

JOINT PUBLIC NOTICE

August 12, 2019

United States Army
Corps of Engineers
New Orleans District
Regulatory Branch
7400 Leake Avenue
New Orleans, La. 70118

State of Louisiana
Department of Environmental Quality
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MVN-2018-00949 MR

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WQC Application Number
WQC # 190805-02

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: [X] 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).

ANDERSON CANAL MITIGATION BANK IN TANGIPAHOA PARISH

NAME OF APPLICANT: Cypress Investment Partners, LLC; c/o Elos Environmental, LLC; Attn: Brittany Berthelot; 43177 E. Pleasant Ridge Rd.; Hammond, Louisiana 70403.

LOCATION OF WORK: The approximate 373 acre site is located off of Interstate 55, on Taylor Drive. in Ponchatoula, Louisiana, in Tangipahoa Parish, as shown on attached drawings (Latitude: 30.419928° N, Longitude: -90.464039° W). The project is located within the Lake Pontchartrain Basin, Hydrologic Unit 08070203 and 08070204.

CHARACTER OF WORK: Gapping spoil banks along two canals, removal of invasive species as well as supplemental plantings to enhance BLH and fresh marsh habitats. Preservation of portions of existing fresh marsh and swamp habitats is also proposed. All work proposed is for the purpose of constructing a mitigation bank.

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 Standard Local Operating Procedure for Endangered Species in Louisiana (SLOPES), dated October 22, 2014, 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 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 interest in the matter.

Martin S. Mayer
Chief, Regulatory Branch

Enclosure

Draft Prospectus for the Proposed Anderson Canal Mitigation Bank

Tangipahoa Parish, Louisiana

June 27th, 2019



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1. Introduction

ELOS Environmental, LLC (ELOS) has prepared the following prospectus to establish the proposed Anderson Canal Mitigation Bank (ACMB). The ACMB is a 373.0 acre proposed mitigation bank located south of Ponchatoula in southern Tangipahoa Parish, Louisiana (**Appendix A: Figure 1**). The proposed bank is comprised of 343.8 acres of wetlands, 10.8 acres of other waters, and 18.4 acres of non-wetlands, as shown on **Appendix A: Figure 2**. The proposed bank will provide compensatory mitigation for unavoidable impacts to “Waters of the United States”. The ACMB will also provide compensatory mitigation for unavoidable impacts to coastal wetland resources under the Louisiana Coastal Resources Program.

The proposed bank, which historically was a thriving bald cypress/tupelo swamp (swamp) is now a degraded wetland that has been severely impacted by the construction of the Anderson Canal and the Anderson Diversion Canal (Diversion Canal), subsequent proliferation of Chinese tallow trees (*Triadica sebifera*), and the lack of regeneration of bald cypress (*Taxodium distichum*) trees. In its current state, large areas of the site do not exhibit the typical characteristics of a healthy and robust swamp habitat. Therefore, the purpose of the proposed bank is to restore this degraded wetland habitat such that it may provide the aquatic resource functions expected from a thriving swamp. Additionally, the proposed bank will enhance existing areas of bottomland hardwoods (BLH) and fresh marsh within the proposed bank by improving their hydrologic connectivity and vegetation composition.

1.1 Site Location

The proposed ACMB is located in the Tickfaw and Lake Maurepas Watersheds, which are contained within the greater Lake Pontchartrain Basin Watershed, in Tangipahoa Parish. The ACMB occupies Sections 37 and 38 in Township 07 South, Range 07 East with the following coordinates roughly representing the center of the proposed bank at Latitude 30.419928° North and Longitude – 90.464039° West. The proposed bank is located within the geographic limits of the Louisiana Coastal Zone Boundary, south of Ponchatoula and west of Interstate 55 (I-55) at the southern edge of the Pleistocene ridge. Two canals traverse the site: Anderson Canal and Diversion Canal, intersecting just prior to exiting the southern boundary of the site. The site is generally flat with small pockets of higher elevations located along the constructed spoil banks of Anderson Canal and Diversion Canal. As shown on **Appendix A: Figure 3**, elevations on site range from 1 foot to approximately 6 feet above mean sea level (NAVD88).

2. Project Goals and Objectives

The goal of the proposed ACMB is to enhance 237.0 acres of swamp, preserve 35.5 acres of swamp, enhance 33.9 acres of BLH, enhance 26.7 acres of fresh marsh, preserve 8.9 acres of fresh marsh, and restore approximately 17.6 acres of upland habitat to forested upland inclusion. The existing land uses and proposed mitigation types are summarized in **Table 1. Appendix A: Figure 4** depicts the proposed mitigation habitat types.

The objectives of the proposed ACMB are to re-establish hydrologic exchange with the surrounding wetland community that occurred prior to the construction and placement of spoil material along Anderson Canal and Diversion Canal and to eradicate the invasive species that inhabit areas of the proposed bank. Placement of spoil material along the banks of the canals has impounded the site, preventing the site from properly draining and eliminating natural tidal exchange. Impoundment and the subsequent lack of drainage causes water to stagnate on the site, which has severely impacted the regeneration of bald cypress and water tupelo (*Nyssa aquatica*) seedlings and allowed opportunistic and invasive species, mainly Chinese tallow, to populate the site.

Proposed site enhancements will include constructing gaps in the existing spoil banks, re-establishing hydrologic connectivity and alleviating the impacts of impoundment discussed above. Enhancement will also be achieved by installation of supplemental plantings of target species in 184.3 acres of swamp habitat.

Degraded swamp and BLH areas exhibiting greater than 10 percent absolute cover of Chinese tallow will be restored via the eradication of Chinese tallow and supplemental planting of target species. The removal of invasive species and improved hydrologic connection, along with successful enhancement of the swamp, bottomland and upland hardwood forests, and fresh marsh habitats will provide additional wetland functions and values not currently provided by the site, allowing for enhanced wildlife habitat value and a greater diversity of species.

Table 1. Existing Habitat Types, Land Use, and Mitigation Types

Baseline Condition	Mitigation Habitat and Type	Mitigation Acres
Degraded Wetland Forest	Swamp Enhancement	237.0
Degraded Wetland Forest	BLH Enhancement	33.9
Degraded Herbaceous Wetland	Fresh Marsh Enhancement	26.7
Wetland Forest	Swamp Preservation	35.5
Herbaceous Wetland	Fresh Marsh Preservation	8.9
Non-wetland Forest	Upland Inclusion	17.6
Other Waters	Other Waters	10.7
Total Cut Area		2.7
Total Mitigation Acreage		342.0
Total Enhancement Credit Acreage		297.6
Total Preservation Acreage		44.4
Total Conservation Servitude Acreage		373.0

The proposed objectives of ACMB, which will help achieve the goal of the bank and thereby ensure the success of the proposed bank, are:

- 1) Re-establishment of the site's hydrologic connection to the surrounding tidally-influenced wetland community through the construction of gaps in the spoil banks along Anderson Canal and Diversion Canal.
- 2) Enhancement of 237.0 acres of swamp, 33.9 acres of BLH, and 26.7 acres of fresh marsh through hydrology restoration and planting of target species.
- 3) Enhancement of 237.0 acres of swamp, and 33.9 acres of BLH through the eradication of invasive species (Chinese tallow).
- 4) Preservation of 62.0 acres of existing swamp, fresh marsh, and upland habitats.
- 5) Provide enhanced habitat for plant and wildlife species customary in swamp, BLH, and fresh marsh habitats.
- 6) Provide long-term protection through a perpetual-term conservation servitude on the 373.0-acre ACMB.

3. Ecological Suitability of the Site/Baseline Conditions

The site is ecologically suited to support swamp, BLH, and fresh marsh habitats based on location, historic hydrology, soil types, and, except for the constructed canals, a lack of anthropogenic influences. Historically, the areas with the lowest elevations on the site were composed of a healthy bald cypress/tupelo swamp. Deciduous bottomland hardwood forest dominated areas with higher elevations.

The geological and hydrological characteristics of the site provide ideal conditions to establish a wetland mitigation bank.

Directly north of the site lies the edge of the Pleistocene ridge with an elevation of approximately +11 feet NAVD88. With a typical elevation of +1-foot NAVD88, the site serves as the transitional point between the developed community of Ponchatoula and the wetlands that surround Lake Maurepas and Lake Pontchartrain. As would be expected, the site receives significant runoff from the surrounding developed community, and serves as a primary area for the attenuation and storage of floodwaters. Man-made spoil banks lining the canals prevent the site from realizing its maximum functional ability to attenuate floodwaters by severely restricting the distribution of water to the impounded wetland community. Instead, water stagnates and near permanent inundation occurs on either side of the canals that divide the site. This stagnation of water on site and the destruction of seedlings by nutria (*Myocastor coypus*) have severely reduced regeneration of bald cypress and water tupelo seedlings on site.

To the south, beyond the Anderson Canal, the landscape transitions from a bald cypress/tupelo swamp into scrub shrub and fresh marsh habitat, which dominates the northern portion of the Manchac land bridge. However, modification of the site has significantly limited hydrological connectivity to this wetland community.

Gapping of the spoil banks impounding the site will re-establish a natural hydrologic connection to the surrounding Maurepas Swamp, allowing tidal exchange and water on the site to flow into the larger swamp region, thereby eliminating the stagnation of water on the site. Increased water exchange and reduction of water stagnation will allow for the regeneration of bald cypress and water tupelo trees. Gapping will also restore the historic sheet flow of water across the site that existed prior to human effectuated changes.

There is no increased risk of flooding for the residential community located north of the site as a result of constructing gaps in the spoil banks along the canals. Tidal storm surge presents the greatest flood risk to the area. The largest surge recorded in the area occurred during Hurricane Issac, with a surge of 6.54 feet NAVD88 registered on the Pass Manchac gauge. None of the recent significant flood events that have occurred in the area, including the floods of March and August of 2016, as well as Hurricane Issac of 2012, have caused the residential community adjacent to the site to flood. While the spoil banks eliminate hydrological connectivity during normal conditions, extreme flood events, such as Hurricane Issac, overtop the spoil banks, allowing storm surge to inundate the site. Yet the residential community has remained unaffected due to the significant elevation change that separates the site (typically +1' NAVD88) and the community (typically +7 to +9 feet NAVD88). Therefore, any increased distribution of water over the site that will result from gapping the spoil banks will not produce an increased flood risk to the residential community. Only significant flood events producing nearly 6 feet of storm surge, which would have overtopped the spoil banks anyway, will pose a flood risk to this community. However, the constructed gaps will provide relief to

the gravity drainage system by allowing through-flow of floodwaters generated during flash floods that would normally not produce enough stormwater to overtop the spoil banks.

3.1 Land Use

The site is mainly forested like much the area that surrounds the site (**Appendix A: Figure 5**). Portions of the site are categorized as marsh. Adjoining the site to the south and east is a portion of the Joyce Wildlife Management Area (WMA), a WMA consisting of over 39,190 acres of bald cypress/tupelo swamp and fresh marsh habitats owned and managed by the Louisiana Department of Wildlife and Fisheries (LDWF).

3.1.1 Historical Land Use

Historically, land uses on the surrounding properties were dominated by timber production, recreational hunting and trapping, agriculture, and rural residential housing. The site proper has historically been used for timber production and was most recently harvested in the 1940s or earlier. It is unknown when construction of the Anderson and Diversion Canals began, but a review of aerial photographs reveals evidence of some construction prior to 1952 (**Appendix A: Figure 6**). According to aerial photographs, construction of the canals does not appear to have been completed until circa 1965 (**Appendix A: Figure 7**). It appears the site consisted of both forested and marsh habitat prior to the construction of the canals. Evidence of a small natural drainage feature is depicted on the 1952 aerial image. It is evident that this drainage feature was modified during the excavation of the canals. Aerial photographs for 1952, 1965, 1972 and 2018 are shown in **Appendix A: Figures 6 – 9**, respectively.

3.1.2 Existing/Current Land Use

The current land use of the site consists of recreational hunting of whitetail deer (*Odocoileus virginianus*), waterfowl, and other small game animals. Low density development exists near the northern border of the site, but to the south, west, and east of the site there is no development, and only large tracts of bald cypress/tupelo swamps, scrub shrub, and fresh marsh habitats owned by private land owners or included in the WMA exist. The site directly borders the Joyce WMA, sharing a border along its southeastern boundary which is illustrated on the Land Use Map (**Appendix A: Figure 5**).

3.2 Soils

As shown on **Appendix A: Figure 10**, all soils mapped within the proposed bank are hydric. A majority of the soils on the site are listed as MP: Maurepas muck, 0 to 1 percent slopes, frequently flooded (180.2 acres). The remainder of the site is composed of BB: Barbary muck (96.6 acres), Gy: Guyton silt loam, 0 to 1 percent

slopes, occasionally flooded (48.9 acres), KE: Kenner muck (38.3 acres), and Go: Guyton silt loam, 0 to 1 percent slopes, rarely flooded (0.8 acres) [1].

The Maurepas muck (MP) soil series are level, very poorly drained, frequently flooded and ponded hydric soils that are found in freshwater swamps. They consist of highly decomposed wood organic material formed over fluid clayey alluvium. The hydric rating for this soil series is 80 to 100 percent. The Barbary muck (BB) soil series are level, very poorly drained, hydric soils that are ponded and flooded most of the time. They are found in freshwater swamps that are formed of clayey alluvium. The hydric rating for this soil series is 75 to 98 percent. The Guyton (Gy) soil series are level, poorly drained, occasionally flooded hydric soils that are found in broad depressional areas, swales, and drainageways of stream or marine terraces. The hydric rating of this soil series is 85 percent. Kenner muck (KE) soils are level, very poorly drained organic hydric soils that are ponded or flooded most of the time. They are found in freshwater marshes and are mainly used as habitat for wetland wildlife. These soils have a hydric rating of 95 percent. Guyton (Go) soil series are level and poorly drained hydric soils found on broad flats and in depressional areas found on stream or marine terraces. This soil series is rarely flooded and have a hydric rating of 90 percent [1].

All soils reviewed on site during the wetland delineation were found to have field indicators sufficient to be considered hydric, except for soils found in sample plot 3. This plot is located in an upland area along the spoil bank of the Diversion Canal.

3.3 Hydrology

3.3.1 Contributing Watershed

The proposed ACMB is located along the boundary of the Tickfaw and Lake Maurepas watersheds. The Tickfaw watershed is 468,538 acres and the Lake Maurepas watershed is 468,360 acres. The United States Geological Survey (USGS) Hydrologic Cataloging Unit (HUC) for the Tickfaw watershed and Lake Maurepas watersheds are 08070203 and 08070204 respectively. The Tickfaw watershed includes portions of Tangipahoa, St. Helena, and Livingston parishes in Louisiana, and Amite County, Mississippi. The Lake Maurepas watershed includes portions of Ascension, St. James, St. John the Baptist, Livingston, and Tangipahoa parishes. As shown on **Appendix A: Figures 11 and 12**, both watersheds are located within the greater Lake Pontchartrain Basin Watershed.

3.3.2 Historical Hydrology and Drainage Patterns

Historically, the site appears to have been flat, with very little relief. According to historic topographic maps (**Appendix A: Figure 13**), the site appears to have served as a distributary basin for two small streams, which were eventually widened and extended to become what are now the Anderson Canal and Diversion Canal (**Appendix A: Figure 14**), providing relief to the developed areas north of the site. Prior to these man-made alterations of the site, the site accepted runoff from the north, where the Pleistocene ridge lies almost 10 feet higher than the

majority of the site. Runoff traveled across the site through sheet flow, eventually draining into Lake Maurepas.

Prior to the construction of the spoil banks and the Anderson and Diversion Canals in 1952 or earlier, the site was composed of a healthy bald cypress/tupelo swamp in the areas with the lowest elevation and deciduous bottomland hardwood forest in areas with higher elevation. Construction and placement of spoil material along the banks of the canals in the 1950s has effectively impounded the site, eliminating hydrologic connection to the surrounding wetland community. Impoundment has created water stagnation and near permanent inundation, preventing site drainage and natural regeneration of bald cypress seedlings, which require dry periods for germination and young seedling growth. Lack of regeneration of bald cypress trees has allowed invasive species, primarily Chinese tallow trees to colonize.

3.3.3 Existing/Current Hydrology and Drainage Patterns

Two canals intersect the proposed ACMB: Anderson Canal and Diversion Canal which are both owned by the Sponsor. Diversion Canal drains into Anderson Canal and Anderson Canal drains into another constructed canal (Interstate Canal) that parallels I-55 before draining into North Pass. Construction of Anderson Canal and Diversion Canal has created spoil banks that flank both canals throughout the site. As indicated previously, prior to man-made alteration, evidence of a natural braided drainage feature existed that drained into the site. However, in an effort to provide relief to developing areas of Ponchatoula north of the site, this stream was widened, deepened, straightened and extended. This process, while successful in the transfer of water, has significantly altered surface hydrology, preventing sheet flow, creating nearly permanent inundation, while also eliminating tidal exchange.

Currently, the site is impounded by spoil banks located along Anderson Canal and Diversion Canal that traverse the site. The current drainage pattern of the site is illustrated in **Appendix A: Figure 15** and existing cross-sections of the canals can be found in **Appendix B Figures 1 - 4**. As shown, both portions of the site north and south of the Diversion Canal are hydrologically connected to the canals only by a single shallow drainage feature (**Appendix B: Figures 5 - 6**). As indicated earlier, disconnection of the site to the canals eliminates tidal exchange, prevents natural drainage, and allows water to stagnate, preventing development of the natural vegetative community and allowing opportunistic invasive species to inhabit site.

Diversion Canal travels through the site, entering from the west, traveling northeast, then turning southeast, before eventually turning south and intersecting with Anderson Canal. Anderson Canal enters the site at the northeast corner and travels in a southwesterly direction until it intersects with Diversion Canal prior to exiting the site. After the two channels converge and exit the site, Anderson Canal travels south, converging with several other channelized waterways before eventually draining into North Pass. Currently the main inputs to the site consist of precipitation and surface runoff from the geologic ridge to the north. With the

exception of two small narrow ditches, the site only receives input from either canal during periods of extreme high water due to the placement of spoil material. Although portions of the spoil banks along the canals do contain wetlands, they are still elevated enough by the placement of dredged material to inhibit the influx of water from either canal during normal conditions.

Tidal exchange, which would have naturally occurred on the site, has been virtually eliminated by the spoil banks. Additionally, drainage of the site is significantly altered by the spoil material along the banks of the canals, preventing water flow into Anderson Canal and Diversion Canal and producing periods of near permanent inundation. This inundation has reduced the regeneration of bald cypress and water tupelo seedlings, which require dry periods for germination and young seedling growth. Lack of regeneration of cypress and tupelo trees has allowed large areas of the site to become populated by invasive Chinese tallow trees.

Construction of Diversion Canal and Anderson Canal has divided the site essentially into separate portions all of which are impounded by the placement of spoil material along the canals, but have separate surface water inputs. Areas of the site located north of Diversion Canal receive inputs of surface flow from the geologic ridge that lies directly north of the site. With the exception of the single shallow drainage feature that connects this portion of the site to Diversion Canal, the influx of water is unable to drain into Diversion Canal due to the spoil banks that impound the site. Lack of drainage creates periods of near permanent inundation.

Areas of the site located south of Diversion Canal receive runoff from the ridge located west of the site and limited input from Joyce WMA to the south. A small extension of the western ridge protrudes into the southern portion of the site which inhibits flow from the northwest corner to the south, effectively impounding this area since surface flow is already inhibited by the spoil banks that line the canal to the north. Runoff received from this ridge is impounded and very little drains into Diversion Canal. The remaining areas located south of Diversion Canal do have limited connectivity to Joyce WMA which directly adjoins the site's southern border. However, lack of regeneration of bald cypress and water tupelo seedlings has opened the canopy and allowed for the development of a thick vegetative mat which reduces the flow of water and hydrologic exchange that occurs between the site and Joyce WMA.

3.3.4 Jurisdictional Wetlands

A wetland delineation was conducted on the site on September 11, 2018 and submitted to the U.S. Army Corps of Engineers (USACE) on November 6, 2018. The results of the wetland delineation can be found in **Appendix A: Figure 2**. The USACE issued Jurisdictional Determination MVN-2018-00949-SG on February 26, 2019 which can be found in **Appendix C**. During the wetland delineation, all soils

were found to have field indicators sufficient to be considered hydric, except the soils found in sample plot 3. This plot is located in an upland area along the spoil bank of the Diversion Canal. The Louisiana Wetland Rapid Assessment Method (LRAM) spreadsheet has been included as **Appendix D**. This is used to calculate compensatory mitigation credits.

3.4 Vegetation

3.4.1 Historical Plant Community

The proposed ACMB occupies an area that historically was a functioning bald cypress/tupelo swamp with small pockets of bottomland hardwoods and fresh marsh habitats. The oldest aerial image of the site found is from 1952 (**Appendix A: Figure 6**) and it appears as though at that time, the site consisted primarily of cypress swamp and fresh marsh habitats with bottomland hardwoods located along ridges. Overall, the apparent boundary of fresh marsh and forested swamp appears to remain very similar to what is depicted on this historic aerial image. The oldest topographic map is from 1935 (**Appendix A: Figure 13**) and also appears to depict the same boundary of fresh marsh and forested swamp as exists currently.

Bald cypress/tupelo swamps which are combined with bald cypress swamp, tupelo-blackgum swamp, scrub/shrub swamp, and shrub swamp by the Louisiana Department of Wildlife and Fisheries (LDWF) in the 2015 Louisiana Wildlife Action Plan, have experienced significant reductions in habitat from their historic extent. LDWF estimates that these habitats covered 2 to 4 million acres historically, but have been reduced to 500,000 to 1 million acres today (a 50 to 75 percent loss of habitat) [2]. Bald cypress swamps consist of forested wetland ecosystems located along rivers and streams, and are also associated with lakes, ponds, and depressional swales. Soils in cypress swamps experience near permanent inundation or saturation by surface or ground water throughout the growing season under normal conditions. However, dry periods are required for natural regeneration as seeds and young seedlings cannot tolerate extended periods of submergence [2].

Bottomland hardwoods are forested alluvial wetlands found throughout Louisiana, occupying broad floodplains. The natural hydrologic regime that characterizes these habitats is alternating wet and dry periods that follow typical seasonal flooding events. They are generally composed of mixtures of both broadleaf and needleleaf deciduous, and evergreen trees and shrubs. The specific species that make up these communities varies and can be dependent on a number of factors, such as soil type and hydrologic regime. Bottomland hardwoods historically occupied between 6 and 8 million acres in Louisiana. However, only 25 to 50 percent of this estimated acreage is believed to remain [2].

Fresh marshes are wetlands dominated by emergent soft-stemmed vegetation that experience frequent inundation. Small pools or ponds are typically scattered throughout these habitats and they are the most floristically diverse marsh habitat.

According to LDWF, pre-settlement extent of this habitat was estimated at 1 to 2 million acres. However, fresh marsh has experienced the greatest loss of habitat compared to other types of marsh, and only 25 to 50 percent of the original extent is believed to remain. The reduction of habitat is believed to be a result of saltwater intrusion, canal dredging, and various types of development [2].

The proposed site has been managed for timber with the most recent harvest occurring around or before the 1940s. Regeneration of bald cypress and water tupelo seedlings has been significantly limited following this harvest and the construction of the Anderson Canal and the Diversion Canal. Lack of regeneration of the natural plant community on the site has allowed for large tracts to become populated with Chinese tallow trees. Continued impoundment of the site by the spoil banks would continue to allow Chinese tallow trees and other invasive, opportunistic species to completely overtake the site.

3.4.2 Existing Plant Community

Currently, the site is composed of several distinct vegetative communities (**Appendix A: Figure 16**), exhibiting varying degrees of likeness to the historic communities that existed on site prior to anthropogenic influence. These communities consist of cypress-tupelo swamp, bottomland hardwoods, and fresh marsh. Chinese tallow can be found throughout the site, and exceeds 10 percent absolute cover in most of the areas proposed for swamp and BLH enhancement. Chinese tallow can be found in the 26.7 acres of fresh marsh proposed for enhancement where the habitat transitions from forested to herbaceous and sporadically throughout the marsh interior.

Historically, the lowest areas of the site would have been dominated by bald cypress and water tupelo while areas with higher elevations would have been dominated by typical bottomland hardwood species. However, due to the hydrological modification of the site, Chinese tallow has become a prominent species observed throughout the site.

Species found in the 237.0 acres proposed for swamp enhancement include, but are not limited to Chinese tallow, bald cypress, water tupelo, red maple (*Acer rubrum*) black willow (*Salix nigra*) sweetgum (*Liquidambar styraciflua*), and laurel oak (*Quercus laurifolia*) in the tree stratum; black gum (*Nyssa sylvatica*), red maple, bald cypress, Chinese tallow, sweetgum, water oak (*Quercus nigra*), wax myrtle (*Morella cerifera*), dwarf palmetto (*Sabal minor*), and buttonbush (*Cephalanthus occidentalis*) in the sapling/shrub stratum; and lizard's tail (*Saururus cernuus*), maidencane (*Panicum hemitomon*), alligator weed (*Alternanthera philoxeroides*), shortbristle horned beaksedge (*Rhynchospora corniculata*), swamp smartweed (*Persicaria hydropiperoides*), drooping bulrush (*Scirpus lineatus*), bald cypress, Chinese tallow, dwarf palmetto, red maple, comfortroot (*Hibiscus aculeatus*), dotted smartweed (*Persicaria punctata*), green arrow arum (*Peltandra virginica*), marsh seedbox (*Ludwigia palustris*), broadleaf

cattail (*Typha latifolia*), buttonbush, and common rush (*Juncus effusus*) in the herbaceous stratum.

Species found in the 35.5 acres of swamp preservation include, but are not limited to bald cypress, and water tupelo in the tree stratum; red maple bald cypress, water tupelo, and Chinese tallow in the sapling/shrub stratum; and lizard's tail, maidencane, and alligator weed in the herbaceous stratum. Chinese tallow is not prevalent within this area.

Species found in the bottomland hardwoods include, but are not limited to Chinese tallow, red maple, water oak, sweetgum, water hickory (*Carya aquatica*), green ash (*Fraxinus pennsylvanica*), swamp chestnut oak (*Quercus michauxii*), laurel oak, hackberry (*Celtis occidentalis*), and loblolly pine (*Pinus taeda*) in the tree stratum; Chinese tallow, red maple, sweetgum, water oak, water hickory, black gum, green ash, bald cypress, dwarf palmetto, American elm (*Ulmus americana*), common persimmon (*Diospyros virginiana*), yaupon (*Ilex vomitoria*), Chinese privet (*Ligustrum sinense*), and wax myrtle in the sapling/shrub stratum; alligator weed, lizard's tail, water oak, Chinese tallow, sawtooth blackberry (*Rubus argutus*), slender woodoats (*Chasmanthium laxum*), pepper vine (*Ampelopsis arborea*), swamp smartweed, dotted smartweed, savannah panicgrass (*Phanopyrum gymnocarpon*), and poison ivy (*Toxicodendron radicans*) in the herbaceous stratum.

Species found in the 26.7 acres proposed for fresh marsh enhancement include, but are not limited to maidencane, swamp sawgrass (*Cladium mariscus*), broadleaf arrowhead (*Sagittaria latifolia*), broadleaf cattail, swamp smartweed, and alligator weed. Bald cypress, black willow, red maple, eastern baccharis (*Baccharis halimifolia*), and buttonbush can also be found sporadically throughout the marsh interior. A limited amount of Chinese tallow was observed within the fresh marsh habitat proposed for enhancement where the habitat transitions from forested to herbaceous and sporadically throughout the marsh interior, but remains below 10 percent absolute cover.

Species found in the 8.9 acres proposed for fresh marsh preservation include, but are not limited to maidencane, eastern marsh fern (*Thelypteris palustris*), bulltongue arrowhead (*Sagittaria lancifolia*), lizard's tail, alligator weed, broadleaf cattail, largeleaf pennywort (*Hydrocotyle bonariensis*), common rush, and blunt broom sedge (*Carex tribuloides*). Bald cypress, black willow, red maple, wax myrtle, and crimson-eyed rosemallow (*Hibiscus moscheutos*) can also be found sporadically throughout the marsh interior. A limited amount of Chinese tallow (2 percent cover) was observed, primarily along the edge of the marsh where the habitat transitions from forested to herbaceous.

Human induced alteration of the site including poor timber management and hydrologic modification has prevented natural regeneration of bald cypress and tupelo seedlings, allowing the site to be infiltrated by Chinese tallow trees

(Appendix A: Figure 4). Very little regeneration of bald cypress and water tupelo seedlings was observed on site during the wetland delineation. Of the 13 delineation sample plots taken, bald cypress and water tupelo saplings were only observed in 7 plots, and cover observed was 10 percent or less. Even less coverage of bald cypress and water tupelo were observed in the shrub and herb strata, with only 3 sample plots exhibiting 5 percent cover or less. This lack of regeneration is most likely attributed to the stagnation of water on site inhibiting the development of seedlings, coupled with seedling destruction by nutria.

3.5 General Need for the Project in this Area

The wetlands surrounding Lake Pontchartrain and Lake Maurepas are some of the most extensive wetlands found along the Gulf Coast. Situated just north of New Orleans, these wetlands consist of large tracts of bald cypress/tupelo swamps, bottomland hardwoods, and saline, brackish, intermediate, and fresh marshes. Unfortunately, many factors have contributed to a decline of these wetlands including, but not limited to, construction of artificial levees, timber harvesting, land subsidence, rising sea levels, saltwater intrusion, and various types of man-made developments. Despite several large tracts of protected areas within the basin, including Joyce WMA, Big Branch National Wildlife Refuge, and Bayou Sauvage National Wildlife Refuge, there is still a need to protect these valuable wetlands as they continue to experience decline in acreage. As mentioned previously, the habitats that will be restored within this mitigation bank (bald cypress/tupelo swamp, bottomland hardwoods, and fresh marsh) have seen a rapid decline in recent history, experiencing an acreage loss of 25 to 50 percent from estimated pre-settlement acreages.

Restoration of this site will provide a wide range of ecological benefits including improved wildlife habitat, nutrient fixation, and water quality improvement. The site is unique in that it lies just south of the geologic ridge that the local community is built upon, improving the habitat in an area that serves as a buffer between the developed uplands and the contiguous marshes and swamps to the south. Improving hydrologic exchange in this area also provides a drainage related benefit allowing stormwater from the developed uplands to make its way to the tidal system and reduces impoundment experienced during extreme rain events. Additionally, the site, which directly borders the Joyce WMA, would increase the amount of large, contiguous tracts of protected wetland habitats within the Lake Pontchartrain Basin.

It is well documented that impoundment of wetlands significantly impacts their ecological function, productivity, and vegetative composition [3]. Impoundment alters the hydrologic regime, arguably the most vital component of a functioning wetland. Effects can include extended dry and/or flooding periods, changes in soil salinity and soil chemistry, reduced sedimentation rates, and reduced subsurface flow as a result of soil compaction under spoil banks. All of these changes can impact the functionality of the wetland, whether it be that impoundment has

resulted in an extended flood period, imposing stress upon the existing vegetation and resulting in conversion to open water, or an increased dry period, resulting in increased soil oxidation and changes in the vegetative composition.

Bald cypress/tupelo swamps, the dominant habitat on site, have been significantly impacted by logging activities and the subsequent lack of regeneration of seedlings and saplings. After the Civil War, and with the passing of the Timber Act of 1876, large tracts of the Lake Pontchartrain and Lake Maurepas swamps were sold and harvested by commercial logging companies [4]. It is estimated that virtually all of the marketable bald cypress trees in the Lake Pontchartrain Basin were harvested between 1876 and 1956 [4], with the most recent harvest on the proposed site occurring in the 1940s or earlier. To accomplish this feat, loggers excavated canals in the swamp and pull boats dragged trees using cables and winches to systematically harvest thousands of acres of bald cypress trees. Evidence of these activities remains on the landscape as wheel-shaped and parallel scars found throughout the Manchac Swamp, and they are especially prevalent along the Manchac Land Bridge. Large tracts of swamp harvested during this period have not regenerated and instead remain as degraded marsh or have converted to open water [4].

The harvest of bald cypress trees, coupled with alterations of natural hydrology, which LDWF describes as one of the most significant impacts to these swamps [2], results in a significantly degraded habitat as is evidenced by the condition of the proposed site. According to the USGS, impoundment of bald cypress swamps results in demise of the habitat. Degradation of the swamp as a result of impoundment begins with reduction in primary production and eventually results in death of the trees [5]. Bald cypress/tupelo swamps are more sensitive to altered hydrologic regimes because of the environmental conditions required for germination and sapling development. Extended dry periods are rare even in unaltered swamps as is evidenced by the even-aged stands that are often encountered. Impoundment of the site all but eliminates the opportunity for a draw down period to occur that would allow for seedling germination and development. Therefore, the proposed mitigation bank is vital to continue to protect and restore these wetland habitats.

The establishment of the ACMB will provide the following benefits:

- 1) An effective, long-term, readily available means of offering mitigation credits that will serve to compensate for unavoidable wetland impacts within the Lake Pontchartrain Basin Primary Service Area for BLH and swamp habitats and the Louisiana Deltaic Plain for fresh marsh habitats, thereby helping achieve the “no-net-loss” policy;
- 2) An effective, long-term means for preserving fish and wildlife resources within the proposed ACMB footprint and adjacent areas by providing habitat that is functionally equivalent to the habitat that has been unavoidably impacted by the permittee;

- 3) An effective means of improving water quality in the Tickfaw and Lake Maurepas watersheds by reducing sediment and nutrient loading (via the processes of sedimentation and nutrient assimilation); and,
- 4) A high-quality means of market driven habitat preservation and pollution abatement that will provide permittees a stable, convenient way to reduce the financial risk and ecological uncertainty associated with Permittee Responsible Mitigation Projects. Additionally, the permittee can reduce temporal loss of resource functions and services given mitigation banks typically require larger, more ecologically valuable parcels, more rigorous scientific and technical analysis, planning, implementation, and milestone achievement than Permittee Responsible Mitigation Projects.

4. Establishment of a Mitigation Bank

4.1 Site Restoration Plan

Site restoration is proposed to take place in one phase. The site encompasses a total of 373.0 acres, 237.0 acres intended for swamp enhancement, 33.9 acres intended for BLH enhancement, 26.7 acres intended for fresh marsh enhancement, 35.5 acres intended for swamp preservation, and 8.9 acres intended for fresh marsh preservation. The proposed restoration activities include re-establishment of hydrologic connectivity to the surrounding wetland community, reduced impoundment, and restoration and enhancement of swamp, BLH, and fresh marsh habitat. Restoration at the site will include the construction of gaps within the spoil banks along both canals that impound the site, eradication of invasive exotics and undesirable vegetation via herbicide application, and installation of vegetative plantings to supplement natural regeneration of the typical wetland vegetative community.

4.1.1 Soils/Hydrologic Work

Currently, the site is impounded by the placement of spoil material along the banks of Diversion Canal and the Anderson Canal. Hydrologic work will consist of constructing 21 gaps in the spoil banks along both sides of the Diversion Canal and the Anderson Canal (see **Appendix A: Figures 4 and 17** for the location of the proposed gaps and **Appendix B Figures 5 - 8** for cross-section views of the work to be performed). As with similar projects, construction of gaps will reduce impoundment effects which, according to the USGS, results in the demise of bald cypress swamps [5]. This reintroduction of hydrologic connection on the site will increase water flow, reduce stagnation, and alleviate the stress imposed by impoundment to improve the productivity of the swamp forest. In addition to alleviating the near-permanent inundation on the site, gaps will re-establish the natural ingress and egress of water from the surrounding wetland community. Re-establishment of tidal exchange will also serve to enhance the impounded 26.7 acres of fresh marsh on the site providing access for aquatic species, and the re-

establishment of a natural hydrologic regime. Post-project drainage flow patterns are shown in **Appendix A: Figure 17**.

Gapping spoils banks is an established method utilized by the Coastal Protection and Restoration Authority (CPRA), the Coastal Wetlands Planning Protection, and Restoration Act (CWPPRA) Task Force, and the USACE to improve the productivity of severely degraded swamps that have been impounded by anthropogenic activity. One example is the *Hydrologic Restoration and Vegetative Planting in des Allemands Swamp (BA-34-2)*. The project, conducted jointly by the U.S. Environmental Protection Agency, CPRA, and the CWPPRA Task Force, consisted of strategically placed gaps constructed in the spoil banks of northern Bayou Chevreuil. Spoil material was used beneficially by placing it along both sides of each gap and planting with bald cypress and water tupelo saplings. As a result of the project, 2,395 acres of degraded swamp habitat were enhanced [6].

Another similarly designed project, with the same restoration goal to alleviate the stress imposed on a bald cypress/tupelo swamp by spoil bank impoundment, is the CPRA project, *Hydrologic Restoration of the Amite River Diversion Canal*. This project constructed gaps in the spoil bank along the Amite River Diversion Canal to reduce impoundment. Conveyance channels were also constructed to improve hydrologic connectivity. As a result, a total of 1,600 acres of forested freshwater swamp was restored by this project [7].

Hydrologic restoration will consist of the excavation of 21 gaps in the spoil banks along both the Diversion Canal and the Anderson Canal. Degradation of the spoil banks will provide ingress and egress of water in equilibrium with the water levels of the surrounding, tidally influenced wetland community. Hydrology restoration will eliminate the stagnation of water on the site and restore tidally influenced hydrology to the proposed site. Gap locations are proposed at the areas with the lowest elevation along each canal to reduce ground disturbance and reduce the amount of earthen material relocated (**Appendix B: Figures 5 - 8**). Existing spoil banks along the canals range between 2.5 to 8 feet in height. Gaps will be excavated to a depth of -1' NAVD88, with a top channel width of 50 feet, and the slope of the banks not to exceed 1:2 (**Appendix B Figures 5 - 8**). Earthen material will be transported off site by barge and then hauled to a non-wetland location. The Anderson and Diversion Canals have widths ranging between 40 feet and 75 feet and an average depth of 5 feet (see **Appendix B Figures 2 – 4** for detailed cross-sections of Anderson and Diversion Canals). The ordinary high-water level in the canals is +2' NAVD88 and the ordinary low water level of +0.5' NAVD88.

The gaps constructed in the spoil banks are not anticipated to be impacted by erosion. Flow velocity within the canals is low under normal conditions and the canals are not heavily trafficked. Additionally, the gaps are designed to be spaced approximately every 400 feet along the banks, distributing the flow, and the hydrologic energy created during periods of rapid flooding or drainage, across the site. To prevent soil erosion, bald cypress seedlings will be planted along the

constructed gaps. Gaps will be monitored after significant rain events to determine the need, if any, for additional measures to prevent soil erosion. If necessary, the gaps will be lined with geotextile fabric or riprap to stabilize the banks and eliminate soil erosion. Furthermore, there are several natural gaps in the spoil banks located offsite and south of the proposed bank that do not exhibit signs of erosion and maintain their depth without any structural modifications.

Constructing gaps in the spoil banks is expected to benefit the entire site by eliminating water stagnation, and allowing a natural ingress and egress of water in equilibrium with the water levels of the surrounding, tidally influenced wetland community. However, the degree of hydrologic improvement is based upon the severity of impoundment for each portion of the site. The areas located north of Diversion Canal along with the northwest corner of the portion of the site located south of Diversion Canal, which are severely impounded, will see the greatest degree of improvement. The swamp and fresh marsh areas that are located south of Diversion Canal and lie closest to Diversion Canal, including the 26.7 acres proposed for fresh marsh enhancement, will also be enhanced by the construction of gaps in the spoil banks. As the distance from Anderson and Diversion Canal increases for the southern portion of the site, hydrology and tidal influence increase from Joyce WMA. Therefore, the most southern portion of the site is not as in need of hydrologic improvement, and will benefit marginally from the construction of gaps in the spoil banks. Enhancement of this most southern area is focused primarily on the removal of Chinese tallow and the planting of cypress and water tupelo trees since regeneration has been limited.

The Consolidated Gravity Drainage District #1 of Tangipahoa Parish (the Drainage District) does not own the Anderson and Diversion Canals, but holds authority and maintenance responsibility over the canals pursuant to Louisiana Revised Statute 38:113:

The various levee and drainage districts shall have control over all public drainage channels or outfall canals within the limits of their districts which are selected by the district, and for a space of one hundred feet on both sides of the banks of such channels or outfall canals, and one hundred feet continuing outward from the mouth of such channels or outfall canals, whether the drainage channels or outfall canals have been improved by the levee or drainage district, or have been adopted without improvement as necessary parts of or extensions to improved drainage channels or outfall canals, and may adopt rules and regulations for preserving the efficiency of the drainage channels or outfall canals.

This statute allows the Drainage District to conduct maintenance, nearly all of which is conducted from within the canals without impacting wetlands. Current maintenance activity primarily focuses on the removal of woody and occasionally man-made debris from Anderson Canal and Diversion Canal as well as the other

canals the Drainage District is responsible for maintaining. The Drainage District's maintenance does not include large scale dredging or widening of canals. Previous permits issued for maintenance work within Anderson Canal and Diversion Canal (P20141376 and MVN-2015-0786-EBB) which authorized the minor dredging and removal of debris in both canals did not negatively impact the site, or any wetlands. The permit authorized the broadcasting of both dredged material and chipped woody debris; however, the material was distributed along the top of bank so as to not exceed 4 inches in depth. No wetlands were impacted, and the distribution of dredged material into the swamp and marsh could be considered a beneficial use of dredged material. Furthermore, the Drainage District has no plans to dredge either canal in the future. Should enough silt material accumulate in either canal to require maintenance dredging, the Drainage District will submit a permit application to OCM and USACE for authorization, and dredging would be limited to current depth of the canals, which is approximately 5 feet. Dredged material will either be hauled off to a non-wetland location, or could once again be used beneficially by broadcasting into the swamp and marsh areas, if agreed upon by the Sponsor and the Interagency Review Team. The Drainage District's authority does not allow for the expansion of canals onto privately owned property. Expansion could only occur by first acquiring land from the Sponsor, obtaining a permit, and directly impacting wetlands, imposing a significant financial burden on the Drainage District. Additionally, the District has provided a letter of support (**Appendix E**) for the project and indicated that all future work will not impact the gaps nor the restoration of the site.

ELOS works with the Drainage District to obtain OCM and USACE permits to authorize their maintenance work throughout the Parish. The Drainage District completes all maintenance work from within the channel, avoiding impacts to wetlands in the process. Activities that would be allowed by the Drainage District only includes routine maintenance. This work only allows for the cutting of living trees along the banks of the canals that are less than 4 inches in diameter at breast height, unless the tree is directly obstructing the flow path of the canals. Overhanging tree limbs are only allowed to be trimmed at a distance of 10 feet above the water surface of the canal. Stumps and root systems are required to remain in place to retain bank stability. The only removal of living vegetation on the banks of the canals would be Chinese tallow, regardless of size, and removal is only authorized when tallow trees can be removed without impacting the bank of the canal.

4.1.2 Vegetative Work

The proposed bank will contain three (3) mitigation habitats: bottomland hardwoods, swamp, and fresh marsh. All of these habitats will be enhanced by the excavation of gaps in the spoil banks and the reintroduction of hydrological connectivity to the surrounding community. The vegetative work required in each habitat will vary and is discussed for each habitat type in detail below.

4.1.2.1 Swamp

The proposed bank will incorporate 237.0 acres of swamp enhancement and 35.5 acres of swamp preservation.

In addition to the re-establishment of hydrological connectivity by the proposed soil work, enhancement of 237.0 acres of swamp will be accomplished by the eradication of Chinese tallow trees and installation of vegetative plantings. Near-permanent inundation of the site has prevented regeneration of bald cypress and tupelo seedlings, opening the canopy, and allowing Chinese tallow to infiltrate the site. Eradication of Chinese tallow will be accomplished during the fall of Year 1 by aerially spraying herbicide using a helicopter and by using the hack and squirt method. Clearcast™ will be the selected herbicide for both treatment methods. Aerial spraying of herbicide is a form of foliar application, a process where forest managers spray herbicide to cover foliage of target trees. A helicopter will be used to apply the herbicide because this method has been found to effectively spray the target species while limiting exposure to non-target species. The hack and squirt method is also known as bark injection, and is a process where the bark of target trees is cut using hatchets and herbicide is applied to the damaged area using a backpack sprayer. Both methods of herbicide application will occur during the late summer to early fall (July to September) to increase the efficacy of the herbicide.

Upon the application of herbicide and eradication of Chinese tallow, and where necessary, 184.3 acres (**Appendix A: Figure 18**) will be planted with bald cypress and water tupelo seedlings on 12-foot centers for an initial stand density of, at a minimum, 302 seedlings per acre to supplement natural regeneration. Seedlings will be installed throughout the 184.3 acres shown on **Appendix A: Figure 18** which encompasses the area that will be treated for Chinese tallow and the area that has not been infiltrated by Chinese tallow, but the lack of regeneration of bald cypress and water tupelo seedlings has opened the canopy and allowed the development of a thick floating vegetative layer. Seedlings will be installed during planting season (December 15 through March 15) and, when available, the Sponsor will install container sized seedlings to improve the success of plantings. Additionally, to protect seedlings from nutria, all seedlings will be planted with a nutria tree guard that will deteriorate within 5 years of installation.

The 35.5 acres of swamp preservation has good coverage of characteristic swamp species consisting primarily of bald cypress and water tupelo trees. The primary difference between the 237.0 acres proposed for swamp enhancement and the 35.5 acres proposed for swamp preservation is that the preservation areas are healthier than the areas proposed for enhancement. Additionally, the areas proposed for swamp preservation will not require vegetative plantings since a healthy stand of bald cypress already exists and Chinese tallow is not prevalent. A minimal amount of Chinese tallow was found in this area, but it is less than 10 percent absolute cover.

4.1.2.2 Bottomland Hardwoods

Chinese tallow will also be eradicated by the hack and squirt method of herbicide application in 33.9 acres proposed for bottomland hardwood enhancement. As with the areas proposed for swamp enhancement, Chinese tallow absolute cover values currently exceed 10 percent in these areas. The existing bottomland hardwoods contain mature hard mast species predominately consisting of water oak, laurel oak, swamp chestnut oak, and water hickory, along with mature soft mast species such as hackberry, red maple, and American elm. After the removal of Chinese tallow, it is expected that there will be sufficient regeneration of existing bottomland hardwood species, including a significant amount of hard mast species regeneration. Therefore, vegetative plantings should not be necessary. Should existing hardwoods not provide sufficient regeneration of hard mast species, vegetative plantings will be installed.

4.1.2.3 Fresh Marsh

Chinese tallow is not as prevalent within the 26.7 acres proposed for fresh marsh enhancement, as the areas of swamp and BLH enhancement, but consists of 5 percent cover and is found along the edge of the marsh and sporadically throughout the marsh interior. Eradication will be accomplished via the hack and squirt method using backpack sprayers and airboats as necessary.

Chinese tallow is not found within the 8.9 acres proposed for fresh marsh preservation and can only be found along the edge of the marsh as the habitat transitions from forested to herbaceous. The fresh marsh area proposed for preservation will not benefit as much from construction gaps in the spoil banks as the 26.7 acres proposed for fresh marsh enhancement. This area proposed for preservation contains nearly 100 percent cover of persistent emergent vegetation consisting primarily of maidencane. Since the 8.9 acres proposed for fresh marsh preservation are not as hydrologically impaired, and contain nearly 100 percent cover of healthy emergent vegetation, they are proposed for preservation instead of enhancement. The primary difference between the two areas of fresh marsh is that the fresh marsh enhancement areas are impounded by the spoil banks of Anderson Canal and Anderson Diversion Canal and contain approximately 5 percent cover of Chinese tallow, while the fresh marsh preservation area has limited hydrologic connectivity and is largely devoid of Chinese tallow.

Chinese tallow will remain the invasive species of greatest concern for the proposed bank. Additional herbicide treatments may be required to eradicate these trees beyond Year 1 and will be implemented if required.

4.2 Technical Feasibility

The location of the proposed Anderson Canal Mitigation Bank provides the desired conditions (i.e., geology, soils, plants, topography, hydrology, and zoning) to

develop and maintain a wetland mitigation bank. ELOS, the agent, has extensive background in wetland ecology, forestry, and regulatory affairs such as securing environmental clearances, permits, and authorizations as required by the National Environmental Policy Act (NEPA), Sections 404 and 401 of the Clean Water Act, Section 10 of the Rivers and Harbor Act, Coastal Use Permits and other regulatory requirements. For over 12 years, ELOS has helped private mitigation banks, Federal agencies and parish governments (e.g., U.S. Fish and Wildlife Service, St. Tammany Parish Government, and Plaquemines Parish Government) achieve expansion, ecological monitoring, work plan development, and compliance management of wetland mitigation banks. ELOS has assisted with the following efforts, providing some of the wetland mitigation bank tasks:

- Jamestown I
- Jamestown II
- Bayou Lacombe Mitigation Bank
- Pollard Branch Mitigation Bank
- Muddy Bayou PRMP
- Ollie Mitigation Bank
- Plaquemines Parish East Bank Levee Improvement PRMP

ELOS will work closely with the mitigation bank owner to manage the necessary gapping, herbicide application, supplemental planting, sample plot maintenance, and all reporting required by the mitigation bank instrument (MBI).

The proposed ACMB site was originally thriving bald cypress/tupelo swamp, bottomland hardwood forest, and fresh marsh habitat ideally located just to the south of a geological ridge with the ability to receive and retain flood waters from the developed community of Ponchatoula, just north of the site. With the help of the Sponsor and sound management, the proposed ACMB can restore the productivity of the proposed site. Gapping spoil banks has been well documented to improve wetland habitats that have been impounded by man-made alteration of waterways. A similar project, the *Hydrologic Restoration and Vegetative Planting in the des Allemands Swamp (BA-34-2)* constructed strategically planned gaps in the spoil bank of Bayou Chevreuil, placed dredged material on site, and replanted bald cypress and water tupelo saplings to enhance over 2,300 acres of swamp habitat [6].

4.3 Current Site Risks

During the operational life of the proposed ACMB, it is possible that force majeure could play a role in rendering some or all of the ACMB ecologically unfit to serve its stated habitat goals. In this event, it is incumbent upon the Sponsor to restore the functionality of the proposed ACMB to support at least the credits that have been issued, and any released credits not yet sold or transferred. If the balance of credits not yet released are to remain part of the plan, then correcting the deficiencies resulting from the force majeure event will be required before those potential credits are included in the ledger balance of the proposed ACMB. The

mitigation bank review team takes an adaptive management approach to these types of problems, and a conceptual contingency for unavoidable loss from acts of God will be included in the MBI.

No significant known conditions exist off-site that would impinge upon the Sponsors ability to sustain the use of this parcel as a commercial mitigation bank. The canals are owned by the Sponsors, but the Drainage District holds authority and maintenance responsibility over the canals. However, the Drainage District has reviewed the proposed work plan and provided a letter (**Appendix E**) supporting the project and stating that all future work will not impact the proposed gaps. The Sponsor does not foresee any negative impacts resulting from the continued existence and operation of the lands adjacent to the proposed ACMB. The majority of the land surrounding the proposed ACMB consists of undeveloped land, a large portion of which is already protected as part of Joyce WMA.

4.4 Long-Term Sustainability of the Site

The Sponsor will perform all work necessary to monitor the ACMB to demonstrate compliance with the success criteria established in the Mitigation Work Plan, which is to be an appendix in the MBI. For swamp and BLH habitats, long-term monitoring will be established within one year of the official enrollment of the bank, but prior to any management activities. Initial monitoring will establish baseline data, which will be captured in a Base Line Data Report. An “As-Built Report” will be submitted to USACE and the Louisiana Department of Natural Resources (LDNR), Office of Coastal Management (OCM) 60 days following the completion of work performed to enhance the site (e.g., vegetative plantings, spoil bank gapping). After the passing of one year (growing season) from the spoil bank gapping and initial plantings, an Initial Success Criteria Report will be provided to the USACE that documents the success of the hydrology and vegetation relative to the criteria established in the Mitigation Work Plan; also included in this report will be a description of any maintenance or management work conducted on the ACMB after submission of the As-Built Report, and any anticipated maintenance or management work to be conducted prior to attainment of interim success criteria. The Sponsor will provide an Interim Success Criteria Report that documents the success of the hydrology and vegetative plantings four years after successfully meeting the initial success criteria. The Sponsor will monitor the ACMB three years after meeting the interim success criteria until an average canopy coverage of 80 percent is established, and then every five years thereafter to assure attainment of the criteria established in the Mitigation Work Plan.

For fresh marsh, an As-Built Report will be submitted to USACE and the LDNR OCM 60 days following the completion of work performed to enhance the site (spoil bank gapping). Initial Success Criteria Monitoring will occur 12 to 14 months after gaps are constructed to document the success of the hydrology restoration and vegetation relative to the criteria established in the Mitigation Work Plan; also included in this report will be a description of any maintenance or management

work conducted on the ACMB after submission of the As-Built Report, and any anticipated maintenance or management work to be conducted prior to attainment of interim success criteria. Interim Success Criteria Monitoring will occur three years after gaps are constructed documenting the success of the hydrology restoration and vegetation of the marsh. Long-term Success Criteria Monitoring will occur seven years after the construction of gaps to document the success of the hydrology and vegetation of the marsh.

Adaptive management will be utilized in conjunction with long-term monitoring to address problems that are keeping the project from meeting its performance standards. Furthermore, the Sponsor will establish an escrow account (that will be funded by credit sales) to fund the long-term maintenance plan, which will prevent the establishment of invasive species, and provide long-term protection of structural features if they are needed to ensure hydrologic and vegetative success.

The existing conditions in the proposed ACMB footprint (i.e., geology, soils, plants, topography, hydrology, and zoning) are all conducive to developing and sustaining a wetland mitigation bank. Even considering the gapping of spoil banks, minimal earth work should be required to establish hydrologic conditions conducive to supporting a bottomland hardwood forest, bald cypress/tupelo swamp, and fresh marsh habitat given the current topography of the area. Long-term viability and sustainability of the proposed ACMB will be ensured through long-term monitoring, adaptive management, and long-term maintenance. No long-term structural management should be required because there are currently no active or proposed structures in the footprint of the proposed ACMB. A long-term management plan will be included within the MBI, which will be prepared after submission and approval of this prospectus. The MBI will contain costs associated with the proposed ACMB and it will identify a funding mechanism in accordance with 33 CFR 332.7(d).

5. Proposed Service Area

The proposed ACMB is located within USGS Cataloging Unit 08070203 and 08070204, which includes portions of Livingston, Tangipahoa, St. Helena, Ascension, St. James, and St. John the Baptist parishes. The Lake Pontchartrain Basin is the Primary Service Area for the BLH and Swamp habitats of this proposed ACMB, and it includes the following USGS Cataloging Units: 08090201, 08090202, 08090203, 08070202, 08070203, 08070204, and 08070205. The Louisiana Deltaic Plain is the Primary Service Area for the fresh marsh habitats of this proposed ACMB, and it includes the following USGS Cataloging Units: 08090301, 08090302, 08090100, 08090201, 08090202, 08090203, 08070202, 08070203, 08070204, 08070205, 08080101, 08080102, and 08080103.

Currently there are six (6) banks with bottomland hardwood habitats located in the Lake Pontchartrain Basin Primary Service Area – Bayou Conway, Bayou Manchac

- Oakley, Belle Pointe Coastal Mitigation Bank, Gum Swamp Mitigation Bank, Jamestown Mitigation Bank, and Jamestown Mitigation Bank II.

There are currently six (6) banks with swamp habitats located in the Lake Pontchartrain Basin Primary Service Area – Belle Pointe Coastal Mitigation Bank, Spanish Lake Restoration Unit II – Bluff Swamp, Spanish Lake Restoration Unit II – Spanish Lake, Spanish Lake Restoration Unit III, Spanish Lake Restoration Unit VI, and Timberton.

Only three (3) banks with fresh marsh habitats exist within the Deltaic Plain – Cypremort Teche Mitigation Bank, Jesuit Bend Mitigation Bank, and Kilgore Plantation Mitigation Bank.

However, many of these banks are currently sold out of credits with no credits available for purchase and are awaiting future credit releases. The active banks will not be able to meet the demand for credits in the coming years that will result from the continued development within the Lake Pontchartrain Basin. State projects, federal projects, commercial development, and residential development impacting bottomland hardwood and swamp habitats within the Lake Pontchartrain Basin Primary Service Area, as well as projects impacting fresh marsh in the Deltaic Plain could use the proposed ACMB to compensate for wetland impacts associated with Department of the Army 10/404 and OCM Coastal Use permits. The Lake Pontchartrain Basin Primary Service Area and Deltaic Plain are selected based upon their ecological homogeneity and their consistency with USACE's regulations (33 CFR 332). The use of the proposed ACMB beyond the Lake Pontchartrain Basin Primary Service Area for BLH and swamp and the Deltaic Plain for fresh marsh will be determined by the USACE and/or OCM on a case-by-case basis.

6. Operation of the Mitigation Bank

This section describes how the proposed Bank will be operated, as stated in 33 CFR 332.8(d)(2)(ii) and provides details on the proposed ownership arrangements and long-term management strategy for the mitigation bank, as stated in 33 CFR 332.8(d)(2)(v.)

6.1 Project Representatives

Sponsor: Cypress Investment Partners LLC
43177 East Pleasant Ridge Road
Hammond, LA 70403
Mr. Jimmy Scherer

Agent: ELOS Environmental, LLC
43177 East Pleasant Ridge Road
Hammond, LA 70403

*Brittany Berthelot
bberthelot@elosenv.com
985-662-5501*

*Landowner: Woodlands, LLC
P.O. Box 1451
Hammond, LA 70404
&
Randal and Dana Daigle
15414 Patricks Drive
Ponchatoula, LA 70454
Mr. Jimmy Scherer*

6.2 Qualifications of the Sponsor

Cypress Investment Partners (CIP) will serve as the Sponsor. CIP combines extensive experience in the practice of silviculture and timber land management with experienced environmental scientists and biologists. ELOS, as an experienced environmental consulting firm, possesses the technical skills to design, monitor, and manage the construction and ecological success of the project. ELOS has designed, constructed, managed and monitored mitigation projects and commercial mitigation banks, and implemented successful brackish marsh Permittee Responsible Mitigation Projects.

6.3 Proposed Long-Term Ownership and Management Representatives

The long-term ownership of the proposed ACMB will reside with the Woodlands and Randal and Dana Daigle. The long-term management of the proposed ACMB will be the ultimate responsibility of the Sponsor. The Sponsor has contracted ELOS to provide guidance and oversight as its agent. ELOS specializes in wetlands and other natural resource analysis and regulatory compliance.

6.4 Site Protection

The Sponsor/Landowner will be responsible for protecting all lands within the proposed ACMB footprint. To ensure protection of the proposed ACMB, the owners will execute a perpetual Louisiana Conservation Servitude in favor of a neutral third party with executory capacity in accordance with the Louisiana Conservation Servitude Act (La. R.S. 9:1271, et seq.) for the entire proposed ACMB footprint. The Conservation Servitude shall be recorded in the Tangipahoa Parish Clerk of Court Conveyance Department.

6.5 Long-Term Strategy

The Sponsor will ensure the long-term success and sustainability of the proposed ACMB through practices such as vegetative plantings, hydrologic restoration and

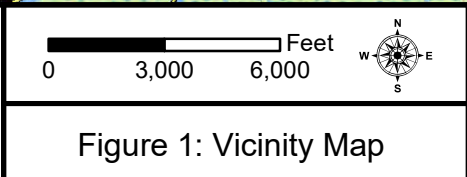
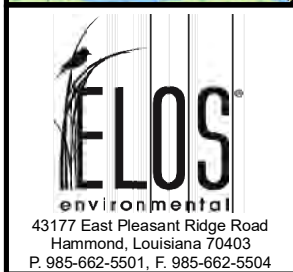
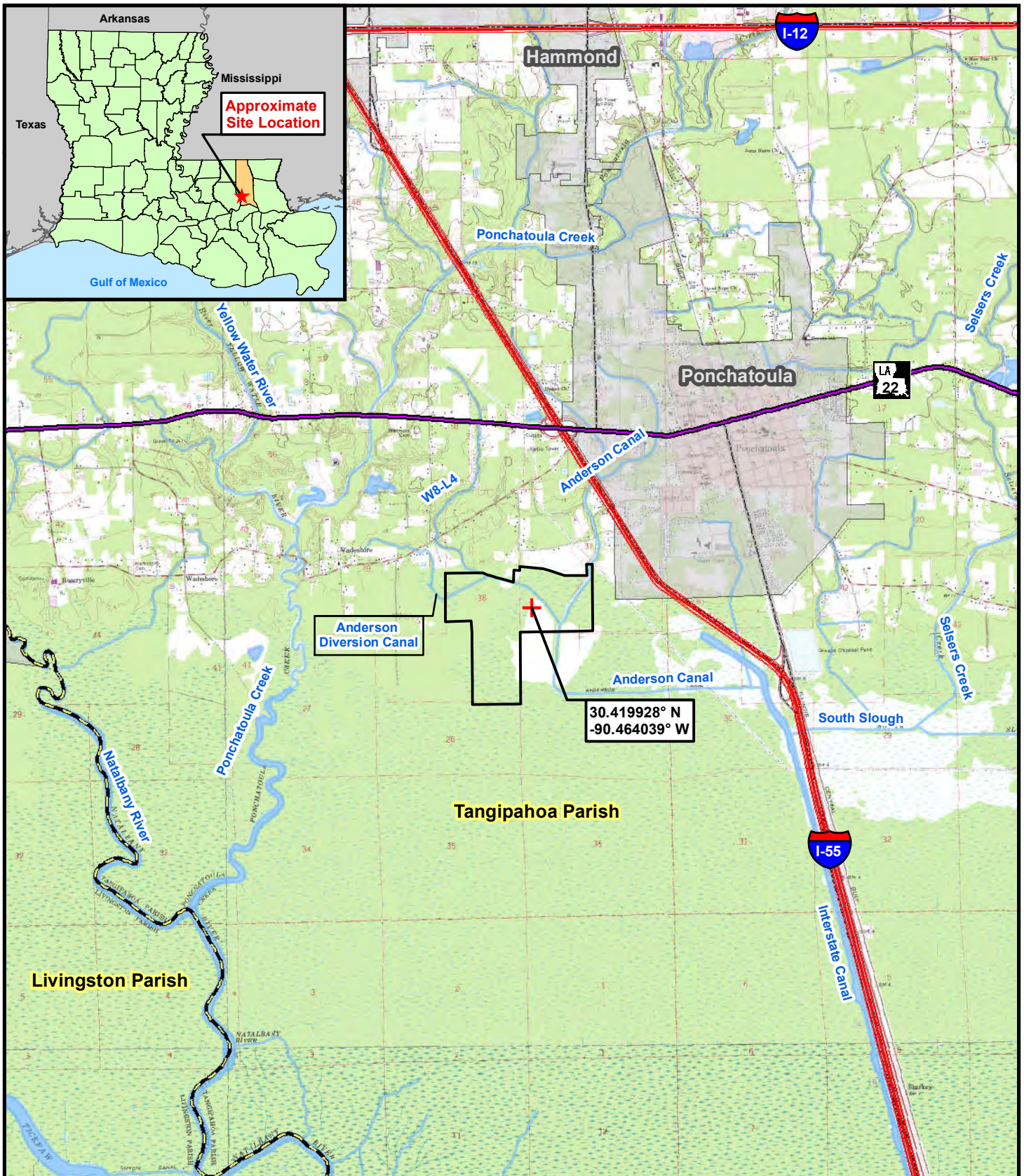
maintenance, invasive species control through herbicide application, site monitoring, long-term management, establishment of financial assurances, and perpetual protection through the filing of a Louisiana Conservation Servitude. In accordance with 33 CFR 332.7(d), a long-term management plan will be included in the MBI that will address long-term management needs, annual cost estimates for these needs, and identify the funding mechanism that will be used to meet those needs.

7. REFERENCES

- [1] Natural Resources Conservation Service, "Web Soil Survey," U.S. Department of Agriculture, Natural Resources Conservation Service, 21 August 2017. [Online]. Available: <https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>. [Accessed 10 October 2018].
- [2] Holcomb, S; et al, "Louisiana Wildlife Action Plan," Louisiana Department of Wildlife and Fisheries, Baton Rouge, LA, 2015.
- [3] R.E. Turner and B. Streever, Approaches to Coastal Wetland Restoration: Northern Gulf of Mexico, Library Research Associates Inc., 2002.
- [4] P.A. Keddy, et al, "The Wetlands of Lakes Pontchartrain and Maurepas: Past, Present, and Future," vol. 15, pp. 43-77, 2007.
- [5] U.S. Geological Survey, "Impoundment of Baldcypress Swamp Management," U.S. Geological Survey, 2006.
- [6] Louisiana Coastal Wetlands Conservation and Restoration Task Force, "Hydrologic Restoration and Vegetative Planting in the des Allemands Swamp (BA-34-2)," 2018.
- [7] Coastal Protection and Restoration Authority , "Hydrologic Restoration of the Amite River Diversion Canal," [Online]. Available: <https://cims.coastal.louisiana.gov/outreach/ProjectView.aspx?projID=PO-0142>. [Accessed 16 10 2018].

Appendix A

Figures

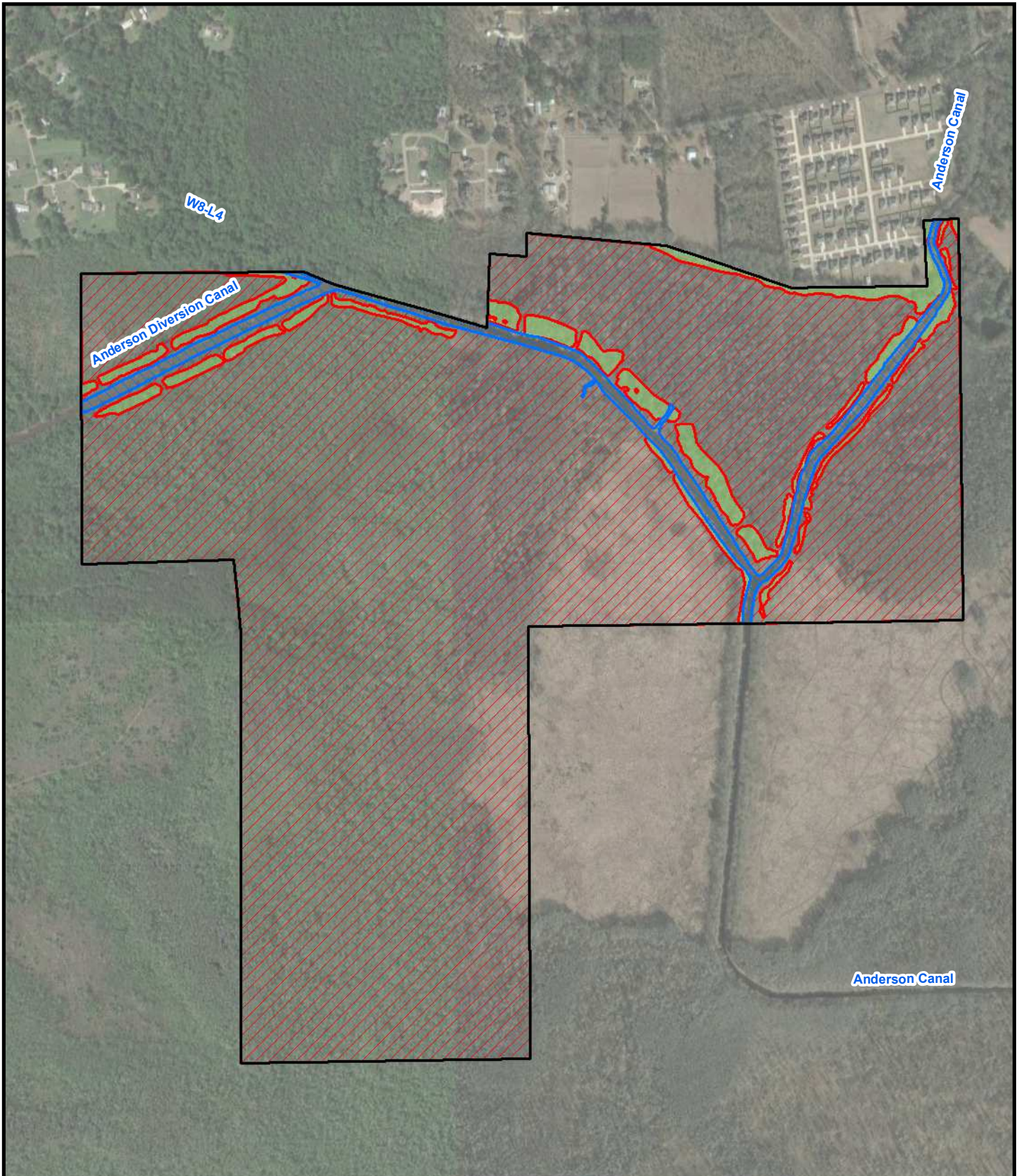


Anderson Canal Mitigation Bank

Legend:	
Site Outline	Interstate
Coastal Zone Boundary	Stream/River
Parish Boundary	Highway
City/Town	Roadway

Sections: 37, 38
Township: 07 South
Range: 07 East

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







Figure 2: Wetland Delineation

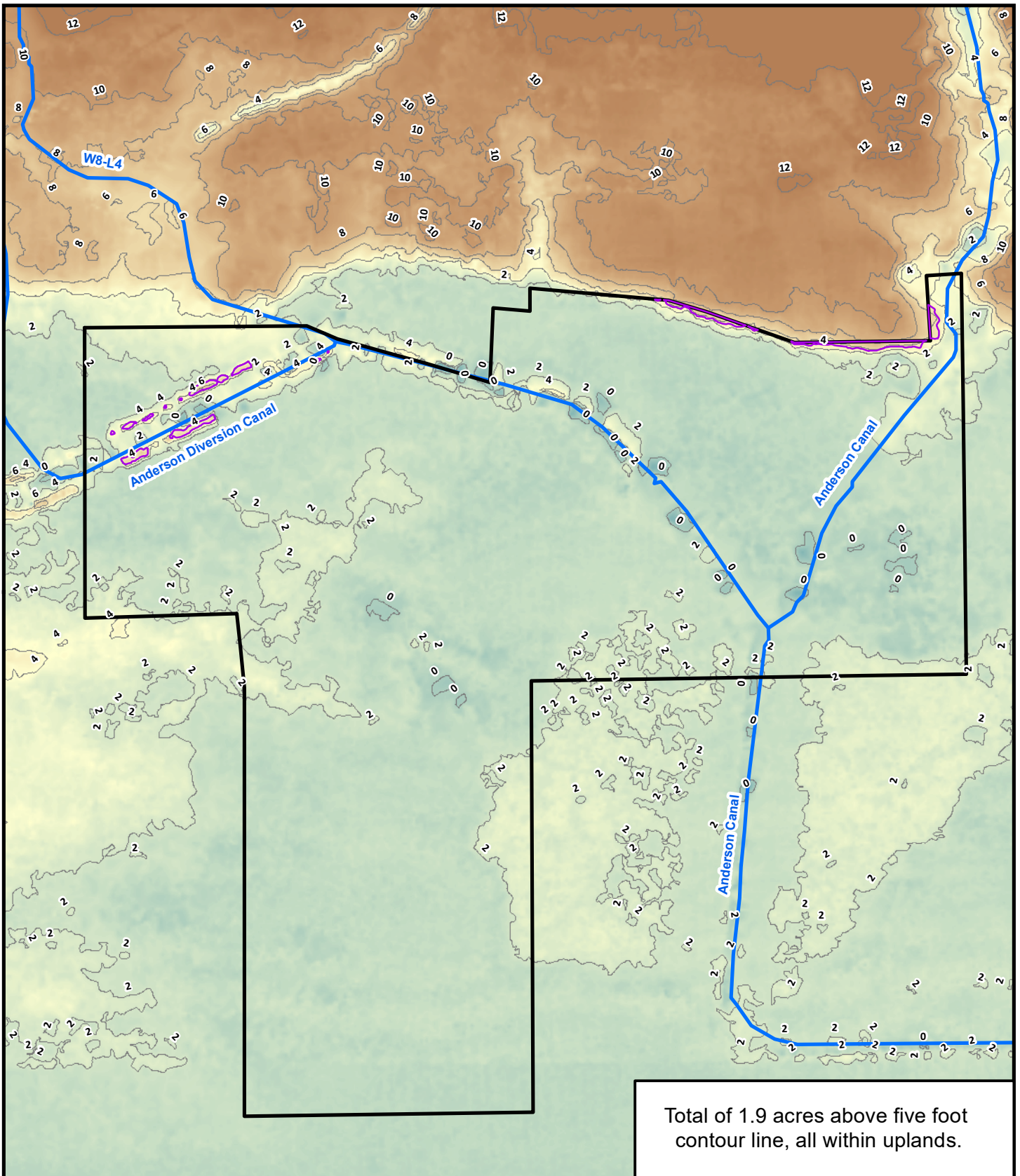
Anderson Canal Mitigation Bank

Legend:

-  Site Outline ~373.0 Acres
-  Proposed Wetlands ~343.8 Acres
-  Proposed Other Waters ~10.8 Acres
-  Uplands ~18.4 Acres
-  Roadway

Refer to MVN-2018-00949-SG

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Total of 1.9 acres above five foot contour line, all within uplands.

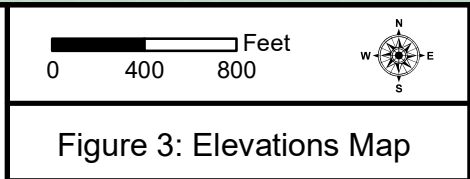


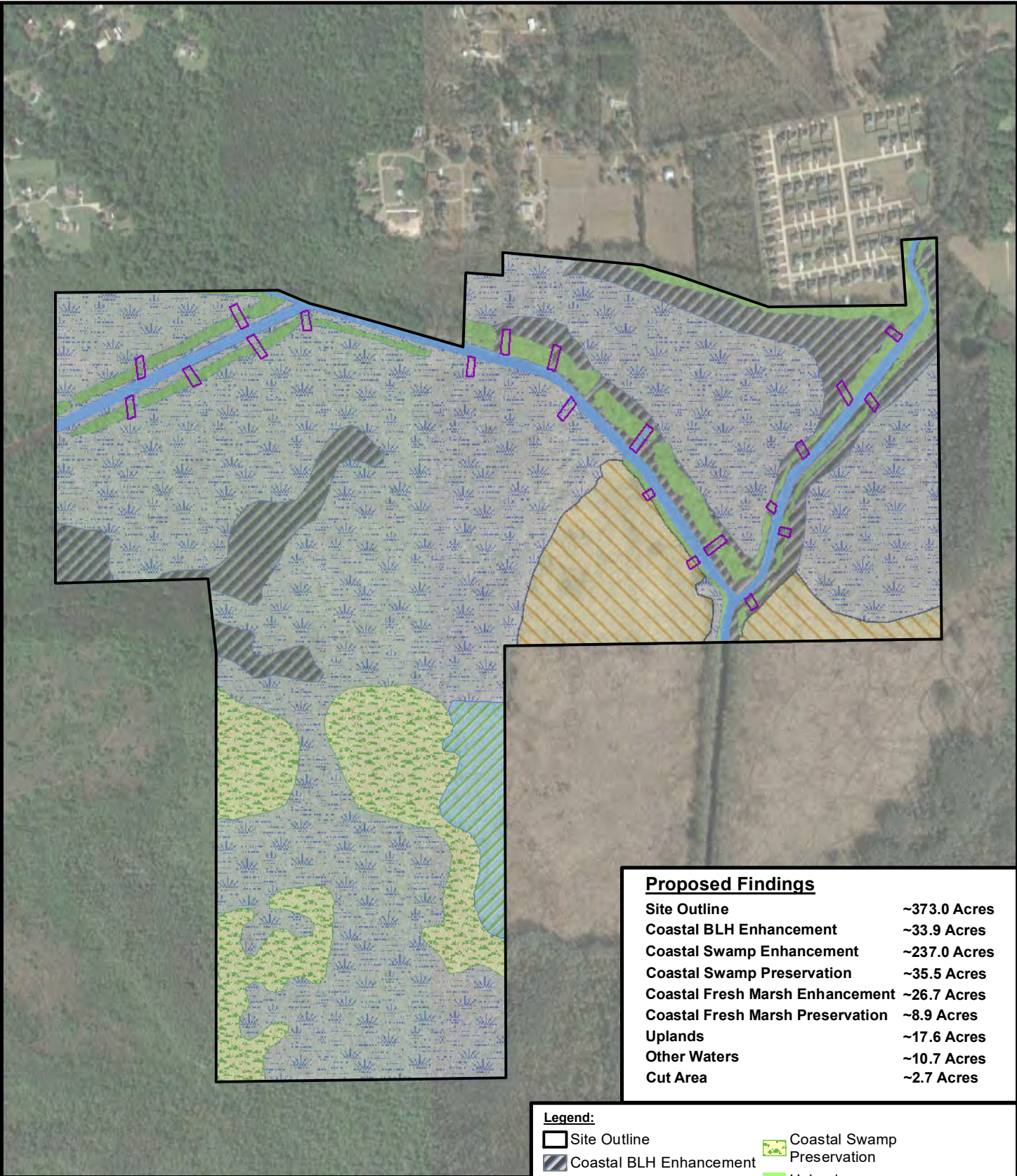
Figure 3: Elevations Map

Anderson Canal Mitigation Bank

Legend:

- Site Outline
- Stream/River
- Five Foot Contour
- Contour
- Higher
- Lower

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Proposed Findings

Site Outline	~373.0 Acres
Coastal BLH Enhancement	~33.9 Acres
Coastal Swamp Enhancement	~237.0 Acres
Coastal Swamp Preservation	~35.5 Acres
Coastal Fresh Marsh Enhancement	~26.7 Acres
Coastal Fresh Marsh Preservation	~8.9 Acres
Uplands	~17.6 Acres
Other Waters	~10.7 Acres
Cut Area	~2.7 Acres

Legend:

- Site Outline
- Coastal BLH Enhancement
- Coastal Swamp Enhancement
- Coastal Fresh Marsh Enhancement
- Coastal Fresh Marsh Preservation
- Coastal Swamp Preservation
- Uplands
- Other Waters
- Cut Area

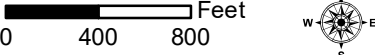
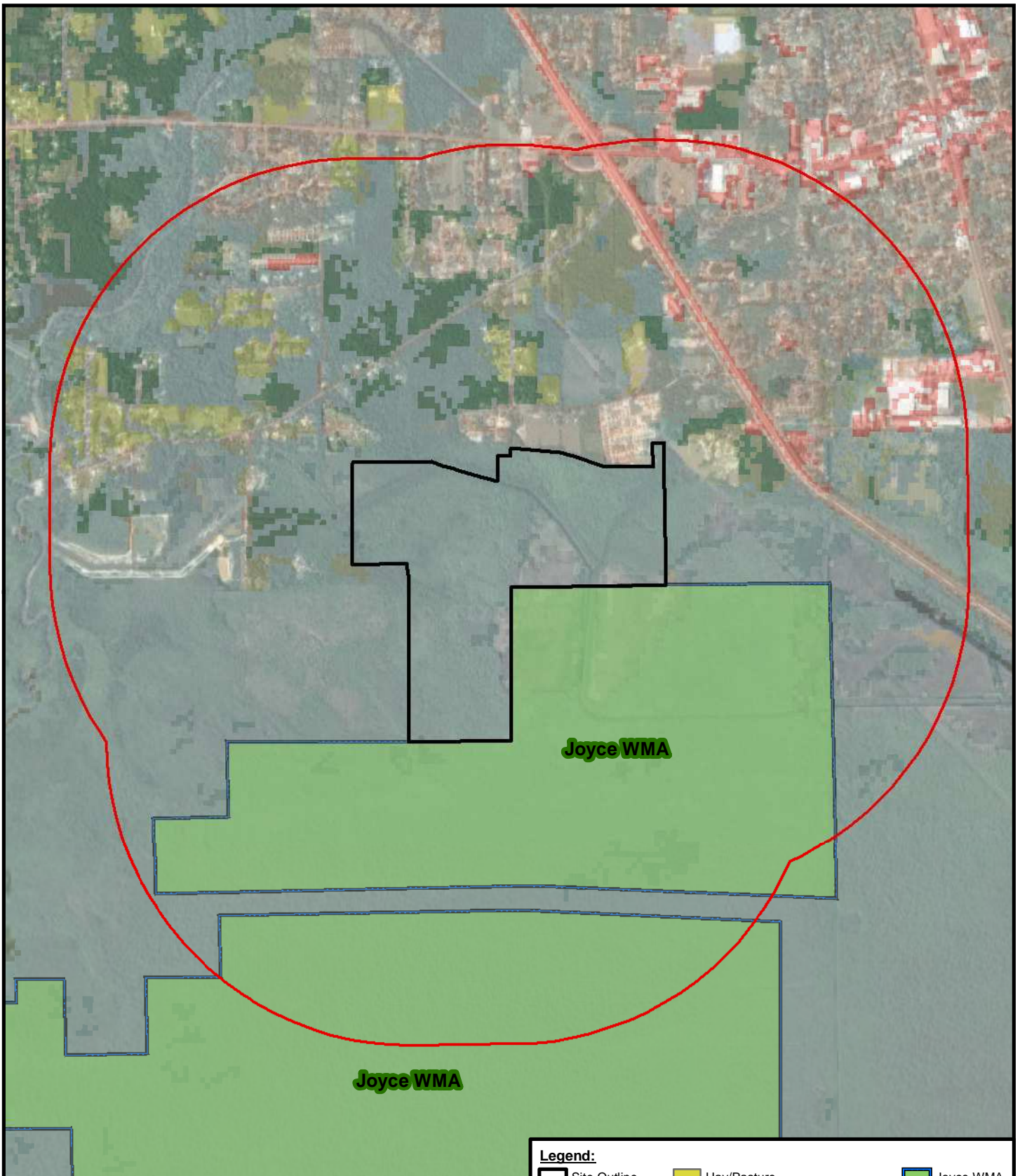


Figure 4: Restoration Plan

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Legend:

Site Outline	Hay/Pasture	Joyce WMA
1 Mile Buffer	Evergreen Forest	
Woody Wetlands	Emergent Herbaceous Wetlands	
Shrub/Scrub	Developed, Open Space	
Mixed Forest	Developed, Medium Intensity	
Herbaceous	Developed, Low Intensity	

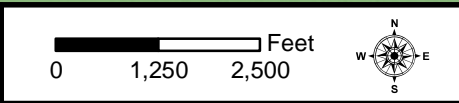
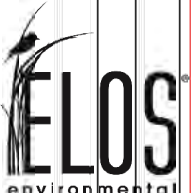


Figure 5: Land Use Map

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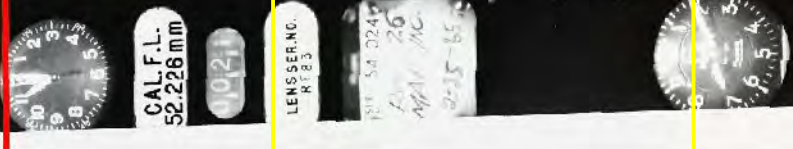


Figure 6: 1952 Aerial
Anderson Canal Mitigation Bank

Legend:
 Site Outline

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



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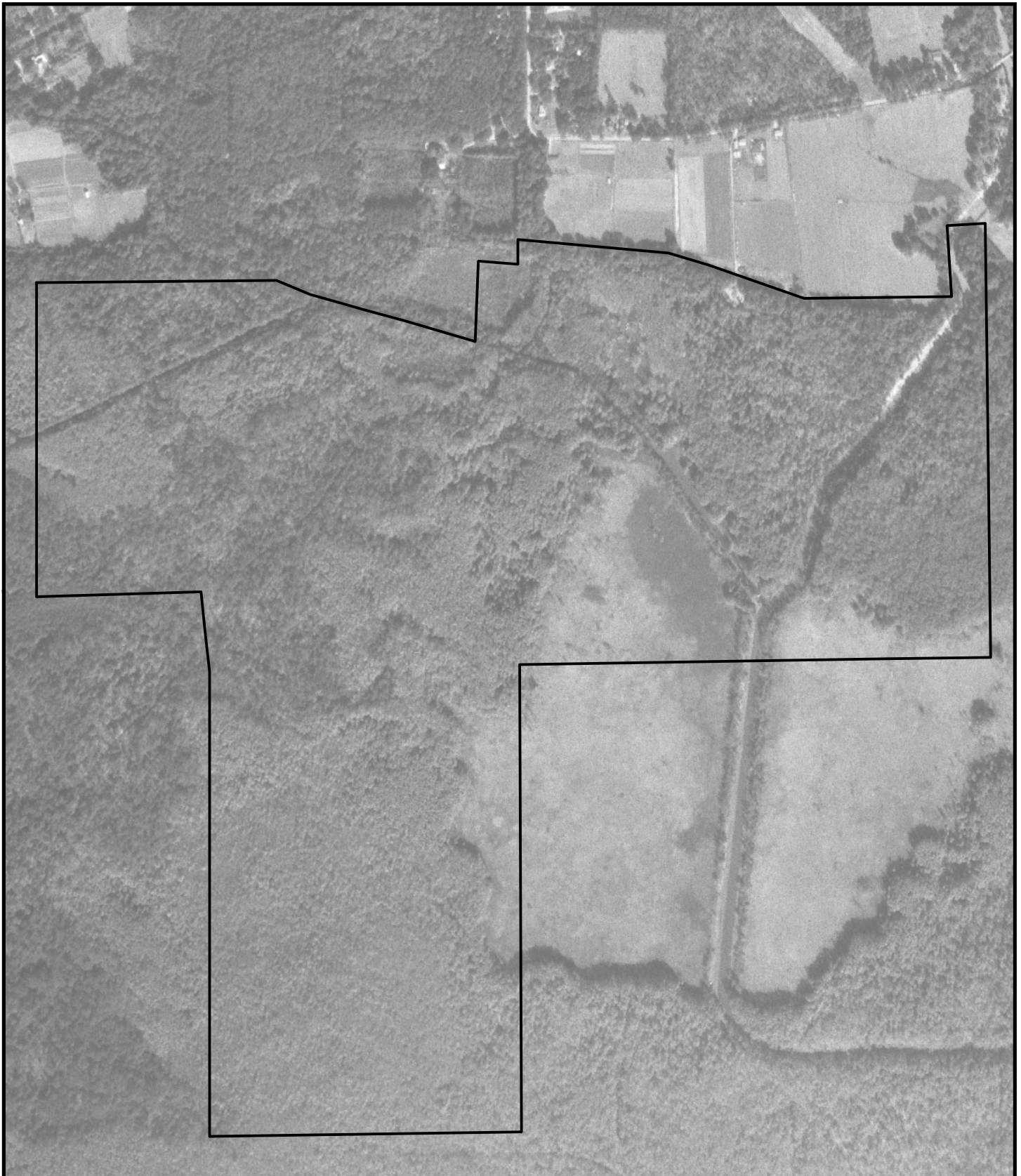
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Figure 7: 1965 Aerial

Anderson Canal Mitigation Bank

Legend:
 Site Outline

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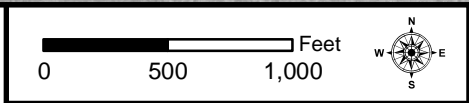


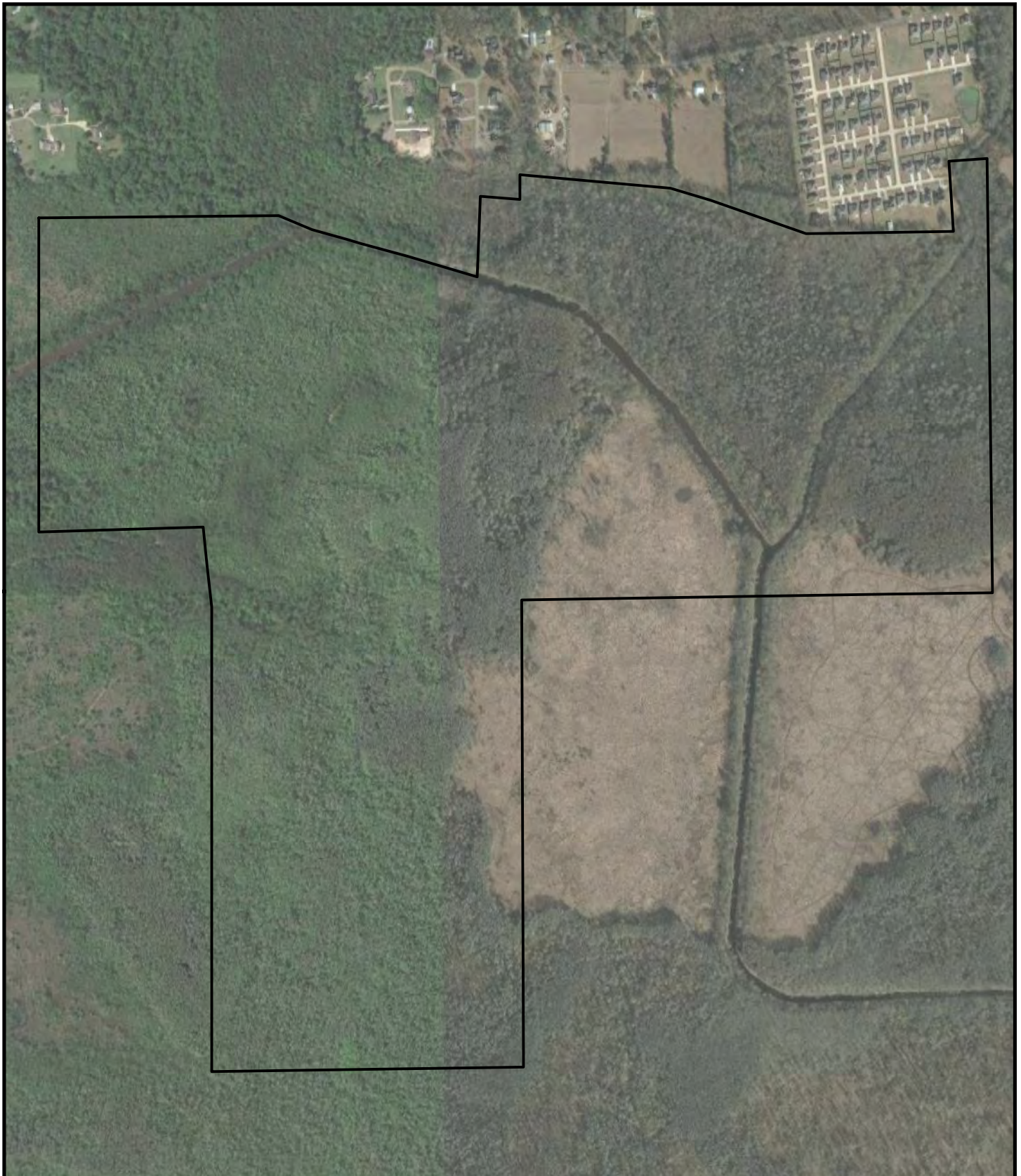
Figure 8: 1972 Aerial

Anderson Canal Mitigation Bank

Legend:

 Site Outline

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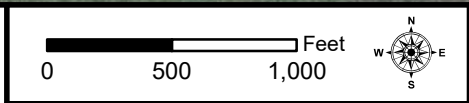
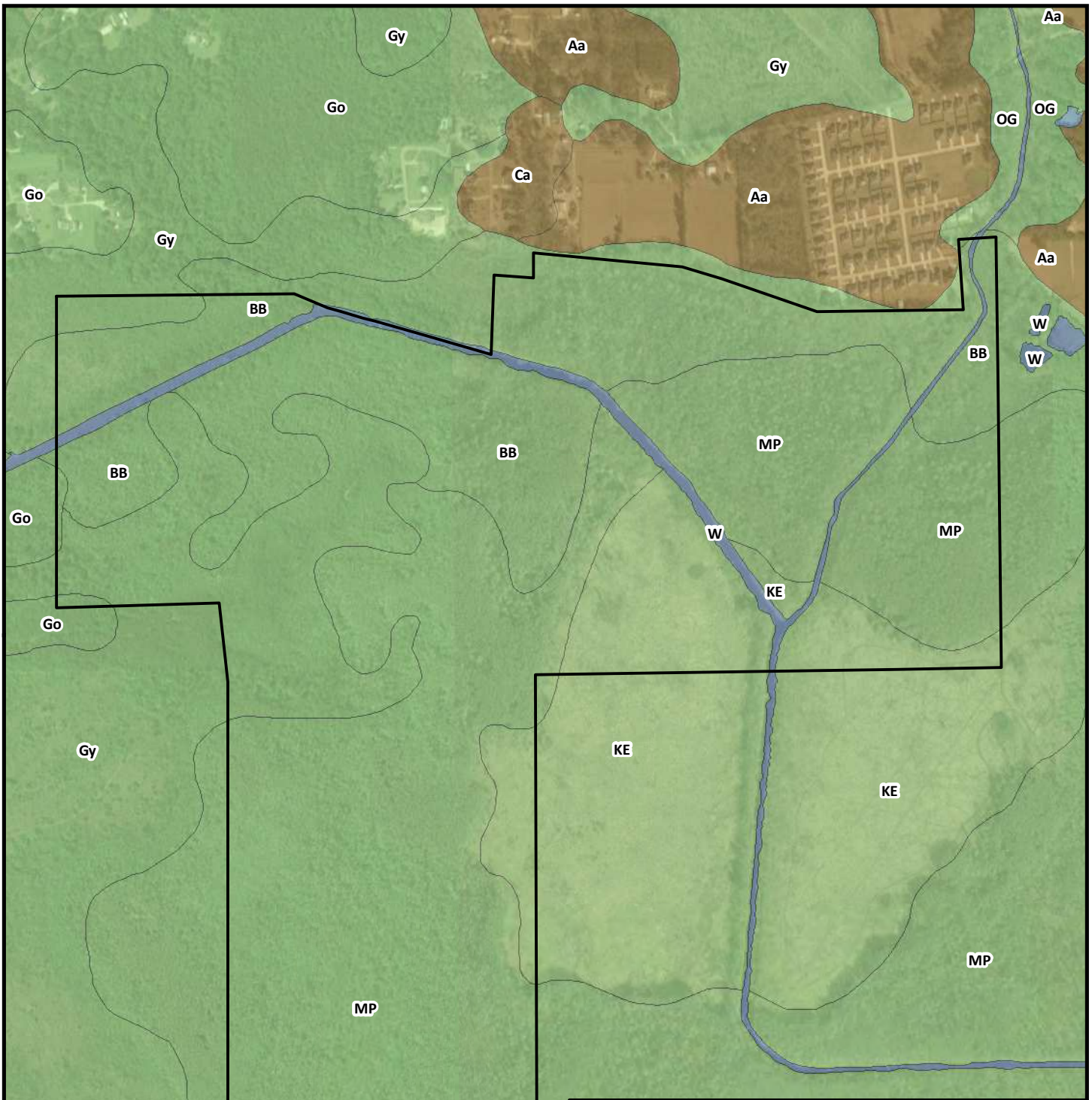


Figure 9: 2018 Aerial

**Anderson Canal
 Mitigation Bank**

Legend:
 Site Outline

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- GO - Guyton Silt Loam, 0 to 1 percent slopes
- Gy - Guyton Silt Loam, 0 to 1 percent slopes
- MP - Maurepas Muck, 0 to 1 percent slopes
- KE - Kenner Muck
- BB - Barbary Muck, 0 to 1 percent slopes
- CA - Cahaba Fine Sandy Loam, 1 to 3 percent slopes
- Aa - Abita Silt Loam, 0 to 2 percent slopes
- OG - Ouachita, 0 to 3 percent slopes
- W - Water

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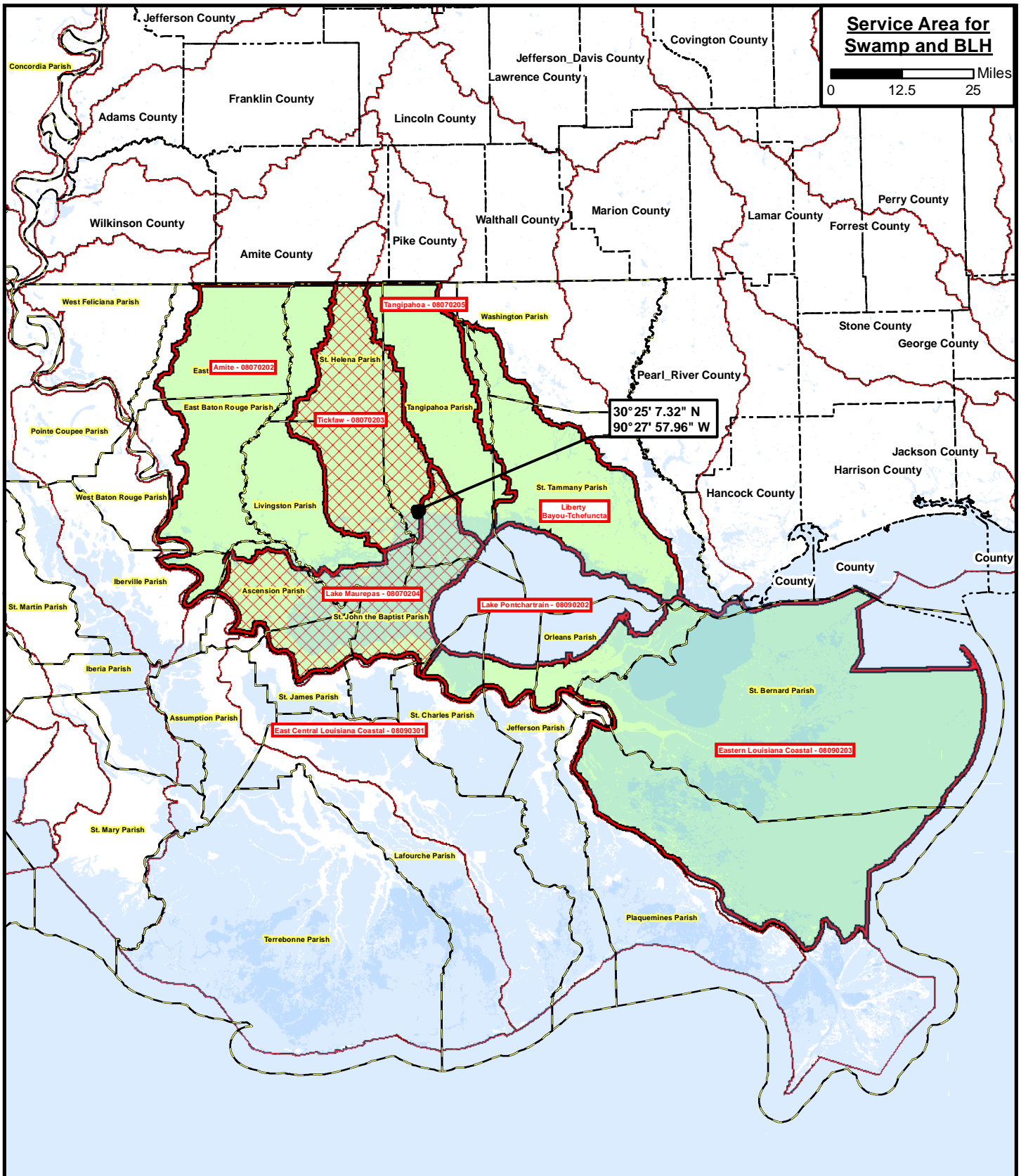
Figure 10: Soils Map

Anderson Canal Mitigation Bank

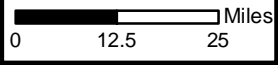
Legend:

Site Outline Non-Hydric
 Hydric Water

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Service Area for Swamp and BLH



30°25' 7.32" N
90°27' 57.96" W

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Figure 11: Swamp and BLH Service Area

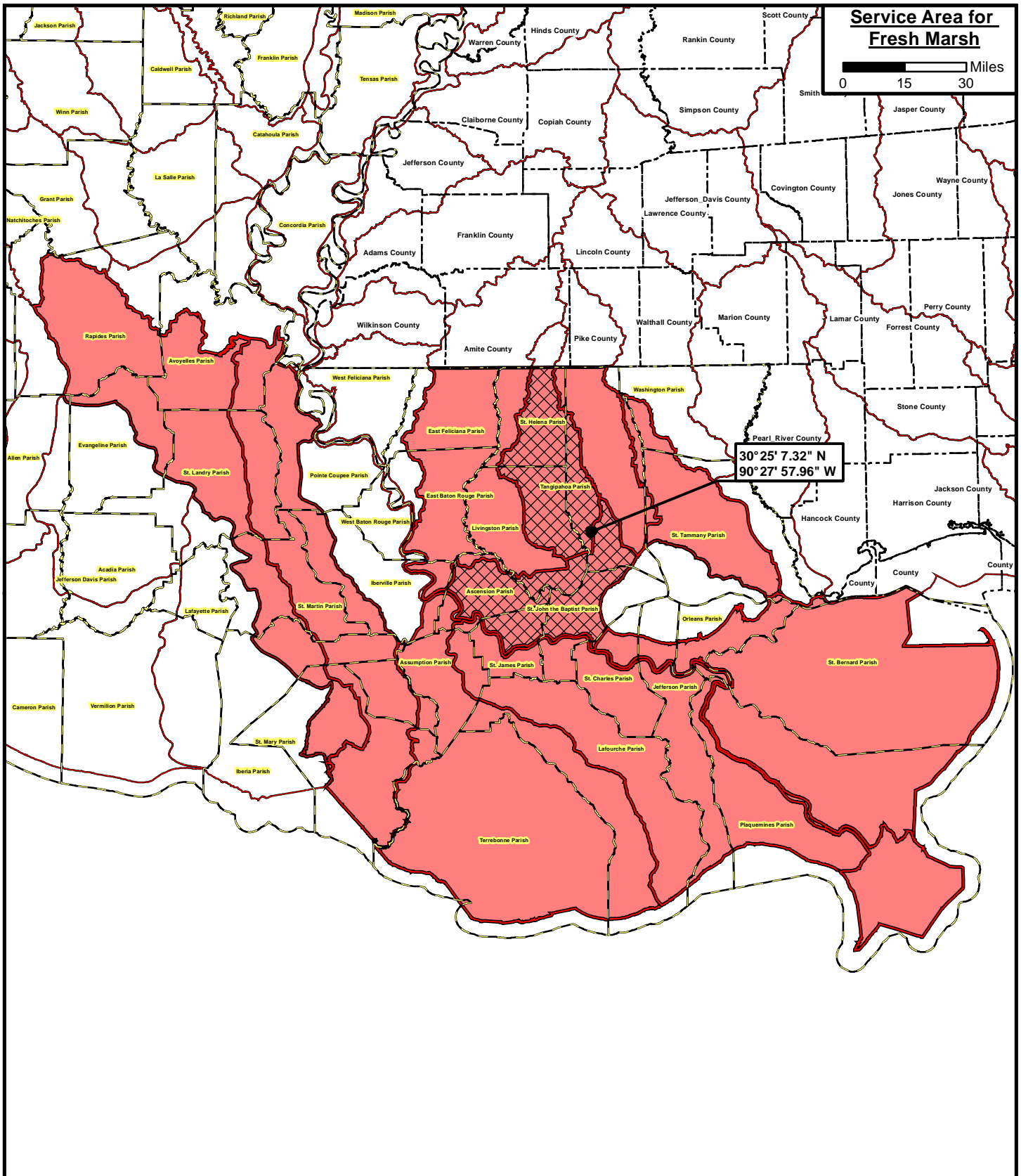
Anderson Canal Mitigation Bank

Legend:


- Site Outline
- Hydrologic Unit Boundary
- ACMB Watershed
- Parish Boundary
- County Boundary
- Service area for Swamp and BLH

Tickfaw-08070203-731.81 Square Miles
Lake Maurepas-08070204-732.09 Square Miles







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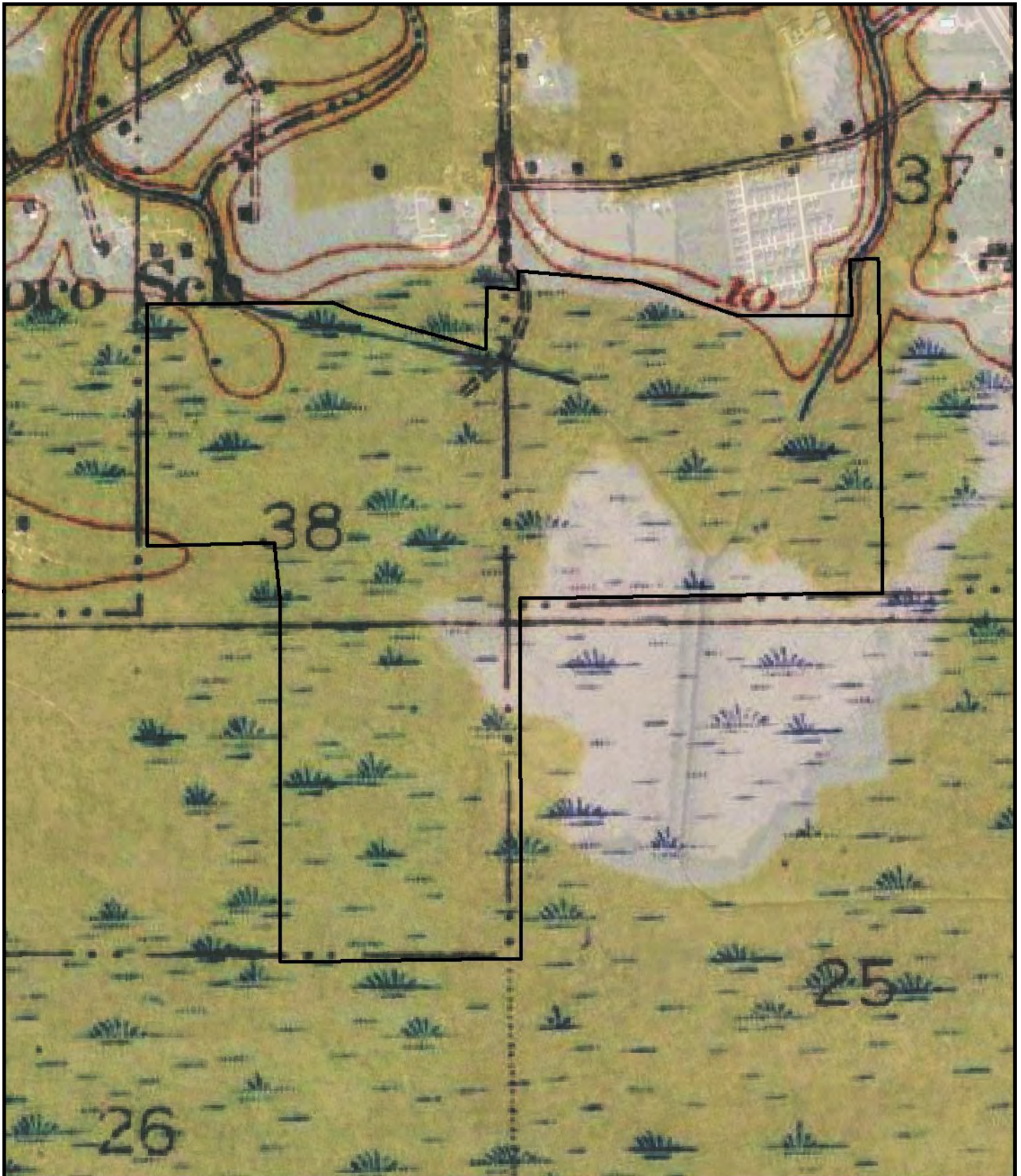

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Figure 12: Fresh Marsh Service Area
Anderson Canal Mitigation Bank

Legend:

-  Site Outline
-  Hydrologic Units
-  Service Area for Fresh Marsh
-  ACMB Watershed
-  Parish Boundary
-  County Boundary

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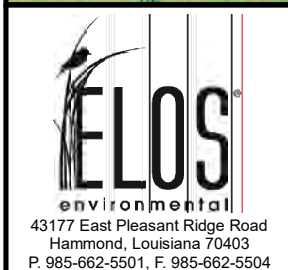
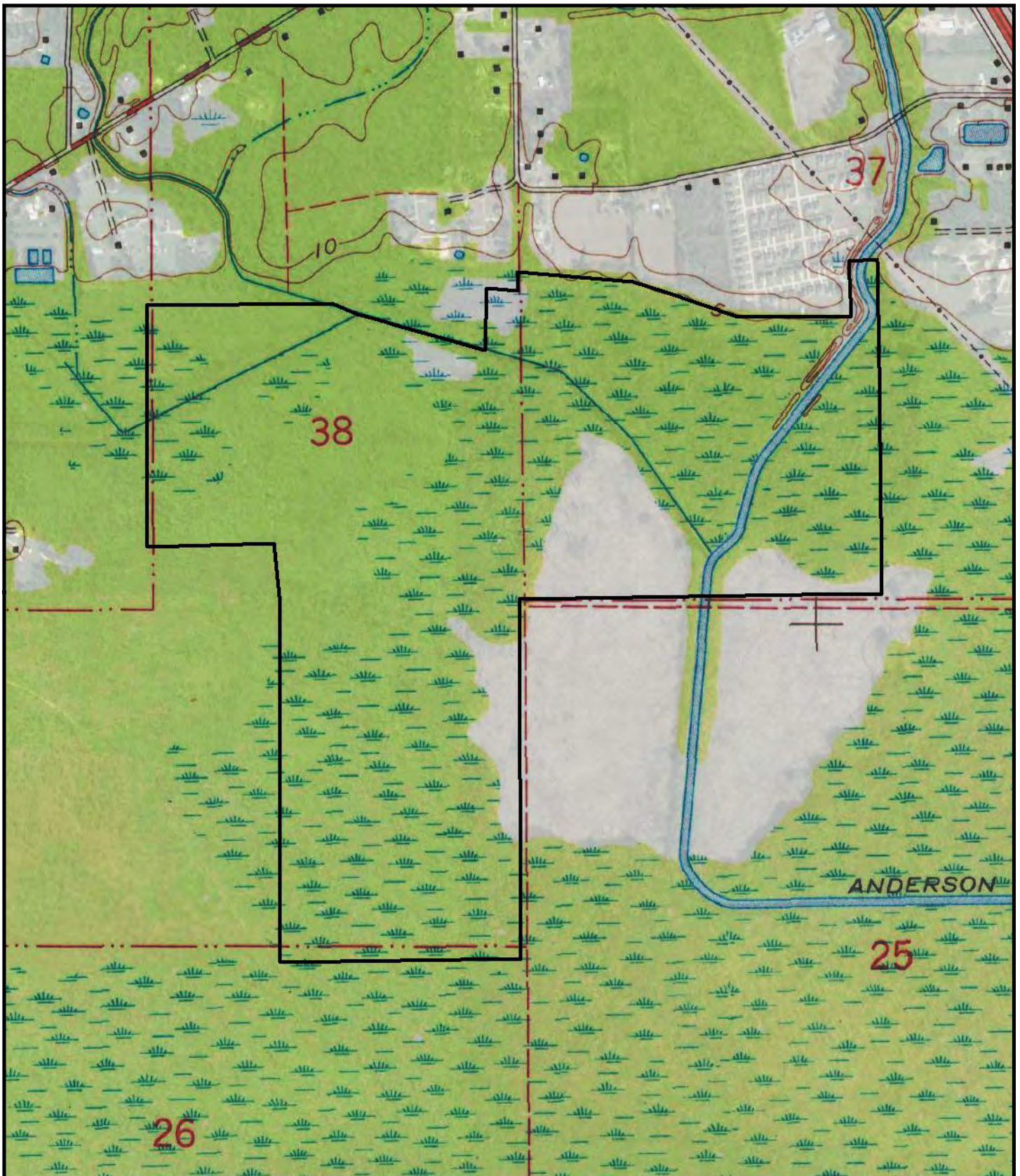


Figure 13: 1935 Topo
Anderson Canal Mitigation Bank

Legend:
 Site Outline

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0 600 1,200 Feet

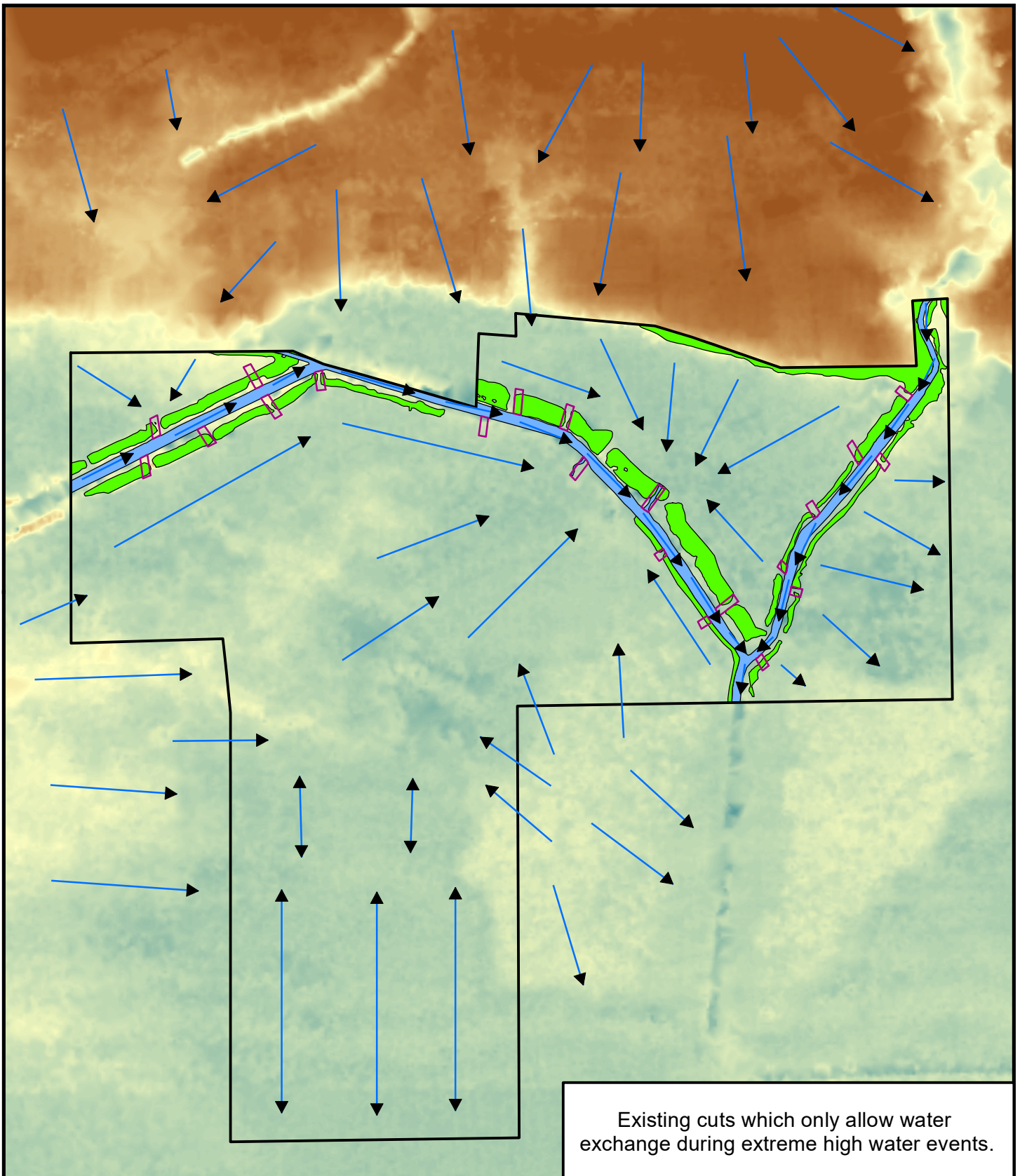
Figure 14: 1968 Topo

Anderson Canal Mitigation Bank

Legend:

Site Outline

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Existing cuts which only allow water exchange during extreme high water events.

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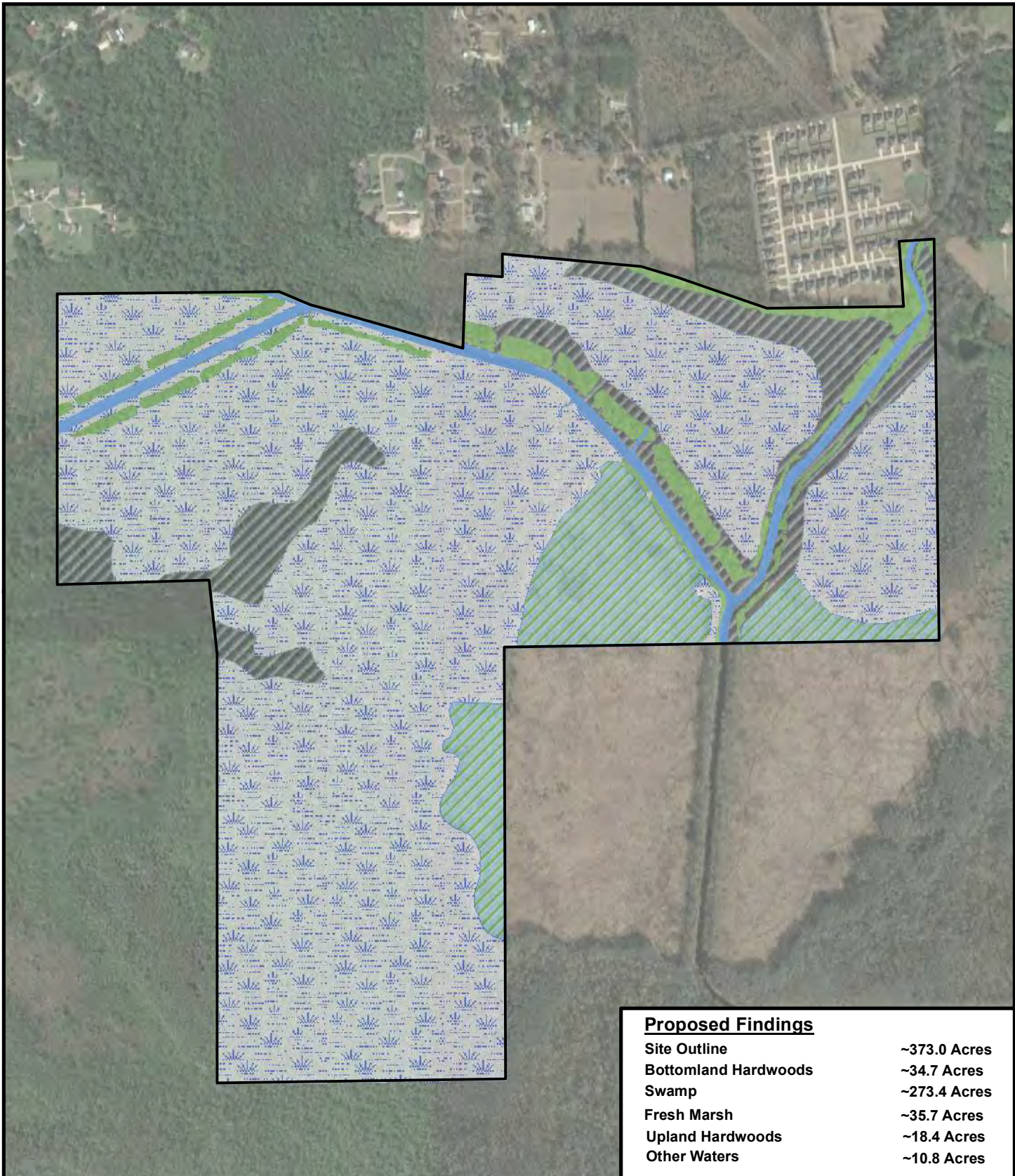
Figure 15: Pre-Drainage Flow Patterns

Anderson Canal Mitigation Bank

Legend:

- Site Outline
- Pre Drainage Flow
- Other Waters
- Uplands
- Existing Cuts
- Higher
- Lower

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Proposed Findings	
Site Outline	~373.0 Acres
Bottomland Hardwoods	~34.7 Acres
Swamp	~273.4 Acres
Fresh Marsh	~35.7 Acres
Upland Hardwoods	~18.4 Acres
Other Waters	~10.8 Acres

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Figure 16: Existing Habitats

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Legend:

Site Outline	Swamp
Bottomland Hardwoods	Upland Hardwoods
Fresh Marsh	Other Waters

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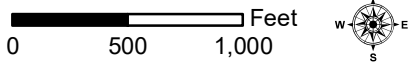
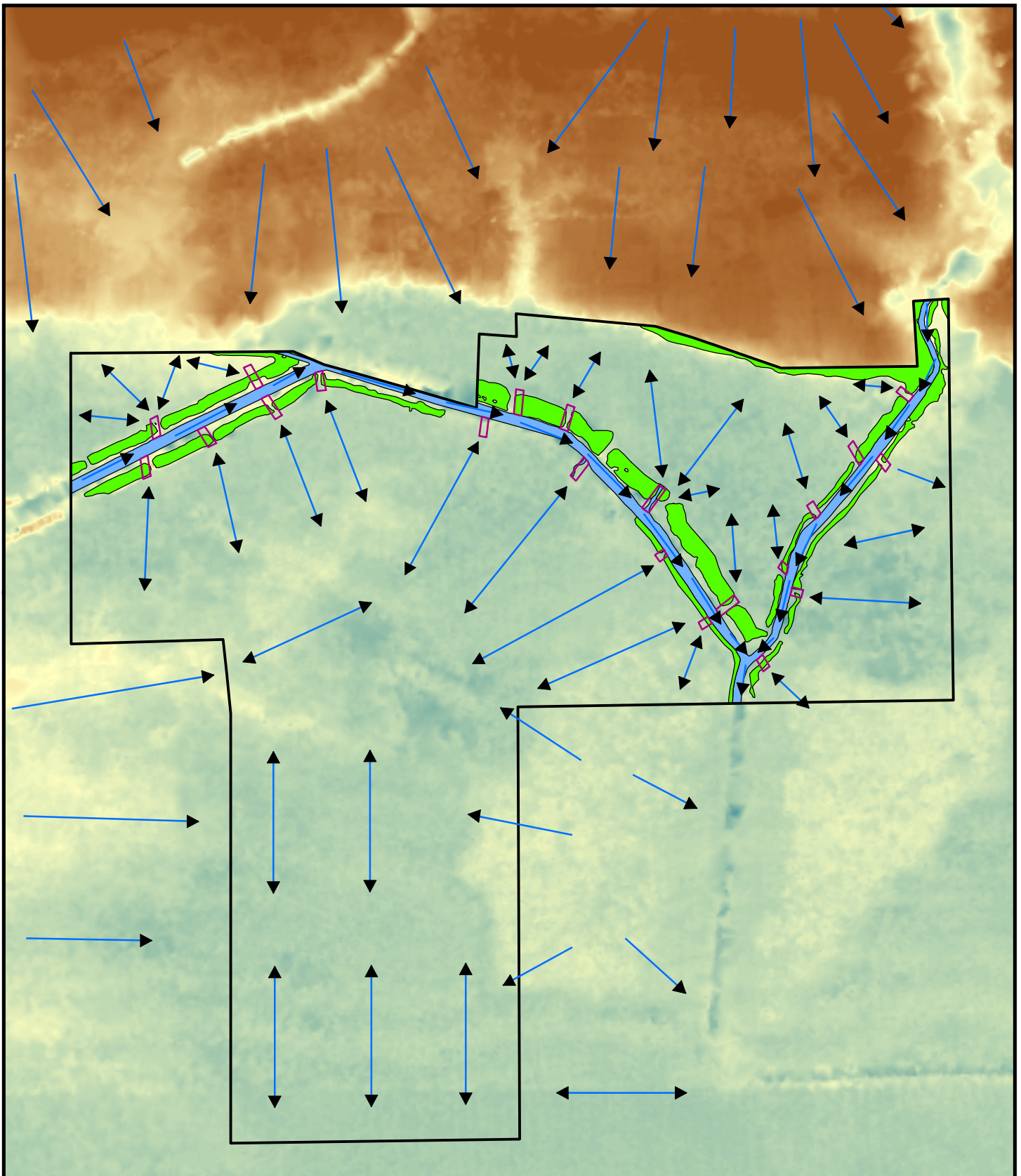


Figure 17: Post-Drainage Flow Patterns

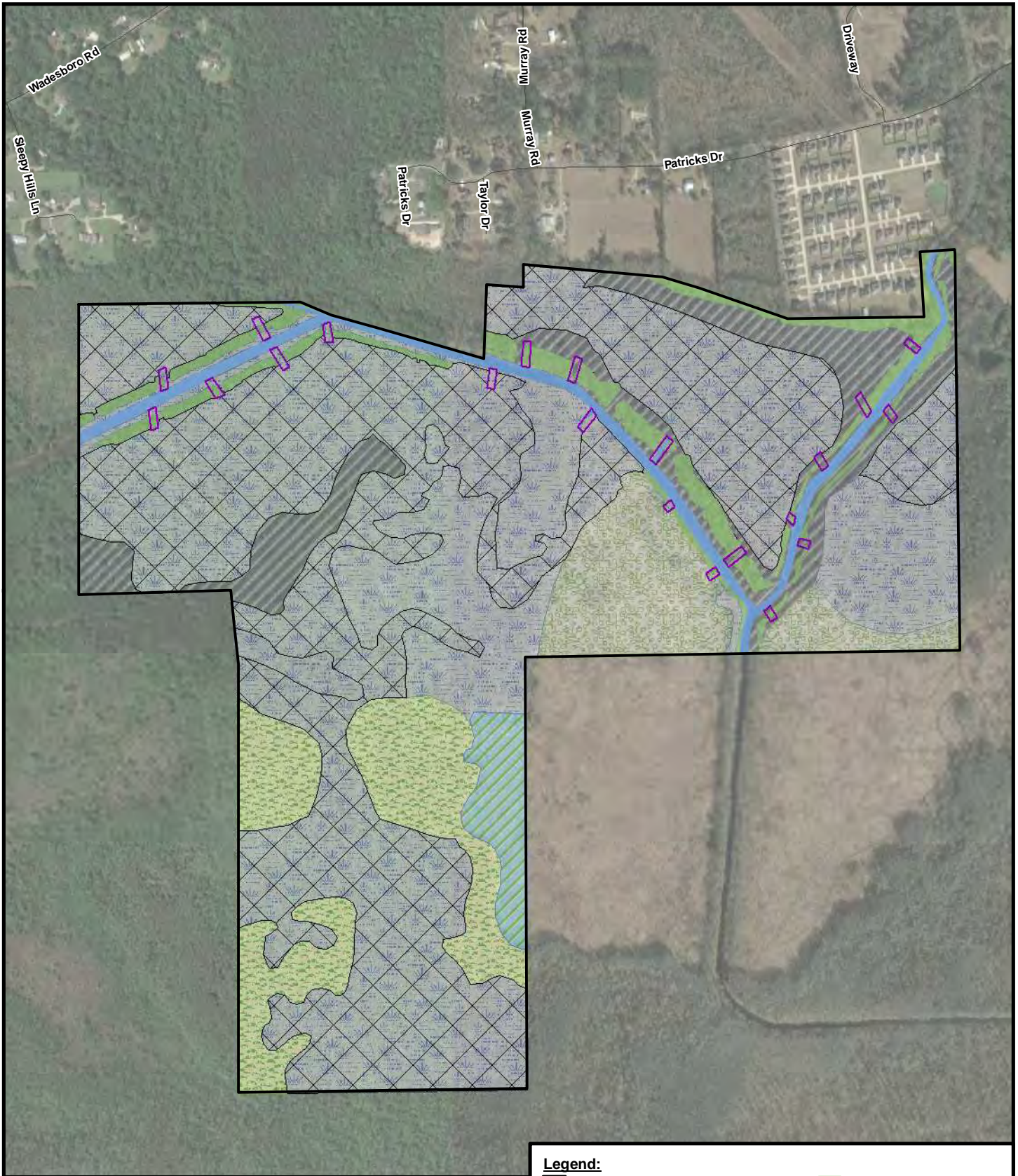
Legend:

- Site Outline
- Post Drainage Flow
- Cut Area
- Other Waters
- Uplands
- Higher
- Lower

Anderson Canal Mitigation Bank

This figure was prepared utilizing public and proprietary data. It should not be used to establish any legal boundaries or specific locations. ELOS Environmental, L.L.C., is not responsible for any usage of this figure contrary to its original, intended purpose.

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Legend:

- Site Outline
- Planting Area ~184.3 Acres
- Bottomland Hardwood Enhancement
- Swamp Enhancement
- Fresh Marsh Preservation
- Fresh Marsh Enhancement
- Swamp Preservation
- Uplands
- Other Waters
- Cut Area
- Roadway

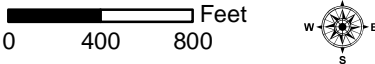


Figure 18: Planting Area

Anderson Canal Mitigation Bank

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Appendix B

Cross-Sections

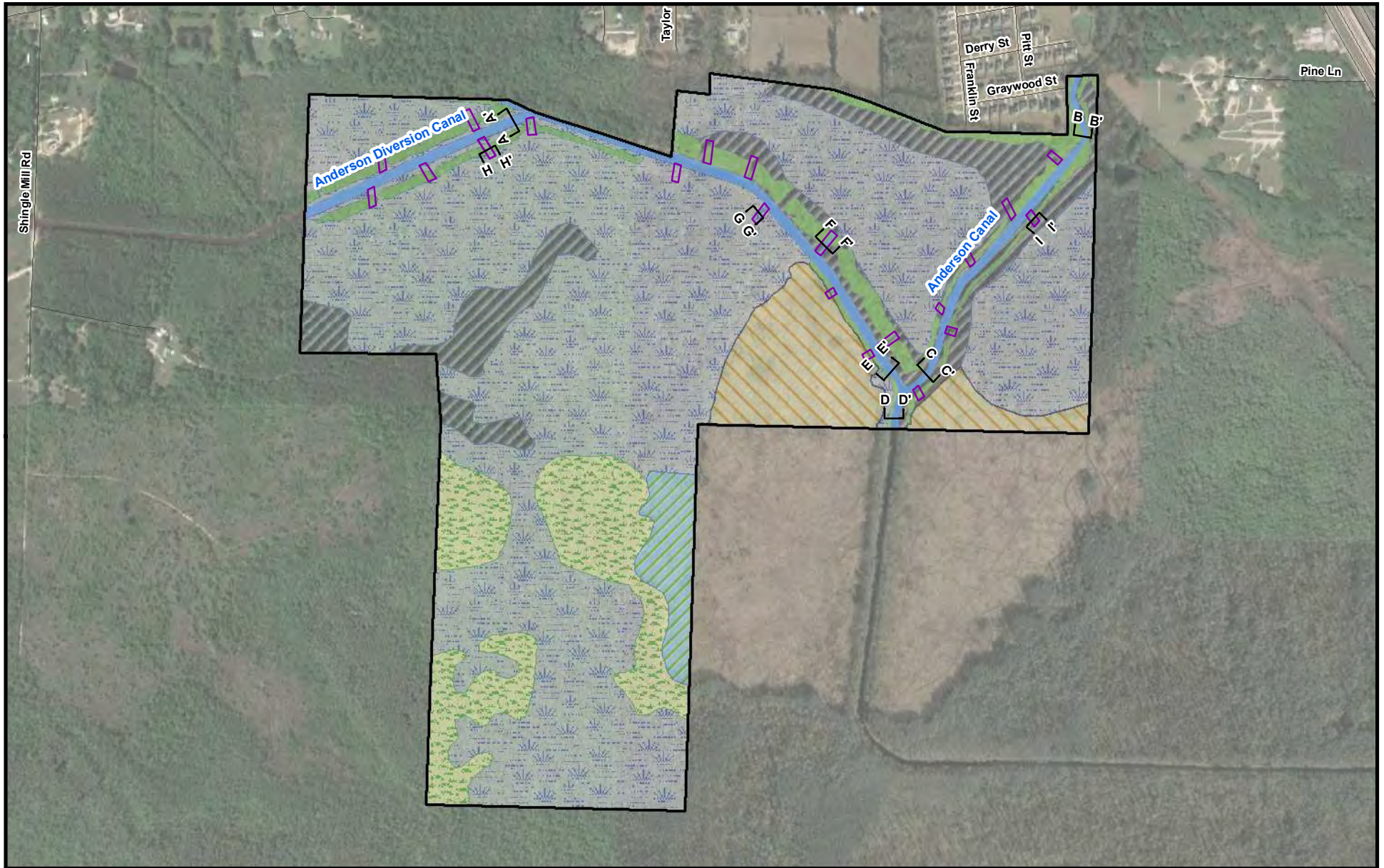


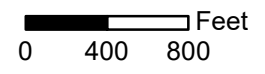
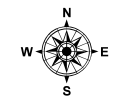
Figure 1: Overview Map

Anderson Canal Mitigation Bank

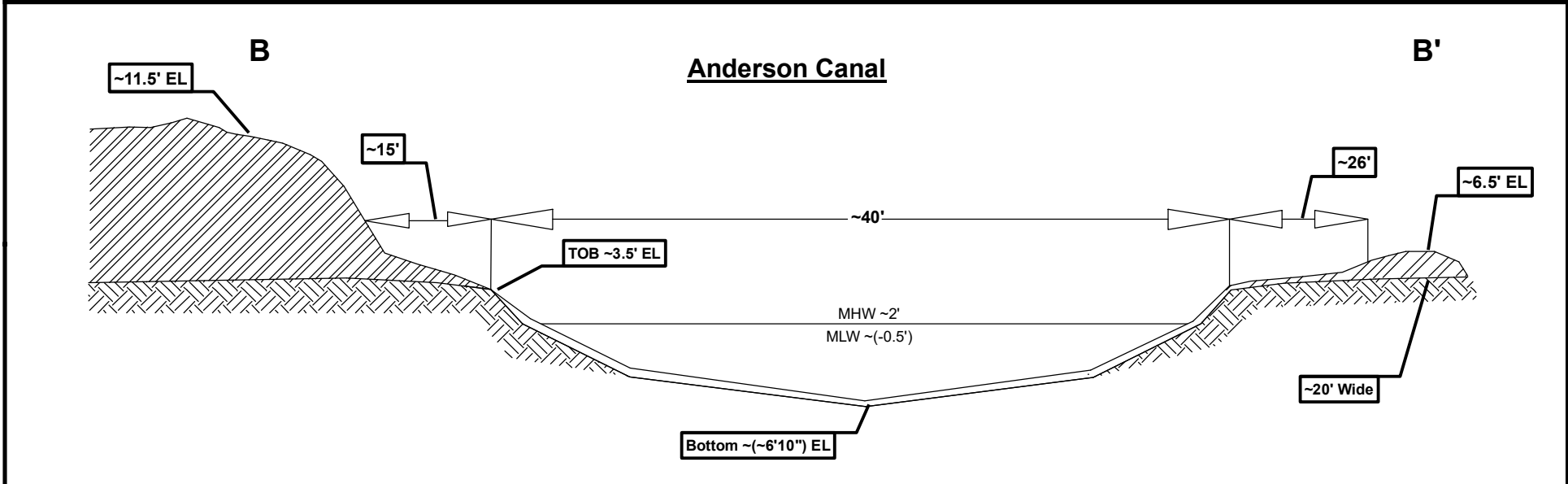
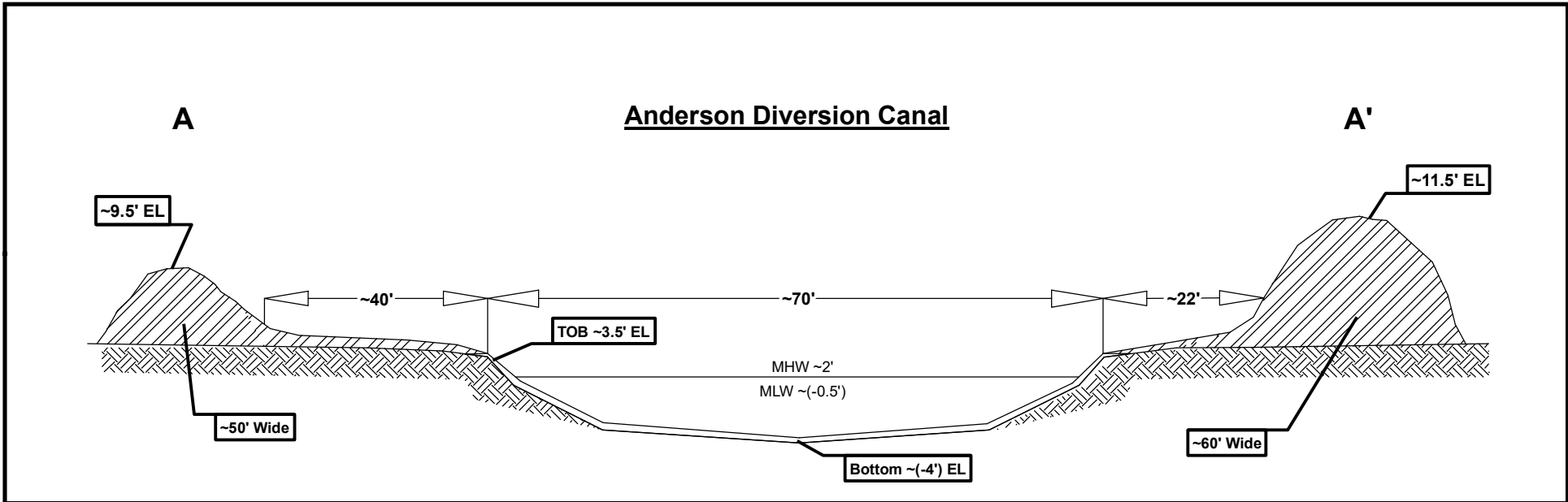
This figure was prepared utilizing public and proprietary data. It should not be used to establish any legal boundaries or specific locations. ELOS Environmental, L.L.C., is not responsible for any usage of this figure contrary to its original, intended purpose.


Legend:

- Site Outline
- Cut Area
- Coastal BLH Enhancement
- Coastal Swamp Enhancement
- Coastal Fresh Marsh Enhancement
- Coastal Fresh Marsh Preservation
- Coastal Swamp Preservation
- Uplands
- Other Waters
- Roadway



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 <p>environmental http://elosenv.com/ 43177 East Pleasant Ridge Road Hammond, Louisiana 70403 P. 985-662-5501, F. 985-662-5504</p>	<p>Figure 2: Existing Canal Profile</p>	<p>Notes:</p> <ol style="list-style-type: none"> 1) Elevations Represented in NAVD88. 2) Measurements Collected May 31, 2019 by ELOS Environmental, LLC. 	<p>Scale = Not to Scale</p>
	<p>Anderson Canal Mitigation Bank</p> <p>This figure was prepared utilizing public and proprietary data. It should not be used to establish any legal boundaries or specific locations. ELOS Environmental, L.L.C., is not responsible for any usage of this figure contrary to its original, intended purpose.</p>		

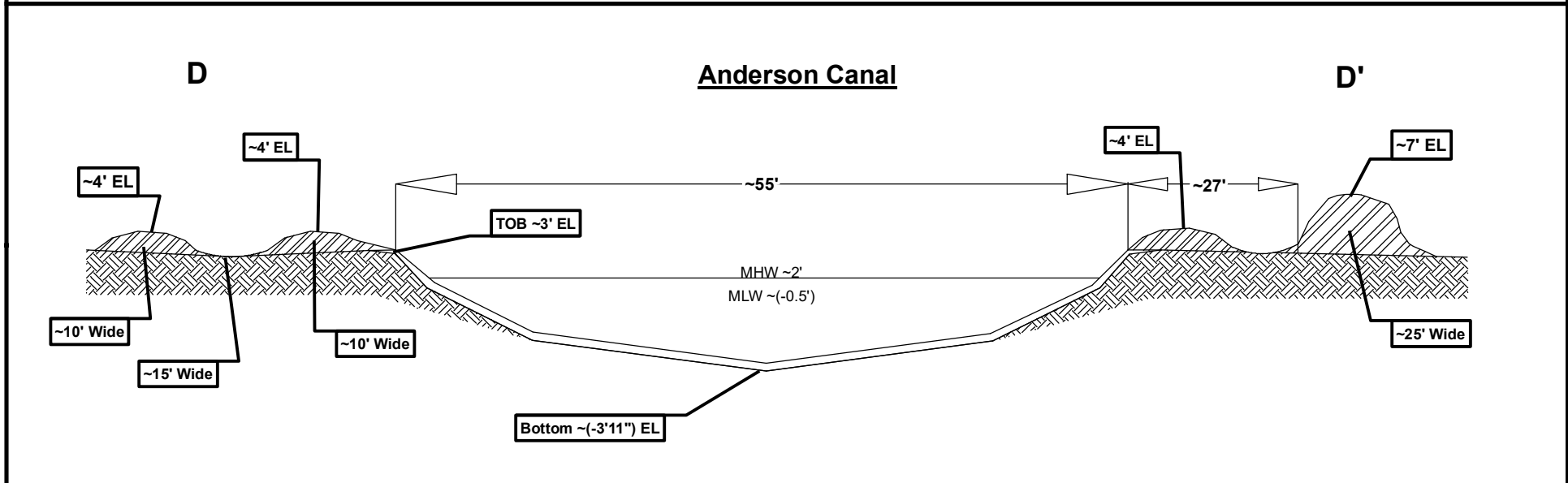
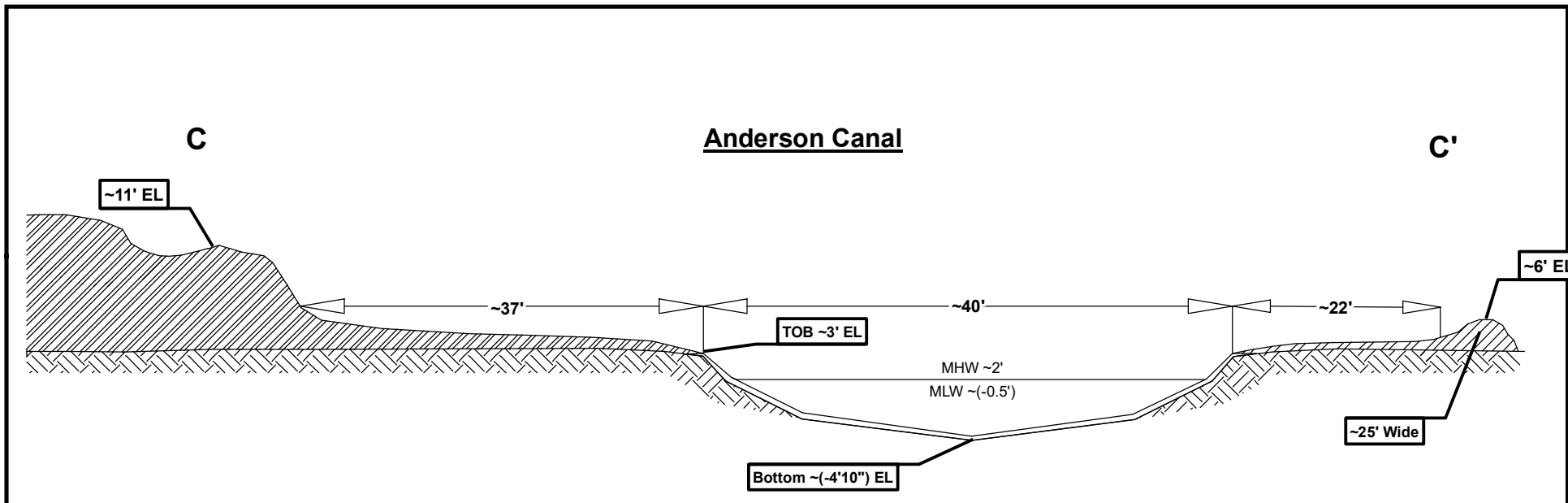


Figure 3: Existing Canal Profile

Anderson Canal Mitigation Bank

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Notes:

- 1) Elevations Represented in NAVD88.
- 2) Measurements Collected May 31, 2019 by ELOS Environmental, LLC.

Scale = Not to Scale

Anderson Diversion Canal

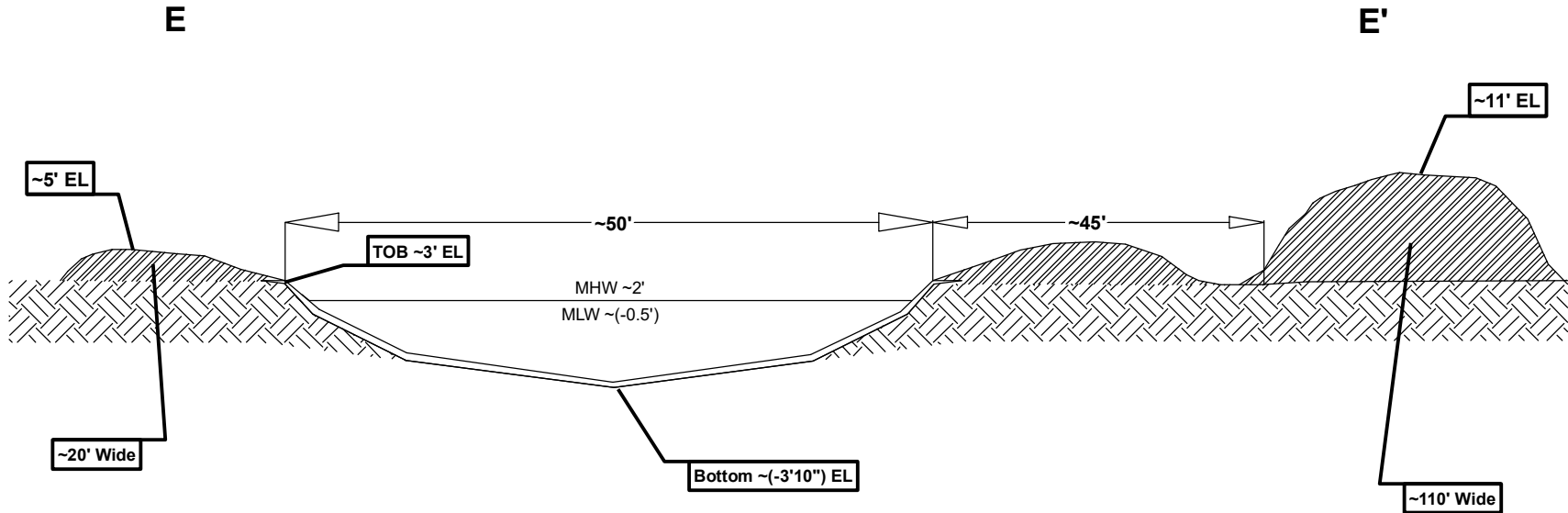


Figure 4: Existing Canal Profile

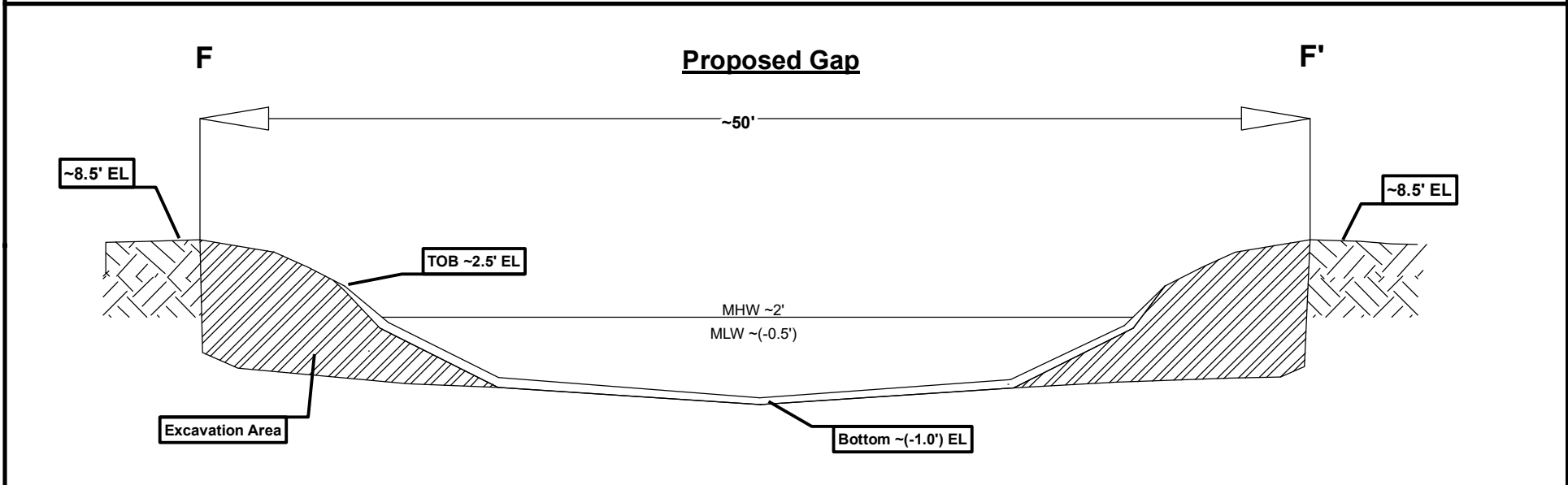
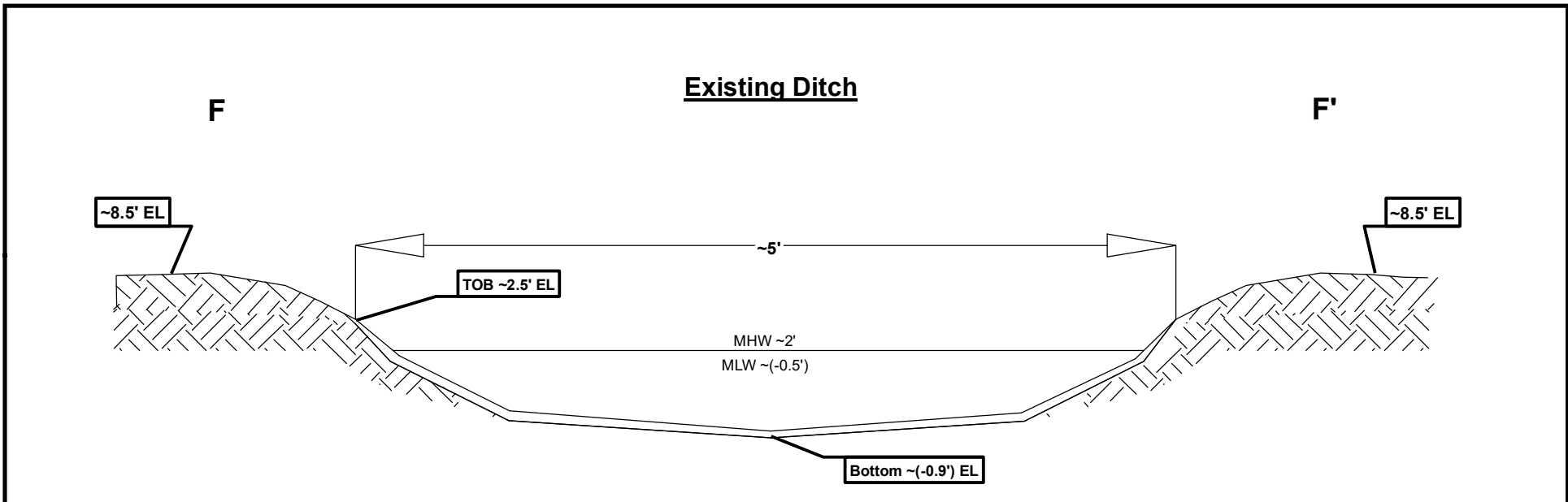
Anderson Canal Mitigation Bank


This figure was prepared utilizing public and proprietary data. It should not be used to establish any legal boundaries or specific locations. ELOS Environmental, L.L.C., is not responsible for any usage of this figure contrary to its original, intended purpose.

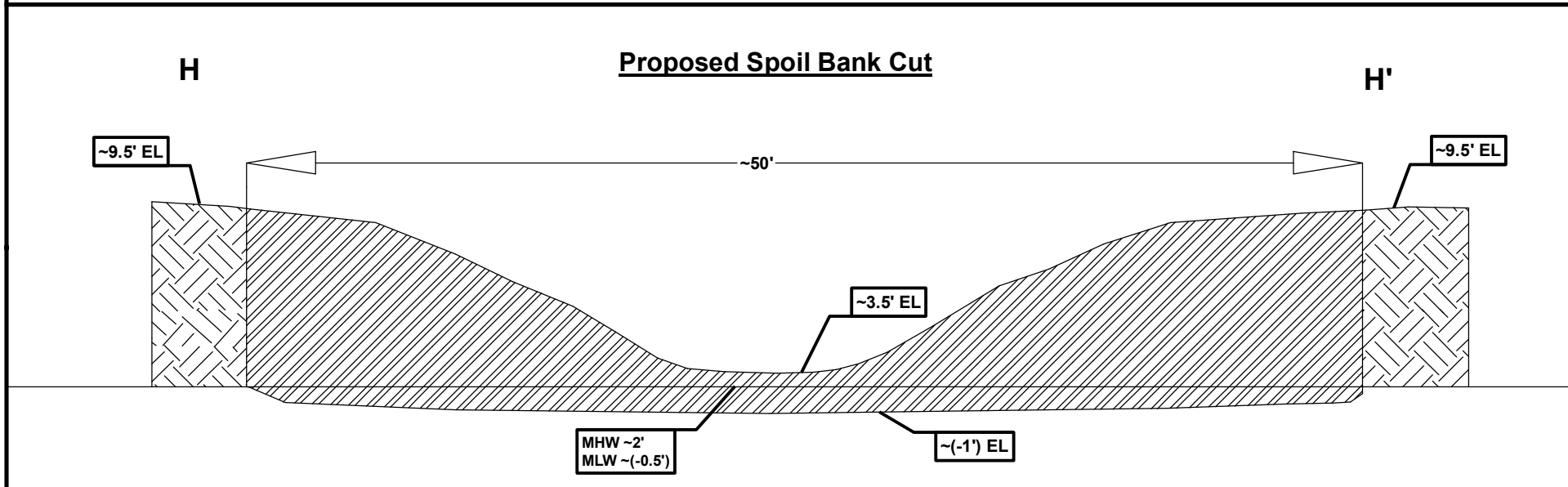
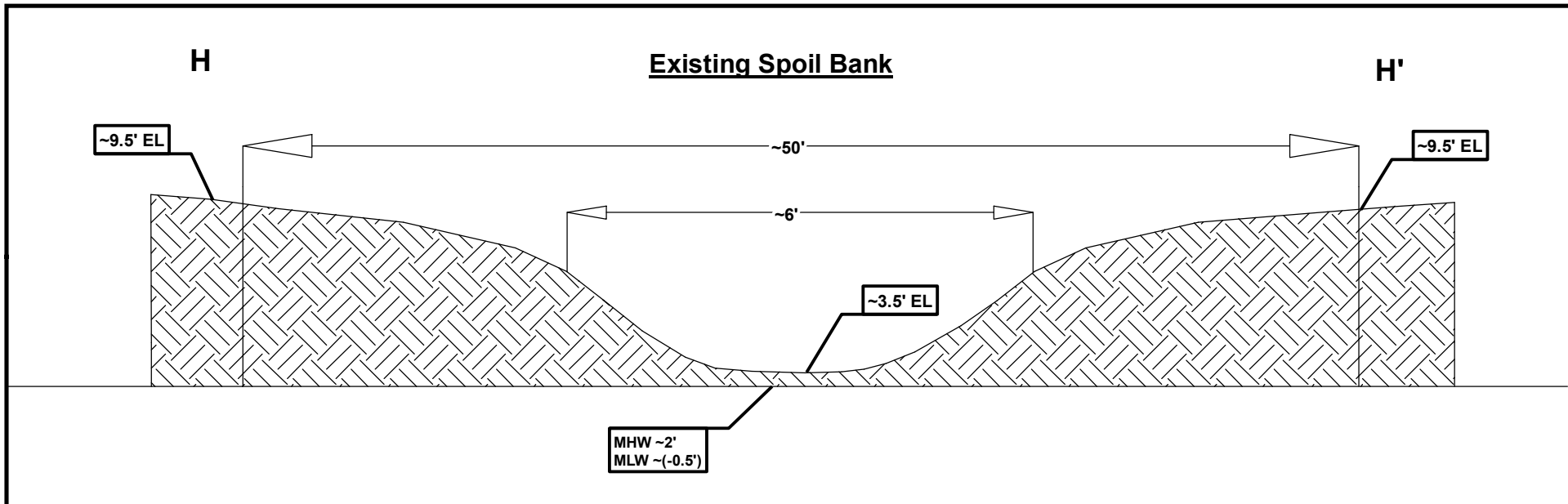
Notes:


- 1) Elevations Represented in NAVD88.
- 2) Measurements Collected May 31, 2019 by ELOS Environmental, LLC.

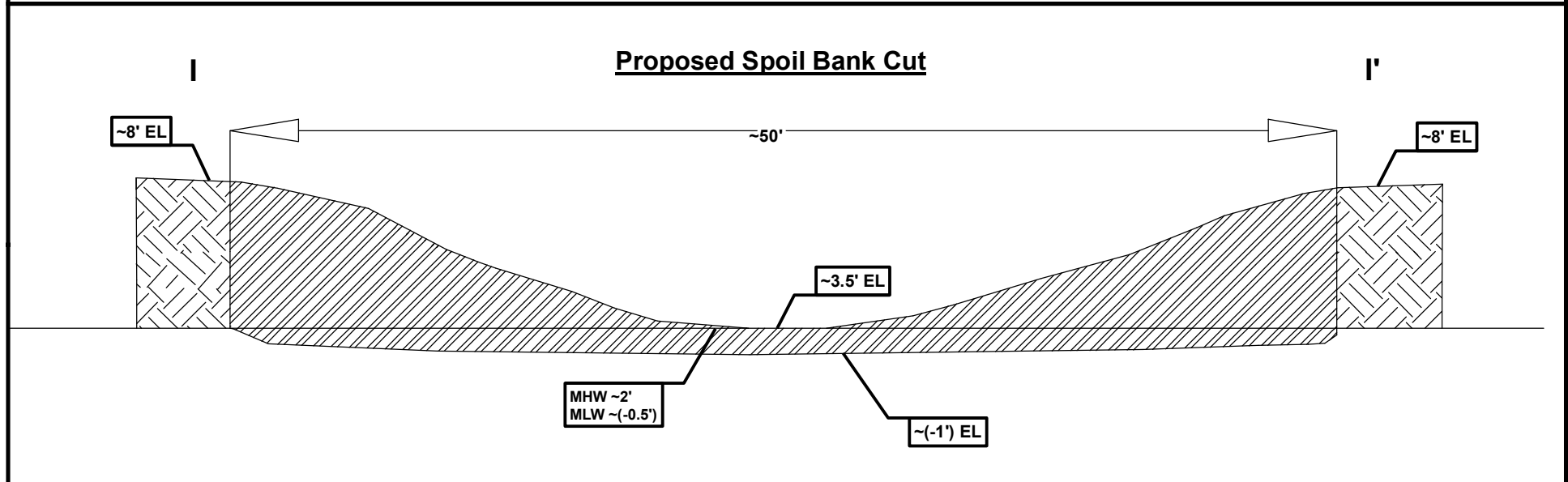
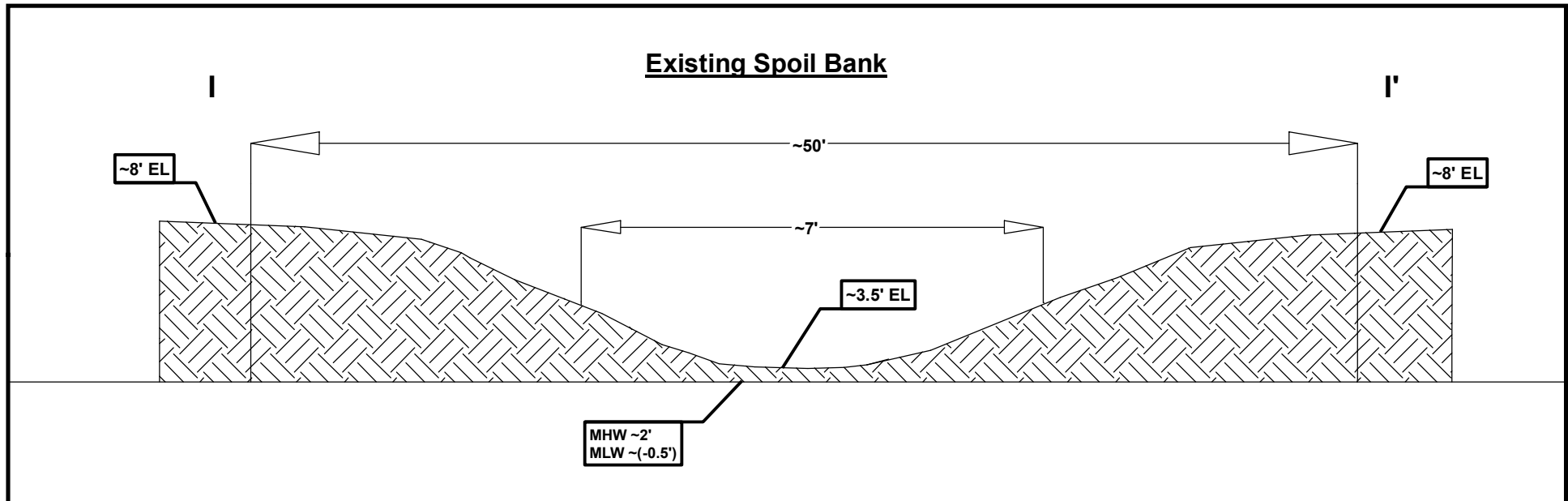
Scale = Not to Scale




 <small>environmental http://elosenv.com/ 43177 East Pleasant Ridge Road Hammond, Louisiana 70403 P. 985-662-5501, F. 985-662-5504</small>	<p>Figure 5: Ditch Profile</p>	<p>Notes:</p> <ol style="list-style-type: none"> 1) Elevations Represented in NAVD88. 2) Measurements Collected May 31, 2019 by ELOS Environmental, LLC. 	<p>Scale = Not to Scale</p>
	<p>Anderson Canal Mitigation Bank</p> <p style="font-size: small;">This figure was prepared utilizing public and proprietary data. It should not be used to establish any legal boundaries or specific locations. ELOS Environmental, L.L.C., is not responsible for any usage of this figure contrary to its original, intended purpose.</p>		



 <p>43177 East Pleasant Ridge Road Hammond, Louisiana 70403 P. 985-662-5501, F. 985-662-5504</p>	<p>Figure 7: Spoil Bank Profile</p>	<p>Notes:</p> <p>1) Elevations Represented in NAVD88. 2) Measurements Collected May 31, 2019 by ELOS Environmental, LLC.</p>	<p>Scale = Not to Scale</p>
	<p>Anderson Canal Mitigation Bank</p>		
	<p>This figure was prepared utilizing public and proprietary data. It should not be used to establish any legal boundaries or specific locations. ELOS Environmental, L.L.C., is not responsible for any usage of this figure contrary to its original, intended purpose.</p>		



 <small>environmental http://elosenv.com/ 43177 East Pleasant Ridge Road Hammond, Louisiana 70403 P. 985-662-5501, F. 985-662-5504</small>	<p>Figure 8: Spoil Bank Profile</p>	<p>Notes:</p> <p>1) Elevations Represented in NAVD88. 2) Measurements Collected May 31, 2019 by ELOS Environmental, LLC.</p>	<p>Scale = Not to Scale</p>
	<p>Anderson Canal Mitigation Bank</p>		
<p>This figure was prepared utilizing public and proprietary data. It should not be used to establish any legal boundaries or specific locations. ELOS Environmental, L.L.C., is not responsible for any usage of this figure contrary to its original, intended purpose.</p>			

Appendix C

Jurisdictional Determination – MVN-
2018-00949-SG

**US Army Corps of Engineers
Preliminary Jurisdictional Determination**

30°25' 24.45"N,
90°28' 26.93"W

Patrick's Dr
Patrick Dr

Taylor

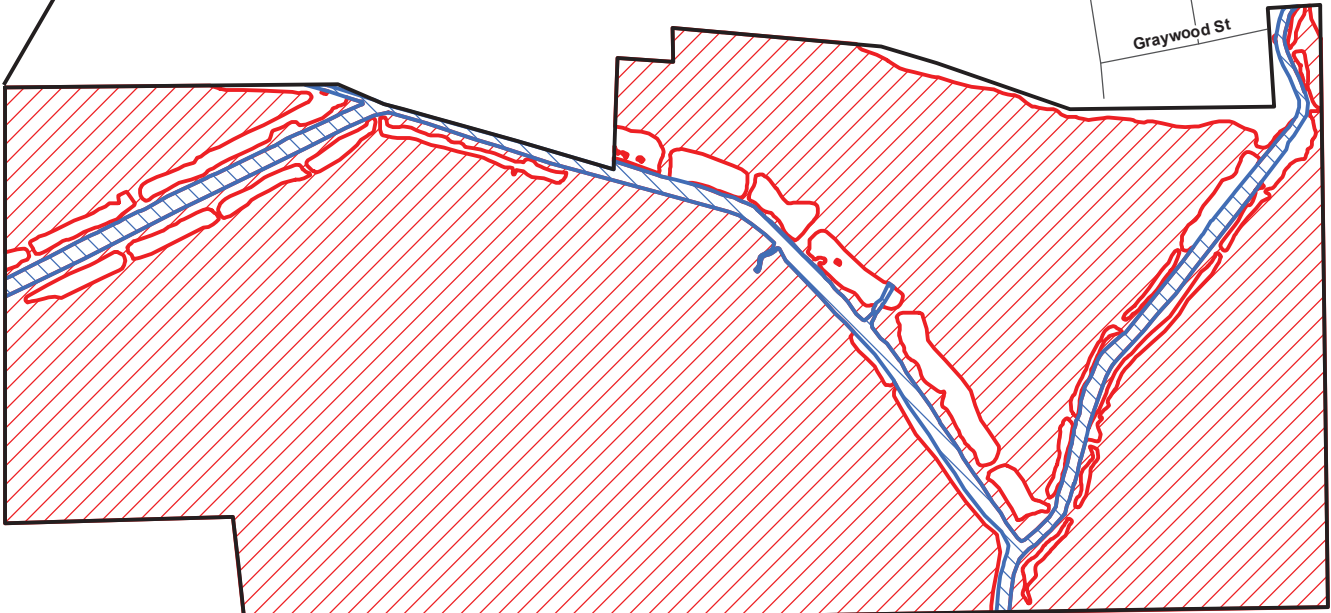
W Murray Rd

Franklin St


Pitt St


Derry St


Graywood St



USACE
 FIELD, 14 FEBRUARY 2018
 BOTANIST MR. JON BARMORE
 FOR Woodlands, LLC
 ACCOUNT # MVN-2018-00949-SG

 **Wetlands**

 **Non-wetland waters**

 **JD Review Area**

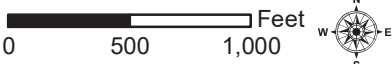


Figure 5: Proposed Delineation

Anderson Canal

This figure was prepared utilizing public and proprietary data. It should not be used to establish any legal boundaries or specific locations. ELOS Environmental, L.L.C., is not responsible for any usage of this figure contrary to its original, intended purpose.



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Appendix D
Louisiana Wetland Rapid Assessment
Method

LOUISIANA WETLAND RAPID ASSESSMENT METHOD (LRAM) 2.0

CEMVN Acct # **MVN-2018-00949**
 Acres Mitigation **272.5**
 Watershed Basin **LakePont**

Bank Name
Anderson Canal Mitigation Bank

		Area 1	Area 2	Area 3	Area 4	Area 5	Area 6	Area 7	Area 8
Mitigation Factors	Mitigation Type	Enhanc	Preser	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here
		3.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0
	Management	None	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Negative Influences	Low	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here
		-0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Size	500 : 100	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Buffer / Upland	Restored	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here
		0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Sum:	3.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0
	Area:	237.0	35.5						
	Sum x Area Affected:	711.0	14.2	0.0	0.0	0.0	0.0	0.0	0.0

Σ Mitigation: 725.2
 Mitigation Potential: 2.7

COMMENTS

Mitigation Type	Swamp Enhancement and Preservation
Management	
Negative Influences	
Size	
Buffer/Upland	

LOUISIANA WETLAND RAPID ASSESSMENT METHOD (LRAM) 2.0

CEMVN Acct # **MVN-2018-00949**
 Acres Mitigation **33.9**
 Watershed Basin **LakePont**

Bank Name
Anderson Canal Mitigation Bank

		Area 1	Area 2	Area 3	Area 4	Area 5	Area 6	Area 7	Area 8
Mitigation Factors	Mitigation Type	Enhanc	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here
		3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Management	None	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Negative Influences	Low	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here
		-0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Size	500 : 100	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Buffer / Upland	Restored	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here
		0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Sum:	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Area:	33.9							
	Sum x Area Affected:	101.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Σ Mitigation: 101.7
 Mitigation Potential: 3.0

COMMENTS

Mitigation Type	BLH Enhancement
Management	
Negative Influences	
Size	
Buffer/Upland	

LOUISIANA WETLAND RAPID ASSESSMENT METHOD (LRAM) 2.0

CEMVN Acct # **MVN-2018-00949**
 Acres Mitigation **35.6**
 Watershed Basin **Deltaic**

Bank Name
Anderson Canal Mitigation Bank

		Area 1	Area 2	Area 3	Area 4	Area 5	Area 6	Area 7	Area 8
Mitigation Factors	Mitigation Type	Enhanc	Preser	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here
		3.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0
	Management	None	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Negative Influences	Low	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here
		-0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Size	500 : 100	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Buffer / Upland	Restored	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here	Pick Here
		0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Sum:	3.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0
	Area:	26.7	8.9						
	Sum x Area Affected:	80.1	3.6	0.0	0.0	0.0	0.0	0.0	0.0

Σ Mitigation: 83.7
 Mitigation Potential: 2.4

COMMENTS

Mitigation Type	Fresh Marsh Enhancement and Preservation
Management	
Negative Influences	
Size	
Buffer/Upland	

Appendix E
Drainage District Letter

KILEY F. BATES, P.E.
Administrator

**CONSOLIDATED GRAVITY
DRAINAGE DISTRICT #1
OF
TANGIPAHOA PARISH**

District 3
LOUIS "NICK" JOSEPH
President
P.O. Box 621
Independence, LA 70443
(985) 878-4711



P.O. BOX 31
HAMMOND, LA 70404

District 4
CARLO S. BRUNO
Vice-President
P.O. Box 1274
Independence, LA 70443
(985) 878-4944

STANAN CAPDEBOSQ
Secretary-Treasurer

Office: (985)542-4292 Fax: (985)345-1821

January 4, 2019

Mitigation Bank Review Team
U.S. Army Corps of Engineers, Lead Agency
New Orleans District
7400 Leake Ave.
New Orleans, LA 70118

Attn: Ms. Jacqueline Farabee
Environmental Resources Specialist

RE: Anderson Canal Mitigation Bank
Spoil Bank Gapping
MVN-2018-00949

Dear Ms. Farabee:

The Consolidated Gravity Drainage District #1 of Tangipahoa Parish (the District), as the agency with authority and maintenance responsibility over the Anderson and Anderson Diversion Canals, has reviewed the details of the hydrologic improvement work proposed as part of the work plan for the Anderson Canal Mitigation Bank. We have no objection to the establishment of this wetland mitigation bank as proposed. The construction of gaps in the spoil banks along the canals is not expected to impact the District's ability to maintain the waterways.

The District does not own the canals, but we do hold a drainage servitude that extends 100 feet from each top of bank of the channels that allows us to conduct maintenance. Additionally, most of our work is completed from within the canals and will not impact the gaps nor the restoration of the site. Finally, our future maintenance work will not impede the gaps that will be constructed in the spoil banks. We view the project as one that might assist with area drainage by reconnecting adjacent flood plains to the waterway, and providing some additional storm water retention capacity by facilitating better exchange between the canals and the adjacent wetlands.

Sincerely,



Kiley F. Bates, P.E.
Administrator

MEMBERS OF COMMISSION

District 2
JAMES BAILEY
21317 Neal Rd.
Husser, LA 70442
(985)320-1986

District 5
BUDDY RIDGEL
17037 Ridgel Rd.
Tickfaw, LA 70466
(985)969-3357

District 6
JOEY MAYEAUX
13115 Mayeaux Ln.
Hammond, LA 70401
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District 7
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District 8
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125 Woodhaven Dr.
Ponchatoula, LA 70454
(985) 969-6010