

FORESTED AND HERBACEOUS/SHRUB WETLAND

PERMITTEE RESPONSIBLE MITIGATION PLAN

SWG-2019-00772

BURTON STATION PROJECT

CHAMBERS COUNTY, TEXAS

Prepared for:

LONE STAR NGL MONT BELVIEU, LP



February 26, 2020

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1.0 Introduction

Delta Land Services, LLC (DLS) presents this riverine forested wetland (PFO) and riverine herbaceous/shrub wetland (PEM/PSS) Permittee Responsible Mitigation Plan (PRMP) for the compensation of unavoidable, permanent impacts to approximately 156.84 acres of wetlands within the U.S. Army Corps of Engineers (USACE) Galveston District (CESWG). The wetland impacts consist of 91.57 acres of PFO, 24.49 acres of PEM, 40.78 acres of PSS wetland, and 0.57 acre of a man-made pond associated with the permit number SWG-2019-00772. Lone Star NGL Mont Belvieu, LP (Lone Star or Permittee) is seeking the Permit for the proposed construction two hydrocarbon processing units (HPUs), four brine ponds, two detention ponds, and two brine disposal wells near Mont Belvieu in Chambers County, Texas.

The Project wetland impacts are located in the North Galveston Bay Subbasin (Hydrologic Unit Code 12040203). Ecologically, the impacts are located within the Northern Humid Gulf Coastal Plain Level IV Ecoregion of the Western Gulf Coast Plain Level III Ecoregion (Seaber et al. 1987, Griffith et al. 2007, EPA 2012). The Project impact site is shown on **Attachment A, Figure 1**.

The preparation of this PRMP was in accordance with USACE regulations for compensatory mitigation for losses of aquatic resources, codified in 33 CFR § 332. More specifically, the contents of the PRMP were designed to satisfy the requirements of 33 CFR § 332.4(c)(2)-(14). The applicant/permittee is Lone Star Mont Belvieu, LP. DLS, acting as the mitigation provider for the Permittee, will implement, monitor, and provide long-term management of the Permittee Responsible Mitigation Area (PRMA) as described in 33 CFR § 332.3(l). Ironwood Holdings, LLC is the PRMA landowner; Ironwood Holdings is a land holding subsidiary wholly owned by DLS. Lastly, the Texas Land Conservancy will hold the conservation easement. Since the site is located adjacent to Cedar Bayou and within its 100-year floodplain, the predicted functional lift on the PRMA was assessed using the USACE Galveston District (CESWG) Riverine Forested and Riverine Herbaceous/Shrub Interim Hydrogeomorphic models (iHGM) [**Attachment A, Figures 2 and 3**].

A 1:1 ratio (i.e., impact function to mitigation function ratio) is utilized to determine the mitigation requirements since the PRMA and impacts are both located in the North Galveston Bay Subbasin (12040203) [**Attachment A, Figure 1**]. The man-made pond will be offset with 1.2 acres of PEM restoration or a 2:1 ratio, justification for the type of mitigation applied for the pond impact is discussed in **Section 6.0**. The mitigation restoration acreages, as determined by the iHGM are approximately 183.9 acres of PFO, 64.1 acres of PSS, and 20.2 acres of PEM (**Table 2 - 4 and Attachment B**). By the end of Year 15, 271.3 acres of wetlands will be restored and perpetually protected.

1.1 Mitigation Property Location

The 288.6-acre PRMA is adjacent to Cedar Bayou in Liberty County, TX and is in the Bayou's 100-year floodplain (**Attachment A, Figure 3**). The PRMA is located approximately 6.6 miles northeast of Crosby, Texas within the North Galveston Bay Subbasin in the Northern Humid Gulf Coastal Plain Level IV Ecoregion within the Western Gulf Coast Plain Level III Ecoregion (Seaber et al. 1987, Griffith et al. 2007, EPA 2012). The approximate centerpoint of the PRMA is Latitude 29.923645° N and Longitude -94.980241° W (UTM 308845 E, 3311972 N).

To access the PRMA from Dayton, TX, travel southwest on US 90W for approximately 6.3 miles. Then turn south (left) onto FM 1413 for 2.3 miles, then right onto Hatcherville Road (County Road 486) for 1.2 miles; then right on unnamed caliche road for approximately 1.1 miles to the west.

1.2 Property Ownership/Qualifications

Ironwood Holdings/DLS own the PRMA and the property encompassing the PRMA. Established in 2009, DLS is a land management and restoration company whose technical staff includes Certified Ecological Restoration Practitioners, Certified Foresters, Certified Wildlife Biologists, and Professional Wetland Scientists

1.3 Description of the Property

The PRMA is a tract of land located near Cedar Bayou (**Attachment A, Figures 2 and 3**). The center point of the PRMA is located at latitude 29.923645° North and longitude -94.980241° West (NAD83). The PRMA perimeter coordinates are listed in **Attachment C** beginning at the northwest corner and proceeding clockwise.

1.4 Recorded Liens, Encumbrances, Easements, Servitudes or Restrictions

The PRMA is cross by a drainage easement and two pipeline easements; the easements will be excluded from the restoration acreage (**Attachment A, Figure 4**). There are no other recorded liens, encumbrances, easements, servitudes or other surface restrictions applicable to the PRMA. The owner of the PRMA does not own the mineral rights. A mineral management plan would be implemented if mineral exploration were to occur.

2.0 Goals and Objectives

The goals of the PRMP are to restore¹, re-establish² 3.1 acres of PFO wetland, rehabilitate³ 75.6 acres of PFO wetland, enhance⁴ 37.6 acres of PFO, preserve⁵ 70.7 acres of PFO, re-establish 15.0

¹Restoration is defined in 33 CFR § 332.2 as the *manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former or degraded aquatic resource. For tracking net gains in aquatic resource area, restoration is divided into two categories: re-establishment and rehabilitation.*

²Re-establishment is defined in 33 CFR § 332.2 as the *manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former aquatic resource. Re-establishment results in rebuilding a former aquatic resource and results in a gain in aquatic resource area and functions.*

³Rehabilitation is defined in 33 CFR § 332.2 as the *manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a degraded aquatic resource. Rehabilitation results in a gain in aquatic resource function but does not result in a gain in aquatic resource area.*

⁴ Enhancement is defined in 33 CFR § 332.2 as the *manipulation of the physical, chemical, or biological characteristics of an aquatic resource to heighten, intensify, or improve a specific aquatic resource function(s). Enhancement results in the gain of selected aquatic resource function(s) but may also lead to a decline in other aquatic resource function(s). Enhancement does not result in a gain in aquatic resource area.*

⁵ Preservation is defined in 33 CFR § 332.2 as the *removal of a threat to, or preventing the decline of, aquatic resources by an action in or near those aquatic resources. This term includes activities commonly associated with the protection and maintenance of aquatic resources through the implementation of appropriate legal and physical mechanisms. Preservation does not result in a gain of aquatic resource area or functions.*

acres of PSS wetland, rehabilitate 49.1 acres of PSS wetlands, re-establish 16.6 acres of PEM wetland and rehabilitate 3.6 acre of PEM wetland located in the North Galveston Bay Watershed within the Northern Humid Gulf Coastal Prairies Level IV Ecoregion. Additionally, approximately 6.2 acres of fire breaks would be established. These areas would serve as permanent fire lanes between the different habitat communities. The fire breaks are not included in the restoration/credit acreage. **Table 1** presents a summary of restoration type by tract within the PRMA.

Table 1. Restoration by Resource Type

Resource Type	Re-establishment	Rehabilitation	Enhancement	Preservation
PEM	16.6 ac	3.6 ac	0.0 ac	0.0 ac
PSS	15.0 ac	49.1 ac	0.0 ac	0.0 ac
PFO	3.1 ac	75.6 ac	37.6 ac	70.7 ac
Totals:	34.7 ac	128.3 ac	37.6 ac	70.7 ac

To meet the goals of PFO, PSS, and PEM restoration, the objectives will consist of the following:

1. permanent cessation of agricultural practices and mowing (except fire breaks),
2. removal and control of pasture grasses (e.g., Bahia grass [*Paspalum notatum*]) and invasive species (e.g., Chinese tallowtree [*Triadica sebifera*]⁶),
3. hydrology restoration consisting of reduce soil compaction, plugging of agricultural ditches, removing agricultural berms, and filling drainage laterals,
4. planting native trees in 116.3 acres of PFO restoration,
5. preserve 70.7 acres of high-quality forested wetland,
6. restoration of PSS areas through planting native shrub species in 64.1 acres of the PRMA and seeding of native herbaceous species along with the use of periodic fire to suppress fire intolerant invasive species,
7. seeding 20.2 acres of PEM habitat with native herbaceous species and use of herbicide/fire to manage woody encroachment and establish a successional plant community,
8. construct, establish, and provide long-term maintenance by establishing the appropriate financial escrow accounts, and
9. protect the PRMA under a perpetual conservation easement.

The PRMA will be restored to historic PFO, PSS, and PEM wetland conditions to offset impacts to aquatic resources associated with the permit described in **Section 1.0**. Due to industrial development and historic agriculture uses, the watershed has experienced degraded water quality, loss of wildlife habitat and limited conservation lands, which define the needs of the watershed. The watershed needs are further defined in the 2015 *Cedar Bayou Watershed Protection Plan*.

The following functions would be improved and/or restored at the PRMA and contribute to the health of the ecologically significant North Galveston Bay watershed:

- re-establish native vegetation, providing sustainable food sources for wildlife,

⁶ The aforementioned and subsequent plant scientific nomenclature is from National Wetland Plant List (2018).

- provide increased native bird and pollinator habitat through the restoration of 178.0 acres of PFO, preservation of 70.7 acres of mature forested wetland, restoration of 64.1 acres of PSS, and restoration of 20.2 acres of PEM wetlands;
- improve natural biological diversity through native plant restoration;
- improve water quality through the cessation of agricultural activities, reducing nutrient loading in Cedar Bayou;
- protect mature floodplain forests along Cedar Bayou;
- improve nonpoint source pollution through vegetation restoration and permanent protection of 271.3 acres of PFO/PSS/PEM wetlands; and
- improve floodwater attenuation through the removal of agricultural ditches and restoration and protection of 271.3 acres of PFO/PSS/PEM wetland.

3.0 Site Selection

The proposed wetland impacts are in the primary service area of Gin City (SWG-2011-01181), and Gin City has the appropriate credit type for forested impacts (Riverine Forested). However due to recent credit reservations and executed transactions, Gin City does not have sufficient riverine forested credits available to offset impacts as a result of the proposed Project. Additionally, Gulf Coastal Plains also services the watershed with non-forested credits but does not have sufficient inventory. Therefore, since no approved bank with available in-kind credits or an approved in-lieu fee program exists, the Permittee proceeded with a strategy of pursuing an offsite PRM under and in accordance with 33 CFR § 332.3(b). An onsite PRM is not feasible due to the lack of available land; the Permittee has plans of full site development, and no adjacent undeveloped land is available for purchase. Thus, the Permittee proceeded with an offsite PRM within the same 8-digit HUC North Galveston Bay Subbasin (**Attachment A, Figure 1**). The PRMA is located approximately 4.9 miles upstream of the impact site.

The nature and location of the PRMA within the landscape provides a high degree of confidence for successful restoration. The PRMA is highly suitable and restorable as functional PFO, PSS, and PEM habitat. The sustainable hydrology of the restored wetlands will be driven by overbank flooding and secondarily localized watershed runoff (re-established sheet flow from the north). Therefore, hydrologic re-establishment will utilize natural processes (passive water flow) and will not rely on active water management (i.e., pumping, diversion, impoundment or removal of water through artificial means from a river, stream, or reservoir).

4.0 Site Protection Instrument

Ironwood Holdings, LLC (Landowner) will allow Texas Land Conservancy to place a perpetual conservation easement covering the PRMA to a Conservation Easement Holder (Holder) in accordance with Chapter 183, Subchapter A of the Texas Natural Resources Code. Pursuant to 33 CFR § 332.7(a)(5), the Landowner, acting through the Permittee, will seek CESWG approval of the conservation easement instrument.

As contemplated in 33 CFR § 332.7(a)(1), the conservation easement instrument will establish the right of the Holder to enforce site protections and provide the resources necessary to monitor and enforce these site protections to the extent practicable. In addition, pursuant to 33 CFR

§ 332.7(a)(2), to the extent appropriate and practicable, the conservation easement instrument will prohibit incompatible uses that might otherwise jeopardize the objectives of the compensatory mitigation project. Furthermore, in accordance with 33 CFR § 332.7(a)(3).

Texas Land Conservancy has been identified as the Holder for the conservation easement (**Attachment D**). Texas Land Conservancy is a non-profit conservation organization that is accredited by the National Land Trust Alliance and is a member of the Texas Land Trust Council. Texas Land Conservancy will conduct annual inspections to verify that there are no activities occurring on the PRMA which are inconsistent with the purpose of preserving the conservation values of the restored area.

After recordation in the real property records of Liberty County, a copy of the recorded conservation easement, clearly showing the book, page, and date of filing, will be provided to the CESWG, typically within 6 months of permit issuance. In addition to the regular reporting, compliance with the terms and conditions of the easement will be verified by the Holder annually by field monitoring and reporting. Upon execution of the conservation easement previously described, the Holder will hold and enforce the conservation easement placed on the PRMA, protecting the site in perpetuity as a wetland mitigation conservation site.

5.0 Mitigation Area Baseline Information

The PRMA and impact site both drain to the upper reaches of Galveston Bay via Cedar Bayou. The watershed in which the impacts and the PRMA are situated has experienced tremendous industrial and residential growth in recent years due to the proximity to the City of Houston and the Mont Belvieu area. Houston-Galveston Area Council projects over a 46% population increase in Harris County by 2045 (HGAC 2017); the eastern portion of Harris County comprises approximately half of the North Galveston Bay watershed. Additionally, the site restoration is consistent with and helps the Cedar Bayou Watershed Partnership achieve the water quality goals stated in the 2015 *Cedar Bayou Watershed Protection Plan* (Cedar Bayou Watershed Partnership 2015).

The PRMA currently consists of floodplain forests and agricultural land near the banks of Cedar Bayou. Following the guidelines of the U. S. Army Corps of Engineers 1987 Wetland Delineation Manual (USACE 1987) and U.S. Army Corps of Engineers Regional Supplement for the Atlantic and Gulf Coastal Plain (AGCP Regional Supplement; USACE 2010), wetland delineation data was collected from the entire 1,297-acre tract. DLS requested a jurisdictional determination from the CESWG on July 17, 2018 (SWG-2018-00742). The CESWG issued an approved jurisdictional determination (AJD) on March 13, 2020. The AJD indicates the PRMA contained 236.6 acres of waters of the United States. The AJD and a wetland summary are presented in **Attachment E**.

5.1 Land Use

5.1.1 Historical Land Use

The existing mature forested portions of the PRMA appear to have been forested prior to 1940’s. The open areas have been in agricultural use since the 1940’s or earlier. Some open areas have remained fallow over the last 5-10 years and have been encroached by Chinese tallow. The PFO enhancement area was logged in the 2004 timeframe and since that logging tallow has heavily encroached the PFO enhancement area.

5.1.2 Current Land Use

The majority of the open land in the vicinity of the mitigation tract, including the PRMA, is used for agricultural production (e.g., sod, livestock, commodity crop, etc.). The PRMA is either forested or agricultural.

5.2 Soils

While the PRMA is not underlain with soils that have a high hydric rating, the majority of the PRMA exhibits hydric soil field indicators. The two common hydric soil indicators observed were Depleted Matrix (F3) and Redox Dark Surface (F6). **Table 2** below lists the soil mapping units that occur within the PRMA.

Table 2: Soil Mapping Components Occurring Within the PRMA, Liberty County, Texas

Symbol	Name	Ponding	Drainage Class	Hydric Conditions
LeaA	League Clay, 0 to 1 percent slopes	No	Somewhat Poorly Drained	10%
MofA	Mocarey-Yeaton Complex	No	Moderately Well Drained	2%

5.3 Hydrology

Within the PRMA, the slight topographical changes from east to west toward Cedar Bayou, micro-depressions, and moderately drained soils (percolation) result in slow to moderate runoff. The PRMA receives over bank flooding from Cedar Bayou by being partially located in its floodway and almost entirely within its 100-year floodplain. Surface water flow (sheet flow) is generally north to south and westerly towards Cedar Bayou. Agriculture drainage ditches are present within the PRMA. These ditches transport water south and west to Cedar Bayou. Additionally, small laterals/furrows have been constructed in the agricultural fields to aid in the movement of water offsite into those ditches. Both the agricultural ditches and laterals have reduced the frequency and flooding duration within the proposed rehabilitation and re-establishment portions of the PRMA.

Approximately 87.2% of the restoration portion of the PRMA remains saturated to sufficiently support wetland hydrology. The most common primary indicators observed were oxidized rhizospheres (C3) and water stained leaves (B9). Common secondary indicators included the FAC-neutral test (D5) and crayfish burrows (C8).

5.4 Vegetation

Riverine forested wetlands (i.e., bottomland hardwoods) occur within the PRMA and are contiguous with adjacent bottomland hardwood forests along Cedar Bayou. The bottomland hardwood forest can be further divided into vegetation communities dominated by oaks (*Quercus* spp.) and those dominated by other hardwood species. Tree assemblages and densities vary in different areas of the PRMA and are to be dependent upon hydrology, soil type, and landscape position.

Oak-dominant mixed hardwood vegetation communities occur on elevations with temporarily to seasonally flooded or saturated hydrologic conditions and are classified as *Quercus phellos* - *Quercus nigra* / *Sabal minor* - *Ditrysinia fruticosa* Floodplain Forest (NatureServe, 2019). These forests with a wetter hydrologic regime are dominated by willow oak (*Quercus phellos*), with water oak (*Quercus nigra*), bottomland post oak (*Quercus similis*), and cherry bark oak (*Quercus pagoda*) present. Other trees found in this vegetation community include American elm (*Ulmus americana*), cedar elm (*Ulmus crassifolia*), and green ash (*Fraxinus pennsylvanica*) with some loblolly pine (*Pinus taeda*). Common shrubs in this community include small seedlings and saplings of the dominant tree species, as well as dwarf palmetto (*Sabal minor*), deciduous holly (*Ilex decidua*), and yaupon holly (*Ilex vomitoria*). Ground cover density varies, but generally is very sparse within forested areas due to a mostly closed tree canopy and high density of dwarf palmetto. Common ground cover species include seedlings of tree and shrub species with few scattered herbaceous species.

Wetland herbaceous vegetation communities occur in lower elevations of fallow crop land, active crop land, and pastures. The eastern portions of the PRMA are still actively cultivated. Dominant species within the herbaceous vegetation communities include prairie dogshade (*Limnoscium pumilum*), Bermudagrass, perennial rye grass (*Lolium perenne*), narrow-leaf carpet grass (*Axonopus fissifolius*), bog rush (*Juncus marginatus*), and broom-sedge (*Andropogon virginicus*). Other common species include carix sedges, beaked sedges, and flat top sedges. Chinese tallow has begun to encroach areas that have remained fallow for a few years.

6.0 Determination of Compensatory Mitigation Requirement

The Permittee and DLS used the iHGM approach to assess the functions of impacted wetlands versus the functions restored wetlands associated with the Project. Specifically, the SWG Riverine Forested and Riverine Herbaceous/Shrub iHGM models were used to calculate the number of lost functions of the impacted wetlands and the number of functions proposed to be generated at the PRMA. This model uses several variables to assess three main functions that best describe and measure both forested and herbaceous wetland health in the region:

1. Physical - Temporary Storage and Detention of Surface Water (TSSW)
2. Biological - Maintenance of Plant and Animal Communities (MPAC)
3. Chemical - Removal and Sequestration of Elements and Compounds (RSEC)

Based on habitat type and hydrology regime, the PRMA was divided into eight (8) restoration types or wetland assessment areas (WAAs). Each restoration type was assessed a baseline iHGM FCI score; then, the FCI scores were projected (“the lift”) based on the proposed restoration

activities. PFO iHGM scores were predicted for Years 4 and 10, and PEM/PSS were predicted for Year 5. **Table 3** below presents the iHGM impacts and **Table 4** presents the iHGM generated at the PRMA by habitat type. **Attachment B** provides the restoration map and iHGM baseline and lift data for each restoration type/WAA within the 271.30-acre restoration footprint. A baseline description of each restoration area/WAA is included in **Attachment B**. Wetland impacts will be offset at a 1:1 ratio, since the impacts and proposed PRMA are both located in the North Galveston Bay watershed. Only wetland restoration/preservation acreage was included in the iHGM calculations. The preservation area was assessed a baseline score, and then 1/10th or 10% of the baseline score was applied to determine credit generation. **Attachment B** provides a detailed breakdown of the iHGM for all habitat types.

For the impacts to the man-made pond, the iHGM was not used to assess mitigation requirements since the lacustrine model cannot be compared to the herbaceous/shrub model, nor is the pond large enough to assess with the lacustrine model. The pond appears to have been excavated (by others) in 2010 based on Google Earth[®] aerial photography review. The pond was excavated in an herbaceous ecological environment. The pond is shallow with little to no wetland fringe characteristics and does not provide much ecological benefit to the landscape. Since the pond was excavated in what was likely an herbaceous wetland, herbaceous wetland restoration is appropriate for the mitigation offset. A 2:1 mitigation offset ratio was applied to adjust for out-of-kind mitigation, which equates to 1.14 acres. The mitigation acreage was then rounded up to 1.2 acres or a 2.1:1 ratio.

The use of the forested wetland preservation area meets the required preservation criteria outlined in the 2008 Mitigation rule for the following reasons:

- High functioning forested wetland system that contributes to the watershed via floodplain storage, habitat diversity, forested habitat for wildlife, and filters stormwater runoff from agricultural fields.
- The forested preservation area is ecological sustainable and according to the iHGM model in **Attachment B** exhibits FCI values consistent with high quality wetlands.
- Currently, this area is under a timber tax exemption, which requires a forest management plan, and typically includes a timber harvesting schedule. The area (PRMA enhancement area) just west was logged in 2004. Additionally, mature native forests along Cedar Bayou have been heavily impacted over the last twenty years, especially due to the recent development in Mont Belvieu.
- Lastly, the site will be protected through a conservation easement, and it will be managed long-term (invasive species control).

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PFO, PSS, and PEM Permittee Responsible Mitigation Plan
SWG-2019-00722
February 26, 2020**Table 3. Wetland Impacts by Acreage and Function**

Function	Wetland Impact Acreage	Impact Functional Capacity Units (FCUs)
PFO Impacts		
TSSW	91.57	49.58
MPAC	91.57	52.17
RSEC	91.57	58.08
PSS Impacts		
TSSW	40.78	18.70
MPAC	40.78	28.87
RSEC	40.78	20.14
PEM Impacts		
TSSW	24.49	9.74
MPAC	24.49	12.89
RSEC	24.49	9.92
Pond Impact		
	0.57	N/A

Table 4. Wetland Mitigation by Acreage and Function

Function	Restoration Acreage	Effective Functional Capacity Index (FCI) Lift	Restored Functional Capacity Units (FCUs)
PFO Restoration			
TSSW	187.0	0.327	61.10
MPAC	187.0	0.284	53.20
RSEC	187.0	0.310	58.43
PSS Restoration			
TSSW	64.1	0.480	30.80
MPAC	64.1	0.451	28.90
RSEC	64.1	0.435	27.90
PEM Restoration			
TSSW	20.2	0.532	10.75
MPAC	20.2	0.708	14.31
RSEC	20.2	0.527	10.64
PRM Wetland Acreage Total			271.3

Per **Table 5** below and consistent with the national “no net loss” policy, the PRMA will provide overall net increase in each wetland function. The PFO, PSS, and PEM iHGM workbooks include the iHGM model spreadsheets for the total PRMA lift (**Attachment B**).

Table 5. Wetland Impacts and Wetland Mitigation Summary by Function and Acreage

Impact/Restoration	Acreage	TSSW FCUs	MPAC FCUs	RSEC FCUs
PFO Impacts and Mitigation Summary				
PFO Impacts	-91.18	-49.58	-52.17	-58.08
PFO Restoration	187.00	61.10	53.20	58.43
<i>Net Gain in Acreage and Function</i>	95.82	11.52	1.03	0.35
PSS Impacts and Mitigation Summary				
PSS Impacts	-40.78	-18.7	-28.87	-20.1
PSS Restoration	64.10	30.80	28.90	27.90
<i>Net Gain in Acreage and Function</i>	23.32	12.10	0.03	7.80
PEM Impacts and Mitigation Summary				
PEM Impacts	-24.49	-9.70	-12.90	-9.90
Pond Impact	-0.57	NA	NA	NA
PEM Restoration	20.2	10.75	14.31	10.64
<i>Net Gain in Acreage and Function</i>	-4.86	1.05	1.41	0.74
<i>Total Acreage Gain</i>	114.28 acres			

7.0 Mitigation Work Plan

7.1 Hydrology Restoration

Prior to the commencement of mitigation work, all agricultural activities will cease. In the current condition, approximately 87.2% of the restoration portion of the PRMA has self-sustaining hydrology except for the 34.7 acres of wetland re-establishment, as indicated by the data collected from the wetland datapoints. In its current state, the non-forested portions of the PRMA are being drained by agricultural improvements, such as agricultural ditches and drainage laterals located within fields (**Attachment A, Figure 5**). Hydrology restoration will focus primarily on plugging of those drainages and field laterals on the eastern half/non-forested portions of the PRMA (**Attachment A, Figures 5 and 6**). Drainages/laterals will be plugged, and levees (farm roads) will be levelled to aid in repairing floodplain storage and restore natural movement of water across the site and thereby increasing the frequency and duration of surface hydrology (**Attachment A, Figures 6 – 7E**). Following the cessation of agricultural activities and removal of major drainage improvements, the PFO/PSS restoration portions of the PRMA will be disked multiple times to 1) reduce surface compaction, 2) eliminate competition from pasture grasses, and 3) level drainage laterals to remove surface features that move water offsite (**Attachment A, Figures 5 and 6**). The PEM restoration portions will not be disked.

The soil surface will be subsoiled in the PFO/PSS (i.e., ripped) to a depth of 14 to 16 inches using a straight shank Eco-Till™ ripper Allen et al. (2000) suggests ripping of compacted soils will increase water infiltration. Ripped furrows will be spaced 10 feet apart to correspond with plant spacing. The straight shank minimizes surface soil disturbance as opposed to a parabolic shank, which may leave air pockets below the surface. The ripper will have an attachment immediately

behind the shank, which will create a slightly elevated row of loose soil no greater than 6 inches above grade. This loose soil will settle back into the rip to ensure the rip seals and minimizes the risk of root exposure to air. Ripping will be conducted in the late summer-fall (i.e., August through October). Immediately following subsoiling, a pre-emergent herbicide will be applied in a four-foot band along each ripped furrow. Due to inherent problems of ripping and disking during wet periods on heavy clay soils, this work is planned during dry periods in the late summer and fall. Note: the subsurface subsoiling will not occur in the PEM restoration areas unless soil compaction does not allow for a seedbed that allows for germination.

7.2 Restoration of Plant Community

Fire breaks will be established between habitat types. These fire breaks will be maintained (mowed) during dry periods so that an established fire lane is present between the different fire/habitat regimes.

PFO Rehabilitation

The PRMA's historic PFO wetland community will be re-established by planting a mixture of native bottomland hardwood seedlings. The selection of planting species was based on species observed within the adjacent forested wetlands located along Cedar Bayou (Preservation Area). Immediately following subsoiling, a pre-emergent herbicide will be applied in a four-foot band along each ripped furrow. The herbicide will help eliminate herbaceous competition prior to planting, which will aid in the establishment of seedlings.

During the planting season (January to February), an aggregate of 436 hardwood seedlings will be planted per acre [i.e., hard and soft mast]. Seedlings will be pre-mixed and planted at approximately 10-foot intervals (**Attachment F; Table F-1**).

For herbaceous and grass species control after planting, a pre-emergent herbicide and/or disking may be used to reduce plant competition. Controlling herbaceous species in year 1 will allow the seedlings to establish and reduce weedy competition. The herbaceous species will not be controlled after Year 1. Following stem planting but prior to the planted seedlings breaking dormancy (i.e., visible signs of budding); a second application of a pre-emergent herbicide may be applied. Controlling herbaceous species in year 1 will allow the seedlings to establish and reduce weedy competition. The herbaceous species will not be controlled after year 1.

PFO Enhancement and Preservation

Within the PFO enhancement portion of the PRMA, Chinese tallow has heavily encroached. Chinese tallow will be mechanically removed, stacked and then burned. Native trees species over 5 inches in diameter will be avoided during Chinese tallow removal, if possible. Like the rehabilitation area, after removal of non-native vegetation, hardwood seedlings will be planted at a rate of 436 trees/acre. This planting number may be adjusted downward, where high counts of native trees are present within the enhancement area. Those native trees would remain in lieu of planting seedlings.

No planting will occur in the PFO preservation area. The area will be treated for invasive species.

Woody species, including tallow will be controlled with triclopyr, and for invasive herbaceous species, a glyphosate and halosulfuron-methyl based mixture will be applied. Individual stems/plants will be targeted so that desirable species are not affected by the herbicide treatment. Invasive woody species at a midstory or overstory level will be girdled/hacked and sprayed with herbicide.

PEM

To supplement the existing herbaceous cover, a seed mixture of native herbaceous species will be purchased from local plant material producers located in southeast Texas or within the Gulf Coastal Plain region. The seed planting mix will consist of commercially available facultative or wetter herbaceous species (e.g., switchgrass [*Panicum virgatum*], gamagrass [*Tripsacum floridanum*], brownseed paspalum [*Paspalum plicatulum*], rattlesnake master [*Eryngium yuccifolium*], slender blazing star [*Liatris acidota*], etc.) [Attachment F; Table F-2]. In the southeast Texas coastal plain, prescribed fire is a natural tool to control woody encroachment and to maintain a diverse herbaceous-shrub ecosystem. Burning will be conducted to select for fire tolerant native herbaceous species and control woody encroachment of Chinese tallow. Controlled burning will occur during favorable conditions for safety and smoke management (e.g., wind direction, wind speed). The initial burn will be applied when an adequate fuel supply (litter) is available and may occur during any season in Year 0 to Year 3. By Year 5, long-term management will consist of spot-treating with herbicides to control species such as Chinese tallowtree and prescribed fire on a three to five-year schedule to control woody and herbaceous fire-intolerant, invasive species. The Permittee/DLS will select a Certified and Insured Commercial Burn Manager (Burn Manager) licensed by the Texas Department of Agriculture.

PSS

The PSS plant community restoration will mimic the PEM restoration with the exception of shrub plantings. Shrub species will be planted at approximately 14-foot by 14-foot intervals or 222 stems per acre. Planted shrubs will consist of the species and percentages listed in Table F-3 in Attachment F. By Year 5, long-term management will consist of spot-treating with herbicides to control species such as Chinese tallow and prescribed fire on a five year schedule to control woody and herbaceous fire-intolerant, invasive species. The five year cycle will allow native shrubs to sprout/regenerate after prescribed fire.

8.0 Maintenance Plan

The PRMA will be monitored and maintained by the Permittee. The Permittee will commit to restore the wetland functions and maintain wetland habitats in accordance with the provisions in this PRMP. Invasive species will be controlled on both the PFO portion and PEM/PSS portions of the PRMA. During the establishment phase for the PRMA, which is 15 years for PFO and 5 years for PEM/PSS, herbicide will be applied to invasive species bi-yearly, beginning one full year after restoration. After long-term performance standards have been met, herbicide application will be applied on a 3 to 5-year cycle, dependent on invasive species presence. Woody species, including tallow will be controlled with triclopyr, and for invasive herbaceous species, a glyphosate and halosulfuron-methyl based mixture will be applied. Individual stems/plants will

be targeted so that desirable species are not affected by the herbicide treatment. If an invasive woody species reaches a midstory or overstory level, it will be girdled/hacked and sprayed with herbicide. Herbicide applications will be applied during the spring/summer months. The easement holder will conduct annual site inspections to ensure the conditions within the conservation easement are being met.

9.0 Performance Standards

The following outlines the performance standards for the PRMA with a native, facultative wet or wetter PFO, PSS, and PEM community and the control of invasive species within the PRMA. The PFO preservation areas will only have an invasive species performance standard along with the commitment of no disturbances that conflict with the conservation easement.

9.1 Initial Success Criteria (Year 1)

9.1.1 Hydrology

PFO/PEM/PSS Restoration

Ground surface elevations must be conducive to the re-establishment of wetland forested, herbaceous and scrub/shrub vegetation and the maintenance of hydric soil characteristics. All alterations of the natural topography that have affected the duration and coverage of surface water will have been removed or otherwise rendered ineffective as discussed in **Section 7.1**. Hydrology success criteria apply only to the wetland rehabilitation, enhancement, and re-establishment areas. It is expected that the preservation areas would continue to exhibit wetland characteristics.

9.1.2 Vegetation (Year 1)

PFO Restoration

A minimum of 200, planted seedlings per acre must survive through the end of the second spring following the planting (i.e., year 1) for re-establishment portion of the PRMA. Those surviving seedlings must be representative both in species composition and percentage identified in **Section 7.2**. This criterion will apply to initial plantings, as well as any subsequent replanting implemented to meet this requirement. The forested preservation area and restoration areas will not exhibit more than 5% basal area per acre for woody species, and invasive species will not represent more than 5% of the herbaceous stratum.

PEM Restoration

By Year 1, vegetative monitoring data will establish the following criteria:

- The PRMA is seeded with appropriate, commercially available, facultative or wetter herbaceous species;
- herbaceous vegetation will exhibit a minimum of 60% absolute cover of facultative or wetter species;
- invasive species cover will represent less than 10% absolute cover; and

- tree strata⁷ will represent less than 5% absolute cover of the PEM restoration areas.

PSS Restoration

By Year 1, vegetative monitoring data will establish the following criteria:

- the PRMA is seeded with appropriate, commercially available, facultative or wetter herbaceous species;
- herbaceous vegetation will exhibit a minimum of 60% absolute cover of facultative or wetter species;
- shrub vegetation will exhibit a minimum of 11% absolute cover of facultative or wetter species;
- invasive species cover will represent less than 10% of absolute cover; and
- tree strata will represent less than 5% absolute cover of the PSS restoration areas.

9.2 Interim Success Criteria (Year 3 and Year 5 for PFO)

9.2.1 Hydrology

PFO Restoration

By Year 3, or two years following attainment of the one-year performance criteria, site hydrology for the re-establishment mitigation area will be restored such that the PRMA meets the wetland hydrology criterion as described in the 1987 Manual and AGCP Regional Supplement. The rehabilitation and enhancement area will continue to meet wetland hydrology criterion. By Year 5, all restored must meet the wetland hydrology criterion. For both Year 3 and Year 5, data demonstrating the presence of wetland hydrology will be collected and submitted to the CESWG in the monitoring report. If Year 5 monitoring indicates the site is not meeting interim success criteria, annual monitoring will continue until the Year 5 criteria is met for at least three consecutive years.

PEM/PSS Restoration

By Year 3, or two years following attainment of the one-year performance criteria, site hydrology for the re-establishment mitigation area will be restored such that the PRMA meets the wetland hydrology criterion as described in the 1987 Manual and AGCP Regional Supplement. Data demonstrating the presence of wetland hydrology will be collected and submitted to the CESWG in the monitoring report.

⁷ All references to strata are as defined in the AGCP Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coast Plan Region (Version 2.0). USACE 2010.

9.2.2 Vegetation

PFO Restoration (Year 3 and 5)

For PFO restoration areas, a minimum of 151 seedlings/saplings per acre must be present at the end of the second year (i.e., year three) following successful attainment of the one-year survivorship criteria. Trees, saplings, and seedlings established through natural recruitment may be included in this tally. Surviving hard mast seedlings should be representative of the species composition and percentage identified in **Section 7.2**.

By Year 5 for PFO restoration areas, four years following successful attainment of the Year 1 survivorship criteria, the PRMA will be virtually free of introduced vegetation (i.e., approximately 5% or less on an acre-by-acre basis). Developing plant community must exhibit characteristics and diversity indicative of a viable native PFO community commensurate with stand age and site conditions by Year 5. Achievement of wetland vegetation dominance is defined as a vegetation community where more than 50% of all dominant species are facultative (“FAC”) or wetter as determined by the appropriate test per the AGCP Regional Supplement. Within the PFO preservation area, woody invasive species will not represent more than 5% basal area per acre, and invasive herbaceous species will comprise more than 5% of the herbaceous stratum.

PEM Restoration

By Year 3, vegetative monitoring data will establish the following criteria:

- exclusive of invasive species, herbaceous vegetation will exhibit a minimum of 70% absolute cover of facultative or wetter species;
- invasive species will represent less than 5% absolute cover; and
- tree strata will represent less than 5% absolute cover of the PEM restoration areas.

PSS Restoration

By Year 3, vegetative monitoring data will establish the following criteria:

- exclusive of invasive species, herbaceous vegetation will exhibit a minimum of 70% absolute cover;
- herbaceous vegetation will exhibit a minimum of 70% herbaceous absolute cover of facultative or wetter species;
- shrub cover will exhibit a minimum of 25% absolute cover of facultative or wetter species;
- invasive species cover will represent less than 5% absolute cover; and
- tree strata will represent less than 5% absolute cover of the PSS restoration areas.

9.3 Long-term Success Criteria (Year 5 for PEM/PSS and Year 15 for PFO)

9.3.1 Hydrology

By Year 5 and beyond, four years following successful attainment of the Year 1 performance criteria, the PRMA will meet the wetland criterion for site vegetation, soils and hydrology as described in the 1987 Manual the AGCP Regional Supplement. To ensure the restoration areas are still meeting wetland hydrology criterion, the restoration areas within the PRMA will be monitored and data demonstrating the presence of wetland hydrology will be collected and submitted to the CESWG in the monitoring report. Year 5 would conclude the hydrology monitoring for the non-forested restoration areas, and monitoring within the forested restoration areas would continue until Year 15.

9.3.2 Vegetation

PFO Restoration

By Year 15 the wetland restoration portion of the mitigation area, crown cover should be approximately 80% and the PRMA will be essentially void of introduced trees such that introduced trees are removed from the site and comprise less than 5% of the PRMA on a per acre basis (e.g., Chinese tallow). Furthermore, an active treatment program for invasive species will continue as part of the long-term maintenance program. If the CESWG determines that thinning is necessary to maintain or enhance the ecological value of the PRMA, the Permittee will develop and implement a thinning plan in coordination with approval by the CESWG. Within the PFO preservation area, woody invasive species will not represent more than 5% basal area per acre, and invasive herbaceous species will comprise more than 5% of the herbaceous stratum.

PEM Restoration

By Year 5, vegetative monitoring data will establish the following criteria:

- exclusive of invasive species, herbaceous plants will exhibit a minimum of 90% absolute cover;
- 60% of restored vegetation will exhibit FACW or obligate wetland plant indicator status;
- invasive species cover will represent less than 5% absolute cover; and
- tree strata will represent less than 3% absolute cover of the PEM restoration areas.

PSS Restoration

By Year 5, vegetative monitoring data will establish the following criteria:

- exclusive of invasive species, herbaceous plants will exhibit a minimum of 80% absolute cover;
- 60% of restored vegetation will exhibit FACW or obligate wetland plant indicator status;
- shrub vegetation will exhibit a minimum of 34% absolute cover;

- invasive species cover will represent less than 5% absolute cover; and
- tree strata will represent less than 3% absolute cover of the PSS restoration areas.

10.0 Monitoring and Reporting Protocols

10.1 Monitoring

The following describes the field methods and data collection that will occur during monitoring. The reporting protocol, including content, frequency, and timing is discussed in **Sections 10.2** and **10.3**.

PFO Restoration

The Permittee agrees to perform all work necessary to monitor the site to determine compliance with the success criteria established in **Section 9.0**. The Permittee will monitor the site in the growing season of each monitoring year to demonstrate achievement of the long-term success criteria using established protocols. Eight monitoring stations will be established in the PFO portion of the PRMA (**Attachment A, Figure 4**). A vegetation survey will occur immediately after planting to establish baseline data (as-built report). In Years 1, 3, 5, 7, 13, and 15, the number of stems, growth, and species of planted trees will be determined during to show establishment and development of the PFO. Additionally, absolute cover of vegetation will be documented. The forested plant community will be sampled utilizing a circular 1/10th-acre, monitoring plot (radius = 37.4 feet). The Permittee will also collect data on hydrologic conditions as necessary to document evidence of wetland hydrology in accordance with the performance standards listed in **Section 9.0**. Documentation will include descriptions of the upper 12 inches of the soil profile sufficient to demonstrate hydric soil properties. The monitoring plot will be identified with GPS coordinates recorded at plot center. A map depicting the location of the plot and a listing of the plot coordinates will be provided to CESWG. Station sampling will occur following tree planting to establish baseline data and then during monitoring years through Year 15.

Data collected for initial, interim and long-term monitoring will use the same sample plot as established in the as-built report. For each monitoring report, the Permittee will provide digital images taken from ground level in each cardinal direction from monitoring plot center and from elevated positions to document overall conditions.

After achieving the long-term success criteria (Year 15), permanent monitoring plot sampling will cease. Thereafter, for five years, annual inspections will occur only for monitoring and controlling invasive species. The monitoring station will provide a fixed location to monitor invasive species, native plant cover, and hydrologic conditions.

PEM/PSS Restoration

The Permittee agrees to perform all work necessary to monitor the site to demonstrate compliance with the success criteria established in **Section 9.0**. The Permittee will monitor the site in Year 1, Year 3, and Year 5 during the growing season through achievement of the long-term success criteria using monitoring protocols described in this Section. The Permittee will collect data on the percent cover and type of herbaceous and shrub vegetation to ensure successful establishment of

a hydrophytic plant community and collect data on hydrologic conditions as necessary to document evidence of wetland hydrology in accordance with the performance standards listed in **Section 9.0**. Hydrology will be monitored based on the methods described in the 1987 Manual and 2010 AGCP Regional Supplement. Wetland hydrology conditions will be documented on a monitoring datasheet and presented in the subsequent monitoring report. Documentation will include descriptions of the upper 12 inches of the soil profile sufficient to demonstrate hydric soil properties and the presence of hydric soil indicators.

Immediately after initial construction, baseline plot data will be collected. DLS will establish approximately six, 1/20th-acre continuous monitoring plot (**Attachment A, Figure 4**). Thereafter, the plot will be surveyed during the monitoring Years or until the PRMA successfully meets or exceeds established long-term criteria. The location of each monitoring plot will be identified, recorded, and reported by GPS coordinates for each plot center. A map depicting the location of the six monitoring stations with a listing of the station coordinates will be provided with the as-built report.

Station sampling will occur following plant material distribution to establish baseline data and then during monitoring years through Year 5. If Year 5 monitoring indicates the site is not meeting long-term success criteria, annual monitoring will continue until the Year 5 criteria is met for at least three consecutive years. The survey of the monitoring stations will provide fixed locations to evaluate percent cover of herbaceous and shrub vegetation.

10.2 As-built Report

The As-built Report will be submitted to the CESWG within 120 days following completion of all the work required to restore the PRMA. In detail, the As-built Report will describe the completed hydrologic work within the re-establishment and rehabilitation areas and an estimated tally of planted stems by species within the restoration areas. Herbaceous species re-establishment (seed distribution) will be reported and include the following information: species list, seed source, existing percent ground cover by species, and total percent ground cover. No significant deviation from the mitigation work plan described in **Section 7.0** will occur without prior approval from the CESWG. If deviation does occur, the As-built Report will include a summary of the CESWG coordination and a description of and reasons for any approved deviation.

10.3 Initial and Interim Success Criteria Reporting

Monitoring reports will be submitted to the CESWG by December 15 of the year performance / success criteria monitoring is required (i.e., as-built report, Year 1, Year 3, Year 5, Year 7, Year 10, Year 13, and Year 15). Each monitoring report will include data sufficient for comparison to the performance standards. The Permittee should also include a discussion of all activities, which took place at the site since the previous monitoring effort. At a minimum, monitoring reports should include the following:

- 1) Purpose and goals of mitigation site
- 2) Mapping of the monitoring stations
- 3) Brief summary of mitigation strategy/actions

- 4) Date mitigation action commenced
- 5) Dates of site inspections and summary of any issues of note
- 6) Dates and description of maintenance activities
 - a) identify measures to eradicate exotic/invasive species and document results of these efforts
- 7) Summary of observations and measurements
 - a) digital images taken from ground level at the monitoring station to document the overall conditions
 - b) a description of the general condition of the plant community and a discussion of likely causes for deficiency
 - c) a general discussion of hydrologic conditions at the monitoring stations
 - d) a description of wildlife usage at the monitoring stations, including any herbivory problems if applicable
 - e) a description of the generalized degree and distribution of exotic/invasive species
- 8) Assessment of success toward the performance standards or success criteria

11.0 Long-term Management Plan

To ensure the long-term sustainability of the resource, the Permittee will perform maintenance and long-term management of the site. These activities will be minimal as the project is anticipated to be a self-sustaining wetland with management activities limited primarily to items such as inspections, controlling invasive species (e.g., spot herbicide treatments), and boundary maintenance. Long-term management will generally consist of spot-treating with herbicides to control species such as Chinese tallow on a three to five-year schedule to control woody and herbaceous invasive species.

The Owner will be the Long-term Steward charged with management and maintenance responsibilities once long-term success criteria in **Section 9.0** are achieved. The Owner requests the option of appointing a different Long-term Steward in accordance with 33 CFR 332.7(d)(1). The appointment of such an entity shall be approved by the CESWG.

12.0 Adaptive Management Plan

An adaptive management plan for a compensatory mitigation project is generally described as a management strategy to address unforeseen changes in site conditions or other mitigation components of the mitigation project. Adaptive management plans facilitate the decision-making process for revising mitigation plans and instituting measures to address both foreseeable and unforeseeable circumstances that adversely affect mitigation success. An adaptive management plan, contingencies, and remedial responsibilities will be implemented if the compensatory mitigation project cannot be implemented in accordance with the approved mitigation plan or if monitoring or other information indicates that the compensatory mitigation project is not progressing towards meeting its performance standards as anticipated. If such circumstances arise, the Permittee must notify the CESWG as soon as possible. The notice will include an explanation

for the changes or potential deficiency and will outline proposed specific practices and measures that will guide decisions for revising the PRMP if needed.

An adaptive management plan will consist of activities that are not normally performed as general maintenance. As the PRMA matures, the Permittee/DLS will monitor as required to ensure the project is meeting the performance standards. However, as the body of ecological restoration knowledge advances, novel methods may be incorporated to improve the overall project quality. Prior to implementation of a new technique or method, it will first be approved by the CESWG.

If monitoring reveals that initial, interim, or long-term success criteria have not been met or do not continue to be met after initially being satisfied, an adaptive management plan with contingencies and remedial responsibilities will be developed and implemented. In the event of a deficiency such as poor planting survival, hydrology construction repairs, or invasive species encroachment, the Permittee shall provide a report that includes the implemented adaptive management plan to the CESWG. The report will provide an explanation for the deficiency, outline the implemented adaptive management practices and outline the implemented adaptive management practices.

If success criteria for a given monitoring period are not met, the Permittee will evaluate and implement adaptive management actions such as those outlined below. The listed potential management activities are not fully inclusive of suitable corrective measures to address any identified deficiencies at the site and do not consist of general maintenance activities such as routine, invasive species control. The potential deficiencies described below are those most likely to occur on projects of this type and scale. Identification of these potential deficiencies and the timely application of adaptive management strategies is the Permittee's effort to remain in compliance with terms set in the PRMP and work plan. The Permittee will provide the CESWG with a report detailing the deficiency, strategy, and implemented techniques.

- Invasive species - If during routine monitoring or general observations, an invasive species such as Chinese tallow is encroaching on an area, the Permittee will implement an adaptive management strategy to remove / control the invasive species.
- Tree survival – If during routine monitoring or general observations, tree survival performance standards are not being met, the Permittee will plant additional tree during the next planting season (winter).
- Hydrology construction repairs - If during routine monitoring or general observations, wetland re-establishment areas are not meeting hydrology standards on account of erosion issues, the Permittee will take appropriate corrective measures for erosion abatement.

If the CESWG determines that the PRMA is at risk of not achieving the terms and intent of this PRMP, the CESWG will provide written notice to the Permittee that includes a detailed description of the non-compliance determination. The Permittee shall submit a written adaptive management plan to the CESWG for review and approval within forty-five (45) days of receiving written notice of non-compliance. The adaptive management plan shall identify the cause of the non-compliance, the necessary remedial measures, and a timeline for implementing said measures to bring the PRMA into compliance. To the extent practicable, the CESWG shall approve or disapprove the adaptive management plan, provided sufficient information and acceptable measures are contained in the plan.

13.0 Financial Assurances

Short-term and Establishment

The total financial exposure for construction and establishment of the PRMA is \$220,654.08. The construction and establishment financial assurances will be provided by a cash escrow. The PFO and PEM/PSS construction cost estimates with 5% contingency adjustments at Year 0 are \$41,650.06 and \$63,788.55, respectively (**Attachment G**). The PEM/PSS establishment cost estimate for Year 1 through Year 5 is \$39,231.53, and the PFO establishment cost through Year 15 is \$75,983.94, which includes a 2.45% inflationary adjustment. To provide financial assurance protection during construction (Year 0) and establishment (Year 1 through Year 10) and per 33 CFR 332.3(n), DLS, as the Responsible Party shall establish a cash escrow to protect the PRMA's mitigation assets in the event of non-compliance or PRMA failure ensuring that sufficient funds are available to a third party. As interim success and long-term success criteria are met, release milestone monies will be released to the Permittee or its designated agent, per the Establishment Cost Table in **Attachment G**.

Long-term

Once the long-term criteria are achieved, the estimated long-term, annual cost to maintain the PRMA is \$7,942.01 per year (**Attachment G**). An analysis is presented in **Attachment G** for both the forested and PEM/PSS long-term financials. To ensure sufficient long-term funding is available for perpetual maintenance and protection of the PRMA, the Permittee/DLS will establish one cash escrow "Long-term Land Management and Maintenance" (LTMM) endowment in the approximate amount of \$226,914.57. The National Fish and Wildlife Foundation (NFWF) will manage the LTMM endowment. To structure the LTMM, the mitigation provider will enter a PRM Endowment Agreement with NFWF. Accrued interest of the account shall be used for the administration, operation, maintenance, and/or other purposes that directly benefit the PRMA.

14.0 References

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Attachment A. Figures

Figure 1. Vicinity, Watershed, and Ecoregion Map

Figure 2. Topographic Map

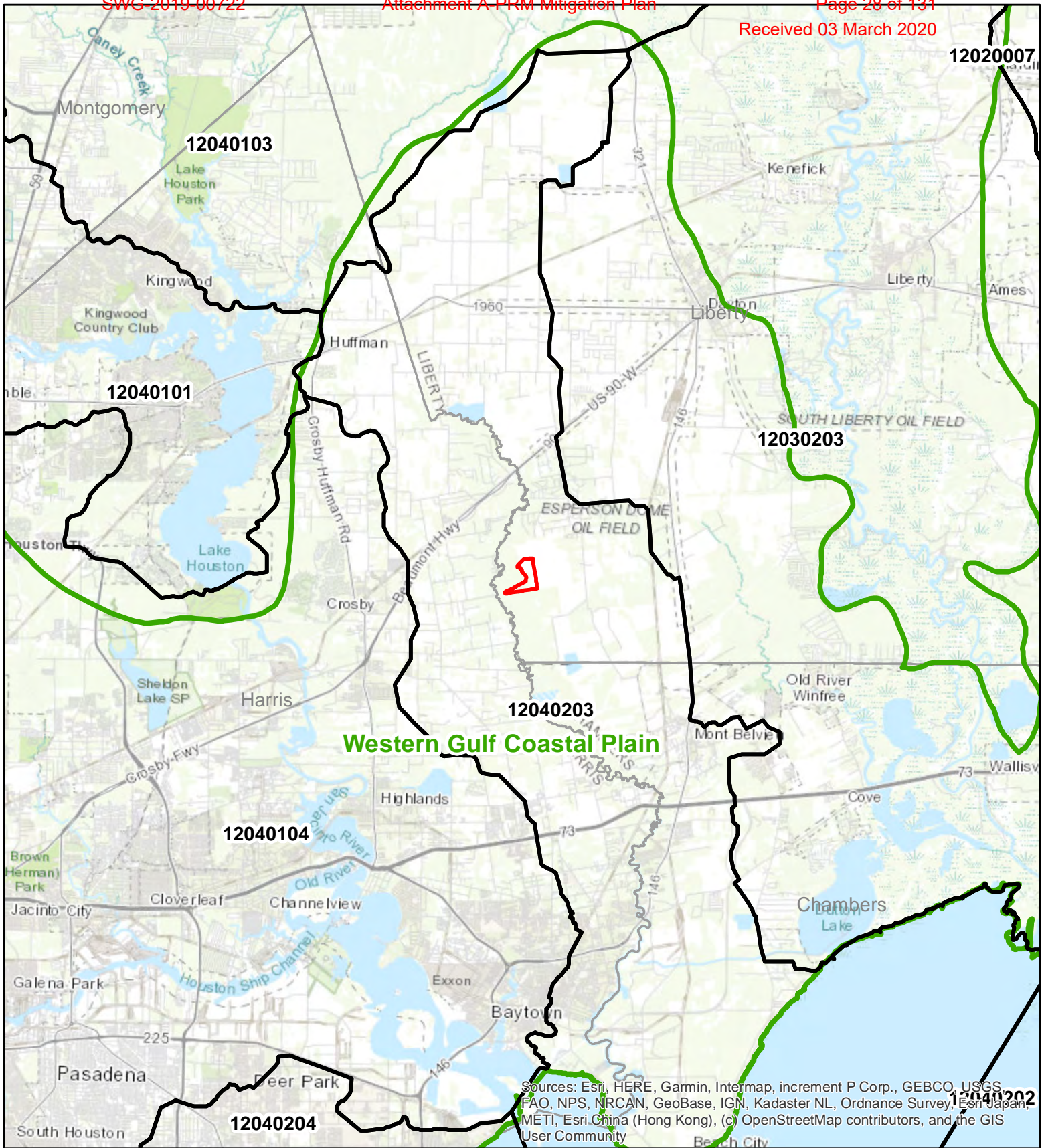
Figure 3. Aerial Map with Soil and Floodplain

Figure 4. Mitigation Features Map

Figure 5. Pre-construction Hydrology

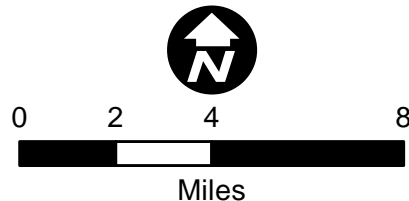
Figure 6. Post Construction Hydrology

Figure 7A-E. Plan View and Cross Sections



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

- PRMA (288.6 ac)
- 8-Digit HUC
- EPA Level III Ecoregion

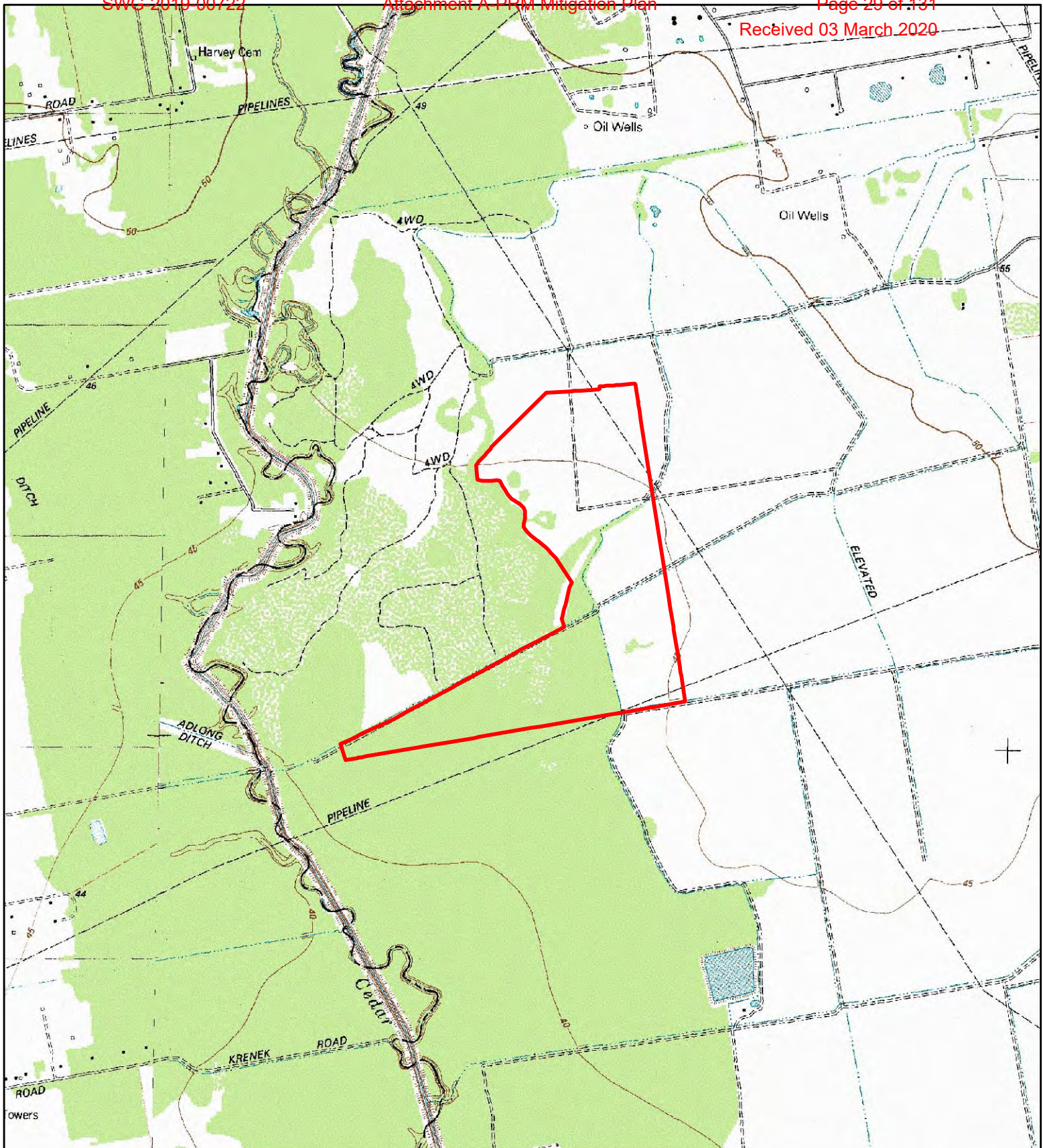



McCoy Ranch Mitigation Area
Lone Star NGL Mont Belvieu, LP
Burton Station Project

Mitigation Features Map
Liberty County, TX

Created : TSC/ARCVIEW	
Approved: SR	
Date : 5/27/2020	
Map No. : 01_Vicinity	

FIGURE 1



 PRMA (288.6 ac)



0 1,000 2,000 4,000



Feet

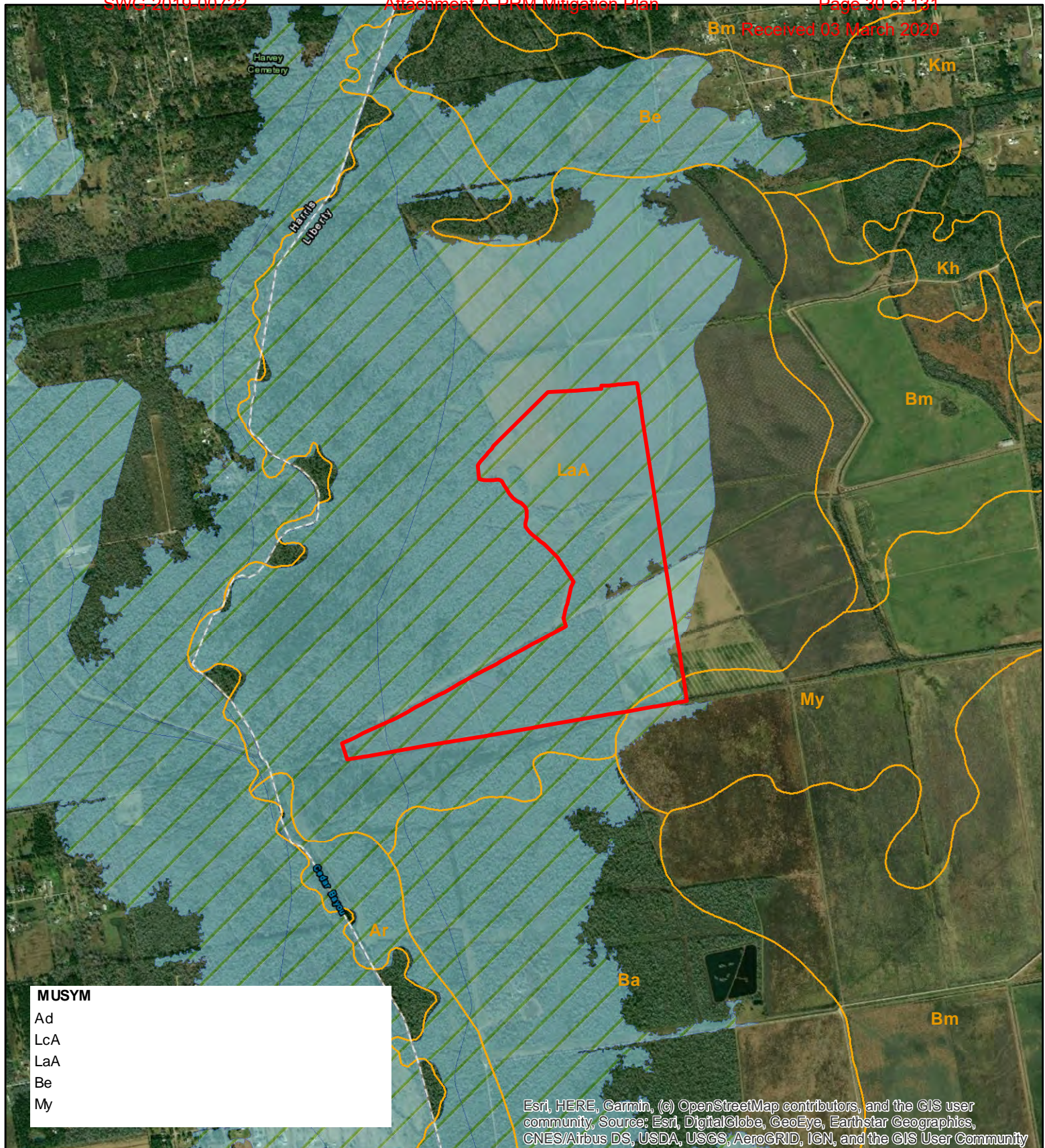
McCoy Ranch Mitigation Area
Lone Star NGL Mont Belvieu, LP
Burton Station Project
TOPOGRAPHIC MAP
Liberty County, TX

Created : TSC/ARCVIEW
 Approved: SR
 Date : 5/27/2020
 Map No. : 02_Topo

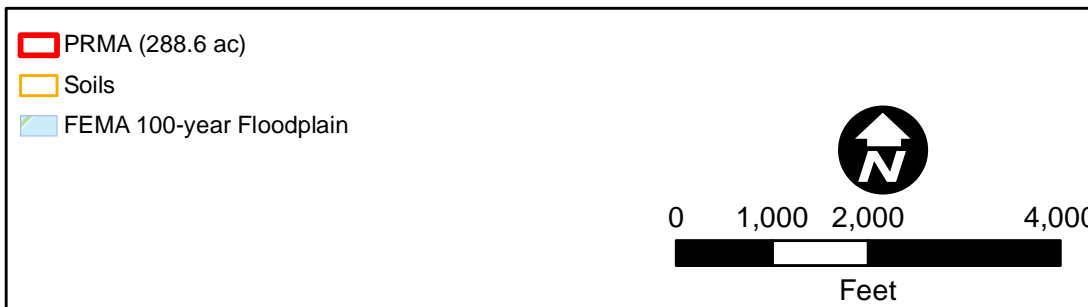


FIGURE 2

Bm Received 03 March 2020



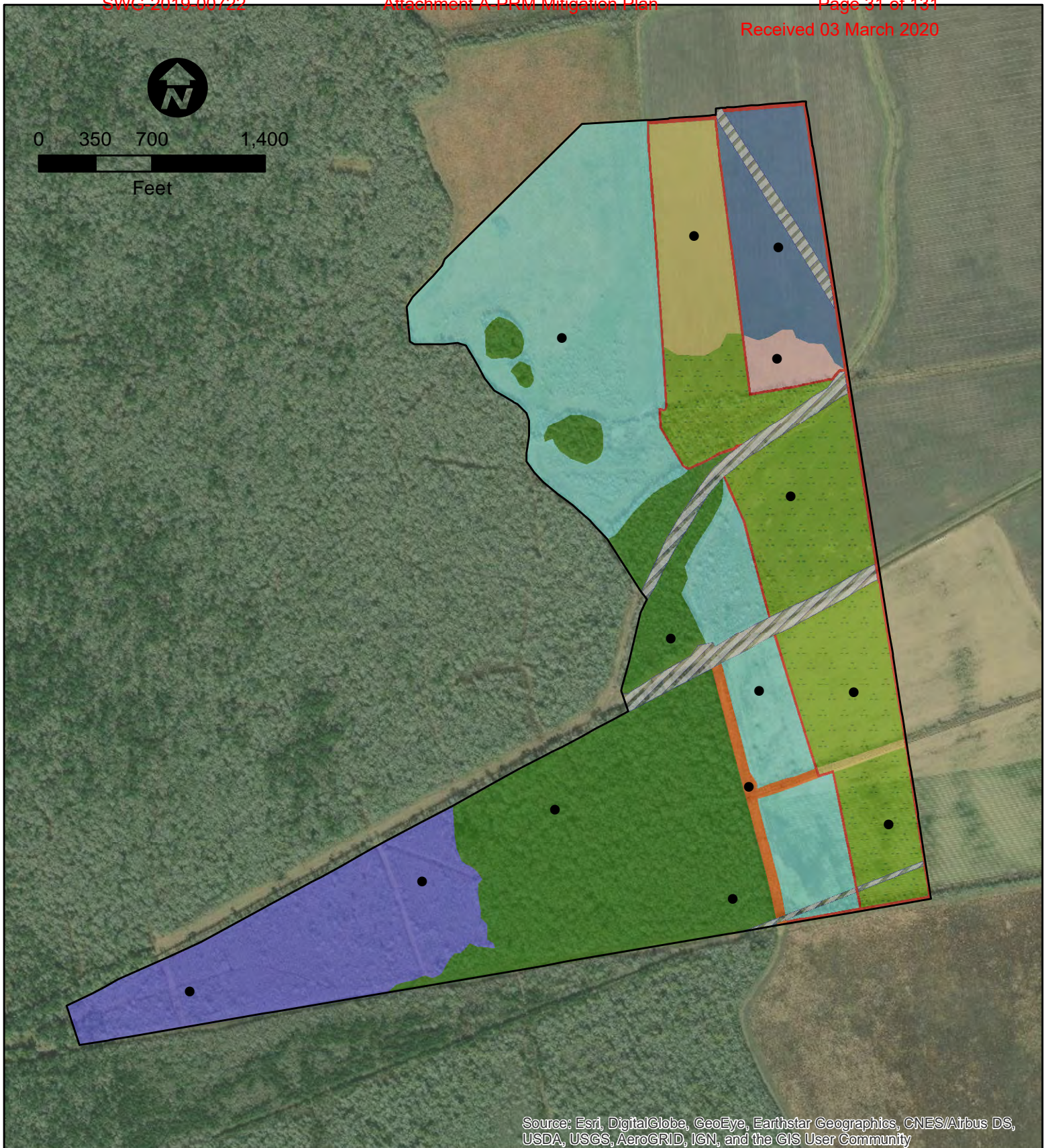
Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



McCoy Ranch Mitigation Area
Lone Star NGL Mont Belvieu, LP
Burton Station Project
AERIAL MAP WITH SOIL
AND FLOODPLAIN
Liberty County, TX

Created : TSC/ARCVIEW	
Approved: SR	
Date : 5/27/2020	
Map No. : 03_SoilsFloodplain	

FIGURE 3



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

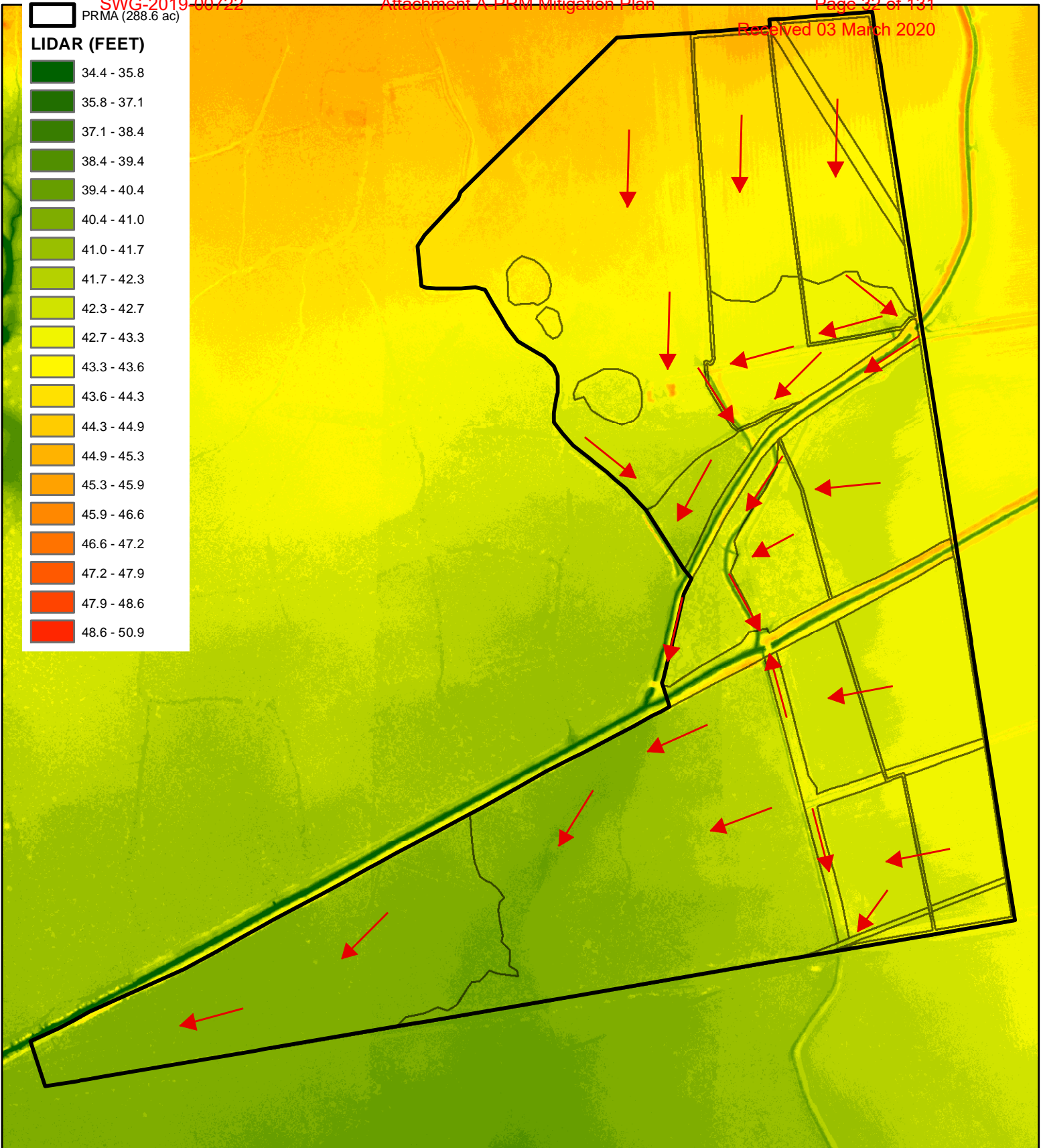
PRMA (288.6 ac)	PFO Preservation (70.6 ac)
Monitoring Plots	PFO Rehabilitation (75.6 ac)
PEM Re-establishment (16.6 ac)	PSS Re-establishment (15.0 ac)
PEM Rehabilitation (3.6 ac)	PSS Rehabilitation (49.1 ac)
PFO Re-establishment (3.0 ac)	Fire Break (6.3 ac)
PFO Enhancement (37.6 ac)	Non-Mitigation (11.2 ac)

McCoy Ranch Mitigation Area Lone Star NGL Mont Belvieu, LP Burton Station Project Mitigation Features Map Liberty County, TX		
Created : TSC/ARCVIEW		
Approved: SR		
Date : 5/27/2020		
Map No. : 04_Features		
FIGURE 4		

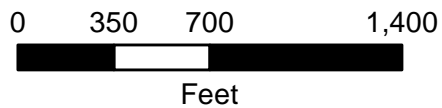
PRMA (288.6 ac)

LIDAR (FEET)

- 34.4 - 35.8
- 35.8 - 37.1
- 37.1 - 38.4
- 38.4 - 39.4
- 39.4 - 40.4
- 40.4 - 41.0
- 41.0 - 41.7
- 41.7 - 42.3
- 42.3 - 42.7
- 42.7 - 43.3
- 43.3 - 43.6
- 43.6 - 44.3
- 44.3 - 44.9
- 44.9 - 45.3
- 45.3 - 45.9
- 45.9 - 46.6
- 46.6 - 47.2
- 47.2 - 47.9
- 47.9 - 48.6
- 48.6 - 50.9



PRMA (288.6 ac)

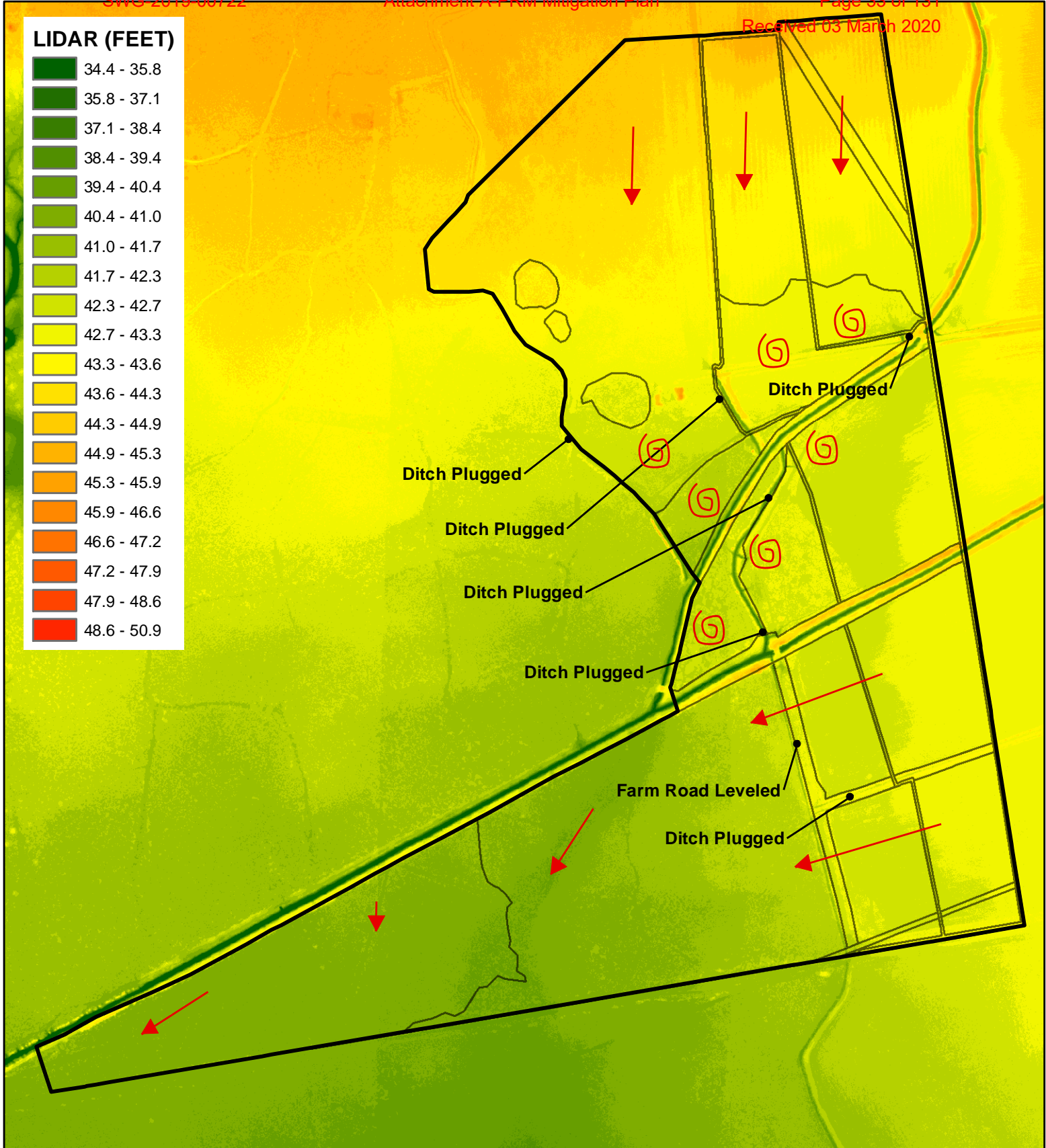


McCoy Ranch Mitigation Area
Lone Star NGL Mont Belvieu, LP
Burton Station Project
PRE-CONSTRUCTION HYDROLOGY
Liberty County, TX

Created : TSC/ARCVIEW
 Approved: SR
 Date :5/27/2020
 Map No. : 05_PreConst



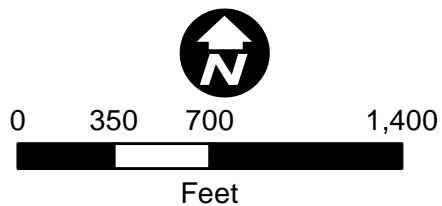
FIGURE 5



LIDAR (FEET)

34.4 - 35.8
35.8 - 37.1
37.1 - 38.4
38.4 - 39.4
39.4 - 40.4
40.4 - 41.0
41.0 - 41.7
41.7 - 42.3
42.3 - 42.7
42.7 - 43.3
43.3 - 43.6
43.6 - 44.3
44.3 - 44.9
44.9 - 45.3
45.3 - 45.9
45.9 - 46.6
46.6 - 47.2
47.2 - 47.9
47.9 - 48.6
48.6 - 50.9

PRMA (288.6 ac)

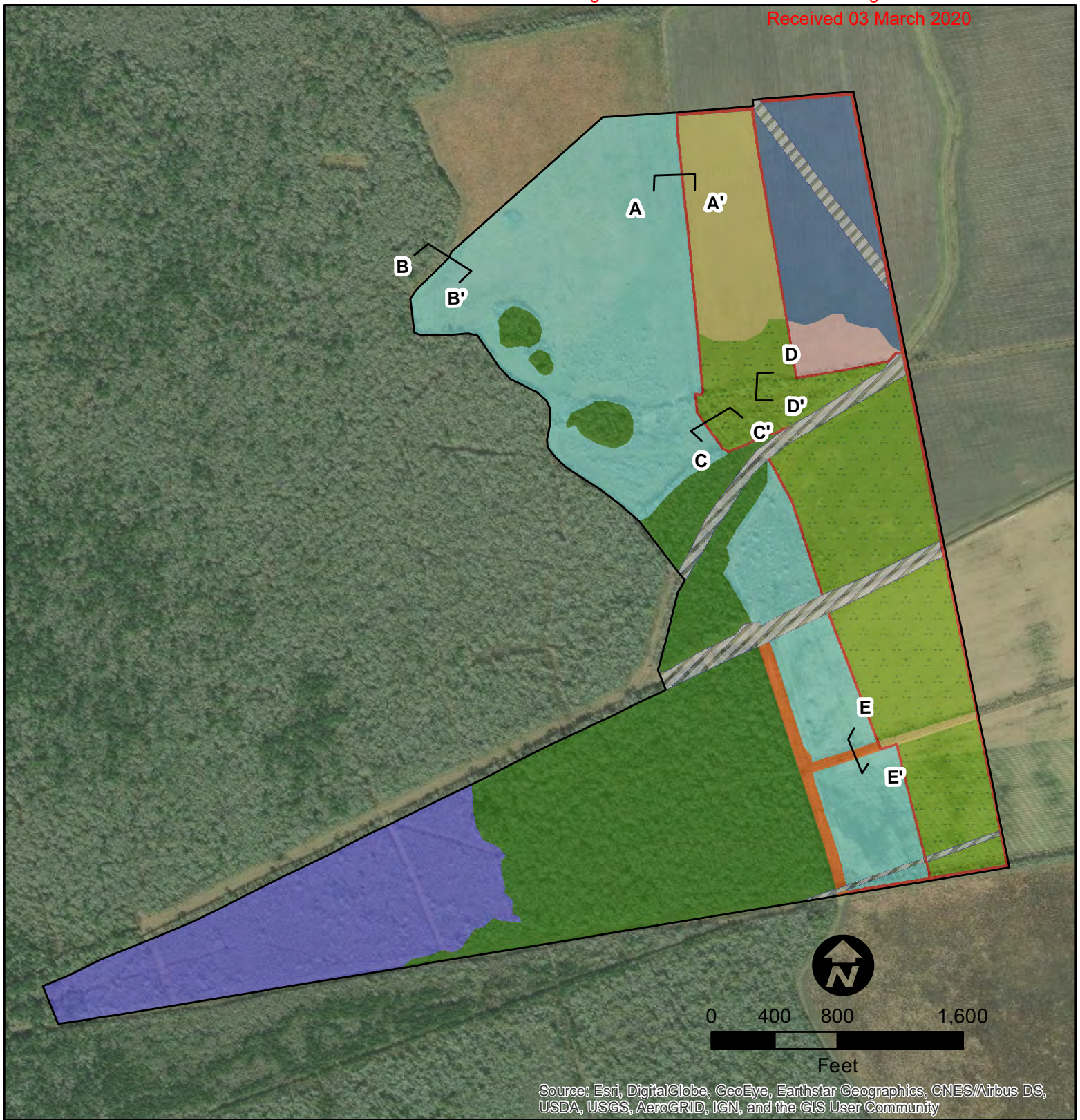


McCoy Ranch Mitigation Area
 Lone Star NGL Mont Belvieu, LP
 Burton Station Project
POST CONSTRUCTION HYDROLOGY
 Liberty County, TX

Created : TSC/ARCVIEW
 Approved: SR
 Date : 5/27/2020
 Map No. : 06_PostConst



FIGURE 6



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

PRMA (288.6 ac)	PFO Rehabilitation (75.6 ac)
PEM Re-establishment (16.6 ac)	PSS Re-establishment (15.0 ac)
PEM Rehabilitation (3.6 ac)	PSS Rehabilitation (49.1 ac)
PFO Re-establishment (3.0 ac)	Fire Break (6.3 ac)
PFO Enhancement (37.6 ac)	Non-Mitigation (11.2 ac)
PFO Preservation (70.6 ac)	

McCoy Ranch Mitigation Area
Lone Star NGL Mont Belvieu, LP
Burton Station Project

Planview
Liberty County, TX

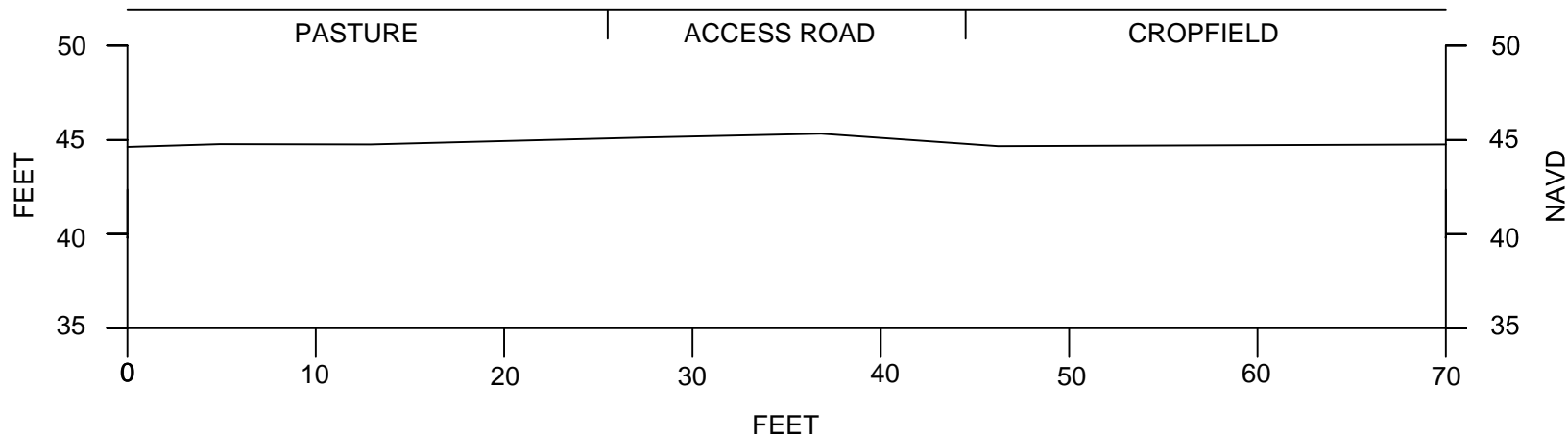
Created : HJS/ArcView10	
Approved : CB	
Date : 5/27/2020	
Map # : planview_PRM.mxd	

FIGURE 7

A

EXISTING CROSS-SECTION A

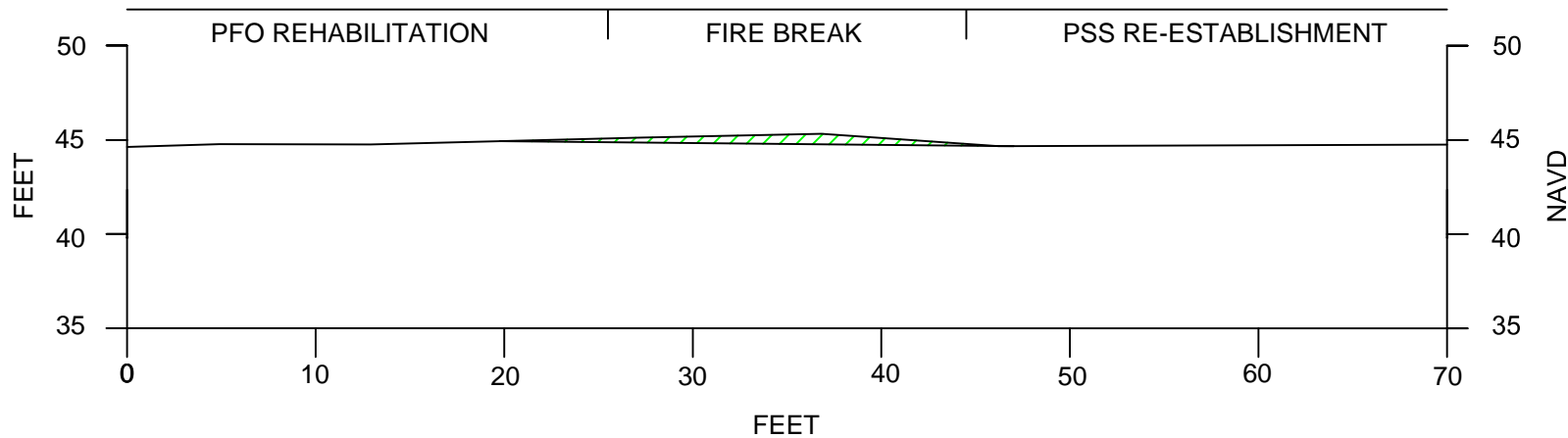
A'

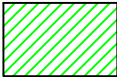
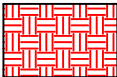


A

PROPOSED CROSS-SECTION A

A'



-  Proposed Excavation
-  Proposed Earthen Fill

Proposed McCoy Ranch PRM
EXISTING CONDITION AND
PROPOSED CONDITION
 Cameron County, TX

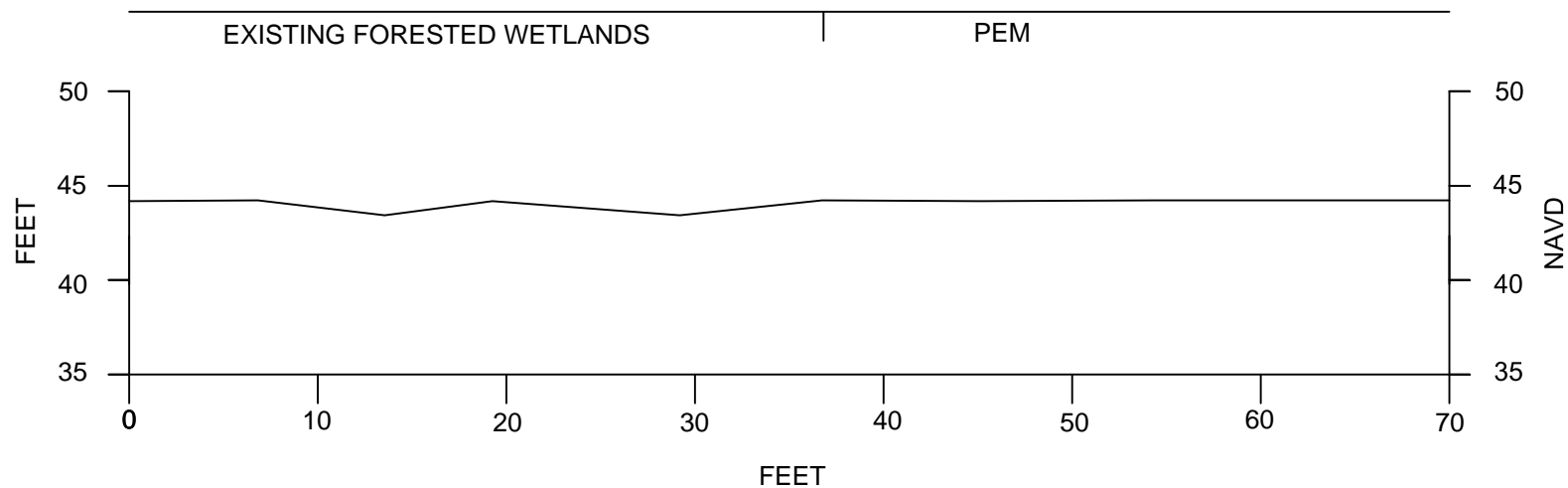
Created:	HJS/AutoCAD
Approved:	CB
Date:	10/11/19
Dwg. No.:	McCoyXSection.dwg

FIGURE 7A

B

EXISTING CROSS-SECTION B

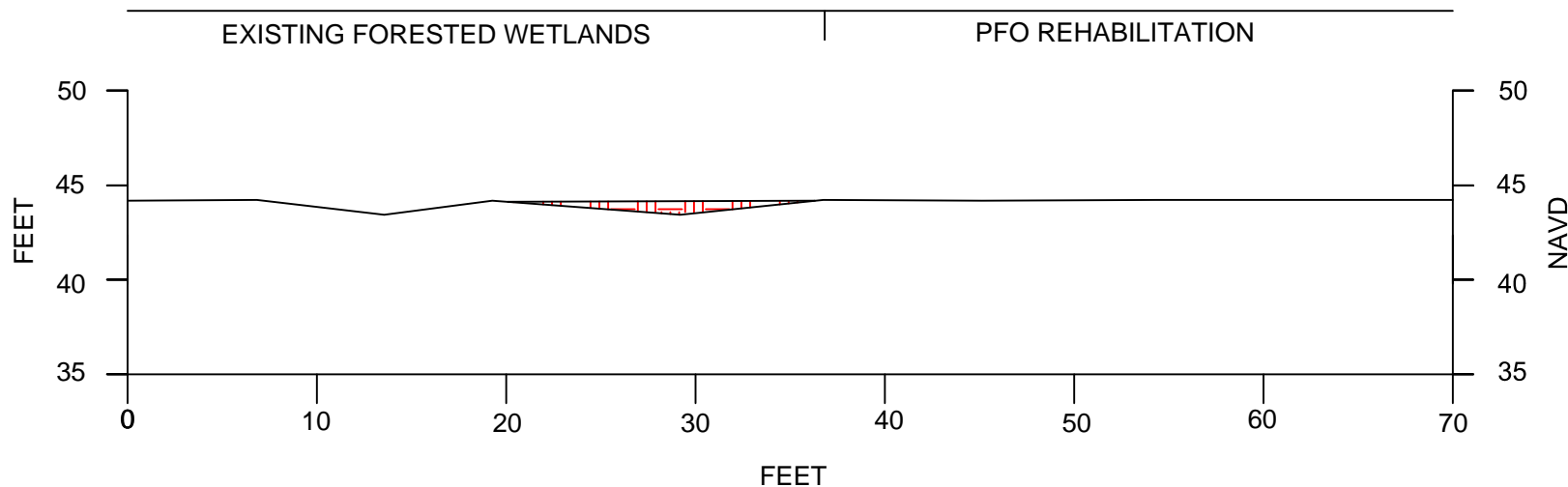
B'

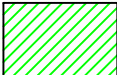
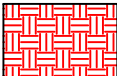


B

PROPOSED CROSS-SECTION B

B'



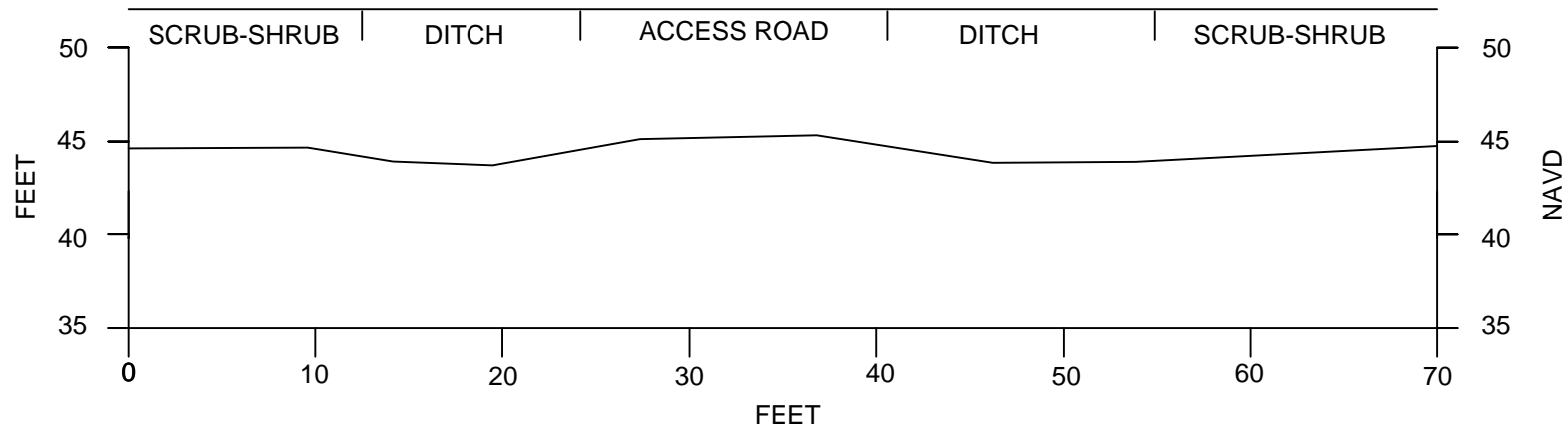
-  Proposed Excavation
-  Proposed Earthen Fill

Proposed McCoy Ranch PRM	
EXISTING CONDITION AND PROPOSED CONDITION	
Cameron County, TX	
Created:	HJS/AutoCAD
Approved:	CB
Date:	10/11/19
Dwg. No.:	McCoyXSection.dwg
FIGURE 7B	

C

EXISTING CROSS-SECTION C

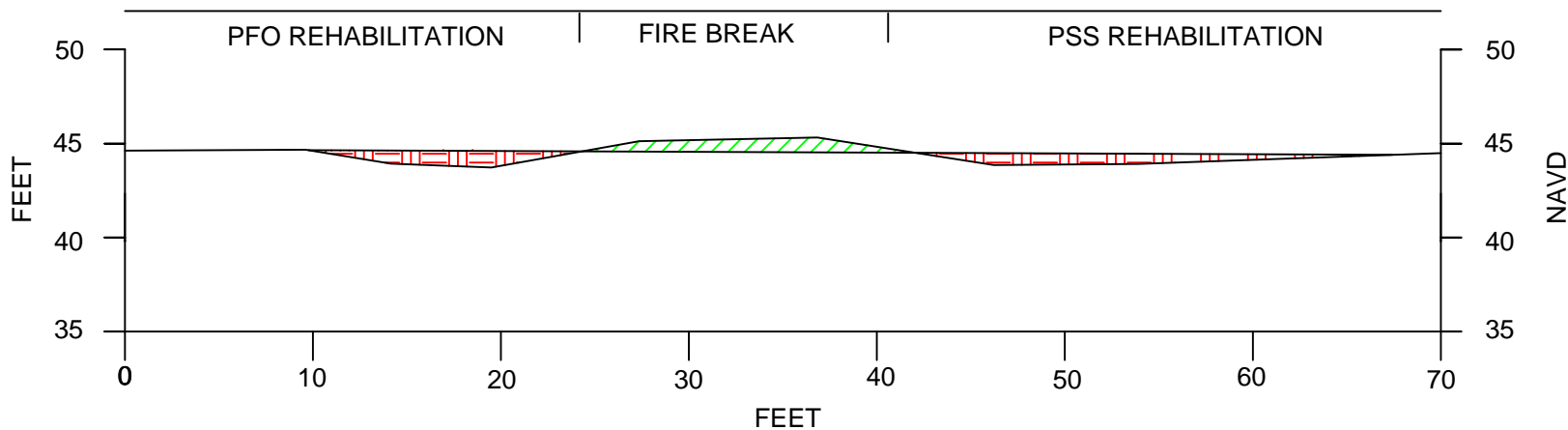
C'

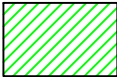
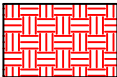


C

PROPOSED CROSS-SECTION C

C'



-  Proposed Excavation
-  Proposed Earthen Fill

Proposed McCoy Ranch PRM
EXISTING CONDITION AND
PROPOSED CONDITION
Cameron County, TX

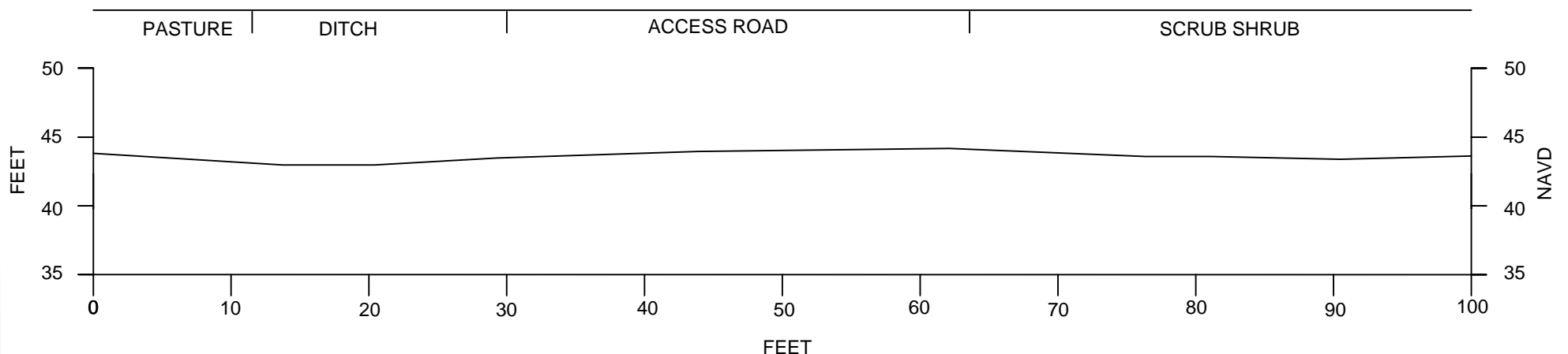
Created:	HJS/AutoCAD
Approved:	CB
Date:	10/11/19
Dwg. No.:	McCoyXSection.dwg

FIGURE 7C

D

EXISTING CROSS-SECTION D

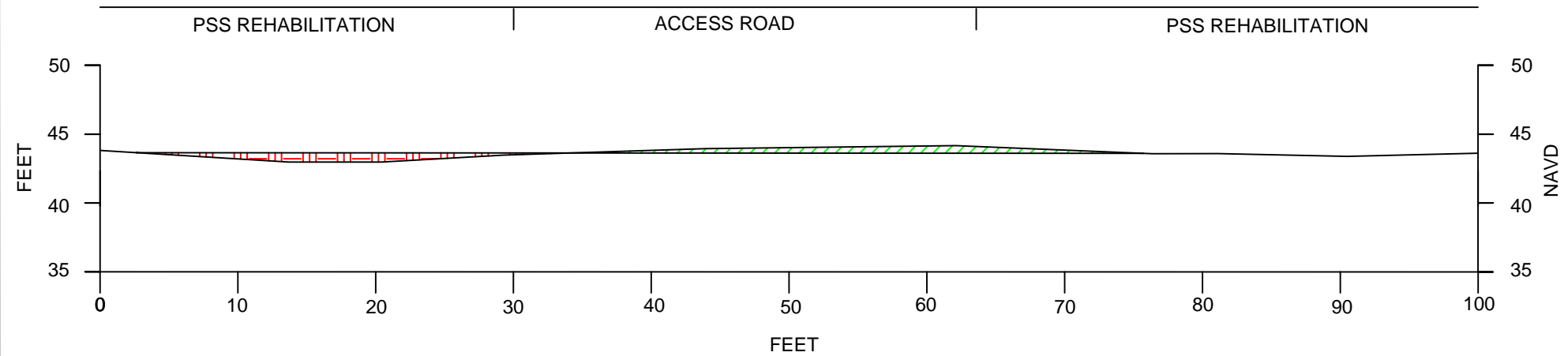
D'

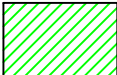
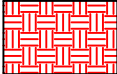


D

PROPOSED CROSS-SECTION D

D'

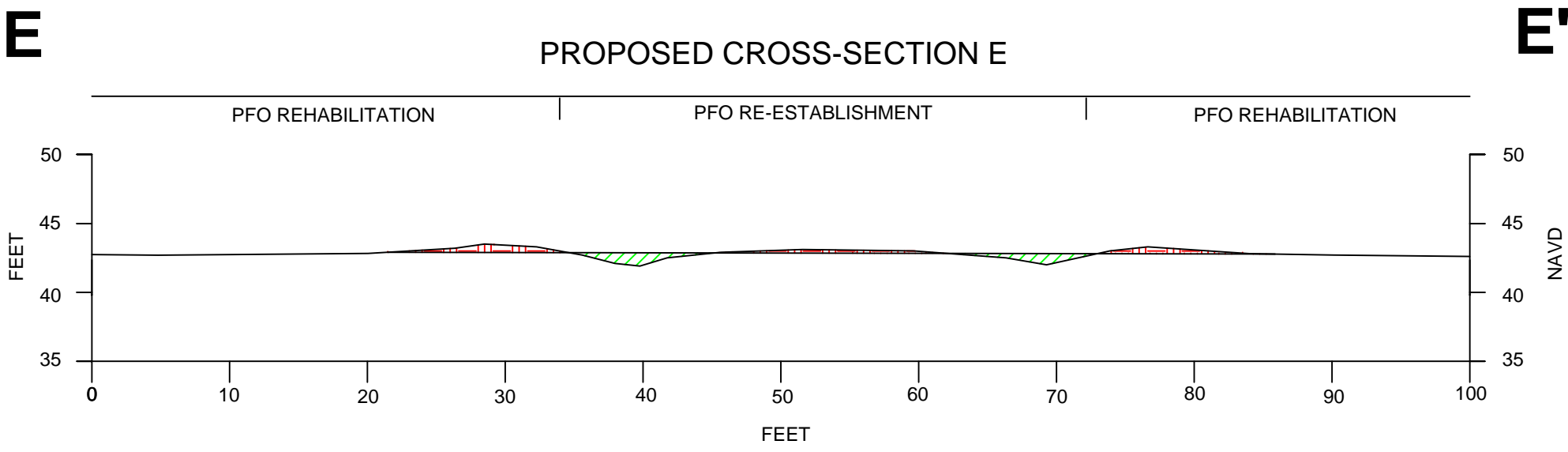
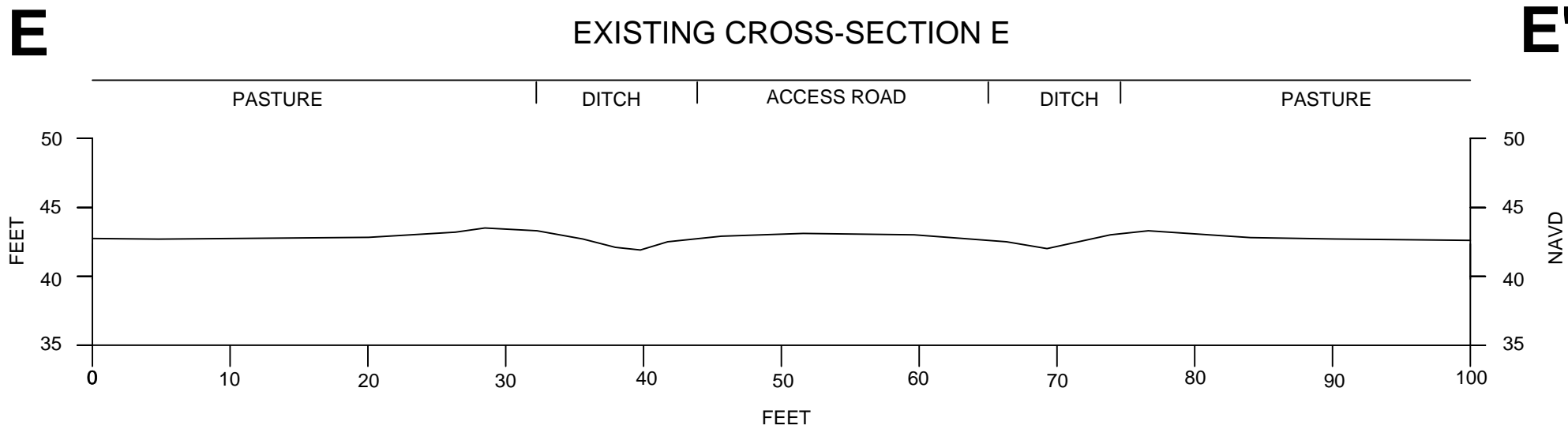


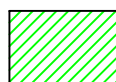
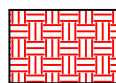
-  Proposed Excavation
-  Proposed Earthen Fill

Proposed McCoy Ranch PRM
EXISTING CONDITION AND
PROPOSED CONDITION
 Cameron County, TX

Created:	HJS/AutoCAD
Approved:	CB
Date:	10/11/19
Dwg. No.:	McCoyXSection.dwg

FIGURE 7D



-  Proposed Excavation
-  Proposed Earthen Fill

Proposed McCoy Ranch PRM
EXISTING CONDITION AND
PROPOSED CONDITION
Cameron County, TX

Created:	HJS/AutoCAD
Approved:	CB
Date:	10/11/19
Dwg. No.:	McCoyXSection.dwg

FIGURE 7E

Attachment B. Riverine Forested and Riverine Herbaceous/shrub Hydrogeomorphic Interim
Model Workbooks (Tables 1 – 19)

Restoration Type Baseline Discussion

The following is a brief description of the methodology that identifies the process in which the Restoration types/Wetland Assessment Areas (WAA) were delineated for the iHGM baseline evaluation and then a general discussion of restoration. According to the NRCS, the soils are uniform across the site, consisting of clay soils; thus, soil types were not considered in delineating the restoration areas.

Riverine Forested Re-establishment – This area is located within the 100-year floodplain along agricultural roads and does not meet the three wetland criteria. Restoration would target the re-establishment of wetland hydrology through the removal of the roadbeds and re-establishment of native wetland forest vegetation.

Riverine Forested Enhancement – This area is located within the 100-year floodplain and meets the definition of a wetland. The area was timber harvested in 2004 and has been heavily encroached by Chinese Tallow with some native trees present. Restoration will target native tree/shrub restoration.

Riverine Forested Rehabilitation - This area is located within the 100-year floodplain and meets the definition of a wetland. The area has been impacted by agricultural drainage ditches and field drain laterals, which have reduced duration and frequency of flooding. Additionally, these areas have been impacted by agricultural production since the 1940's. Restoration would restore natural hydrology and the native forest community.

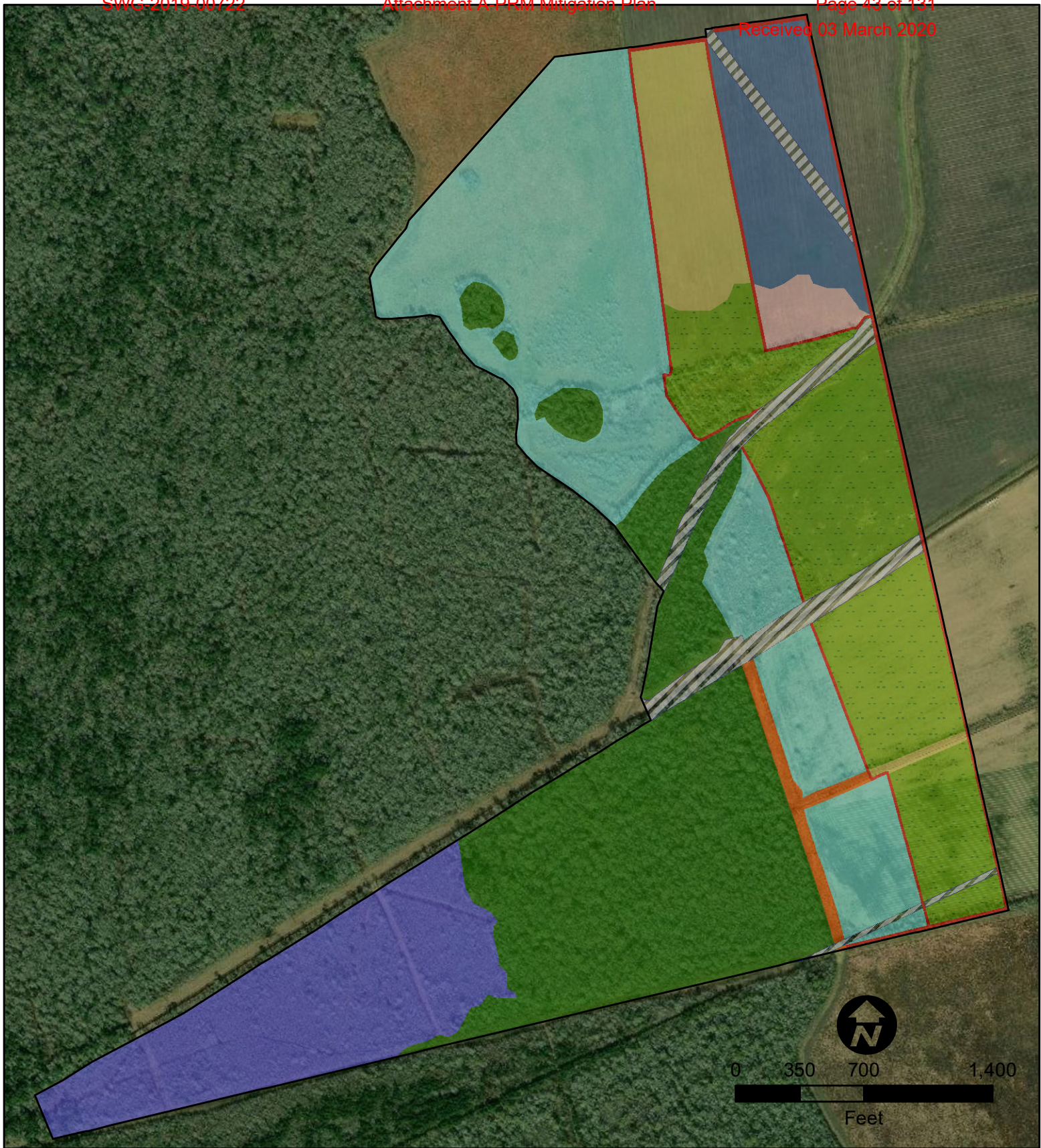
Riverine Forested Preservation - This area is a mature forest within the 100-year floodplain that does not appear to have had major disturbances over the last 80 years and potentially longer. This area would be protected, and invasive species would be managed/controlled.

Riverine Herbaceous Rehabilitation - This area is located within the 100-year floodplain and meets the definition of a wetland. The area has been impacted by agricultural drainage ditches and field drain laterals, which have reduced duration and frequency of flooding. Additionally, these areas have been impacted by agricultural production since the 1940's and are actively farmed. Restoration would restore natural hydrology through the removal or plugging of drainages and re-establishment of a native herbaceous community. All agricultural activities would cease.

Riverine Herbaceous Re-establishment – This area is located within the 100-year floodplain within active agricultural fields. Hydric soils are typically present, but the area is often devoid of vegetation due to tilling or crops are present. These areas did not meet the three wetland criteria. Restoration would target the re-establishment of wetland hydrology through the removal of agricultural drainages and re-establishment of native wetland herbaceous vegetation. All agricultural activities would cease.

Riverine Shrub Rehabilitation - This area is located within the 100-year floodplain and meets the definition of a wetland. The area has been impacted by agricultural drainage ditches and field drain laterals, which have reduced duration and frequency of flooding. Additionally, these areas have been impacted by agricultural production since the 1940's with periodic crop production, hay production, and cattle grazing. Restoration would restore natural hydrology through the removal or plugging of drainages and re-establishment of a native shrub and herbaceous community. All agricultural activities would cease.

Riverine Shrub Re-establishment – This area is located within the 100-year floodplain within active agricultural fields. Hydric soils are typically present, but the area is often devoid of vegetation due to tilling or crops are present. These areas did not meet the three wetland criteria. Restoration would target the re-establishment of wetland hydrology through the removal of agricultural drainages and re-establishment of native wetland shrub and herbaceous vegetation. All agricultural activities would cease.



PRMA (288.6 ac)	PFO Rehabilitation (75.6 ac)
PEM Re-establishment (16.6 ac)	PSS Re-establishment (15.0 ac)
PEM Rehabilitation (3.6 ac)	PSS Rehabilitation (49.1 ac)
PFO Re-establishment (3.0 ac)	Fire Break (6.3 ac)
PFO Enhancement (37.6 ac)	Non-Mitigation (11.2 ac)
PFO Preservation (70.6 ac)	

McCoy Ranch Mitigation Area
Lone Star NGL Mont Belvieu, LP
Burton Station Project

WAA MAP
Liberty County, TX

Created : TSC/ARCVIEW	
Approved: SR	
Date : 05/27/2020	
Map No. : WAAmap.mxd	

FIGURE B-1

Table 1. Predicted FCU Lift by Mitigation Type.

Riverine Forested Re-establishment 3.1 Acres	Year 0 Baseline	Year 10 Lift	Total Lift by Function		Total PFO Lift
Physical	0.0	2.3	2.3		61.87
Biological	0.0	2.2	2.2		53.18
Chemical	0.0	2.6	2.6		58.43
Riverine Forested Enhancement 37.6 Acres	Year 0 Baseline	Year 10 Lift	Total Lift by Function		Total Herbaceous Lift
Physical	12.7	19.6	6.9		10.75
Biological	15.0	20.3	5.4		14.31
Chemical	14.6	20.9	6.3		10.64
Riverine Forested Rehabilitation 75.6 Acres	Year 0 Baseline	Year 10 Lift	Total Lift by Function		Total Shrub Lift
Physical	9.5	56.1	46.6		30.8
Biological	15.1	54.5	39.4		28.9
Chemical	20.9	64.0	43.1		27.9
Riverine Forested Preservation 70.7 Acres	Year 0 Baseline	Year 10 Lift	Total Lift by Function*		
Physical	61.2	NA	6.1		
Biological	62.2	NA	6.2		
Chemical	63.6	NA	6.4		

*PFO preservation, 10% of baseline FCU was used for credit generation

Riverine Herbaceous Re-establishment 16.6 Acres	Year 0 Baseline	Year 5 Lift	Total Lift by Function
Physical	0.0	9.3	9.3
Biological	0.0	12.5	12.5
Chemical	0.0	9.6	9.6
Riverine Herbaceous Re-establishment 3.6 Acres	Year 0 Baseline	Year 5 Lift	Total Lift by Function
Physical	0.57	2.02	1.4
Biological	0.84	2.70	1.9
Chemical	1.01	2.08	1.1
Riverine Shrub Rehabilitation 49.1 Acres	Year 0 Baseline	Year 5 Lift	Total Lift by Function
Physical	13.4	36.2	22.8
Biological	24.6	40.9	16.4
Chemical	17.7	36.7	19.0
Riverine Shrub Re-establishment 15.0	Year 0 Baseline	Year 5 Lift	Total Lift by Function
Physical	0.0	8.0	8.0
Biological	0.0	12.5	12.5
Chemical	0.0	8.9	8.9

Table 2. PFO Re-establishment Year 0/Baseline iHGM Burton Station PRM A SWG-2019-00722

Riverine Forested Re-establishment Year 0	PFO
Acreage	3.10
Variable	Baseline
Vdur: Duration of flooding	0.00
Vfreq: Frequency of flooding	0.00
Vtopo: Topography	0.00
Vcwd: Course woody debris	0.00
Vwood: Woody vegetation	0.00
Vtree: Tree species	0.00
Vrich: Tree richness/diversity	0.00
Vbasal: Tree basal area	0.00
Vdesity: Tree density	0.00
Vmid: Midstory (Shrub/sapling/woody vines)	0.00
Vherb: Herbaceous layer	0.00
Vdetritus: Detritus	0.00
Vredox: Redoximorphic process	0.00
Vsorpt: Sorptive Soil Properties	0.00
Vconnect: Connectivity to other habitat types	0.00
Physical FCI: Temporary Storage & Detention of Storage Water	0.000
Biological FCI: Maintain Plant and Animal Community	0.000
Chemical FCI: Removal & Sequestration of Elements & Compounds	0.000
Physical FCU: Temporary Storage & Detention of Storage Water	0.0
Biological FCU: Maintain Plant and Animal Community	0.0
Chemical FCU: Removal & Sequestration of Elements & Compounds	0.0

Table 3. PFO Re-establishment Year 4 iHGM Burton Station PRMA SWG-2019-00722
Revised March 2020

Riverine Forested Re-establishment Year 4	PFO
Acreage	3.10
Variable	Baseline
Vdur: Duration of flooding	0.75
Vfreq: Frequency of flooding	0.75
Vtopo: Topography	0.40
Vcwd: Course woody debris	0.30
Vwood: Woody vegetation	0.75
Vtree: Tree species	0.50
Vrich: Tree richness/diversity	0.60
Vbasal: Tree basal area	0.40
Vdesity: Tree density	0.40
Vmid: Midstory (Shrub/sapling/woody vines)	0.75
Vherb: Herbaceous layer	0.50
Vdetritus: Detritus	0.50
Vredox: Redoximorphic process	1.00
Vsorpt: Sorptive Soil Properties	1.00
Vconnect: Connectivity to other habitat types	0.75
Physical FCI: Temporary Storage & Detention of Storage Water	0.602
Biological FCI: Maintain Plant and Animal Community	0.529
Chemical FCI: Removal & Sequestration of Elements & Compounds	0.713
Physical FCU: Temporary Storage & Detention of Storage Water	1.866
Biological FCU: Maintain Plant and Animal Community	1.640
Chemical FCU: Removal & Sequestration of Elements & Compounds	2.211
Total Lift	
Physical FCU: Temporary Storage & Detention of Storage Water	1.866
Biological FCU: Maintain Plant and Animal Community	1.640
Chemical FCU: Removal & Sequestration of Elements & Compounds	2.211

Table 4. PFO Re-establishment Year 10 iHGM Burton Station PRMA SWG-2019-00722
Revised March 2020

Riverine Forested Re-establishment Year 10	PFO
Acreage	3.10
Variable	Baseline
Vdur: Duration of flooding	0.75
Vfreq: Frequency of flooding	0.75
Vtopo: Topography	0.70
Vcwd: Course woody debris	0.50
Vwood: Woody vegetation	1.00
Vtree: Tree species	0.80
Vrich: Tree richness/diversity	0.80
Vbasal: Tree basal area	0.60
Vdesity: Tree density	0.60
Vmid: Midstory (Shrub/sapling/woody vines)	0.75
Vherb: Herbaceous layer	1.00
Vdetritus: Detritus	1.00
Vredox: Redoximorphic process	1.00
Vsorpt: Sorptive Soil Properties	1.00
Vconnect: Connectivity to other habitat types	0.75

Physical FCI: Temporary Storage & Detention of Storage Water	0.742
Biological FCI: Maintain Plant and Animal Community	0.721
Chemical FCI: Removal & Sequestration of Elements & Compounds	0.847

Physical FCU: Temporary Storage & Detention of Storage Water	2.299
Biological FCU: Maintain Plant and Animal Community	2.235
Chemical FCU: Removal & Sequestration of Elements & Compounds	2.625

Total Lift

Physical FCU: Temporary Storage & Detention of Storage Water	2.299
Biological FCU: Maintain Plant and Animal Community	2.235
Chemical FCU: Removal & Sequestration of Elements & Compounds	2.625

Table 5. PFO Enhancement Year 0/Baseline iHGM Burton Station PRMA SWG-2019-00722

Riverine Forested Enhancement Year 0	PFO
Acreage	37.60
Variable	Baseline
Vdur: Duration of flooding	0.50
Vfreq: Frequency of flooding	0.50
Vtopo: Topography	0.70
Vcwd: Course woody debris	0.50
Vwood: Woody vegetation	0.50
Vtree: Tree species	0.50
Vrich: Tree richness/diversity	0.80
Vbasal: Tree basal area	0.60
Vdesity: Tree density	0.60
Vmid: Midstory (Shrub/sapling/woody vines)	0.75
Vherb: Herbaceous layer	1.00
Vdetritus: Detritus	1.00
Vredox: Redoximorphic process	1.00
Vsorpt: Sorptive Soil Properties	1.00
Vconnect: Connectivity to other habitat types	0.50
Physical FCI: Temporary Storage & Detention of Storage Water	0.532
Biological FCI: Maintain Plant and Animal Community	0.629
Chemical FCI: Removal & Sequestration of Elements & Compounds	0.613
Physical FCU: Temporary Storage & Detention of Storage Water	12.669
Biological FCU: Maintain Plant and Animal Community	14.974
Chemical FCU: Removal & Sequestration of Elements & Compounds	14.597

Table 6. PFO Enhancement Year 0/Baseline iHGM Burton Station PRMA SWG 2019-00722
Revised March 2020

Riverine Forested Enhancement Year 4	PFO
Acreage	37.60
Variable	Baseline
Vdur: Duration of flooding	0.75
Vfreq: Frequency of flooding	0.75
Vtopo: Topography	0.70
Vcwd: Course woody debris	0.50
Vwood: Woody vegetation	0.75
Vtree: Tree species	0.50
Vrich: Tree richness/diversity	0.80
Vbasal: Tree basal area	0.60
Vdesity: Tree density	1.00
Vmid: Midstory (Shrub/sapling/woody vines)	0.75
Vherb: Herbaceous layer	1.00
Vdetritus: Detritus	1.00
Vredox: Redoximorphic process	1.00
Vsorpt: Sorptive Soil Properties	1.00
Vconnect: Connectivity to other habitat types	0.75
Physical FCI: Temporary Storage & Detention of Storage Water	0.698
Biological FCI: Maintain Plant and Animal Community	0.704
Chemical FCI: Removal & Sequestration of Elements & Compounds	0.780
Physical FCU: Temporary Storage & Detention of Storage Water	16.617
Biological FCU: Maintain Plant and Animal Community	16.759
Chemical FCU: Removal & Sequestration of Elements & Compounds	18.564
Total Lift	
Physical FCU: Temporary Storage & Detention of Storage Water	3.949
Biological FCU: Maintain Plant and Animal Community	1.785
Chemical FCU: Removal & Sequestration of Elements & Compounds	3.967

Table 7. PFO Enhancement Year 10 iHGM Burton Station PRMA SWG-2019-00722 Rev. 07/2018 March 2020

Riverine Forested Enhancement Year 10	PFO
Acreage	37.60
Variable	Baseline
Vdur: Duration of flooding	0.75
Vfreq: Frequency of flooding	0.75
Vtopo: Topography	0.70
Vcwd: Course woody debris	1.00
Vwood: Woody vegetation	1.00
Vtree: Tree species	0.80
Vrich: Tree richness/diversity	0.80
Vbasal: Tree basal area	0.80
Vdesity: Tree density	1.00
Vmid: Midstory (Shrub/sapling/woody vines)	0.75
Vherb: Herbaceous layer	1.00
Vdetritus: Detritus	1.00
Vredox: Redoximorphic process	1.00
Vsorpt: Sorptive Soil Properties	1.00
Vconnect: Connectivity to other habitat types	0.75
Physical FCI: Temporary Storage & Detention of Storage Water	0.822
Biological FCI: Maintain Plant and Animal Community	0.854
Chemical FCI: Removal & Sequestration of Elements & Compounds	0.880
Physical FCU: Temporary Storage & Detention of Storage Water	19.554
Biological FCU: Maintain Plant and Animal Community	20.329
Chemical FCU: Removal & Sequestration of Elements & Compounds	20.944
Total Lift	
Physical FCU: Temporary Storage & Detention of Storage Water	6.885
Biological FCU: Maintain Plant and Animal Community	5.355
Chemical FCU: Removal & Sequestration of Elements & Compounds	6.347

Table 8. PFO Rehabilitation Year 0/Baseline iHGM Burton Station PRMA SWG-2019-00722 Revised March 2020

Riverine Forested Rehabilitation Year 0	PFO
Acreage	75.60
Variable	Baseline
Vdur: Duration of flooding	0.10
Vfreq: Frequency of flooding	0.25
Vtopo: Topography	0.10
Vcwd: Course woody debris	0.10
Vwood: Woody vegetation	0.10
Vtree: Tree species	0.10
Vrich: Tree richness/diversity	0.10
Vbasal: Tree basal area	0.10
Vdesity: Tree density	0.10
Vmid: Midstory (Shrub/sapling/woody vines)	0.10
Vherb: Herbaceous layer	0.50
Vdetritus: Detritus	0.50
Vredox: Redoximorphic process	1.00
Vsorpt: Sorptive Soil Properties	1.00
Vconnect: Connectivity to other habitat types	0.50
Physical FCI: Temporary Storage & Detention of Storage Water	0.126
Biological FCI: Maintain Plant and Animal Community	0.200
Chemical FCI: Removal & Sequestration of Elements & Compounds	0.277
Physical FCU: Temporary Storage & Detention of Storage Water	9.5
Biological FCU: Maintain Plant and Animal Community	15.1
Chemical FCU: Removal & Sequestration of Elements & Compounds	20.9

Table 9. PFO Rehabilitation Year 0/Baseline iHGM Burton Station PRMA SWG-2019-00722 Revised March 2020

Riverine Forested Rehabilitation Year 4	PFO
Acreage	75.60
Variable	Baseline
Vdur: Duration of flooding	0.75
Vfreq: Frequency of flooding	0.75
Vtopo: Topography	0.40
Vcwd: Course woody debris	0.30
Vwood: Woody vegetation	0.50
Vtree: Tree species	0.50
Vrich: Tree richness/diversity	0.60
Vbasal: Tree basal area	0.40
Vdesity: Tree density	0.40
Vmid: Midstory (Shrub/sapling/woody vines)	0.75
Vherb: Herbaceous layer	0.50
Vdetritus: Detritus	0.50
Vredox: Redoximorphic process	1.00
Vsorpt: Sorptive Soil Properties	1.00
Vconnect: Connectivity to other habitat types	0.75
Physical FCI: Temporary Storage & Detention of Storage Water	0.548
Biological FCI: Maintain Plant and Animal Community	0.529
Chemical FCI: Removal & Sequestration of Elements & Compounds	0.647
Physical FCU: Temporary Storage & Detention of Storage Water	41.4
Biological FCU: Maintain Plant and Animal Community	40.0
Chemical FCU: Removal & Sequestration of Elements & Compounds	48.9
Total Lift	
Physical FCU: Temporary Storage & Detention of Storage Water	31.902
Biological FCU: Maintain Plant and Animal Community	24.885
Chemical FCU: Removal & Sequestration of Elements & Compounds	27.972

Table 10. PFO Rehabilitation Year 10 iHGM Burton Station PRMA SWG-2019-00722
Revised March 2020

Riverine Forested Rehabilitation Year 10	PFO
Acreage	75.60
Variable	Baseline
Vdur: Duration of flooding	0.75
Vfreq: Frequency of flooding	0.75
Vtopo: Topography	0.70
Vcwd: Course woody debris	0.50
Vwood: Woody vegetation	1.00
Vtree: Tree species	0.80
Vrich: Tree richness/diversity	0.80
Vbasal: Tree basal area	0.60
Vdesity: Tree density	0.60
Vmid: Midstory (Shrub/sapling/woody vines)	0.75
Vherb: Herbaceous layer	1.00
Vdetritus: Detritus	1.00
Vredox: Redoximorphic process	1.00
Vsorpt: Sorptive Soil Properties	1.00
Vconnect: Connectivity to other habitat types	0.75
Physical FCI: Temporary Storage & Detention of Storage Water	0.742
Biological FCI: Maintain Plant and Animal Community	0.721
Chemical FCI: Removal & Sequestration of Elements & Compounds	0.847
Physical FCU: Temporary Storage & Detention of Storage Water	56.1
Biological FCU: Maintain Plant and Animal Community	54.5
Chemical FCU: Removal & Sequestration of Elements & Compounds	64.0
Total Lift	
Physical FCU: Temporary Storage & Detention of Storage Water	46.560
Biological FCU: Maintain Plant and Animal Community	39.375
Chemical FCU: Removal & Sequestration of Elements & Compounds	43.092

Table 11. PFO Preservation Baseline iHGM Burton Station PRMA SWG-2019-00722 Revised March 2020

Riverine Forested Preservation Baseline	PFO
Acreage	70.70
Variable	Baseline
Vdur: Duration of flooding	0.75
Vfreq: Frequency of flooding	0.75
Vtopo: Topography	1.00
Vcwd: Course woody debris	1.00
Vwood: Woody vegetation	1.00
Vtree: Tree species	0.80
Vrich: Tree richness/diversity	0.80
Vbasal: Tree basal area	1.00
Vdesity: Tree density	0.60
Vmid: Midstory (Shrub/sapling/woody vines)	0.75
Vherb: Herbaceous layer	1.00
Vdetritus: Detritus	1.00
Vredox: Redoximorphic process	1.00
Vsorpt: Sorptive Soil Properties	1.00
Vconnect: Connectivity to other habitat types	1.00
Physical FCI: Temporary Storage & Detention of Storage Water	0.866
Biological FCI: Maintain Plant and Animal Community	0.879
Chemical FCI: Removal & Sequestration of Elements & Compounds	0.900
Physical FCU: Temporary Storage & Detention of Storage Water	61.2
Biological FCU: Maintain Plant and Animal Community	62.2
Chemical FCU: Removal & Sequestration of Elements & Compounds	63.6

Table 12. PEM Re-establishment Year 0/Baseline iHGM Burton Station PRM A-534-2019-00722

PEM Re-establishment 15.4 acres Year 0	
Acreage	16.60
Variable	Index Value
Vdur: Duration of flooding	0.00
Vfreq: Frequency of flooding	0.00
Vtopo: Topography	0.00
Vwood: Woody vegetation	0.00
Vmid: Midstory (Shrub/sapling/woody vines)	0.00
Vherb: Herbaceous layer	0.00
Vconnect: Connectivity to other habitat types	0.00
Vdetritus: Detritus	0.00
Vredox: Redoximorphic process	0.00
Vsorpt: Sorptive Soil Properties	0.00

Physical FCI: Temporary Storage & Detention of Storage Water	0.000
Biological FCI: Maintain Plant and Animal Community	0.000
Chemical FCI: Removal & Sequestration of Elements & Compounds	0.000
Physical FCU: Temporary Storage & Detention of Storage Water	0.0
Biological FCU: Maintain Plant and Animal Community	0.0
Chemical FCU: Removal & Sequestration of Elements & Compounds	0.0

Table 13. PEM Re-establishment Year 5 iHGM Burton Station PRM A SWG-2019-00722
Revised March 2020

PEM Re-establishment 15.4 acres Year 5	
Acreage	16.60
Variable	Index Value
Vdur: Duration of flooding	0.75
Vfreq: Frequency of flooding	0.50
Vtopo: Topography	0.40
Vwood: Woody vegetation	0.25
Vmid: Midstory (Shrub/sapling/woody vines)	0.25
Vherb: Herbaceous layer	1.00
Vconnect: Connectivity to other habitat types	1.00
Vdetritus: Detritus	0.50
Vredox: Redoximorphic process	1.00
Vsorpt: Sorptive Soil Properties	1.00

Physical FCI: Temporary Storage & Detention of Storage Water	0.560
Biological FCI: Maintain Plant and Animal Community	0.750
Chemical FCI: Removal & Sequestration of Elements & Compounds	0.577

Physical FCU: Temporary Storage & Detention of Storage Water	9.3
Biological FCU: Maintain Plant and Animal Community	12.5
Chemical FCU: Removal & Sequestration of Elements & Compounds	9.6

Total Lift

Physical FCU: Temporary Storage & Detention of Storage Water	9.300
Biological FCU: Maintain Plant and Animal Community	12.450
Chemical FCU: Removal & Sequestration of Elements & Compounds	9.573

Table 14. PSS Rehabilitation Year 0/Baseline iHGM Burton Station PRMA SWG-2019-00722

PSS Rehabilitation 49.1 acres Year 0	
Acreage	49.10
Variable	Index Value
Vdur: Duration of flooding	0.25
Vfreq: Frequency of flooding	0.25
Vtopo: Topography	0.10
Vwood: Woody vegetation	0.10
Vmid: Midstory (Shrub/sapling/woody vines)	0.25
Vherb: Herbaceous layer	0.75
Vconnect: Connectivity to other habitat types	0.50
Vdetritus: Detritus	0.50
Vredox: Redoximorphic process	1.00
Vsorpt: Sorptive Soil Properties	1.00

Physical FCI: Temporary Storage & Detention of Storage Water	0.274
Biological FCI: Maintain Plant and Animal Community	0.500
Chemical FCI: Removal & Sequestration of Elements & Compounds	0.360
Physical FCU: Temporary Storage & Detention of Storage Water	13.4
Biological FCU: Maintain Plant and Animal Community	24.6
Chemical FCU: Removal & Sequestration of Elements & Compounds	17.7

Table 15. PSS Rehabilitation Year 5 iHGM Burton Station PRMA SWG-2019-00722

PSS Rehabilitation 49.1 acres Year 5	
Acreage	49.10
Variable	Index Value
Vdur: Duration of flooding	0.75
Vfreq: Frequency of flooding	0.75
Vtopo: Topography	0.70
Vwood: Woody vegetation	0.50
Vmid: Midstory (Shrub/sapling/woody vines)	0.50
Vherb: Herbaceous layer	1.00
Vconnect: Connectivity to other habitat types	1.00
Vdetritus: Detritus	1.00
Vredox: Redoximorphic process	1.00
Vsorpt: Sorptive Soil Properties	1.00

Physical FCI: Temporary Storage & Detention of Storage Water	0.737
Biological FCI: Maintain Plant and Animal Community	0.833
Chemical FCI: Removal & Sequestration of Elements & Compounds	0.747

Physical FCU: Temporary Storage & Detention of Storage Water	36.2
Biological FCU: Maintain Plant and Animal Community	40.9
Chemical FCU: Removal & Sequestration of Elements & Compounds	36.7

Total Lift

Physical FCU: Temporary Storage & Detention of Storage Water	22.759
Biological FCU: Maintain Plant and Animal Community	16.367
Chemical FCU: Removal & Sequestration of Elements & Compounds	18.985

Table 16. PSS Re-establishment Year 0/Baseline iHGM Burton Station PRM A SWG-2019-00722

PSS Re-establishment 15.0 acres Year 0	
Acreage	15.00
Variable	Index Value
Vdur: Duration of flooding	0.00
Vfreq: Frequency of flooding	0.00
Vtopo: Topography	0.00
Vwood: Woody vegetation	0.00
Vmid: Midstory (Shrub/sapling/woody vines)	0.00
Vherb: Herbaceous layer	0.00
Vconnect: Connectivity to other habitat types	0.00
Vdetritus: Detritus	0.00
Vredox: Redoximorphic process	0.00
Vsorpt: Sorptive Soil Properties	0.00

Physical FCI: Temporary Storage & Detention of Storage Water	0.000
Biological FCI: Maintain Plant and Animal Community	0.000
Chemical FCI: Removal & Sequestration of Elements & Compounds	0.000
Physical FCU: Temporary Storage & Detention of Storage Water	0.000
Biological FCU: Maintain Plant and Animal Community	0.000
Chemical FCU: Removal & Sequestration of Elements & Compounds	0.000

Table 17. PSS Re-establishment Year 5 iHGM Burton Station PRM A SWG-2019-00722

PSS Re-establishment 15.0 acres Year 5	
Acreage	15.00
Variable	Index Value
Vdur: Duration of flooding	0.50
Vfreq: Frequency of flooding	0.50
Vtopo: Topography	0.40
Vwood: Woody vegetation	0.50
Vmid: Midstory (Shrub/sapling/woody vines)	0.50
Vherb: Herbaceous layer	1.00
Vconnect: Connectivity to other habitat types	1.00
Vdetritus: Detritus	0.50
Vredox: Redoximorphic process	1.00
Vsorpt: Sorptive Soil Properties	1.00

Physical FCI: Temporary Storage & Detention of Storage Water	0.536
Biological FCI: Maintain Plant and Animal Community	0.833
Chemical FCI: Removal & Sequestration of Elements & Compounds	0.593

Physical FCU: Temporary Storage & Detention of Storage Water	8.043
Biological FCU: Maintain Plant and Animal Community	12.500
Chemical FCU: Removal & Sequestration of Elements & Compounds	8.900

Total Lift

Physical FCU: Temporary Storage & Detention of Storage Water	8.043
Biological FCU: Maintain Plant and Animal Community	12.500
Chemical FCU: Removal & Sequestration of Elements & Compounds	8.900

Table 18. PEM Rehabilitation Year 0/Baseline iHGM Burton Station PRM A SWG-2019-00722

PEM Rehabilitation 3.6 acres Year 0	
Acreage	3.60
Variable	Index Value
Vdur: Duration of flooding	0.25
Vfreq: Frequency of flooding	0.25
Vtopo: Topography	0.10
Vwood: Woody vegetation	0.10
Vmid: Midstory (Shrub/sapling/woody vines)	0.10
Vherb: Herbaceous layer	0.10
Vconnect: Connectivity to other habitat types	0.50
Vdetritus: Detritus	0.10
Vredox: Redoximorphic process	1.00
Vsorpt: Sorptive Soil Properties	1.00

Physical FCI: Temporary Storage & Detention of Storage Water	0.158
Biological FCI: Maintain Plant and Animal Community	0.233
Chemical FCI: Removal & Sequestration of Elements & Compounds	0.280
Physical FCU: Temporary Storage & Detention of Storage Water	0.569
Biological FCU: Maintain Plant and Animal Community	0.840
Chemical FCU: Removal & Sequestration of Elements & Compounds	1.008

Table 19. PEM Rehabilitation Year 5 iHGM Burton Station PRMA RSWG-2019-00722

PEM Rehabilitation 3.6 acres Year 5	
Acreage	3.60
Variable	Index Value
Vdur: Duration of flooding	0.75
Vfreq: Frequency of flooding	0.50
Vtopo: Topography	0.40
Vwood: Woody vegetation	0.25
Vmid: Midstory (Shrub/sapling/woody vines)	0.25
Vherb: Herbaceous layer	1.00
Vconnect: Connectivity to other habitat types	1.00
Vdetritus: Detritus	0.50
Vredox: Redoximorphic process	1.00
Vsorpt: Sorptive Soil Properties	1.00

Physical FCI: Temporary Storage & Detention of Storage Water	0.560
Biological FCI: Maintain Plant and Animal Community	0.750
Chemical FCI: Removal & Sequestration of Elements & Compounds	0.577

Physical FCU: Temporary Storage & Detention of Storage Water	2.017
Biological FCU: Maintain Plant and Animal Community	2.700
Chemical FCU: Removal & Sequestration of Elements & Compounds	2.076

Total Lift

Physical FCU: Temporary Storage & Detention of Storage Water	1.448
Biological FCU: Maintain Plant and Animal Community	1.860
Chemical FCU: Removal & Sequestration of Elements & Compounds	1.068

Received 03 March 2020

PFO, PSS, and PEM Permittee Responsible Mitigation Plan
SWG-2019-00772
February 26, 2020

Attachment C. PRMA Perimeter Coordinates

PRMA Perimeter Coordinates

Longitude	Latitude	Longitude	Latitude	Longitude	Latitude
-94.978778	29.931394	-94.987736	29.918244	-94.982448	29.926747
-94.978612	29.931409	-94.987316	29.918454	-94.982508	29.926882
-94.978546	29.931416	-94.987160	29.918533	-94.982684	29.927030
-94.977406	29.931523	-94.986557	29.918822	-94.982758	29.927067
-94.977353	29.931528	-94.986351	29.918921	-94.982782	29.927079
-94.977077	29.931554	-94.985975	29.919112	-94.982966	29.927169
-94.977002	29.931560	-94.985564	29.919320	-94.983140	29.927253
-94.976977	29.931416	-94.985362	29.919422	-94.983333	29.927457
-94.975335	29.923240	-94.985085	29.919562	-94.983458	29.927644
-94.975262	29.922879	-94.984443	29.919867	-94.983564	29.927795
-94.975256	29.922846	-94.983822	29.920169	-94.983714	29.928010
-94.975070	29.921920	-94.983623	29.920266	-94.983880	29.928051
-94.975047	29.921807	-94.982994	29.920584	-94.984126	29.928025
-94.974887	29.921009	-94.982530	29.920822	-94.984553	29.928019
-94.974864	29.920897	-94.982087	29.921025	-94.984726	29.928024
-94.974717	29.920166	-94.981902	29.921109	-94.984809	29.928058
-94.974707	29.920113	-94.981717	29.921198	-94.984886	29.928651
-94.974670	29.919932	-94.981315	29.921392	-94.984775	29.928818
-94.974653	29.919848	-94.981046	29.921521	-94.984386	29.929194
-94.974427	29.918719	-94.980712	29.921682	-94.984210	29.929363
-94.976002	29.918459	-94.980579	29.921747	-94.984163	29.929475
-94.976080	29.918446	-94.980419	29.921825	-94.983613	29.929945
-94.977423	29.918224	-94.980566	29.922178	-94.983536	29.930010
-94.978268	29.918085	-94.980545	29.922229	-94.981411	29.931823
-94.978424	29.918059	-94.980465	29.922512	-94.980267	29.931906
-94.981528	29.917547	-94.980409	29.922711	-94.980219	29.931910
-94.981974	29.917474	-94.980396	29.922766	-94.980181	29.931913
-94.984545	29.917049	-94.980210	29.923515	-94.980171	29.931914
-94.984765	29.917013	-94.980085	29.923742	-94.979841	29.931940
-94.987271	29.916599	-94.980217	29.923888	-94.979806	29.931943
-94.987440	29.916571	-94.980888	29.924766	-94.979652	29.931955
-94.990044	29.916142	-94.981145	29.924991	-94.979425	29.931973
-94.990289	29.916101	-94.981239	29.925075	-94.979374	29.931977
-94.990429	29.916078	-94.981424	29.925212	-94.979026	29.932005
-94.990466	29.916072	-94.981573	29.925321	-94.978955	29.932011
-94.991040	29.915984	-94.981771	29.925454	-94.978950	29.932011
-94.991306	29.916651	-94.981856	29.925510	-94.978950	29.932011
-94.990827	29.916850	-94.982156	29.925706	-94.978950	29.932011
-94.990570	29.916976	-94.982332	29.925875	-94.978871	29.932018
-94.990297	29.917110	-94.982492	29.926052	-94.978782	29.931423
-94.989319	29.917508	-94.982495	29.926195	-94.978778	29.931394
-94.988686	29.917770	-94.982456	29.926423		
-94.988141	29.918042	-94.982443	29.926497		

Attachment D. Texas Land Conservancy Letter of Intent



TEXAS LAND CONSERVANCY

Protecting the Nature of Texas.

Chad Butler
Delta Land Services, LLC
Texas Regulatory Manager
6750 West Loop South, Suite 780
Bellaire, TX 77401

January 22, 2020

Re: Letter of Intent for Holding a Conservation Easement

Dear Mr. Butler,

Thank you for the opportunity to collaborate on being a partner on the McCoy Ranch Mitigation Bank (USACE permit number is **SWG-2019-00772**). This proposed project is an excellent opportunity to establish a conservation area that will benefit future generations of Texans. Please accept this non-binding Letter of Intent by the Texas Land Conservancy ("TLC") to work toward placing a conservation easement on this property being approximately 1,300 acres of land in Liberty County, Texas (the "Property"), including a 288.6-acre permittee responsible mitigation (PRM) area, subject to the approval of TLC's Board of Directors.

The required due diligence for this project would be as follows:

1. **Baseline Documentation Report:** Grantor to obtain a qualified baseline documentation report at its cost.
2. **Survey:** Grantor to obtain a current survey at its cost, which will be used to determine the total acreage and legal description of the Property.
3. **Title Policy:** Grantor to pay for the Title Policy premium.
4. **Title Review & Property Inspection:** Adequate time shall be permitted for title review and inspection of the property.
5. **Approval:** The completion of the conservation easement is subject to approval of TLC's Board of Directors.

This is a Letter of Intent and is not a binding agreement. This Letter of Intent represents the good faith intention of TLC to work towards the execution of a perpetual conservation easement in conjunction with the creation of the McCoy Ranch Mitigation Bank.

Thank you for your consideration, and please do not hesitate to contact me if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "Mark Steinbach".

Mark Steinbach
Executive Director

P.O. Box 162481
Austin, Texas 78716
texaslandconservancy.org



Attachment E. AJD and Wetland Delineation Summary



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, GALVESTON DISTRICT
P. O. BOX 1229
GALVESTON, TEXAS 77553-1229

March 13, 2020

Compliance Branch

SUBJECT: **SWG-2018-00742**; Delta Land Services, LLC. Approved Jurisdictional Determination, 1,318-Acre Tract, Crosby, Liberty County, Texas

Mr. Chris Little
DESCO
26902 Nichols Sawmill
Magnolia, Texas 77355

Dear Mr. Little:

This letter is in response to the DESCO request, on behalf of the Delta Land Services, LLC, received on July 17, 2018, for an approved jurisdictional determination on a 1,318-acre tract. The site is located approximately four miles east of Crosby, Liberty County, Texas.

Based on the review of the information provided, our site visits, and off-site data, we determined that there are thirty-two wetlands plus the wetlands in fifty-one percent of the mosaic area on the site totaling approximately 710.1 acres. These wetlands were identified using the Regional Supplement to the 1987 Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (Version 2.0), which requires under normal circumstances, a predominance of hydrophytic vegetation, hydric soils, and sufficient hydrology at/or near the surface for adequate duration and frequency to support this aquatic ecosystem.

We determined that nineteen of the wetlands; specifically, Wetland 5, Wetland 12, Wetland 13, Wetland 14, Wetland 15, Wetland 16, Wetland 17, Wetland 18, Wetland 19, Wetland 20, Wetland 22, Wetland 24, Wetland 25, Wetland 26, Wetland 27, Wetland 28, Wetland 29, Wetland 30, Wetland 31, plus a portion of the mosaic wetland totaling 258.3 acres have a significant nexus to the downstream Traditional Navigable Water, Cedar Bayou, and are waters of the United States subject to Section 404.

In addition, we determined that thirteen of the wetlands, specifically, Wetland 1, Wetland 2, Wetland 3, Wetland 4, Wetland 6, Wetland 7, Wetland 8, Wetland 9, Wetland 10, Wetland 11, Wetland 21, Wetland 23, Wetland 32, plus the southern portion of the mosaic wetland totaling 451.8 acres are adjacent to the Traditional Navigable Water, Cedar Bayou, and are waters of the United States subject to Section 404. Any discharge of dredged and/or fill material into the thirty-three wetlands require a Department of the Army permit.

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We also determined that there is approximately 9,902 linear feet of the Unnamed Tributary to Cedar Bayou is within the project area. This non-navigable tributary is a relatively permanent water which flows either directly or indirectly into a traditional navigable water, Cedar Bayou; therefore, this tributary is a water of the United States subject to Section 404 of the Clean Water Act. Any discharge of dredged and/or fill material into this tributary would require a Department of the Army permit.

Areas of Federal Interests (federal projects, and/or work areas) may be located within this proposed project area. Any activities in these federal interest areas would also be subject to federal regulations under the authority of Section 14 of the Rivers and Harbors Act (aka Section 408). Section 408 makes it unlawful for anyone to alter in any manner, in whole or in part, any work (ship channel, flood control channels, seawalls, bulkhead, jetty, piers, etc.) built by the United States unless it is authorized by the Corps of Engineers (i.e., Navigation and Operations Division).

This determination has been conducted to identify the limits of the United States Army Corps of Engineers (USACE) CWA jurisdiction for the site identified in this request. However, this determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985 as amended. If you or your tenant are USDA program participants or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service prior to starting work.

This letter contains an AJD for your subject site. If you wish to appeal the AJD, please see the enclosed sheets regarding the administrative appeal process for jurisdictional determinations: Notification of Appeals Process (NAP) fact sheet and Request for Appeal (RFA) form. If you object to this determination, you may request an administrative appeal under USACE regulations at 33 CFR Part 331. If you request to appeal this determination, you must submit a completed RFA form to the Southwestern Division Office at the following address:

Mr. Elliott Carman
Appeal Review Officer, CESWD-PD-O
U.S. Army Corps of Engineer Division,
Southwestern
1100 Commerce Street, Room 831
Dallas, Texas 75242-1731
Telephone: 469-487-7061; FAX: 469-487-7199

-3-

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete; that it meets the criteria for appeal under 33 CFR Part 331.5, and that it has been received by the Division Office within **60 days** of the date of the NAP; noting the letter date is considered day 1. It is not necessary to submit an RFA form to the Division office if you do not object to the determination in this letter.

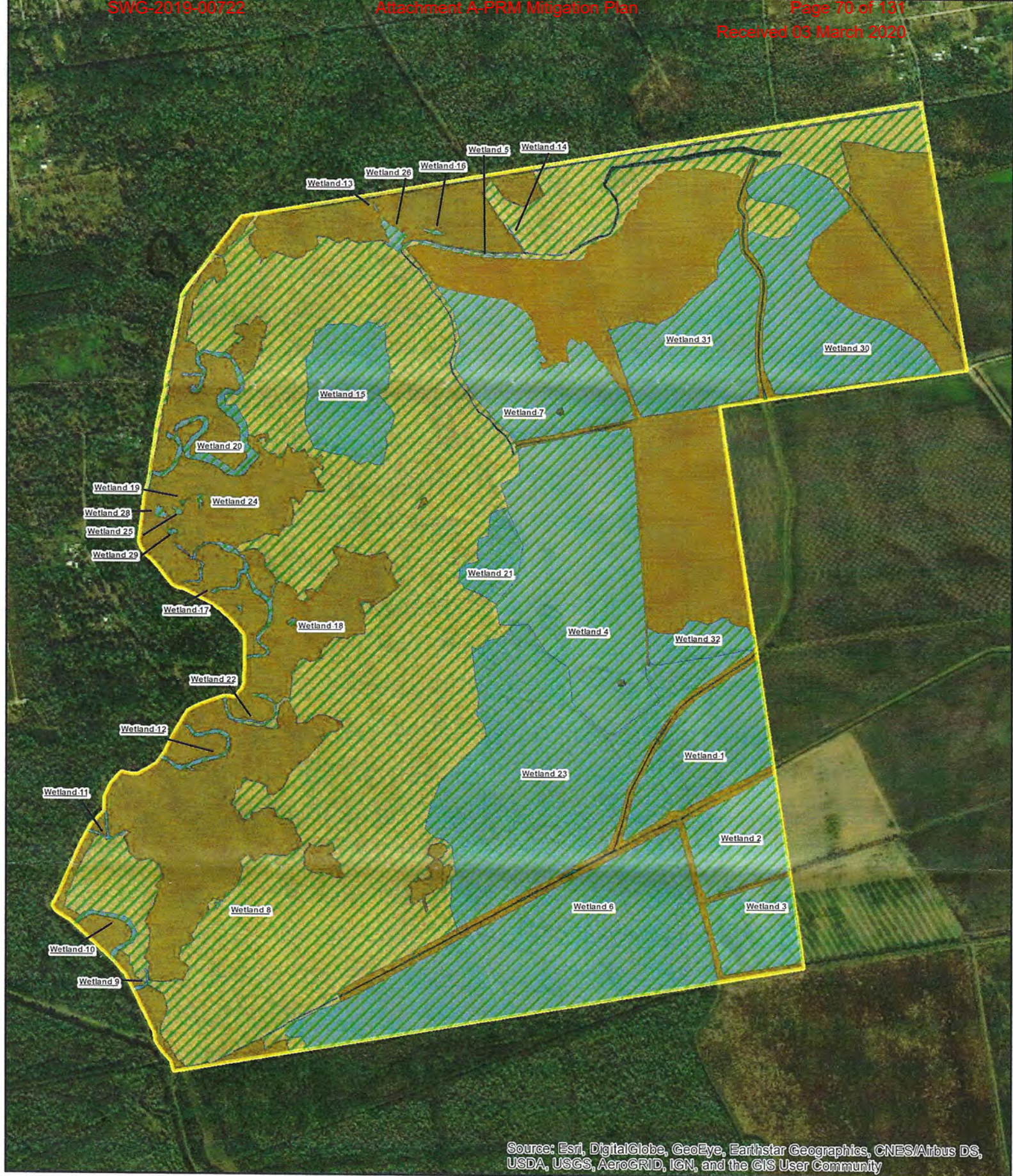
This AJD is valid for 5 years from the date of this letter unless new information warrants a revision prior to the expiration date. If you have any questions concerning this jurisdictional determination, please reference file number **SWG-2018-00742** and contact Ms. Lynne Ray at the letterhead address or by telephone at 409-766-6322. To assist us in improving our service to you, please complete the survey found at http://corpsmapu.usace.army.mil/cm_apex/f?p=136:4:0 and/or if you would prefer a hard copy of the survey form, please let us know, and one will be mailed to you.

Sincerely,



John Davidson
Team Lead
Compliance Branch

Enclosures



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

- Legend**
- Property Boundary · 1,318.48 acres
 - Mosaic · 402.18 acres
 - OHWM · 1.80 acres
 - Non-Wetlands · 405.18 acres
 - Wetlands · 501.45 acres

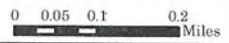
Figure 11: 2016 NC Delineation Map

McCoy 1,300 Acre Site
Crosby, Texas

Liberty County, Texas

Map Base: 2016 NC Aerial Imagery from TNRIS
Map Datum: NAD 1983 UTM Zone 15N, meters
Map Date: January 2, 2020

SWG 2018 - 00742



Aquatic Resource Table - McCoy 1,300 Acre Site, Liberty County, Texas

	Latitude	Longitude	Cowardin	Area/Acres
Wetland 1	3312084.100	309065.456	PEM/PFO	29.662
Wetland 2	3311807.960	309170.465	PEM	19.370
Wetland 3	3311534.707	309224.736	PEM	15.805
Wetland 4	3312640.269	308688.611	PFO/PEM	75.908
Wetland 5	3313617.284	308351.442	PEM	0.535
Wetland 6	3311451.147	308578.756	PFO	93.340
Wetland 7	3313221.967	308537.604	PEM	37.004
Wetland 8	3311597.342	307565.825	PFO	0.053
Wetland 9	3311352.722	307334.156	PFO	0.172
Wetland 10	3311523.112	307244.688	PFO	1.006
Wetland 11	3311827.429	307220.906	PFO	0.300
Wetland 12	3312078.319	307516.230	PFO	1.032
Wetland 13	3313755.572	308046.723	PFO	0.033
Wetland 14	3313659.174	308480.031	PEM	0.084
Wetland 15	3313185.758	307967.132	PFO	24.373
Wetland 16	3313681.926	308221.819	PFO	0.170
Wetland 17	3312570.434	307638.691	PFO	1.965
Wetland 18	3312474.407	307792.864	PFO	0.096
Wetland 19	3312843.446	307457.395	PFO	0.053
Wetland 20	3313075.314	307550.931	PFO	5.717
Wetland 21	3312671.746	308416.807	PFO	8.171
Wetland 22	3312203.899	307672.850	PFO	0.521
Wetland 23	3312015.579	308564.564	PFO	94.373
Wetland 24	3312849.175	307508.963	PFO	0.120
Wetland 25	3312817.103	307440.332	PFO	0.103
Wetland 26	3313669.105	308101.431	PEM	0.922
Wetland 27	3312517.695	307631.224	PFO	0.045
Wetland 28	3312810.725	307386.680	PFO	0.230
Wetland 29	3312752.060	307423.526	PFO	0.100
Wetland 30	3313471.711	309411.535	PEM	46.023
Wetland 31	3313335.009	309037.374	PEM	36.327
Wetland 32	3312419.781	309044.019	PEM	7.835
Ditches and Ponds (OHWM)	3313209.174	308872.422	NA	9.67
Mosaic/Wetland	3312557.018	308072.924	PFO	208.71
Total Potentially Jurisdictional Features Delineated				719.83

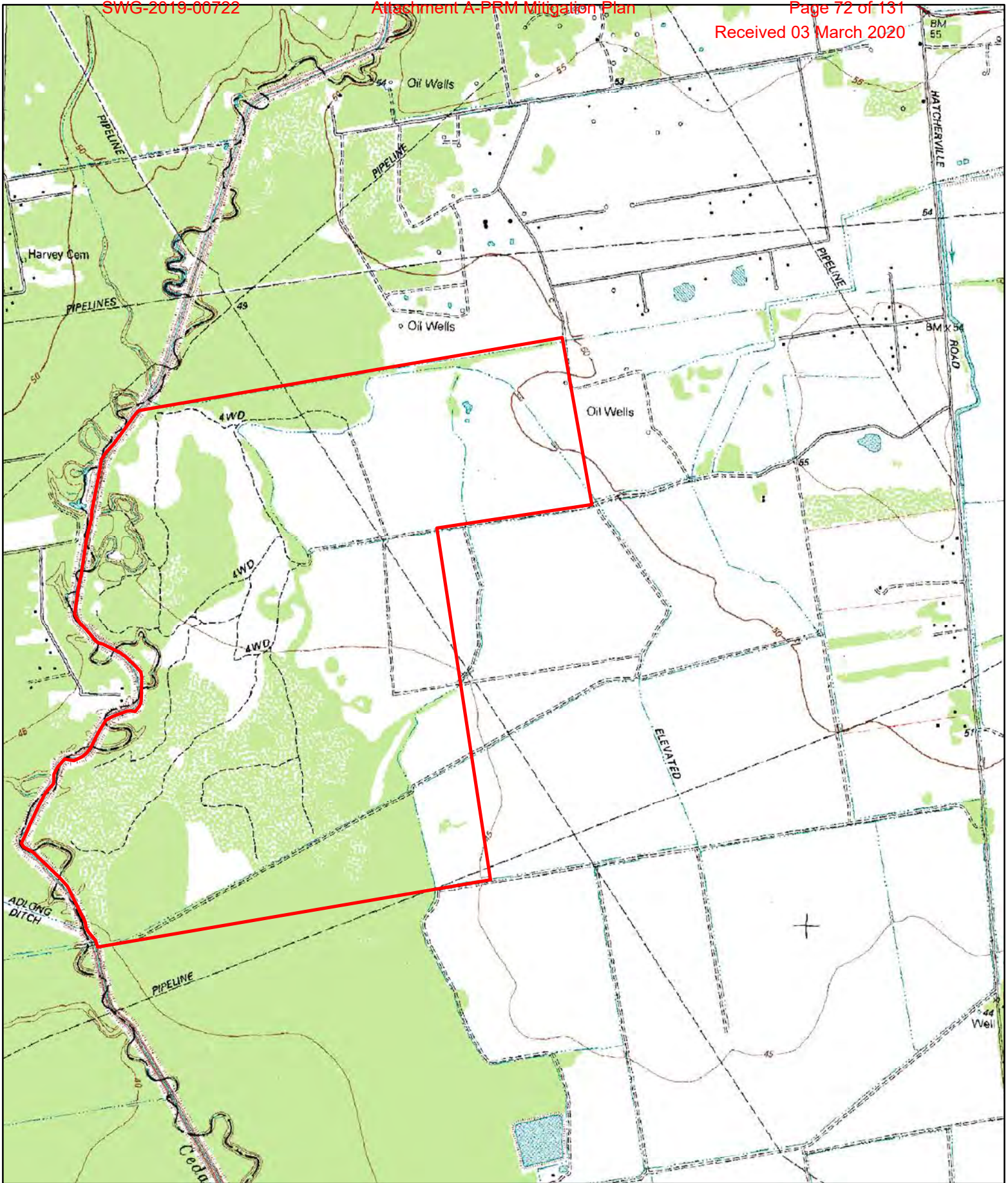



Figure 2: Project Area Map
 McCoy 1,300 Acre Site
 Crosby, Texas

Liberty County, Texas

Map Base: ERSI World Streetmap
 Map Datum: NAD 1983 UTM Zone 15N, meters
 Map Date: April 23, 2019

Legend

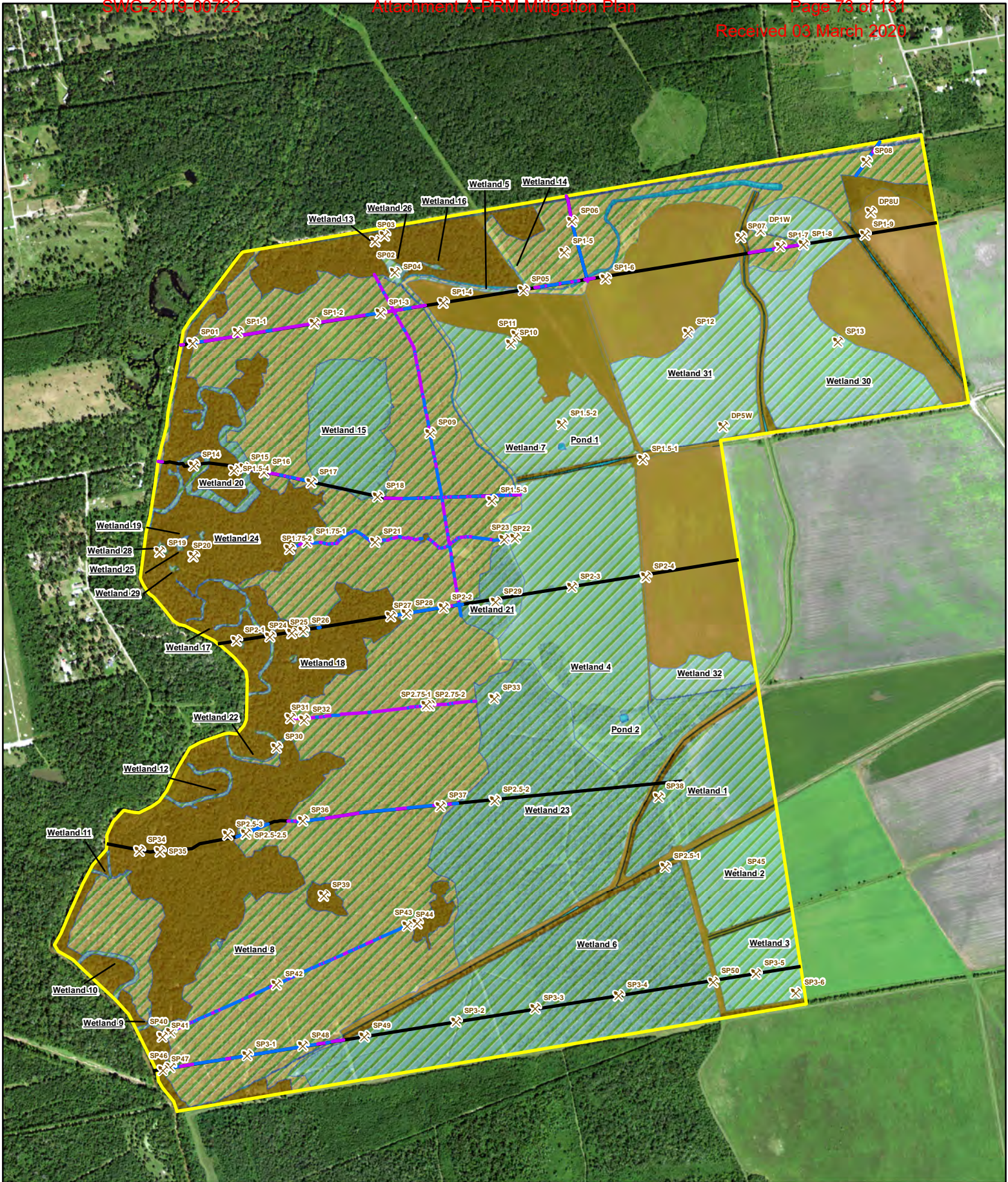
 Property Location - 1,318.48 acres



1:24,000



0 0.125 0.25 0.5
 Miles



Legend

	Sample Points		Property Boundary - 1,318.48 acres
	Transects		Mosaic - 402.18 acres
Mosaic Transects			
	Upland - 10,601.81'		OHWM - 9.67 acres
	Wet - 11,436.38'		Non-Wetlands - 405.18 acres
			Wetlands - 501.45 acres

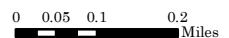
Figure 11: 2016 NC Delineation Map
McCoy 1,300 Acre Site
Crosby, Texas

Liberty County, Texas

Map Base: 2016 NC Aerial Imagery from TNHRIS
 Map Datum: NAD 1983 UTM Zone 15N, meters
 Map Date: January 2, 2020



1:15,000



WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: McCoy 1300 Acre Site City/County: Liberty County Sampling Date: 5/2/18
 Applicant/Owner: Delta Land Services State: Texas Sampling Point: SP2-3
 Investigator(s): DESCO (Arthur Perkins & Chris Little) Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): T Lat: 3312696.88182058 Long: 308649.074922141 Datum: NAD 83
 Soil Map Unit Name: League Clay, 0 to 1 % slopes NWI classification: None

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

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

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Remarks: Sample point is in a fallow field/improved pasture. Field is grazed.	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) <table style="width:100%; border: none;"> <tr> <td><input type="checkbox"/> Surface Water (A1)</td> <td><input type="checkbox"/> Aquatic Fauna (B13)</td> </tr> <tr> <td><input type="checkbox"/> High Water Table (A2)</td> <td><input type="checkbox"/> Marl Deposits (B15) (LRR U)</td> </tr> <tr> <td><input type="checkbox"/> Saturation (A3)</td> <td><input type="checkbox"/> Hydrogen Sulfide Odor (C1)</td> </tr> <tr> <td><input type="checkbox"/> Water Marks (B1)</td> <td><input checked="" type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)</td> </tr> <tr> <td><input type="checkbox"/> Sediment Deposits (B2)</td> <td><input type="checkbox"/> Presence of Reduced Iron (C4)</td> </tr> <tr> <td><input type="checkbox"/> Drift Deposits (B3)</td> <td><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)</td> </tr> <tr> <td><input type="checkbox"/> Algal Mat or Crust (B4)</td> <td><input type="checkbox"/> Thin Muck Surface (C7)</td> </tr> <tr> <td><input type="checkbox"/> Iron Deposits (B5)</td> <td><input type="checkbox"/> Other (Explain in Remarks)</td> </tr> <tr> <td><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Water-Stained Leaves (B9)</td> <td></td> </tr> </table>	<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input type="checkbox"/> Water-Stained Leaves (B9)		Secondary Indicators (minimum of two required) <table style="width:100%; border: none;"> <tr><td><input checked="" type="checkbox"/> Surface Soil Cracks (B6)</td></tr> <tr><td><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)</td></tr> <tr><td><input type="checkbox"/> Drainage Patterns (B10)</td></tr> <tr><td><input type="checkbox"/> Moss Trim Lines (B16)</td></tr> <tr><td><input type="checkbox"/> Dry-Season Water Table (C2)</td></tr> <tr><td><input checked="" type="checkbox"/> Crayfish Burrows (C8)</td></tr> <tr><td><input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)</td></tr> <tr><td><input type="checkbox"/> Geomorphic Position (D2)</td></tr> <tr><td><input type="checkbox"/> Shallow Aquitard (D3)</td></tr> <tr><td><input checked="" type="checkbox"/> FAC-Neutral Test (D5)</td></tr> <tr><td><input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)</td></tr> </table>	<input checked="" type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	<input type="checkbox"/> Moss Trim Lines (B16)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input checked="" type="checkbox"/> Crayfish Burrows (C8)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	<input type="checkbox"/> Geomorphic Position (D2)	<input type="checkbox"/> Shallow Aquitard (D3)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)																															
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)																															
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)																															
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<input checked="" type="checkbox"/> FAC-Neutral Test (D5)																																
<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)																																
Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes _____ No <u>X</u> Depth (inches): _____	Wetland Hydrology Present? Yes <u>X</u> No _____																															
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:																																
Remarks: The field/pasture has adjacent drainage ditches.																																

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

Sampling Point: SP2-3

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>2</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100 %</u> (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>12</u> x 1 = <u>12</u> FACW species <u>21</u> x 2 = <u>42</u> FAC species <u>61</u> x 3 = <u>183</u> FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: <u>94</u> (A) <u>237</u> (B) Prevalence Index = B/A = <u>2.52</u>
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Sapling/Shrub Stratum (Plot size: <u>30'</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Herb Stratum (Plot size: <u>30'</u>)				
1. <u>Andropogon virginicus</u>	<u>30</u>	<u>Y</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Dichantherium acuminatum</u>	<u>25</u>	<u>Y</u>	<u>FAC</u>	
3. <u>Limnoscium pumilum</u>	<u>10</u>		<u>OBL</u>	
4. <u>Rhynchospora inexpansa</u>	<u>10</u>		<u>FACW</u>	
5. <u>Axonopus fissifolius</u>	<u>10</u>		<u>FACW</u>	
6. <u>Albizia julibrissin</u>	<u>3</u>		<u>NI</u>	
7. <u>Rhynchospora glomerata</u>	<u>2</u>		<u>OBL</u>	
8. <u>Phyla nodiflora</u>	<u>2</u>		<u>FAC</u>	
9. <u>Verbena brasiliensis</u>	<u>2</u>		<u>NI</u>	
10. <u>Rubus argutus</u>	<u>2</u>		<u>FAC</u>	
11. <u>Ambrosia trifida</u>	<u>2</u>		<u>FAC</u>	
12. <u>Plantago heterophylla</u>	<u>1</u>		<u>FACW</u>	
<u>99</u> = Total Cover				
50% of total cover: <u>49.5</u> 20% of total cover: <u>19.8</u>				
Woody Vine Stratum (Plot size: <u>30'</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Remarks: (If observed, list morphological adaptations below).				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
				Hydrophytic Vegetation Present? Yes <u>X</u> No _____

SOIL

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-5	10yr4/2	97	10yr5/8	3	C	M	Clay	
5-20	10yr3/2	95	10yr5/8	5	C	M	Clay	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

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

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Organic Bodies (A6) (LRR P, T, U)
- 5 cm Mucky Mineral (A7) (LRR P, T, U)
- Muck Presence (A8) (LRR U)
- 1 cm Muck (A9) (LRR P, T)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Coast Prairie Redox (A16) (MLRA 150A)
- Sandy Mucky Mineral (S1) (LRR O, S)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR P, S, T, U)

- Polyvalue Below Surface (S8) (LRR S, T, U)
- Thin Dark Surface (S9) (LRR S, T, U)
- Loamy Mucky Mineral (F1) (LRR O)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Marl (F10) (LRR U)
- Depleted Ochric (F11) (MLRA 151)
- Iron-Manganese Masses (F12) (LRR O, P, T)
- Umbric Surface (F13) (LRR P, T, U)
- Delta Ochric (F17) (MLRA 151)
- Reduced Vertic (F18) (MLRA 150A, 150B)
- Piedmont Floodplain Soils (F19) (MLRA 149A)
- Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)

Indicators for Problematic Hydric Soils³:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:



Photo 31: SP2-3 Soil Profile



Photo 32: SP2-3 Habitat

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: McCoy 1300 Acre Site City/County: Liberty County Sampling Date: 5/2/18
 Applicant/Owner: Delta Land Services State: Texas Sampling Point: SP2-4
 Investigator(s): DESCO (Arthur Perkins & Chris Little) Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): T Lat: 3312727.15 Long: 308877.067 Datum: NAD 83
 Soil Map Unit Name: League Clay, 0 to 1 % slopes NWI classification: None

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

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

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Remarks: Sample point is in a planted soybean field.	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) <table style="width:100%; border: none;"> <tr> <td style="width:50%; border: none;"><input type="checkbox"/> Surface Water (A1)</td> <td style="width:50%; border: none;"><input type="checkbox"/> Aquatic Fauna (B13)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> High Water Table (A2)</td> <td style="border: none;"><input type="checkbox"/> Marl Deposits (B15) (LRR U)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Saturation (A3)</td> <td style="border: none;"><input type="checkbox"/> Hydrogen Sulfide Odor (C1)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Water Marks (B1)</td> <td style="border: none;"><input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Sediment Deposits (B2)</td> <td style="border: none;"><input type="checkbox"/> Presence of Reduced Iron (C4)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Drift Deposits (B3)</td> <td style="border: none;"><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Algal Mat or Crust (B4)</td> <td style="border: none;"><input type="checkbox"/> Thin Muck Surface (C7)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Iron Deposits (B5)</td> <td style="border: none;"><input checked="" type="checkbox"/> Other (Explain in Remarks)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)</td> <td></td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Water-Stained Leaves (B9)</td> <td></td> </tr> </table>	<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Iron Deposits (B5)	<input checked="" type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input type="checkbox"/> Water-Stained Leaves (B9)		Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)																				
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<input type="checkbox"/> Iron Deposits (B5)	<input checked="" type="checkbox"/> Other (Explain in Remarks)																				
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)																					
<input type="checkbox"/> Water-Stained Leaves (B9)																					
Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes _____ No <u>X</u> Depth (inches): _____	Wetland Hydrology Present? Yes <u>X</u> No _____																				
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:																					
Remarks: The field has adjacent drainage ditches. Furrows are created in the field when planted to drain excess water, so oxidized rhizospheres that would typically be present are not currently.																					

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

Sampling Point: SP2-4

	Absolute % Cover	Dominant Species?	Indicator Status		
Tree Stratum (Plot size: <u>30'</u>)					
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>0</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0 %</u> (A/B)	
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
_____ = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____	
50% of total cover: _____		20% of total cover: _____			
Sapling/Shrub Stratum (Plot size: <u>30'</u>)					
1. _____	_____	_____	_____		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
_____ = Total Cover				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input checked="" type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) Soybeans planted in agricultural field. ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
50% of total cover: _____		20% of total cover: _____			
Herb Stratum (Plot size: <u>30'</u>)					
1. <u>Glycine max</u>	<u>10</u>	<u>Y</u>	<u>NI</u>		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
9. _____	_____	_____	_____		
10. _____	_____	_____	_____		
11. _____	_____	_____	_____		
12. _____	_____	_____	_____		
_____ = Total Cover				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.	
50% of total cover: <u>5</u>		20% of total cover: <u>2</u>			
Woody Vine Stratum (Plot size: <u>30'</u>)					
1. _____	_____	_____	_____		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
_____ = Total Cover				Hydrophytic Vegetation Present? Yes <u>X</u> No _____	
50% of total cover: _____		20% of total cover: _____			

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

Hydrologic indicators are not present to support prevalence index use. The field was recently plowed and planted with soybeans. Native vegetation is very sparse. Adjacent edge vegetation is upland in nature; however the field is slightly lower in elevation.

SOIL

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-6	10yr4/1						Clay	
6-20	10yr4/1	90	10yr5/8	10	C	M	Clay	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

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

- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Organic Bodies (A6) (LRR P, T, U)
- 5 cm Mucky Mineral (A7) (LRR P, T, U)
- Muck Presence (A8) (LRR U)
- 1 cm Muck (A9) (LRR P, T)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Coast Prairie Redox (A16) (MLRA 150A)
- Sandy Mucky Mineral (S1) (LRR O, S)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR P, S, T, U)

- Polyvalue Below Surface (S8) (LRR S, T, U)
- Thin Dark Surface (S9) (LRR S, T, U)
- Loamy Mucky Mineral (F1) (LRR O)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Marl (F10) (LRR U)
- Depleted Ochric (F11) (MLRA 151)
- Iron-Manganese Masses (F12) (LRR O, P, T)
- Umbric Surface (F13) (LRR P, T, U)
- Delta Ochric (F17) (MLRA 151)
- Reduced Vertic (F18) (MLRA 150A, 150B)
- Piedmont Floodplain Soils (F19) (MLRA 149A)
- Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)

Indicators for Problematic Hydric Soils³:

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

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

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

Soils tilled down to approximately 6 inches.



Photo 33: SP2-4 Soil Profile



Photo 34: SP2-4 Habitat

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: McCoy 1300 Acre Site City/County: Liberty County Sampling Date: 5/4/18
 Applicant/Owner: Delta Land Services State: Texas Sampling Point: SP2.5-1
 Investigator(s): DESCO (Arthur Perkins & Chris Little) Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): ditch edge Local relief (concave, convex, none): Convex Slope (%): 0-2
 Subregion (LRR or MLRA): T Lat: 3311836.039 Long: 308937.024 Datum: NAD 83
 Soil Map Unit Name: League Clay, 0 to 1 % slopes NWI classification: None

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

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

Hydrophytic Vegetation Present? Yes _____ No <u>X</u> Hydric Soil Present? Yes _____ No <u>X</u> Wetland Hydrology Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Remarks: Sample point is on the upland edge of a man-made drainage ditch, which empties into Cedar Bayou to the west.	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) <table style="width:100%; border: none;"> <tr> <td><input type="checkbox"/> Surface Water (A1)</td> <td><input type="checkbox"/> Aquatic Fauna (B13)</td> </tr> <tr> <td><input type="checkbox"/> High Water Table (A2)</td> <td><input type="checkbox"/> Marl Deposits (B15) (LRR U)</td> </tr> <tr> <td><input type="checkbox"/> Saturation (A3)</td> <td><input type="checkbox"/> Hydrogen Sulfide Odor (C1)</td> </tr> <tr> <td><input type="checkbox"/> Water Marks (B1)</td> <td><input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)</td> </tr> <tr> <td><input type="checkbox"/> Sediment Deposits (B2)</td> <td><input type="checkbox"/> Presence of Reduced Iron (C4)</td> </tr> <tr> <td><input type="checkbox"/> Drift Deposits (B3)</td> <td><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)</td> </tr> <tr> <td><input type="checkbox"/> Algal Mat or Crust (B4)</td> <td><input type="checkbox"/> Thin Muck Surface (C7)</td> </tr> <tr> <td><input type="checkbox"/> Iron Deposits (B5)</td> <td><input type="checkbox"/> Other (Explain in Remarks)</td> </tr> <tr> <td><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Water-Stained Leaves (B9)</td> <td></td> </tr> </table>	<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input type="checkbox"/> Water-Stained Leaves (B9)		Secondary Indicators (minimum of two required) <table style="width:100%; border: none;"> <tr><td><input type="checkbox"/> Surface Soil Cracks (B6)</td></tr> <tr><td><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)</td></tr> <tr><td><input type="checkbox"/> Drainage Patterns (B10)</td></tr> <tr><td><input type="checkbox"/> Moss Trim Lines (B16)</td></tr> <tr><td><input type="checkbox"/> Dry-Season Water Table (C2)</td></tr> <tr><td><input type="checkbox"/> Crayfish Burrows (C8)</td></tr> <tr><td><input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)</td></tr> <tr><td><input type="checkbox"/> Geomorphic Position (D2)</td></tr> <tr><td><input type="checkbox"/> Shallow Aquitard (D3)</td></tr> <tr><td><input type="checkbox"/> FAC-Neutral Test (D5)</td></tr> <tr><td><input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)</td></tr> </table>	<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	<input type="checkbox"/> Moss Trim Lines (B16)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Crayfish Burrows (C8)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	<input type="checkbox"/> Geomorphic Position (D2)	<input type="checkbox"/> Shallow Aquitard (D3)	<input type="checkbox"/> FAC-Neutral Test (D5)	<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)
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Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes _____ No <u>X</u> Depth (inches): _____	Wetland Hydrology Present? Yes _____ No <u>X</u>																															
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:																																
Remarks:																																

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

Sampling Point: SP2.5-1

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0%</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species <u>2</u> x 2 = <u>4</u> FAC species <u>4</u> x 3 = <u>12</u> FACU species <u>53</u> x 4 = <u>212</u> UPL species _____ x 5 = _____ Column Totals: <u>59</u> (A) <u>228</u> (B) Prevalence Index = B/A = <u>3.86</u>
50% of total cover: _____ 20% of total cover: _____				
Sapling/Shrub Stratum (Plot size: <u>30'</u>)				
1. _____	_____	_____	_____	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
50% of total cover: _____ 20% of total cover: _____				
Herb Stratum (Plot size: <u>30'</u>)				
1. <u>Sorghum helepense</u>	<u>15</u>	<u>Y</u>	<u>FACU</u>	Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
2. <u>Paspalum notatum</u>	<u>10</u>	<u>Y</u>	<u>FACU</u>	
3. <u>Monarda punctata</u>	<u>10</u>	<u>Y</u>	<u>FACU</u>	
4. <u>Cynodon dactylon</u>	<u>5</u>		<u>FACU</u>	
5. <u>Rubus trivialis</u>	<u>5</u>		<u>FACU</u>	
6. <u>Lolium perenne</u>	<u>5</u>		<u>FACU</u>	
7. <u>Oenothera speciosa</u>	<u>3</u>		<u>NI</u>	
8. <u>Phalaris caroliniana</u>	<u>2</u>		<u>FACW</u>	
9. <u>Mimosa strigillosa</u>	<u>2</u>		<u>FAC</u>	
10. <u>Sida spinosa</u>	<u>2</u>		<u>FACU</u>	
11. <u>Paspalum urvillei</u>	<u>2</u>		<u>FAC</u>	
12. <u>Oxalis dillenii</u>	<u>1</u>		<u>FACU</u>	
<u>62</u> = Total Cover				Hydrophytic Vegetation Present? Yes _____ No <u>X</u>
50% of total cover: <u>31</u> 20% of total cover: <u>12.4</u>				
Woody Vine Stratum (Plot size: <u>30'</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Remarks: (If observed, list morphological adaptations below).				

SOIL

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-5	10yr4/1	90					Silty clay	
	10yr6/3	10						
5-11	10yr4/1	60					Clay	
	10yr6/3	40						
11-22	10yr4/1	60	10yr5/6	5			Clay	
	10yr6/3	35						

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils³:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:



Photo 35: SP2.5-1 Soil Profile



Photo 36: SP2.5-1 Habitat

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: McCoy 1300 Acre Site City/County: Liberty County Sampling Date: 5/2/18
 Applicant/Owner: Delta Land Services State: Texas Sampling Point: SP3-2
 Investigator(s): DESCO (Arthur Perkins & Chris Little) Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): None Slope (%): 0-1
 Subregion (LRR or MLRA): T Lat: 3311360.419 Long: 308292.735 Datum: NAD 83
 Soil Map Unit Name: League Clay, 0 to 1 % slopes NWI classification: None

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

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

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Remarks:	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) <table style="width:100%; border: none;"> <tr> <td style="width:50%; border: none;"><input type="checkbox"/> Surface Water (A1)</td> <td style="width:50%; border: none;"><input type="checkbox"/> Aquatic Fauna (B13)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> High Water Table (A2)</td> <td style="border: none;"><input type="checkbox"/> Marl Deposits (B15) (LRR U)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Saturation (A3)</td> <td style="border: none;"><input type="checkbox"/> Hydrogen Sulfide Odor (C1)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Water Marks (B1)</td> <td style="border: none;"><input checked="" type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Sediment Deposits (B2)</td> <td style="border: none;"><input type="checkbox"/> Presence of Reduced Iron (C4)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Drift Deposits (B3)</td> <td style="border: none;"><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Algal Mat or Crust (B4)</td> <td style="border: none;"><input type="checkbox"/> Thin Muck Surface (C7)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Iron Deposits (B5)</td> <td style="border: none;"><input type="checkbox"/> Other (Explain in Remarks)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)</td> <td></td> </tr> <tr> <td style="border: none;"><input checked="" type="checkbox"/> Water-Stained Leaves (B9)</td> <td></td> </tr> </table>	<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input checked="" type="checkbox"/> Water-Stained Leaves (B9)		Secondary Indicators (minimum of two required) <table style="width:100%; border: none;"> <tr><td><input type="checkbox"/> Surface Soil Cracks (B6)</td></tr> <tr><td><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)</td></tr> <tr><td><input type="checkbox"/> Drainage Patterns (B10)</td></tr> <tr><td><input type="checkbox"/> Moss Trim Lines (B16)</td></tr> <tr><td><input type="checkbox"/> Dry-Season Water Table (C2)</td></tr> <tr><td><input type="checkbox"/> Crayfish Burrows (C8)</td></tr> <tr><td><input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)</td></tr> <tr><td><input type="checkbox"/> Geomorphic Position (D2)</td></tr> <tr><td><input type="checkbox"/> Shallow Aquitard (D3)</td></tr> <tr><td><input checked="" type="checkbox"/> FAC-Neutral Test (D5)</td></tr> <tr><td><input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)</td></tr> </table>	<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	<input type="checkbox"/> Moss Trim Lines (B16)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Crayfish Burrows (C8)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	<input type="checkbox"/> Geomorphic Position (D2)	<input type="checkbox"/> Shallow Aquitard (D3)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)
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Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes _____ No <u>X</u> Depth (inches): _____	Wetland Hydrology Present? Yes <u>X</u> No _____																															
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:																																
Remarks:																																

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

Sampling Point: SP3-2

	Absolute % Cover	Dominant Species?	Indicator Status		
Tree Stratum (Plot size: <u>30'</u>)					
1. <u>Triadica sebifera</u>	<u>70</u>	<u>Y</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)	
2. <u>Quercus phellos</u>	<u>10</u>		<u>FACW</u>		
3. _____					
4. _____					
5. _____					
6. _____					
7. _____					
8. _____					
<u>80</u> = Total Cover 50% of total cover: <u>40</u> 20% of total cover: <u>16</u>				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>2</u> x 1 = <u>2</u> FACW species <u>88</u> x 2 = <u>176</u> FAC species <u>103</u> x 3 = <u>309</u> FACU species <u>1</u> x 4 = <u>4</u> UPL species _____ x 5 = _____ Column Totals: <u>194</u> (A) <u>491</u> (B) Prevalence Index = B/A = <u>2.53</u>	
Sapling/Shrub Stratum (Plot size: <u>30'</u>)					
1. <u>Sabal minor</u>	<u>70</u>	<u>Y</u>	<u>FACW</u>		
2. <u>Triadica sebifera</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>		
3. <u>Fraxinus pennsylvanica</u>	<u>5</u>		<u>FACW</u>		
4. <u>Ilex vomitoria</u>	<u>2</u>		<u>FAC</u>		
5. <u>Chironanthus virginicus</u>	<u>1</u>		<u>FACU</u>		
6. <u>Rubus argutus</u>	<u>1</u>		<u>FAC</u>		
7. <u>Viburnum dentatum</u>	<u>1</u>		<u>FAC</u>		
8. _____					
<u>100</u> = Total Cover 50% of total cover: <u>50</u> 20% of total cover: <u>20</u>				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)	
Herb Stratum (Plot size: <u>30'</u>)					
1. <u>Rubus argutus</u>	<u>5</u>	<u>Y</u>	<u>FAC</u>		
2. <u>Ilex vomitoria</u>	<u>2</u>	<u>Y</u>	<u>FAC</u>		
3. <u>Carex caroliniana</u>	<u>1</u>		<u>FACW</u>		
4. <u>Rhynchospora caduca</u>	<u>1</u>		<u>OBL</u>		
5. <u>Dichantherium acuminatum</u>	<u>1</u>		<u>FAC</u>		
6. <u>Carex longii</u>	<u>1</u>		<u>OBL</u>		
7. <u>Carex flacosperma</u>	<u>1</u>		<u>FACW</u>		
8. <u>Carex abscondita</u>	<u>1</u>		<u>FACW</u>		
9. <u>Hypericum hypericoides</u>	<u>1</u>		<u>FAC</u>		
10. _____					
11. _____					
12. _____					
<u>14</u> = Total Cover 50% of total cover: <u>7</u> 20% of total cover: <u>2.8</u>				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.	
Woody Vine Stratum (Plot size: <u>30'</u>)					
1. _____					
2. _____					
3. _____					
4. _____					
5. _____					
_____ = Total Cover 50% of total cover: _____ 20% of total cover: _____					Hydrophytic Vegetation Present? Yes <u>X</u> No _____
Remarks: (If observed, list morphological adaptations below).					

SOIL

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	10yr4/2	98	10yr5/6	2	C	PL	Silty clay	
4-6	10yr4/2	80	10yr5/8	20	C	M	Silty clay	
6-24	10yr5/2	25	10yr5/8	25	C	M	Silty clay	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

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

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Organic Bodies (A6) (LRR P, T, U)
- 5 cm Mucky Mineral (A7) (LRR P, T, U)
- Muck Presence (A8) (LRR U)
- 1 cm Muck (A9) (LRR P, T)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Coast Prairie Redox (A16) (MLRA 150A)
- Sandy Mucky Mineral (S1) (LRR O, S)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR P, S, T, U)

- Polyvalue Below Surface (S8) (LRR S, T, U)
- Thin Dark Surface (S9) (LRR S, T, U)
- Loamy Mucky Mineral (F1) (LRR O)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Marl (F10) (LRR U)
- Depleted Ochric (F11) (MLRA 151)
- Iron-Manganese Masses (F12) (LRR O, P, T)
- Umbric Surface (F13) (LRR P, T, U)
- Delta Ochric (F17) (MLRA 151)
- Reduced Vertic (F18) (MLRA 150A, 150B)
- Piedmont Floodplain Soils (F19) (MLRA 149A)
- Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)

Indicators for Problematic Hydric Soils³:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:



Photo 43: SP3-2 Soil Profile



Photo 44: SP3-2 Habitat

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: McCoy 1300 Acre Site City/County: Liberty County Sampling Date: 5/2/18
 Applicant/Owner: Delta Land Services State: Texas Sampling Point: SP3-3
 Investigator(s): DESCO (Arthur Perkins & Chris Little) Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): None Slope (%): 0
 Subregion (LRR or MLRA): T Lat: 3311400.899 Long: 308536.145 Datum: NAD 83
 Soil Map Unit Name: League Clay, 0 to 1 % slopes NWI classification: PEM

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

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

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Remarks:	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) <table style="width:100%; border: none;"> <tr> <td style="width:50%; border: none;"><input type="checkbox"/> Surface Water (A1)</td> <td style="width:50%; border: none;"><input type="checkbox"/> Aquatic Fauna (B13)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> High Water Table (A2)</td> <td style="border: none;"><input type="checkbox"/> Marl Deposits (B15) (LRR U)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Saturation (A3)</td> <td style="border: none;"><input type="checkbox"/> Hydrogen Sulfide Odor (C1)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Water Marks (B1)</td> <td style="border: none;"><input checked="" type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Sediment Deposits (B2)</td> <td style="border: none;"><input type="checkbox"/> Presence of Reduced Iron (C4)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Drift Deposits (B3)</td> <td style="border: none;"><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Algal Mat or Crust (B4)</td> <td style="border: none;"><input type="checkbox"/> Thin Muck Surface (C7)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Iron Deposits (B5)</td> <td style="border: none;"><input type="checkbox"/> Other (Explain in Remarks)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)</td> <td></td> </tr> <tr> <td style="border: none;"><input checked="" type="checkbox"/> Water-Stained Leaves (B9)</td> <td></td> </tr> </table>	<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input checked="" type="checkbox"/> Water-Stained Leaves (B9)		Secondary Indicators (minimum of two required) <table style="width:100%; border: none;"> <tr><td style="border: none;"><input type="checkbox"/> Surface Soil Cracks (B6)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> Drainage Patterns (B10)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> Moss Trim Lines (B16)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> Dry-Season Water Table (C2)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> Crayfish Burrows (C8)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> Geomorphic Position (D2)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> Shallow Aquitard (D3)</td></tr> <tr><td style="border: none;"><input checked="" type="checkbox"/> FAC-Neutral Test (D5)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)</td></tr> </table>	<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	<input type="checkbox"/> Moss Trim Lines (B16)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Crayfish Burrows (C8)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	<input type="checkbox"/> Geomorphic Position (D2)	<input type="checkbox"/> Shallow Aquitard (D3)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)
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Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes _____ No <u>X</u> Depth (inches): _____	Wetland Hydrology Present? Yes <u>X</u> No _____																															
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:																																
Remarks:																																

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

Sampling Point: SP3-3

	Absolute % Cover	Dominant Species?	Indicator Status																	
Tree Stratum (Plot size: <u>30'</u>)																				
1. <u>Triadica sebifera</u>	<u>80</u>	<u>Y</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>7</u> (A) Total Number of Dominant Species Across All Strata: <u>7</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)																
2. <u>Quercus phellos</u>	<u>2</u>		<u>FACW</u>																	
3. <u>Liquidambar styraciflua</u>	<u>2</u>		<u>FAC</u>																	
4. _____																				
5. _____																				
6. _____																				
7. _____																				
8. _____																				
<u>84</u> = Total Cover 50% of total cover: <u>42</u> 20% of total cover: <u>16.8</u>				Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%; text-align:left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>5</u></td> <td>x 1 = <u>5</u></td> </tr> <tr> <td>FACW species <u>48</u></td> <td>x 2 = <u>96</u></td> </tr> <tr> <td>FAC species <u>129</u></td> <td>x 3 = <u>387</u></td> </tr> <tr> <td>FACU species _____</td> <td>x 4 = _____</td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = _____</td> </tr> <tr> <td>Column Totals: <u>182</u> (A)</td> <td><u>488</u> (B)</td> </tr> <tr> <td colspan="2" style="text-align:center;">Prevalence Index = B/A = <u>2.68</u></td> </tr> </table> Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)	Total % Cover of:	Multiply by:	OBL species <u>5</u>	x 1 = <u>5</u>	FACW species <u>48</u>	x 2 = <u>96</u>	FAC species <u>129</u>	x 3 = <u>387</u>	FACU species _____	x 4 = _____	UPL species _____	x 5 = _____	Column Totals: <u>182</u> (A)	<u>488</u> (B)	Prevalence Index = B/A = <u>2.68</u>	
Total % Cover of:	Multiply by:																			
OBL species <u>5</u>	x 1 = <u>5</u>																			
FACW species <u>48</u>	x 2 = <u>96</u>																			
FAC species <u>129</u>	x 3 = <u>387</u>																			
FACU species _____	x 4 = _____																			
UPL species _____	x 5 = _____																			
Column Totals: <u>182</u> (A)	<u>488</u> (B)																			
Prevalence Index = B/A = <u>2.68</u>																				
Sapling/Shrub Stratum (Plot size: <u>30'</u>)																				
1. <u>Triadica sebifera</u>	<u>30</u>	<u>Y</u>	<u>FAC</u>		Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.															
2. <u>Sabal minor</u>	<u>25</u>	<u>Y</u>	<u>FACW</u>																	
3. <u>Fraxinus pennsylvanica</u>	<u>8</u>		<u>FACW</u>																	
4. <u>Acer rubrum</u>	<u>4</u>		<u>FAC</u>																	
5. <u>Viburnum dentatum</u>	<u>1</u>		<u>FAC</u>																	
6. _____																				
7. _____																				
8. _____																				
<u>68</u> = Total Cover 50% of total cover: <u>34</u> 20% of total cover: <u>13.6</u>																				
Herb Stratum (Plot size: <u>30'</u>)																				
1. <u>Rhynchospora inexpectata</u>	<u>8</u>	<u>Y</u>	<u>FACW</u>	Hydrophytic Vegetation Present? Yes <u>X</u> No _____																
2. <u>Rubus argutus</u>	<u>5</u>	<u>Y</u>	<u>FAC</u>																	
3. <u>Persicaria hydropiperoides</u>	<u>3</u>	<u>Y</u>	<u>OBL</u>																	
4. <u>Agalinis purpurea</u>	<u>2</u>		<u>FACW</u>																	
5. <u>Crinum americanum</u>	<u>2</u>		<u>OBL</u>																	
6. <u>Hypericum hypericoides</u>	<u>2</u>		<u>FAC</u>																	
7. <u>Toxicodendron radicans</u>	<u>2</u>		<u>FAC</u>																	
8. <u>Mikania scandens</u>	<u>1</u>		<u>FACW</u>																	
9. <u>Fraxinus pennsylvanica</u>	<u>1</u>		<u>FACW</u>																	
10. <u>Acer rubrum</u>	<u>1</u>		<u>FAC</u>																	
11. <u>Eleocharis montevidensis</u>	<u>1</u>		<u>FACW</u>																	
12. <u>Viburnum dentatum</u>	<u>1</u>		<u>FAC</u>																	
<u>29</u> = Total Cover 50% of total cover: <u>14.5</u> 20% of total cover: <u>5.8</u>																				
Woody Vine Stratum (Plot size: <u>30'</u>)																				
1. <u>Ampelopsis arborea</u>	<u>1</u>	<u>Y</u>	<u>FAC</u>																	
2. _____																				
3. _____																				
4. _____																				
5. _____																				
<u>1</u> = Total Cover 50% of total cover: <u>0.5</u> 20% of total cover: <u>0.2</u>																				

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

SOIL

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	10yr3/1	95	10yr5/8	5	C	M	Clay loam	
4-16	10yr4/1	90	10yr5/8	10	C	M	Clay	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

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

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Organic Bodies (A6) (LRR P, T, U)
- 5 cm Mucky Mineral (A7) (LRR P, T, U)
- Muck Presence (A8) (LRR U)
- 1 cm Muck (A9) (LRR P, T)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Coast Prairie Redox (A16) (MLRA 150A)
- Sandy Mucky Mineral (S1) (LRR O, S)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR P, S, T, U)

- Polyvalue Below Surface (S8) (LRR S, T, U)
- Thin Dark Surface (S9) (LRR S, T, U)
- Loamy Mucky Mineral (F1) (LRR O)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Marl (F10) (LRR U)
- Depleted Ochric (F11) (MLRA 151)
- Iron-Manganese Masses (F12) (LRR O, P, T)
- Umbric Surface (F13) (LRR P, T, U)
- Delta Ochric (F17) (MLRA 151)
- Reduced Vertic (F18) (MLRA 150A, 150B)
- Piedmont Floodplain Soils (F19) (MLRA 149A)
- Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)

Indicators for Problematic Hydric Soils³:

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

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

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:



Photo 45: SP3-3 Soil Profile



Photo 46: SP3-3 Habitat

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: McCoy 1300 Acre Site City/County: Liberty County Sampling Date: 5/2/18
 Applicant/Owner: Delta Land Services State: Texas Sampling Point: SP3-4
 Investigator(s): DESCO (Arthur Perkins & Chris Little) Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): None Slope (%): 0
 Subregion (LRR or MLRA): T Lat: 3311439.327 Long: 308793.535 Datum: NAD 83
 Soil Map Unit Name: League Clay, 0 to 1 % slopes NWI classification: PFO

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

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

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Remarks:	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) <table style="width:100%; border: none;"> <tr> <td style="width:50%; border: none;"><input type="checkbox"/> Surface Water (A1)</td> <td style="width:50%; border: none;"><input type="checkbox"/> Aquatic Fauna (B13)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> High Water Table (A2)</td> <td style="border: none;"><input type="checkbox"/> Marl Deposits (B15) (LRR U)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Saturation (A3)</td> <td style="border: none;"><input type="checkbox"/> Hydrogen Sulfide Odor (C1)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Water Marks (B1)</td> <td style="border: none;"><input checked="" type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Sediment Deposits (B2)</td> <td style="border: none;"><input type="checkbox"/> Presence of Reduced Iron (C4)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Drift Deposits (B3)</td> <td style="border: none;"><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Algal Mat or Crust (B4)</td> <td style="border: none;"><input type="checkbox"/> Thin Muck Surface (C7)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Iron Deposits (B5)</td> <td style="border: none;"><input type="checkbox"/> Other (Explain in Remarks)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)</td> <td></td> </tr> <tr> <td style="border: none;"><input checked="" type="checkbox"/> Water-Stained Leaves (B9)</td> <td></td> </tr> </table>	<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input checked="" type="checkbox"/> Water-Stained Leaves (B9)		Secondary Indicators (minimum of two required) <table style="width:100%; border: none;"> <tr><td style="border: none;"><input type="checkbox"/> Surface Soil Cracks (B6)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> Drainage Patterns (B10)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> Moss Trim Lines (B16)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> Dry-Season Water Table (C2)</td></tr> <tr><td style="border: none;"><input checked="" type="checkbox"/> Crayfish Burrows (C8)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> Geomorphic Position (D2)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> Shallow Aquitard (D3)</td></tr> <tr><td style="border: none;"><input checked="" type="checkbox"/> FAC-Neutral Test (D5)</td></tr> <tr><td style="border: none;"><input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)</td></tr> </table>	<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	<input type="checkbox"/> Moss Trim Lines (B16)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input checked="" type="checkbox"/> Crayfish Burrows (C8)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	<input type="checkbox"/> Geomorphic Position (D2)	<input type="checkbox"/> Shallow Aquitard (D3)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)																															
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)																															
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)																															
<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)																															
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<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)																															
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)																															
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)																															
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)																																
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)																																
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<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)																																
Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes _____ No <u>X</u> Depth (inches): _____	Wetland Hydrology Present? Yes <u>X</u> No _____																															
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:																																
Remarks:																																

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

Sampling Point: SP3-4

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				
1. <u>Triadica sebifera</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>7</u> (A) Total Number of Dominant Species Across All Strata: <u>7</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
2. <u>Fraxinus pennsylvanica</u>	<u>10</u>	<u>Y</u>	<u>FACW</u>	
3. <u>Acer rubrum</u>	<u>10</u>	<u>Y</u>	<u>FAC</u>	
4. <u>Liquidambar styraciflua</u>	<u>10</u>	<u>Y</u>	<u>FAC</u>	
5. <u>Ulmus americana</u>	<u>8</u>		<u>FAC</u>	
6. <u>Ulmus rubra</u>	<u>5</u>		<u>FAC</u>	
7. <u>Quercus phellos</u>	<u>5</u>		<u>FACW</u>	
8. _____				
<u>68</u> = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>4</u> x 1 = <u>4</u> FACW species <u>48</u> x 2 = <u>96</u> FAC species <u>71</u> x 3 = <u>213</u> FACU species <u>1</u> x 4 = <u>4</u> UPL species _____ x 5 = _____ Column Totals: <u>124</u> (A) <u>317</u> (B) Prevalence Index = B/A = <u>2.56</u>
50% of total cover: <u>34</u>		20% of total cover: <u>13.6</u>		
Sapling/Shrub Stratum (Plot size: <u>30'</u>)				
1. <u>Sabal minor</u>	<u>20</u>	<u>Y</u>	<u>FACW</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
2. <u>Triadica sebifera</u>	<u>8</u>		<u>FAC</u>	
3. <u>Acer rubrum</u>	<u>5</u>		<u>FACW</u>	
4. <u>Quercus phellos</u>	<u>3</u>		<u>FAC</u>	
5. <u>Ditrysinia fruticosa</u>	<u>1</u>		<u>FAC</u>	
6. _____				
7. _____				
8. _____				
<u>37</u> = Total Cover				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
50% of total cover: <u>18.5</u>		20% of total cover: <u>7.4</u>		
Herb Stratum (Plot size: <u>30'</u>)				
1. <u>Rhynchospora inexpansa</u>	<u>5</u>	<u>Y</u>	<u>FACW</u>	Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
2. <u>Carex leptalea</u>	<u>4</u>	<u>Y</u>	<u>OBL</u>	
3. <u>Sabal minor</u>	<u>1</u>		<u>FACW</u>	
4. <u>Rubus argutus</u>	<u>1</u>		<u>FACW</u>	
5. <u>Lonicera japonica</u>	<u>1</u>		<u>FACU</u>	
6. <u>Triadica sebifera</u>	<u>1</u>		<u>FAC</u>	
7. <u>Toxicodendron radicans</u>	<u>1</u>		<u>FAC</u>	
8. <u>Acer rubrum</u>	<u>1</u>		<u>FAC</u>	
9. <u>Fraxinus pennsylvanica</u>	<u>1</u>		<u>FACW</u>	
10. <u>Liquidambar styraciflua</u>	<u>1</u>		<u>FAC</u>	
11. <u>Hypericum hypericoides</u>	<u>1</u>		<u>FAC</u>	
12. <u>Dichanthelium acuminatum</u>	<u>1</u>		<u>FAC</u>	
<u>19</u> = Total Cover				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
50% of total cover: <u>9.5</u>		20% of total cover: <u>3.8</u>		
Woody Vine Stratum (Plot size: <u>30'</u>)				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
_____ = Total Cover				
50% of total cover: _____		20% of total cover: _____		
Remarks: (If observed, list morphological adaptations below).				

SOIL

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	10yr4/2	98	10yr5/6	2	C	M	Clay	
2-17	10yr4/1	80	10yr5/8	20	C	M	Clay	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

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

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Organic Bodies (A6) (LRR P, T, U)
- 5 cm Mucky Mineral (A7) (LRR P, T, U)
- Muck Presence (A8) (LRR U)
- 1 cm Muck (A9) (LRR P, T)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Coast Prairie Redox (A16) (MLRA 150A)
- Sandy Mucky Mineral (S1) (LRR O, S)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR P, S, T, U)

- Polyvalue Below Surface (S8) (LRR S, T, U)
- Thin Dark Surface (S9) (LRR S, T, U)
- Loamy Mucky Mineral (F1) (LRR O)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Marl (F10) (LRR U)
- Depleted Ochric (F11) (MLRA 151)
- Iron-Manganese Masses (F12) (LRR O, P, T)
- Umbric Surface (F13) (LRR P, T, U)
- Delta Ochric (F17) (MLRA 151)
- Reduced Vertic (F18) (MLRA 150A, 150B)
- Piedmont Floodplain Soils (F19) (MLRA 149A)
- Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)

Indicators for Problematic Hydric Soils³:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:



Photo 47: SP3-4 Soil Profile



Photo 48: SP3-4 Habitat

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: McCoy 1300 Acre Site City/County: Liberty County Sampling Date: 5/4/18
 Applicant/Owner: Delta Land Services State: Texas Sampling Point: SP3-5
 Investigator(s): DESCO (Arthur Perkins & Chris Little) Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): Convex Slope (%): 0-1
 Subregion (LRR or MLRA): T Lat: 3311506.618 Long: 309215.725 Datum: NAD 83
 Soil Map Unit Name: League Clay, 0 to 1 % slopes NWI classification: None

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

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

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Remarks: Sample point is in a fallow crop field that has been plowed with in the last year or two.	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) <table style="width:100%; border: none;"> <tr> <td><input type="checkbox"/> Surface Water (A1)</td> <td><input type="checkbox"/> Aquatic Fauna (B13)</td> </tr> <tr> <td><input type="checkbox"/> High Water Table (A2)</td> <td><input type="checkbox"/> Marl Deposits (B15) (LRR U)</td> </tr> <tr> <td><input type="checkbox"/> Saturation (A3)</td> <td><input type="checkbox"/> Hydrogen Sulfide Odor (C1)</td> </tr> <tr> <td><input type="checkbox"/> Water Marks (B1)</td> <td><input checked="" type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)</td> </tr> <tr> <td><input type="checkbox"/> Sediment Deposits (B2)</td> <td><input type="checkbox"/> Presence of Reduced Iron (C4)</td> </tr> <tr> <td><input type="checkbox"/> Drift Deposits (B3)</td> <td><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)</td> </tr> <tr> <td><input type="checkbox"/> Algal Mat or Crust (B4)</td> <td><input type="checkbox"/> Thin Muck Surface (C7)</td> </tr> <tr> <td><input type="checkbox"/> Iron Deposits (B5)</td> <td><input type="checkbox"/> Other (Explain in Remarks)</td> </tr> <tr> <td><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Water-Stained Leaves (B9)</td> <td></td> </tr> </table>	<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input type="checkbox"/> Water-Stained Leaves (B9)		Secondary Indicators (minimum of two required) <table style="width:100%; border: none;"> <tr><td><input type="checkbox"/> Surface Soil Cracks (B6)</td></tr> <tr><td><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)</td></tr> <tr><td><input type="checkbox"/> Drainage Patterns (B10)</td></tr> <tr><td><input type="checkbox"/> Moss Trim Lines (B16)</td></tr> <tr><td><input type="checkbox"/> Dry-Season Water Table (C2)</td></tr> <tr><td><input checked="" type="checkbox"/> Crayfish Burrows (C8)</td></tr> <tr><td><input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)</td></tr> <tr><td><input type="checkbox"/> Geomorphic Position (D2)</td></tr> <tr><td><input type="checkbox"/> Shallow Aquitard (D3)</td></tr> <tr><td><input checked="" type="checkbox"/> FAC-Neutral Test (D5)</td></tr> <tr><td><input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)</td></tr> </table>	<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	<input type="checkbox"/> Moss Trim Lines (B16)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input checked="" type="checkbox"/> Crayfish Burrows (C8)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	<input type="checkbox"/> Geomorphic Position (D2)	<input type="checkbox"/> Shallow Aquitard (D3)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)
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Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes _____ No <u>X</u> Depth (inches): _____	Wetland Hydrology Present? Yes <u>X</u> No _____																															
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:																																
Remarks: The fallow field has adjacent drainage ditches.																																

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

Sampling Point: SP3-5

	Absolute % Cover	Dominant Species?	Indicator Status		
Tree Stratum (Plot size: <u>30'</u>)					
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)	
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
_____ = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>65</u> x 1 = <u>65</u> FACW species <u>6</u> x 2 = <u>12</u> FAC species _____ x 3 = _____ FACU species <u>10</u> x 4 = <u>40</u> UPL species _____ x 5 = _____ Column Totals: <u>81</u> (A) <u>117</u> (B) Prevalence Index = B/A = <u>1.44</u>	
50% of total cover: _____		20% of total cover: _____			
Sapling/Shrub Stratum (Plot size: <u>30'</u>)					
1. _____	_____	_____	_____		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
_____ = Total Cover				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)	
50% of total cover: _____		20% of total cover: _____			
Herb Stratum (Plot size: <u>30'</u>)					
1. <u>Limnoscadium pumilum</u>	<u>60</u>	<u>Y</u>	<u>OBL</u>		
2. <u>Lolium perenne</u>	<u>10</u>		<u>FACU</u>		
3. <u>Steinchisma hians</u>	<u>3</u>		<u>OBL</u>		
4. <u>Juncus marginatus</u>	<u>2</u>		<u>FACW</u>		
5. <u>Juncus acuminatus</u>	<u>2</u>		<u>OBL</u>		
6. <u>Cyperus virens</u>	<u>1</u>		<u>FACW</u>		
7. <u>Phalaris caroliniana</u>	<u>1</u>		<u>FACW</u>		
8. <u>Eragrostis refracta</u>	<u>1</u>		<u>FACW</u>		
9. <u>Plantago heterophylla</u>	<u>1</u>		<u>FACW</u>		
10. _____	_____	_____	_____		
11. _____	_____	_____	_____		
12. _____	_____	_____	_____		
<u>81</u> = Total Cover				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.	
50% of total cover: <u>40.5</u>		20% of total cover: <u>16.2</u>			
Woody Vine Stratum (Plot size: <u>30'</u>)					
1. _____	_____	_____	_____		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
_____ = Total Cover				Hydrophytic Vegetation Present? Yes <u>X</u> No _____	
50% of total cover: _____		20% of total cover: _____			
Remarks: (If observed, list morphological adaptations below).					
Hydrologic and hydric soils indicators are present.					

SOIL

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	10yr3/1	100					Clay	
4-16	10yr3/1	97	10yr5/8	3	C	PL	Clay	
16-20	10yr3/1	95	10yr5/8	5	D	M,PL	Clay	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

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

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Organic Bodies (A6) (LRR P, T, U)
- 5 cm Mucky Mineral (A7) (LRR P, T, U)
- Muck Presence (A8) (LRR U)
- 1 cm Muck (A9) (LRR P, T)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Coast Prairie Redox (A16) (MLRA 150A)
- Sandy Mucky Mineral (S1) (LRR O, S)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR P, S, T, U)

- Polyvalue Below Surface (S8) (LRR S, T, U)
- Thin Dark Surface (S9) (LRR S, T, U)
- Loamy Mucky Mineral (F1) (LRR O)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Marl (F10) (LRR U)
- Depleted Ochric (F11) (MLRA 151)
- Iron-Manganese Masses (F12) (LRR O, P, T)
- Umbric Surface (F13) (LRR P, T, U)
- Delta Ochric (F17) (MLRA 151)
- Reduced Vertic (F18) (MLRA 150A, 150B)
- Piedmont Floodplain Soils (F19) (MLRA 149A)
- Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)

Indicators for Problematic Hydric Soils³:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:



Photo 49: SP3-5 Soil Profile



Photo 50: SP3-5 Habitat

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: McCoy 1300 Acre Site City/County: Liberty County Sampling Date: 5/4/18
 Applicant/Owner: Delta Land Services State: Texas Sampling Point: SP3-6
 Investigator(s): DESCO (Arthur Perkins & Chris Little) Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): Convex Slope (%): 0-1
 Subregion (LRR or MLRA): T Lat: 3311448.23663003 Long: 309338.418735929 Datum: NAD 83
 Soil Map Unit Name: Mocarey-Yeaton Complex, 0 to 1 % slopes NWI classification: None

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

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

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Remarks: Sample point is in a fallow crop field that has been plowed with in the last year or two.	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) <table style="width:100%; border: none;"> <tr> <td><input type="checkbox"/> Surface Water (A1)</td> <td><input type="checkbox"/> Aquatic Fauna (B13)</td> </tr> <tr> <td><input type="checkbox"/> High Water Table (A2)</td> <td><input type="checkbox"/> Marl Deposits (B15) (LRR U)</td> </tr> <tr> <td><input type="checkbox"/> Saturation (A3)</td> <td><input type="checkbox"/> Hydrogen Sulfide Odor (C1)</td> </tr> <tr> <td><input type="checkbox"/> Water Marks (B1)</td> <td><input checked="" type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)</td> </tr> <tr> <td><input type="checkbox"/> Sediment Deposits (B2)</td> <td><input type="checkbox"/> Presence of Reduced Iron (C4)</td> </tr> <tr> <td><input type="checkbox"/> Drift Deposits (B3)</td> <td><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)</td> </tr> <tr> <td><input type="checkbox"/> Algal Mat or Crust (B4)</td> <td><input type="checkbox"/> Thin Muck Surface (C7)</td> </tr> <tr> <td><input type="checkbox"/> Iron Deposits (B5)</td> <td><input type="checkbox"/> Other (Explain in Remarks)</td> </tr> <tr> <td><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Water-Stained Leaves (B9)</td> <td></td> </tr> </table>	<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input type="checkbox"/> Water-Stained Leaves (B9)		Secondary Indicators (minimum of two required) <table style="width:100%; border: none;"> <tr><td><input type="checkbox"/> Surface Soil Cracks (B6)</td></tr> <tr><td><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)</td></tr> <tr><td><input type="checkbox"/> Drainage Patterns (B10)</td></tr> <tr><td><input type="checkbox"/> Moss Trim Lines (B16)</td></tr> <tr><td><input type="checkbox"/> Dry-Season Water Table (C2)</td></tr> <tr><td><input checked="" type="checkbox"/> Crayfish Burrows (C8)</td></tr> <tr><td><input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)</td></tr> <tr><td><input type="checkbox"/> Geomorphic Position (D2)</td></tr> <tr><td><input type="checkbox"/> Shallow Aquitard (D3)</td></tr> <tr><td><input checked="" type="checkbox"/> FAC-Neutral Test (D5)</td></tr> <tr><td><input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)</td></tr> </table>	<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	<input type="checkbox"/> Moss Trim Lines (B16)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input checked="" type="checkbox"/> Crayfish Burrows (C8)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	<input type="checkbox"/> Geomorphic Position (D2)	<input type="checkbox"/> Shallow Aquitard (D3)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)
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Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes _____ No <u>X</u> Depth (inches): _____	Wetland Hydrology Present? Yes <u>X</u> No _____																															
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:																																
Remarks: The fallow field has adjacent drainage ditches. When in cultivation, drainage furrows are used to drain the field of excess water.																																

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

Sampling Point: SP3-6

<u>Tree Stratum</u> (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>2</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50 %</u> (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>22</u> x 1 = <u>22</u> FACW species <u>23</u> x 2 = <u>46</u> FAC species _____ x 3 = _____ FACU species <u>35</u> x 4 = <u>140</u> UPL species _____ x 5 = _____ Column Totals: <u>80</u> (A) <u>208</u> (B) Prevalence Index = B/A = <u>2.6</u>
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
<u>Sapling/Shrub Stratum</u> (Plot size: <u>30'</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
<u>Herb Stratum</u> (Plot size: <u>30'</u>)				
1. <u>Lolium perenne</u>	<u>25</u>	<u>Y</u>	<u>FACU</u>	
2. <u>Limnoscium pumilum</u>	<u>20</u>	<u>Y</u>	<u>OBL</u>	
3. <u>Cynodon dactylon</u>	<u>10</u>		<u>FACU</u>	
4. <u>Eragrostis refracta</u>	<u>10</u>		<u>FACW</u>	
5. <u>Juncus marginatus</u>	<u>8</u>		<u>FACW</u>	
6. <u>Cyperus virens</u>	<u>5</u>		<u>FACW</u>	
7. <u>Juncus acuminatus</u>	<u>2</u>		<u>OBL</u>	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: <u>40</u> 20% of total cover: <u>16</u>				
<u>Woody Vine Stratum</u> (Plot size: <u>30'</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Remarks: (If observed, list morphological adaptations below). Hydrologic and hydric soils indicators are present.				
Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)				
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.				
Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.				
Hydrophytic Vegetation Present? Yes <u>X</u> No _____				

SOIL

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	10yr3/1	98	10yr5/8	2	C	M	Clay	
4-18	10yr4/1	75	10yr5/8	5	C	M	Clay	
			10yr6/1	20	D	M	Clay	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

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

- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Organic Bodies (A6) (LRR P, T, U)
- 5 cm Mucky Mineral (A7) (LRR P, T, U)
- Muck Presence (A8) (LRR U)
- 1 cm Muck (A9) (LRR P, T)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Coast Prairie Redox (A16) (MLRA 150A)
- Sandy Mucky Mineral (S1) (LRR O, S)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR P, S, T, U)

- Polyvalue Below Surface (S8) (LRR S, T, U)
- Thin Dark Surface (S9) (LRR S, T, U)
- Loamy Mucky Mineral (F1) (LRR O)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Marl (F10) (LRR U)
- Depleted Ochric (F11) (MLRA 151)
- Iron-Manganese Masses (F12) (LRR O, P, T)
- Umbric Surface (F13) (LRR P, T, U)
- Delta Ochric (F17) (MLRA 151)
- Reduced Vertic (F18) (MLRA 150A, 150B)
- Piedmont Floodplain Soils (F19) (MLRA 149A)
- Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)

Indicators for Problematic Hydric Soils³:

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

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

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:



Photo 51: SP3-6 Soil Profile



Photo 52: SP3-6 Habitat

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: McCoy 1300 Acre Site **City/County:** Liberty County **Sampling Date:** 21-May-19
Applicant/Owner: Delta Land Services **State:** Texas **Sampling Point:** SP38
Investigator(s): DESCO-Chris Little & Thomas Wilder **Section, Township, Range:** S T R
Landform (hillslope, terrace, etc.): **Local relief (concave, convex, none):** **Slope:** 0.0 % / 0.0 °
Subregion (LRR or MLRA): LRR T **Lat.:** 3312051.295 **Long.:** 308916.274 **Datum:** NAD 83
Soil Map Unit Name: League Clay, 0 to 1 percent slopes **NWI classification:** none

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Hydric Soil Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="radio"/> No <input type="radio"/>
Remarks:	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of 2 required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) (LRR U) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry Season Water Table (C2) <input checked="" type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input checked="" type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)
Field Observations: Surface Water Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): _____ Water Table Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): _____		Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

VEGETATION (Five/Four Strata) - Use scientific names of plants.

Received 03 March 2020
 Sampling Point: SP38

		Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30' radius)				
1.	<i>Celtis laevigata</i>	20	<input checked="" type="checkbox"/> 36.4%	FACW
2.	<i>Quercus phellos</i>	20	<input checked="" type="checkbox"/> 36.4%	FACW
3.	<i>Ulmus americana</i>	10	<input type="checkbox"/> 18.2%	FAC
4.	<i>Fraxinus pennsylvanica</i>	5	<input type="checkbox"/> 9.1%	FACW
5.		0	<input type="checkbox"/> 0.0%	
6.		0	<input type="checkbox"/> 0.0%	
7.		0	<input type="checkbox"/> 0.0%	
8.		0	<input type="checkbox"/> 0.0%	
50% of Total Cover: 27.5		20% of Total Cover: 11	55	= Total Cover
Sapling or Sapling/Shrub Stratum (Plot size: 30' radius)				
1.	<i>Sabal minor</i>	20	<input checked="" type="checkbox"/> 57.1%	FACW
2.	<i>Ilex vomitoria</i>	5	<input type="checkbox"/> 14.3%	FAC
3.	<i>Ilex decidua</i>	5	<input type="checkbox"/> 14.3%	FACW
4.	<i>Quercus phellos</i>	5	<input type="checkbox"/> 14.3%	FACW
5.		0	<input type="checkbox"/> 0.0%	
6.		0	<input type="checkbox"/> 0.0%	
7.		0	<input type="checkbox"/> 0.0%	
8.		0	<input type="checkbox"/> 0.0%	
50% of Total Cover: 17.5		20% of Total Cover: 7	35	= Total Cover
Shrub Stratum (Plot size:)				
1.		0	<input type="checkbox"/> 0.0%	
2.		0	<input type="checkbox"/> 0.0%	
3.		0	<input type="checkbox"/> 0.0%	
4.		0	<input type="checkbox"/> 0.0%	
5.		0	<input type="checkbox"/> 0.0%	
6.		0	<input type="checkbox"/> 0.0%	
50% of Total Cover: 0		20% of Total Cover: 0	0	= Total Cover
Herb Stratum (Plot size: 30' radius)				
1.	<i>Toxicodendron radicans</i>	5	<input checked="" type="checkbox"/> 41.7%	FAC
2.	<i>Parthenocissus quinquefolia</i>	2	<input checked="" type="checkbox"/> 16.7%	FACU
3.	<i>Quercus phellos</i>	2	<input checked="" type="checkbox"/> 16.7%	FACW
4.	<i>Sabal minor</i>	2	<input checked="" type="checkbox"/> 16.7%	FACW
5.	<i>Carex caroliniana</i>	1	<input type="checkbox"/> 8.3%	FACW
6.		0	<input type="checkbox"/> 0.0%	
7.		0	<input type="checkbox"/> 0.0%	
8.		0	<input type="checkbox"/> 0.0%	
9.		0	<input type="checkbox"/> 0.0%	
10.		0	<input type="checkbox"/> 0.0%	
11.		0	<input type="checkbox"/> 0.0%	
12.		0	<input type="checkbox"/> 0.0%	
50% of Total Cover: 6		20% of Total Cover: 2.4	12	= Total Cover
Woody Vine Stratum (Plot size: 30' radius)				
1.		0	<input type="checkbox"/> 0.0%	
2.		0	<input type="checkbox"/> 0.0%	
3.		0	<input type="checkbox"/> 0.0%	
4.		0	<input type="checkbox"/> 0.0%	
5.		0	<input type="checkbox"/> 0.0%	
50% of Total Cover: 0		20% of Total Cover: 0	0	= Total Cover

Dominance Test worksheet:

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

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

Percent of dominant Species That Are OBL, FACW, or FAC: 85.7% (A/B)

Prevalence Index worksheet:

Total % Cover of: Multiply by:

OBL species 0 x 1 = 0

FACW species 80 x 2 = 160

FAC species 20 x 3 = 60

FACU species 2 x 4 = 8

UPL species 0 x 5 = 0

Column Total s: 102 (A) 228 (B)

Prevalence Index = B/A = 2.235

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is > 50%

3 - Prevalence Index is ≤ 3.0¹

Problematic Hydrophytic Vegetation¹ (Explain)

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

Definition of Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

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

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes No

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

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

SOIL

Sampling Point: SP38

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

Depth (inches)	Matrix			Redox Features				Texture	Remarks	
	Color (moist)		%	Color (moist)	%	Tvpe ¹	Loc ²			
0-14	10YR	3/1	97	10YR	5/6	3	C	M	Clay	

¹ Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains ²Location: PL=Pore Lining. M=Matrix

Hydric Soil Indicators:

Histosol (A1)

Histic Epipedon (A2)

Black Histic (A3)

Hydrogen Sulfide (A4)

Stratified Layers (A5)

Organic Bodies (A6) (LRR P, T, U)

5 cm Mucky Mineral (A7) (LRR P, T, U)

Muck Presence (A8) (LRR U)

1 cm Muck (A9) (LRR P, T)

Depleted Below Dark Surface (A11)

Thick Dark Surface (A12)

Coast Prairie Redox (A16) (MLRA 150A)

Sandy Muck Mineral (S1) (LRR O, S)

Sandy Gleyed Matrix (S4)

Sandy Redox (S5)

Stripped Matrix (S6)

Dark Surface (S7) (LRR P, S, T, U)

Polyvalue Below Surface (S8) (LRR S, T, U)

Thin Dark Surface (S9) (LRR S, T, U)

Loamy Mucky Mineral (F1) (LRR O)

Loamy Gleyed Matrix (F2)

Depleted Matrix (F3)

Redox Dark Surface (F6)

Depleted Dark Surface (F7)

Redox Depressions (F8)

Marl (F10) (LRR U)

Depleted Ochric (F11) (MLRA 151)

Iron-Manganese Masses (F12) (LRR O, P, T)

Umbric Surface (F13) (LRR P, T, U)

Delta Ochric (F17) (MLRA 151)

Reduced Vertic (F18) (MLRA 150A, 150B)

Piedmont Floodplain Soils (F19) (MLRA 149A)

Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)

Indicators for Problematic Hydric Soils³:

1 cm Muck (A9) (LRR O)

2 cm Muck (A10) (LRR S)

Reduced Vertic (F18) (outside MLRA 150A,B)

Piedmont Floodplain Soils (F19) (LRR P, S, T)

Anomalous Bright Loamy Soils (F20) (MLRA 153B)

Red Parent Material (TF2)

Very Shallow Dark Surface (TF12)

Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Remarks:

Hydric Soil Present? Yes No



Photo 19: SP38 Soil Profile



Photo 20: SP38 Habitat

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: McCoy 1300 Acre Site **City/County:** Liberty County **Sampling Date:** 21-May-19
Applicant/Owner: Delta Land Services **State:** Texas **Sampling Point:** SP45
Investigator(s): DESCO-Chris Little & Thomas Wilder **Section, Township, Range:** S T R
Landform (hillslope, terrace, etc.): Flat **Local relief (concave, convex, none):** none **Slope:** 0.0 % / 0.0 °
Subregion (LRR or MLRA): LRR T **Lat.:** 3311818.866 **Long.:** 309162.893 **Datum:** NAD 83
Soil Map Unit Name: League Clay, 0 to 1 percent slopes **NWI classification:** none

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

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

Hydrophytic Vegetation Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="radio"/> No <input type="radio"/>
Hydric Soil Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	
Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	
Remarks: possible hay field, dominant grass could not be positively identified due to lack of seed heads	

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of 2 required)	
Primary Indicators (minimum of one required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input checked="" type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Moss Trim Lines (B16)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Dry Season Water Table (C2)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input checked="" type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Water-Stained Leaves (B9)		<input type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/>		<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)	
Field Observations:		Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	
Surface Water Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): _____		
Water Table Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): _____		
Saturation Present? (includes capillary fringe) Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): _____		
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks:			

VEGETATION (Five/Four Strata) - Use scientific names of plants.

Received 03 March 2020
 Sampling Point: SP45

Tree Stratum (Plot size: 30' radius)		Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
1.		0	<input type="checkbox"/> 0.0%	
2.		0	<input type="checkbox"/> 0.0%	
3.		0	<input type="checkbox"/> 0.0%	
4.		0	<input type="checkbox"/> 0.0%	
5.		0	<input type="checkbox"/> 0.0%	
6.		0	<input type="checkbox"/> 0.0%	
7.		0	<input type="checkbox"/> 0.0%	
8.		0	<input type="checkbox"/> 0.0%	
50% of Total Cover: 0		20% of Total Cover: 0	0	= Total Cover
Sapling or Sapling/Shrub Stratum (Plot size: 30' radius)				
1.		0	<input type="checkbox"/> 0.0%	
2.		0	<input type="checkbox"/> 0.0%	
3.		0	<input type="checkbox"/> 0.0%	
4.		0	<input type="checkbox"/> 0.0%	
5.		0	<input type="checkbox"/> 0.0%	
6.		0	<input type="checkbox"/> 0.0%	
7.		0	<input type="checkbox"/> 0.0%	
8.		0	<input type="checkbox"/> 0.0%	
50% of Total Cover: 0		20% of Total Cover: 0	0	= Total Cover
Shrub Stratum (Plot size:)				
1.		0	<input type="checkbox"/> 0.0%	
2.		0	<input type="checkbox"/> 0.0%	
3.		0	<input type="checkbox"/> 0.0%	
4.		0	<input type="checkbox"/> 0.0%	
5.		0	<input type="checkbox"/> 0.0%	
6.		0	<input type="checkbox"/> 0.0%	
50% of Total Cover: 0		20% of Total Cover: 0	0	= Total Cover
Herb Stratum (Plot size: 30' radius)				
1.	<i>Paspalum notatum</i>	95	<input checked="" type="checkbox"/> 97.9% FACU	
2.	<i>Carex flaccosperma</i>	1	<input type="checkbox"/> 1.0% FACW	
3.	<i>Eleocharis montevidensis</i>	1	<input type="checkbox"/> 1.0% FACW	
4.		0	<input type="checkbox"/> 0.0%	
5.		0	<input type="checkbox"/> 0.0%	
6.		0	<input type="checkbox"/> 0.0%	
7.		0	<input type="checkbox"/> 0.0%	
8.		0	<input type="checkbox"/> 0.0%	
9.		0	<input type="checkbox"/> 0.0%	
10.		0	<input type="checkbox"/> 0.0%	
11.		0	<input type="checkbox"/> 0.0%	
12.		0	<input type="checkbox"/> 0.0%	
50% of Total Cover: 48.5		20% of Total Cover: 19.4	97	= Total Cover
Woody Vine Stratum (Plot size: 30' radius)				
1.		0	<input type="checkbox"/> 0.0%	
2.		0	<input type="checkbox"/> 0.0%	
3.		0	<input type="checkbox"/> 0.0%	
4.		0	<input type="checkbox"/> 0.0%	
5.		0	<input type="checkbox"/> 0.0%	
50% of Total Cover: 0		20% of Total Cover: 0	0	= Total Cover

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)

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

Percent of dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of: 97 Multiply by: (A)

OBL species 0 x 1 = 0

FACW species 2 x 2 = 4

FAC species 0 x 3 = 0

FACU species 95 x 4 = 380

UPL species 0 x 5 = 0

Column Total s: 97 (A) 384 (B)

Prevalence Index = B/A = 3.959

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is > 50%

3 - Prevalence Index is ≤ 3.0¹

Problematic Hydrophytic Vegetation¹ (Explain)

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

Definition of Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

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

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes No

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

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.



Photo 149: SP45 Soil Profile



Photo 150: SP45 Habitat

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: McCoy 1300 Acre Site **City/County:** Liberty County **Sampling Date:** 21-May-19
Applicant/Owner: Delta Land Services **State:** Texas **Sampling Point:** SP49
Investigator(s): DESCO-Chris Little & Thomas Wilder **Section, Township, Range:** S T R
Landform (hillslope, terrace, etc.): Flat **Local relief (concave, convex, none):** none **Slope:** 0.0 % / 0.0 °
Subregion (LRR or MLRA): LRR T **Lat.:** 3311314.507 **Long.:** 308010.954 **Datum:** NAD 83
Soil Map Unit Name: League Clay, 0 to 1 percent slopes **NWI classification:** none

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="radio"/> No <input type="radio"/>
Hydric Soil Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	
Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	
Remarks:	

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of 2 required)	
Primary Indicators (minimum of one required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Moss Trim Lines (B16)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Dry Season Water Table (C2)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input checked="" type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)		<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)	
Field Observations:		Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	
Surface Water Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): _____		
Water Table Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): _____		
Saturation Present? (includes capillary fringe) Yes <input checked="" type="radio"/> No <input type="radio"/>	Depth (inches): <u>6</u>		
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks:			

VEGETATION (Five/Four Strata) - Use scientific names of plants.

Received 03 March 2020
 Sampling Point: SP49

		Dominant Species?		Indicator Status	
Tree Stratum (Plot size: 30' radius)		Absolute % Cover	Rel.Strat. Cover		
1.	Triadica sebifera	50	<input checked="" type="checkbox"/>	76.9%	FAC
2.	Quercus phellos	10	<input type="checkbox"/>	15.4%	FACW
3.	Fraxinus pennsylvanica	5	<input type="checkbox"/>	7.7%	FACW
4.		0	<input type="checkbox"/>	0.0%	
5.		0	<input type="checkbox"/>	0.0%	
6.		0	<input type="checkbox"/>	0.0%	
7.		0	<input type="checkbox"/>	0.0%	
8.		0	<input type="checkbox"/>	0.0%	
50% of Total Cover: 32.5		20% of Total Cover: 13	65	= Total Cover	
Sapling or Sapling/Shrub Stratum (Plot size: 30' radius)					
1.	Triadica sebifera	30	<input checked="" type="checkbox"/>	60.0%	FAC
2.	Fraxinus pennsylvanica	20	<input checked="" type="checkbox"/>	40.0%	FACW
3.		0	<input type="checkbox"/>	0.0%	
4.		0	<input type="checkbox"/>	0.0%	
5.		0	<input type="checkbox"/>	0.0%	
6.		0	<input type="checkbox"/>	0.0%	
7.		0	<input type="checkbox"/>	0.0%	
8.		0	<input type="checkbox"/>	0.0%	
50% of Total Cover: 25		20% of Total Cover: 10	50	= Total Cover	
Shrub Stratum (Plot size:)					
1.		0	<input type="checkbox"/>	0.0%	
2.		0	<input type="checkbox"/>	0.0%	
3.		0	<input type="checkbox"/>	0.0%	
4.		0	<input type="checkbox"/>	0.0%	
5.		0	<input type="checkbox"/>	0.0%	
6.		0	<input type="checkbox"/>	0.0%	
50% of Total Cover: 0		20% of Total Cover: 0	0	= Total Cover	
Herb Stratum (Plot size: 30' radius)					
1.	Rubus argutus	5	<input checked="" type="checkbox"/>	27.8%	FAC
2.	Fraxinus pennsylvanica	4	<input checked="" type="checkbox"/>	22.2%	FACW
3.	Scleria oligantha	4	<input checked="" type="checkbox"/>	22.2%	FAC
4.	Ulmus alata	2	<input type="checkbox"/>	11.1%	FACU
5.	Carex flaccosperma	1	<input type="checkbox"/>	5.6%	FACW
6.	Dichanthelium commutatum	1	<input type="checkbox"/>	5.6%	FAC
7.	Bignonia capreolata	1	<input type="checkbox"/>	5.6%	FAC
8.		0	<input type="checkbox"/>	0.0%	
9.		0	<input type="checkbox"/>	0.0%	
10.		0	<input type="checkbox"/>	0.0%	
11.		0	<input type="checkbox"/>	0.0%	
12.		0	<input type="checkbox"/>	0.0%	
50% of Total Cover: 9		20% of Total Cover: 3.6	18	= Total Cover	
Woody Vine Stratum (Plot size: 30' radius)					
1.		0	<input type="checkbox"/>	0.0%	
2.		0	<input type="checkbox"/>	0.0%	
3.		0	<input type="checkbox"/>	0.0%	
4.		0	<input type="checkbox"/>	0.0%	
5.		0	<input type="checkbox"/>	0.0%	
50% of Total Cover: 0		20% of Total Cover: 0	0	= Total Cover	

Dominance Test worksheet:

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

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

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of: Multiply by:

OBL species 0 x 1 = 0

FACW species 40 x 2 = 80

FAC species 91 x 3 = 273

FACU species 2 x 4 = 8

UPL species 0 x 5 = 0

Column Total s: 133 (A) 361 (B)

Prevalence Index = B/A = 2.714

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is > 50%

3 - Prevalence Index is ≤ 3.0¹

Problematic Hydrophytic Vegetation¹ (Explain)

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

Definition of Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

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

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes No

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

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

SOIL

Sampling Point: SP49

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

Depth (inches)	Matrix			Redox Features					Texture	Remarks
	Color (moist)		%	Color (moist)	%	Tvpe ¹	Loc ²			
0-3	10YR	3/1	90	10YR	4/6	5	C	M	Clay	
	10YR	4/1	5							
3-16	10YR	4/1	85	10YR	4/6	5	C	M	Clay	
	10YR	3/1								

¹Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains ²Location: PL=Pore Lining. M=Matrix

<p>Hydric Soil Indicators:</p> <p><input type="checkbox"/> Histosol (A1)</p> <p><input type="checkbox"/> Histic Epipedon (A2)</p> <p><input type="checkbox"/> Black Histic (A3)</p> <p><input type="checkbox"/> Hydrogen Sulfide (A4)</p> <p><input type="checkbox"/> Stratified Layers (A5)</p> <p><input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)</p> <p><input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)</p> <p><input type="checkbox"/> Muck Presence (A8) (LRR U)</p> <p><input type="checkbox"/> 1 cm Muck (A9) (LRR P, T)</p> <p><input type="checkbox"/> Depleted Below Dark Surface (A11)</p> <p><input type="checkbox"/> Thick Dark Surface (A12)</p> <p><input type="checkbox"/> Coast Prairie Redox (A16) (MLRA 150A)</p> <p><input type="checkbox"/> Sandy Muck Mineral (S1) (LRR O, S)</p> <p><input type="checkbox"/> Sandy Gleyed Matrix (S4)</p> <p><input type="checkbox"/> Sandy Redox (S5)</p> <p><input type="checkbox"/> Stripped Matrix (S6)</p> <p><input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)</p>	<p><input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)</p> <p><input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)</p> <p><input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)</p> <p><input type="checkbox"/> Loamy Gleyed Matrix (F2)</p> <p><input checked="" type="checkbox"/> Depleted Matrix (F3)</p> <p><input type="checkbox"/> Redox Dark Surface (F6)</p> <p><input type="checkbox"/> Depleted Dark Surface (F7)</p> <p><input type="checkbox"/> Redox Depressions (F8)</p> <p><input type="checkbox"/> Marl (F10) (LRR U)</p> <p><input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)</p> <p><input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)</p> <p><input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)</p> <p><input type="checkbox"/> Delta Ochric (F17) (MLRA 151)</p> <p><input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)</p> <p><input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)</p> <p><input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)</p>	<p>Indicators for Problematic Hydric Soils³:</p> <p><input type="checkbox"/> 1 cm Muck (A9) (LRR O)</p> <p><input type="checkbox"/> 2 cm Muck (A10) (LRR S)</p> <p><input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)</p> <p><input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)</p> <p><input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 153B)</p> <p><input type="checkbox"/> Red Parent Material (TF2)</p> <p><input type="checkbox"/> Very Shallow Dark Surface (TF12)</p> <p><input type="checkbox"/> Other (Explain in Remarks)</p>
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³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
 Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:



Photo 157: SP49 Soil Profile



Photo 158: SP49 Habitat

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: McCoy 1300 Acre Site **City/County:** Liberty County **Sampling Date:** 21-May-19
Applicant/Owner: Delta Land Services **State:** Texas **Sampling Point:** SP50
Investigator(s): DESCO-Chris Little & Thomas Wilder **Section, Township, Range:** S T R
Landform (hillslope, terrace, etc.): Flat **Local relief (concave, convex, none):** none **Slope:** 0.0 % / 0.0 °
Subregion (LRR or MLRA): LRR T **Lat.:** 3311482.303 **Long.:** 309083.741 **Datum:** NAD 83
Soil Map Unit Name: League Clay, 0 to 1 percent slopes **NWI classification:** none

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	Is the Sampled Area within a Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/>
Hydric Soil Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	
Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	
Remarks:	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Marl Deposits (B15) (LRR U) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9)		Secondary Indicators (minimum of 2 required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input checked="" type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)
Field Observations: Surface Water Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): _____ Water Table Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): _____	Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

VEGETATION (Five/Four Strata) - Use scientific names of plants.

Received 03 March 2020
 Sampling Point: SP50

Tree Stratum	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
1. _____	0	<input type="checkbox"/> 0.0%	_____
2. _____	0	<input type="checkbox"/> 0.0%	_____
3. _____	0	<input type="checkbox"/> 0.0%	_____
4. _____	0	<input type="checkbox"/> 0.0%	_____
5. _____	0	<input type="checkbox"/> 0.0%	_____
6. _____	0	<input type="checkbox"/> 0.0%	_____
7. _____	0	<input type="checkbox"/> 0.0%	_____
8. _____	0	<input type="checkbox"/> 0.0%	_____
50% of Total Cover: 0	20% of Total Cover: 0	0	= Total Cover
Sapling or Sapling/Shrub Stratum (Plot size: 30' radius)			
1. <u>Morella cerifera</u>	1	<input checked="" type="checkbox"/> 33.3%	FAC
2. <u>Triadica sebifera</u>	1	<input checked="" type="checkbox"/> 33.3%	FAC
3. <u>Diospyros virginiana</u>	1	<input checked="" type="checkbox"/> 33.3%	FAC
4. _____	0	<input type="checkbox"/> 0.0%	_____
5. _____	0	<input type="checkbox"/> 0.0%	_____
6. _____	0	<input type="checkbox"/> 0.0%	_____
7. _____	0	<input type="checkbox"/> 0.0%	_____
8. _____	0	<input type="checkbox"/> 0.0%	_____
50% of Total Cover: 1.5	20% of Total Cover: 0.6	3	= Total Cover
Shrub Stratum (Plot size: _____)			
1. _____	0	<input type="checkbox"/> 0.0%	_____
2. _____	0	<input type="checkbox"/> 0.0%	_____
3. _____	0	<input type="checkbox"/> 0.0%	_____
4. _____	0	<input type="checkbox"/> 0.0%	_____
5. _____	0	<input type="checkbox"/> 0.0%	_____
6. _____	0	<input type="checkbox"/> 0.0%	_____
50% of Total Cover: 0	20% of Total Cover: 0	0	= Total Cover
Herb Stratum (Plot size: 30' radius)			
1. <u>Carex cherokeensis</u>	40	<input checked="" type="checkbox"/> 57.1%	FACW
2. <u>Ambrosia artemisiifolia</u>	10	<input type="checkbox"/> 14.3%	FACU
3. <u>Cyperus virens</u>	5	<input type="checkbox"/> 7.1%	FACW
4. <u>Rhynchospora caduca</u>	3	<input type="checkbox"/> 4.3%	OBL
5. <u>Axonopus fissifolius</u>	3	<input type="checkbox"/> 4.3%	FACW
6. <u>Triadica sebifera</u>	3	<input type="checkbox"/> 4.3%	FAC
7. <u>Solidago sempervirens</u>	2	<input type="checkbox"/> 2.9%	FACW
8. <u>Sorghum halepense</u>	2	<input type="checkbox"/> 2.9%	FACU
9. <u>Liquidambar styraciflua</u>	1	<input type="checkbox"/> 1.4%	FAC
10. <u>Fraxinus pennsylvanica</u>	1	<input type="checkbox"/> 1.4%	FACW
11. _____	0	<input type="checkbox"/> 0.0%	_____
12. _____	0	<input type="checkbox"/> 0.0%	_____
50% of Total Cover: 35	20% of Total Cover: 14	70	= Total Cover
Woody Vine Stratum (Plot size: 30' radius)			
1. _____	0	<input type="checkbox"/> 0.0%	_____
2. _____	0	<input type="checkbox"/> 0.0%	_____
3. _____	0	<input type="checkbox"/> 0.0%	_____
4. _____	0	<input type="checkbox"/> 0.0%	_____
5. _____	0	<input type="checkbox"/> 0.0%	_____
50% of Total Cover: 0	20% of Total Cover: 0	0	= Total Cover

Dominance Test worksheet:

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

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

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by: _____

OBL species 3 x 1 = 3

FACW species 51 x 2 = 102

FAC species 7 x 3 = 21

FACU species 12 x 4 = 48

UPL species 0 x 5 = 0

Column Total s: 73 (A) 174 (B)

Prevalence Index = B/A = 2.384

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is > 50%

3 - Prevalence Index is ≤ 3.0¹

Problematic Hydrophytic Vegetation¹ (Explain)

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

Definition of Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

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

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes No

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

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

SOIL

Sampling Point: SP50

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

Depth (inches)	Matrix			Redox Features					Texture	Remarks
	Color (moist)		%	Color (moist)	%	Tvpe ¹	Loc ²			
0-4	10YR	3/1	90	10YR	5/6	5	C	M	Clay	
	10YR	4/1	5							
4-18	10YR	3/1	90	10YR	4/6	10	C	M	Clay	

¹Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains ²Location: PL=Pore Lining. M=Matrix

<p>Hydric Soil Indicators:</p> <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U) <input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U) <input type="checkbox"/> Muck Presence (A8) (LRR U) <input type="checkbox"/> 1 cm Muck (A9) (LRR P, T) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Coast Prairie Redox (A16) (MLRA 150A) <input type="checkbox"/> Sandy Muck Mineral (S1) (LRR O, S) <input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U) <input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U) <input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> Marl (F10) (LRR U) <input type="checkbox"/> Depleted Ochric (F11) (MLRA 151) <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T) <input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U) <input type="checkbox"/> Delta Ochric (F17) (MLRA 151) <input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B) <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A) <input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	<p>Indicators for Problematic Hydric Soils³:</p> <input type="checkbox"/> 1 cm Muck (A9) (LRR O) <input type="checkbox"/> 2 cm Muck (A10) (LRR S) <input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B) <input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T) <input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 153B) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks)
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³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
 Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:



Photo 159: SP50 Soil Profile



Photo 160: SP50 Habitat

Attachment F. Planting List

Table F-1. PRM Forested Project Planting List¹

Common Name ²	Scientific Name	AGCP Wetland Indicator ³	Percent Range of Composition
PFO Restoration			
<i>Hard Mast (approximately 65-75%)</i>			
water hickory	<i>Carya aquatica</i>	OBL	15-20
willow oak	<i>Quercus phellos</i>	FACW	15-20
water oak	<i>Quercus nigra</i>	FAC	15-20
cherrybark oak	<i>Quercus pagoda</i>	FACW	15-20
overcup oak	<i>Quercus lyrata</i>	FACW	<1-5
bottomland post oak	<i>Quercus similis</i>	FACW	<1-5
<i>Soft Mast (approximately 15-25%)</i>			
sugarberry	<i>Celtis laevigata</i>	FACW	3-10
green ash	<i>Fraxinus pennsylvanica</i>	FACW	3-10
red maple	<i>Acer rubrum</i>	FAC	3-10
American elm	<i>Ulmus americana</i>	FAC	3-10
cedar elm	<i>Ulmus crassifolia</i>	FAC	3-10
black gum	<i>Nyssa sylvatica</i>	FAC	<1-5
parsley hawthorn	<i>Crateagus marhsali</i>	FAC	<1-5
arrowwood	<i>Viburnum dentatum</i>	FAC	<1-5
possumhaw	<i>Ilex decidua</i>	FACW	<1-5
green hawthorn	<i>Crateagus viridus</i>	FACW	<1-5
red mulberry	<i>Morus rubra</i>	FACU	<1-5

¹ The exact species and quantities for planting will be determined by the availability of such species from commercial nurseries providing localized ecotype seedlings.

² The above-referenced and subsequent scientific plant names are from NRCS 2020.

³ The wetland plant indicator status for the Atlantic and Gulf Coastal Plain per the 2016 National Wetland Plant List (Lichvar et al)

Table F-2. Potential herbaceous seed distribution list

Scientific Name	Common Name
<i>Agalinis heterophylla</i>	prairie agalinis
<i>Ageratina altissima</i>	snakeroot
<i>Andropogon glomeratus</i>	bushy bluestem
<i>Andropogon virginicus</i>	broomsedge bluestem
<i>Aristida divaricata</i>	poverty threeawn
Asteraceae	aster
<i>Centaurea americana</i>	American basket-flower
<i>Coreopsis tinctoria</i>	plains coreopsis
<i>Elionurus</i> sp.	balsamscale grass
<i>Eragrostis trichodes</i>	sand lovegrass
<i>Eryngium yuccifolium</i>	rattlesnake master
<i>Helianthus</i> sp.	sunflower
<i>Koeleria macrantha</i>	prairie Junegrass
<i>Liatris pycnostachya</i>	gayfeather blazing star
<i>Monarda citridora</i>	lemon mint
<i>Muhlenbergia filipes</i>	Gulf Coast muhly
<i>Panicum virgatum</i>	switchgrass
<i>Paspalum floridanum</i>	Florida paspalum
<i>Paspalum plicatulum</i>	brownseed paspalum
<i>Persicaria</i> sp.	smartweed
<i>Rudbeckia maxima</i>	giant coneflower
<i>Solidago altissima</i>	tall goldenrod
<i>Sorghastrum nutans</i>	Indiangrass
<i>Sporobolus compositus</i>	tall dropseed
<i>Sporobolus cryptandrus</i>	sand dropseed
<i>Sporobolus clandestinus</i>	rough dropseed
<i>Sporobolus silveanus</i>	Silveanus' dropseed
<i>Guara longiflora</i>	tall guara

*Species may vary dependent on commercial availability

Table F-3. PRM Shrub Project Planting List¹

Common Name ²	Scientific Name	AGCP Wetland Indicator ³	Percent Range of Composition
parsley hawthorn	<i>Crateagus marhsali</i>	FAC	10-30%
arrowwood	<i>Viburnum dentatum</i>	FAC	10-30%
possumhaw	<i>Ilex decida</i>	FACW	10-30%
green hawthorn	<i>Crateagus viridus</i>	FACW	10-30%
common buttonbush	<i>Cephalanthus occidentalis</i>	OBL	10-30%

¹ The exact species and quantities for planting will be determined by the availability of such species from commercial nurseries providing localized ecotype seedlings.

² The above-referenced and subsequent scientific plant names are from NRCS 2020.

³ The wetland plant indicator status for the Atlantic and Gulf Coastal Plain per the 2016 National Wetland Plant List (Lichvar et al)

Attachment G. Construction, Establishment, and Long-term Finances

Costs Analysis

Received 03 March 2020

COE SWG-2019-00772

Item	Units	Unit Values	Price Per Unit	Total Cost
Boundary Maintenance	Mile	5.5	\$ 150.00	\$ 825.00
Mow Fire Lane	Mile	3.0	\$ 175.00	\$ 525.00
PFO Invasive Species Control	Acre	187.0	\$ 20.00	\$ 3,740.00
PFO Invasive Species Control Mobilization	Fixed	Fixed	Fixed	\$ 100.00
PEM/PSS Invasive Species Control	Acre	84.3	\$ 20.00	\$ 1,686.00
PEM/PSS Invasive Species Control Mobilization	Fixed	Fixed	Fixed	\$ 100.00
PFO Inspections (rate and per diem)	Day	1.0	\$ 700.00	\$ 700.00
PEM/PSS Inspections (rate and per diem)	Day	1.0	\$ 700.00	\$ 700.00
Taxes on PFO Project Acreage	Acre	187.0	\$ 10.00	\$ 1,870.00
Taxes on PEM Project Acreage	Acre	99.0	\$ 10.00	\$ 990.00
Herbaceous Planting Acreage	Acre	84.3	NA	NA
Herbaceous Planting Materials and Distribution	Seeds	10.0	\$ 50.00	\$ 42,150.00
Prescribed Fire (PEM/PSS)	Acre	84.3	\$ 50.00	\$ 4,215.00
Forest Planting Acreage	Acre	116.3	NA	NA
Site Prep per Acre (disking and ripping)	Acre	116.3	\$ 40.00	\$ 4,652.00
Site Prep per Acres (herbicides)	Acre	187.0	\$ 40.00	\$ 7,480.00
Seedling Planting Rate	Trees/Acre	436.0	NA	NA
Seedling Cost	Seedling	50706.8	\$ 0.22	\$ 11,155.50
Seedling Installation Rate	Seedling	50706.8	\$ 0.17	\$ 8,620.16
Seedling and Planting Cost	Seedling	50706.8	\$ 0.39	\$ 19,775.65
Shrub Planting Rate	shrub/acre	222.0	NA	
Shrub Costs	shrub	14230.2	\$ 0.22	\$ 3,130.64
Shrub Installation Rate	shrub	14230.2	\$ 0.17	\$ 2,419.13
Shrub and Planting Cost	shrub	14230.2	\$ 0.39	\$ 5,549.78
Hydrology Restoration (Earth Moving; blade/disk)	Cubic Yard	10000	\$ 0.50	\$ 5,000.00
Site Prep and Pre-emergent Spray (PFO)	Acre	187.0	\$ 100.00	\$ 18,700.00
Site Prep Herbaceous/PSS	Acre	84.3	\$ 40.00	\$ 3,372.00
Conservation Easement Acreage	Acre	276.6	NA	NA
PFO Mitigation Acres	Acre	187.0	100%	
PEM/PSS Mitigation Acres	Acre	84.3		

**PFO and PEM Construction Costs
COE SWG-2019-00722**

PFO Construction Costs

Item	Units	Unit Values	Price Per Unit	Percent	Cost
Hydrology Restoration	Cubic Yards	5000	\$ 0.50	100%	\$ 2,500.00
PFO Invasive Species Control	Herbicide	187.0	\$ 40.00	100%	\$ 7,480.00
PFO Invasive Species Mobilization	Application	100	-	100%	\$ 100.00
PFO Site Prep (disking, ripping, and pre-emergent herbicide)	Acres	116.3	\$ 80.00	100%	\$ 9,304.00
Planting (Seedlings and Installation)	Seedlings	50707	\$ 0.40	100%	\$ 20,282.72
PFO Subtotal					\$ 39,666.72
PFO Construction Cost with 5% Contingency					\$ 41,650.06

Total PFO Construction **\$ 41,650.06**

Total PFO Construction and Establishment **\$ 117,634.00**

PEM/PSS Construction Costs

Item	Units	Unit Values	Price Per Unit	Percent	Cost
Hydrology Restoration	Cubic Yards	5000	\$ 0.50	100%	\$ 2,500.00
PEM/PSS Invasive Species Control	Herbicide	84.3	\$ 40.00	100%	\$ 3,372.00
PEM/PSS Invasive Species Mobilization	Application	100	-	100%	\$ 100.00
PEM/PSS Site Prep	Acres	84.3	40	100%	\$ 3,372.00
Planting Materials and Distribution	Seeds	830	50	100%	\$ 41,500.00
Prescribed Fire	Acres	84.3	50	100%	\$ 4,215.00
Shrub Planting	seedlings	14230.0	0	100%	\$ 5,692.00
PEM Subtotal					\$ 60,751.00
PEM Construction Cost with 5% Contingency					\$ 63,788.55

Total PEM/PSS Construction **\$ 63,788.55**

Total PEM/PSS Construction and Establishment **\$ 103,020.08**

Total PFO and PEM/PSS Construction and Establishment Costs **\$ 220,654.08**

PFO Establishment Costs for
COE SWG-2019-00722

Year	Event	Event Cost	Percent	Occurrences /Year	Year 0 Cost	Inflationary Adjustment from Year 0	Percent of Cost
1	Monitoring/ Inspection	\$ 700.00	100%	1	\$ 700.00		
1	Replant (30%)	\$ 19,775.65	30%	1	\$ 5,932.70		
1	Invasive Species Control (100%)	\$ 3,740.00	100%	1	\$ 3,740.00		
1	Invasive Species Mobilization	\$ 100.00	100%	1	\$ 100.00		
1	Property Taxes	\$ 1,870.00	100%	1	\$ 1,870.00		
1	Subtotal	\$ 24,215.65			\$ 12,342.70	\$ 12,645.09	19.0%
2	Monitoring/ Inspection	\$ 700.00	100%	1	\$ 700.00		
2	Replant (10%)	\$ 19,775.65	10%	1	\$ 1,977.57		
2	Invasive Species Control (25%)	\$ 3,740.00	100%	1	\$ 3,740.00		
2	Invasive Species Mobilization	\$ 100.00	100%	1	\$ 100.00		
2	Property Taxes	\$ 1,870.00	100%	1	\$ 1,870.00		
2	Subtotal	\$ 26,185.65			\$ 8,387.57	\$ 8,803.59	12.9%
3	Monitoring/ Inspection	\$ 700.00	100%	1	\$ 700.00		
3	Invasive Species Control (20%)	\$ 3,740.00	50%	1	\$ 1,870.00		
3	Invasive Species Mobilization	\$ 100.00	100%	1	\$ 100.00		
3	Property Taxes	\$ 1,870.00	100%	1	\$ 1,870.00		
3	Subtotal	\$ 6,410.00			\$ 4,540.00	\$ 4,881.93	7.0%
4	Monitoring/ Inspection	\$ 700.00	100%	1	\$ 700.00		
4	Invasive Species Control (10%)	\$ 3,740.00	50%	1	\$ 1,870.00		
4	Invasive Species Mobilization	\$ 100.00	100%	1	\$ 100.00		
4	Property Taxes	\$ 1,870.00	100%	1	\$ 1,870.00		
4	Subtotal	\$ 6,410.00			\$ 4,540.00	\$ 5,001.54	7.0%
5	Monitoring/ Inspection	\$ 700.00	100%	1	\$ 700.00		
5	Invasive Species Control (5%)	\$ 3,740.00	40%	1	\$ 1,496.00		
5	Invasive Species Mobilization	\$ 100.00	100%	1	\$ 100.00		
5	Property Taxes	\$ 1,870.00	100%	1	\$ 1,870.00		
5	Subtotal	\$ 6,410.00			\$ 4,166.00	\$ 4,701.96	6.4%
6	Monitoring/ Inspection	\$ 700.00	100%	1	\$ 700.00		
6	Invasive Species Control (5%)	\$ 3,740.00	30%	1	\$ 1,122.00		
6	Invasive Species Mobilization	\$ 100.00	100%	1	\$ 100.00		
6	Property Taxes	\$ 1,870.00	100%	1	\$ 1,870.00		
6	Subtotal	\$ 6,410.00			\$ 3,792.00	\$ 4,384.70	5.8%
7	Monitoring/ Inspection	\$ 700.00	100%	1	\$ 700.00		
7	Invasive Species Control (5%)	\$ 3,740.00	20%	1	\$ 748.00		
7	Invasive Species Mobilization	\$ 100.00	100%	1	\$ 100.00		
7	Property Taxes	\$ 1,870.00	100%	1	\$ 1,870.00		
7	Subtotal	\$ 6,410.00			\$ 3,418.00	\$ 4,049.07	5.3%
8	Monitoring/ Inspection	\$ 700.00	100%	1	\$ 700.00		
8	Invasive Species Control (5%)	\$ 3,740.00	10%	1	\$ 374.00		
8	Invasive Species Mobilization	\$ 100.00	100%	1	\$ 100.00		
8	Property Taxes	\$ 1,870.00	100%	1	\$ 1,870.00		
8	Subtotal	\$ 6,410.00			\$ 3,044.00	\$ 3,694.37	4.7%
9	Monitoring/ Inspection	\$ 700.00	100%	1	\$ 700.00		
9	Invasive Species Control (5%)	\$ 3,740.00	5%	1	\$ 187.00		
9	Invasive Species Mobilization	\$ 100.00	100%	1	\$ 100.00		
9	Property Taxes	\$ 1,870.00	100%	1	\$ 1,870.00		
9	Subtotal	\$ 6,410.00			\$ 2,857.00	\$ 3,552.37	4.4%
10	Monitoring/ Inspection	\$ 700.00	100%	1	\$ 700.00		
10	Invasive Species	\$ 3,740.00	5%	1	\$ 187.00		
10	Invasive Species Mobilization	\$ 100.00	100%	1	\$ 100.00		
10	Property Taxes	\$ 1,870.00	100%	1	\$ 1,870.00		
10	Boundary Maintenance	\$ 825.00	100%	1	\$ 825.00		
10	Subtotal	\$ 7,235.00	100%		\$ 3,682.00	\$ 4,690.33	5.7%
11	Monitoring/ Inspection	\$ 700.00	100%	1	\$ 700.00		
11	Invasive Species	\$ 3,740.00	5%	1	\$ 187.00		
11	Invasive Species Mobilization	\$ 100.00	100%	1	\$ 100.00		
11	Property Taxes	\$ 1,870.00	100%	1	\$ 1,870.00		
11	Subtotal	\$ 13,645.00	100%		\$ 2,857.00	\$ 3,728.57	4.4%
12	Monitoring/ Inspection	\$ 700.00	100%	1	\$ 700.00		
12	Invasive Species	\$ 3,740.00	5%	1	\$ 187.00		
12	Invasive Species Mobilization	\$ 100.00	100%	1	\$ 100.00		
12	Property Taxes	\$ 1,870.00	100%	1	\$ 1,870.00		
12	Subtotal	\$ 20,055.00	100%		\$ 2,857.00	\$ 3,819.92	4.4%
13	Monitoring/ Inspection	\$ 700.00	100%	1	\$ 700.00		
13	Invasive Species	\$ 3,740.00	5%	1	\$ 187.00		
13	Invasive Species Mobilization	\$ 100.00	100%	1	\$ 100.00		
13	Property Taxes	\$ 1,870.00	100%	1	\$ 1,870.00		
13	Subtotal	\$ 26,465.00	100%		\$ 2,857.00	\$ 3,913.50	4.4%
14	Monitoring/ Inspection	\$ 700.00	100%	1	\$ 700.00		
14	Invasive Species	\$ 3,740.00	5%	1	\$ 187.00		
14	Invasive Species Mobilization	\$ 100.00	100%	1	\$ 100.00		

**PFO Establishment Costs for
 COE SWG-2019-00772**

14	Property Taxes	\$ 1,870.00	100%	1	\$ 1,870.00		
14	Subtotal	\$ 32,875.00	100%		\$ 2,857.00	\$ 4,009.38	4.4%
15	Monitoring/ Inspection	\$ 700.00	100%	1	\$ 700.00		
15	Invasive Species	\$ 3,740.00	5%	1	\$ 187.00		
15	Invasive Species Mobilization	\$ 100.00	100%	1	\$ 100.00		
15	Property Taxes	\$ 1,870.00	100%	1	\$ 1,870.00		
15	Subtotal	\$ 39,285.00	100%		\$ 2,857.00	\$ 4,107.61	4.4%
	<i>Inflationary rate (2001-2011)</i>		2.45%				
	Total Establishment Cost				\$ 65,054.26	\$ 75,983.94	100.0%

Year	Event	Event Cost	Percent of Event Cost	Occurrences Per Year	Cost	Percent of Cost	Release Milestone
1	Monitoring/ Inspection	\$ 100.00	100%	1	\$ 100.00		
1	PEM/PSS Seed Replanting	\$ 42,150.00	30%	1	\$ 12,645.00		
1	Invasive Species Mobilization/Control	\$ 1,686.00	100%	1	\$ 1,686.00		
1	Property Taxes	\$ 990.00	100%	1	\$ 990.00		Initial Success
1	Subtotal				\$ 15,421.00	39.3%	\$15,421.00
2	Monitoring/ Inspection	\$ 200.00	100%	1	\$ 200.00		
2	PEM/PSS Seed Replanting	\$ 42,150.00	10%	1	\$ 4,215.00		
2	Invasive Species Mobilization/Control	\$ 1,786.00	100%	1	\$ 1,786.00		
2	Mow Fire Lane	\$ 525.00	100%	1	\$ 525.00		
2	Prescribed Fire	\$ 4,215.00	100%	1	\$ 4,215.00		
2	Property Taxes	\$ 990.00	100%	1	\$ 990.00		
2	Subtotal				\$ 11,931.00	30.4%	
3	Monitoring/ Inspection	\$ 200.00	100%	1	\$ 200.00		
3	Invasive Species Mobilization/Control	\$ 1,786.00	50%	1	\$ 893.00		
3	Shrub Replanting	\$ 5,549.78	30%	1	\$ 1,664.93		
3	Property Taxes	\$ 990.00	100%	1	\$ 990.00		Interim Success
3	Subtotal				\$ 3,747.93	9.6%	\$15,678.93
4	Monitoring/ Inspection	\$ 200.00	100%	1	\$ 200.00		
4	Invasive Species Mobilization/Control	\$ 1,686.00	40%	1	\$ 674.40		
4	Property Taxes	\$ 990.00	100%	1	\$ 990.00		
4	Subtotal				\$ 1,864.40	4.8%	
5	Monitoring/ Inspection	\$ 200.00	100%	1	\$ 200.00		
5	Invasive Species Mobilization/Control	\$ 1,686.00	20%	1	\$ 337.20		
5	Mow Fire Lane	\$ 525.00	100%	1	\$ 525.00		
5	Prescribed Fire	\$ 4,215.00	100%	1	\$ 4,215.00		
5	Property Taxes	\$ 990.00	100%	1	\$ 990.00		Long-term Success
5	Subtotal				\$ 6,267.20	16.0%	\$8,131.60
Total Establishment Cost					\$ 39,231.53	100.00%	
Total PEM/PSS Construction and Establishment Cost					\$ 103,020.08		

PFO Long-term Land Management and Maintenance

Item	Units	Unit Values	Price Per Unit	Unit Percent	Cost	Years	Annualized Cost
Boundary Maintenance (5-year event)	Miles	5.50	\$ 150.00	100.0%	\$ 825.00	5	\$ 165.00
Annual Invasive Species Control	Acre	187.00	\$ 50.00	10.0%	\$ 935.00	1	\$ 935.00
Annual Inspection	Day	1.00	\$ 700.00	100.0%	\$ 700.00	1	\$ 700.00
Taxes (annual event)	Acre	187.00	\$ 10.00	100.0%	\$ 1,870.00	1	\$ 1,870.00
Average Annual Cost (Starting at Year 15)							\$ 3,670.00
Long-term Land Management and Maintenance Endowment (cap rate 3.5%)							\$ 104,857.14

PEM/PSS Long-term Land Management and Maintenance

Item	Units	Unit Values	Price Per Unit	Unit Percent	Cost	Years	Annualized Cost
Taxes on Project Acreage*	Acres	101.60	\$ 10.00	100.0%	\$ 1,016.00	1	\$ 1,016.00
Invasive Species Control*	Acres	101.60	\$ 50.00	25.0%	\$ 1,270.00	1	\$ 1,270.00
Prescribed Fire	Acres	84.30	\$ 40.00	33.0%	\$ 1,112.76	1	\$ 1,112.76
Mow Fire Lane	Mile	3.00	\$ 175.00	33.0%	\$ 173.25	1	\$ 173.25
Inspections (rate and per diem)	Day	1.00	\$ 700.00	100.0%	\$ 700.00	1	\$ 700.00
Average Annual Cost (Starting at Year 6)							\$ 4,272.01
Long-term Land Management and Maintenance Endowment (cap rate 3.5%)							\$ 122,057.43

*Includes non-credit acres