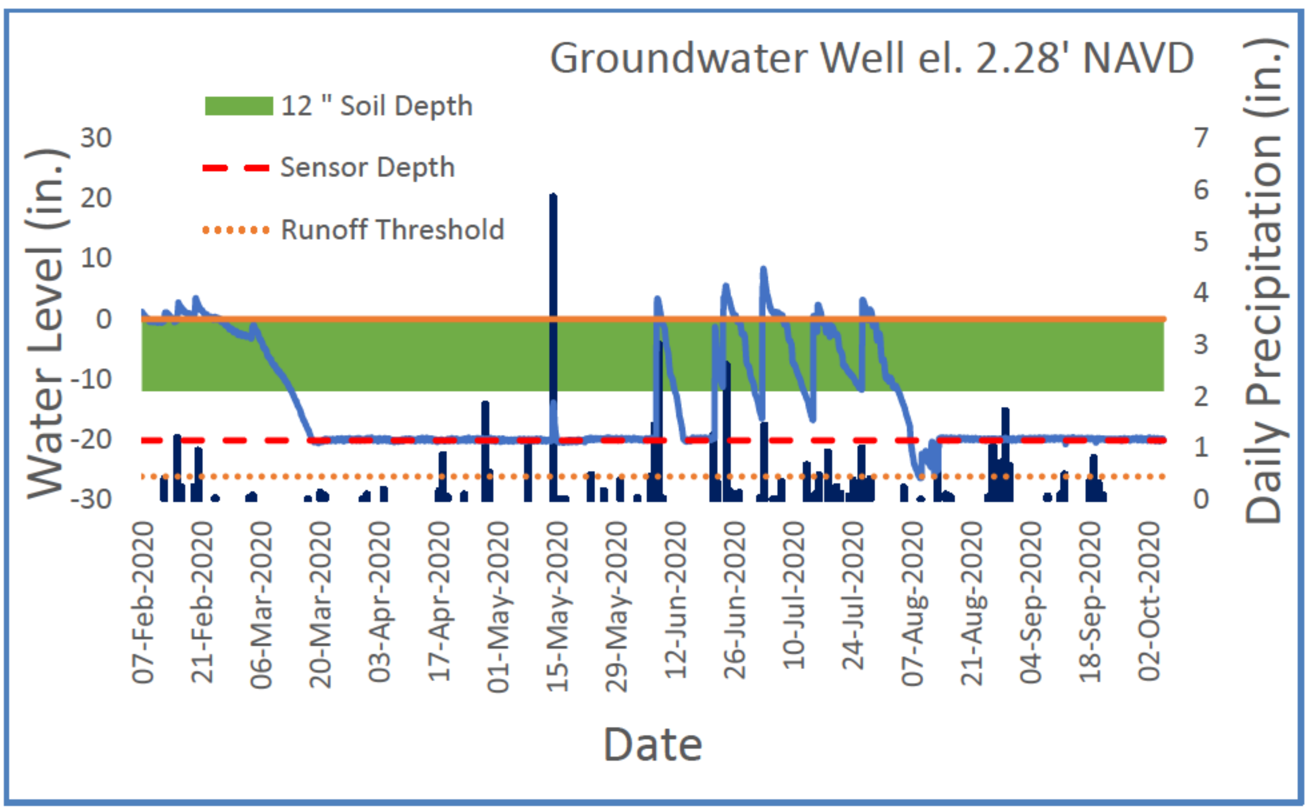

Figure 6: Groundwater well readings relative to the soil surface recorded in the project area and daily precipitation recorded at Thibodaux 4 SE.

The remainder of the bank is comprised of Schriever clay (Sr) and Fausse-Schriever (FA). These soils have generally identical hydrological characteristics except they exhibit a perched water table near the surface year-round. The FA soil exhibits a thicker water table and up to 12 inches of ponding above the surface throughout the year; this may be considered a groundwater input but it makes up less than 1% of the project acreage and is volumetrically equivalent to an increase of 0.1 inches of water per month throughout the entire project area.

Hydrographs for Selected Years

The hydrographs found in Figures 7-9 display potential sources of water inputs and outputs, excluding surface water output, for the project area during selected dry, median, and wet years as determined by ranked annual precipitation. Precipitation is based on monthly totals, potential evapotranspiration is based on monthly mean temperature, runoff was based on a TR-55 curve number of 85 and assumes all generated runoff reaches the project area, and infiltration is assumed to be 0.7 inches per month. The aforementioned inputs and outputs were then used to generate a "monthly net in/out," shown as a water depth across the project area.

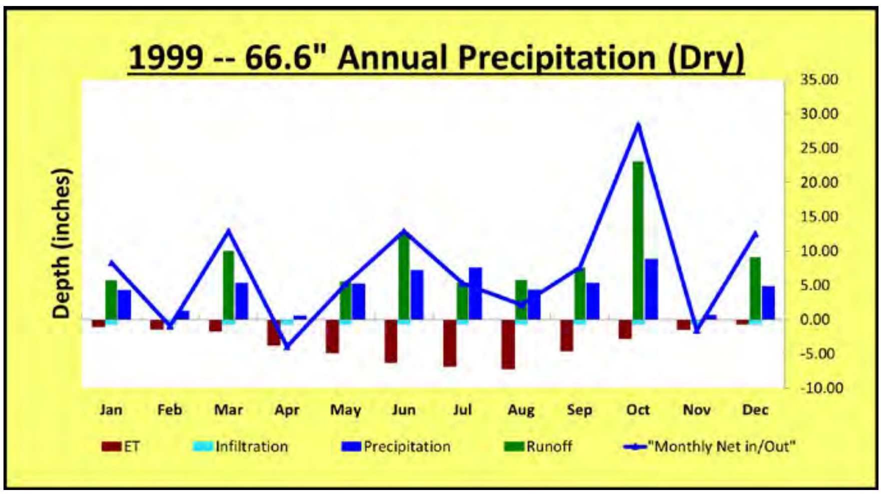

Figure 7: 1999 Hydrograph (Dry Year)

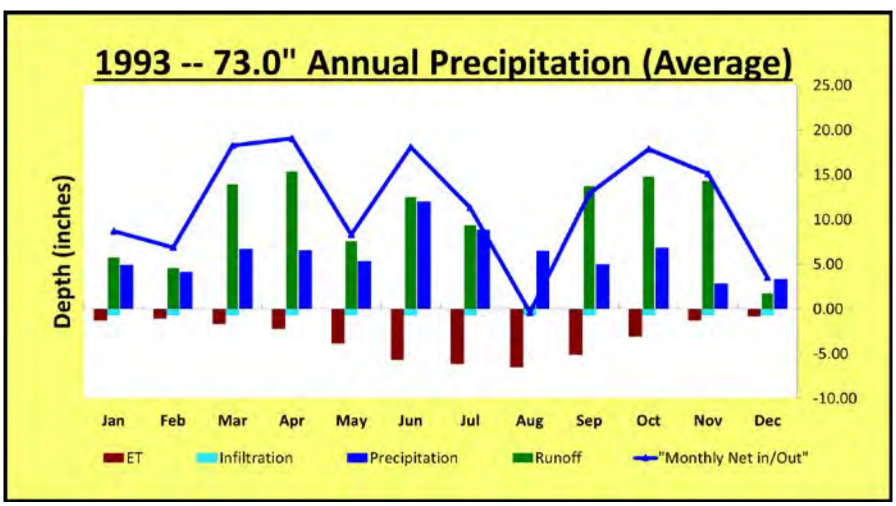

Figure 8: 1993 Hydrograph (Average Year)

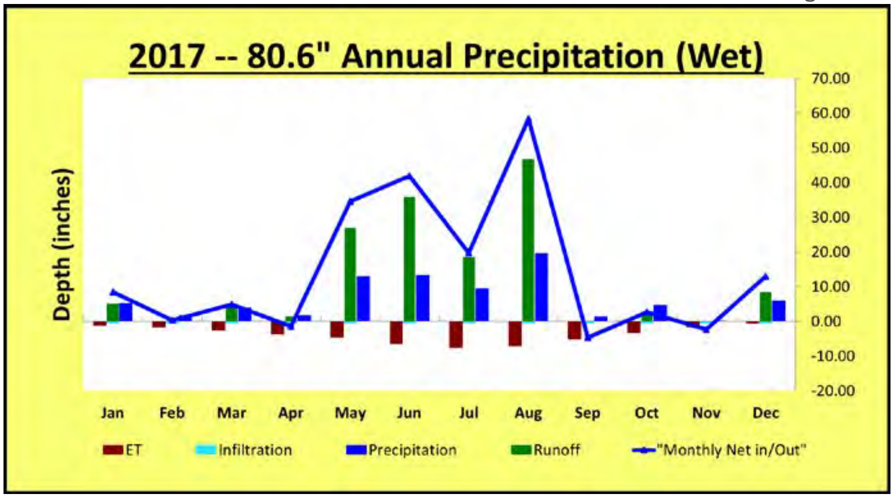

Figure 9: 2017 Hydrograph (Wet Year)

Figure 10 below illustrates the calculated hydrograph for 2020 through September 2020, overlaid by the onsite monitoring data during the same period. Infiltration is excluded from the plot.

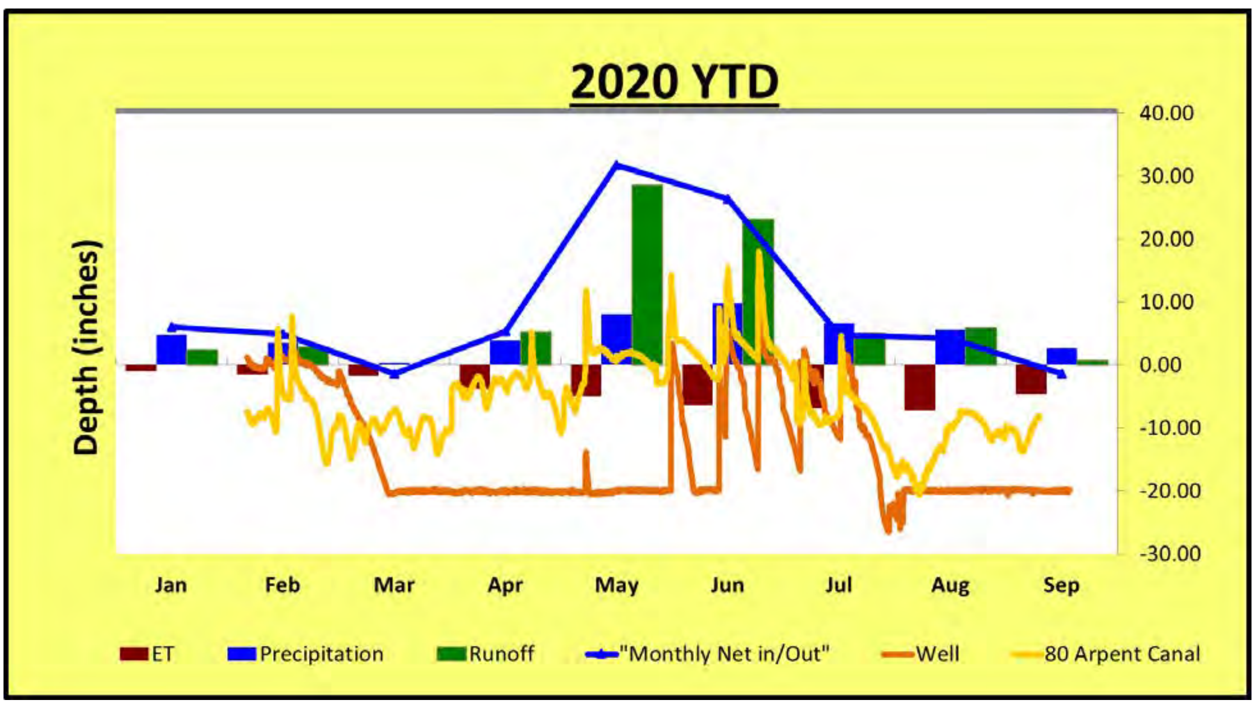

Figure 10: Calculated hydrograph for January through September 2020, and water levels recorded at project site between February-September 2020. Both sets of water levels are relative to ground level at groundwater well (elevation 2.28' NAVD 88)

3.3.5 Existing Hydrology Discussion

The Bank is currently hydrologically isolated from its watershed by levees subject to removal when the bank is constructed. Excluding artificial drainage, the current hydrology is controlled by precipitation and evapotranspiration. Prolonged soil saturation was observed in February 2020 when precipitation exceeded evapotranspiration and infiltration was minimal due to the low transmissivity of the Schriever clay. The two subsequent dry months may have facilitated increased potential infiltration by drying and cracking the soil, as saturation was not detected in the groundwater well following a 6-inch precipitation event in May. Surface inundation occurred on 5 occasions from June to August and soil saturation occurred on 4 occasions including a contiguous period from July 15 to August 5. This is consistent with the general pattern observed in the hydrographs of all selected years, in which precipitation-dominated summer and winter months are interrupted by brief net-dry periods in the spring and fall.

3.3.6 Jurisdictional Wetlands

A Jurisdictional Determination (JD) for the Bank and other land areas owned by the Sponsor was issued January 27, 2020 (MVN-2016-01564-SG). Appendix C contains the JD and Appendix A-Figure 19 illustrates the existing Jurisdictional Wetlands and Waters of the US within the Bank.

3.4 Vegetation

3.4.1 Historical Plant Community

After a review of the Natural Communities of Louisiana (LDWF 2009), the Bank would primarily consisted of the "Overcup Oak – Water Hickory," and/or the "Hackberry-American Elm-Green Ash" Associations in the higher elevations, and Baldcypress Swamp within the lower elevations.

The Overcup Oak – Water Hickory association occur in low-lying poorly drained flats, sloughs in the lowest backwater basins, and on low ridges with clay soils that are subject to inundation. Semi-permanently inundated or saturated soils are generally present for a major portion of the growing season. Co-dominant species include *Quercus lyrata* (Overcup Oak) and *Carya aquatica* (Water Hickory), while associate species include *Fraxinus pennsylvanica* (Green Ash), *Celtis laevigata* (Sugarberry), *Cornus foemina* (Swamp Dogwood*), Forestiera acuminata* (Swamp Privet), *Planera aquatica* (Planertree), *Cephalanthus occidentalis* (Buttonbush) and vines. This community type has a long successional stage.

The Hackberry-American Elm-Green Ash association occurs in floodplains of major rivers on low ridges, flats and sloughs in first bottoms. Soils are seasonally inundated or saturated periodically for 1 to 2 months during the growing season. In addition to Sugarberry, *Ulmus americana* (American Elm), and Green Ash other species include Water Hickory, *Quercus texana* (Nuttall Oak), *Q*. *phellos* (Willow Oak), Q. *nigra* (Water Oak), Overcup Oak, *Liquidambar styraciflua* (Sweetgum), Acer *negundo* (Box Elder), Ulmus *alata* (Winged Elm), *Acer rubrum* (Red Maple), Gleditsia *aquatica* (Water Locust) and Plantanus *occidentalis* (American Sycamore). Understory species include *Cornus foemina* (Swamp Dogwood), Crataegus *spp.* (Hawthorn), and *Morus rubra* (Red Mulberry). Many vines and herbaceous plants are present.

Baldcypress-Tupelo swamps are forested, alluvial swamps growing on intermittently exposed soils. Soils are inundated or saturated by surface water or groundwater on a nearly permanent basis throughout the growing season except during periods of extreme drought. The historic SWP species present would have included baldcypress, *Nyssa aquatica* (tupelo gum), Nyssa biflora (swamp blackgum), green ash, Red Maple, *Gleditsia aquatica* (water locust), *Cephalanthus occidentalis* (buttonbush), *Fraxinus profunda* (pumpkin ash), *Salix nigra* (black willow) *Planera aquatica* (water elm), and *Itea virginica* (Virginia willow).

3.4.2 Existing Plant Community

There are 3 distinct plant communities within the 206.4-acre Bank which include the following:

1) 122.0 acres of artificial fresh marsh/herbaceous wetland habitat created within the historic/current crawfish farming impoundments. This plant community supports a wide range of herbaceous species including *Polygonum punctatum* (Smartweed), *Alternanthera philoxeroides* (Alligator Weed), *Ipomoea lacunose* (morning glory), *Panicum hemitomon* (Maidencane), *Paspalum urvillei* (Vasey's Grass), *Rhynchospora inundata* (Beakrush), *Leersia oryzoides* (Cut-grass), Juncus *roemarianus* (Needlerush) and *Juncus effuses* (Common Rush), *Cyperus odoratus* (Rusty Flat Sedge), *Eleocharis spp*. (Spikerushes), and *Eichhornia crassipes* (Water Hyacinth).

2) 28.5 acres of forested wetland habitat located in the northwest portion of the site and a small area on the southeast portion of the site. Dominant species in this frequently flooded ecosystem include Red Maple, *Fraxinus pennsylvanica* (Green Ash), *Ulmus rubra* (Slippery Elm), *Quercus nigra* (*W*ater Oak) and Sugarberry. The understory is dominated by *Sabal minor* (Dwarf Palmetto) and Red Maple.

3) 22.0 acres of non-wetland forested habitat located in the northern portion of the property along the 80 Arpent Canal and within the southwest portion of the site. This area supports a dominant overstory of *Quercus nigra* (Water Oak), Sugarberry, American Elm, and an understory of scattered *Sabal minor* (Dwarf Palmetto), *Ligustrum sinense* (Chinese Privet), and *Vitis rotundifolia* (Muscadine).

The remaining acreage of the site consists of 17.1-acres of non-wetland/non-forested spoil banks consisting primarily of *Cynodon dactylon* (Bermuda Grass), along with aquatic habitat which consists of 16.8 acres of open water in the channels/ditches and recreational fishing pond. Appendix A-Figure 20 illustrates the plant communities as well as data points taken for this prospectus and the 2019 Wetland Delineation. Detailed information regarding the species composition of the plant communities 1, 2, and 3 is found in Appendix D.

3.5 General Need for the Project in this Area

The Bank is located in the Deltaic Plain, within HUC #08090301 (Appendix A-Figure 13), which is in the larger Central Louisiana Accounting Unit and Lower Mississippi Subregion (USGS). This area is also referred to as the Barataria Basin.

General Market Need for Mitigation Credits

The Barataria Basin is an active mitigation market area in southeastern Louisiana, particularly regarding coastal credits. During the past year, there have been many instances where coastal BLH and coastal SW demand outweighed supply, and impacts occurring within the Barataria Basin were mitigated in the Terrebonne Basin. Furthermore, there is a currently shortage of coastal credits in the Pontchartrain Basin, which as a result credits were at one point being secured "out of basin" in the Barataria and Terrebonne Basins.

There are flood protection projects within the Barataria and Pontchartrain Basins already planned/funded/authorized by the CEMVN-Civil Works Division as well as planned pipeline projects that will require large quantities of mitigation within the next 1-2 years. This is in combination with a high demand already being seen within the Barataria Basin due to commercial, residential, and industrial development. Therefore, the Bank is needed to provide appropriate wetland mitigation to allow for these projects to be constructed, while at the same time providing improved wetland functions and values.

Need for Wetland Functions and Values

The Bank will provide improved wetland functions following the implementation of the mitigation work plan and the establishment of a 206.4-acre BLH ecosystem. Bottomland hardwood forests are important ecosystems for maintenance of water quality, provision of a habitat for a variety of fish and wildlife, and regulation of flooding and stream recharge. These forests are a result of physical forcing functions, particularly hydrologic and geomorphologic conditions where water, energy, and materials from upstream areas converge, which results in nutrient exchange and organic export taking place within the watershed (Taylor et al 1990). Baldcypress swamps also provide many of the above benefits, including maintenance of water quality, productive habitat for a variety of fish and wildlife species, and regulation of flooding and stream recharge (LDWF).

According to the LDWF and the Barataria-Terrebonne National Estuary Program (2010), bottomland hardwood loss is estimated to be 50 to 75% of the original pre-settlement acreage. The primary factor leading to fragmentation and decline of these valuable ecosystems was clearing for agriculture purposes. Additional factors of loss and existing threats include hydrological alterations, construction of roads, utilities, and pipelines, and the spread of invasive exotic species. Based on a review of historical documentation, BLH functions within the Bank have been largely lost due to historic agricultural activities and surrounding land-use changes associated with human development.

Swamp forests represent a unique and important ecosystem in the southeastern United States, with baldcypress being the dominant tree in the coastal plain of Louisiana when settlers first arrived in the state. Early estimates of the area of baldcypress forests range from 0.67-3.64 million ha, but following intensive timber harvesting activities from 1890-1925, this number was reduced drastically to only 0.14 million ha. In addition to timber harvesting, other causes of decline include hydrology modifications, invasive species, and natural subsidence (Conner and Toliver 1990).

In order to reverse the historic and current trends of wetland loss within Louisiana and the Barataria River Basin, wetland restoration, enhancement, and preservation projects – such as the proposed Bank – must be conducted, maintained, and managed for the long term. However, to support the socioeconomic values that exist due to the presence of these wetlands, a sustainable approach to land use must also take place. The following organizations have formed to develop plans to address the needs of the watershed:

- ***Lafourche Parish Coastal Zone Management –*** Lafourche Parish has developed a coastal zone management division which recognizes the "value in natural coastal ecosystems and coastal-dependent commercial activity," and seeks to "balance these values in Lafourche Parish to allow current and future residents the opportunity to enjoy the multiple benefits and cultural values associated with a healthy coastal zone," which will "foster the public safety, health, and welfare of Lafourche Parish residents" (Lafourche Parish Government 2017).

- ***Barataria-Terrebonne National Estuary Program –*** Some of the goals of the BTNEP (2010) include preserving and restoring wetlands and barrier islands, promoting environmentally responsible economic activities that sustain estuarine resources, realistically supporting diverse, natural biological communities, and developing and maintaining comprehensive watershed planning.

The activities proposed within the Bank are consistent with the Lafourche Parish Coastal Zone Management Division and the BTNEP, and most importantly, will help contribute to the statewide and national goal of "no-net loss of wetlands." As unavoidable impacts to wetlands are authorized by the Section 404 or Coastal Use Permitting Programs, compensatory mitigation must be secured prior to the impact occurring. The Bank will provide this mitigation, in effect allowing the public benefit of the project to be realized while at the same time providing improved BLH functions and values for the watershed.

4.0 Establishment of the Mitigation Bank

4.1 Site Restoration Plan

The site restoration plan includes a soils and hydrologic work plan to restore historic/natural wetland hydrology to the maximum extent practicable, followed by the implementation of a vegetation work plan to restore native vegetation.

4.1.1 Soils/Hydrologic Work Plan – Overview

The proposed soils and hydrologic work plan primarily consists of the degradation of artificial spoil banks/levees throughout the property. In total, 22,583 linear feet of spoil banks will be excavated and 3,309 linear feet of artificial ridges will be excavated. Spoil banks proposed to be degraded containing woody vegetation will first be cleared as well as the space needed to deposit/spread the material. Fill material will be placed within 3 artificial channels within the property or will be spread evenly within the site. Extensive calculations have been performed to ensure that final ground surface elevations will be a maximum of 3 inches higher following fill spreading/deposition.

Along with the spoil bank/levee/ridge degradation, 3 artificial channels within the site will be filled. These channels will be filled in a manner that will keep the natural slope of the land, allowing for natural flow and will not result in any adverse impacts to the watershed as described in the subsequent sections of this prospectus. It must also be noted that the center/primary channel will remain open for the first 450-feet upon entering the site.

Earthen plugs will be installed within the remnant agricultural ditches found within the forested area on the western portion of the Bank. These plugs will be installed at the lower/northern end of the former forested wetland (6 plugs) as well as on the northern boundary of the Bank along the 80 Arpent Canal (5 plugs). A 40-foot wide cut will also be made in a forested non-wetland spoil bank in the northeastern corner of the site. Woody vegetation will first be removed in this location, followed by the degradation of the spoil bank and depositing/spreading of the fill material towards the interior of the Bank.

Appendix A-Figure 21 illustrates the soils and hydrologic work plan, and Appendix E contains detailed drawings and cross sections submitted for the Section 404/Coastal Use Permit Application. Typical earth moving equipment such as excavators and bull dozers will be used for conducting the work.

4.1.2 Soils/Hydrologic Work Plan – Discussion

Channel Volumes

Survey transects across channels included elevations at the levee crests, levee bases, and water bottoms. As a simplifying assumption, the cross-sectional area was considered to be rectangular between the levee base and the water bottom (referred to as “channel”), and trapezoidal between the base and crest of the levees (referred to as “spoil bank”). Inside the project area, most channels had multiple transects. The volumes of the segments defined by the transect locations were calculated using the end area volume formula.

$$Volume = Length * \left(\frac{Area1 + Area2}{2}\right)$$

The volumes of the segments near the inlets and outlets, as well as those channels with only one transect, were assumed to have constant area and therefore calculated as the product of length and area.

For channels outside the project area, the end area volume method was again used, with one area derived from the nearest transect. Using the measurement tool in ArcGIS, the width between levee crests at the upslope was measured and the other channel widths were assumed to have identical proportions. However, the channel depth was assumed to be constant.

The total volume of drainage features in the entire watershed is 169,684 cubic yards. The drainage features within the project area have a combined volume of 59,418 cubic yards (approximately 35%), while those outside have a combined volume of 110,267 cubic yards (65%) (Figure 11). Inside the project area, approximately 38% of the drainage volume is located below the bases of spoil banks (Figure 12).

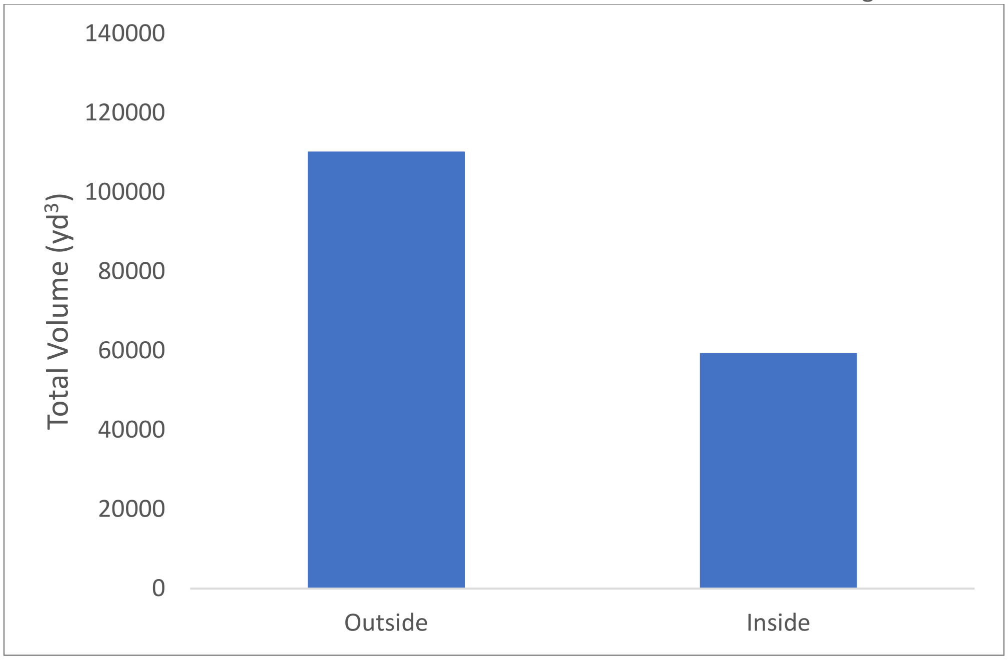

Figure 11: Comparison of estimated drainage channel volumes inside and outside project area.

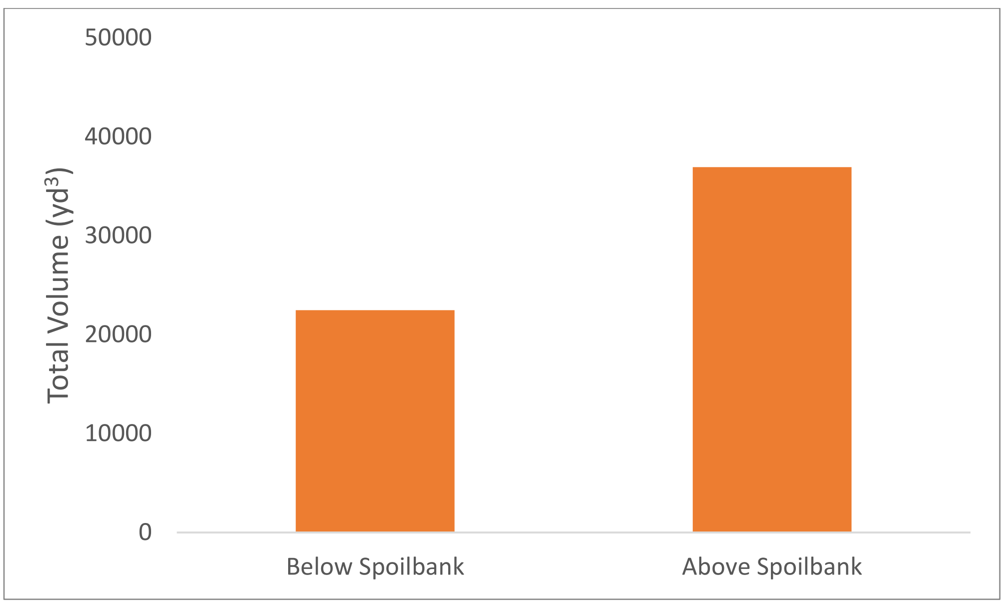

Figure 12: Comparison of estimated volumes above and below spoil banks for channels inside project area.

Design Scenarios

For reference, the major channels that output to the 80 Arpent Canal are labeled A through D (Figure 13).

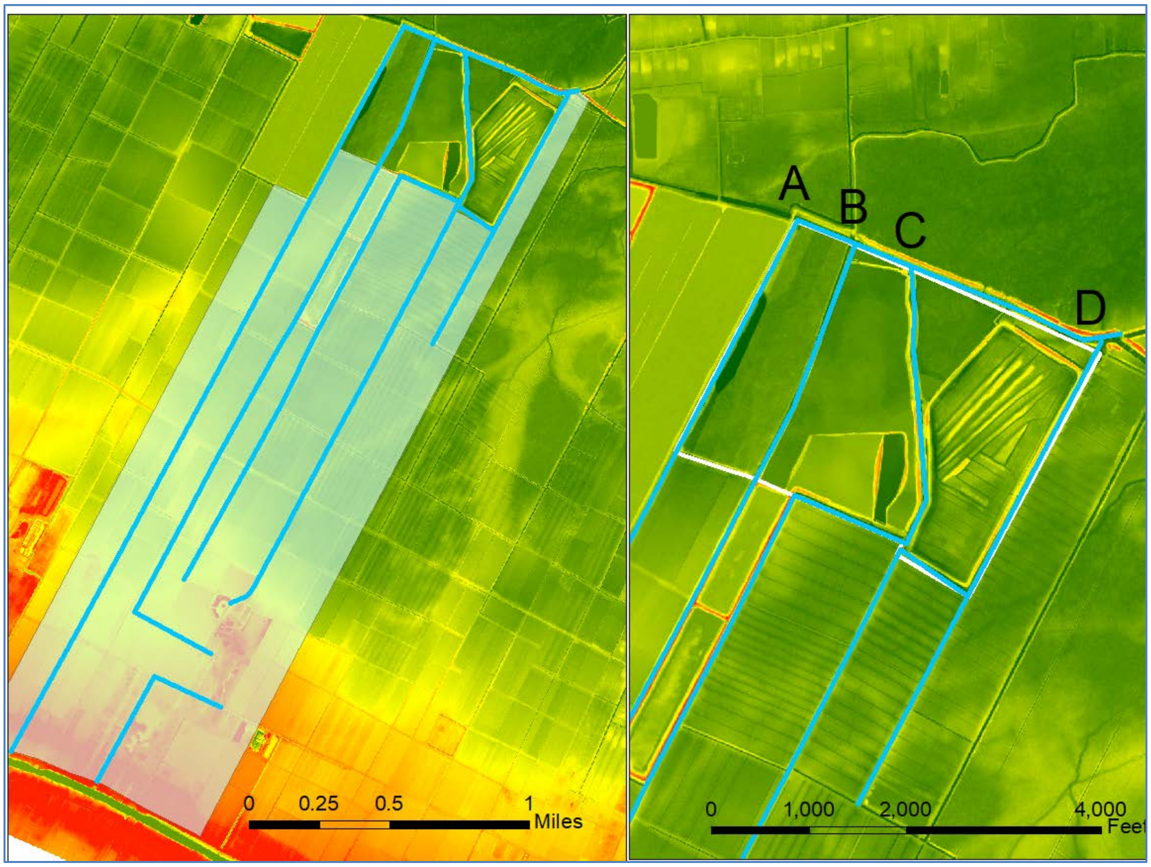

***Figure 13: Primary drainage channels in contributing watershed (left) and project area channel labels (**right)*

Drainage calculations were performed for the following design alternatives.

1. *No Action*: This reflects current conditions
2. *Keep None:* All spoil banks are removed. No channelized flow in the project area; all water travels over land via shallow concentrated flow.
3. *Keep BC:* All spoil banks are removed. Channelized flow takes place below a threshold discharge defined by bank-full conditions in the B and C channels at the base elevation of the former spoil banks. All water above this threshold, and all water entering from the A and D channels, travels over land via shallow concentrated flow.
4. *Keep AD:* All spoil banks are removed. Channelized flow takes place below a threshold discharge defined by bank-full conditions in the A and D channels at the base elevation of the former spoil banks. All water above this threshold, and all water entering from the B and C channels, travels over land via shallow concentrated flow.
5. *Keep All Channels:* All spoil banks are removed. Channelized flow takes place below a threshold discharge defined by bank-full conditions at the base elevation of the former spoil banks. All water above this threshold travels over land via shallow concentrated flow.

Methodology

This investigation followed the methods of USDA Technical Report 55, "Urban Hydrology for Small Watersheds." (1986). The curve number and runoff amounts for the watershed were previously generated using this method. The contributing watershed was assigned a curve number of 85 and was adjusted to 84 for the design alternatives that include forested wetlands throughout the project area.

The time of concentration, or travel time through the entire watershed, was calculated for channels A through D using the total cross-sectional area at the outlet, channel bottom slope from multiple transects, overland slopes measured from LIDAR, and travel distance. Manning's roughness was assumed to be 0.022 for a clean, weathered, earthen channel. Time of concentration was calculated for distinct phases of the flow path, as different equations are prescribed for sheet flow, channelized flow, and shallow concentrated flow. The overall time of concentration for the watershed was assumed to be the weighted average by cross-sectional area of the travel time to each of the four outlets.

Peak discharge of runoff following a given 24-hour rain amount was calculated from the curve number based on land cover, time of concentration, and watershed area. Finally, the ratio between peak discharge with no action and that of a design alternative was used to calculate the retention capacity required within the bank to prevent backflow and potential flooding on adjacent properties. The volume of the existing project area below 5 ft NAVD 88 was calculated using the Surface Volume tool in ArcGIS. The required retention capacity divided by the acreage of the proposed bank estimates the peak water depth on the property following rainfall.

Results

The travel times for all design alternatives are shown in Table 2 and Figure 14. Note that the travel time to the property boundary is 0.78 hours under all scenarios, as the upslope drainage network is never modified.

Table 2: Estimated time of concentration from upslope watershed bounday to 80 Arpent Canal for five design alternatives.

Design Alternative	T_c (hr)
No Action	1.08
Keep None	9.01
Keep BC	7.55
Keep AD	7.01
Keep All	5.56

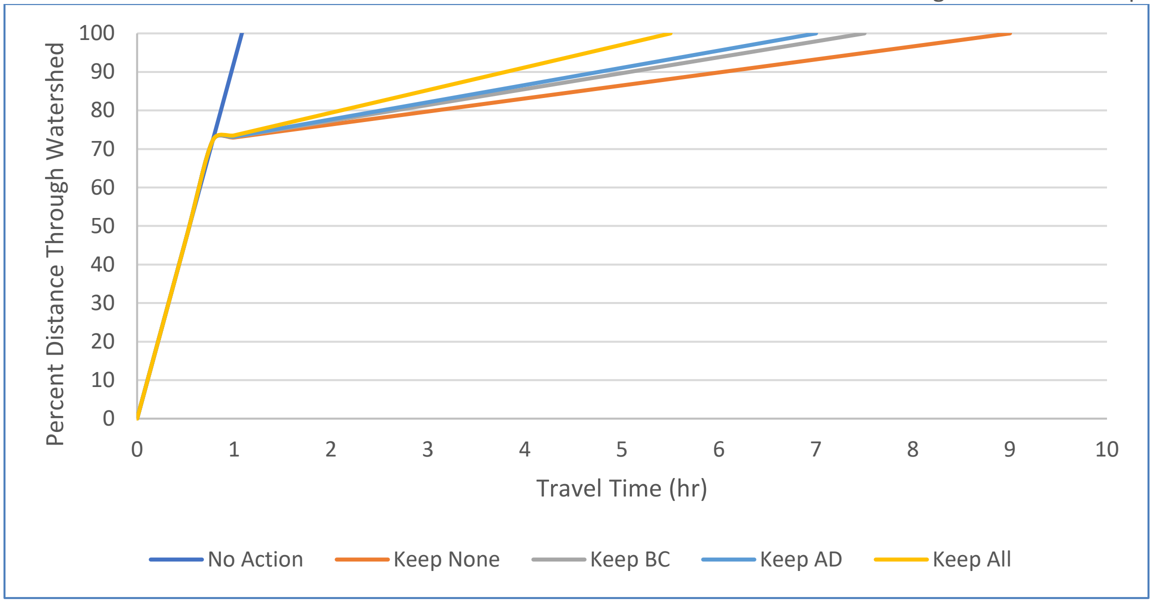

Figure 14: Comparison of travel rates through watershed, expressed as percent distance from upslope watershed boundary to 80 Arpent Canal. Inflection point indicates property boundary.

Peak discharges following a 24-hour rain event over the range of return frequencies from 1 to 1000, along with the associated rainfall amount, are shown in Figure 15 for all scenarios. The average peak water depths on the property following the aforementioned set of 24-hour rain events across design scenarios are shown in Figure 16. Finally, the corresponding necessary storage volumes relative to the estimated retention capacity of the project area are shown in Figure 17.

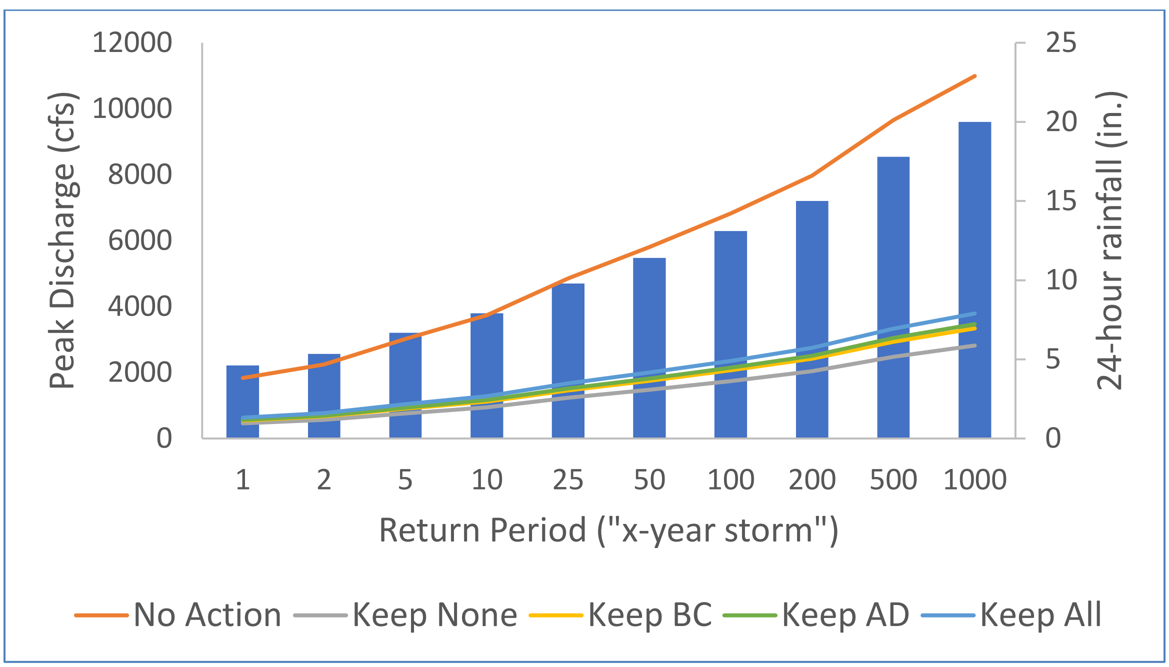

Figure 15: Peak discharges following 24-hour rainfall events across return periods for all design scenarios. Blue bars indicate rainfall amounts associated with each return period.

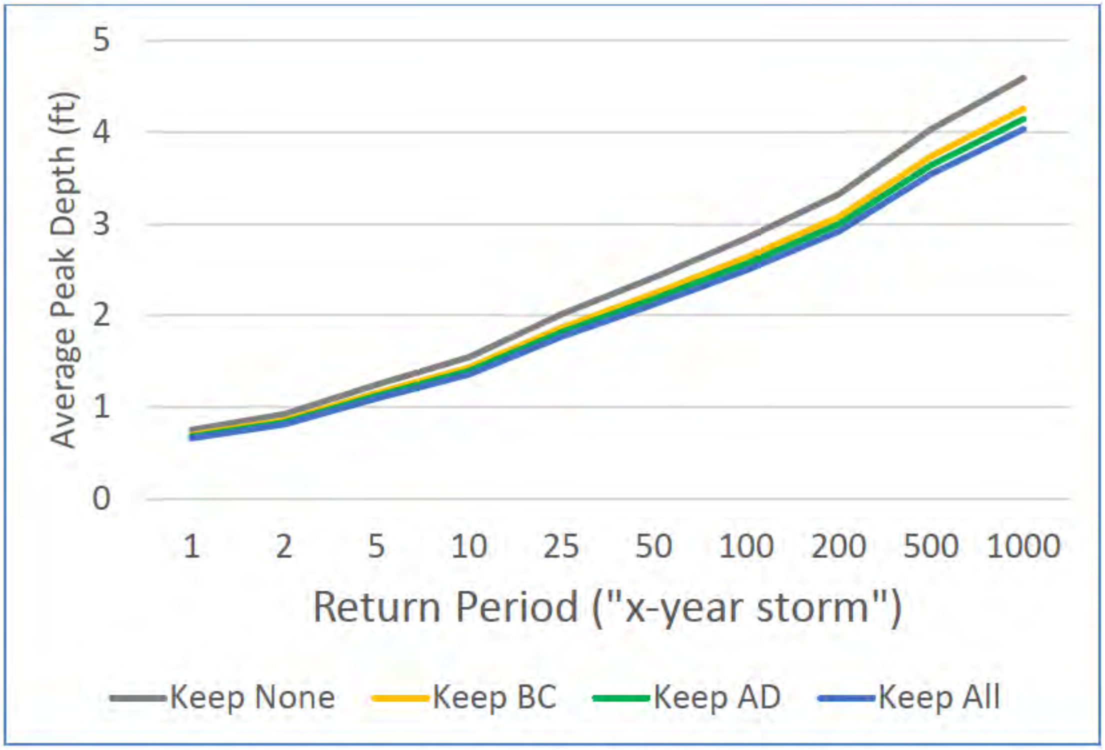

Figure 16: Average peak depths expected in project area following 24-hour rainfall events across return periods for all design alternatives.

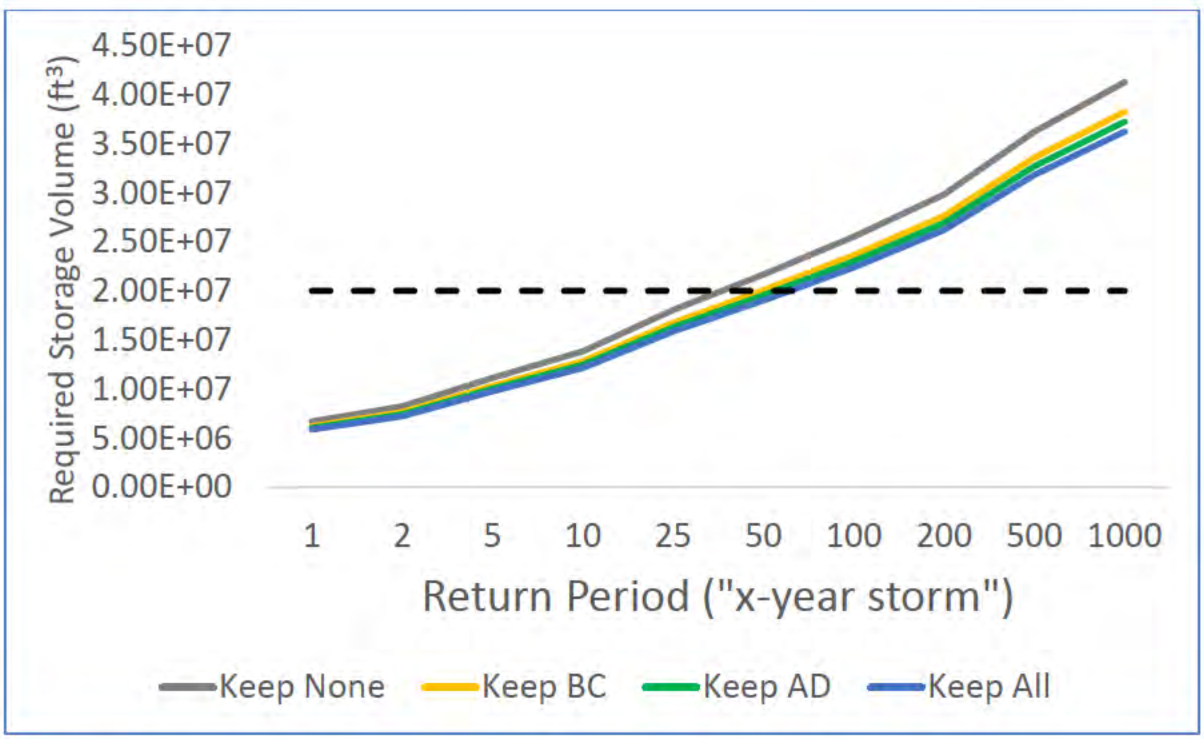

Figure 17: Calculated detention volumes required to avoid flooding after 24-hour rainfall events across return periods for all design alternatives. Horizontal dashed line indicates estimated volume of project area below 5 ft.

Selected Design Alternative

The Sponsor has determined that the preferred design alternative is Option 4:

- *All spoil banks are removed. Channelized flow takes place below a threshold discharge defined by bank-full conditions in the A and D channels at the base elevation of the former spoil banks. All water above this threshold, and all water entering from the B and C channels, travels over land via shallow concentrated flow*.

Selected Design Alternative - Discussion

The conversion of channelized flow to shallow concentrated flow following bank construction will delay the time of concentration by a factor of 5 to 9, with travel time decreasing with more channels remaining. Peak discharges through the project area are significantly lower for all design alternatives as compared to the upslope drainage network, and the magnitude of the difference between flow segments increases with the severity of the storm. Therefore, those storms that would produce more flooding simply due to the amount of rainfall would also cause substantially greater amounts of potential backwater flooding. The mismatch between upslope and project area discharges is balanced by ensuring the project area acts as a detention basin, temporarily storing enough incoming water as the outgoing water slowly drains. The current volume of the project area below 5 feet NAVD 88 is sufficient to avert backwater flooding following the 25-year rainfall amount for all design alternatives. In the “Keep All” and “Keep AD” scenarios, the Bank could potentially absorb the runoff from a 50-year rainfall event. However, the “Keep All” scenario may not generate sufficient overland flow after rainfall associated with typical conditions, and therefore fail to achieve wetland hydrology and associated wetland functions. Retaining only the channels along the property boundary would likely promote superior wetland hydrology in the center of the project area while still allowing for adequate drainage from neighboring/upstream properties.

4.1.3 Berm Removal Discussion

A major component of the soils/hydrologic work plan will be the removal of berms that channelize incoming runoff and hydrologically isolate the channels from the remainder of the project area. Three issues associated with berm removal must be considered. First, spreading material will raise elevations over the spread area, this could disturb the planned flood regime by either flooding too infrequently for wetland hydrology, or by impeding flows and cause other areas to flood too frequently for wetland vegetation. Second, infilling reduces the detention capacity of the bank, meaning a smaller magnitude rain event as previously discussed could cause backwater flooding on adjacent properties. Finally, increasing the distance over which material is spread and/or transported will eventually become prohibitively expensive.

Berm volumes throughout the project area were estimated from surveyed elevations and the adjusted LIDAR. A berm with height *h* and base width *2w* was assumed to have a parabolic shape (Figure 18) defined by the function $f(x) = h\left(1 - \frac{x^2}{w^2}\right)$, and cross-sectional area *A* calculated by integrating this function $\int_{-w}^{w} f(x)dx$.

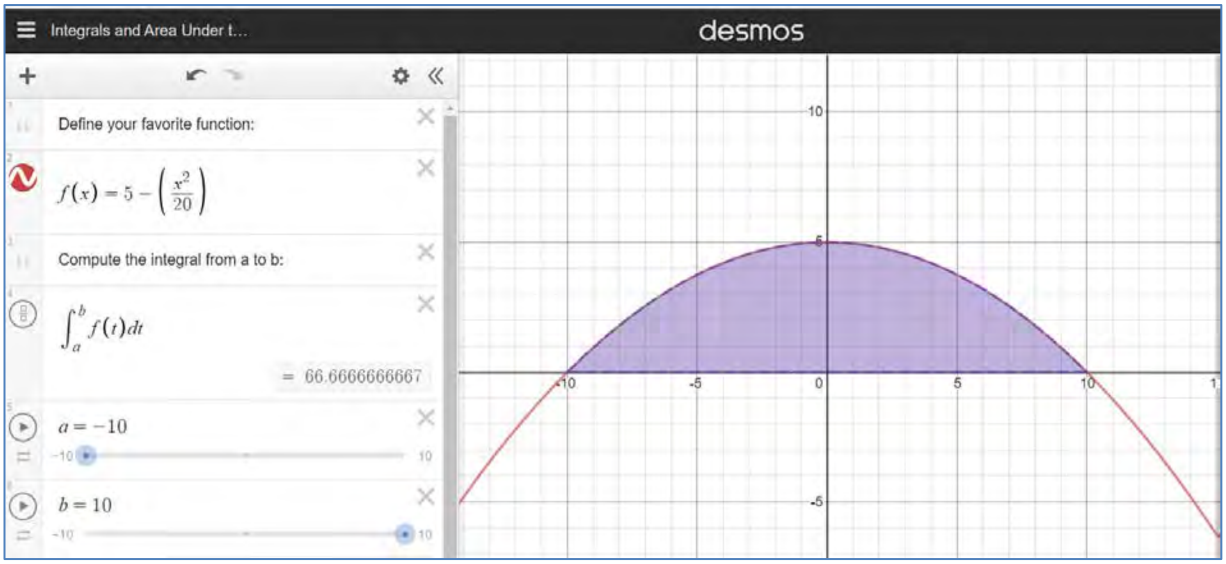

Figure 18: Berm Volume Calculation Methodology

The base elevation z_{base} was calculated by interpolating a line in ArcMap parallel to the berm along each edge and extracting elevation values from the adjusted LIDAR surface. The elevations for each transect were averaged and the higher elevation was chosen. Base width $2w$ was calculated by interpolating lines in ArcMap perpendicular to the berm at regularly spaced intervals and extracting elevation values from the adjusted LIDAR surface. The widths of the elevation profiles at elevation = z_{base} were averaged. Crest elevation z_{crest} was calculated either by averaging surveyed elevations from berm crests where available, or by interpolating a line in ArcMap along the berm crest and averaging the extracted values. The berm height h was calculated as $h = z_{crest} - z_{base}$. All berm segment lengths L were measured in ArcMap from the LIDAR. The berm volume segment volume V was then calculated as $V = A * L$. It was assumed that spread material would settle vertically to 2/3 of the original volume. For berms being used to fill channels, the volume to be spread was calculated as V – (channel volume) * 1.5. The spread thickness was calculated as spread volume / (L * spread distance). This value was then multiplied by 2/3 to calculate the settled spread thickness.

Appendix A, Figure 21 illustrates the anticipated spread distances/area of fill deposition following berm removal. In all cases (except for the artificial pond), the maximum thickness of the fill deposition is 3.0 inches. The pond will be filled to match adjacent elevations. Based on these calculations, this fill thickness will minimally impact the hydrology of the project area and would not require material to be spread by an extraordinary distance.

4.1.4 BLH Enhancement Area Discussion

Following the submission of the draft prospectus, questions were raised regarding the southwestern BLH enhancement area, and whether or not the hydrologic improvements would be sufficient to create conditions that would result in the conversion of a non-wetland forest to wetland forest. Additionally, questions were asked if the Sponsor would anticipate any mortality of existing, mature species because of the wetter conditions that would result following the implementation of the soils/hydrologic work plan.

In response to the questions regarding increased wetland hydrology, as described in the analysis above selecting an appropriate design alternative, it is anticipated that upon removing the spoil banks and the BC channels, travel time (retention) will increase, peak discharge rates will decrease, peak depth will increase, along with an increase of water being spread out across the site during storm events. According to groundwater data collected in this area saturation in the upper 12" soil profile is already occurring to some extent and would be expected to increase in duration due to the earthen plugs and in frequency due to the removal of surrounding berms following mitigation work plan activities.

In response to the questions regarding potential mortality of mature species; the species present are representative of a typical bottomland hardwood habitat which has been present since this area was abandoned for agriculture beginning in the 1940's. This regeneration and continued growth has also occurred in other areas surrounding the site that exhibit frequent flooding such as the area north of the 80 Arpent Canal. The mature species in these surrounding areas and within the enhancement area are wetland tolerant and are expected to benefit from the soils/hydrologic work plan, as the removal of artificial barriers should also increase sedimentation, mineral/organic accretion, and nutrient uptake.

4.1.5 Post Mitigation Work Plan Hydrology

Following the completion of the soils/hydrologic work plan the Bank will have improved wetland hydrology. (Appendix A-Figure 22). The removal of all artificial spoil banks/levees/ridges will allow for sheet flow across the site, will prevent artificial impoundments, and will increase hydrologic connectivity to the surrounding watershed and the tidal waters of Lake Des Allemands. Rainfall runoff/drainage from upstream areas will not be adversely affected. Any rainfall below 0.96 inches will be contained within the remaining channels and will flow unaltered into the 80 Arpent Canal. Any 24-hour rainfall above 0.96 inches will result in overland flow into the Bank, which occurred 13 times during the 9-month monitoring period of 2020. Due the removal of the spoil banks, the Bank will have the capacity to absorb conservatively a 25-year storm (9 inches in 24 hours) and likely up to a 50-year storm (11 inches in 24 hours). In terms of on-site rainfall, any rainfall above 0.45 inches will result in runoff/sheet flow across the site which will now be unabated due to the removal of the spoil banks. This type of event occurred 29 times during the 9-month monitoring period. Therefore, the Sponsor has determined that the proposed soils/hydrologic work plan is the preferred alternative to restoring wetland hydrology to the maximum extent practicable.

4.1.2 Vegetative Work

The Sponsor will plant BLH and SW species within 156.3 acres of the Bank (Appendix A-Figure 23). These areas represent the artificial fresh marsh/herbaceous wetland areas and the area beneath the footprint of the artificial spoil banks and the fill deposition areas of these spoil banks upon degradation and any necessary removal of woody vegetation.

Planting will occur during the non-growing season (approximately December 15 to March 15). One-year-old bare root seedlings will be obtained from a regional registered licensed nursery grower and properly stored and handled prior to planting. Seedlings will be mixed upon arrival to ensure a mosaic of species planted. Some natural recruitment is expected, since the surrounding habitat is currently forested. The planted area will be monitored and maintained however, on an as needed basis, through chemical and/or mechanical means, to control exotic/noxious species, such as Triadica *sebifera (*Chinese tallow*)*. Nuisance wildlife species will also be monitored and controlled as necessary.

Site preparation within the existing artificial fresh marsh/herbaceous wetland habitat will consist of bush-hogging/disking/ripping where necessary, the application of a foliar herbicide (Roundup) where necessary, and will also consist of leveling surface elevations within the spoil bank degradation areas. A pre-emergent herbicide (OustXP) will be applied either before or immediately after plantings. The Sponsor anticipates that herbivory will be minimal, however, as part of the ongoing maintenance and monitoring operations, the Sponsor will continuously check for signs of herbivory and implement remedial actions as necessary. The Sponsor will also continuously control invasive vegetation/noxious weeds using foliar and/or basal herbicides. As seedlings grow and natural recruitment occurs it is anticipated that overtime, the need to control weeds/exotic vegetation will decrease over time.

Species associations will be based on the natural communities defined by the Louisiana Natural Heritage Program (LHNP 2009) and specific species assemblages, densities, and percentages will be approved by CEMVN, DNR, and the IRT.

After a review of the hydrograph of the 80 Arpent Canal during the monitoring period of February through September 2020, the Sponsor has determined that Baldcypress Swamp Habitat is appropriate for elevations generally below 2.0 feet NAVD 88. This is based on water surface elevations in the 80 Arpent Canal that stayed continuously above this level from approximately May 14 to July 16, 2020. Within this area, planting densities would be 302 stems per acre at 12 foot by 12 foot spacing, shown in Table 3 below:

Table 3 – Baldcypress Swamp Planting

BALDCYPRESS SWAMP SPECIES	SOFTMAST	HARDMAST	COMPOSITION
Taxodium distichum	X		70%
Nyssa biflora	X		10%
Acer rubrum	X		10%
Fraxinus pennsylvanica	X		10%

The hydrograph of the 80 Arpent Canal during the monitoring period also showed 4 peaks that were approximately 3.5 feet NAVD 88. Therefore, land areas below this elevation but above the 2.0 feet NAVD 88 elevation will be planted with the Overcup Oak-Water Hickory BLH type (Table 4), and areas generally above 3.5 feet NAVD 88 will be planted with the Sugarberry-American Elm-Green Ash BLH type (Table 5). The Sponsor will plant a higher percentage of hard mast species to account for anticipated natural regeneration of soft mast species. Hard mast species will account for at least 70% of all BLH plantings with the remaining 30% consisting of soft mast tree species. Planting densities will be approximately 538 stems per acre (9 foot by 9 foot spacing).

Table 4 – Overcup Oak-Water Hickory BLH Type 1 (112.1 acres)

BOTTOMLAND HARDWOOD SPECIES	SOFTMAST	HARDMAST	COMPOSITION
Quercus lyrata		X	30%
Carya aquatica		X	20%
Quercus nuttallii		X	20%
Acer rubrum	X		10%
Celtis laevigata	X		10%
Taxodium distichum	X		10%

Table 5 – Sugarberry-American Elm-Green Ash BLH Type 2 (19.7 acres)

BOTTOMLAND HARDWOOD SPECIES	SOFTMAST	HARDMAST	COMPOSITION
Quercus nuttallii		X	30%
Quercus phellos		X	20%
Quercus michauxii		X	10%
Quercus nigra		X	10%
Ulmus americana	X		10%
Celtis laevigata	X		10%
Fraxinus pennsylvanica	X		5%
Liquidambar styraciflua	X		5%

Following the implementation of the vegetation work plan and through active management and maintenance, the Sponsor anticipates that natural regeneration will occur. The planting of species listed in Tables 3-5 will provide genetic material, forest structure, and ultimately seed producing trees. Natural regeneration will also be aided by the implementation of the soils/hydrologic work plan.

4.2 Technical Feasibility

The activities proposed in this prospectus are practicable and represent well-established techniques that have resulted in successful mitigation projects in other areas of coastal Louisiana. The removal of perimeter and internal levees will allow for improved hydrologic connectivity to the surrounding watershed, tidal flux, sheet flow, and stormwater retention/detention within the site. Existing site conditions indicate favorable conditions for BLH plantings due to the hydric soils present and existing BLH Habitat within and around the Bank.

4.3 Current Site Risks

There are little-to-no risks associated with the establishment and management of the Bank. There are no known Rights of Way within the limits of the Bank. There are no issues regarding water rights. The soils and hydrologic work plan has been designed in a manner that will not impede drainage from upstream areas and will not inhibit tidal exchange to the surrounding area. The Sponsor has created a 75 foot “buffer” from the 80-Arpent Canal that will be included within the Bank however will not receive any credit. The Bank is also immediately adjacent to the approved Greenwood Plantation and proposed Family Farms Mitigation Banks; this further supports the establishment of a BLH ecosystem and collectively will result in a substantial contiguous wetland habitat that will be protected for perpetuity.

4.4 Long-Term Sustainability of the Site

Following the implantation of the mitigation work plan, the Bank will be sustainable, as wetland hydrology (sheet flow, retention/detention, tidal connectivity) will be improved, and native wetland plant species will be established. The soils within the Bank are hydric and therefore suitable for the establishment of a self-sustaining BLH and SW ecosystem, which will in turn provide improved wetland functions and the realization of the wetland values within the watershed. The Sponsor is also the landowner of the Bank and will therefore have full authority to monitor and maintain the Bank for the long-term.

5.0 Proposed Service Area

The Sponsor proposes to use the Barataria River Basin as the primary service area and the Terrebonne and Pontchartrain River Basins as the secondary service areas (Appendix A-Figure 13). Impacts to coastal wetlands must be compensated with coastal credits within the Bank. As impacts to BLH occurs within this area, securing credits from the Bank will result in a no-let loss of wetland/aquatic resources within the watershed. Use beyond these service areas/habitat types will be determined by CEMVN and DNR on a case-by-case basis.

6.0 Operation of the Mitigation Bank

6.1 Project Representatives

***Sponsor* and Landowner:**
Stand Up Triple, LLC
410 Olive Street
Monroe, LA 71201
Attn: Pat Porter

Agent:
Natural Resource Professionals, LLC
7330 Highland Road, Suite B-1
Baton Rouge, LA 70808
Attn: Gregg Fell

6.2 Qualifications of the Sponsor

Stand Up Triple, LLC is managed by Mr. Pat Porter of Monroe, Louisiana. Mr. Porter is a manager of the Laurel Oak Mitigation Bank in the Pontchartrain River Basin and is also a co-owner/manager of RecLand Realty which provides brokerage services for hunting land, farms and ranches, timberland, and rural home sites in Louisiana, Arkansas, Mississippi, Texas, Iowa, and Missouri. Agent for the Sponsor is Natural Resource Professionals, LLC (NRP) which has extensive experience in wetland mitigation and wetland permitting throughout South Louisiana.

6.3 Proposed Long-Term Ownership and Management Representatives

Stand Up Triple, LLC will serve as the Sponsor and Owner of the Bank but will reserve the option of appointing a long-term steward which must be approved by the CEMVN, DNR, and IRT. The Sponsor anticipates that the long-term management requirements will be boundary control, trash/debris cleanup, invasive species control, general maintenance, and monitoring.

6.4 Site Protection

The Bank will be protected in perpetuity by a conservation servitude pursuant to Louisiana Revised Statute 9:1271 *et seq*. The servitude will be held by Mississippi River Trust, a non-profit conservation-oriented 501(c) (3) organization. The servitude will inure and run with the property title. The servitude will prohibit activities, such as clear cutting, fill discharges, cattle grazing, or other commercial surface development that would diminish the quality or quantity of restored wetlands. Appendix A-Figure 10 illustrates the land areas (206.4 acres) that will be protected by the Conservation Servitude.

6.5 Construction and Establishment Financial Assurances

Upon approval of the Addendum, the Sponsor will establish a Construction and Establishment Financial Assurance (CE Fund), which will be in the form of an escrow account and/or a letter of credit. The CE fund will be held by an entity accredited by the Federal Deposit Insurance Corporation (FDIC), and the beginning balance of the CE Fund will be coordinated with the USACE, DNR, an IRT to account for construction costs, maintenance costs, monitoring, and bank management during the construction and establishment period. The CE Fund will be reduced as success criteria are achieved and the probability decreases that those funds would be needed.

6.6 Long-Term Strategy

The Sponsor will provide long-term management of the Bank in accordance with 33 CFR §332.7. The Sponsor will provide site protection by establishing conservation servitude over the Bank, which will be held by a third-party non-profit corporation. Following the establishment period, the Bank would only require long term management activities such as invasive species control, boundary maintenance, and general site inspections. However, the Sponsor - through coordination with CEMVN, DNR, and the IRT - will employ an Adaptive Management Plan if monitoring or other information indicates that the Bank is not progressing towards meeting its anticipated performance standards. The Sponsor will also establish a long-term management fund/long term escrow account which will be funded annually/incrementally as credit sales are made to ensure that monies are available to perform any anticipated management and maintenance needs.

7.0 References

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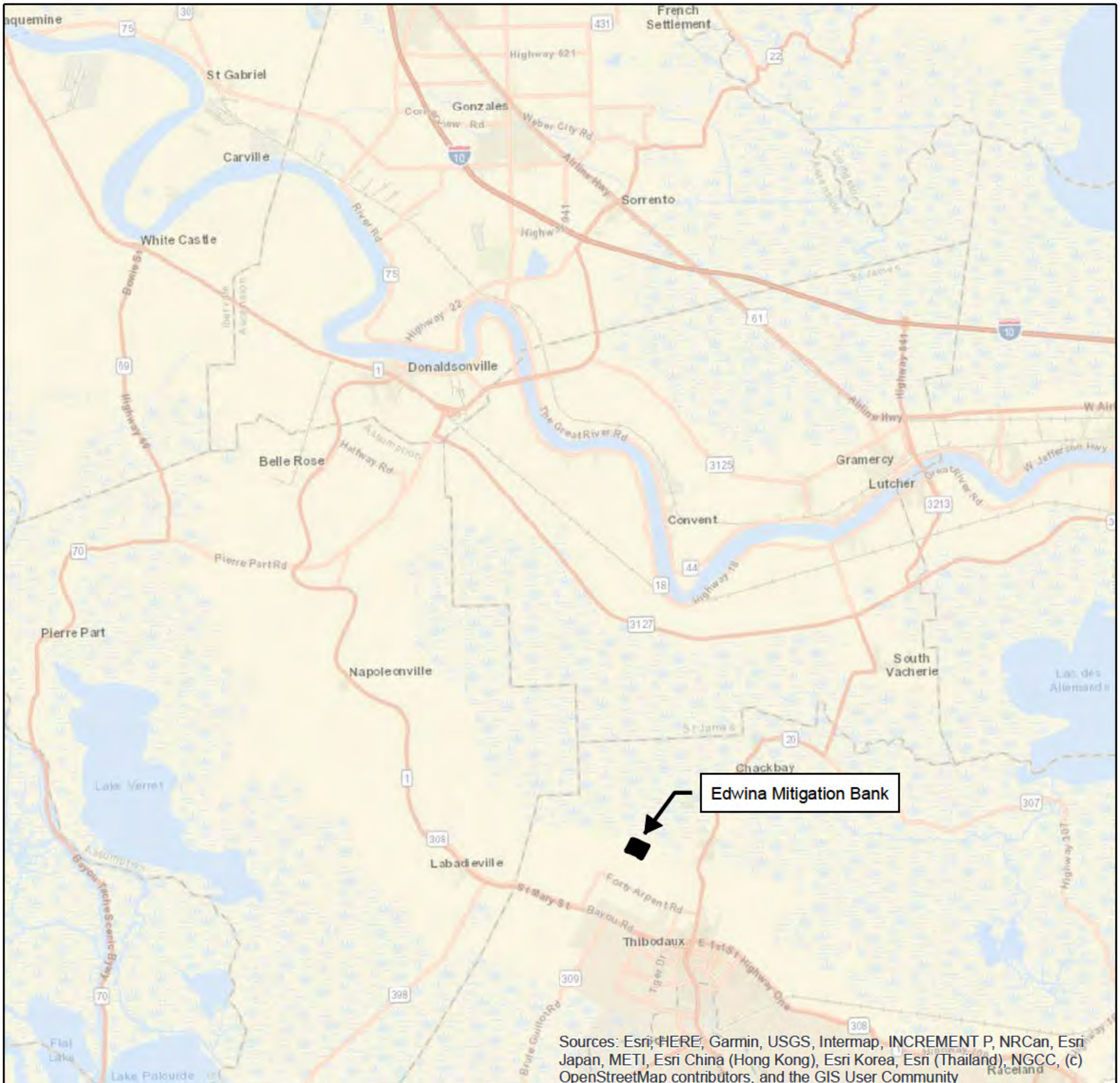
Appendix A

Prospectus Figures



Legend

Edwina Mitigation Bank (206.4 acres)

5.0 2.5 0 5.0 Miles

N

Map Notes:

1. The boundary shown is based on the boundary survey provided by the client.
2. Map projected to NAD83 UTM Zone 15.

NRP

Stand Up Triple, LLC

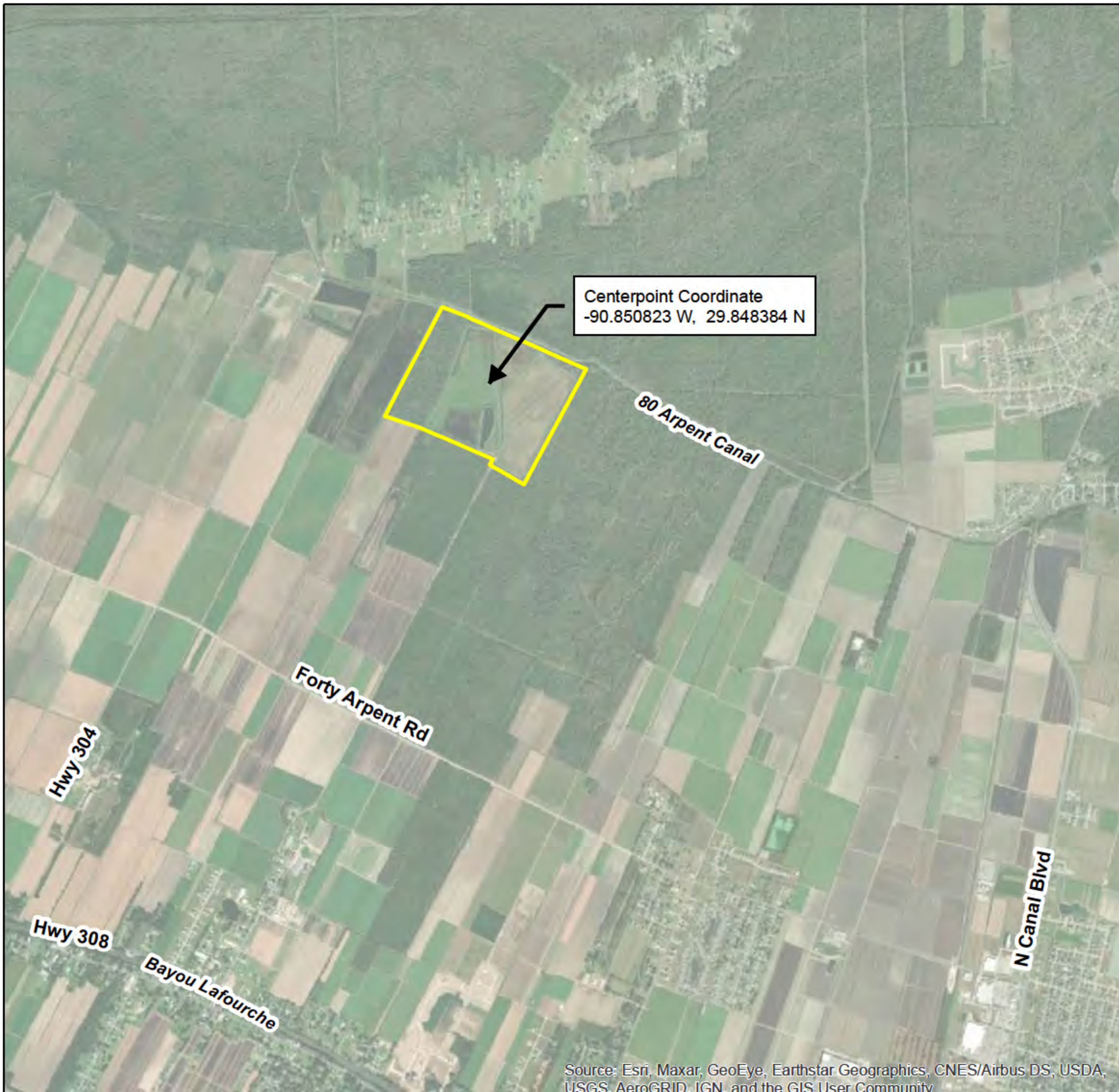
Monroe, LA

VICINITY MAP

LAFOURCHE PARISH, LA

Created :	AGB/ArcView
Approved :	GLF
Date :	11/06/2020
Map No. :	

APPENDIX A FIGURE 1



Legend

Edwina Mitigation Bank (206.4 acres)

3,000 1,500 0 3,000 Feet

N

NRP

Map Notes:

1. The boundary shown is based on the boundary survey provided by the client.
2. Map projected to NAD83 UTM Zone 15.

Stand Up Triple, LLC

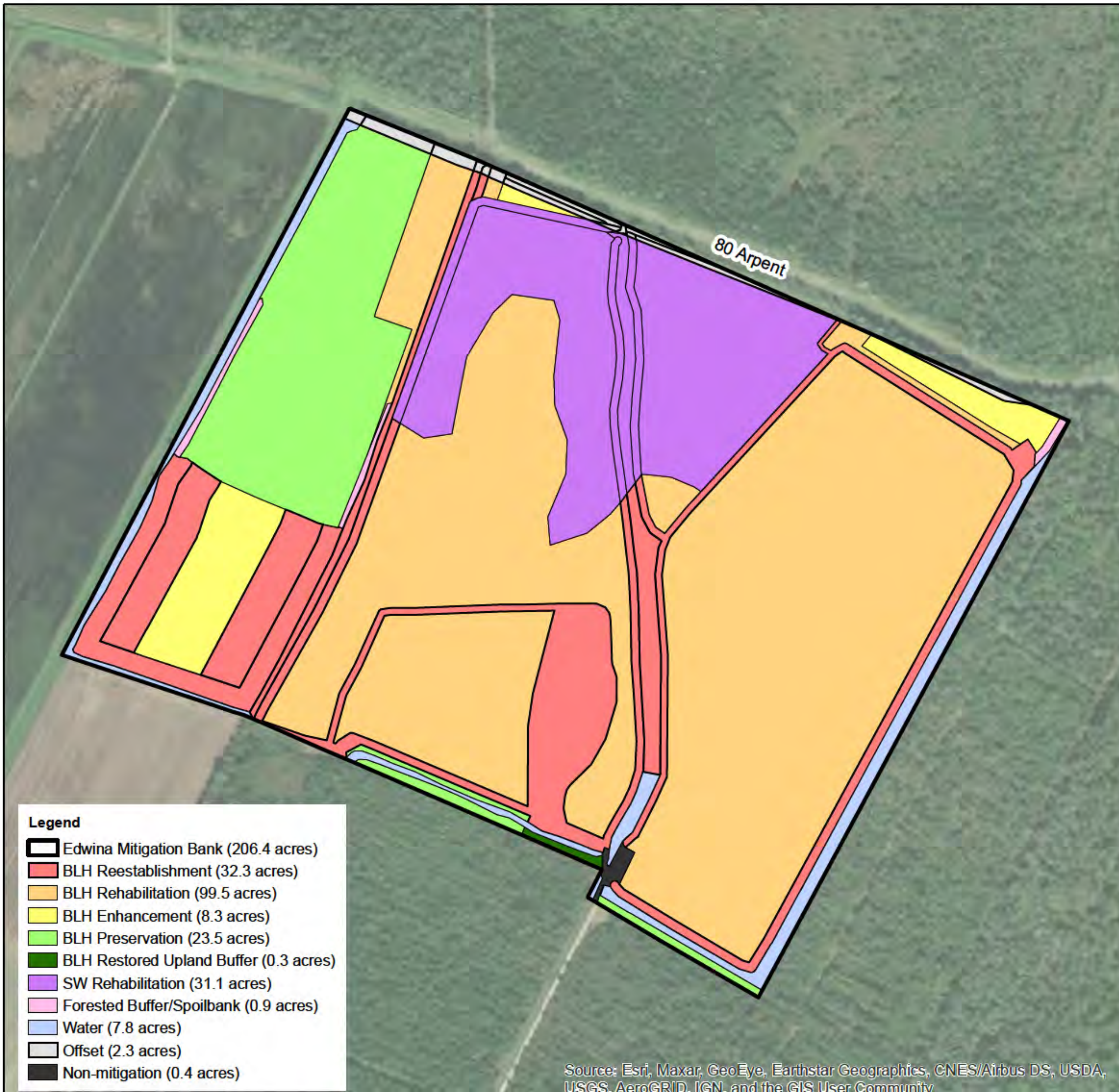
Monroe, LA

AERIAL LOCATION MAP

LAFOURCHE PARISH, LA

Created :	AGB/ArcView
Approved :	GLF
Date :	11/06/2020
Map No. :	

APPENDIX A FIGURE 2



Map Notes:
1. The boundary shown is based on the boundary survey provided by the client.
2. Map projected to NAD83 UTM Zone 15.

NRP

Stand Up Triple, LLC

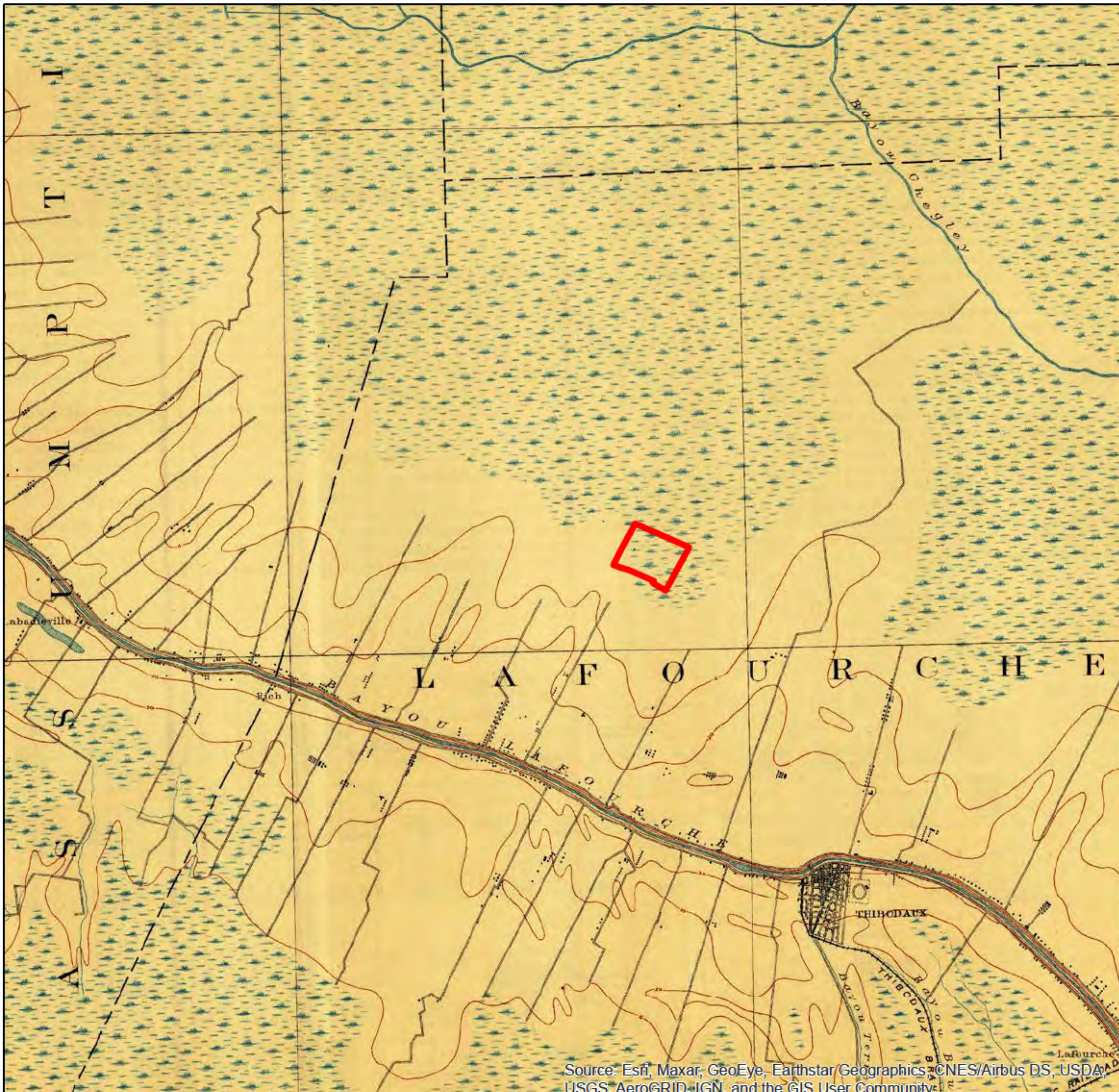
Monroe, LA

MITIGATION FEATURES

LAFOURCHE PARISH, LA

Created :	AGB/ArcView
Approved :	GLF
Date :	11/06/2020
Map No. :	

APPENDIX A FIGURE 3



Legend

Edwina Mitigation Bank (206.4 acres)

8,000 4,000 0 8,000 Feet

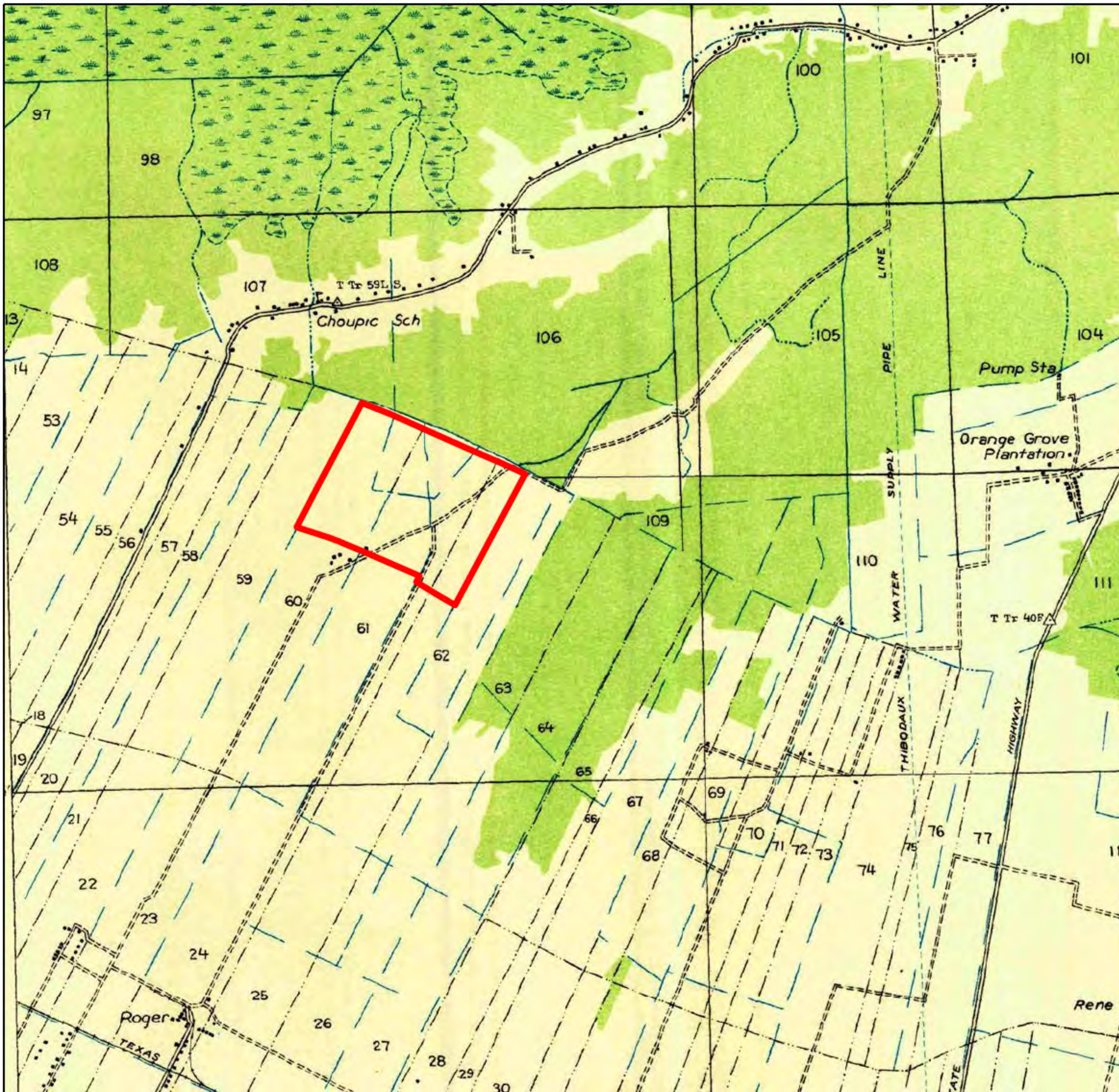
N

Map Notes:

1. The boundary shown is based on the boundary survey provided by the client.
2. Map projected to NAD83 UTM Zone 15.

NRP

Stand Up Triple, LLC **Monroe, LA**	
1892 USGS TOPO MAP **LAFOURCHE PARISH, LA**	
Created :	AGB/ArcView
Approved :	GLF
Date :	11/06/2020
Map No. :	
APPENDIX A FIGURE 4	



Legend

Edwina Mitigation Bank (206.4 acres)

0.5 0.25 0 0.5 Miles

N

Map Notes:

1. The boundary shown is based on the boundary survey provided by the client.
2. Map projected to NAD83 UTM Zone 15.

NRP

Stand Up Triple, LLC

Monroe, LA

1932 USGS TOPO MAP

LAFOURCHE PARISH, LA

Created :	AGB/ArcView
Approved :	GLF
Date :	11/06/2020
Map No. :	

APPENDIX A FIGURE 5

Legend

Edwina Mitigation Bank (206.4 acres)

1,000 500 0 1,000 Feet

N

Map Notes:

1. The boundary shown is based on the boundary survey provided by the client.
2. Map projected to NAD83 UTM Zone 15.
3. Historic Aerial obtained from LSU's Cartographic Information Center.

NRP

Stand Up Triple, LLC

Monroe, LA

1940 AERIAL MAP

LAFOURCHE PARISH, LA

Created :	AGB/ArcView
Approved :	GLF
Date :	11/06/2020
Map No. :	

APPENDIX A FIGURE 6

Legend

Edwina Mitigation Bank (206.4 acres)

650 325 0 650 Feet

N

Map Notes:
1. The boundary shown is based on the boundary survey provided by the client.
2. Map projected to NAD83 UTM Zone 15.
3. Historic Aerial obtained from LSU's Cartographic Information Center.

Stand Up Triple, LLC

Monroe, LA

1957 AERIAL MAP

LAFOURCHE PARISH, LA

Created :	AGB/ArcView
Approved :	GLF
Date :	11/06/2020
Map No. :	

APPENDIX A FIGURE 7

Legend

Edwina Mitigation Bank (206.4 acres)

650 325 0 650
Feet

Map Notes:
1. The boundary shown is based on the boundary survey provided by the client.
2. Map projected to NAD83 UTM Zone 15.
3. Historic Aerial obtained from LSU's Cartographic Information Center.

N

NRP

Stand Up Triple, LLC

Monroe, LA

1980 AERIAL MAP

LAFOURCHE PARISH, LA

Created :	AGB/ArcView
Approved :	GLF
Date :	11/06/2020
Map No. :	

APPENDIX A FIGURE 8

Legend

Edwina Mitigation Bank (206.4 acres)

650 325 0 650 Feet

N

Map Notes:
1. The boundary shown is based on the boundary survey provided by the client.
2. Map projected to NAD83 UTM Zone 15.
3. Color Infrared Aerial obtained from Atlas.LSU.edu.

NRP

Stand Up Triple, LLC

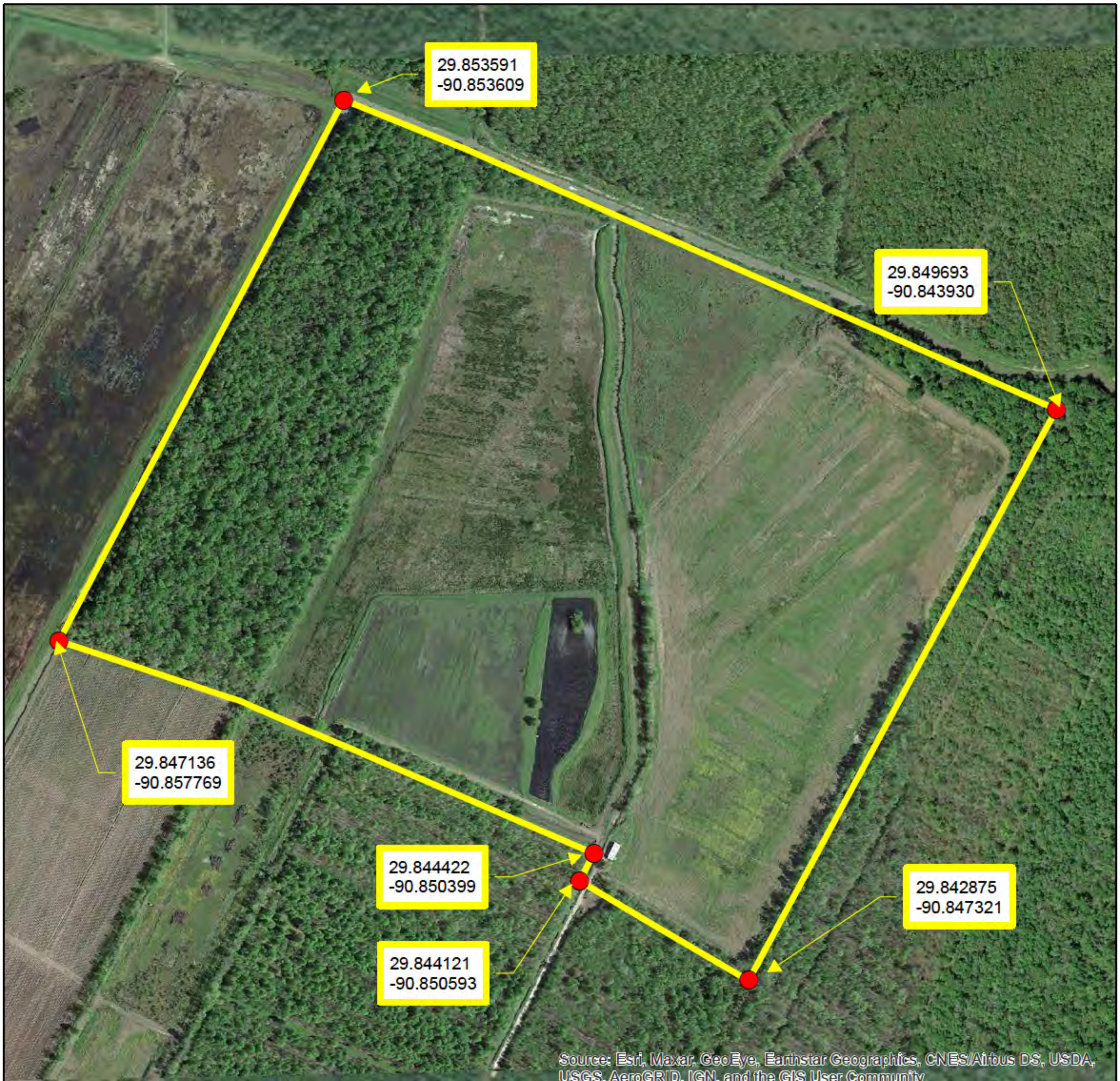
Monroe, LA

1998 COLOR INFRARED MAP

LAFOURCHE PARISH, LA

Created :	AGB/ArcView
Approved :	GLF
Date :	11/06/2020
Map No. :	

APPENDIX A FIGURE 9



Legend

Edwina Mitigation Bank (206.4 acres)

Boundary Coordinates

600 300 0 600 Feet

N

Map Notes:

1. The boundary shown is based on the boundary survey provided by the client.
2. Map projected to NAD83 UTM Zone 15.
3. Aerial obtained from Google Earth.

NRP

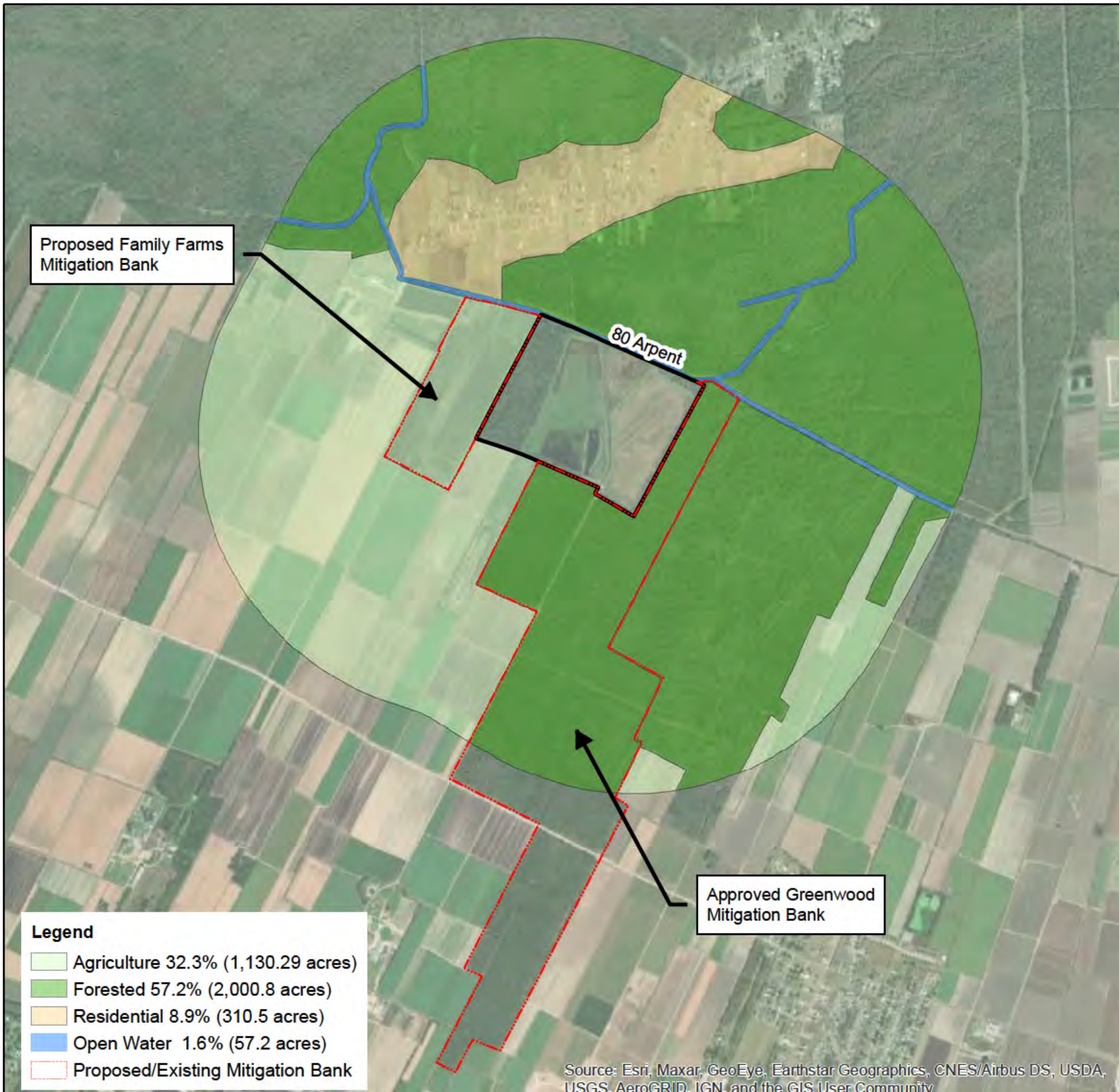
Stand Up Triple, LLC

Monroe, LA

2019 GOOGLE EARTH AERIAL & BOUNDARY COORDINATES LAFOURCHE PARISH, LA

Created :	AGB/ArcView
Approved :	GLF
Date :	11/06/2020
Map No. :	

APPENDIX A FIGURE 10



Legend

Edwina Mitigation Bank (206.4 acres)

0.5 0.25 0 0.5 Miles

N

Map Notes:

1. The boundary shown is based on the boundary survey provided by the client.
2. Map projected to NAD83 UTM Zone 15.

NRP

Stand Up Triple, LLC

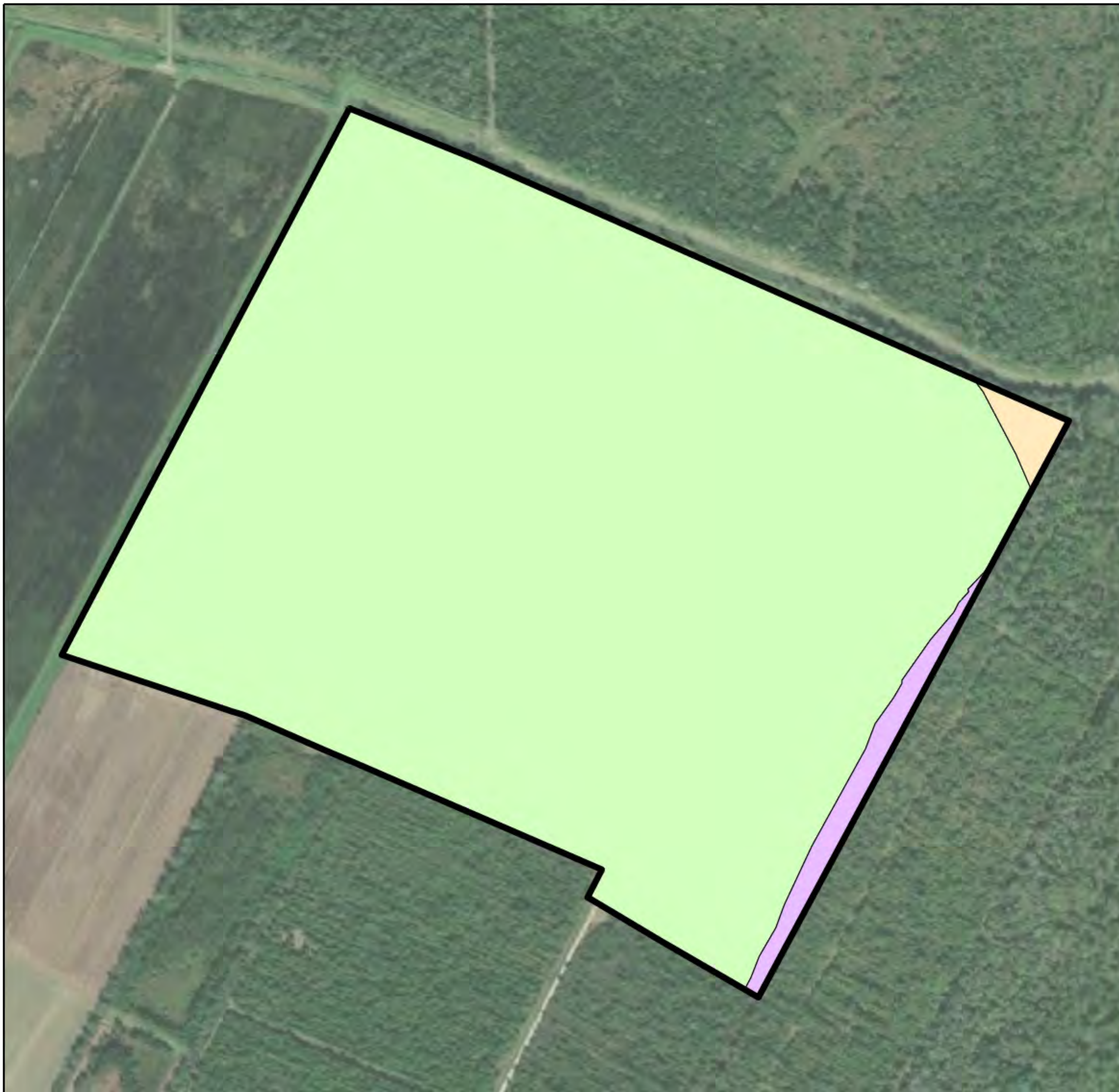
Monroe, LA

ADJACENT LAND USE

LAFOURCHE PARISH, LA

Created :	AGB/ArcView
Approved :	GLF
Date :	11/06/2020
Map No. :	

APPENDIX A FIGURE 11



Legend

Edwina Mitigation Bank (206.4 acres)

600 300 0 600 Feet

Soil Types

Fausse-Schriever (FA) Hydric (1.6 acres)

Schriever (Sk) Hydric (200.6 acres)

Schriever (Sr) Hydric (4.2 acres)

Map Notes:

1. The boundary shown is based on the boundary survey provided by the client.
2. Map projected to NAD83 UTM Zone 15.

N

NRP

Stand Up Triple, LLC

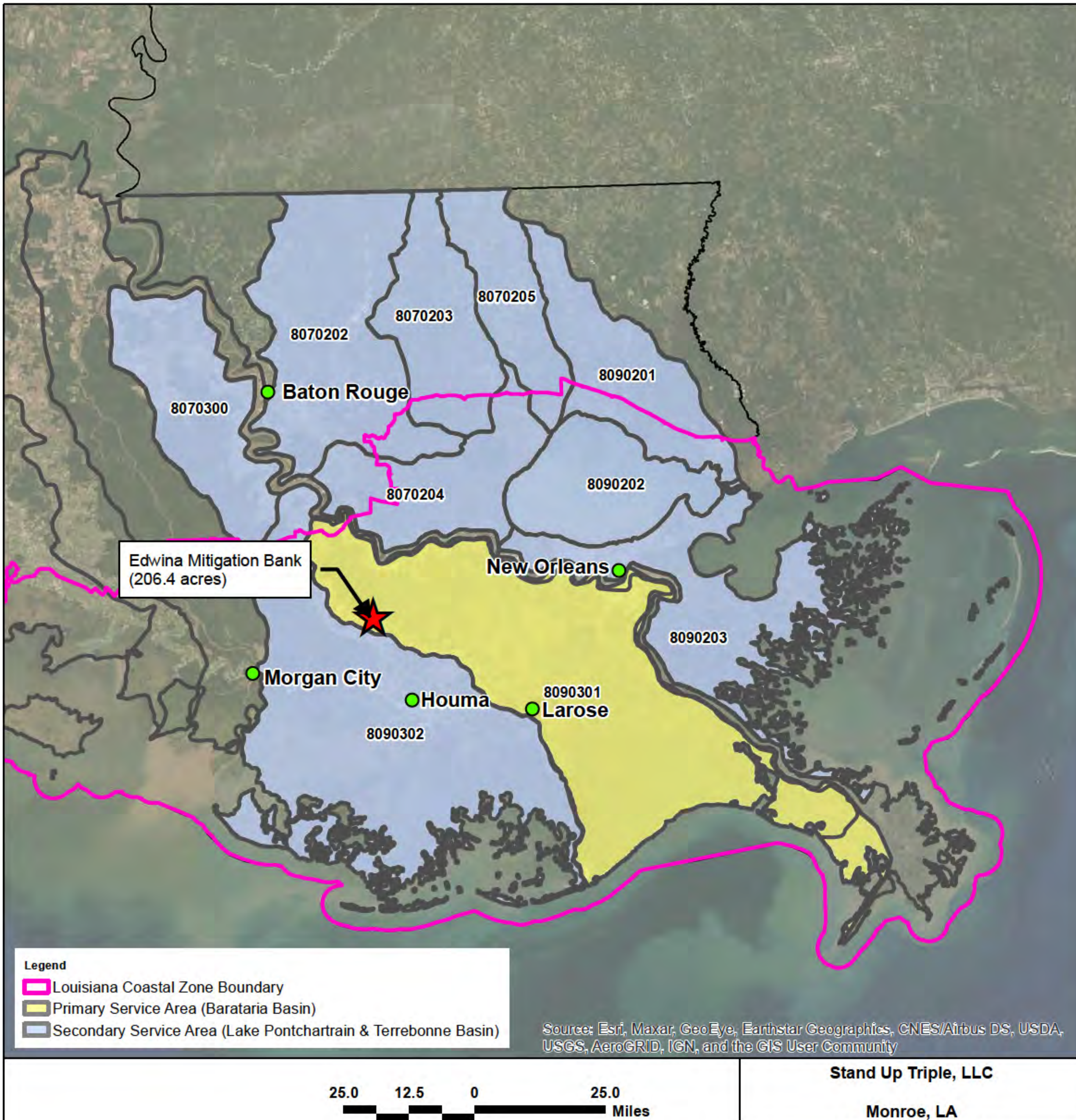
Monroe, LA

SOIL MAP

LAFOURCHE PARISH, LA

Created :	AGB/ArcView
Approved :	GLF
Date :	11/06/2020
Map No. :	

APPENDIX A FIGURE 12



Map Notes:
1. The boundary shown is based on the boundary survey provided by the client.
2. Map projected to NAD83 UTM Zone 15.

NRP

Stand Up Triple, LLC

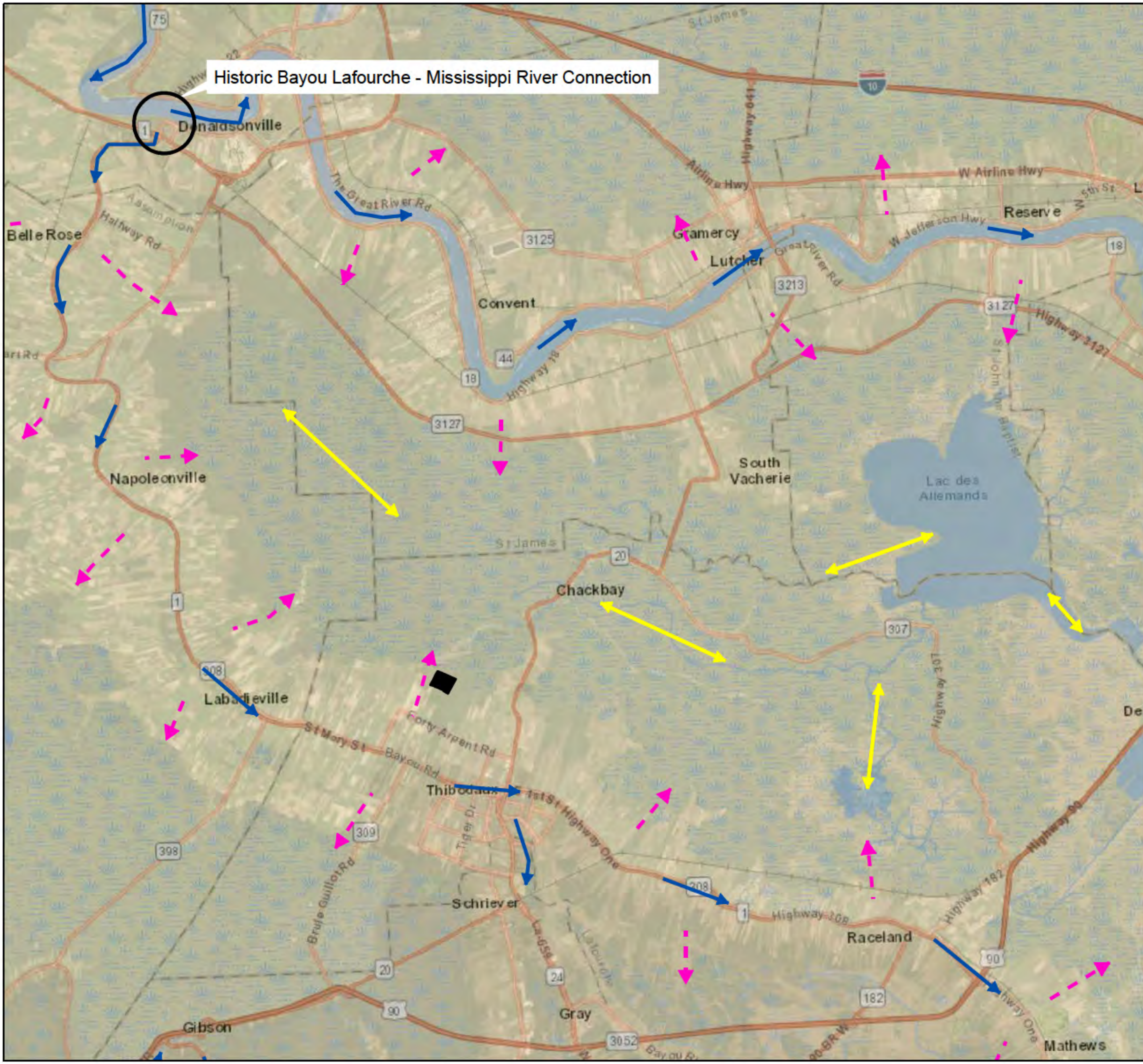
Monroe, LA

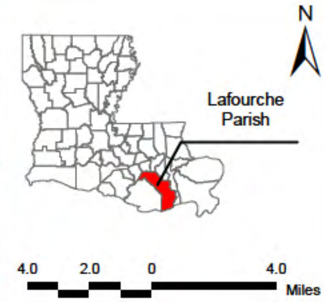
WATERSHED MAP

LAFOURCHE PARISH, LA

Created :	AGB/ArcView
Approved :	GLF
Date :	11/06/2020
Map No. :	

APPENDIX A FIGURE 13





Legend

Edwina Mitigation Bank (206.4 acres)

Flow Type

Channelized

Overbank River Flooding

Tidal Flux

NRP

Map Notes:

1. The boundary shown is based on the boundary survey provided by the client.
2. Map projected to NAD83 UTM Zone 15.

Stand Up Triple, LLC

Monroe, LA

HISTORIC HYDROLOGY

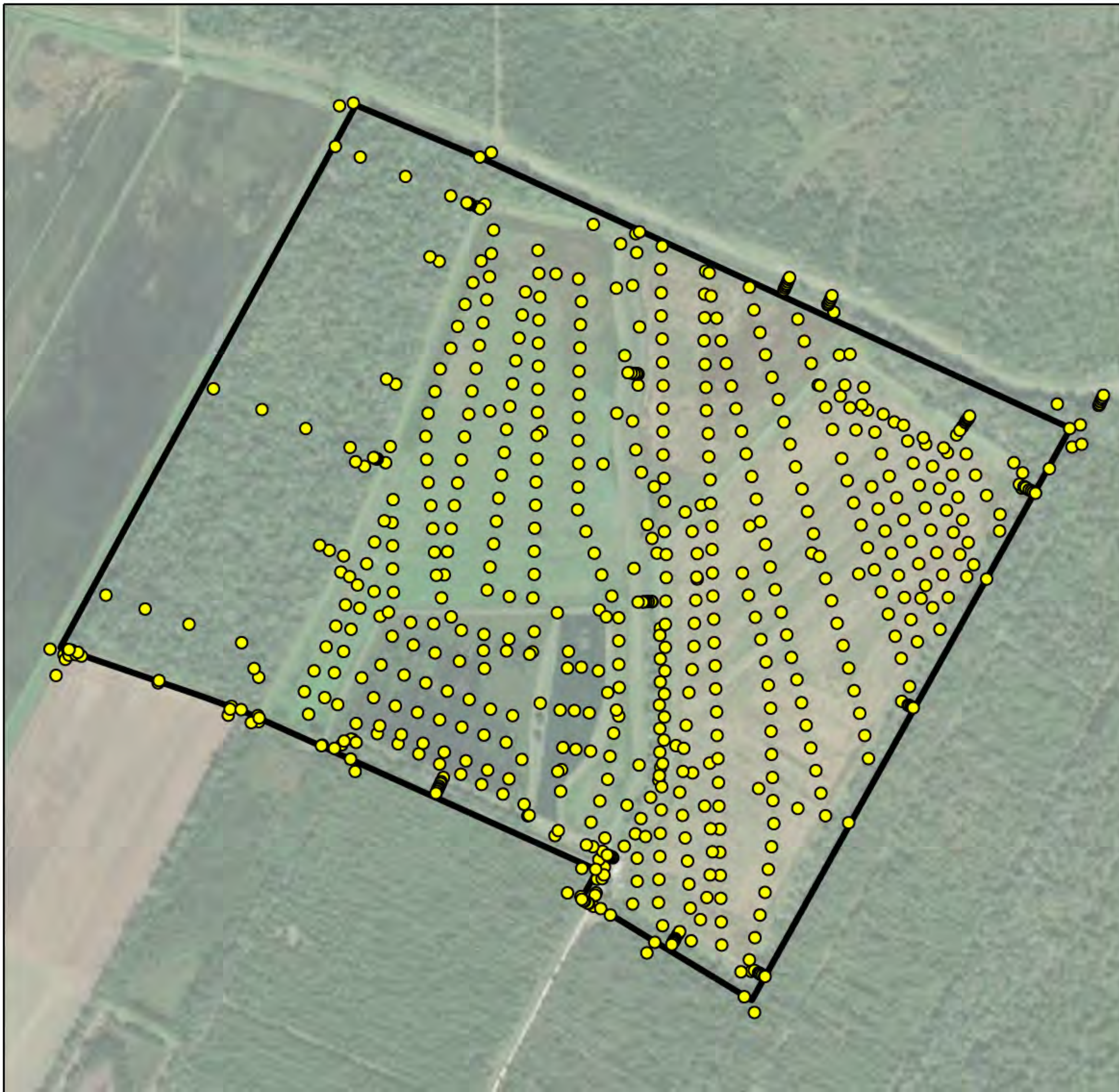
LAFOURCHE PARISH, LA

Created: AGB/ArcView

Approved: GLF

11/06/2020

APPENDIX A
FIGURE 14



Legend

Project Area (206.4 acres)

Survey Elevation Points

600 300 0 600 Feet

N

Map Notes:
1. The boundary shown is based on the boundary survey provided by the client.
2. Map projected to NAD83 UTM Zone 15.
3. Elevation points surveyed by Charles L. McDonald

NRP

Raceland 330, LLC

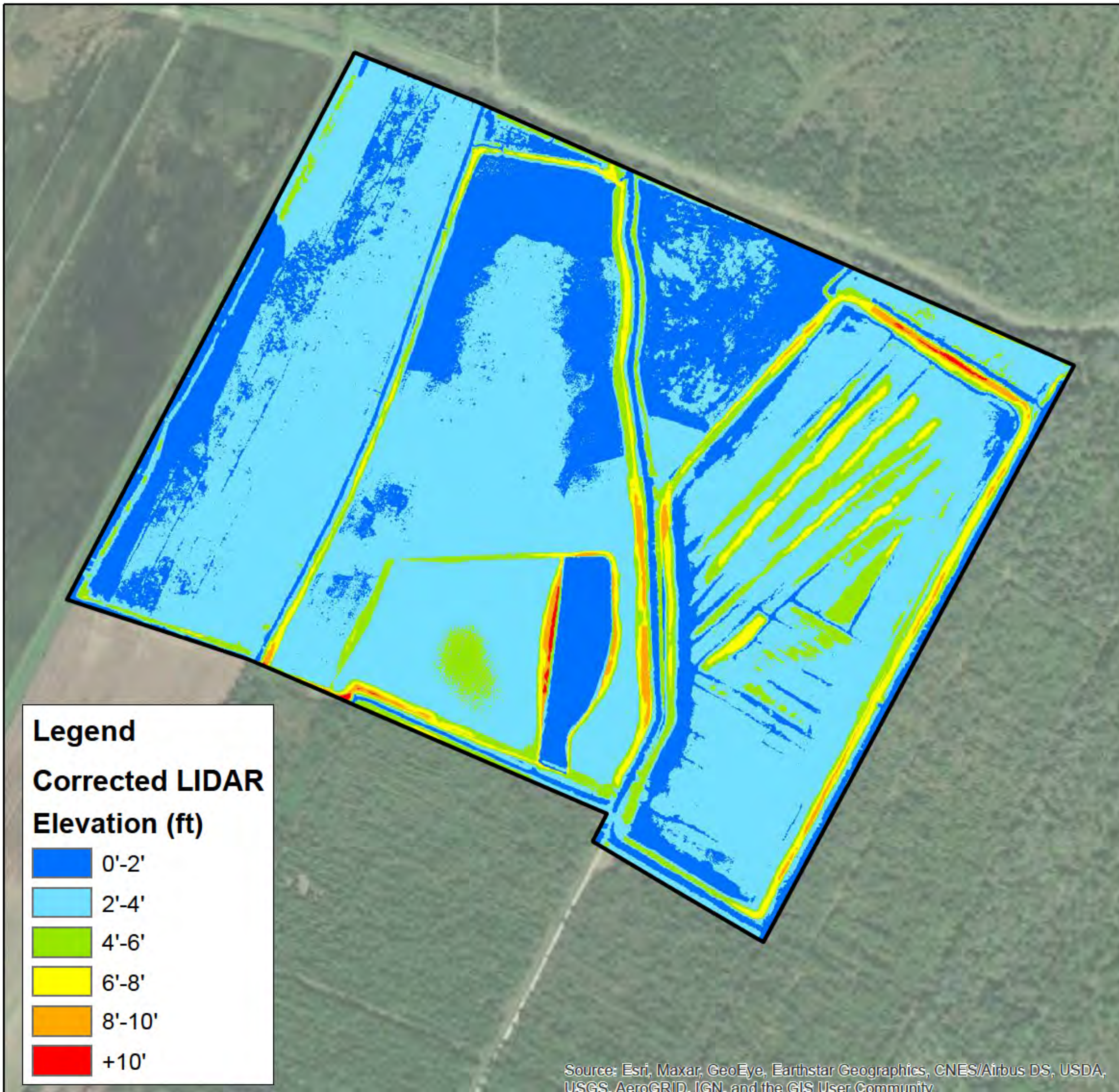
Des Allemands, LA

2020 ELEVATION SURVEY POINTS

LAFOURCHE PARISH, LA

Created :	AGB/ArcView
Approved :	GLF
Date :	11/06/2020
Map No. :	

APPENDIX A FIGURE 15



Legend

Edwina Mitigation Bank (206.4 acres)

600 300 0 600 Feet

N

NRP

Map Notes:

1. The boundary shown is based on the boundary survey provided by the client.
2. Map projected to NAD83 UTM Zone 15.

Stand Up Triple, LLC

Monroe, LA

ELEVATION MAP
CORRECTED LIDAR
LAFOURCHE PARISH, LA

Created :	AGB/ArcView
Approved :	GLF
Date :	11/06/2020
Map No. :	

APPENDIX A FIGURE 16

Legend

Project Area (206.4 acres)

Elevation (ft)

5.0 ft and below (~190.2 acres)

>5.0 ft (~16.2 acres)

600 300 0 600 Feet

N

NRP

Map Notes:
1. The boundary shown is based on the boundary survey provided by the client.
2. Map projected to NAD83 UTM Zone 15.

Raceland 330, LLC

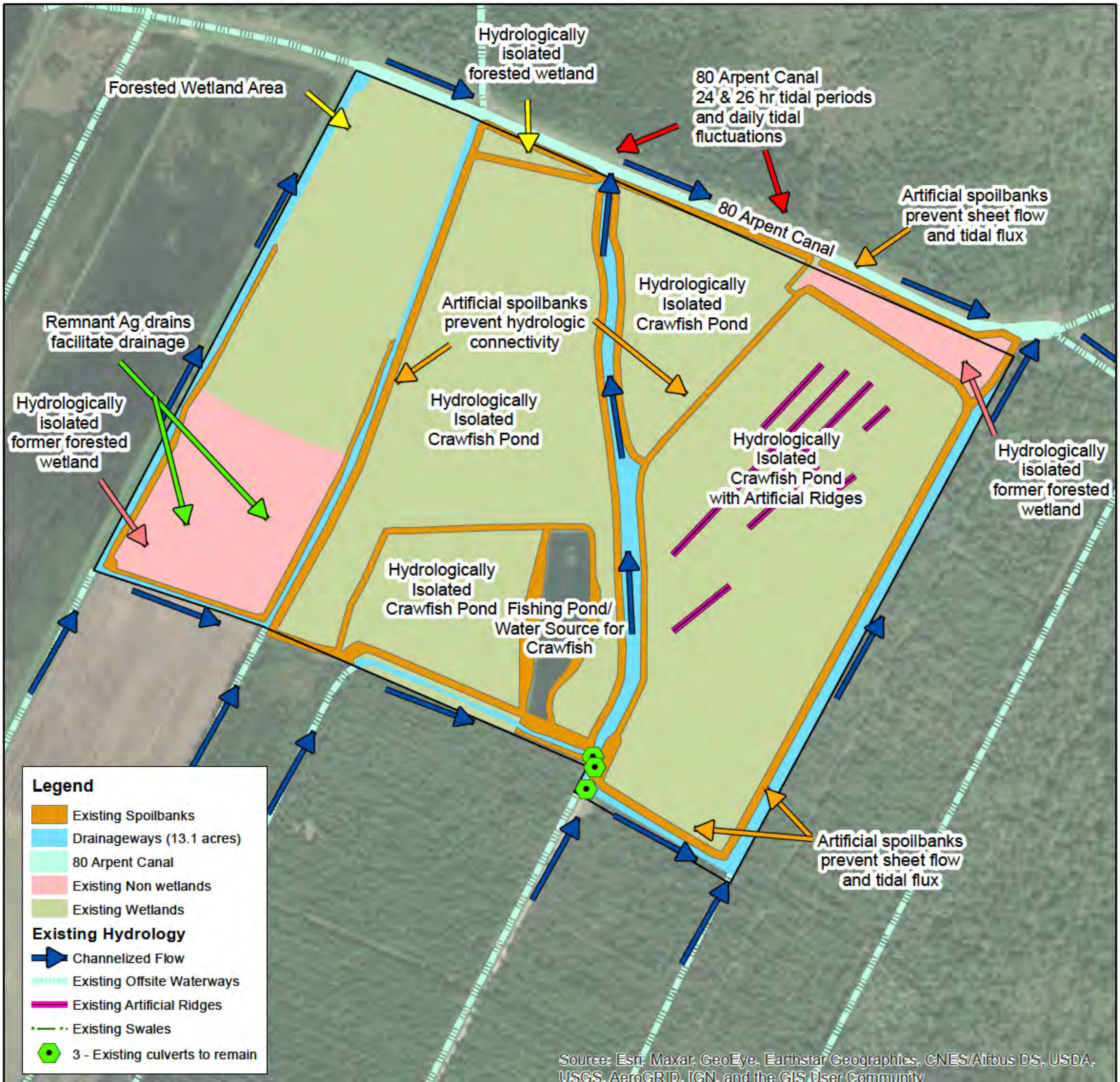
Des Allemands, LA

FIVE FOOT CONTOUR MAP

LAFOURCHE PARISH, LA

Created :	AGB/ArcView
Approved :	GLF
Date :	11/06/2020
Map No. :	

APPENDIX A FIGURE 17



Legend

Edwina Mitigation Bank (206.4 acres)

650 325 0 650 Feet

N

Map Notes:

1. The boundary shown is based on the boundary survey provided by the client.
2. Map projected to NAD83 UTM Zone 15.

NRP

Stand Up Triple, LLC

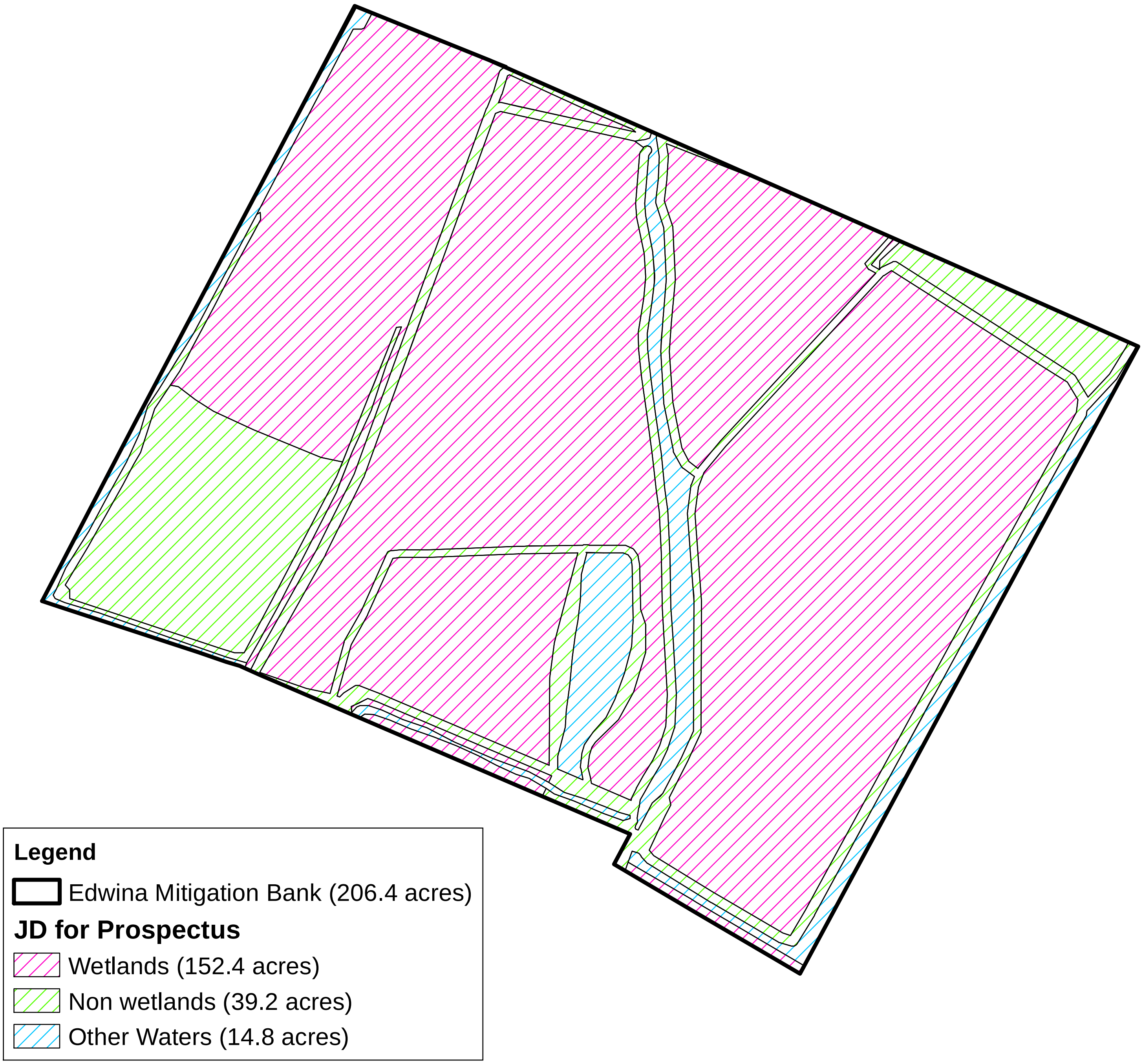
Monroe, LA

EXISTING HYDROLOGY

LAFOURCHE PARISH, LA

Created :	AGB/ArcView
Approved :	GLF
Date :	11/06/2020
Map No. :	

APPENDIX A FIGURE 18



600 300 0 600
Feet

N

Map Notes:
1. The boundary shown is based on the boundary survey provided by the client.
2. Map projected to NAD83 UTM Zone 15.

Stand Up Triple, LLC

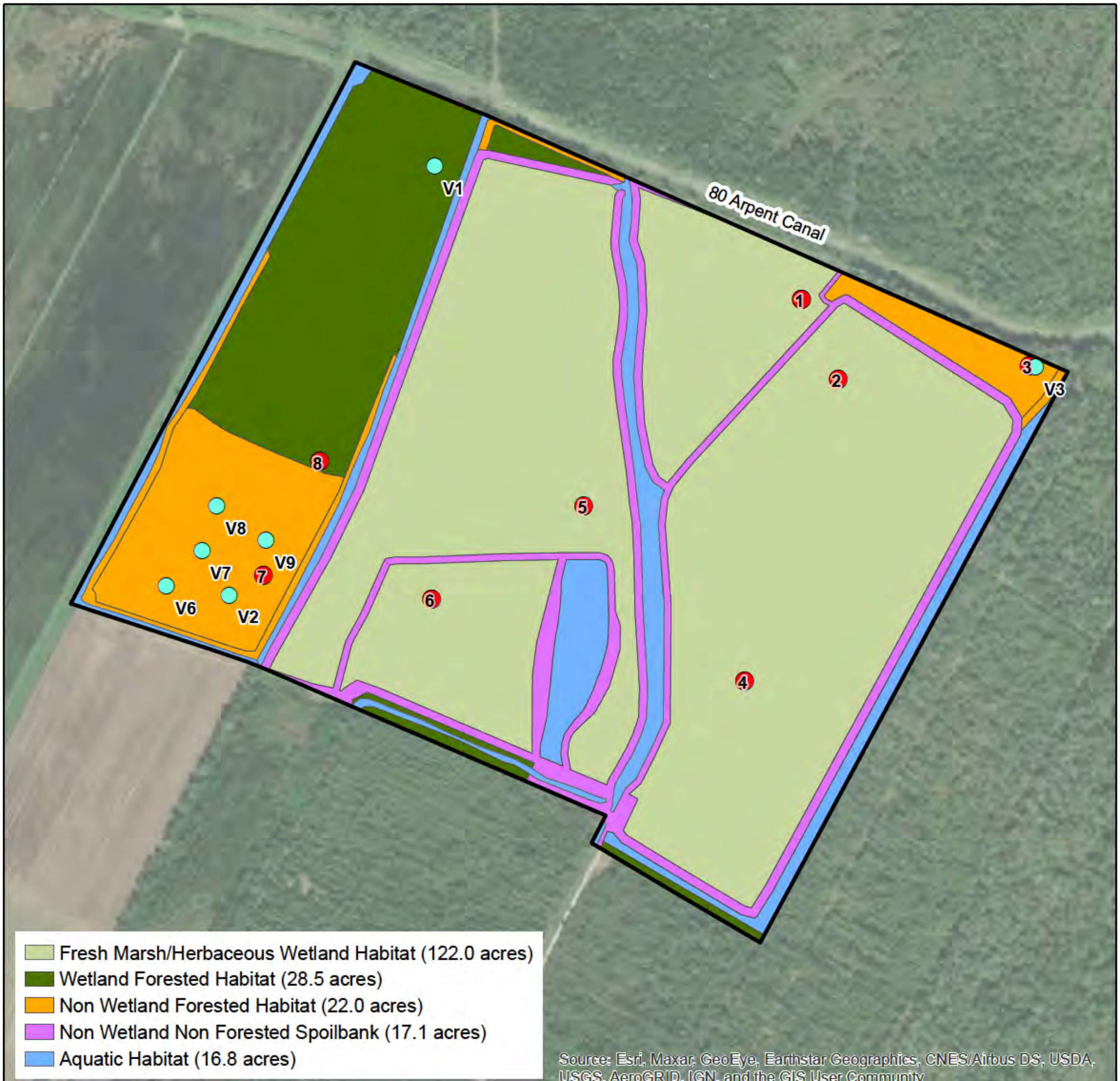
Monroe, LA

WETLAND MAP

LAFOURCHE PARISH, LA

Created :	AGB/ArcView
Approved :	GLF
Date :	11/06/2020
Map No. :	

APPENDIX A FIGURE 19



Legend

Edwina Mitigation Bank (206.4 acres)

Wetland Delineation Data Points

Vegetation Data Points

600 300 0 600 Feet

N

NRP

Map Notes:
1. The boundary shown is based on the boundary survey provided by the client.
2. Map projected to NAD83 UTM Zone 15.

Stand Up Triple, LLC

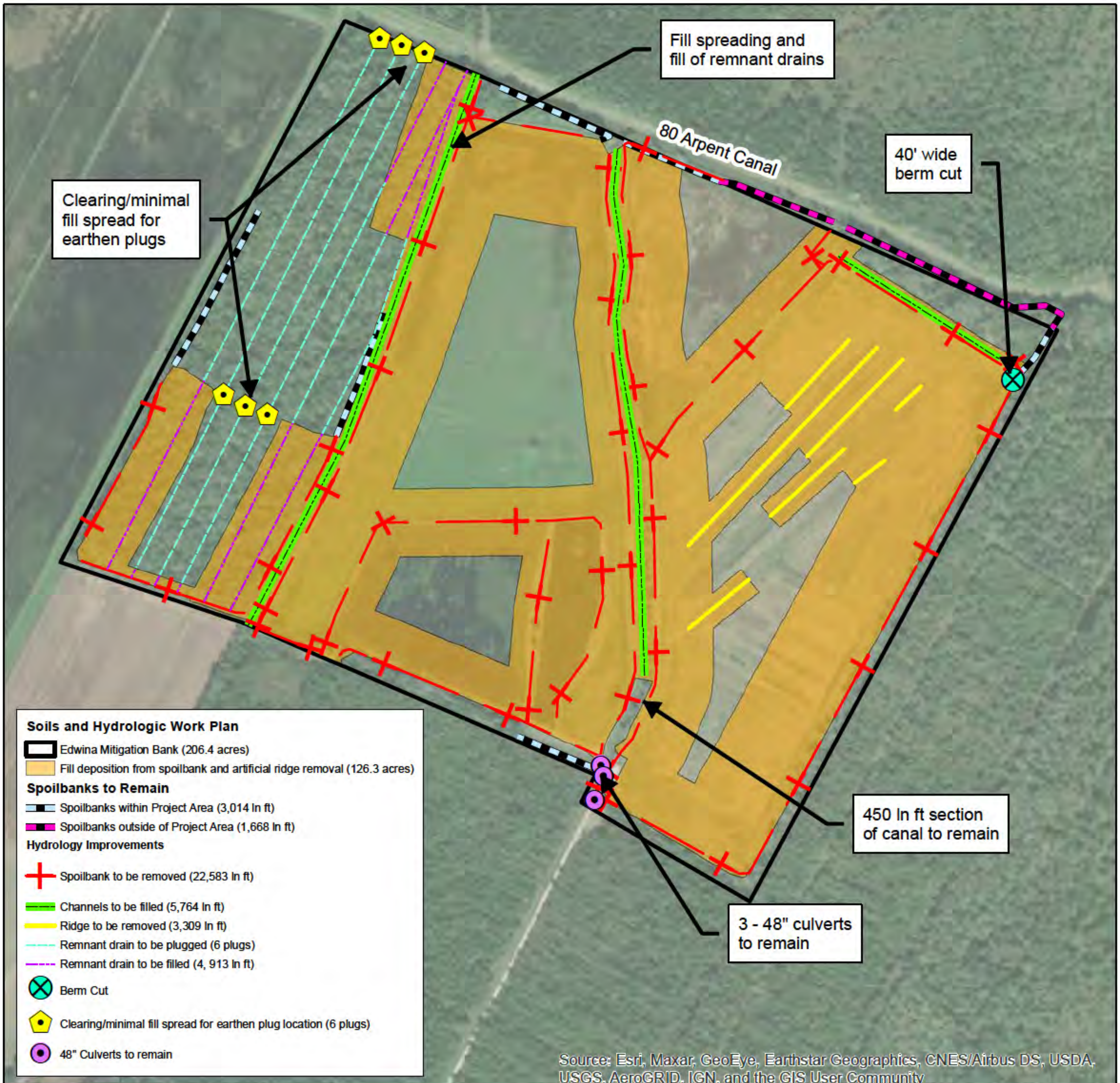
Monroe, LA

PLANT COMMUNITIES

LAFOURCHE PARISH, LA

Created :	AGB/ArcView
Approved :	GLF
Date :	11/09/2020
Map No. :	

APPENDIX A FIGURE 20



600 300 0 600
Feet

N

Stand Up Triple, LLC

Monroe, LA

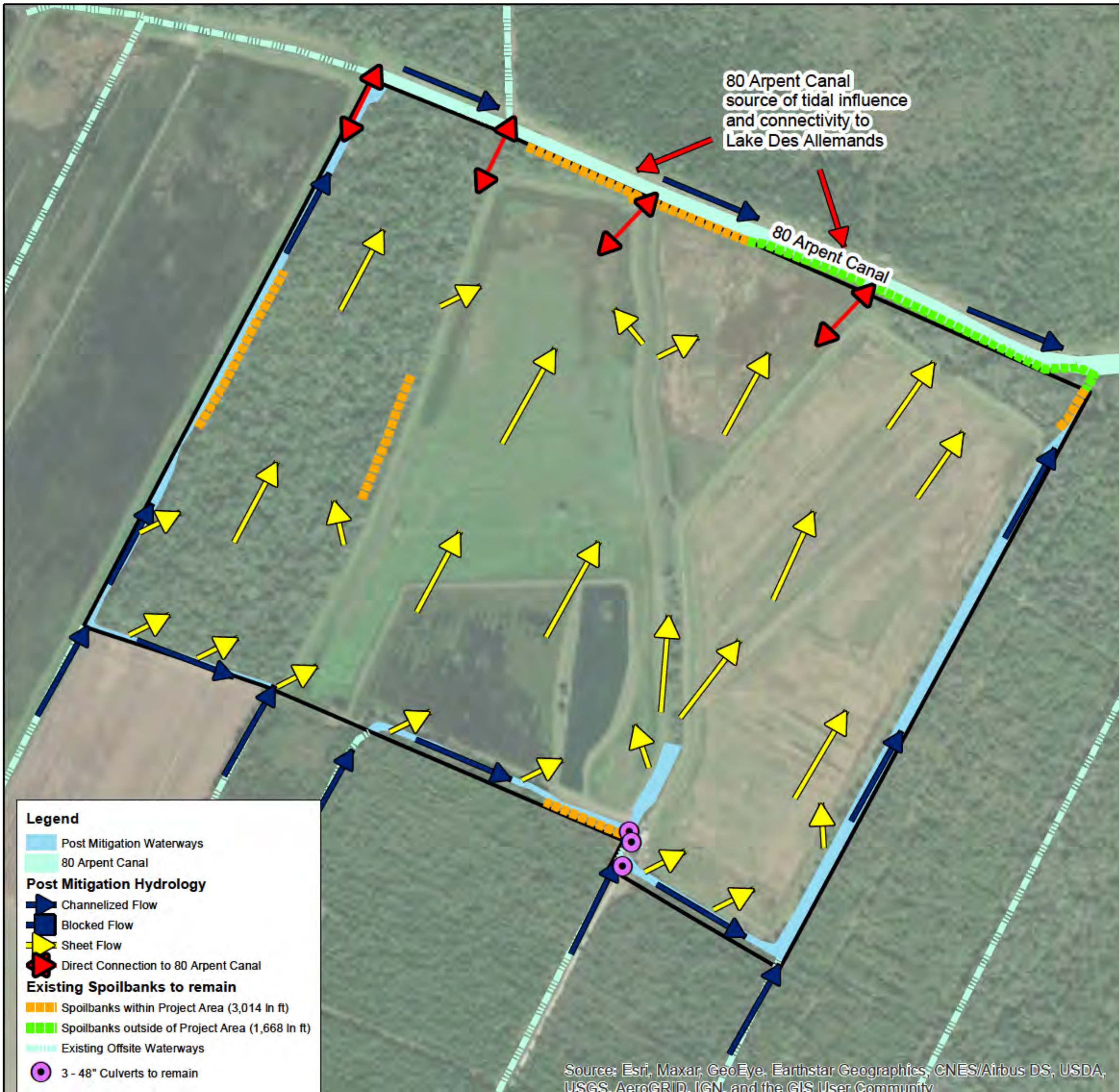
SOILS AND HYDROLOGIC WORK PLAN

LAFOURCHE PARISH, LA

Created :	AGB/ArcView
Approved :	GLF
Date :	11/06/2020
Map No. :	

APPENDIX A FIGURE 21

Map Notes:
1. The boundary shown is based on the boundary survey provided by the client.
2. Map projected to NAD83 UTM Zone 15.



Legend

Edwina Mitigation Bank (206.4 acres)

Map Notes:

1. The boundary shown is based on the boundary survey provided by the client.
2. Map projected to NAD83 UTM Zone 15.

Stand Up Triple, LLC

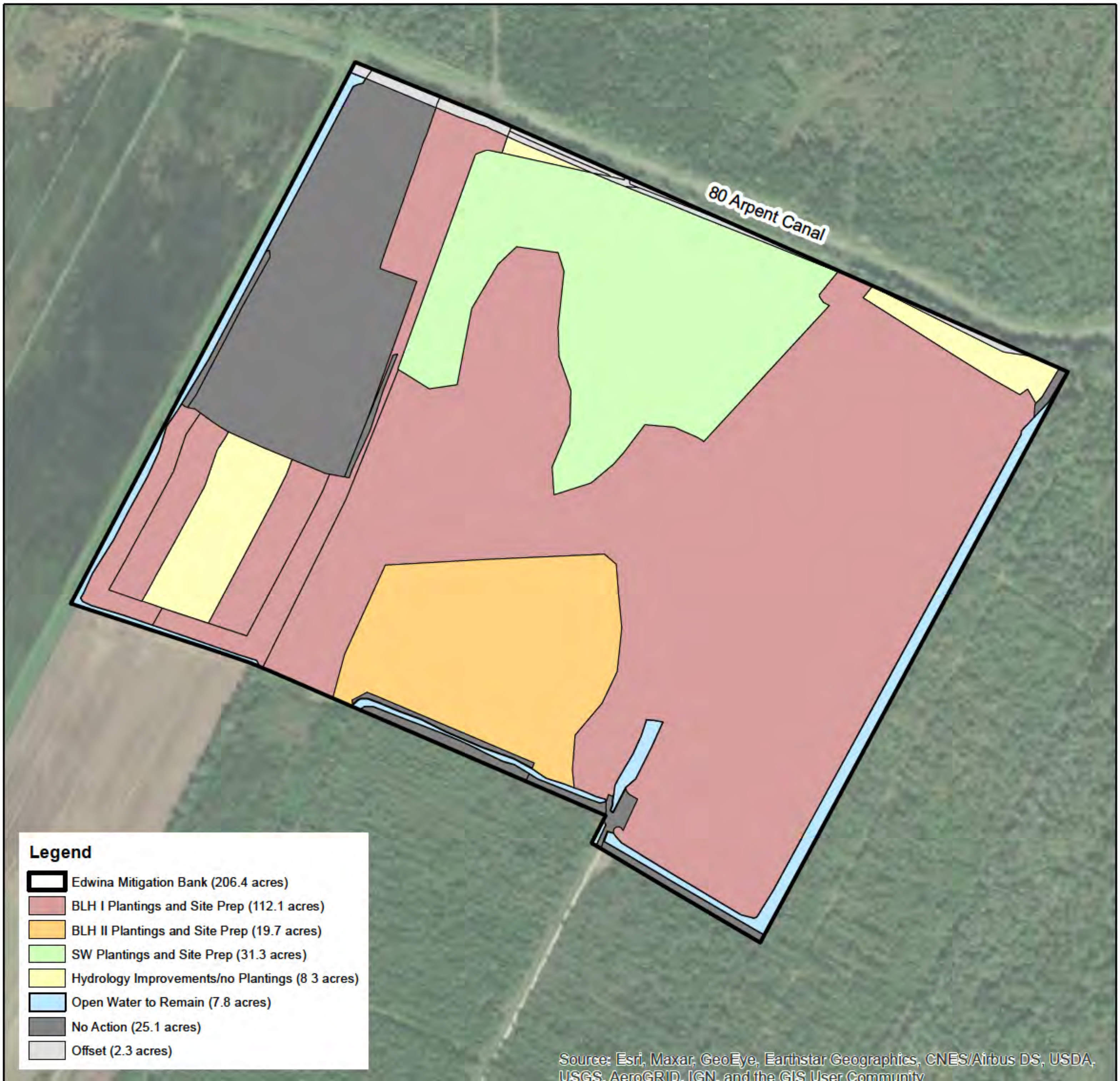
Monroe, LA

POST WORK PLAN HYDROLOGY

LAFOURCHE PARISH, LA

Created :	AGB/ArcView
Approved :	GLF
Date :	11/06/2020
Map No. :	

APPENDIX A FIGURE 22



Map Notes:
1. The boundary shown is based on the boundary survey provided by the client.
2. Map projected to NAD83 UTM Zone 15.
3. BLH I = Overcup Oak - Water Hickory Type
4. BLH II = Sugaryberry - American Elm - Green Ash Type

NRP

Stand Up Triple, LLC

Monroe, LA

VEGETATIVE WORK PLAN

LAFOURCHE PARISH, LA

Created :	AGB/ArcView
Approved :	GLF
Date :	11/06/2020
Map No. :	

APPENDIX A FIGURE 23

Appendix B

Assessment of Tidal Influence

Appendix B:
Assessment of Tidal Influence
Edwina Mitigation Bank

Any potential tidal influences on the water levels near the Edwina Bank would originate in Barataria Bay and propagate inland via Lakes Salvador and Des Allemands. Tidal influence on water levels will manifest in continuously monitored data as a daily fluctuation in water levels recurring at known periods unique to the coastal region. At Grand Isle, LA, NOAA has identified the K1 and O1 harmonic constituents, with periods of 23.9 and 25.8 hours, respectively, as the primary factors determining tides.[1] K1 describes the interacting gravitational effects of the sun and moon, while O1 describes the interacting effects of the moon's gravity and its daily change in declination angle (Talley et al. 2011[2]).

The spectrum() function in R was applied to the available water level data (Feb-Sept 2020) in the 80 Arpent Canal just outside the Edwina Bank, as well as the US Army Corps of Engineers gage in Bayou Des Allemands and the NOAA tide gauge at Grand Isle (Feb – July 2020). This function utilizes the Fast Fourier Transform to create a periodogram, or plot describing the relative contribution to a timeseries by periodic signals across a range of frequencies. Water levels primarily driven by tides will display prominent peaks corresponding to the tidal period(s) in their periodogram (in this case, around 24 and 26 hours), while those with little or no tidal influence will not display any discernible peaks at these locations.

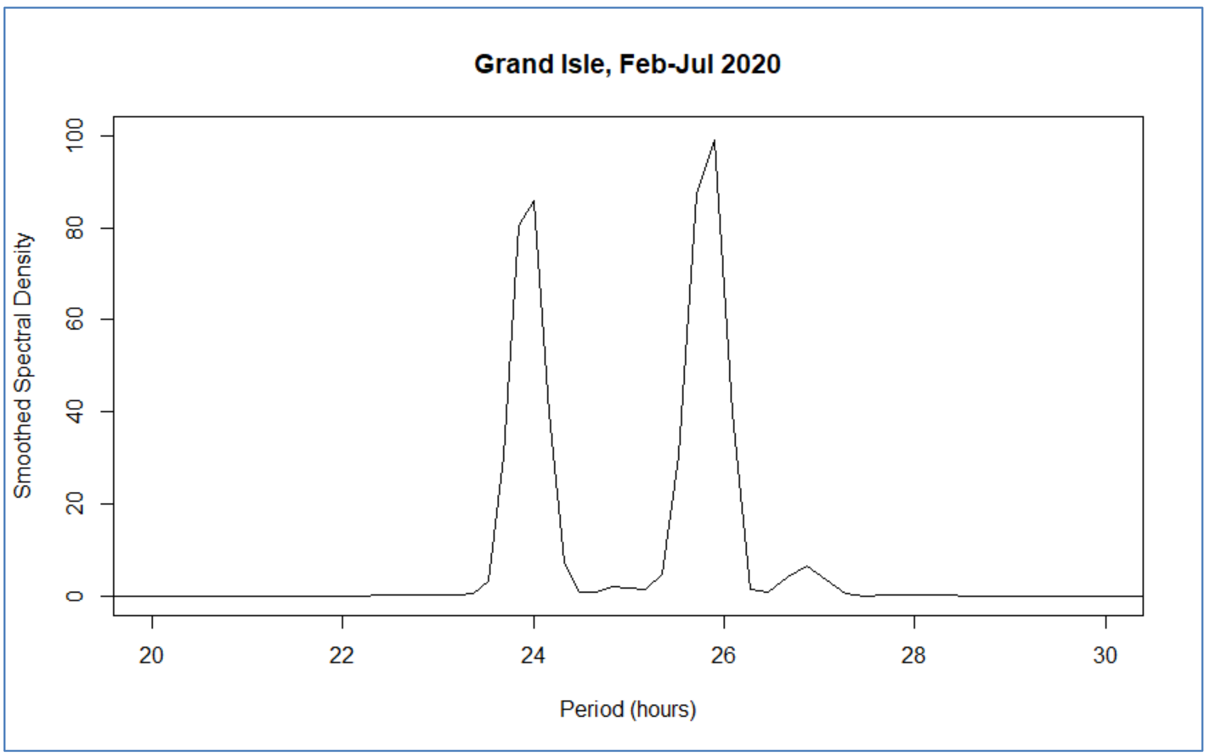


Figure 1: Periodogram for the water level recorded at Grand Isle for the period of record identical to that of the data collected at the project site.

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[1] https://tidesandcurrents.noaa.gov/harcon.html?unit=1&timezone=1&id=8761724&name=Grand+Isle&state=LA

[2] Talley, L.D. et al. (2011): Gravity waves, tides, and coastal oceanography. *Descriptive Physical Oceanography, Sixth Edition*. Academic Press: 223-244

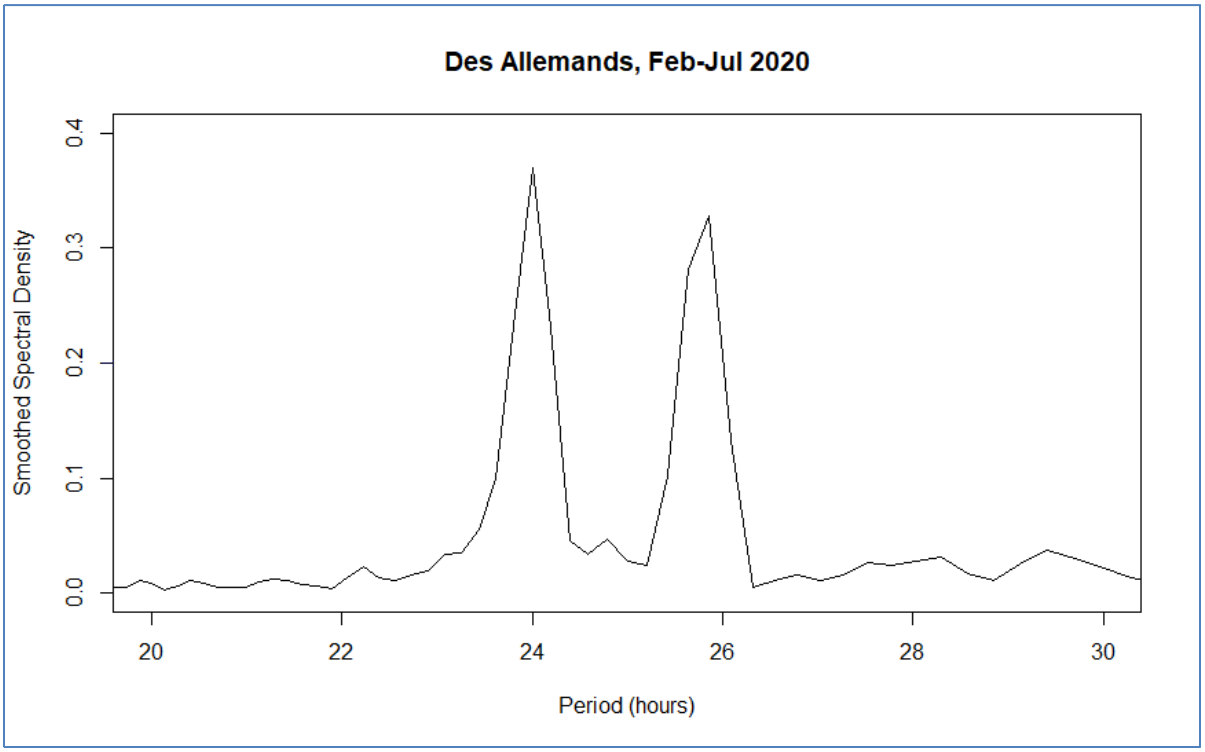


Figure 2: Periodogram for the water level recorded in Bayou Des Allemands for the period of record identical to that of the data collected at the project site.

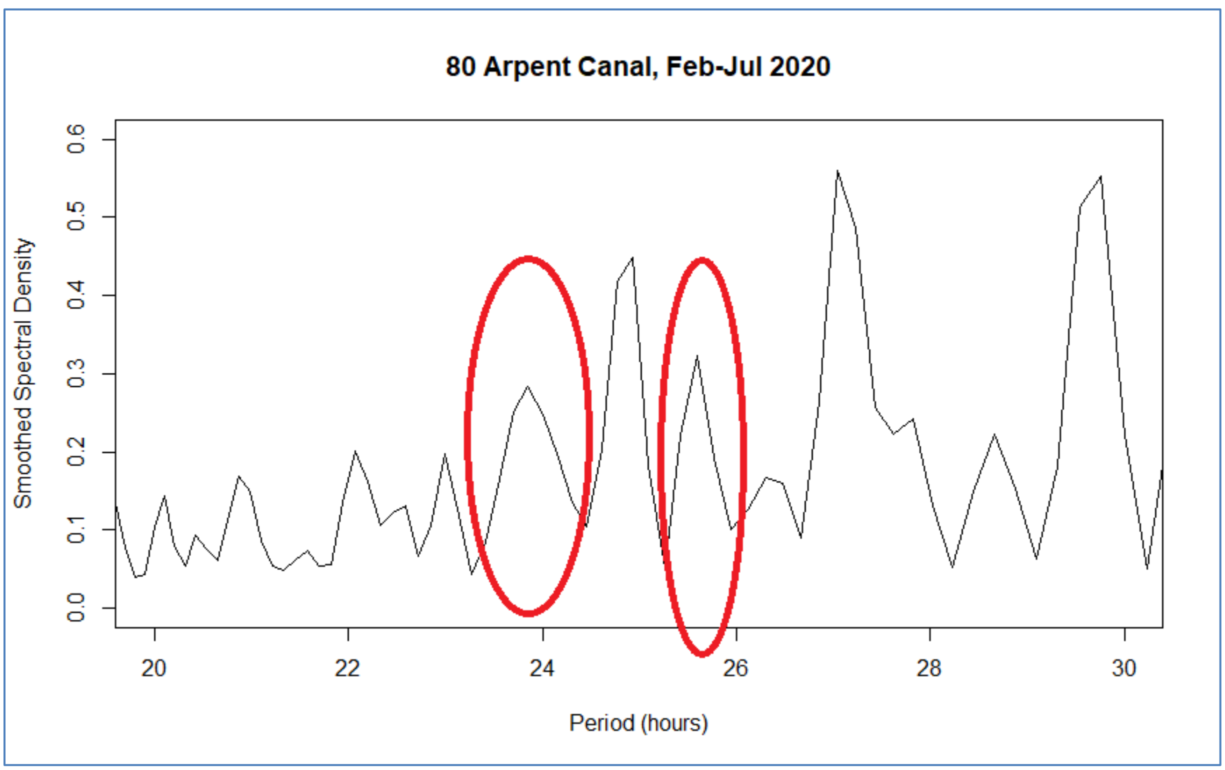


Figure 3: Water levels recorded in the 80 Arpent Canal exhibiting small peaks corresponding to 24 and 26 hours

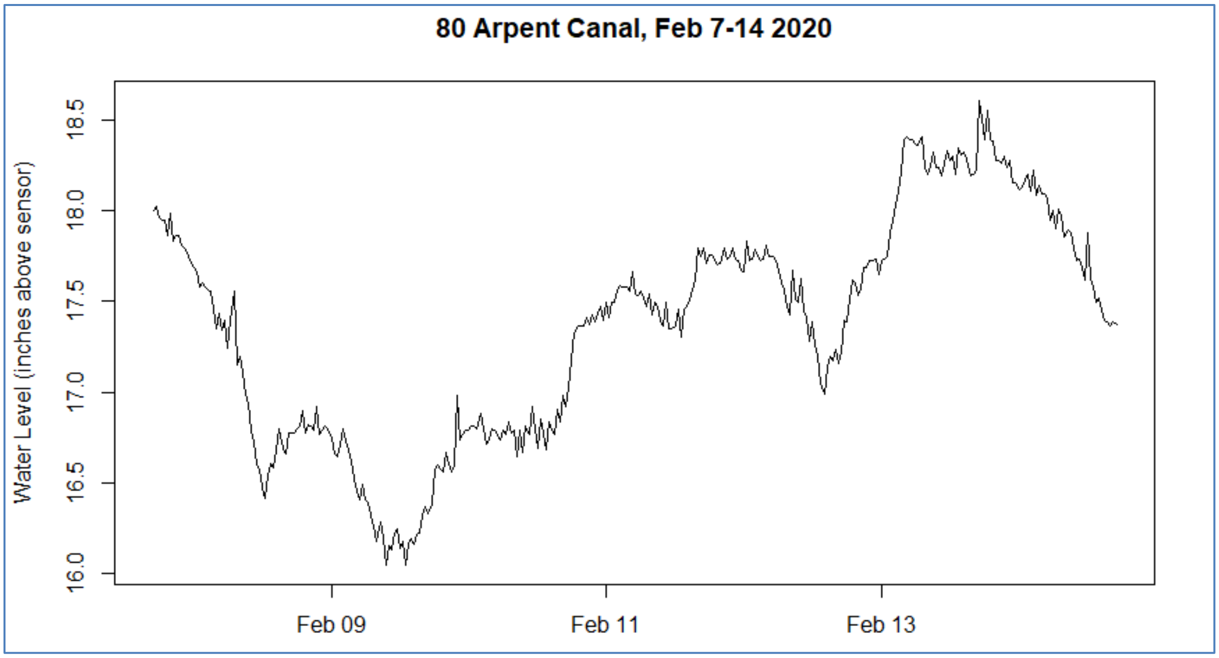


Figure 4: Water levels recorded in the 80 Arpent Canal exhibiting small daily fluctuations consistent with tidal influence.

Following the above analysis, additional data was analyzed from February 2020 through September 2020, which shows more prominent peaks corresponding to 24 and 26 hours.

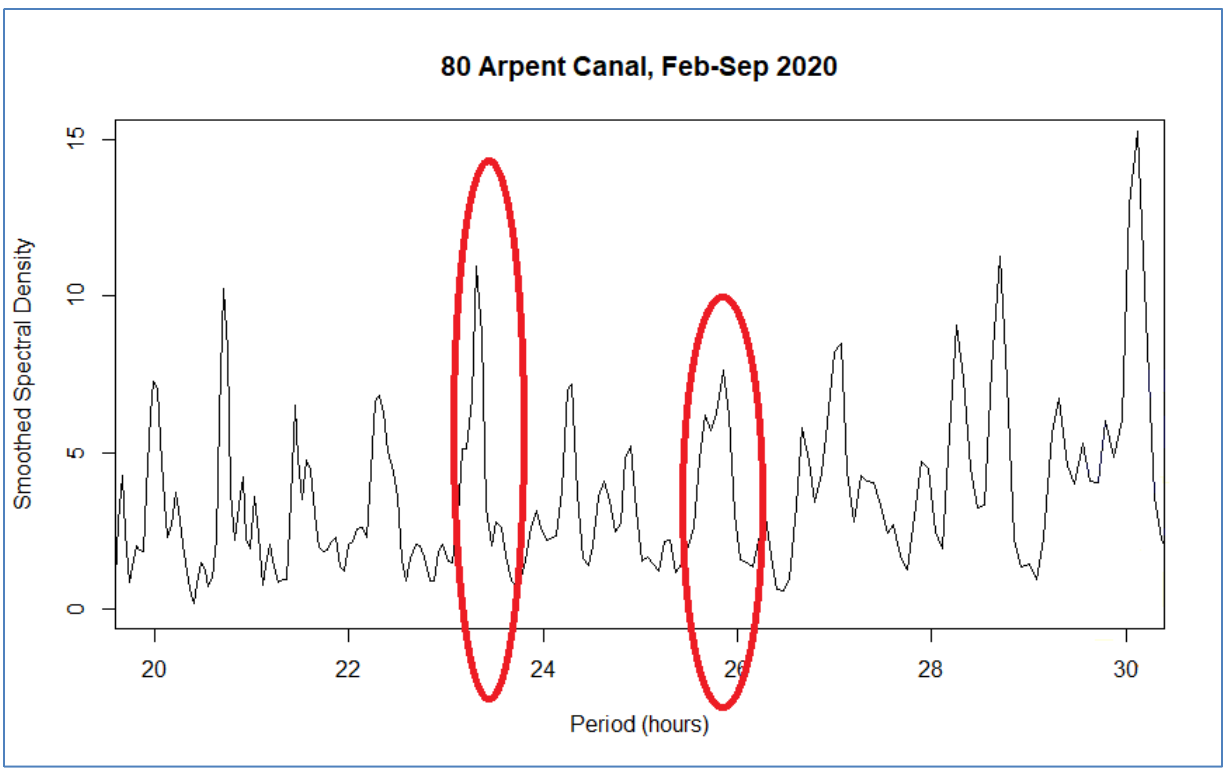


Figure 5: Water levels recorded in the 80 Arpent Canal exhibiting more prominent peaks corresponding to 24 and 26 hours

Based on this analysis, Grand Isle (Figure 1) and Bayou Des Allemands (Figure 2) exhibit strong tidal influence while the 80 Arpent Canal does not (Figures 3). Peaks corresponding to 24 and 26 hours do exist in the plot but are comparable to or weaker than the surrounding noise from frequencies not associated with tides. Although the site is hydrologically connected to Lake Des Allemands, it is also more proximally connected to a network of drainage and access canals. Therefore, precipitation runoff likely eclipses any influences of tide on water levels at this location. Visual inspection of the timeseries did show small daily fluctuations in the absence of rain events, but they appear to modify water levels by 0.5 to 1.5 inches on average (Figure 4). It is possible that a longer timeseries may produce more prominent tidal peaks, as evident in Figure 5. However, based on the available data it is concluded that although a tidal signature is present within the 80 Arpent Canal adjacent to the site, precipitation runoff is the dominating hydrologic influence on the Edwina Mitigation Bank.

Appendix C

Jurisdictional Determination

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, NEW ORLEANS DISTRICT
7400 LEAKE AVE
NEW ORLEANS, LA 70118-3651

January 27, 2020

Operations Division
Surveillance and Enforcement Section

Ms. Alissa Berthelot
Natural Resources Professionals, LLC
10621 N Oak Hills Pkwy, Ste A
Baton Rouge, LA 70810

Dear Ms. Berthelot:

Reference is made to your request, on behalf of Stand Up Triple, LLC, for a U.S. Army Corps of Engineers' (Corps) jurisdictional determination on property located in Sections 60, 61, and 62, Township 14 South, Range 16 East, Lafourche Parish, Louisiana (enclosed map). Specifically, this property is identified as a ±211.5 acre site north of Greenwood Plantation Road located in Thibodaux, LA.

Based on review of recent maps, aerial photography, soils data, and the delineation report provided with your request, we have determined that part of the property contains wetlands and non-wetland waters that may be subject to Corps' jurisdiction. The approximate limits of the wetlands and non-wetland waters are designated in red and blue, respectively, on the map. A Department of the Army permit under Section 404 of the Clean Water Act will be required prior to the deposition or redistribution of dredged or fill material into waters of the U.S.

You and your client are advised that this preliminary jurisdictional determination is valid for a period of 5 years from the date of this letter unless new information warrants revision prior to the expiration date. Additionally, this determination is only valid for the identified project or individual(s) only and is not to be used for decision-making by any other individual or entity.

Please be advised that this property is in the Louisiana Coastal Zone and a Coastal Use Permit may be required prior to initiation of any activities on this site. For additional information, contact Ms. Christine Charrier, Office of Coastal Management, Louisiana Department of Natural Resources at (225) 342-7953.

Should there be any questions concerning these matters, please contact Mr. Jon Barmore at (504) 862-1704 and reference our Account No. MVN-2019-01285-SG. If you have specific questions regarding the permit process or permit applications, please contact our Central Evaluation Section at (504) 862-1581.

Sincerely,

[redacted]

Chief, Regulatory Branch

Enclosures

US Army Corps of Engineers
Preliminary Jurisdictional Determination

USACE

In House, 22 January 2020

BOTANIST Mr. Jon Barmore

FOR Stand Up Triple, LLC

ACCOUNT # MVN-2019-01285-SG

- Wetlands
- Non-wetland waters
- Uplands
- JD Review Area

325 0 650 Feet

N

Stand Up Triple, LLC

Monroe, LA

WETLAND MAP

LAFOURCHE PARISH, LA

Created :	AGB/ArcView
Approved :	GLF
Date :	11/07/2019
Map No. :	

FIGURE 8

Appendix D

Existing Vegetative Community

Appendix B – Existing Vegetative Species Composition

Habitat 1 (122.0 acres) – Artificial Fresh Marsh/Herbaceous Wetland Habitat (all 30' Radius plots)

Wetland Delineation Data Point 1

- Soldago *altissima aka canadensis* (10%)
- Saccharum *giganteum* (15%)
- Ipomoea *lacunose* (5%)
- Polygonum *hydropiperoides* (60%)
- Baccharis *halimifolia* (5%)
- Juncus *effuses* (5%)

Wetland Delineation Data Point 2

- Solidago *canadensis* (5%)
- Paspalum *urvillei* (5%)
- Panicum *hemitomon* (50%)
- Baccharis *halimifolia* (10%)
- Distichlis *spicata* (20%)
- Paspalum *urvillei* (10%)

Wetland Delineation Data Point 4

- Paspalum *urvillei* (90%)
- Rhynchospora *inundata* (5%)

Wetland Delineation Data Point 5

- Juncus *effuses* (25%)
- Eupatorium *serotinum* (10%)
- Soildago *altissima* (3%)
- Sesbania *drummondi* (2%)
- Baccharis *halimifolia* (20%)
- Xanthium *strumarium* (25%)
- Symphyotrichum *subulatum* (15%)
- Also present was 1 Taxodium *distichum* (estimated DBH 20")

Wetland Delineation Data Point 6

- Polygonum *hydropiperoides* (70%)
- Juncus *effuses* (5%)
- Diodia *virginiana* (5%)
- Physalis *angulate* (5%)
- Sesbania *drummondi* (5%)
- Leptochloa *panicea* (10%)

Appendix B – Existing Vegetative Species Composition

Habitat 2 (28.5 acres) – Forested Wetland Habitat

Prospectus Vegetation Data Point 1 (26' Radius)

Bottom Land Hardwood Forest – Plot 1 near 80 Arpent canal	% Composition	DBH	Softmast	Hardmast
Trees				
Liquidambar *styraciflua* (Sweetgum)	20	17"	X	
Ulmus *rubra* (Slippery Elm)	10		X	
Quercus *nigra* (Water Oak)	20	30"		X
Quercus *spp.* (Red Oak)	10			X
Total	***60***			
Sapling				
Quercus *nigra* (Water Oak)	15			X
Fagus grandifolia (American beech)	5			X
Acer *rubrum* (Red Maple)	10		X	
Ulmus *rubra* (Slippery Elm)	5		X	
Celtis *laevigata* (Sugar Hackberry)	5		X	
Total	***40***			
Shrub				
Sabal *minor* (Dwarf Palmetto)	60			
Total	***60***			
Herbaceous				
Rubus *aboriginum* (Dewberry)	3			
Viola *sororia* (Common Blue Violet)	0.5			
Poa *spp.*	0.5			
Total	***4***			

Wetland Delineation Data Point 8 (30' Radius)

Tree Stratum	Herb Stratum
· Acer *rubrum* (40%) · Quercus *nigra* (35%) · Acer *negundo* (15%) · Ulmus *Americana* (10%) Sapling/Shrub Stratum · Carya *illinoinensis* (45%) · Fraxinus *pennsylvanica* (40%) · Salix *nigra* (5%) · Taxodium *distichum* (10%)	· Saururus *cernuus* (40%) · Cyperus *acuminatus* (30%) · Baccharis *halimifolia* (10%) · Juncus *effuses* (10%) · Sabal *minor* (10%)

Appendix B – Existing Vegetative Species Composition

Prospectus Vegetation Data Point 4 (26' Radius)

Bottom Land Hardwood Forest - Plot 4 near 80 arpent Canal	% Composition	DBH	Softmast	Hardmast
Trees				
Symplocos *tinctorial* (Horse Sugar)	5	10"	X	
Quercus *nigra* (Water Oak)	10			X
Quercus *lyrate* (Overcup Oak)	10			X
Ulmus *rubra* (Slippery Elm)	20	16.5"	X	
Acer *rubrum* (Red Maple)	10	12"	X	
Acer negundo (Box Elder)	10		X	
Celtis *laevigata* (Sugar Hackberry)	10	12"	X	
Total	**75**			
Sapling				
Quercus *nigra* (Water Oak)	10			X
Acer *rubrum* (Red maple)	10		X	
Celtis *laevigata* (Sugar Hackberry)	10		X	
Total	**30**			
Shrub				
Sabal *minor* (Dwarf Palmetto)	30			
Cornus *florida* (Flowering Dogwood)	5			
Total	**35**			
Herbaceous				
Toxicodendron *radicans* (Poison Ivy)	20			
Commeline *communis* (Asiatic Dayflower)	5			
Chaerophyllum *procumbens* (Spreading Chervil)	2			
Arisaema *dracontium* (Green Dragon	2			
Total	**29**			

Appendix B – Existing Vegetative Species Composition

Habitat 3 (22.0 acres) – Non-Wetland Forested Habitat

Prospectus Vegetation Data Point 2 (26' Radius)

Bottom Land Hardwood Forest – Plot 2 Southwest side near Sugarcane Field	**% Composition**	**DBH**	**Softmast**	**Hardmast**
Trees				
Acer *rubrum* (Red Maple)	20		X	
Quercus *nigra* (Water Oak)	20	26"		X
Celtis *laevigata* (Sugar Hackberry)	15	19"	X	
Ulmus *rubra* (Slippery Elm)	5		X	
Totals	***60***			
Sapling				
Acer *rubrum* (Red Maple)	10		X	
Quercus *nigra* (Water Oak)	5			X
Ulmus *rubra* (Slippery Elm)	20		X	
Ilex *vomitoria* (Yaupon)	5		X	
Cornus *florida* (Flowering Dogwood)	5		X	
Fagus *grandifolia* (American Beech)	15			X
Totals	***60***			
Shrub				
Sabal *minor* (Dwarf Palmetto)	35			
Total	***35***			
Herbaceous				
Carex *Debilis* (White Water Sedge)	35			
Packera *glabella* (Honey Top)	5			
Total	***40***			

Wetland Delination Data Point 7 (30' Radius)

Tree Stratum · Celtis *laevigata* (60%) · Quercus *falcata* (20%) · Quercus *nigra* (20%) · Ulmus *americana* (5%) · Carya *illinoinensis* (5%) Sapling/Shrub Stratum · Celtis *laevigata* (30%) · Quercus *falcata* (20%) · Acer *negundo* (20%) · Diospyros *virginiana* (15%) · Acer *rubrum* (10%) · Liquidambar *styraciflua* (5%)	Herb Stratum · Lygodium *japonicum* (20%) · Sabal *minor* (20%) · Toxicodendron *radicans* (15%) · Dryopteris *ludoviciana* (15%) · Ligustrum *sinense* (15%)

Appendix B – Existing Vegetative Species Composition

Prospectus Vegetation Data Point 3 (26' Radius)

Bottom Land Hardwood Forest – Plot 3 Northeast side	**% Composition**	**DBH**	**Softmast**	**Hardmast**
Trees				
Quercus *nigra* (Water Oak)	20	32"		X
Liquidambar *styraciflua* (Sweetgum)	20	19"	X	
Total	***40***			
Sapling				
Acer *rubrum* (Red Maple)	1.5		X	
Quercus *nigra* (Water Oak)	2.5			X
Ulmus *rubra* (Slippery Elm)	0.5		X	
Fagus grandifolia (American Beech)	1			X
Acer negundo (Box Elder)	1.5		X	
Total	***7***			
Shrub				
Sabal *minor* (Dwarf Palmetto)	1.25			
Total	***1.25***			
Herbaceous				
Cirsium *horridulum* (Bull Thistle)	1.25			
Total	***1.25***			

Wetland Delineation Data Point 3 (30' Radius)

Tree Stratum · Quercus *nigra* (80%) · Liquidambar *styraciflua* (40%) · Ulmus *Americana* (20%) Sapling/Shrub Stratum · Quercus *nigra* (85%) · Liquidambar *styraciflua* (10%) · Sabal *minor* (5%)	Herb Stratum · Cirsium *horridulum* (5%) · Thelypteris *ovata* (35%) · Lygodium *japonicum* (15%) · Ageratina *altissima* (5%)

Appendix B – Existing Vegetative Species Composition

Prospectus Vegetation Data Point 5 (26' Radius)

Bottom Land Hardwood Forest - Plot 5 Northeast side	**% Composition**	**DBH**	**Softmast**	**Hardmast**
Trees				
Quercus *nigra* (Water Oak)	40	30"		X
Liquidambar *styraciflua* (Sweetgum)	30	20"	X	
Acer negundo (Box Elder)	20	11.5"	X	
Total	**90**			
Sapling				
Quercus *nigra* (Water Oak)	10			
Ulmus *rubra* (Slippery Elm)	5			
Acer *rubrum* (Red Maple)	5			
Prunus *spp.*	2			
Total	**22**			
Shrub				
Sabal *minor* (Dwarf Palmetto)	10			
Total	**10**			
Herbaceous				
Toxicodendron *radicans* (Poison Ivy)	10			
Arisaema *dracontium* (Green Dragon)	5			
Campsis *radicans* (Trumpet Creeper)	5			
Total	***20***			

Appendix B – Existing Vegetative Species Composition

Prospectus Vegetation Data Point 6 (26’ Radius)

Bottom Land Hardwood Forest – Plot 6 Southwest	% Composition	DBH	Softmast	Hardmast
Trees				
Celtis *laevigata* (Sugar Hackberry)	15	17”	x	
Quercus *nigra* (Water Oak)	15	16”		x
Ulmus *americana* (American Elm)	15	15”	X	
Acer negundo (Box Elder)	15	17”	X	
Totals	**60**			
Saplings				
Acer *rubrum* (Red maple)	10			
Quercus *nigra* (Water Oak)	10			
Ulmus *americana* (American Elm)	10			
Celtis *laevigata* (Sugar Hackberry)	10			
Totals	**40**			
Shrub				
Sabal *minor* (Dwarf Palmetto)	60			
Totals	**60**			

Prospectus Vegetation Data Point 7 (26’ Radius)

Bottom Land Hardwood Forest – Plot 7 Southwest	% Composition	DBH	Softmast	Hardmast
Trees				
Acer *rubrum* (Red Maple)	10	17”	X	
Quercus *nigra* (Water Oak)	10	19”		X
Acer negundo (Box Elder)	10	14”	X	
Ulmus *americana* (American Elm)	40	24”	X	
Totals	**70**			

Appendix B – Existing Vegetative Species Composition

Sapling				
Acer *rubrum* (Red Maple)	40			
Quercus *nigra* (Water Oak)	10			
Ulmus *americana* (American Elm)	10			
Totals	**60**			
Shrub				
Sabal minor (Dwarf Palmetto)	30			
Totals	**30**			
Herbaceous				
Smilax rotundifolia (Common green Briar)	10			
Poa spp.	20			
Total	**30**			

Prospectus Vegetation Data Point 8 (26' Radius)

Bottom Land Hardwood Forest – Plot 7 Southwest	% Composition	DBH	Softmast	Hardmast
Acer *rubrum* (Red Maple)	10	17"	X	
Quercus *nigra* (Water Oak)	40	25"		X
Acer *negundo* (Box Elder)	10	16"	X	
Catalpa *bignonioides* (Cigar tree)	1	15"	X	
Totals	**61**			
Saplings				
Acer *rubrum* (Red Maple)	10			
Celtis *laevigata* (Sugar Hackberry)	10			
Totals	**20**			
Shrubs				
Sabal minor (Dwarf Palmetto)	20			
Totals	**20**			

Appendix B – Existing Vegetative Species Composition

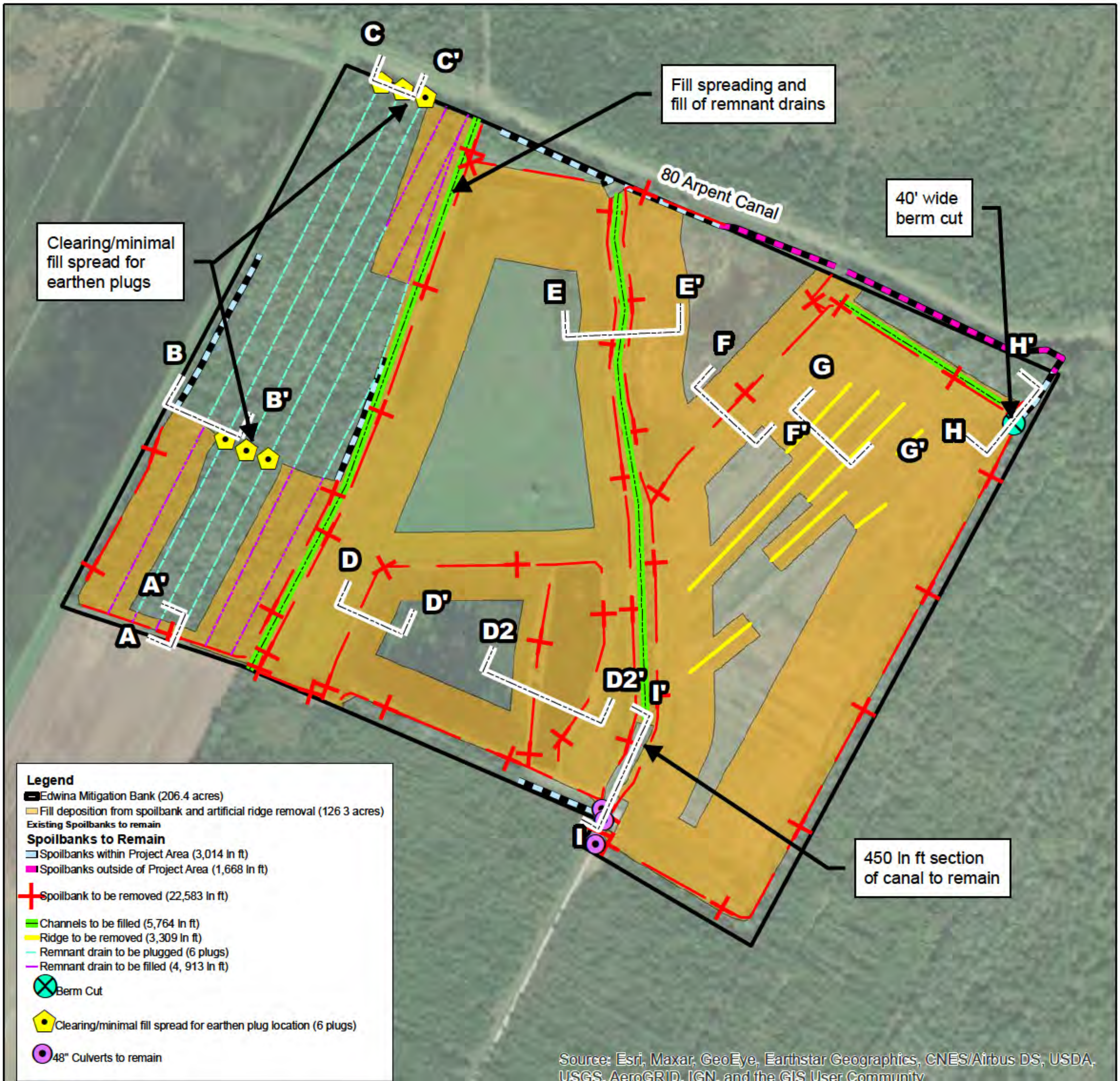
Herbaceous				
Smilax rotundifolia (Common green Briar)	5			
Parthenocissus *quinquefolia* (Virginia creeper)	5			
Lygodium *japonicum* (Japanese climbing fern)	2			
Toxicodendron radicans (Poison Ivy)	1			
Totals	**13**			

Prospectus Vegetation Data Point 9 (26' Radius)

Bottom Land Hardwood Forest – Plot 7 Southwest	% Composition	DBH	Softmast	Hardmast
Trees				
Salix *nigra* (Black willow)	1	22"	X	
Quercus *nigra* (Water Oak)	10	15"		X
Acer negundo (Box Elder)	5	15"	X	
Ulmus *americana* (American Elm)	20	26"	X	
Celtis *laevigata* (Sugar Hackberry)	30	18"	X	
Totals	**66**			
Saplings				
Quercus nigra (Water Oak)	10			
Totals	**10**			
Shrub				
Ligustrum *sinense (Chinese privet)*	10			
Totals	**10**			

Appendix E

Detailed Mitigation Work Plan Figures



Map Notes:

1. The boundary shown is based on the boundary survey provided by the client.
2. Map projected to NAD83 UTM Zone 15.

NRP

Stand Up Triple, LLC

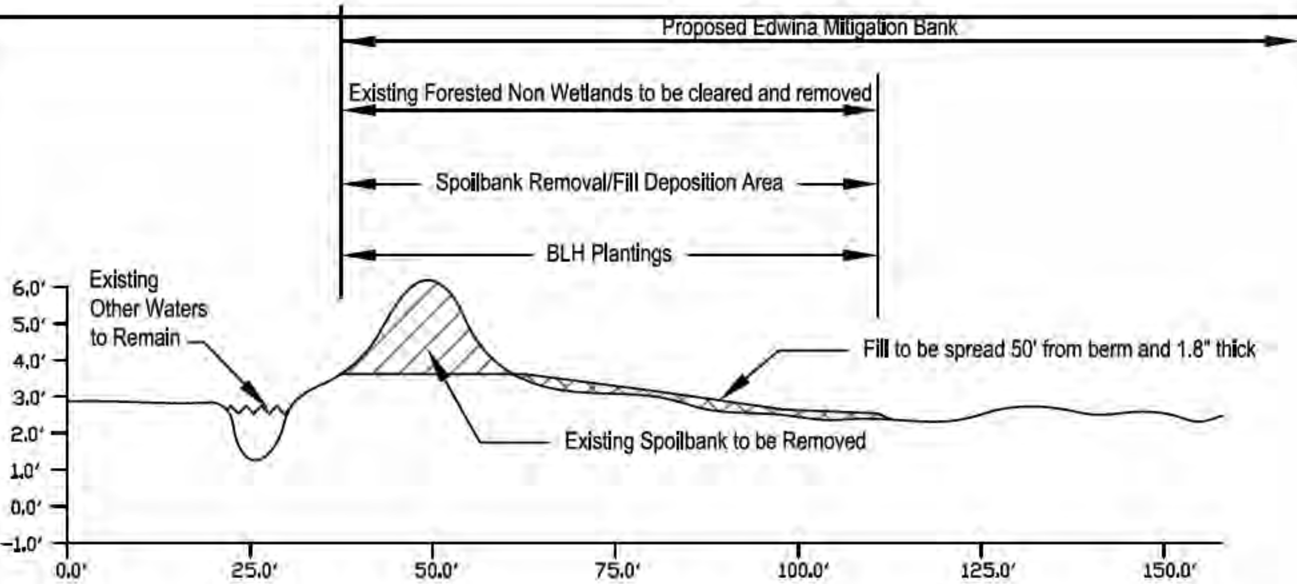
Monroe, LA

CROSS SECTION MAP

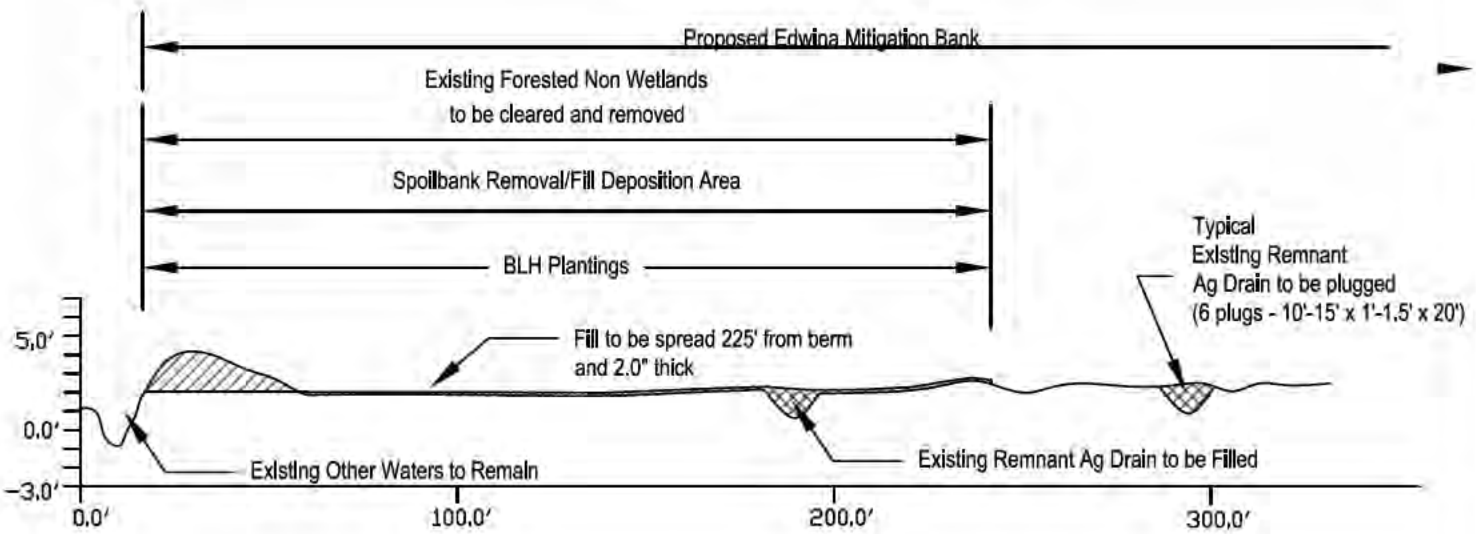
LAFOURCHE PARISH, LA

Created :	AGB/ArcView
Approved :	GLF
Date :	11/06/2020
Map No. :	

APPENDIX E FIGURE 1



Section A-A': Existing Spoilbank to be Removed
5:1 Vertical Exaggeration



Section B-B': Typical Existing Spoilbank Removal and Remnant Agricultural Drains to be Plugged within Non Wetland Forested Habitat
5:1 Vertical Exaggeration

Fill

Excavation

N

Stand Up Triple, LLC

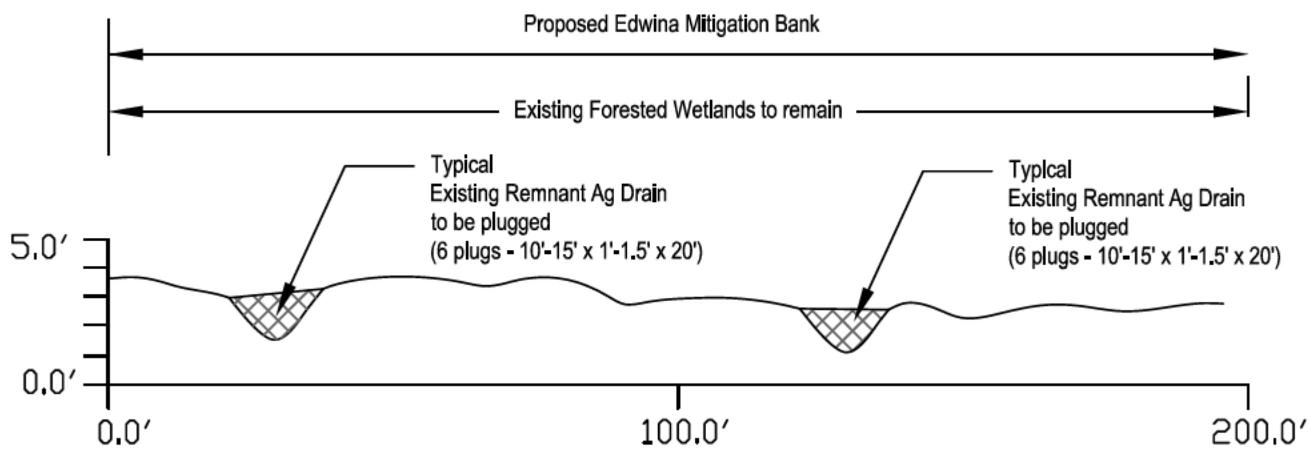
Monroe, LA

CROSS SECTION A & B

LAFOURCHE PARISH, LA

Created: AGB
Approved: GLF
Date: 11/10/2020
Map No.:

APPENDIX E FIGURE 2



Section C-C': Typical Existing Remnant Agricultural Drains to be Plugged within Wetland Forested Habitat
5:1 Vertical Exaggeration

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CROSS SECTION C

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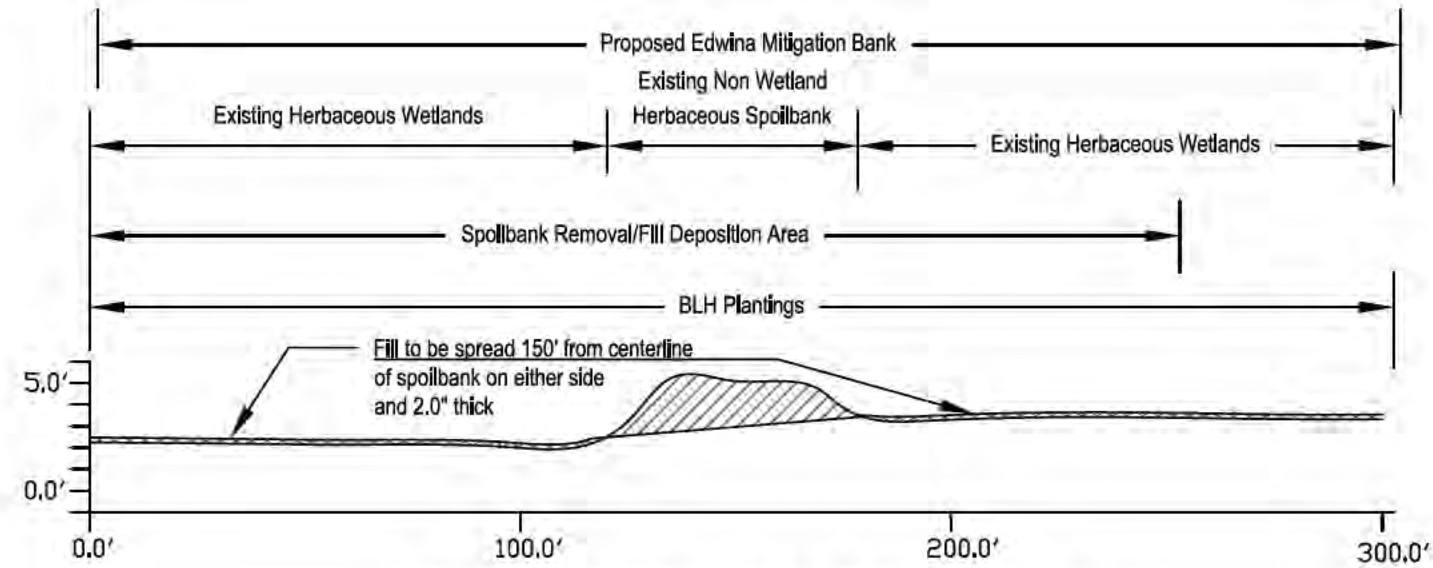
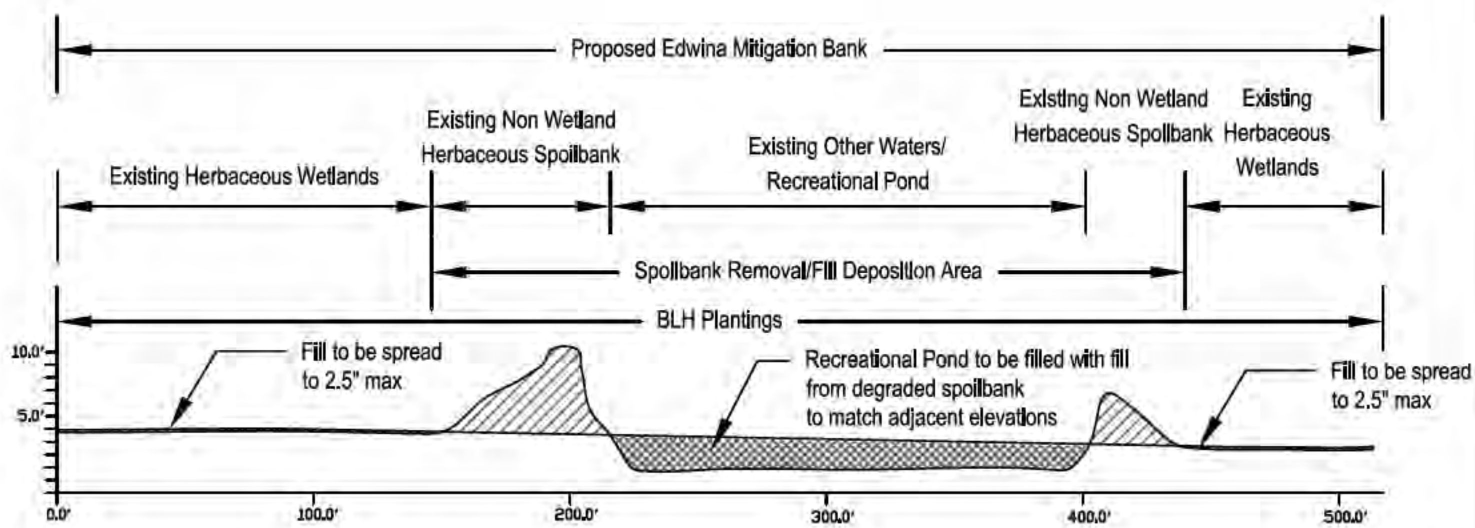
APPENDIX E FIGURE 3



Section D-D': Existing Spoilbank within Crawfish Pond to be Removed
5:1 Vertical Exaggeration



Section D2-D2': Existing Spoilbank within Crawfish Pond/Recreational Pond/Other Waters to be Removed
5:1 Vertical Exaggeration

Fill

Excavation

N

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CROSS SECTION D and D2

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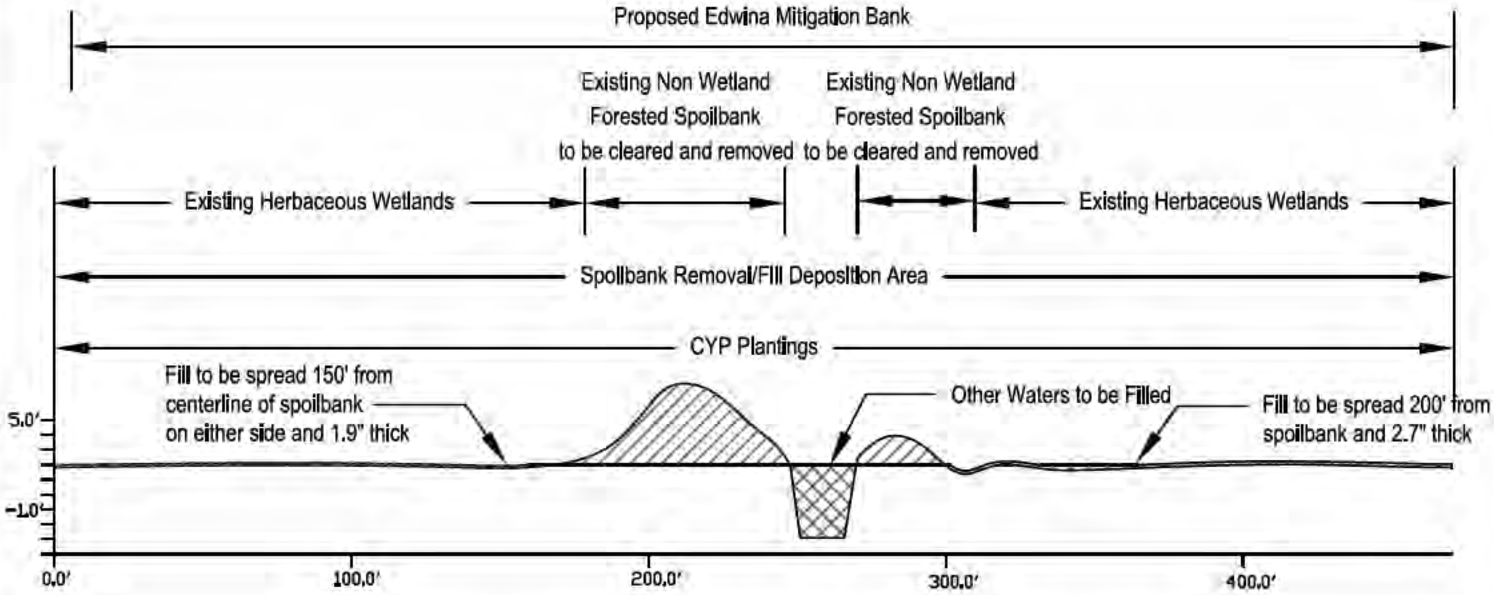
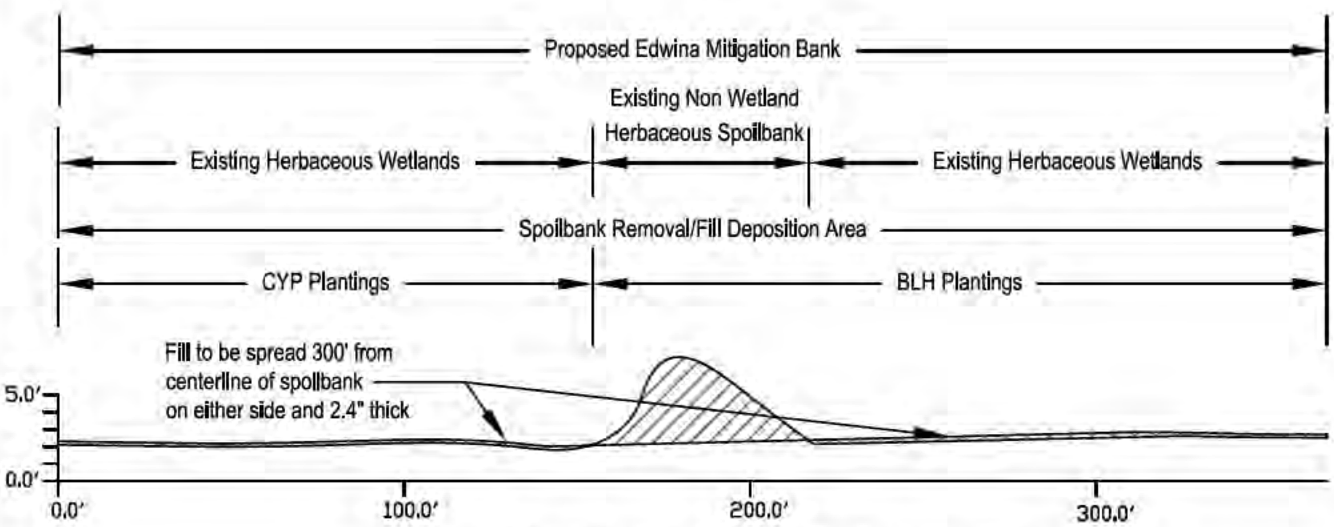
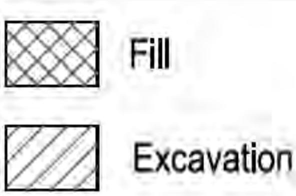
APPENDIX E FIGURE 4



Section E-E': Existing spoilbank removal and fill of adjacent to other waters
5:1 Vertical Exaggeration



Section F-F': Existing Spoilbank Removal in Herbaceous Wetland
5:1 Vertical Exaggeration



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CROSS SECTION E & F

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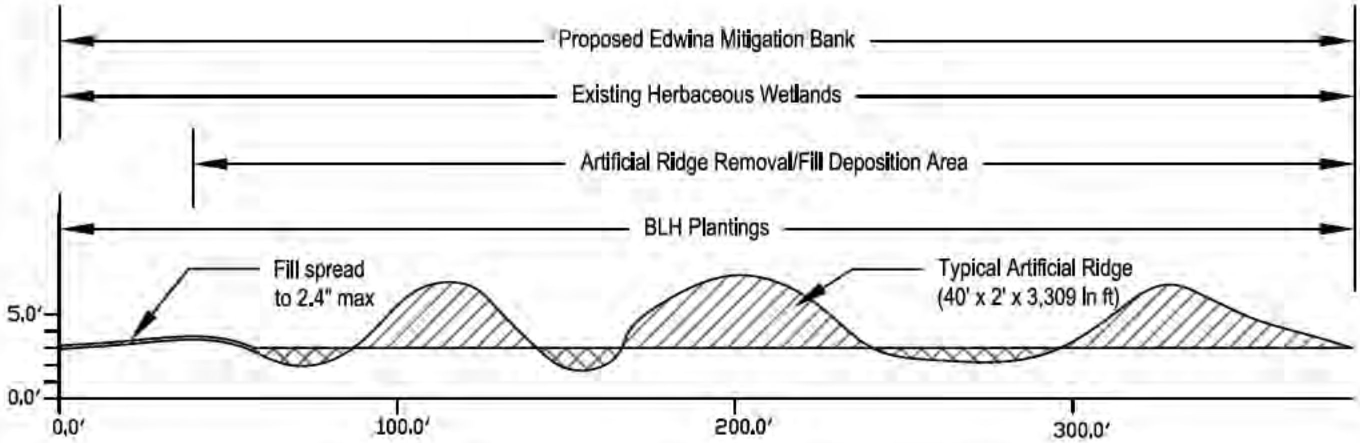
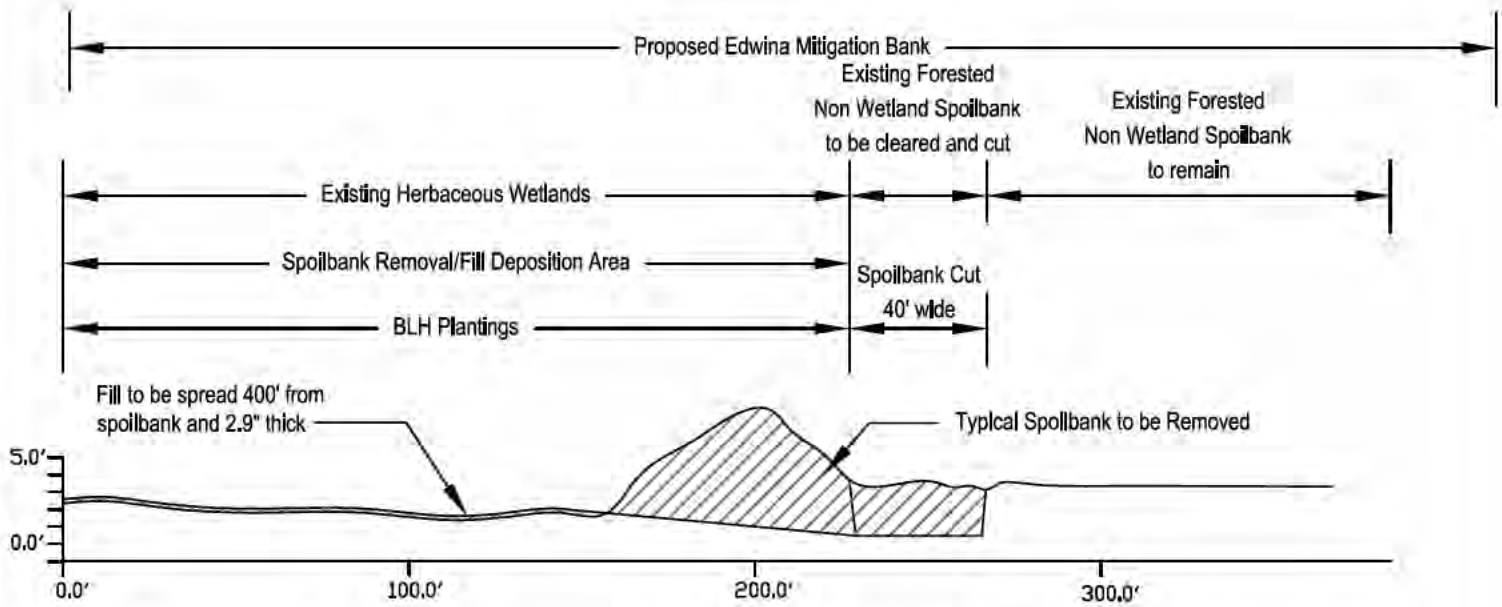
APPENDIX E FIGURE 5



Section G-G': Existing Artificial Ridge to be Removed
5:1 Vertical Exaggeration



Section H-H' Existing Spoilbank to be Removed and Adjacent Spoilbank to be Cut
5:1 Vertical Exaggeration

Fill

Excavation

N

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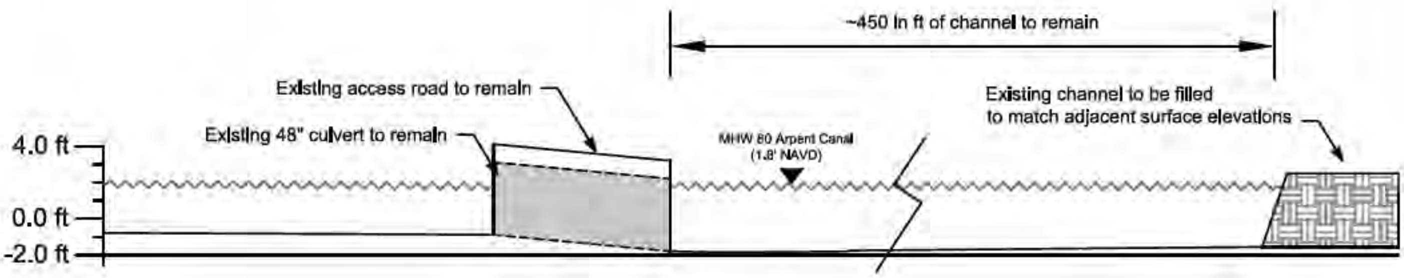
APPENDIX E FIGURE 6	



Section I-I': Existing Channel to be Filled
5:1 Vertical Exaggeration

Fill

Excavation

N

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Monroe, LA

CROSS SECTION I

LAFOURCHE PARISH, LA

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Approved: GLF

Date: 11/10/2020

Map No.:

APPENDIX E FIGURE 7