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

PUBLIC NOTICE

February 28, 2022

United States Army
Corps of Engineers
New Orleans District
Attn: Regulatory Division, RG
7400 Leake Ave.
New Orleans, Louisiana 70118-3651

Project Manager:
Stephen Pfeffer
(504) 862-2099
stephen.d.pfeffer@usace.army.mil
Application #: MVN-2020-01269-MS

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

PROPOSED PARISH LINE MITIGATION BANK IN LAFOUCHE AND TERREBONNE PARISHES

NAME OF APPLICANT: Resource Environmental Solutions, LLC, 412 North Fourth Street, Suite 300, Baton Rouge, Louisiana 70802.

LOCATION OF WORK: The 306.9-acre proposed site is located in Sections 61, 68, and 82, Township 15 South, Range 16 East, approximately 2.6 miles south of Thibodaux, Louisiana. The site is centered on the point 29.7552° N, -90.8372° W, located in Hydrologic Unit Code 08090302, as shown in the attached prospectus.

CHARACTER OF WORK: Site restoration shall be accomplished through cessation of agricultural activities, hydrological restoration and afforestation of the native vegetative community. This includes removal of undesirable vegetative species, preparation and replanting of appropriate species in order to generate bottomland hardwood and cypress swamp credits that could be used as compensation for unavoidable impacts to wetlands associated with Department of the Army (DA) permits authorized under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. Additional details of the mitigation plan are included in the attached prospectus.

The Corps of Engineers is soliciting written comments from the public; federal, state, and local agencies and officials; Indian Tribes; and other interested parties. The

comment period will close **30 days** from the date of this public notice advertisement. Written comments, including suggestions for modifications or objections to the proposed work, stating reasons thereof, are being solicited from anyone having interest in this prospectus. Letters must reference the applicant's name and the subject number, be addressed and mailed to the above address,
ATTENTION: REGULATORY DIVISION.

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

Martin S. Mayer
Chief, Regulatory Division

Enclosure

PARISH LINE MITIGATION BANK

FINAL PROSPECTUS

Based on the 2016 CEMVN Template

Bottomland Hardwood
Preservation, Enhancement, Rehabilitation, and Re-Establishment

Cypress Swamp
Enhancement and Rehabilitation

Located In
Lafourche and Terrebonne Parishes, Louisiana

Submitted: June 25, 2021

Sponsor: Fifth Louisiana Resource, LLC
c/o Resource Environmental Solutions, LLC
Attn: David Hill
412 N. Fourth Street, Suite 300
Baton Rouge, Louisiana 70802

Agent: Resource Environmental Solutions, LLC
Attn: Tiffany Hammond
412 Settlers Trace Blvd, Suite 200
Lafayette, Louisiana 70508

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FINAL PROSPECTUS
PARISH LINE MITIGATION BANK

1 Introduction

Fifth Louisiana Resource, LLC (hereinafter the Sponsor) has prepared this prospectus for submittal to the U.S. Army Corps of Engineers – New Orleans District (CEMVN) and the Interagency Review Team (IRT) to provide an overview of the establishment and operation of the proposed Parish Line Mitigation Bank (Bank). The details pertaining to the use of this site as a mitigation bank shall be specified in the subsequent Mitigation Banking Instrument (MBI).

The Bank has the potential to provide compensatory mitigation requirements for bottomland hardwood (BLH) and cypress swamp (CYP) impacts in the Louisiana Wetland Rapid Assessment Method (LRAM) Terrebonne Service Basin (**Exhibit 1**). Additionally, the Bank will provide compensatory mitigation for unavoidable impacts to coastal wetland resources under the Louisiana Coastal Resources Program (LCRP) per the provisions of LAC 43:724 and RS 49:214.22 (8). The Bank is in Lafourche and Terrebonne Parishes, Louisiana and entirely within the Louisiana Coastal Zone (CZ) boundary.

The proposed preservation, enhancement, rehabilitation, and re-establishment of BLH and CYP habitats is approximately 289.9 acres. Specifically, the Bank shall preserve 8.9 acres, enhance 10.4 acres, rehabilitate 38.6 acres, and re-establish 173.1 acres of BLH, and enhance 38.2 acres, and rehabilitate 20.7 acres of CYP. The Bank will also include approximately 17.0 acres of non-mitigation features composed of critical drainage features, maintenance areas, and an existing access road (**Exhibit 2**), totaling a 306.9-acre Bank.

1.1 Site Location

The Bank is centered at Latitude 29.755255°; Longitude -90.837207°, approximately 2.65 miles south of Thibodaux, Louisiana, in Sections 61, 68, and 82, Township 15 South, and Range 16 East in Lafourche and Terrebonne Parishes, Louisiana (**Exhibit 1**).

The Bank lies within the West Central Louisiana Coastal (08090302) United States Geologic Survey (USGS) Hydrologic Unit Code (HUC) within the LRAM Terrebonne Service Basin (**Exhibit 1**). It is located entirely within the CZ boundary and has portions either within or directly adjacent to the Coastal Conservation Plan boundary.

1.2 Driving Directions

To reach the Bank from Thibodaux, Louisiana (corner of 1st and Canal Blvd), head south on Canal Boulevard for 1.6 miles until Canal Boulevard becomes West Main Street. Continue straight on West Main Street for 1.3 miles. Turn west (right) onto Elizabeth Street / Parish Road 34 / Highway 3185 and travel 0.6 miles. Turn south (left) onto North Main Project Road and travel 0.5 miles to the Bank entrance on west (right) side of road at the approximate address of 400-498 N Main Project Road, Schriever, Louisiana 70395 (**Exhibit 3**). From this point, access onto the Bank property will need to be coordinated with the Sponsor.

2 Project Goals and Objectives

The Bank is proposed to preserve 8.9 acres, enhance 10.4 acres, rehabilitate 38.6 acres, and re-establish 173.1 acres of BLH, and enhance 38.2 acres, and rehabilitate 20.7 acres of CYP (**Exhibit 2**). Approximately 17.0 acres of existing access road, maintenance areas, and multiple critical drainage features shall be maintained as non-mitigation acreage. The Bank shall provide additional BLH and CYP functions and values not currently recognized under existing conditions and land use, as well as enhance these values in portions of the Bank where these habitats currently exist. Current functions and values not currently recognized under existing conditions are as follows:

1. Wildlife Habitat (food, water and shelter);
2. Increased Organic Matter;
3. Flood Retention;
4. Groundwater Recharge;
5. Atmospheric Maintenance;
6. Water Quality Improvement; and
7. Opportunities for recreation and education.

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

CYP habitats are forested, alluvial swamps growing on intermittently exposed soils. Soils are inundated by surface or ground water on a nearly permanent basis throughout the growing season. CYP habitats are characterized by having low floristic diversity and often sparse understory due to low light conditions and the long hydroperiod. CYP habitats provide important ecosystem functions including, but not limited to, biogeochemical cycling, water maintenance, productive habitat for a variety of fish and wildlife species and regulate flood and stream recharge (LNHP 2009).

2.1 Project Goals

The goals of the Bank are to: enhance and restore the native vegetative community, restore a more natural topography and hydrology, enhance various biogeochemical cycles, improve sediment retention, reduce non-point source pollution, and provide habitat and refuge to wildlife. The holistic goal is to establish a self-sustaining BLH and CYP habitat resistant and resilient to disturbance events that shall maintain, restore, preserve, rehabilitate, or enhance aquatic ecosystem function and water quality within the LRAM Terrebonne Basin.

Proposed Bank habitats were derived using the historical land use, current land cover, soils, elevations, and the current vegetation data gathered during a wetland delineation and baseline survey within the Bank. The Bank is proposed to preserve, enhance, rehabilitate, and re-establish 231.0 acres of BLH as well as enhance and rehabilitate 58.9 acres of CYP with 17.0 acres of non-mitigation features composed of an existing access road, maintenance areas, and multiple drainage features, totaling a 306.9-acre Bank (**Table 1** and **Exhibit 2**).

Table 1: Proposed Bank Habitats

BLH		CYP	
Mitigation Type	Acreage	Mitigation Type	Acreage
Preservation	8.9	-	-
Enhancement	10.4	Enhancement	38.2
Rehabilitation	38.6	Rehabilitation	20.7
Re-establishment	173.1	-	
Total BLH	**231.0**	**Total CYP**	**58.9**
Non-Mitigation Features: 17.0			
Total Bank Size: 306.9			

2.2 Objectives

The goals of the Bank shall be accomplished through the following objectives:

1. Create a self-sustainable 231.0-acre BLH forested wetland area and 58.9-acre CYP forested wetland area through selective planting of native species in rehabilitation, enhancement, and re-establishment areas, hydrological restoration in rehabilitation and re-establishment areas and management of invasive species across the Bank;

2. Rehabilitation of the vegetative community structure through selective planting of native species and forest management strategies;

3. Soil preparation shall alleviate compaction, increase soil pore water space, and increase the efficiency of various biogeochemical cycles;

4. Vegetative plantings shall be used to restore natural vegetation across the Bank, increase species diversity, increase nutrient and contaminant uptake, and create a vegetation community indicative of sustainable wetland forested areas;

5. Long-term maintenance shall prevent colonization by noxious plants, erosion along interfaces of drainageways, and trespass vandalism;

6. Control of invasive species, which shall reduce the negative impacts to the existing vegetative community, as well as reduce the seed source that may infiltrate adjacent wetland areas;

7. The cessation of agricultural practices shall aid in reducing nonpoint source pollution, and allow the microtopographic sinuosity patterns to re-emerge restoring a more natural flow across the Bank;

8. Degradation of the agricultural field rows shall restore a more natural overland flow and create/restore flow through natural sloughs (swale-like features);

9. Water currently routed through rows, in a semi-channelized fashion, will be allowed to more naturally overland flow, thereby retaining surface water and upper soil saturation for a longer duration;

10. Restoration shall create improved wildlife habitat, as well as benefit water quality and various biogeochemical cycles;

11. Ensure system stability and continuity by protecting the Bank in perpetuity with a conservation easement; and

12. Ensure the long-term viability and sustainability of the Bank through active and adaptive management activities including, but not limited to, invasive species control, appropriate monitoring and long-term maintenance.

3 Ecological Suitability of the Site/Baseline Conditions

This section describes the ecological suitability of the Bank to achieve the objectives of the proposed mitigation bank, including the physical, chemical, and biological characteristics of the Bank site and how that site will support the planned types of aquatic resources and function, as stated in 33 CFR 332.8(d)(2)(vii)(B). This section provides the baseline/current site conditions on and adjacent to the proposed site.

Despite extensive anthropogenic alteration associated with agricultural and aquaculture production, the Bank is ecologically suited to support BLH and CYP wetland habitats based on location, historic and current habitats, proximity to existing forested wetland habitats, historic hydrology, and soil types. These site characteristics provide ideal conditions for the establishment of a mitigation bank that will provide additional areas of contiguous forested wetland habitat to support resident and migratory wildlife native to BLH and CYP ecosystems in an area that has experienced significant loss of wetlands to agricultural conversion.

3.1 Land Use

3.1.1 Historical Land Use

The Bank is located within the approximately 25 million-acre Lower Mississippi Alluvial Valley (LMAV). Prior to European settlement and colonization, the LMAV consisted of mostly contiguous BLH and CYP swamp forests with some alterations due to Native Americans (Gardiner and Oliver 2005). Significant deforestation began after colonization required timber harvesting of wetland habitats to satisfy a growing demand. These harvested areas were then converted to agricultural uses. Further deforestation of the LMAV in the 20th Century was due to the construction of major flood control projects, (Lower Mississippi River Joint Venture [LMRJV] 2007). Approximately 20 percent of the original forested acreage of the LMAV remains with much of it in fragmented blocks averaging 158 acres in size (Twedt et al. 1999).

Based on historical topographical quadrangle maps (**Exhibits 4a–4g**) and aerial photographs (**Exhibits 5a–5i**), the Bank site historically contained BLH and/or CYP forested habitats on most of the Bank. Topographic maps and aerial photographs reveal that sometime, prior to 1955, the eastern side of the Bank was cleared for agricultural use; however, some areas were left forested (**Exhibits 4b** and **5a**). Around 1978, some mature forests were cleared again to create aquaculture ponds for crawfish production. Significant anthropogenic alteration of the Bank associated with agricultural production has continued until present day. **Tables 2** and **3** detail the changes on the land from when it was minimally impacted until today.

3.1.1.1 Review of USGS Topographical Quadrangles

USGS quadrangle maps were reviewed as a supplement to the historical aerial photographs and to determine the prior use or occupancy of the subject properties. Copies of these USGS quadrangle excerpts are presented in **Exhibits 4a – 4g** along with a written observation in **Table 2**.

Table 2. Historic Topographic Map Review

Quadrangle Date	Observations
1892	Shown to lack wetland features in the eastern portion of the Bank. Shown to have marsh or swamp wetland features existing on the western portion of the Bank.
1955	Shown to lack wetland features in the eastern portion of the Bank. Shown to have wooded wetland features existing in the southwestern portion of the Bank. A waterbody is shown running across the Bank in an east-west trajectory.
1962	Shown to be largely unchanged from 1955 quad; however, a large waterbody is shown just outside the western boundary of the Bank.
1998	Habitats shown to be largely unchanged within the Bank from 1962 quad; however, a light duty road borders the eastern side of the Bank. Also, perennial waterbodies bisect the western and southwestern sides of the Bank.
2012	Shown to lack wetlands. Additional named, light duty roads have been constructed north of the Bank.
2015	Shown to lack all wetland features. Additional waterbody features are shown.
2018	Shown to have marsh or swamp wetland features existing on the western portion of the Bank. Waterbodies shown on previous quads are still shown.

Note: While the intervals between historical topographic maps span several years, the land use did not change significantly. Therefore, this discontinuous information is not considered a data gap.

3.1.1.2 Review of Aerial Photographs

Aerial photographs were reviewed to investigate historical properties, adjacent land uses, and to observe potential impacts to the subject properties. Copies of these aerial photographs are included as **Exhibits 5a – 5i**. **Table 3** provides written observations.

Table 3. Historical Aerial Photograph Review

Imagery Date	Observations
1956	Shown to be predominately cleared of mature forested habitat for use in agriculture. Drainage features have been installed across the Site to convey water through fields to larger drainages. Mature forests remain along the western and southern borders of the bank, of which a large majority of the mature forest habitat is separated from the remainder of the bank by large drainage canals. Parish Road 26 does not appear on the aerial.
1961	Shown to be largely unchanged from 1956 regarding the Site being used for agriculture, except for a small portion of mature forests have been cleared south of existing fields in the southwest of the Bank.
1978	Shown to have been cleared of more mature forested habitat in the southwest portion of the Bank, up to the existing large drainage canals. It appears open water ponds replaced the mature forest habitats in the southwestern portion of the Bank. Mature forests separated by the drainage canals appear to remain unchanged from 1961 aerial. Parish Road 26 appears to the east of the Bank; constructed since the 1961 aerial.
1998	Shown to remain largely unchanged from 1978 aerial, with most of the Bank predominately used for agriculture. The western most open water pond appears to be supporting wetland forest of unknown species as the aerial resolution is low. The remaining ponds appear to be dominated by herbaceous wetlands. The remaining mature forests along the western and southern boundaries appear to be unchanged since the 1978 aerial.
2004	Shown to remain largely unchanged from the 1998 aerial.
2008	Shown to remain largely unchanged from the 2004 aerial.
2013	Shown to remain largely unchanged from the 2008 aerial. The forested wetland located in the western-most pond appears to be degraded from the 2008 aerial.
2017	Shown to remain largely unchanged from the 2013 aerial. The forested wetland located in the western-most pond appears to be more degraded than what is seen in the 2013 aerial.
2019	Shown to remain largely unchanged from the 2017 aerial. The forested wetland located in the western-most pond appears to be more degraded than what is seen in the 2017 aerial. The center ponded area has reverted to an open water pond.

Note: While the intervals between aerial photographs span several years, the land use did not change significantly. Therefore, this discontinuous information is not considered a data gap.

3.1.2 Existing/Current Land Use

As detailed in **Section 3.1.1**, historical topographic maps and aerial photographs show significant acreage in the Bank was cleared prior to 1955 for agricultural production and has remained in production to present day. A wetland delineation survey (MVN-2020-01245-SG) was conducted between September 28, 2020 and October 14, 2020 by Resource Environmental Solutions, LLC (RES) who identified five (5) distinct habitat types existing on the Bank including: mature, but degraded, BLH forests, a mature, but degraded CYP forest, a palustrine emergent (PEM) wetland, open water pond area, and active agricultural fields.

The most dominant land use on the Bank is agriculture, specifically sugarcane encompassing approximately 57.6% of the Bank (**Exhibit 6**). The second-most dominant land cover is mature BLH and/or CYP woody forests (27.3%). Additional land use consists of abandoned aquaculture areas (12%) that have converted to PEM wetlands and open water areas, waterbodies (2.7%), and an existing road (0.5%) allowing access to the Bank from Parish Road 26.

The dominant land use/cover within a 1-mile buffer area around the Bank is woody wetlands (31.3%) followed by developed/low intensity development (18.3%), sugarcane (13.6%), and grassland/pasture (10.3%) (**Exhibit 7**). Although there is development within one (1) mile of the Bank boundary, this development is mostly residences along portions of the northeastern boundary. Based on current, on-site observations the adjacent land use is as follows:

a. **North** of the Bank is housing developments (mostly on the eastern edge) and forested wetlands.

b. **East** of the Bank is Parish Road 26 and just beyond the road is additional agricultural fields currently used for sugarcane production.

c. **South** of the Bank is an agricultural drainage feature that also serves to separate the Bank from adjacent properties. Further south from this drainage is additional agricultural fields used for sugarcane production and the Thibodaux Municipal Airport. BLH and/or CYP forested wetlands of the Chacahoula Oil and Gas Field also exist beyond the southwestern boundary of the Bank.

d. **West** of the Bank is the Leighton-Morvant Levee System and associated Lafourche-Terrebonne Drainage Canal. Just beyond the levee system is the forested swamps of the Chacahoula Oil and Gas Field.

3.2 Soils

The U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Soil Survey Geographic (SSURGO) dataset for Lafourche and Terrebonne Parishes show that the Bank is underlain by six (6) soil map units (**Exhibit 8**) (NRCS 2018). **Table 4** shows the soil map unit's individual soil component description, hydric status, and percentage of the Bank the map unit encompasses.

Table 4. Site Soils

Map Unit Name (MUN)	Soil Series Component	Component %	Hydric Status	% Hydric of MUN	% of Site
CdA: Cancienne silty clay loam, 0 to 1 percent slopes				**10**	**0.7**
	Cancienne	*85-98*	*No*		
	Carville	*2-10*	*No*		
	Thibaut	*1-5*	*No*		
	Gramercy	*1-5*	*No*		
FA: Fausse-Schriever association				**85**	**1.5**
	Fausse	*65*	*Yes*		
	Schriever	*20*	*Yes*		
	Minor components	*15*	*No*		
GaA: Gramercy silty clay loam, 0 to 1 percent slopes				**92**	**19.5**
	Gramercy	*79-95*	*Yes*		
	Cancienne	*0-10*	*No*		
	Schriever	*1-10*	*Yes*		
ShA: Schriever clay, 0 to 1 percent slopes				**96**	**64.9**
	Schriever	*92-100*	*Yes*		
	Gramercy	*0-8*	*Yes*		
	Thibaut	*1-5*	*-*		
SIA: Schriever clay, 0 to 1 percent slopes, frequently flooded				**100**	**5.9**
	Schriever-Frequently flooded	*85-95*	*Yes*		
	Fausse-Frequently flooded	*5-15*	*Yes*		
Sk: Schriever clay, 0 to 1 percent slopes				**98**	**7.5**
	Schriever	*92-100*	*Yes*		
	Gramercy	*0-8*	*Yes*		
	Thibaut	*1-5*	*-*		

Generally, the soils that occur on the Bank site are described in the SSURGO database as gently sloping and level. These soils exhibit very poorly drained soils to somewhat poorly drained soils and have a high to very high available water storage in the profile. Textures of these soils are predominately silt loam, silty clay loam, and clay and associated with natural levee and backswamp landforms (NRCS 2018). The dominate soil map units on the Bank site are Schriever clay, 0 to 1 percent slopes (ShA) (64.9%) and Gramercy silty clay loam, 0 to 1 percent slopes (GaA) (19.5%).

The **Gramercy** series consists of very deep, poorly drained, very slowly permeable soils that formed in clayey over fine-silty alluvium. Gramercy series soils are poorly drained, and surface runoff is slow. These soils are very slowly permeable in the clayey upper horizons from approximately soil surface (0") to 42 inches, and moderately permeable below 42 inches. Areas of these soils that are not protected by levees are subject to rare to frequent flooding for brief to long periods.

The **Schriever** series consists of very deep, poorly drained, very slowly permeable soils that formed in clayey alluvium. They are poorly drained, and surface runoff is high on slopes less than 1 percent and very high on slopes up to 3 percent. Permeability is very slow. Schriever soils are flooded for brief to very long durations during most years, unless protected by levees.

A wetland delineation survey was completed by RES in September and October 2020 and provided a better understanding of the soils that underlie the Bank site. Twenty-seven (27) soil samples were taken throughout the Bank during the survey (**Exhibit 8**). Soil sample data show predominately clay soils, and all soil samples were identified as hydric based on the presence of redoximorphic features seen in the samples.

As the soils are predominately clayey, as seen during the wetland delineation, with low to very low permeability near the soil surface (the top 42 inches per the SSURGO database), water from precipitation events appears to inundate the site, creating temporary ponding in some areas or draining from the site via overland flow into one of the multiple drainage features on the property. Water that manages to infiltrate the soil creates extend saturation of the upper soil horizons as it slowly permeates through the clayey soil layers. Water that is unable to penetrate the soil appears to move across the bank via overland flow in the direction of decreasing elevation. Currently, water flow is routed down agricultural rows towards installed culverts that move water into existing agricultural drainage and canal waterbody features in and bounding the Bank site.

The Bank has been used consistently for agricultural production since at least 1955. Some of the impacts of agriculture practices on the soil are reduced productivity within the soil, a loss of organic matter, and compaction from farming equipment, which in turn leads to a reduction in water availability and increases runoff. Additionally, being used for agriculture nearly eliminates hydrological connection from the landscape due to rowing practices and creates a non-native monotypic unsustainable vegetative community.

3.3 Hydrology

3.3.1 Contributing Watershed

The contributing watershed was identified using data from USGS National Hydrography Dataset (NHD) (**Exhibit 9**). Flow directional arrows were added to the NHD flowlines to identify which water features flowed into or through the Bank. Based on the NHD, the existing drainage area is contained within the boundaries of the 306.9-acre Bank mainly comprised of the internal drainages of the Bank (**Exhibit 9**).

3.3.2 Historical Hydrology and Drainage Patterns

Historic or pre-development sources of surface water on the Bank were likely precipitation and surface water flooding from the surrounding swamp, given the Sites' physiographic position in a backswamp area. Unfortunately, there is very little available data that provides accurate information of the true drainage patterns of the Bank prior to development.

Historic USGS topographic maps suggest the site was developed prior to 1955. Post-development drainage patterns were derived from a combination of topographic map contours and surface elevation data from the Louisiana Oil Spill Coordinator's Office (LOSCO) Light Detecting and Ranging (LiDAR) dataset (**Exhibit 10**). These elevation datasets suggest the drainage on the Bank should be generally east to west with much of the Bank draining into agricultural drainage features

in the center of the Bank. This is due to the decrease in elevation from approximately 7 feet high at the eastern boundary of the Bank to approximately 2 feet high near the western boundary. In the southwest corner of the Bank, LiDAR suggest lower elevations that should create an outfall point for hydrological connectivity; however, existing levees installed to create aquaculture ponds, sometime prior to 1978, obstruct flow directly into large drainage canals that occur in the western and southwestern portions of the Bank where flow would continue south in the large canals until exiting the Bank along the southern boundary.

Please note the historical hydrology is not anticipated to return to the site post-construction (refer to **Section 3.3.4** below) as some of the internal drainage will remain as flood relief and protection to the adjacent properties.

3.3.3 Existing/Current Hydrology and Drainage Patterns

As stated in **Section 3.3.2**, pre-development hydrology is assumed to be via overland flow into the Chacahoula Oil and Gas Field swamps to the west of the Bank. However, post-development elevations suggest hydrological connection was southeast to northwest and into existing drainage features which moved water north offsite with levees preventing hydrological connection directly into the swamps to the west of the Bank.

Hydrology on the Bank has been altered through agricultural production of sugarcane. Agricultural practices disturb the topography of the land and inhibit the natural sinuous drainage pattern of the landscape when overland flow is present. Specifically, the agricultural field rows cover approximately 176.7 acres of the 306.9-acre site, reducing hydrological connection, and facilitating channelized flow during precipitation events.

Existing hydrology on-site is heavily determined by the direction of the rows, ditches, levees, pumping operation, weir, earthen plugs and culverts which aid in channelizing or inhibiting hydrological connection. Due to constant alteration associated with the agriculture production, there are effectively two (2) individual drainage systems that affect the hydrological connection across the Bank (**Exhibit 11a**). Drainage Network 1 contains multiple existing waterbodies, rowed areas, and hydrological modification features such as culverts and earthen plugs that affect hydrology for approximately 140.2 acres of the Bank site. Drainage Network 2 also contains multiple waterbodies, rowed areas, and hydrological modification features which affect hydrology on approximately 166.7 acres of the Bank site. The following sections provided further detail on the existing conditions within each Drainage Network.

3.3.3.1 Drainage Network 1

The eastern portion of the Bank, dominated by agricultural fields, currently drains in an east-west direction down the existing agricultural rows and into small interior ditches oriented north-south (**Exhibit 11b**). These smaller interior drainages connect to a large drainage feature that alleviates flooding pressure due to stormwater runoff and flow from the roadside ditches and other adjacent properties east of the Bank. This flood protection drainage runs east-west from a culvert beneath N. Main Project Road and into the Bank. Ultimately, the ditch carries water west, then south, then west again until discharging into the southwestern drainage canal that bounds the Bank.

The western portion of the Bank contains a large drainage canal system that separates the agricultural areas in the Bank from existing BLH habitats and the CYP habitat of the Chacahoula Oil and Gas Field. These canals are also a part of Drainage Network #1 as the flood protection ditch discharges into the southern-most drainage canal. Hydrological connectivity to the remainder of the Bank is impeded by levee systems and earthen plugs that prevent water from flowing into the interior drainages existing on the Bank site. However, the existing BLH preservation and CYP enhancement areas are connected to these drainage canals through gaps created in their levee systems. These canals have little flow, however what does exist is driven by decreasing elevations towards the southwestern corner of the Bank. Also, due to the connection to the Chacahoula Oil and Gas Field, the water levels in the drainage canals are heavily influenced by water levels in the adjacent forested habitats of the Chacahoula Oil and Gas Field.

3.3.3.2 Drainage Network 2

The central portion of the Bank is dominated by agricultural fields that currently drain in a westward direction down the existing agricultural rows (**Exhibit 11c**). The fields north of the access road drain into a small interior drainage oriented north-south that conveys water south to a large central drainage feature. The fields south of the access road drain directly into the large central drainage feature. Eventually, the central ditch drains north, then west, then north again before eventually discharging into a small creek at the northern boundary of the Bank. This creek then moves water slightly north and then west, eventually discharging into the Lafourche-Terrebonne Drainage Canal via a culvert under the Leighton-Morvant Levee System that creates the western boundary of the Bank. The Lafourche-Terrebonne Drainage Canal, via a lock system, moves waters from the protected areas north of the levee system into the Chacahoula Oil and Gas Field swamps.

The abandoned aquaculture areas and the existing CYP area are impounded by a levee system. Water flow in and out of the impoundments is dependent on a pump system to transport water from the adjacent drainage canals of Drainage Network 1 into the impoundments and hydrologic devices such as drop pipes and weirs to transport water out of the impoundments. Water released through hydrological devices moves back into either the adjacent drainage canals or to the large central ditch described above. Levees around the aquaculture ponds have effectively impounded these areas and cut off natural hydrological connectivity with the remainder of the Bank except through the hydrological devices mentioned. The existing drop pipe in the CYP area is installed slightly higher than the adjacent levee separating the CYP area from the aquaculture area to the east. This suggests that any water movement out of the CYP area likely overflows the dividing levee and enters the aquaculture areas where it can then outfall into the large central ditch before eventually discharging into the Lafourche-Terrebonne Drainage Canal, as previously described. This is the reasoning for including the aquaculture areas and CYP area as part of Drainage Network 2.

3.3.4 Anticipated Post-Construction Hydrology

After construction is complete, the Bank's hydrology shall be primarily driven by precipitation, overland flow, run off, high-water tables, and overbank flooding of the modified agricultural drainage features (**Exhibit 12**). Agricultural field rows will be degraded and contoured. Interior man-made drainage features will be partially filled to swale-like features to promote ground-water recharge while providing slower, more natural overland flow of water currently routed into the internal agricultural ditches. This will increase surface water retention and upper soil saturation

needed for the Bank to be successful. It is anticipated that overland flow will be more naturally restored to a general southeast-northwest direction in the rowed areas. The eastern portion of the Bank site will be comprised of swaled drainage features and a drainage feature to remain unaltered to facilitate the drainage of off-site properties. The western portion of the Bank site will consist of a swaled drainage feature in the smaller interior ditches. A series of armored check dams, designed to slow the flow of water offsite and allow for accretion over time, will be installed in the large central drainageway. The series of check dams will step down and allow water to be transported within this waterway to alleviate deep, prolonged ponding while holding water in drier times to facilitate groundwater recharge and hydrology conducive to re-establishing the bottomland hardwood wetlands.

Post-construction flow within the abandoned aquaculture areas and existing CYP area will be generally west before draining north into the interior central drainage ditch via hydrologic modification devices such as low water crossings (LWCs). Additionally, the internal levees in the aquaculture areas will be degraded into existing borrow areas, allowing overland flow as the dominant action for water movement in these areas.

Hydrologic restoration achieves many objectives by improving water quality, biogeochemical cycling and the hydrologic cycling, which shall inundate soils and restore them to their native historic hydric processes.

3.3.5 Jurisdictional Wetlands

As stated in **Section 3.1.2**, a wetland delineation survey was conducted by RES on the Bank from September 28, 2020 to October 14, 2020. A Preliminary Jurisdictional Determination (PJD) request was prepared by RES and submitted to the CEMVN on November 19, 2020. A Preliminary Jurisdictional Determination (PJD) was issued on April 12, 2021 (MVN-2020-01245-SG) (**Exhibit 13**) and confirms the Bank is comprised of approximately 101.3 acres of jurisdictional wetlands, 21.1 acres of impounded non-wetland waters, and 22,467 L.F. of channelized non-wetland waters.

3.4 Vegetation

3.4.1 Historical Plant Community

The Bank is in the Mississippi Alluvial Plain Level III Ecoregion and the Inland Swamps Level IV Ecoregion (73n; Environmental Protection Agency [EPA] 2003; Omernik 1987), the Mississippi Delta Cotton and Feed Grains Region Land Resource Region (LRR O), and the Southern Mississippi River Alluvium Major Land Resource Area (MLRA 131A; Natural Resources Conservation Service [NRCS] 2006).

The Inland Swamps Ecoregion contains the largest BLH forest swamps in North America. The historic natural vegetation of this Level IV Ecoregion was dominated by bald cypress (*Taxodium distichum*) and tupelo gum (*Nyssa spp.*), which are generally intolerant of brackish water except for short periods, such as during a hurricane. In areas flooded less frequently, live oak (*Quercus virginiana*) dominate forests, overcup oak (*Quercus lyrata*) – water hickory (*Carya aquatica*) forest and oak (*Quercus spp.*) – sweetgum (*Liquidambar styraciflua*) forests were commonly found. In areas where freshwater flooding was more prolonged, the vegetation community was historically dominated by species of grasses, sedges, and rushes. Specifically, wetland vegetation in highly inundated areas typically included water hyacinths (*Eichhornia spp.*), water lily (*Nymphaea spp.*), cattails (*Typha spp.*), and duckweed (*Lemna spp.*) (EPA 2003).

The 1892 topographic map shows the Bank as undeveloped with portions of marsh/swamp wetland habitats dominating the western side. Sometime prior to 1955 much of the Bank was converted to agricultural production, which has continued to this day. Given the soil type, landscape position and observation of neighboring, extant forests, the native plant community on the Bank was likely mixed, deciduous BLH and CYP tree species with elements of palustrine emergent (PEM) wetlands.

3.4.2 Existing Plant Community

The wetland delineation survey conducted in September and October 2020 identified five (5) distinct habitat types existing on the Bank including: mature, but degraded BLH forests, a mature, but degraded CYP forest, a palustrine emergent (PEM) wetland, open water pond, and active agricultural fields. Agricultural fields were the most prevalent habitat on the Bank.

In the agricultural fields the most dominant vegetation was sugarcane. Other herbaceous species were also present, such as Bermuda grass (*Cynodon dactylon*), bahiagrass (*Paspaulm notatum*), yellow nutsedge (*Cyperus esculentus*), ricefield flatsedge (*Cyperus iria*), nutgrass (*Cypersus rotundus*), barnyard grass (*Echinochloa crus-galli*), whitemouth dayflower (*Commelina erecta*), oceanblue morning-glory (*Ipomoea indica*), annual ragweed (*Ambrosia artemisiifolia*), southern crab grass (*Digitaria ciliaris*), and oppositeleaf spotflower (*Acmella repens*).

The BLH wetlands are dominated by a mixture of species typically found in native BLH forests. The tree stratum consists of species such as sweetgum, sugarberry (*Celtis laevigata*), green ash (*Fraxinus pensylvanica*), water oak (*Quercus nigra*), American elm (*Ulmus americana*), red maple (*Acer rubrum*), boxelder (*Acer negundo*), common persimmon (*Diospyros virginiana*), Chinese privet (*Ligustrum sinense*), and Chinese tallow-tree (*Triadica sebifera*). The sapling/shrub layer in this habitat includes the aforementioned species as well as dwarf palmetto (*Sabal minor*) and deciduous holly (*Ilex decidua*). The herbaceous layer in this habitat is primarily comprised of alligator weed (*Alternanthera philoxeroides*), bottlebrush sedge (*Carex comosa*), lizard's-tail (*Saururus cernuus*), lamp rush (*Juncus effusus*), slender woodoats (*Chasmanthium laxum*), and whorled marsh pennywort (*Hydrocotyle verticillata*). Woody vines observed included trumpet creeper (*Campsis radicans*) and poison ivy (*Toxicodendron radicans*).

The CYP habitat is dominated by species such as bald cypress, black willow (*Salix nigra*), water oak, red maple, Chinese tallow-tree, and green ash (*Fraxinus pennsylvanica*) in the tree stratum. The sapling/shrub layer in this habitat contains the aforementioned species, as well as common buttonbush (*Cephalanthus occidentalis*) and groundseltree (*Baccharis halimifolia*). The herbaceous layer in this stratum is primarily comprised of lizard's-tail (*Saururus cernuus*), lamp rush (*Juncus effusus*), swamp smartweed (*Persicaria hydropiperoids*), common water hyacinth (*Eichhornia crassipes*).

The PEM habitat is dominated by species such as fall panicgrass (*Panicum dichotomiflorum*), yellow nutsedge, ricefield flatsedge, wingleaf primrose-willow (*Ludwigia decurrens*), barnyard grass, common boneset (*Eupatorium perfoliatum*), and rattlebush (*Sesbania drummondii*) in the herbaceous stratum.

Using the habitats identified by the wetland delineation survey, as well as the soils and Bank hydrology previously discussed, the following mitigation habitat types are proposed for construction on the Bank:

1. **BLH Preservation** is defined as areas of existing BLH where the Sponsor can minimize, with an attempt to eradicate, the existing invasive Chinese tallow-tree and to prevent further decline of the existing BLH habitat by controlling invasive and noxious species through herbicide treatment. No hydrologic modification or vegetative plantings are proposed for the BLH Preservation areas. These areas are considered functioning and integral to the functionality of adjacent wetlands.

2. **BLH Enhancement** is defined as areas where BLH is existing, but a lack of diversity in the vegetative community exists. These areas are currently dominated by soft mast species and intermingled with Chinese tallow present in nearly all strata.

3. **BLH Rehabilitation** is defined as the open water pond and PEM wetland areas once used for aquaculture. These areas do not exhibit any of the general characteristics of the forested wetlands that historically occurred in this area of the Bank. Hydrologic modification will be required to restore some aquatic resource functions and connect existing hydrology to the remainder of the Bank, as these areas are currently isolated by levees. The open water pond and PEM wetlands were once crawfish and choupique ponds constructed in former wet areas and have since been out of agricultural production for less than five (5) years. Installation of hydrology modifications (i.e., LWCs) to counter the existing levees will repair the hydrological connections across the Bank, resulting in a net gain in aquatic resource functionality (i.e., overland flow). The planting of native BLH species and return to a more naturally variable hydrology regime shall improve multiple aquatic resource functions (i.e., organic matter, wildlife habitat and refuge, removal of the non-historical monotypic habitat).

4. **BLH Re-Establishment** is defined as non-wet agricultural fields, that were historically forested wetlands, and have lost the necessary hydrologic component to support hydrophytic vegetation due to the conversion to agricultural production. The cessation of agricultural practices along with the degradation of field rows and partial filling of ditches shall repair the hydrologic functions resulting in a net gain in aquatic resource functionality (i.e., overland flow) and shall improve multiple aquatic resource functions.

5. **CYP Enhancement** is defined as areas where degraded BLH habitat exists due to extended inundation periods caused by previous hydrological modifications. CYP species are present in low numbers, but soft-mast species (i.e., green ash, black willow) typically observed in BLH habitats dominate (greater than 50 percent) the area. Due to restrictions in completing hydrological modifications that would reduce inundation, these areas will likely remain too wet for BLH species to persist, and conditions will likely shift to ones more suitable for CYP establishment. Given the proximity to the CYP habitats of the Chacahoula Oil and Gas Fields, there is a high likelihood that typical CYP species will establish in these wetter areas and over time the degraded BLH will eventually convert to CYP completely. Therefore, supplemental planting of native CYP species shall improve multiple aquatic resource functions (i.e., organic matter, water quality, wildlife habitat and refuge) and result in a vegetation species composition that is associated with historical CYP habitats of the Terrebonne Basin. No hydrologic modification is proposed for CYP Enhancement areas.

6. **CYP Rehabilitation** is defined as areas where degraded CYP currently exists. Hydrologic modification will be required to restore aquatic resource function and connect existing hydrology to the remainder of the Bank, as this area is currently isolated by levees.

Degradation of levees and removal of hydrologic modification devices will reduce hydroperiod and allow for a more natural drainage regime. Additionally, supplemental planting of native CYP species shall improve multiple aquatic resource functions (i.e., organic matter, water quality, wildlife habitat and refuge) and result in a vegetation species composition that is associated with historical CYP habitats of the Terrebonne Basin. The Sponsor can also minimize, with an attempt to eradicate, any invasive species from the Bank and prevent the further decline of the existing CYP habitat by controlling invasive and noxious species.

3.5 General Need for the Project in this Area

The reclaimed wetland forest should resemble the adjacent BLH and CYP forests. The restoration of BLH and CYP wetlands on the Bank will provide additional wetland functions and values, which are not realized in the Site's current condition. These include, but are not limited to, expanding the acreage of existing BLH and CYP forest; increasing the quality of wildlife habitat; increased organic matter, and increasing watershed water quality by retiring existing agricultural land from production.

BLH habitats, specifically, are important for a variety of fauna, important for water quality maintenance and important in regulating flooding and stream recharge. BLH forest loss is estimated to be 50 to 75 percent of the original pre-settlement acreage (LNHP 2009). CYP habitat has been reduced state-wide by an estimated 25 to 50 percent of the original pre-settlement acreage. All of Louisiana's swamps are threatened by land loss and encroaching interests which prevent adequate regeneration of these habitats (LNHP 2009).

Specifically, the Terrebonne Basin has experienced the greatest decrease in wetland area with approximately 502 square miles or 321,730 acres of net loss since 1932 (Couvillion et al. 2017). The basin experienced higher annual change rates in the late 1970s to early 1980s like coastwide trends, with gradually decreasing loss rates since that time. Land loss in the Terrebonne Basin is attributed to subsidence, sediment deficit, saltwater intrusion along navigation canals, historic oil and gas activity, habitat switching due to prolong high water levels (swamp/fresh marshes) and natural deterioration of barrier islands.

Furthermore, BLH in Louisiana are known to support 61 Species of Greatest Conservation Need (SGCN) which include 1 mollusk species, 1 crustacean species, 6 arthropods species, 5 amphibian species, 4 reptile species, 20 bird species, 10 mammal species, and 14 plant species. Baldcypress-Tupelo-Blackgum Swamps support 37 SGCN which include 4 arthropod species, 3 amphibian species, 3 reptile species, 9 bird species, 6 mammal species, and 12 plant species. Freshwater floating marshes support 18 SGCN which include 1 arthropod species, 1 reptile species, 13 bird species, 1 mammal species, and 2 plant species (Holcombe et al. 2015).

The restoration and afforestation of the Bank, near larger extant tracts of forested wetlands, will provide benefit to various species of wildlife such as Nearctic-Neotropical migrant birds. Over 107 bird species nest regularly within the LMAV with 70 of these species utilizing BLH as their primary habitat (Twedt et al. 1999). The Partners in Flight (PIF) Bird Conservation Plan (BCP) for the LMAV recommends increasing interior areas of forested fragments to increase habitat for forest-dwelling bird species (Twedt and Loesch 1999). The planting and long-term management of seedlings will provide habitat stability and encourage the recruitment of breeding populations of scrub-dwelling and forest-dwelling bird species (Twedt et al. 1999, Twedt et al. 2010).

The protection, conservation and restoration of corridors is identified as a strategy to facilitate wildlife and plant migration in response to transitions anticipated with predicted climate change (National Fish, Wildlife and Plants Climate Adaptation Strategy Management Team [Strategy] 2012). Species other than nongame migratory bird species will benefit from the restoration of the Bank. Large expanses of BLH forests are vital for the management of mallards (*Anas platyrhynchos*), wood ducks (*Aix sponsa*) and American woodcock (*Scolopax minor*) (Kelly and Rau 2006). The Mississippi Museum of Natural Science (MMNS 2005) purports that old growth BLH forests are critical habitat for 11 of the 18 species of bats known to the Southeast. Two of these species, the Southeastern myotis (*Myotis austroriparius*) and Rafinesque's big-eared bat (*Corynorhinus rafinesquii*) prefer large, hollow trees in mature BLH and swamp habitats, respectively (LMRJV 2007; Taylor 2006). Loeb (2013) purports that unfragmented, contiguous forest with small openings maintained for flight corridors are important components in maintaining and sustaining bat populations as these are critical for roosting and predator protection.

Lastly, the Bank is needed to allow for mitigation to offset population growth and oil and gas exploration.

4 Establishment of a Mitigation Bank

This section describes how the mitigation bank will be established, as stated in 33 CFR 332.8(d)(2) (ii); the technical feasibility of the proposed mitigation bank, as stated in 33 CFR 332.8(d)(2) (iv); and the assurance of sufficient water rights to support the long-term sustainability of the mitigation bank, as stated in 33 CFR 332.8(d)(2)(vii)(A).

4.1 Site Restoration Plan

This section provides information on the proposed soils, hydrologic, and vegetative work that was determined to be necessary for restoration of the proposed Bank.

The Bank is proposed to preserve 8.9 acres, enhance 10.4 acres, rehabilitate 38.6 acres, and re-establish 173.1 acres of BLH, and enhance 38.2 acres, and rehabilitate 20.7 acres of CYP. There are 17.0 acres of non-mitigation features, which is composed of drainage features, maintenance areas, and an existing access road (**Exhibit 2**), creating a 306.9-acre Bank that will provide compensatory mitigation for unavoidable wetland impacts in the Terrebonne Basin.

The proposed mitigation work plan (**Exhibit 14**) involves the cessation of agricultural operations, restoration of surface hydrology, and afforestation with native vegetation. Details on the proposed restoration plan for the Bank are provided below in more detail and in **Exhibits 15a – 15l**.

4.2 Soil Work Plan

4.2.1 Agricultural Row Degradation

Agricultural fields within the Bank shall be mechanically prepared for vegetative plantings through grading. Approximately 175.5 acres of the Bank will require recontouring, to the maximum extent practical with in-situ earthen material, to degrade existing rows and return a natural hydrological connection across the Bank (**Exhibit 15a**). Subsoiling may be used to alleviate soil compaction and encourage air and water pore space for root growth. Post-construction cross-sections will be provided as part of the *As-Built Report*, as detailed in the MBI.

Similarly, approximately 40.1 acres of the aquaculture areas shall be recontoured to the maximum extent practical with in-situ earthen material, including spoil material obtained from degrading approximately 6,199.0 linear feet (L.F.) of levees. Spoil from levee degradation will be returned to the adjacent borrow areas the material was taken from originally (**Exhibits 15b** and **15c**).

4.2.2 Road Degradation

The existing access road does not impede hydrological connection across the Bank (**Exhibit 15d**) from the road on the eastern border until the aquaculture ponds begin; therefore, no alteration is proposed. From the beginning of aquaculture ponds until the western boundary of the Bank the road turns into an elevated levee road. The elevated levee road will not be altered and will contain two (2) low water crossings to facilitate a hydrological connection. Approximately 3,884 L.F. of access road will remain as non-mitigation acreage to facilitate maintenance and monitoring activities.

4.2.3 Soil Management

The only anticipated intentional soil movement will be during site preparation. Agricultural harvesting practices will likely disturb soil in some areas; however, it will be required that those practices adhere to the most current Best Management Practices.

4.2.4 Erosion Control Measures

Roads that experience erosion will be regraded and appropriate erosion control measures will be used.

4.3 Hydrological Work Plan

The Bank shall satisfy the wetland criteria as described in the USACE 1987 Wetlands Delineation Manual and be capable of performing the important functions lost due to the project for which it is mitigating.

In converting the property to agricultural use, certain hydrological modifications were put in place to control site hydrology using anthropogenic methods. To restore the Bank to a more natural hydrologic state and meet the objectives for the Bank the following shall occur (**Exhibits 14** and **15e – 15m**):

1. Fifty (50) agricultural field culverts shall be removed and/or degraded (rendered ineffective) to restore overland flow (**Exhibits 14 and 15e**);

2. Three (3) drop pipes shall be removed and/or rendered ineffective (**Exhibit 15f**);

3. Three (3) culverts shall be removed and replaced by low water crossings (LWCs) (**Exhibit 15f**);

4. Two (2) weirs shall be removed and replaced by LWCs (**Exhibit 15f**);

5. Three (3) LWCs will be installed to create additional hydrologic connectivity and will be used to traverse the site for monitoring, assessment, and maintenance activities (**Exhibits 15g**);

6. Approximately 5,804 L.F. of agricultural field drains shall be partially backfilled with in-situ earthen material to create shallowly swaled, microtopographic drainage features (**Exhibit 15h**);

7. Approximately 3,795 L.F. of drainages will be recontoured to become a stream-like feature containing armored check dams which will aid in reducing water velocity and allow for increased temporary ponding and sediment deposition that may, over time, elevate the water bottom to allow for overbank flooding. Under low-flow conditions, the check dams will allow water to pond and then slowly drain off-site, infiltrate the soil, or evaporate. Sediment will also begin to accumulate behind the check dams. Under high-flow conditions, ponding will occur in the areas between check dams faster than water can drain and creating overbank flooding into the adjacent Bank habitats. The goal of this feature is to reduce the surface hydro period while maintaining the subsurface hydrology (**Exhibits 15i – 15j**).

8. As stated in **Section 4.1.1.1**, approximately 6,199 L.F. of levees in/or surrounding the aquaculture ponds and CYP forest area shall be degraded and pushed into the borrow areas or used as in-situ material to swale drainage features (**Exhibits 15b, 15c,** and **15j**) to restore hydrology in these areas;

9. Approximately 11,295 L.F. of existing drainages will remain unaltered as they are part of the stormwater ditch system that alleviates flooding pressure from adjacent properties (**Exhibit 15k**);

10. Approximately 2,591 L.F. of drainage will be newly constructed and/or altered to reroute water currently flowing through the flood protection drainage in Drainage Network 1. This reroute will continue to alleviate stormwater flooding from properties east of the Bank but will also allow the original drainage channel to be partially backfilled to create a swaled, microtopographic drainage feature (**Exhibit 15l**). Rerouting the existing drainage will reconnect areas of the Bank that are currently hydrologically disconnected due to existing channelized features that disrupt overland flow;

11. Approximately 971 L.F. of a new levee will be constructed to the east of the new rerouted drainage to reduce the risk of overbank flooding from the new drainage onto the property just outside the Bank boundary (**Exhibit 15l**).

12. One (1) 20 to 40-foot-wide earthen plug will be installed at the intersection of the stormwater drainage in Drainage Network 1 and the new rerouted drainage to stop the flow of water on its current path through the bank. This will allow drainages in the Bank interior to be swaled to promote hydrological connectivity across the Bank site;

13. Three (3) new culverts will be installed along the new levee to aid in water movement off the adjacent properties and therefore, reducing flooding risks. These culverts are not needed for restoration purposes and are strictly remaining to ensure adjacent properties drain as they currently do;

14. Ten (10) existing culverts will remain as they are part of the stormwater ditch system that alleviates flooding pressure from adjacent properties. These culverts are not needed for restoration purposes and are strictly remaining to ensure adjacent properties drain as they currently do;

15. Approximately 7,231 L.F. of levee will remain to reduce flooding from the waterway on the western side of the property;

16. Approximately 3,844 L.F. of road will remain to facilitate construction, monitoring, assessment and maintenance activities over the life of the Bank;

17. Three (3) earthen plugs will remain that stop water from back flooding the property from the large waterbody on the western border; and

18. One (1) pump system shall be removed as it is not needed to restore the Bank. The Sponsor does not propose to maintain or operate the pumps for any reason.

4.4 Vegetation Work Plan

Numerous Bank objectives shall be achieved through afforestation of native plant species. Planting shall positively affect the physical structure of the area and restore biogeochemical processes in the soil considerably through additional plant and invertebrate detritus. Additionally, it shall provide improved biotic conditions and create habitat for mammals, amphibians, arachnids, insects, and migratory birds. Restored forested and vegetative habitats filter sediment runoff into the Bank and help prevent deposition downstream. Furthermore, it provides atmospheric maintenance and natural aesthetics to the area. The following sections provide details on planting specifications for each of the proposed mitigation habitat types:

4.4.1 BLH Planting Specifications

4.4.1.1 BLH Rehabilitation and Re-Establishment

In areas proposed as BLH Rehabilitation and BLH Re-establishment, tree plantings shall consist of one (1) or two (2) year old bare-root seedlings and/or potted trees composed of a mixture of the hard and soft mast species listed in **Table 5**, obtained from a Louisiana registered, licensed nursery grower. If seedlings listed in **Table 5** are not available or there is only a limited supply, then substitutions may be made from **Table 6**. The Sponsor will mix species, off site, in such a manner that will ensure adequate species diversity and that monotypic tree rows will not be established. Adequate time will be allowed for reserving seedlings from nurseries.

Seedlings will be hand planted on a 9′ by 9′ spacing in rows, to achieve an initial stand density of 538 seedlings per acre. Hard and soft mast species will be planted to achieve an overall Bank composition, on average, of 60-70 percent hard mast species. The species mix for BLH habitat may include any mixture of the native hard mast species listed in **Table 5**. Please note that due to the existing soft mast seed bank present (based on wetland delineation report and multiple field site visits), soft mast species are anticipated to naturally regenerate; therefore, the soft mast species diversity, over time, shall exceed that noted in **Table 5**. Planting will occur between December 15 through March 15. The specific list and number of planted species, which is dependent upon availability, shall be provided in the *As-Built Report*.

Table 6 provides a cursory list of potential planting substitutions. The species proposed as substitutions have been provided but no percentages have been listed at this time, as their need is unknown. Quantities for substitution species would be provided in the *As-Built Report* if a species were used to replace another species in **Table 5**.

Table 5. Planting List for BLH Rehabilitation and Re-establishment

Scientific Name	Common Name	Mast	Percentage
Quercus lyrata	Overcup Oak	Hard	15
Quercus texana	Texas Red Oak	Hard	15
Quercus nigra	Water Oak	Hard	10
Quercus shumardii	Shumard's Oak	Hard	10
Carya aquatica	Water Hickory	Hard	10
Quercus michauxii	Swamp Chestnut Oak	Hard	10
Taxodium distichum	Bald Cypress	Soft	10
Acer rubrum	Red Maple	Soft	5
Liquidambar styraciflua	Sweetgum	Soft	5
Celtis laevigata	Sugarberry	Soft	5
Ulmus americana	American Elm	Soft	5

Table 6. Substitution List for BLH Rehabilitation and Re-establishment

Scientific Name	Common Name	Mast
Quercus laurifolia	Laurel Oak	Hard
Quercus pagoda	Cherry-Bark Oak	Hard
Quercus phellos	Willow Oak	Hard
Carya lecontei	Bitter Pecan	Hard
Platanus occidentalis	American Sycamore	Soft

4.4.1.2 BLH Enhancement

In areas proposed as BLH Enhancement, tree plantings shall consist of one (1) or two (2) year old bare-root seedlings and/or potted trees composed of a mixture of the hard and soft mast species listed in **Table 7**, obtained from a Louisiana registered, licensed nursery grower. If seedlings listed in **Table 7** are not available or there is only a limited supply, then substitutions may be made from **Table 8**. The Sponsor will mix species, off site, in such a manner that will ensure adequate species diversity and that monotypic tree rows will not be established. Adequate time will be allowed for reserving seedlings from nurseries.

Seedlings will be hand planted on a 12' by 12' spacing in rows to achieve an initial stand density of 302 seedlings per acre. Taking the existing vegetation into account hard mast species will consist of 80 percent of the species being planted with bald cypress will make up the remaining 20 percent. In the long-term the Bank will achieve an overall Bank composition, on average, of 60-70 percent hard mast species.

Please note that due to the existing soft mast seed bank present (based on wetland delineation report and multiple field visits), soft mast species are anticipated to naturally regenerate. Planting will occur between December 15 through March 15. The specific list and number of planted species, which is dependent upon availability, shall be provided in the *As-Built Report*.

Table 8 provides a cursory list of potential planting substitutions. The species proposed as substitutions have been provided but no percentages have been listed at this time, as their need is unknown. Quantities for substitution species would be provided in the *As-Built Report* if a species were used to replace another species in **Table 7**.

Table 7. Planting List for BLH Enhancement

Scientific Name	Common Name	Mast	Percentage
Quercus lyrata	Overcup Oak	Hard	15
Quercus texana	Texas Red Oak	Hard	15
Quercus nigra	Water Oak	Hard	15
Quercus shumardii	Shumard's Oak	Hard	10
Carya aquatica	Water Hickory	Hard	15
Quercus michauxii	Swamp Chestnut Oak	Hard	10
Taxodium distichum	Bald Cypress	Soft	20

Table 8. Substitution List for BLH Enhancement

Scientific Name	Common Name	Mast
Quercus laurifolia	Laurel Oak	Hard
Quercus pagoda	Cherry-Bark Oak	Hard
Quercus phellos	Willow Oak	Hard
Carya lecontei	Bitter Pecan	Hard

4.4.1.3 BLH Preservation

No planting is proposed for BLH Preservation areas; however, the Sponsor will manage for invasive or noxious species that negatively affect the physical structure of the area through herbicide treatment.

4.4.2 CYP Planting Specifications

4.4.2.1 CYP Enhancement and Rehabilitation

In areas proposed as CYP Enhancement or Rehabilitation, tree plantings shall consist of one (1) or two (2) year old bare-root seedlings and/or potted trees composed of a mixture of primarily (80%) bald cypress along with other soft mast species (**Table 9**). The seedlings will be obtained from a Louisiana registered, licensed nursery grower. The Sponsor will mix species in such a manner that will ensure adequate species diversity. Adequate time will be allowed for reserving seedlings from nurseries. Planting will occur between December 15 through March 15. The specific list and number of planted species, which is dependent upon availability, shall be provided in the *As-Built Report*.

Due to existing vegetation in the CYP Enhancement and Rehabilitation areas, soil ripping and rowing will not be utilized prior to planting. Seedlings will be hand planted on a 12' by 12' spacing, to achieve a stand density of 302 TPA and an overall Bank composition, on average, of 80 percent bald cypress. Taking into consideration the existing vegetation the only species proposed to be planted is bald cypress. Undesirable soft mast species and invasive species, such as black willow and Chinese tallow-tree, currently dominate the CYP Rehabilitation area (based on wetland delineation report) creating a significant seed bank for natural regeneration of these species and over time may out compete existing and planted bald cypress resulting in an overall composition less than 80 percent. Planting of soft mast species is proposed at a very low percentage to ensure the CYP Rehabilitation area reaches the desired 80 percent bald cypress composition while also creating species diversity typical for CYP swamp habitats in southeastern Louisiana. Additionally, the Sponsor will attempt to eradicate during planting any invasive or noxious species that negatively affect the physical structure of the area through herbicide treatment.

Table 9. Planting List for CYP Enhancement and Rehabilitation

Scientific Name	Common Name	Mast	Percentage
Taxodium distichum	Bald Cypress	Soft	100

4.4.3 Chemical Control of Invasive / Non-Native Plants

Chemical control of existing problematic invasive non-native species will occur on an as needed basis throughout the life of the Bank, post-planting.

4.5 Technical Feasibility

Construction work required to develop the Bank is routine, feasible, and based on currently accepted restoration methods. The construction work and subsequent mitigation activities will consist of 1) site preparation, 2) vegetation planting, and 3) monitoring. The presence of hydric soils and relatively low relief of the Bank indicate that minimal soil work shall be required for the successful restoration of BLH and CYP habitats. Existence of BLH and CYP adjacent to the Bank indicate a high potential for successful restoration. Drainage modifications shall provide for a more natural and historic water regime creating a more self-sustaining Bank. Furthermore, the Bank's conservation objective shall be achieved through preservation of the Bank from future development activities through legal documentation (e.g., conservation easements).

4.6 Current Site Risks

The Sponsor does not foresee any adverse impacts to the Bank resulting from continued existence and operation of neighboring land uses. There are no existing hydrologic disturbances on or adjacent to the Site at the present time.

Since this is the Prospectus, no official survey has been completed on the property. Should the IRT approve this project and recommend that it should move forward, a survey will be completed and contained within the Draft MBI.

4.7 Long-Term Sustainability of the Site

The Bank Sponsor shall be the responsible agent for the long-term management of the Bank, unless a third-party entity is established and given authority to maintain the Bank in perpetuity through approval by the IRT.

The primary long-term strategy of the Bank is to be self-sustaining with relatively low maintenance. This management strategy is linked to the development stage of the mitigation banking process, particularly in the design and establishment of the Bank. Native planting plans and increased natural flood attenuation shall provide these ecological benefits with minimal routine maintenance or attention after establishment. However, if the Bank is underperforming and not meeting the proposed performance standards, the Bank Sponsor shall provide additional management designs to address the ecological benefit. The strategies shall be tailored to specific disturbances to achieve optimal results. Therefore, Adaptive Management Plans shall be derived at the time of the disturbance and based on the analysis of the data collected at the time. Work plans shall be submitted to the IRT for commentary and guidance.

5 Proposed Service Area

This section identifies the proposed services areas as stated in 33 CFR § 332.8(d) (2) and the general need for the proposed Bank in this area as stated in 33 CFR § 332.8(d)(2)(iv).

As defined by Louisiana Department of Environmental Quality (LDEQ) source data, LOSCO (2004), the Terrebonne Basin watershed will serve as the Bank's geographical service area (Exhibit 1). The watershed is comprised of two Subregions: Lower Grand River (USGS HUC 08070300) and the West – Central Louisiana Coastal (USGS HUC 08090302).

6 Operation of the Mitigation Bank

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

6.1 Project Representatives

Sponsor/Landowner/Operations Manager:

Fifth Louisiana Resource, LLC
c/o Resource Environmental Solutions, LLC
412 N. Fourth Street, Suite 300
Baton Rouge, Louisiana 70802

Point of Contact: David Hill
Email: david@res.us
Phone Number: (346) 310-6214

Agent:

Resource Environmental Solutions, LLC
412 Settlers Trace Blvd., Suite 200
Lafayette, Louisiana 70508

Point of Contact: Tiffany Hammond
Email: thammond@res.us
Phone Number: (337) 443-6925

6.2 Qualifications of the Sponsor

RES' experiences and qualifications include:

- Restoration, enhancement, and preservation of 58,024 acres of wetlands;
- Restoration of over 328 miles of streams;
- Rehabilitation, preservation, and/or management of over 15,000 acres of special-status species habitat;
- Successful close-out of over 100 Banks;
- Permitted and developed over 200 permittee-responsible mitigation projects;
- Designed, permitted, managed, and developed 138 wetland, stream, species and conservation banks;
- Delivered of 20,000 acres of custom, turnkey mitigation solutions;
- Designed and constructed over 350 stormwater management facilities;
- Reduced over 267 tons of water quality nutrients;
- Planted over 17,400,000 trees across all operating regions;
- Developed and operated nurseries in three (3) states including the largest coastal nursery in Louisiana;

- Facilitated compensatory mitigation and nutrient offsets for over 3,434 federal and state permits; and
- Currently, monitoring for over 50,000 acres of mitigation habitat.

A company profile may be viewed at www.res.us.

6.3 Proposed Long-Term Ownership and Management Representatives

The Sponsor shall establish a Conservation Servitude. The MBI will provide detailed information regarding the Bank's operation, including long-term management and annual monitoring activities, for review and approval by the IRT. Upon approval of the Site's long-term success by the IRT, the Site shall be transferred to a long-term land steward (to be determined by the Mitigation Plan). The long-term steward shall be responsible for periodic inspection of the site to ensure that restrictions required in the Conservation Servitude of the deed restriction document(s) are upheld. Endowment funds required to uphold easement and deed restrictions shall be negotiated prior to Site transfer to the responsible party.

The Sponsor shall ensure the Conservation Servitude allows for the implementation of an initial monitoring phase, which shall be developed during the design phase and conducted by the Sponsor. The Conservation Servitude shall allow for annual monitoring and, if necessary, maintenance of the Bank during the initial monitoring phase. These activities shall be conducted in accordance with the terms and conditions of the MBI and entered in to by Fifth Louisiana Resource, CEMVN and the IRT.

Long Term Ownership and Management:

Fifth Louisiana Resource, LLC
c/o Resource Environmental Solutions, LLC
412 Settlers Trace Blvd., Suite 200
Lafayette, Louisiana 70508

Point of Contact: Tiffany Hammond
Email: thammond@res.us
Phone Number: (337) 443-6925

6.4 Site Protection

The Owner of the proposed Bank shall burden the Bank with a perpetual Conservation Servitude in accordance with the Louisiana Conservation Servitude Act, R.S. 9:1271 et seq. The Conservation Servitude shall be signed and filed with Lafourche and Terrebonne Parish offices with the MBI and Department of Army (DA) permits attached. The conservation servitude shall be filed prior to performing any work authorized by DA permit (MVN-2020-01245-SG).

After filing, a copy of the recorded Conservation Servitude will be provided to CEMVN clearly showing the book, page, and date of filing. Upon receipt of a copy of the recorded Conservation Servitude, CEMVN will advise the Sponsor in writing that work may proceed.

Prior to execution of the Conservation Servitude, the Sponsor shall ensure that the entity proposed to hold the Conservation Servitude is a CEMVN approved Holder by virtue of being either a governmental body empowered to hold an interest in immovable property under the laws of the State of Louisiana or the United States of America; or a non-profit corporation organized pursuant to Louisiana's Non-Profit Corporation Law, Title 12, Sections 201-269 of the Louisiana Revised Statues, the purposes or powers of which include retaining or protecting the natural, scenic, or open–space values of immovable property; assuring the availability of immovable property for agricultural, forest, recreational or open-

space use; protecting natural resources; maintaining or enhancing air or water quality; or preserving the historical, archaeological or cultural aspects of unimproved immovable property. Upon execution of the Conservation Servitude previously described, the Holder shall hold and enforce the conservation servitude placed on the Bank and the Bank shall be protected in perpetuity.

Modification of the conservation servitude is not permissible without prior written authorization from CEMVN. Any request to modify the Conservation Servitude, or to the rights and obligations created under it, shall be made in writing and forwarded to CEMVN for review and approval. All requests must describe existing language and the requested modification.

6.5 Long-Term Strategy

To ensure long-term sustainability of the resource, the Sponsor will perform all necessary work to maintain the Bank consistent with the performance standards established in the MBI. Maintenance includes all monitoring, long-term management, reporting, adaptive management, if needed, and all work required and identified in the MBI, to be developed pending approval of the Prospectus.

Specific long-term needs include:

1. Monitoring as established in the MBI;
2. Wetland delineations as established in the MBI;
3. Hydrological maintenance and modifications, as needed;
4. Thinning of soft mast, as needed;
5. Eradication of noxious or invasive species, as needed; and
6. Supplemental planting events, as needed.

During monitoring and field activities at the Bank, potential issues will be identified, evaluated, and mapped. Monitoring notes will be recorded as to the type, location and any other details that would be beneficial in dealing with such issues. Once details are recorded, the long-term Steward or Agent will prepare a recommendation to address the noted issue if needed and propose measures to avoid and/or minimize such issues in the future. Corrective actions as determined to be appropriate by the USACE and the Adaptive Management Plan (AMP) will be implemented. During annual Bank monitoring events, the Long-term Steward, Holder, or Agent will note any land use changes on adjacent lands and modify management activities accordingly.

7 References

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2. Environmental Protection Agency. 2003. Level III ecoregions of the continental United States (revision of Omernik 1987): Corvallis, OR, U.S. Environmental Protection Agency – National Health and Environmental Effects Research Laboratory, Map M-1, various scales.

3. Gardiner, E.S. and J.M. Oliver. 2005. Restoration of bottomland hardwood forest in the Lower Mississippi Alluvial Valley In: Restoration of boreal and temperate forests in the Lower Mississippi Alluvial Valley, Stanturf, J.A.; Madsen, P., eds. Boca Raton, FL.

4. Holcomb, S.R., A.A. Bass, C.S. Reid, M.A.Seymour, N.F. Lorenz, B.B. Gregory, S.M. Javed, K.F. Balkum. 2015. Louisiana Wildlife Action Plan. Louisiana Department of Wildlife and Fisheries. Baton Rouge, Louisiana.

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9. Natural Resources Conservation Service (2006) Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. United States Department of Agriculture Handbook 296.

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11. Omernik, J.M. (1987) Ecoregions of the Conterminous United States (map supplement): Annals of the Association of American Geographers, v. 77, no. 1, p. 118-125, scale 1:7,500,000.

12. Taylor, D. (2006) Forest Management and Bats. Bat Conservation International Publication.

13. Twedt, D., D. Pashley, C. Hunter, A. Mueller, C. Brown and B. Ford (1999) Partners in Flight Bird Conservation Plan for the Mississippi Alluvial Valley, Version 1.0.

14. Twedt, D.J. and C.R. Loesch (1999)2 Forest area and distribution in the Mississippi Alluvial Valley: implications for breeding bird conservation. Journal of Biogeography. 26:1215-1224.

15. U.S. Army Corps of Engineers (2017) Louisiana Wetland Rapid Assessment Method For use within the Boundaries of the New Orleans District, Version 2.0.

8 Appendix

EXHIBIT 1

Vicinity and Service Area Map

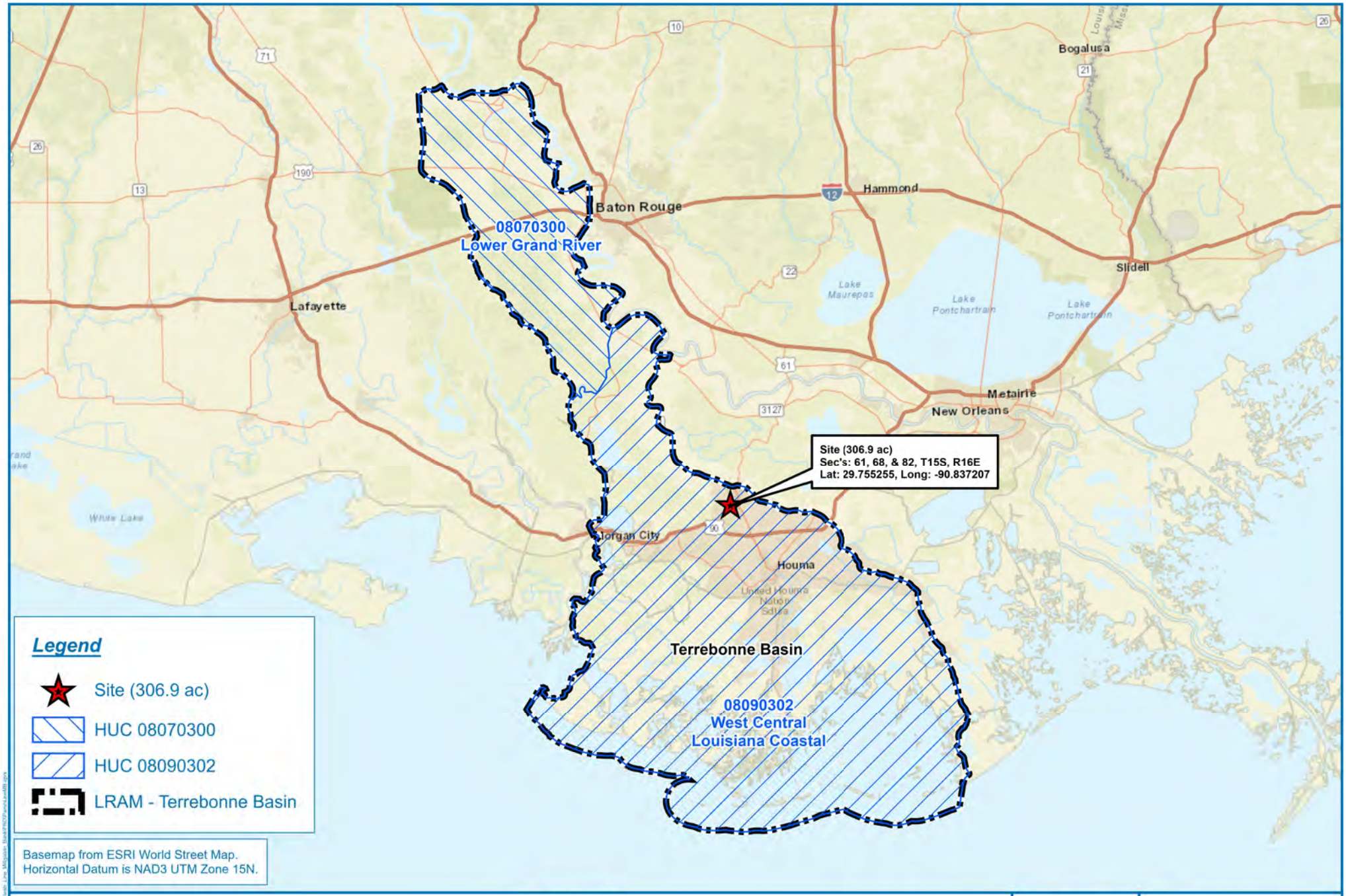


EXHIBIT 1

PARISH LINE MITIGATION BANK
FIFTH LOUISIANA RESOURCE, L.L.C.
VICINITY AND SERVICE AREA MAP

LAFOURCHE AND TERREBONNE PARISHES, LOUISIANA

Date: 6/11/2021

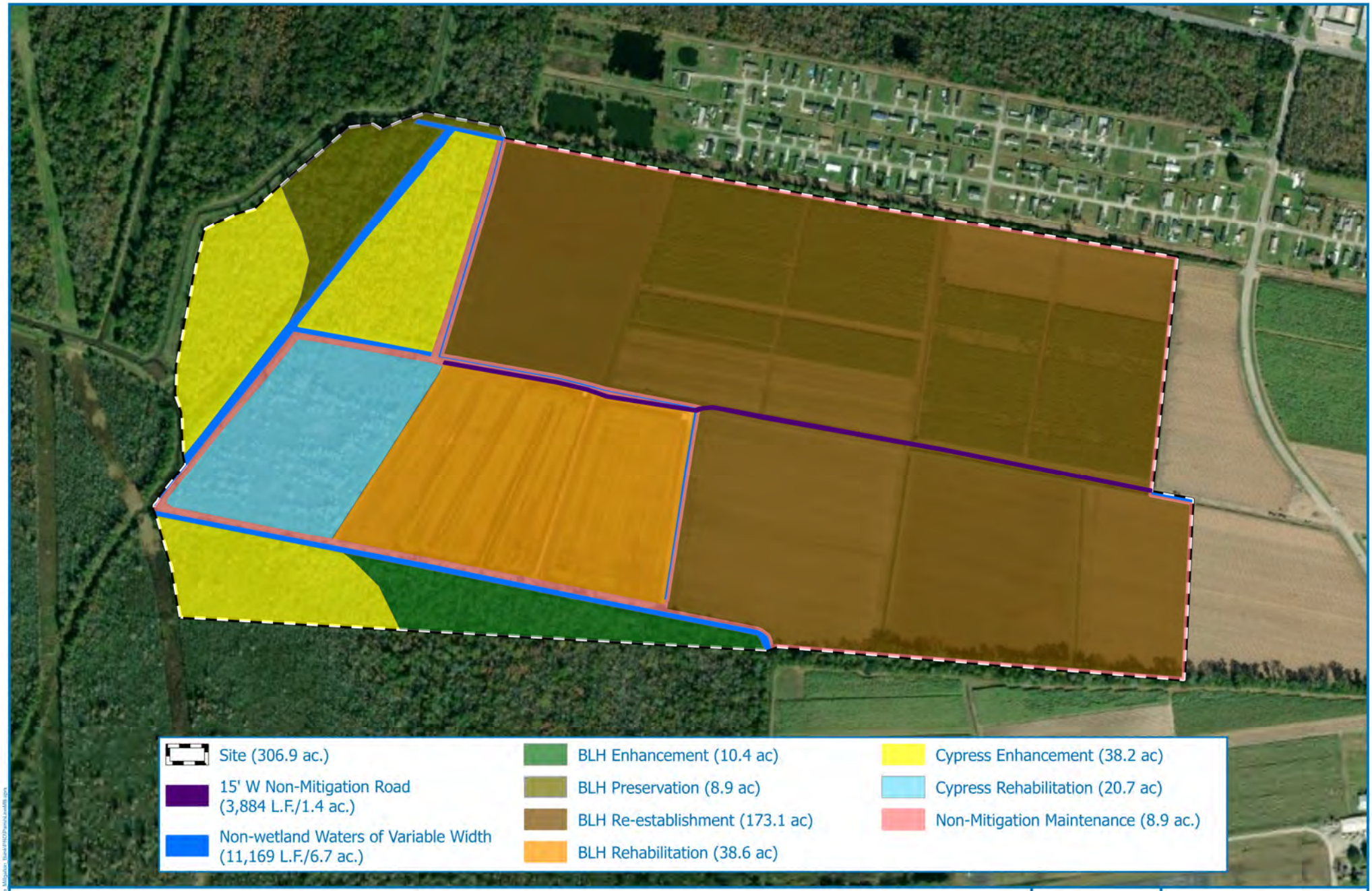
Drawn by: TB

Checked by: BM

res

EXHIBIT 2

Mitigation Habitat Plan



Project limits are approximate. The parcel data information/property boundaries depicted on this map is for prospect assessment purposes only. It is not to be used as final boundaries.
Source Data: Maxar

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PCS: NAD 1983 UTM Zone 15N

EXHIBIT 2

PARISH LINE MITIGATION BANK
FIFTH LOUISIANA RESOURCE, L.L.C.
MITIGATION HABITAT PLAN

LAFORCHE AND TERREBONNE PARISHES, LOUISIANA

Date: 6/15/2021
Drawn by: blaprarie
Checked by: BM

res

EXHIBIT 3

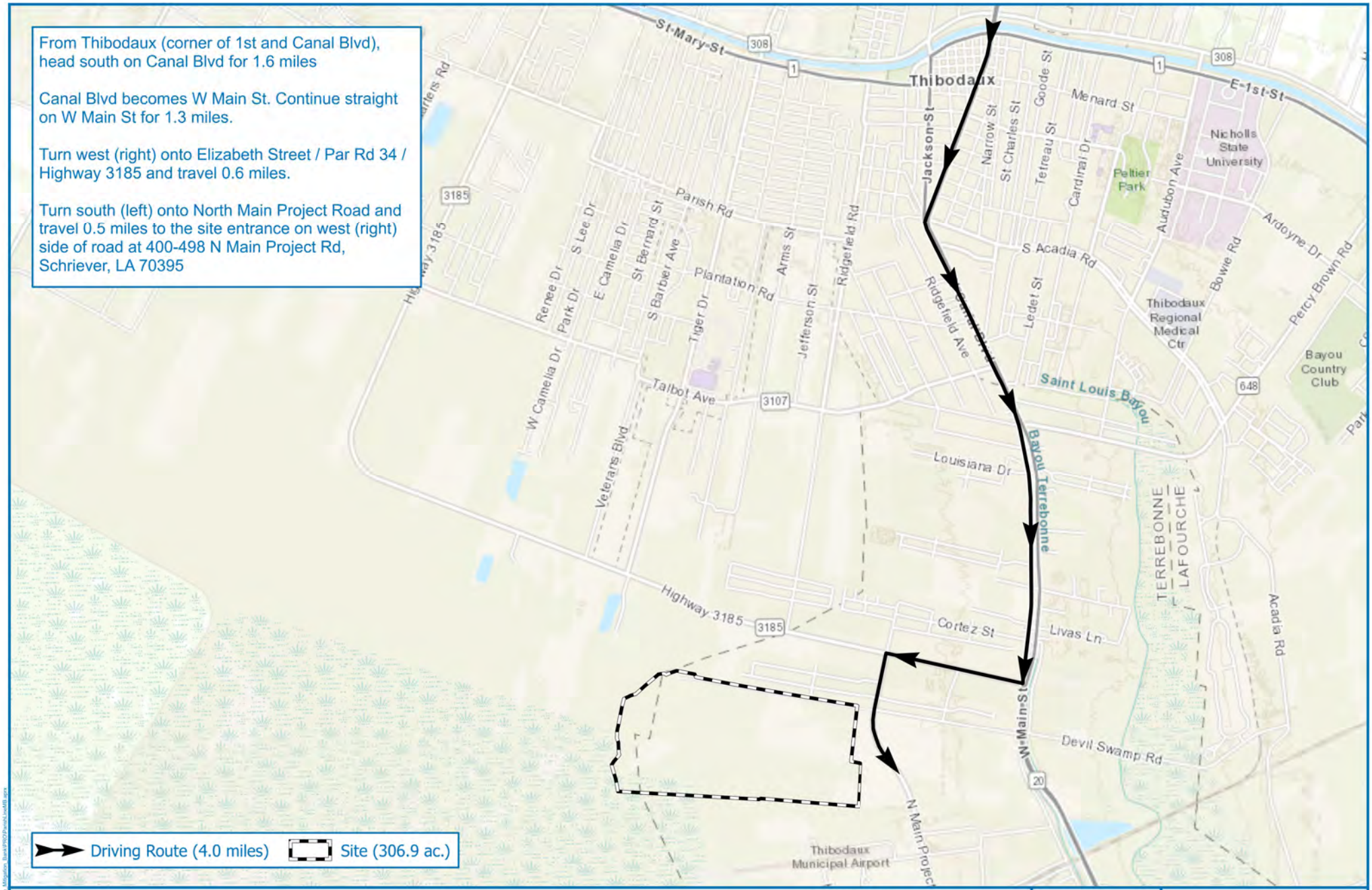
Driving Directions

From Thibodaux (corner of 1st and Canal Blvd), head south on Canal Blvd for 1.6 miles

Canal Blvd becomes W Main St. Continue straight on W Main St for 1.3 miles.

Turn west (right) onto Elizabeth Street / Par Rd 34 / Highway 3185 and travel 0.6 miles.

Turn south (left) onto North Main Project Road and travel 0.5 miles to the site entrance on west (right) side of road at 400-498 N Main Project Rd, Schriever, LA 70395



Driving Route (4.0 miles) Site (306.9 ac.)

Project limits are approximate. The parcel data information/property boundaries depicted on this map is for prospect assessment purposes only. It is not to be used as final boundaries.
Source Data: Esri, HERE, Garmin, USGS, NGA, EPA, USDA, NPS

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Miles

PCS: NAD 1983 UTM Zone 15N

EXHIBIT 3

PARISH LINE MITIGATION BANK
FIFTH LOUISIANA RESOURCE, L.L.C.
DRIVING DIRECTIONS

LAFORCHE AND TERREBONNE PARISHES, LOUISIANA

Date: 6/11/2021
Drawn by: blaprarie
Checked by: BM

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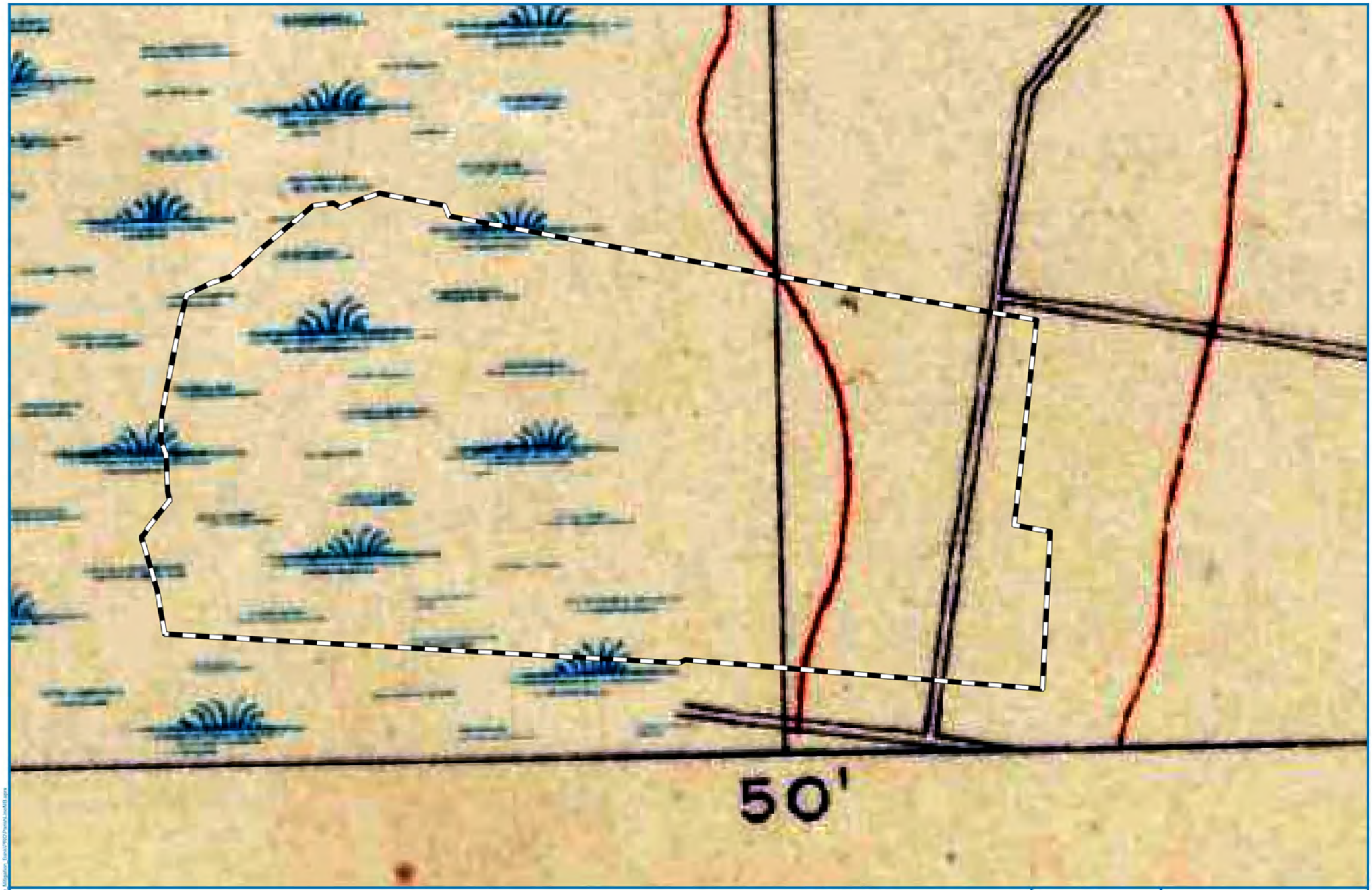
EXHIBITS 4a-4g

Topographic Maps Package



Site (306.9 ac.)

Project limits are approximate. The parcel data information/property boundaries depicted on this map is for prospect assessment purposes only. It is not to be used as final boundaries.
Source Data: USGS,

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PCS: NAD 1983 UTM Zone 15N

EXHIBIT 4a

PARISH LINE MITIGATION BANK
FIFTH LOUISIANA RESOURCE, L.L.C.
1892 USGS TOPOGRAPHIC MAP

LAFORCHE AND TERREBONNE PARISHES, LOUISIANA

Date: 6/17/2021
Drawn by: blaprarie
Checked by: BM

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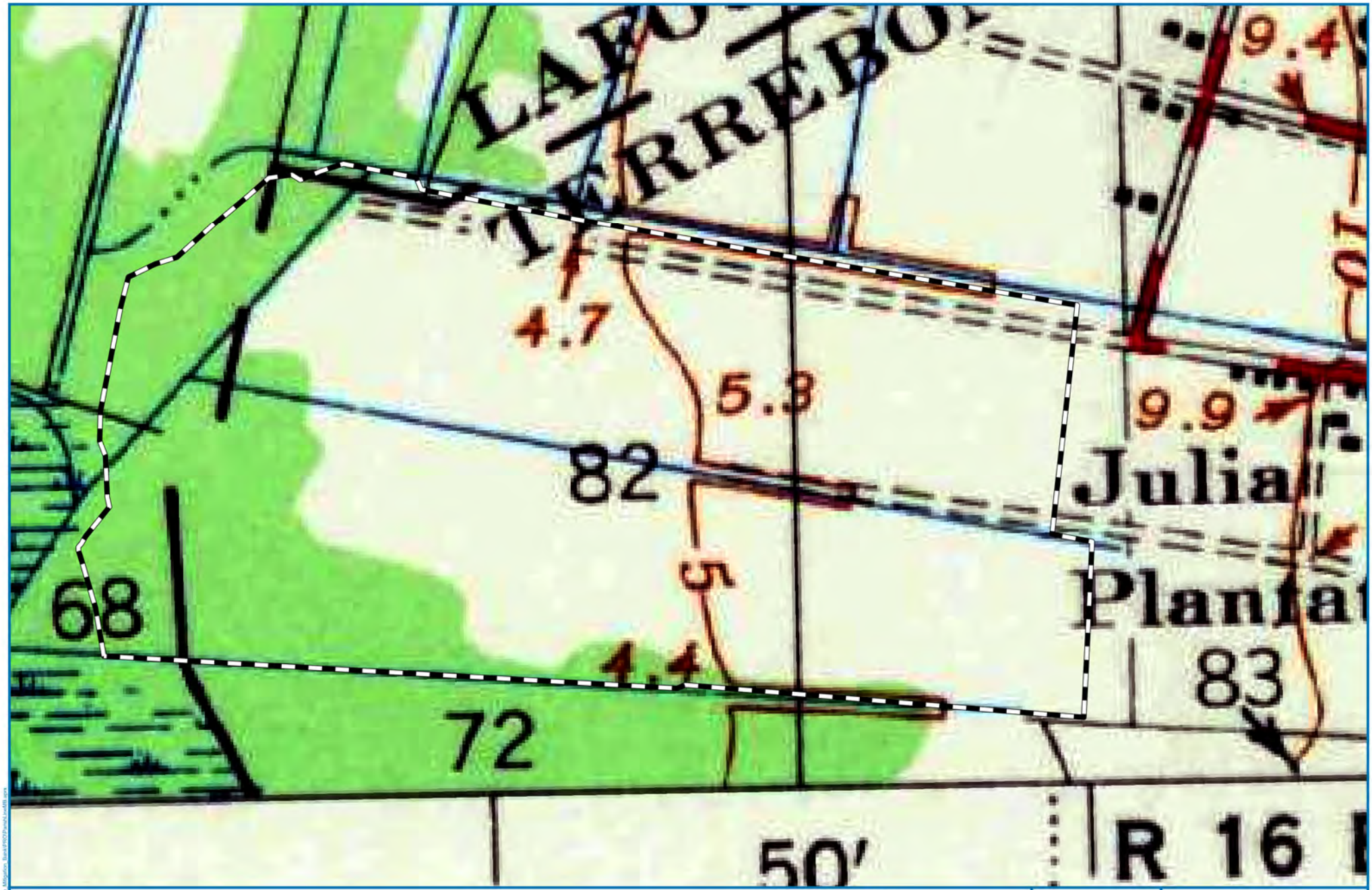

Site (306.9 ac.)

Project limits are approximate. The parcel data information/property boundaries depicted on this map is for prospect assessment purposes only. It is not to be used as final boundaries.
Source Data: USGS,

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PCS: NAD 1983 UTM Zone 15N

EXHIBIT 4b

PARISH LINE MITIGATION BANK
FIFTH LOUISIANA RESOURCE, L.L.C.
1955 USGS TOPOGRAPHIC MAP

LAFORCHE AND TERREBONNE PARISHES, LOUISIANA

Date: 6/11/2021
Drawn by: blaprarie
Checked by: BM

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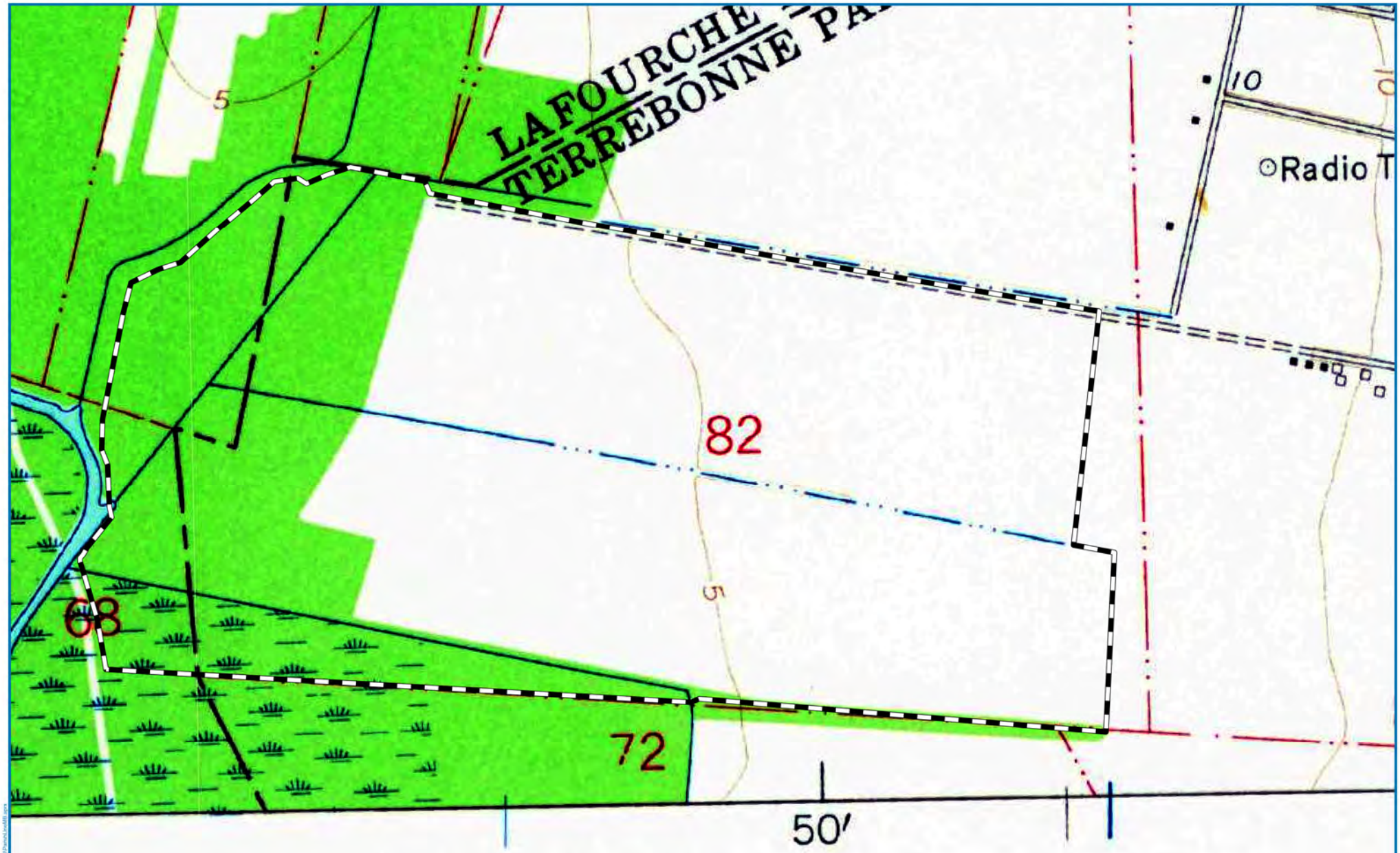

Site (306.9 ac.)

Project limits are approximate. The parcel data information/property boundaries depicted on this map is for prospect assessment purposes only. It is not to be used as final boundaries.
Source Data: USGS,

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PCS: NAD 1983 UTM Zone 15N

EXHIBIT 4c

PARISH LINE MITIGATION BANK
FIFTH LOUISIANA RESOURCE, L.L.C.
1962 USGS TOPOGRAPHIC MAP

LAFORCHE AND TERREBONNE PARISHES, LOUISIANA

Date: 6/11/2021
Drawn by: blaprarie
Checked by: BM

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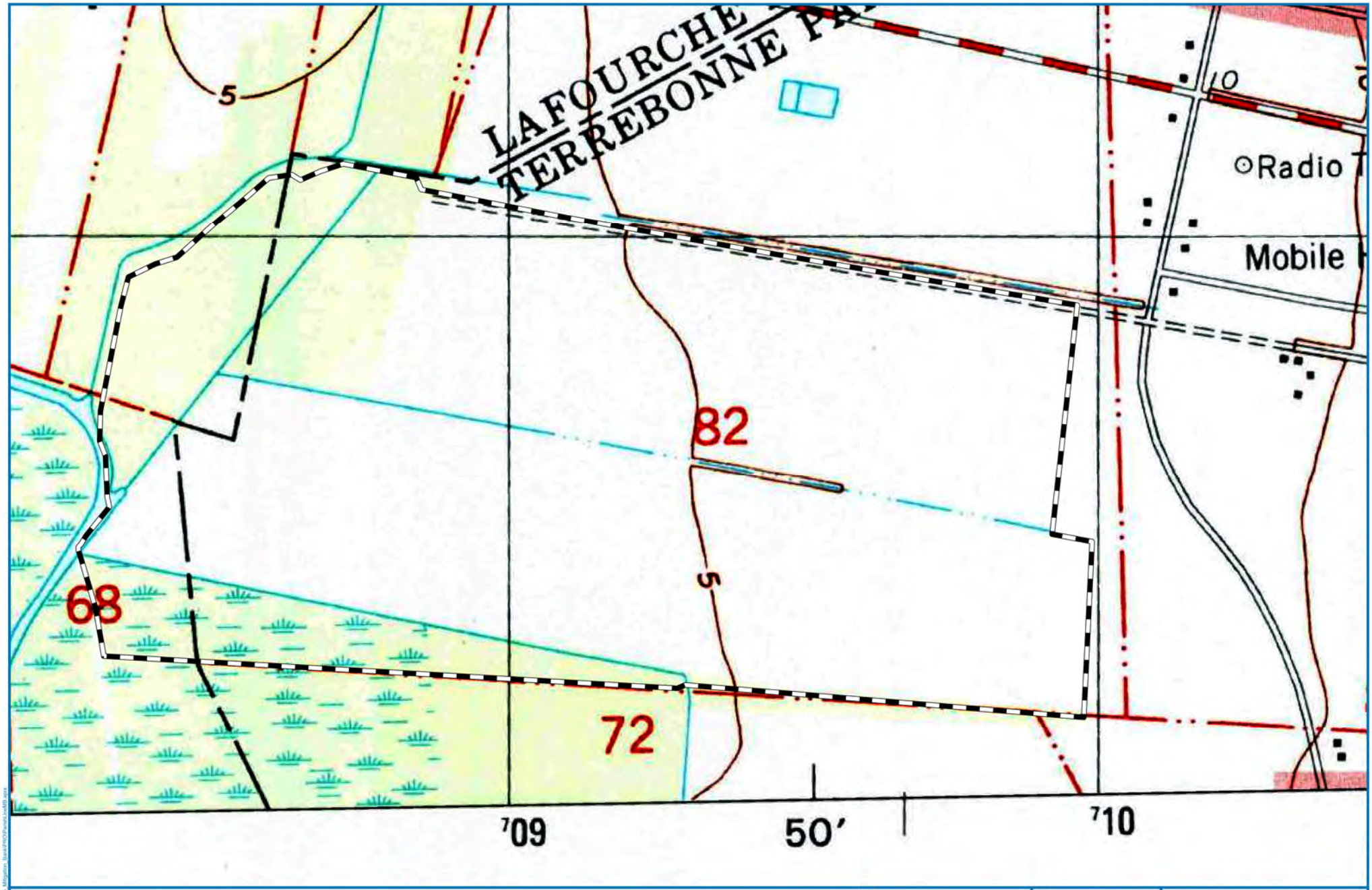

Site (306.9 ac.)

Project limits are approximate. The parcel data information/property boundaries depicted on this map is for prospect assessment purposes only. It is not to be used as final boundaries.
Source Data: USGS,

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PCS: NAD 1983 UTM Zone 15N

EXHIBIT 4d

PARISH LINE MITIGATION BANK
FIFTH LOUISIANA RESOURCE, L.L.C.
1998 USGS TOPOGRAPHIC MAP

LAFORCHE AND TERREBONNE PARISHES, LOUISIANA

Date: 6/11/2021
Drawn by: blaprarie
Checked by: BM

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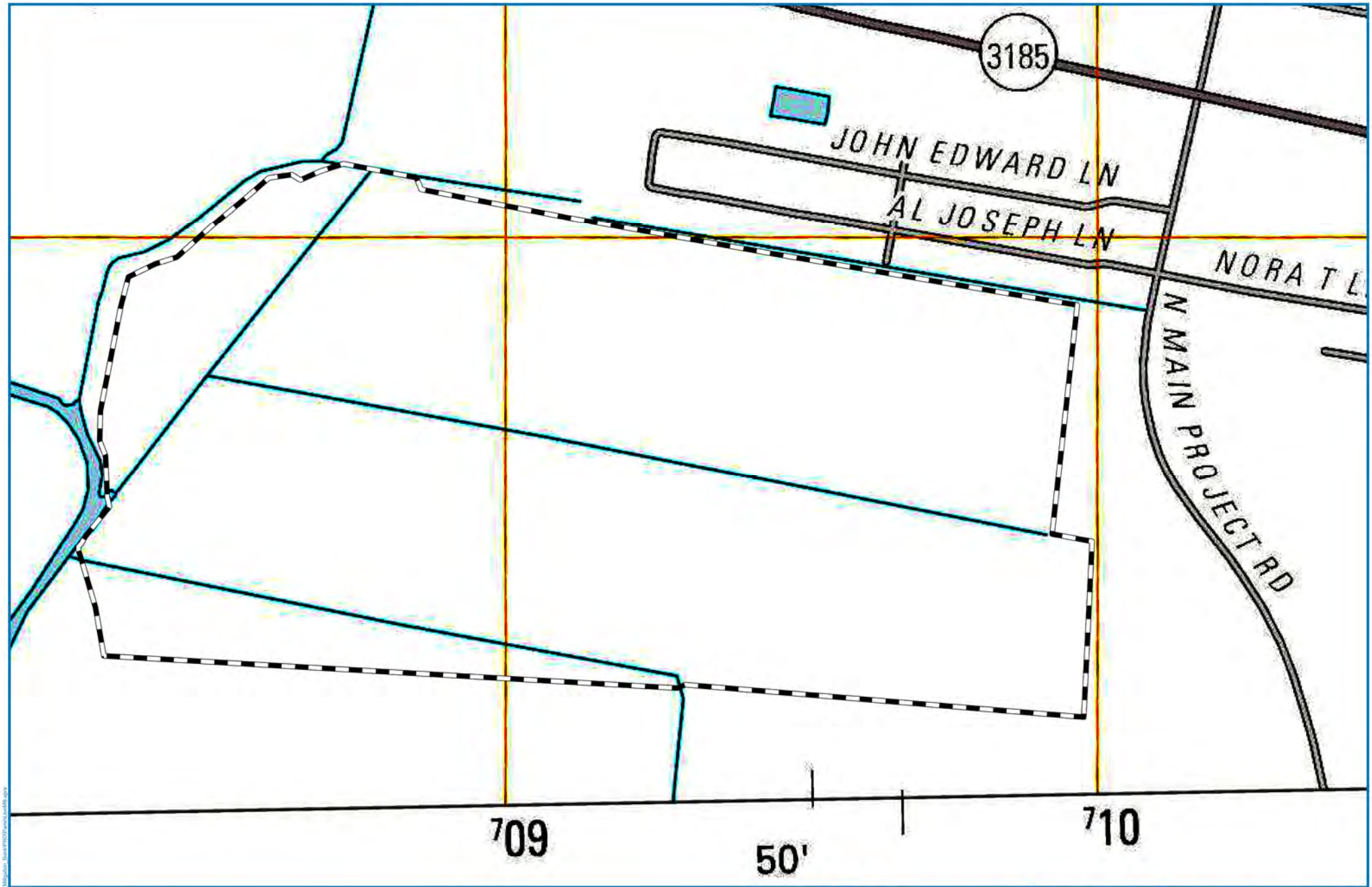

Site (306.9 ac.)

Project limits are approximate. The parcel data information/property boundaries depicted on this map is for prospect assessment purposes only. It is not to be used as final boundaries.
Source Data: USGS,

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PCS: NAD 1983 UTM Zone 15N

EXHIBIT 4e

PARISH LINE MITIGATION BANK
FIFTH LOUISIANA RESOURCE, L.L.C.
2012 USGS TOPOGRAPHIC MAP

LAFORCHE AND TERREBONNE PARISHES, LOUISIANA

Date: 6/11/2021
Drawn by: blaprarie
Checked by: BM

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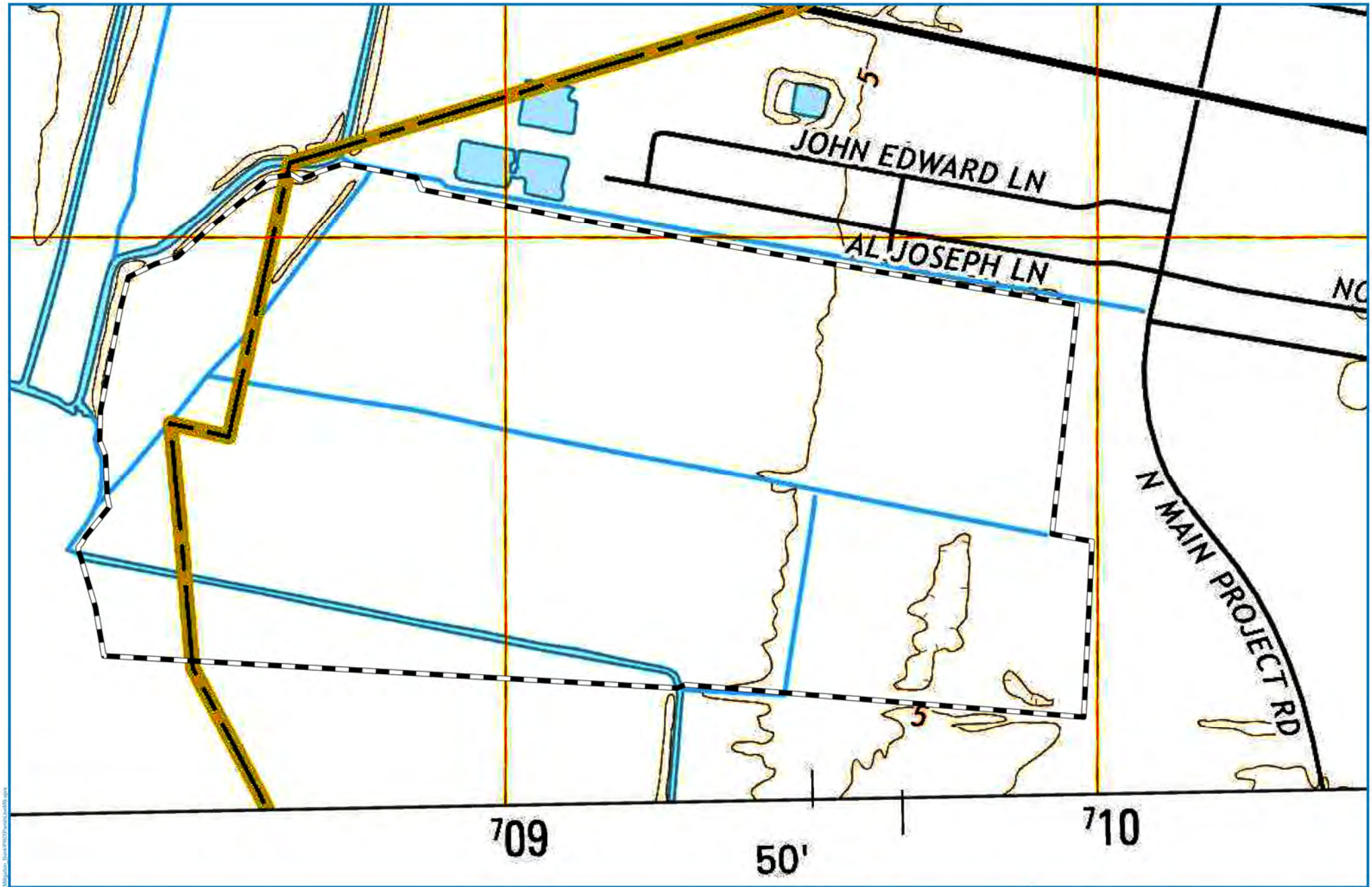

Site (306.9 ac.)

Project limits are approximate. The parcel data information/property boundaries depicted on this map is for prospect assessment purposes only. It is not to be used as final boundaries.
Source Data: USGS,

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PCS: NAD 1983 UTM Zone 15N

EXHIBIT 4f

PARISH LINE MITIGATION BANK
FIFTH LOUISIANA RESOURCE, L.L.C.
2015 USGS TOPOGRAPHIC MAP

LAFORCHE AND TERREBONNE PARISHES, LOUISIANA

Date: 6/11/2021
Drawn by: blaprarie
Checked by: BM

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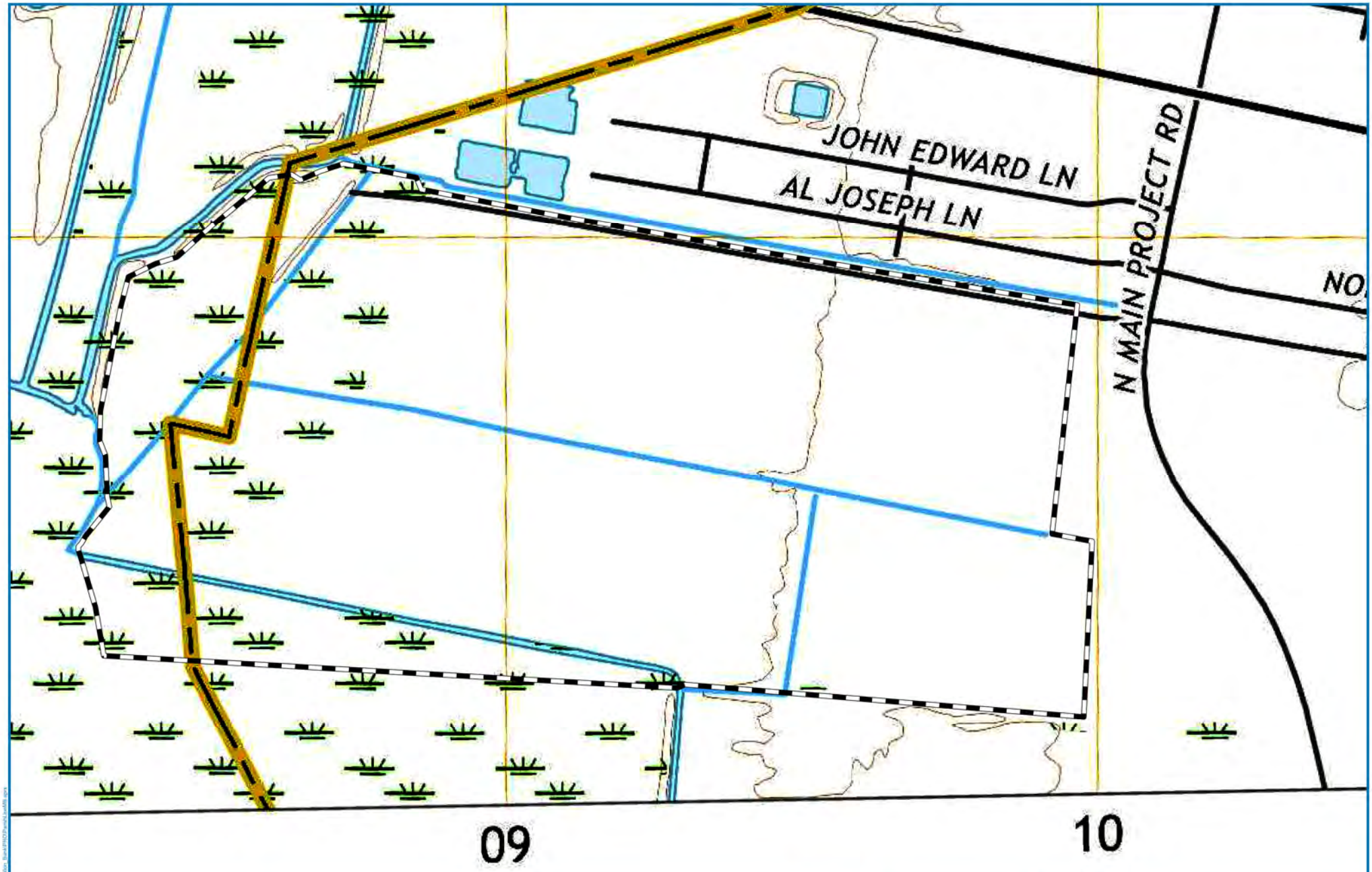

Site (306.9 ac.)

Project limits are approximate. The parcel data information/property boundaries depicted on this map is for prospect assessment purposes only. It is not to be used as final boundaries.
Source Data: USGS,

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PCS: NAD 1983 UTM Zone 15N

EXHIBIT 4g

PARISH LINE MITIGATION BANK
FIFTH LOUISIANA RESOURCE, L.L.C.
2018 USGS TOPOGRAPHIC MAP

LAFORCHE AND TERREBONNE PARISHES, LOUISIANA

Date: 6/11/2021
Drawn by: blaprarie
Checked by: BM

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EXHIBITS 5a-5i

Aerial Maps Package

Site (306.9 ac.)

Project limits are approximate. The parcel data information/property boundaries depicted on this map is for prospect assessment purposes only. It is not to be used as final boundaries.
Source Data: EarthExplorer

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PCS: NAD 1983 UTM Zone 15N

EXHIBIT 5a

PARISH LINE MITIGATION BANK
FIFTH LOUISIANA RESOURCE, L.L.C.
1956 AERIAL MAP

LAFORCHE AND TERREBONNE PARISHES, LOUISIANA

Date: 6/11/2021
Drawn by: blaprarie
Checked by: BM

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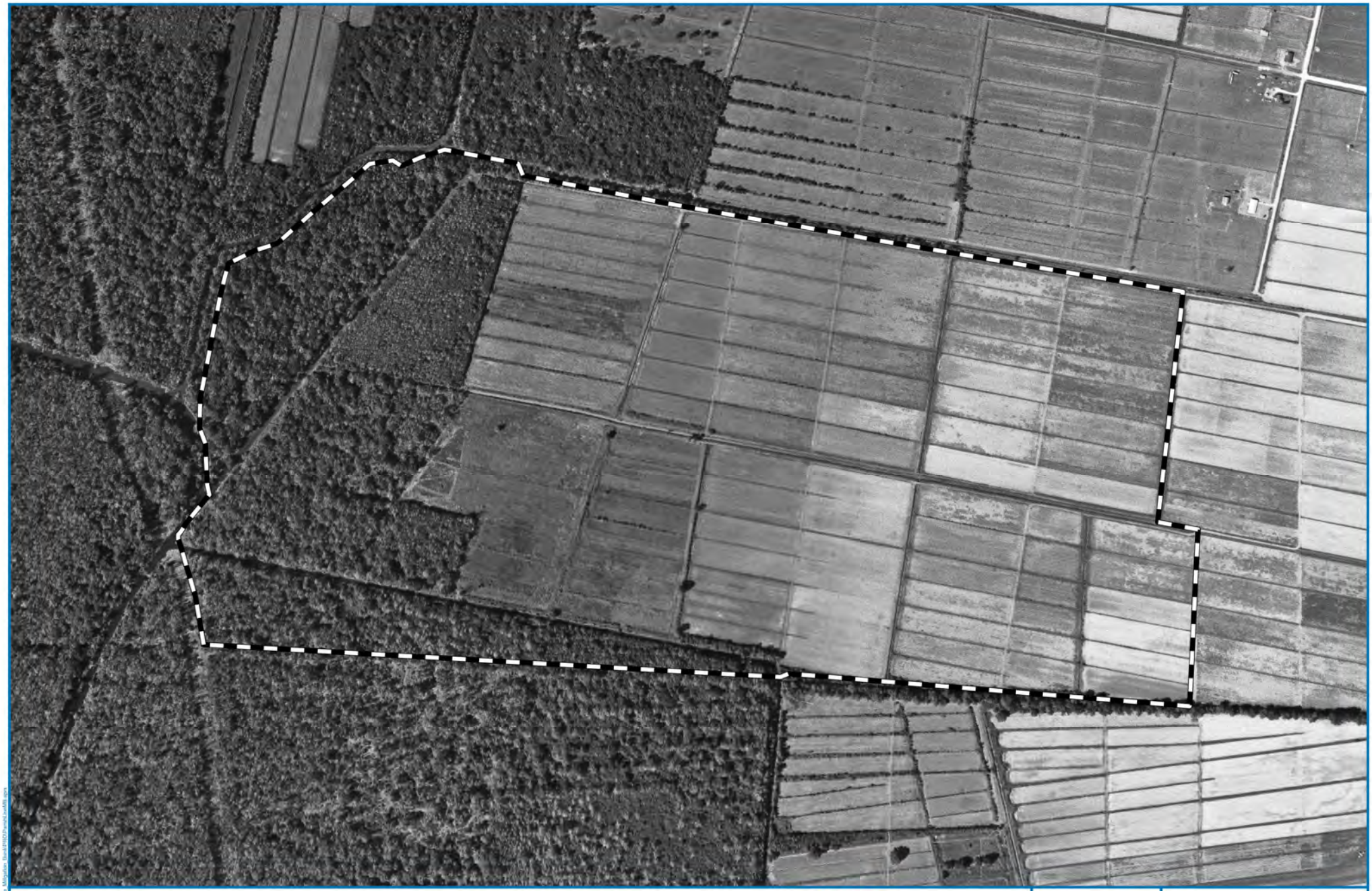

Site (306.9 ac.)

Project limits are approximate. The parcel data information/property boundaries depicted on this map is for prospect assessment purposes only. It is not to be used as final boundaries.
Source Data: EarthExplorer

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PCS: NAD 1983 UTM Zone 15N

EXHIBIT 5b

PARISH LLINE MITIGATION BANK
FIFTH LOUISIANA RESOURCE, L.L.C.
1961 AERIAL MAP

LAFORCHE AND TERREBONNE PARISHES, LOUISIANA

Date: 6/11/2021

Drawn by: blaprarie

Checked by: BM

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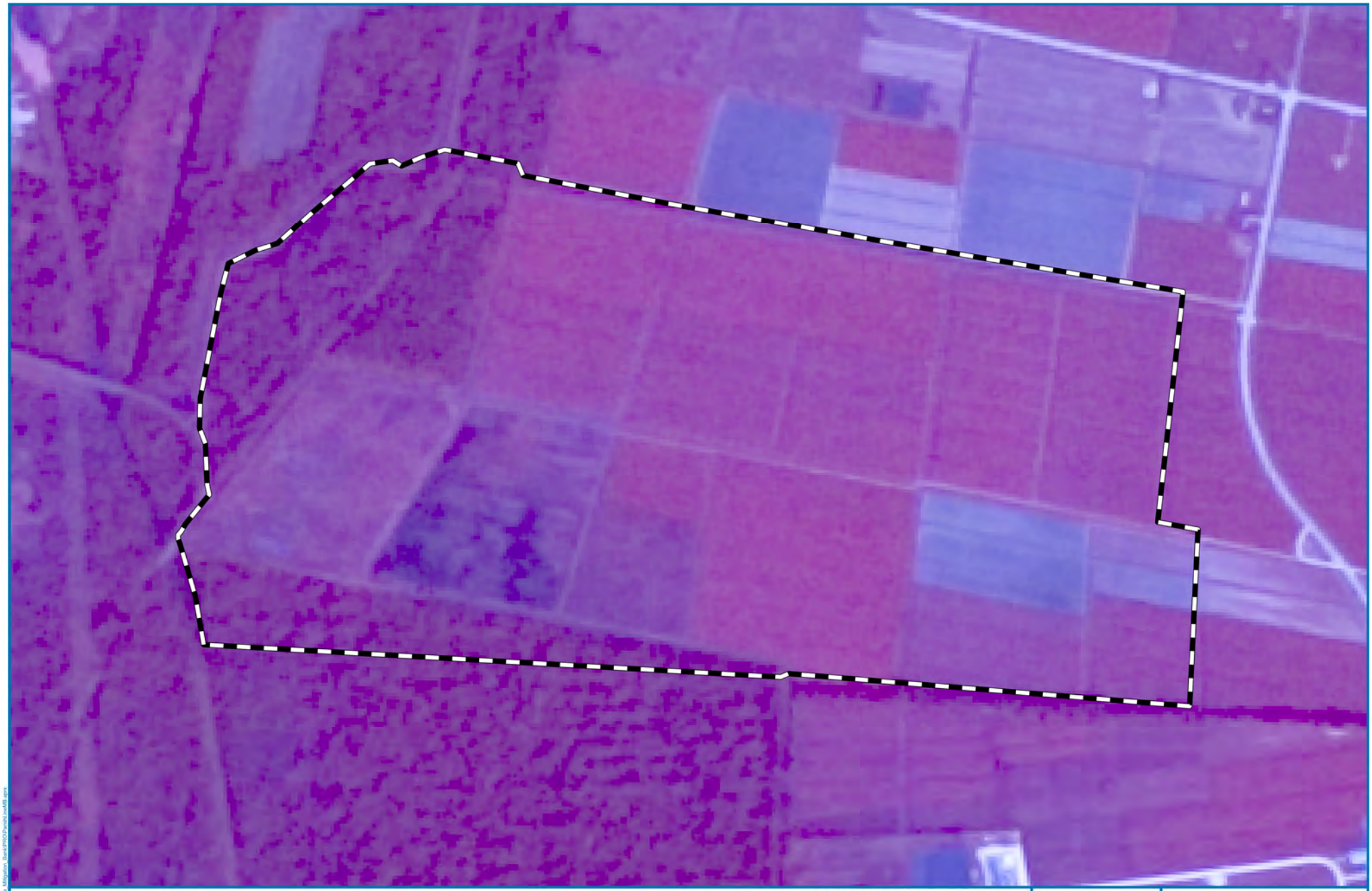

Site (306.9 ac.)

Project limits are approximate. The parcel data information/property boundaries depicted on this map is for prospect assessment purposes only. It is not to be used as final boundaries.
Source Data: EarthExplorer

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PCS: NAD 1983 UTM Zone 15N

EXHIBIT 5c

PARISH LINE MITIGATION BANK
FIFTH LOUISIANA RESOURCE, L.L.C.
1978 AERIAL MAP

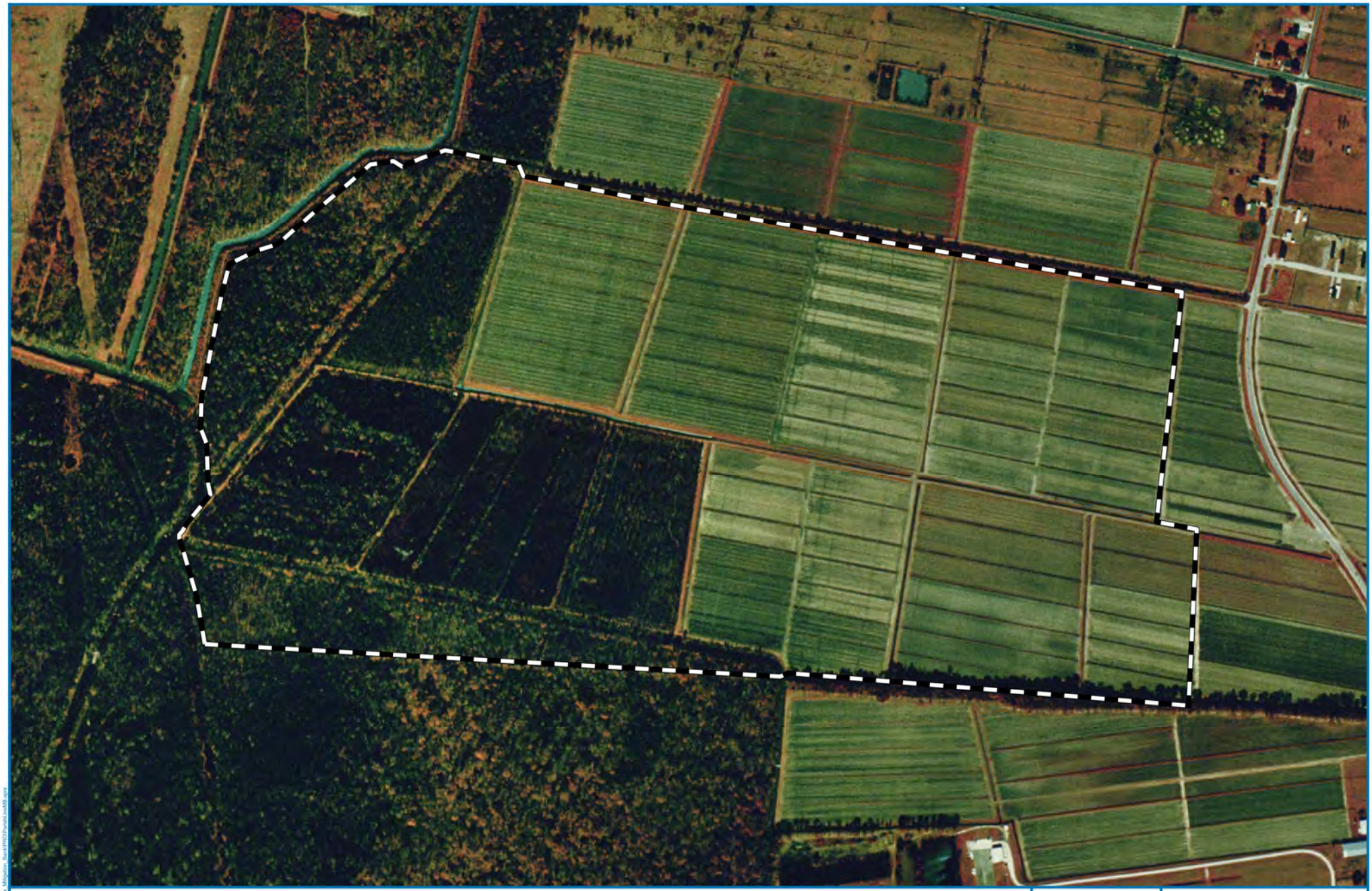
LAFORCHE AND TERREBONNE PARISHES, LOUISIANA

Date: 6/11/2021

Drawn by: blaprarie

Checked by: BM

res



Site (306.9 ac.)

Project limits are approximate. The parcel data information/property boundaries depicted on this map is for prospect assessment purposes only. It is not to be used as final boundaries.
Source Data: LOSCO DOQQ

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PCS: NAD 1983 UTM Zone 15N

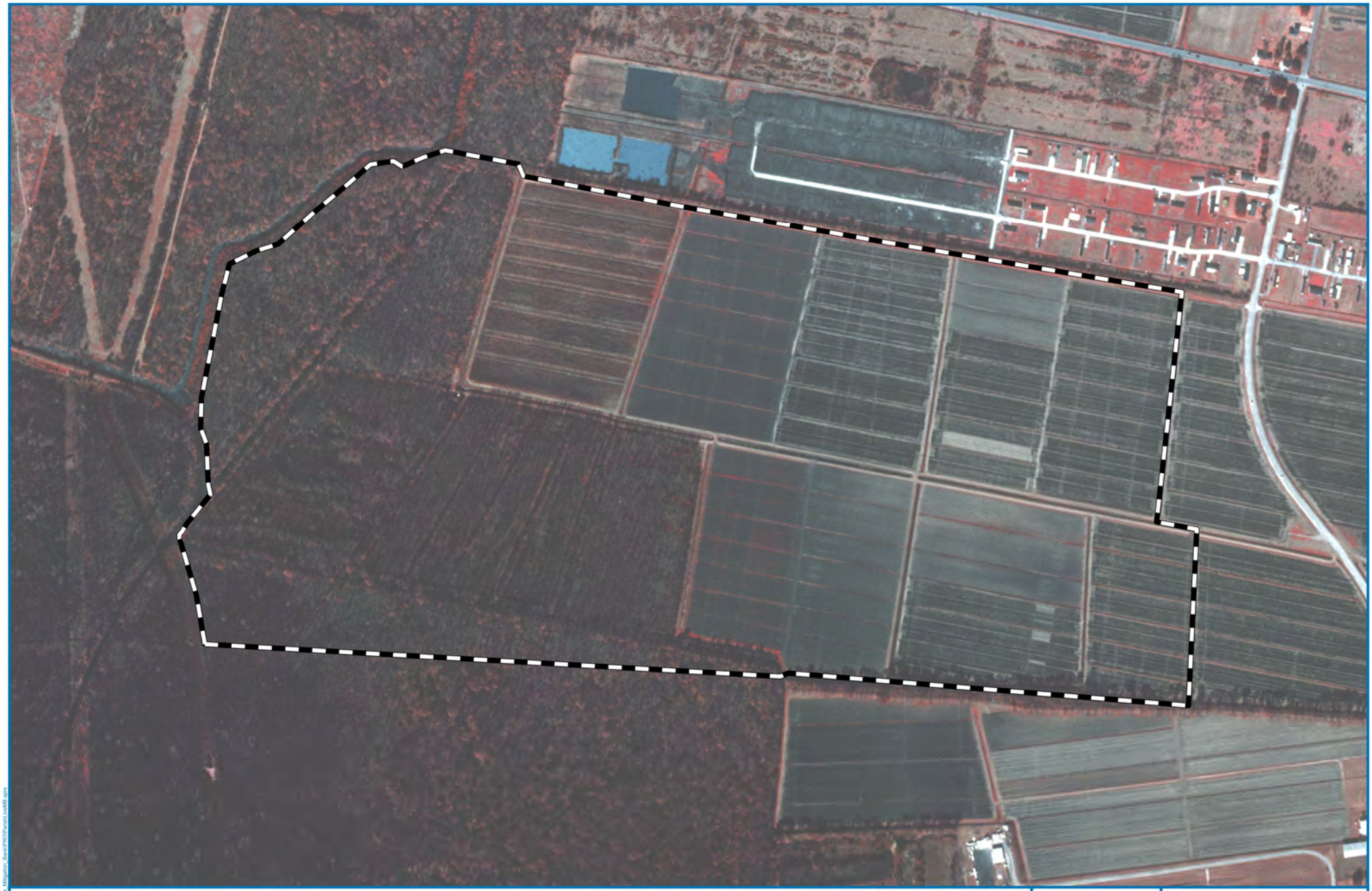
EXHIBIT 5d

PARISH LINE MITIGATION BANK
FIFTH LOUISIANA RESOURCE, L.L.C.
1998 AERIAL MAP

LAFORCHE AND TERREBONNE PARISHES, LOUISIANA

Date: 6/11/2021
Drawn by: blaprarie
Checked by: BM

res



Site (306.9 ac.)

Project limits are approximate. The parcel data information/property boundaries depicted on this map is for prospect assessment purposes only. It is not to be used as final boundaries.
Source Data: LOSCO DOQQ

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PCS: NAD 1983 UTM Zone 15N

EXHIBIT 5e

PARISH LINE MITIGATION BANK
FIFTH LOUISIANA RESOURCE, L.L.C.
2004 AERIAL MAP

LAFORCHE AND TERREBONNE PARISHES, LOUISIANA

Date: 6/11/2021

Drawn by: blaprarie

Checked by: BM

res

Site (306.9 ac.)

Project limits are approximate. The parcel data information/property boundaries depicted on this map is for prospect assessment purposes only. It is not to be used as final boundaries.
Source Data: LOSCO DOQQ

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PCS: NAD 1983 UTM Zone 15N

EXHIBIT 5f

PARISH LINE MITIGATION BANK
FIFTH LOUISIANA RESOURCE, L.L.C.
2008 AERIAL MAP

LAFORCHE AND TERREBONNE PARISHES, LOUISIANA

Date: 6/11/2021

Drawn by: blaprarie

Checked by: BM

res

Site (306.9 ac.)

Project limits are approximate. The parcel data information/property boundaries depicted on this map is for prospect assessment purposes only. It is not to be used as final boundaries.
Source Data: 2013 NAIP

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PCS: NAD 1983 UTM Zone 15N

EXHIBIT 5g

PARISH LINE MITIGATION BANK
FIFTH LOUISIANA RESOURCE, L.L.C.
2013 AERIAL MAP

LAFORCHE AND TERREBONNE PARISHES, LOUISIANA

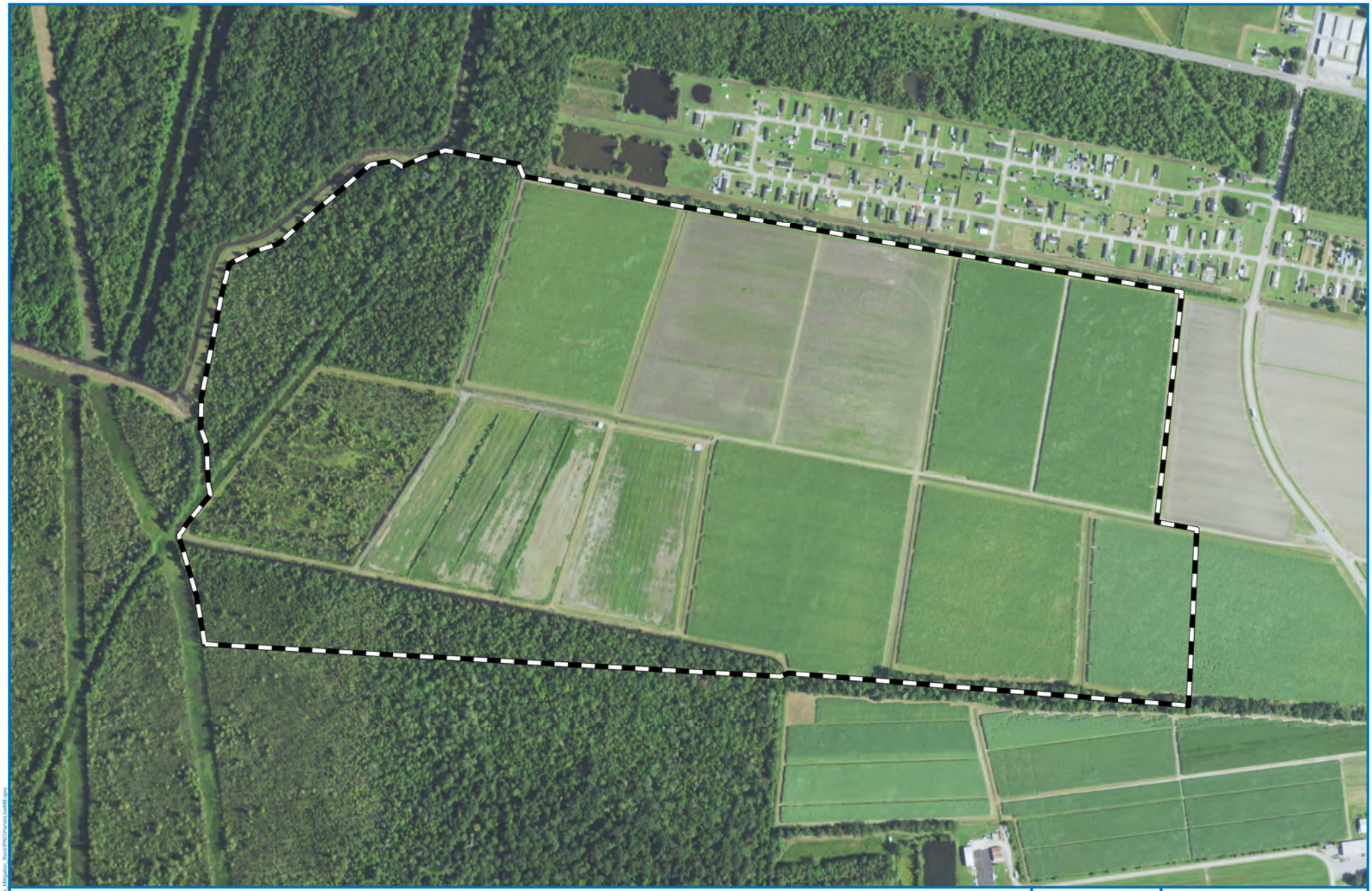
Date: 6/11/2021

Drawn by: blaprarie

Checked by: BM

res

Document Path: R:\Projects\Projects\107251 Parish Line Mitigation Bank\PRO\Parish Line MB.aprx



Site (306.9 ac.)

Project limits are approximate. The parcel data information/property boundaries depicted on this map is for prospect assessment purposes only. It is not to be used as final boundaries.
Source Data: 2017 NAIP

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Feet

PCS: NAD 1983 UTM Zone 15N

EXHIBIT 5h

PARISH LINE MITIGATION BANK
FIFTH LOUISIANA RESOURCE, L.L.C.
2017 AERIAL MAP

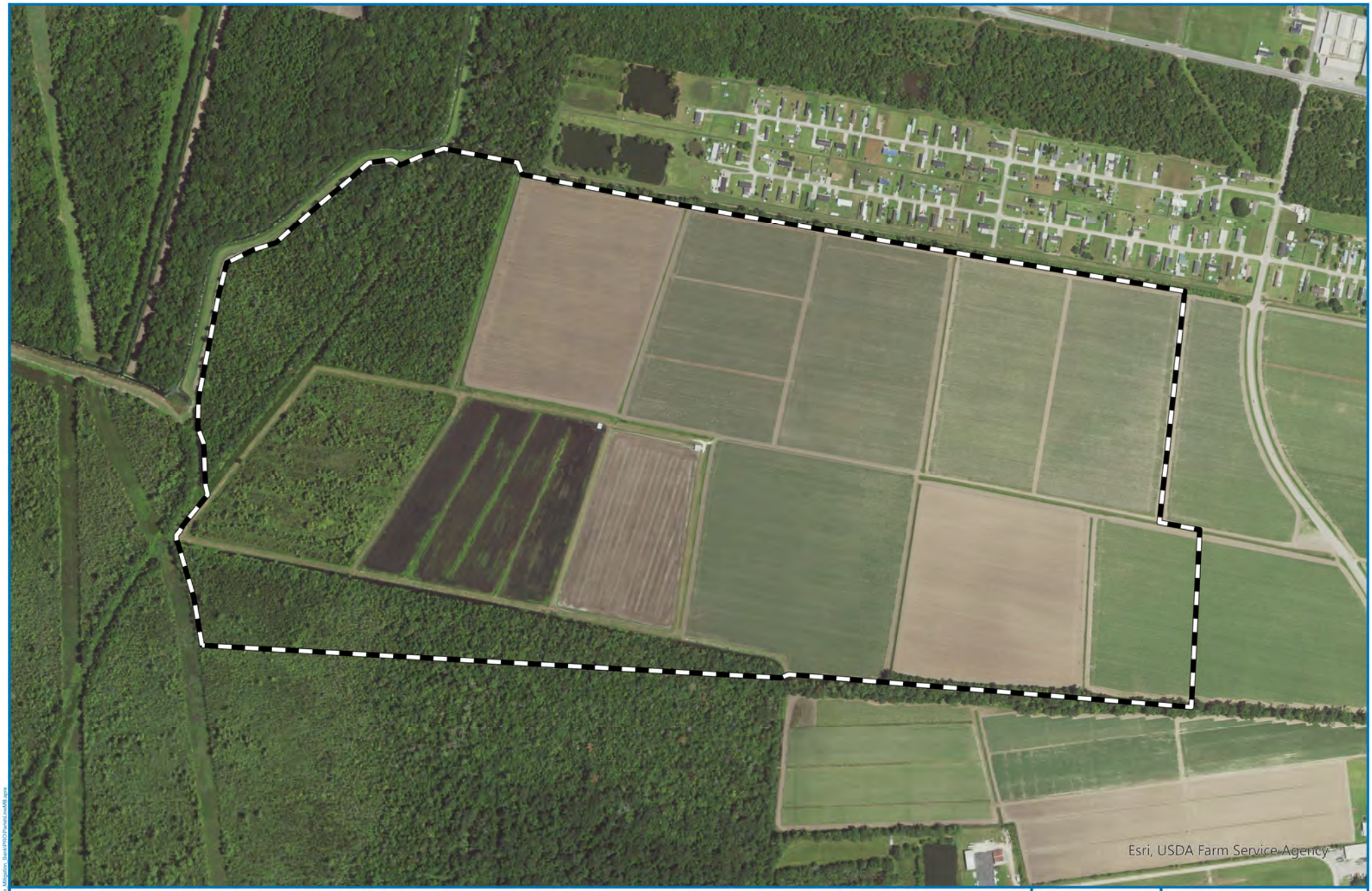
LAFORCHE AND TERREBONNE PARISHES, LOUISIANA

Date: 6/11/2021

Drawn by: blaprarie

Checked by: BM

res



Site (306.9 ac.)

Project limits are approximate. The parcel data information/property boundaries depicted on this map is for prospect assessment purposes only. It is not to be used as final boundaries.
Source Data: 2019 NAIP

N
W E
S

0 500 1,000
Feet

PCS: NAD 1983 UTM Zone 15N

EXHIBIT 5i

PARISH LINE MITIGATION BANK
FIFTH LOUISIANA RESOURCE, L.L.C.
2019 AERIAL MAP

LAFORCHE AND TERREBONNE PARISHES, LOUISIANA

Date: 6/11/2021

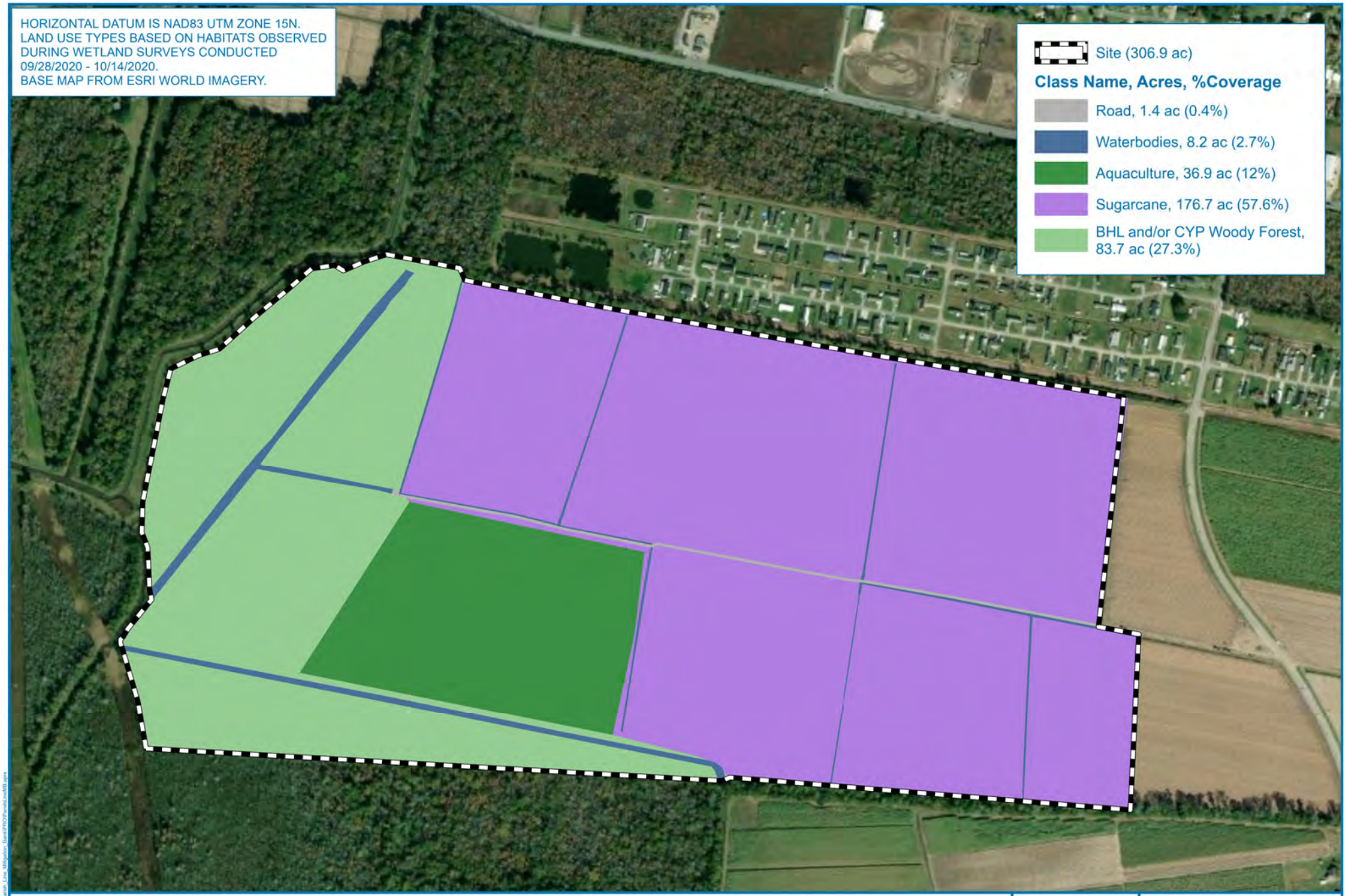
Drawn by: blaprarie

Checked by: BM

res

EXHIBIT 6

Land Use and Land Cover Within Bank



N
W E
S

0 350 700

Feet

EXHIBIT 6

PARISH LINE MITIGATION BANK
FIFTH LOUISIANA RESOURCE, L.L.C.
LAND USE AND LAND COVER WITHIN BANK

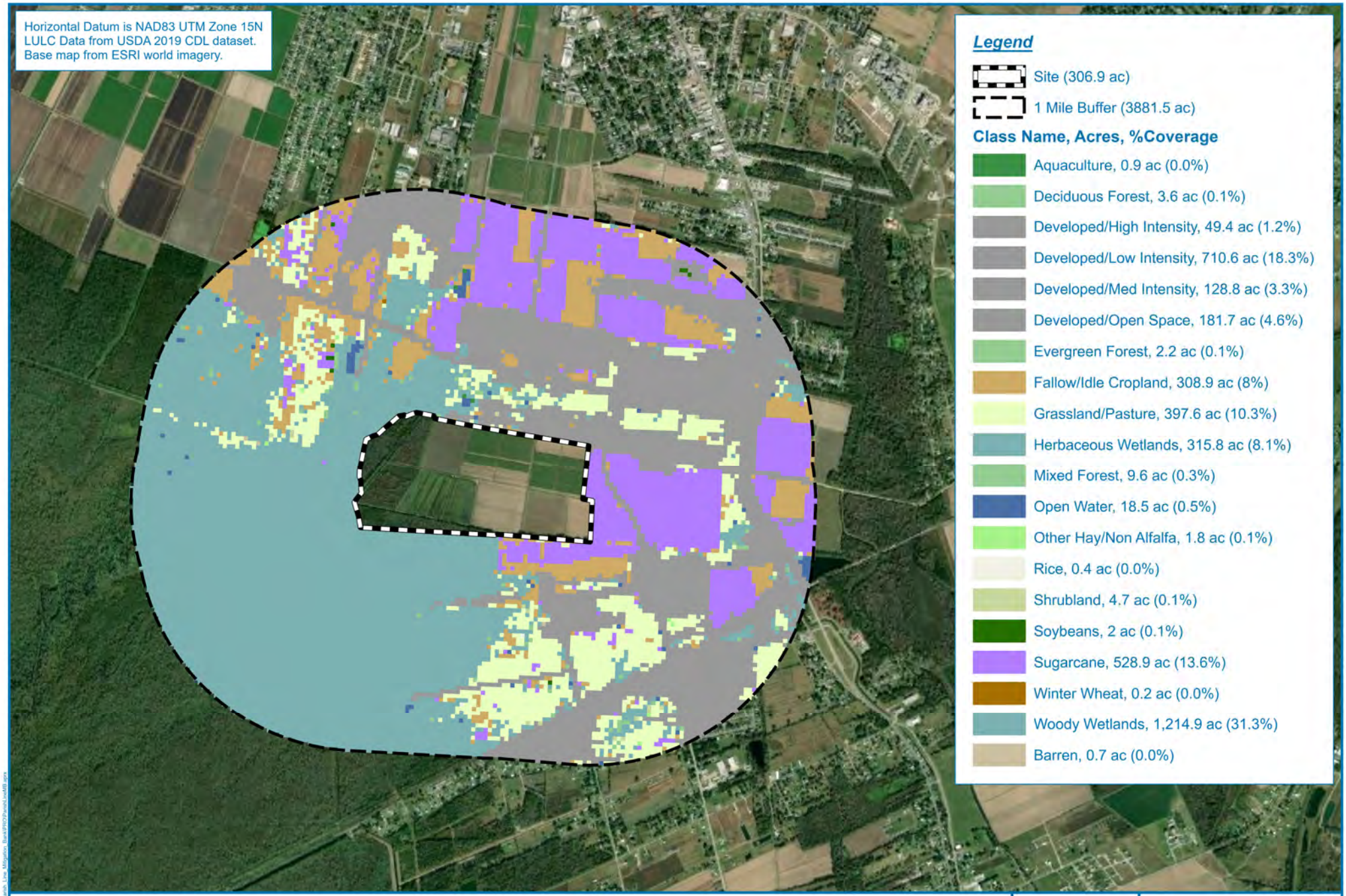
LAFOURCHE AND TERREBONNE PARISHES, LOUISIANA

Date:	6/15/2021
Drawn by:	BL
Checked by:	BM

res

EXHIBIT 7

Land Use and Land Cover Within 1 Mile



N
W
E
S
0
0.5
1
Miles

EXHIBIT 7

PARISH LINE MITIGATION BANK
FIFTH LOUISIANA RESOURCE, L.L.C.
LAND USE AND LAND COVER WITHIN 1 MILE

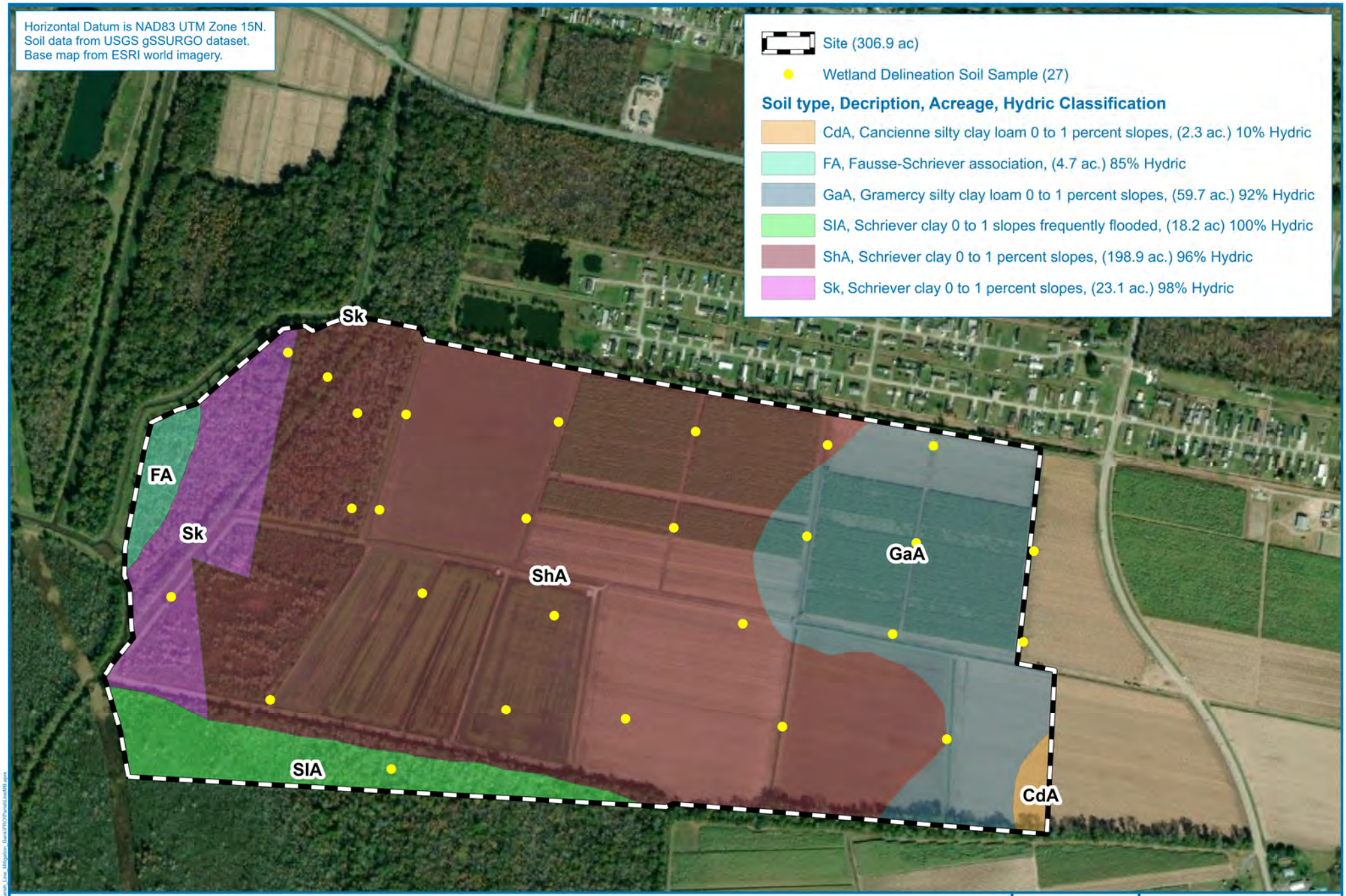
LAFOURCHE AND TERREBONNE PARISHES, LOUISIANA

Date: 6/11/2021
Drawn by: BL
Checked by: BM

res

EXHIBIT 8

Soils Map



0 350 700
Feet

EXHIBIT 8

PARISH LINE MITIGATION BANK
FIFTH LOUISIANA RESOURCE, L.L.C.
SOILS MAP

LAFOURCHE AND TERREBONNE PARISHES, LOUISIANA

Date: 6/14/2021
Drawn by: BL
Checked by: BM

res

EXHIBIT 9

Contributing Watershed

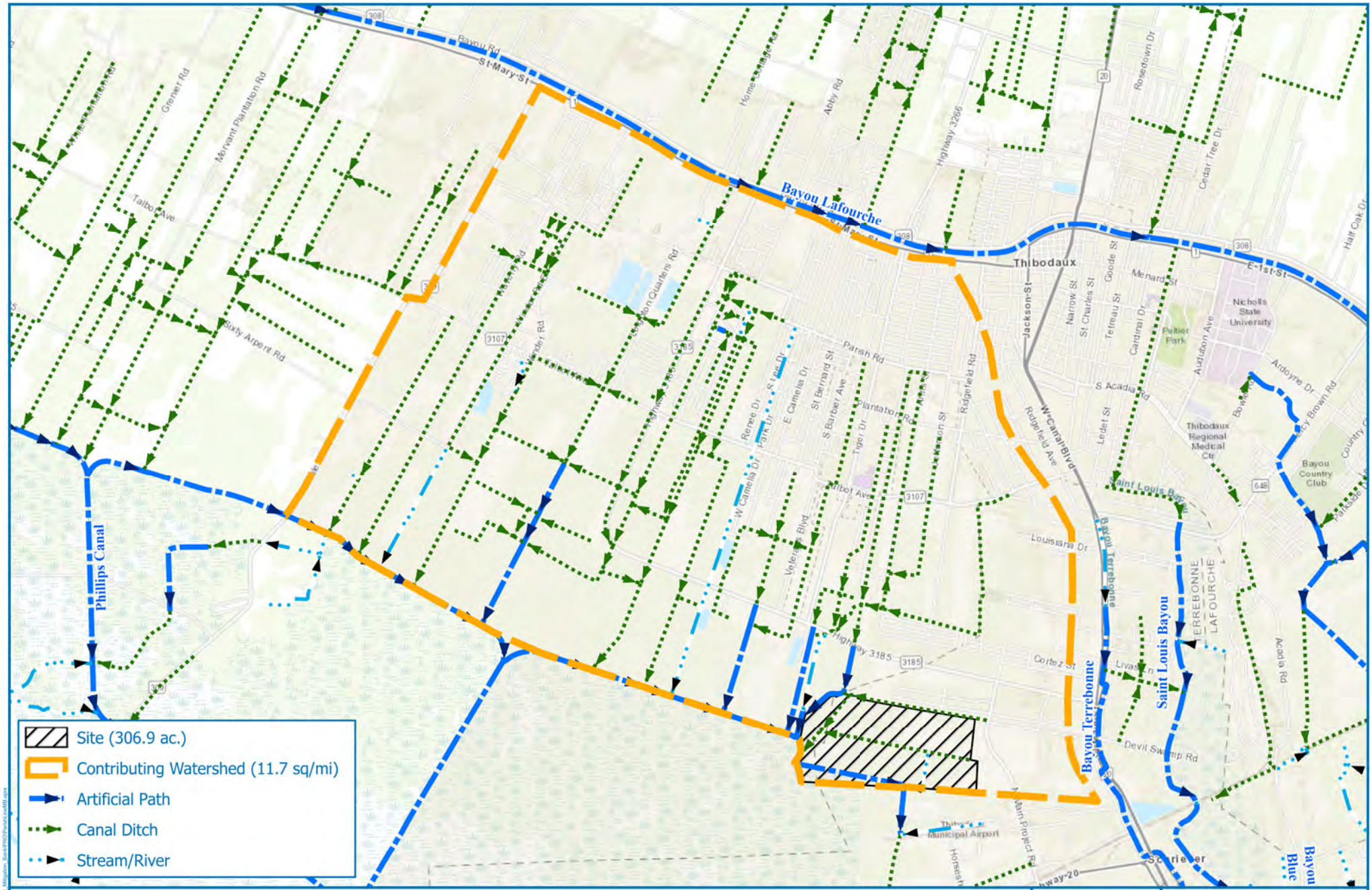


EXHIBIT 9

PARISH LINE MITIGATION BANK
FIFTH LOUISIANA RESOURCE, L.L.C.
CONTRIBUTING WATERSHED

LAFORCHE AND TERREBONNE PARISHES, LOUISIANA

Date: 6/11/2021

Drawn by: blaprarie

Checked by: BM

res

EXHIBIT 10

Elevation Map

Horizontal Datum is NAD83 UTM Zone 15N.
Elevation data from LOSCO LIDAR 2009.
Base Map from ESRI world imagery.

N
W E
S

0 350 700

Feet

EXHIBIT 10

PARISH LINE MITIGATION BANK
FIFTH LOUISIANA RESOURCE, L.L.C.
ELEVATION MAP

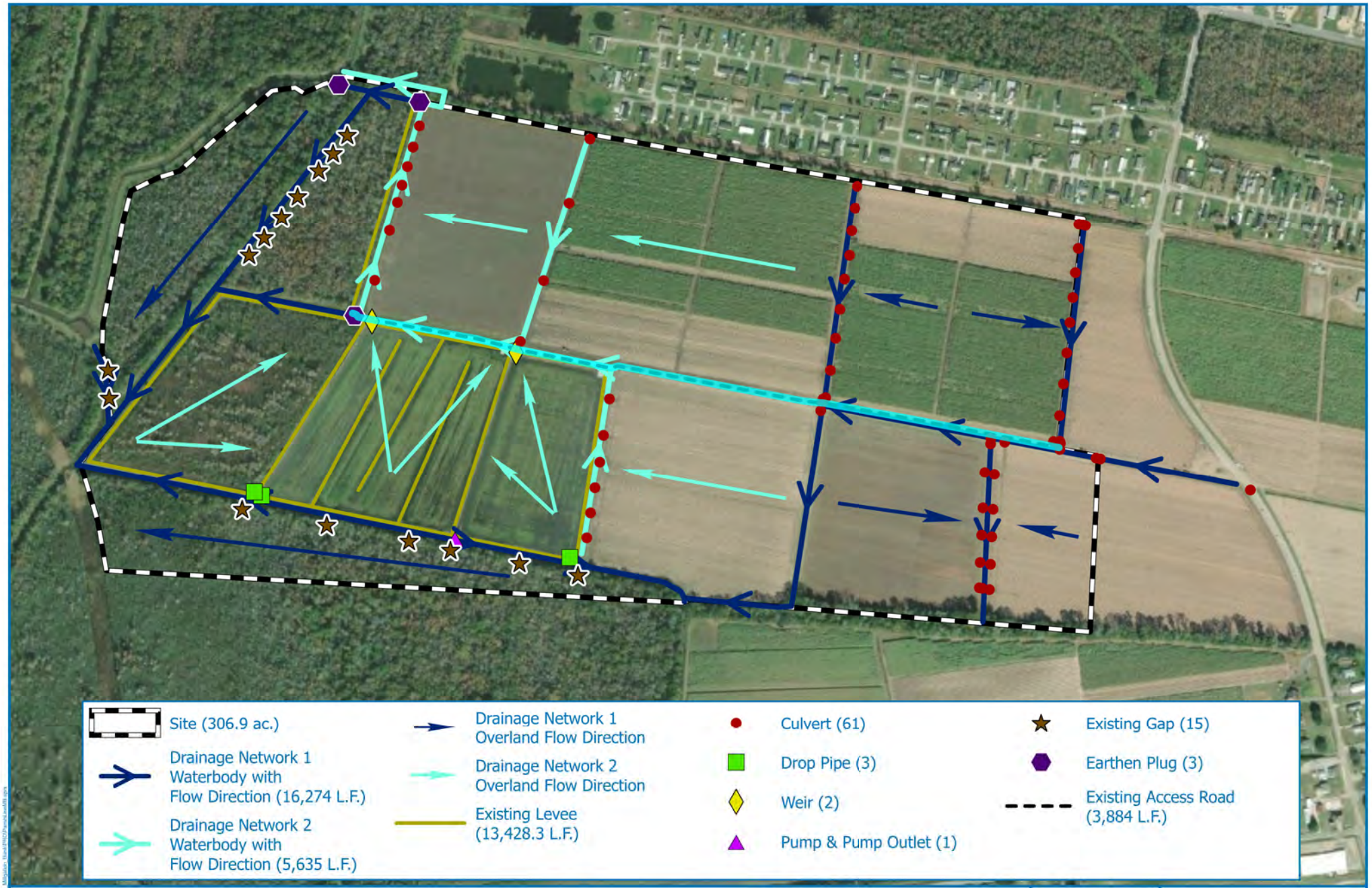
LAFOURCHE AND TERREBONNE PARISHES, LOUISIANA

Date:	6/14/2021
Drawn by:	BL
Checked by:	BM

res

EXHIBITS 11a-11c

Existing Hydrology (Pre-Construction)



Project limits are approximate. The parcel data information/property boundaries depicted on this map is for prospect assessment purposes only. It is not to be used as final boundaries.
Source Data: Maxar

0 500 1,000
Feet

PCS: NAD 1983 UTM Zone 15N

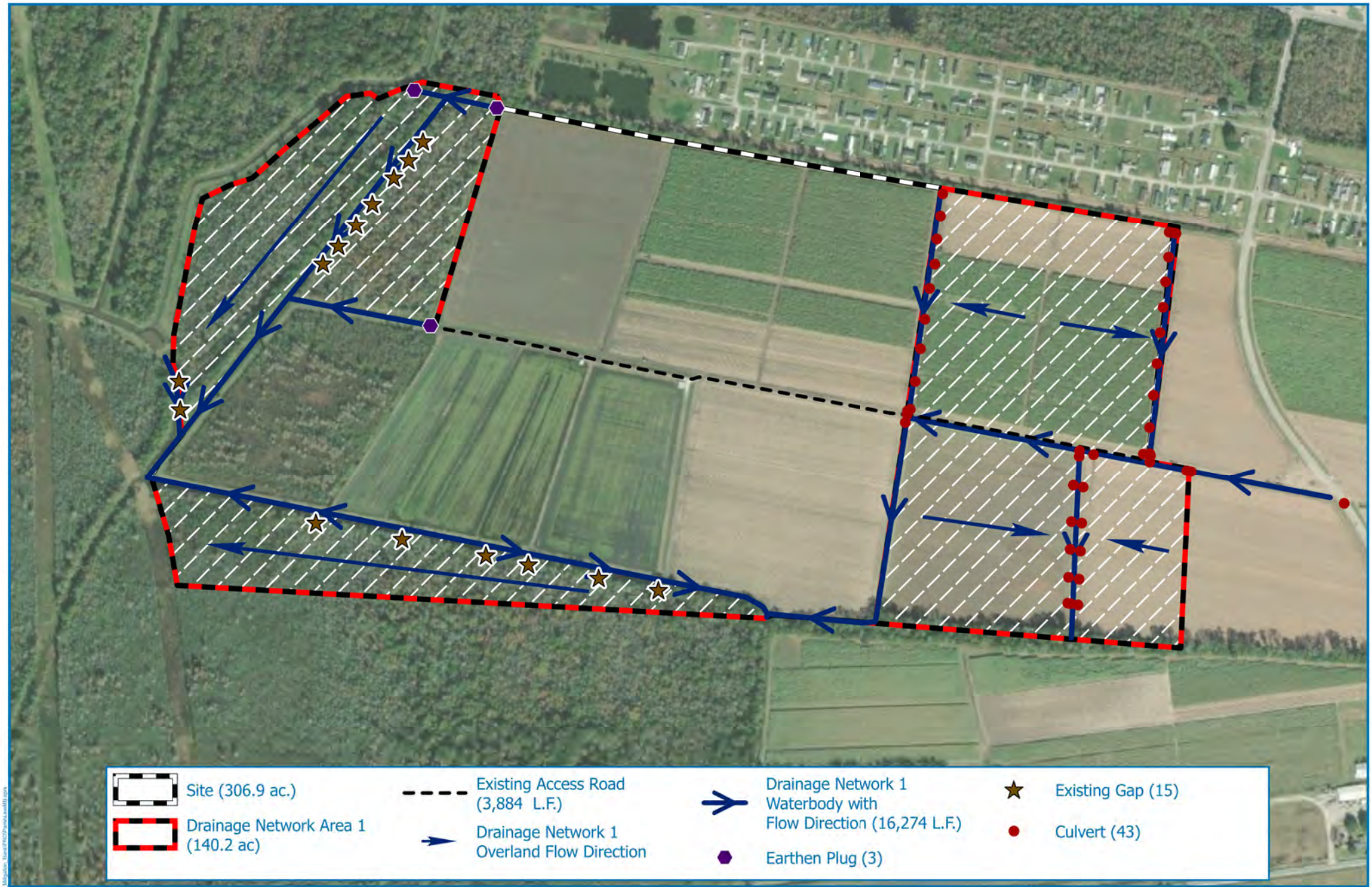
FIGURE 11a

PARISH LINE MITIGATION BANK
FIFTH LOUISIANA RESOURCE, L.L.C.
EXISTING HYDROLOGY (PRE-CONSTRUCTION)

LAFORCHE AND TERREBONNE PARISHES, LOUISIANA

Date: 6/15/2021
Drawn by: blaprarie
Checked by: BM

res



Project limits are approximate. The parcel data information/property boundaries depicted on this map is for prospect assessment purposes only. It is not to be used as final boundaries.
Source Data: Maxar

0 350 700
Feet

PCS: NAD 1983 UTM Zone 15N

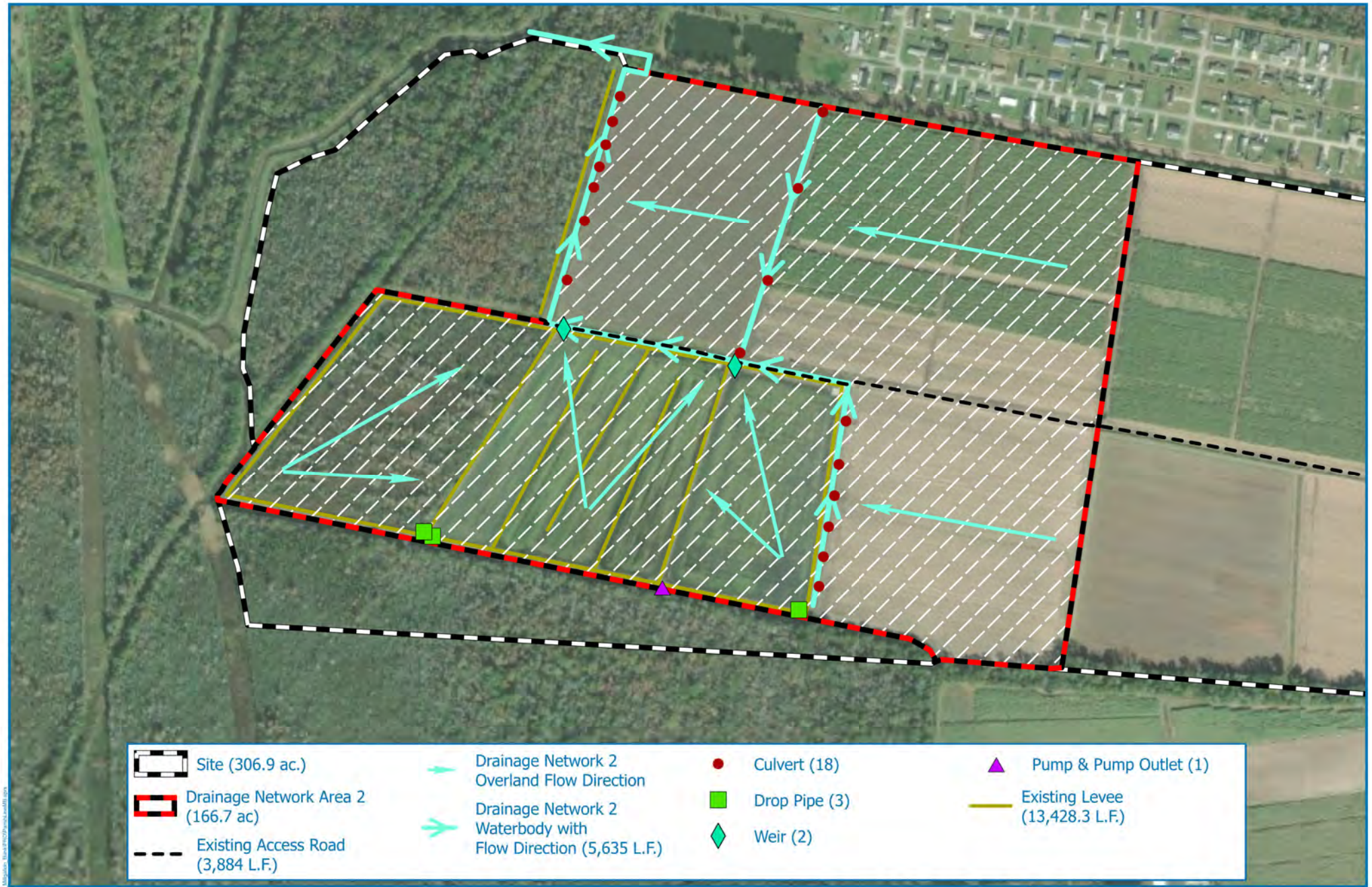
FIGURE 11b

PARISH LINE MITIGATION BANK
FIFTH LOUISIANA RESOURCE, L.L.C.
EXISTING HYDROLOGY (PRE-CONSTRUCTION)
DRAINAGE NETWORK 1

LAFORCHE AND TERREBONNE PARISHES, LOUISIANA

Date: 6/14/2021
Drawn by: blaprarie
Checked by: BM

res



Project limits are approximate. The parcel data information/property boundaries depicted on this map is for prospect assessment purposes only. It is not to be used as final boundaries.
Source Data: Maxar

0 300 600
Feet

PCS: NAD 1983 UTM Zone 15N

FIGURE 11c

PARISH LINE MITIGATION BANK
FIFTH LOUISIANA RESOURCE, L.L.C.
EXISTING HYDROLOGY (PRE-CONSTRUCTION)
DRAINAGE NETWORK 2

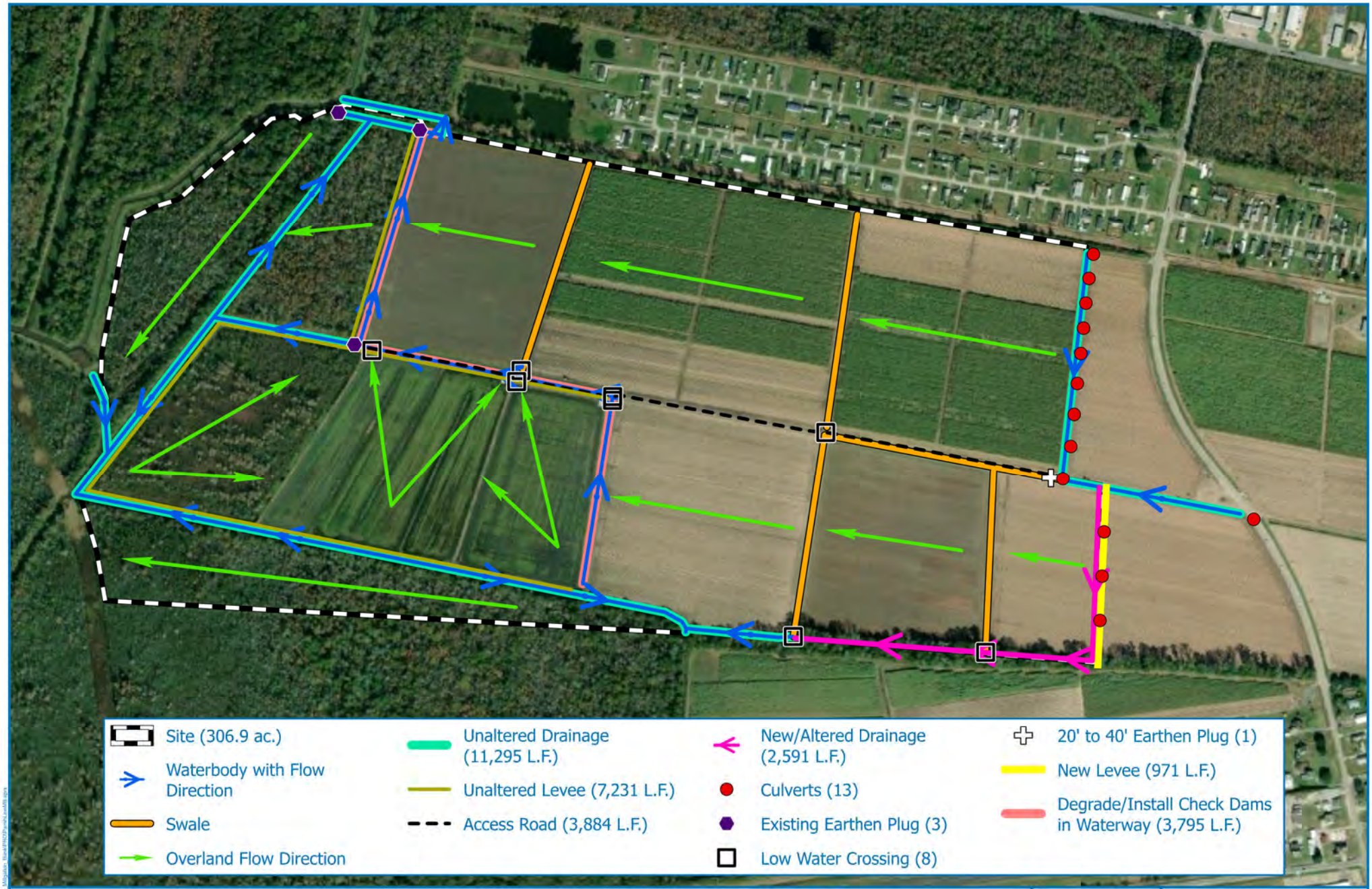
LAFORCHE AND TERREBONNE PARISHES, LOUISIANA

Date: 6/14/2021
Drawn by: blaprarie
Checked by: BM

res

EXHIBIT 12

Anticipated Post-Construction Hydrology



Project limits are approximate. The parcel data information/property boundaries depicted on this map is for prospect assessment purposes only. It is not to be used as final boundaries.
Source Data: Maxar

0 500 1,000
Feet

PCS: NAD 1983 UTM Zone 15N

EXHIBIT 12

PARISH LINE MITIGATION BANK
FIFTH LOUISIANA RESOURCE, L.L.C.
ANTICIPATED POST-CONSTRUCTION HYDROLOGY

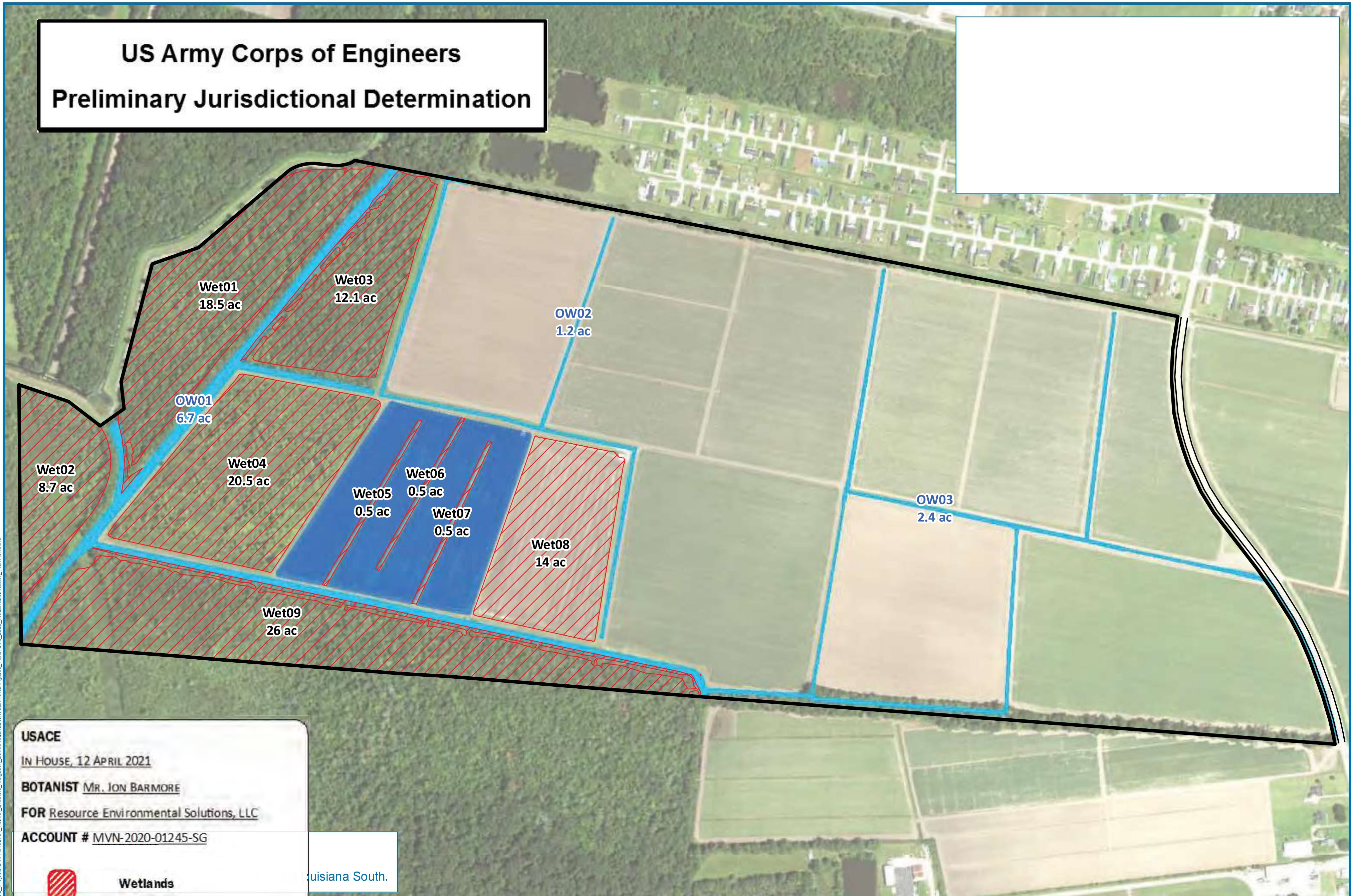
LAFORCHE AND TERREBONNE PARISHES, LOUISIANA

Date: 6/25/2021
Drawn by: blaprarie
Checked by: BM

res

EXHIBIT 13

CEMVN Preliminary Jurisdictional Determination



US Army Corps of Engineers

Preliminary Jurisdictional Determination

USACE

In House, 12 April 2021

BOTANIST Mr. Jon Barmore

FOR Resource Environmental Solutions, LLC

ACCOUNT # MVN-2020-01245-SG

uisiana South.

Wetlands

Non-wetland waters

JD Review Area

FIGURE 3

PARISH LINE SITE
FIFTH LOUISIANA RESOURCE, L.L.C.
VETLAND DELINEATION - 2020 - POTENTIAL JURISDICTIONAL FEATURES

LAFOURCHE & TERREBONNE PARISHES, LOUISIANA

Date: 11/16/2020

Drawn by: TB

Checked by: BM

PRELIMINARY JURISDICTIONAL DETERMINATION (PJD) FORM

BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR PJD: 4/12/2021

B. NAME AND ADDRESS OF PERSON REQUESTING PJD:

Mr Blain McNabb
RES
6575 West Loop South, Suite 300
Bellaire, TX 77401

C. DISTRICT OFFICE, FILE NAME, AND NUMBER: MVN-2020-01245-SG

D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION:

(USE THE TABLE BELOW TO DOCUMENT MULTIPLE AQUATIC RESOURCES AND/OR AQUATIC RESOURCES AT DIFFERENT SITES)

State: Louisiana County/parish/borough: Lafourche/Terrebonne City:

Center coordinates of site (lat/long in degree decimal format):

Lat.: 29.7549 ° Long.: -90.8365 °

Universal Transverse Mercator:

Name of nearest waterbody: Bayou Terrebonne

E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☒ Office (Desk) Determination. Date: 4/12/2021

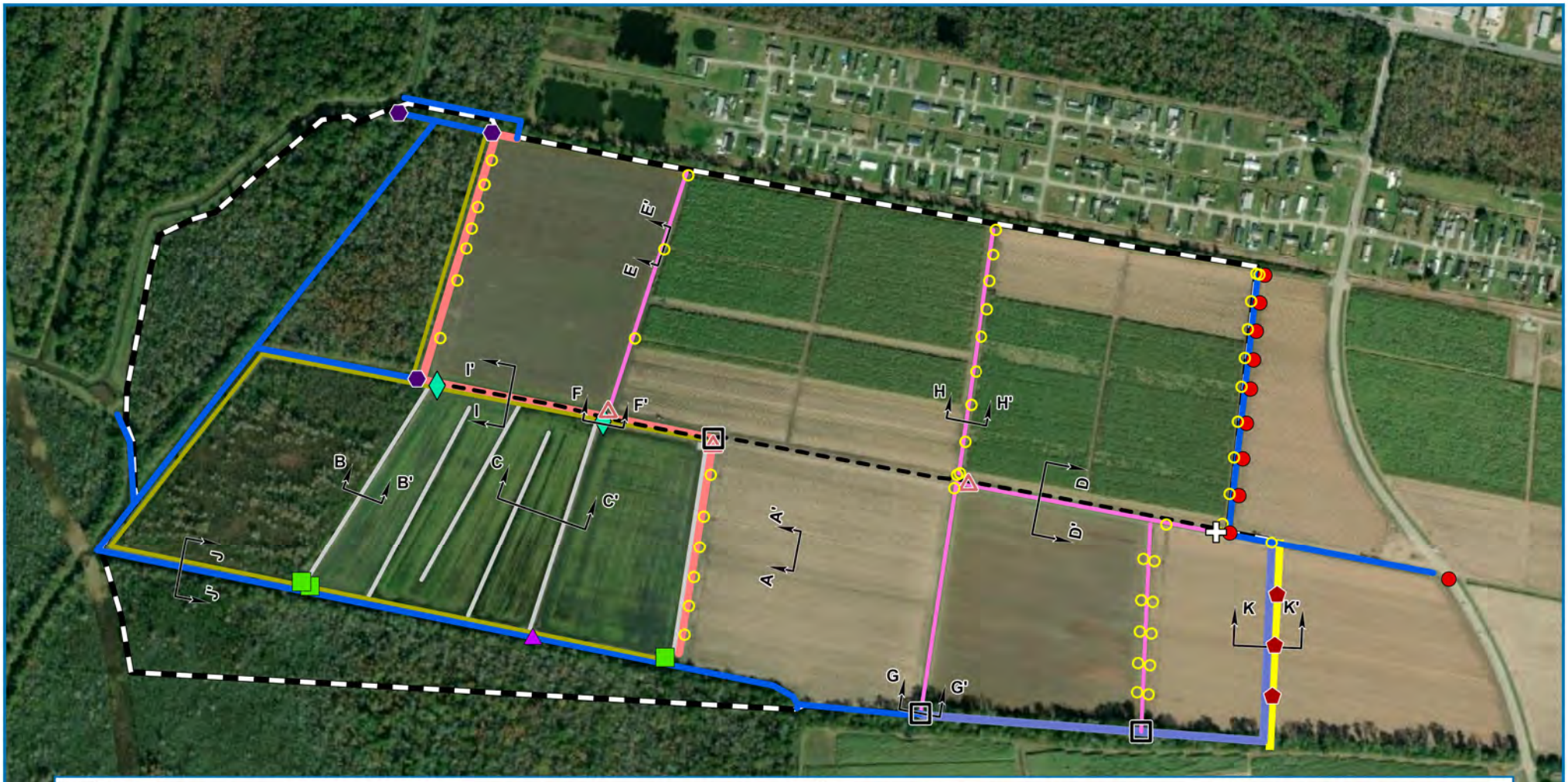
☐ Field Determination. Date(s):

TABLE OF AQUATIC RESOURCES IN REVIEW AREA WHICH "MAY BE" SUBJECT TO REGULATORY JURISDICTION.

Site number	Latitude (decimal degrees)	Longitude (decimal degrees)	Estimated amount of aquatic resource in review area (acreage and linear feet, if applicable)	Type of aquatic resource (i.e., wetland vs. non-wetland waters)	Geographic authority to which the aquatic resource "may be" subject (i.e., Section 404 or Section 10/404)
1	29.7549	-90.8365	±101.3 ac	wetland	Sec 404
1	29.7549	-90.8365	±21.1 ac	non-wetland water	Sec 404
1	29.7549	-90.8365	±22,467 lf	non-wetland water	Sec 404

EXHIBIT 14

Proposed Work Plan



- Site (306.9 ac.)
- Remove Drop Pipe (3)
- Remove Weir/Install Low Water Crossing (2)
- Remove Pump & Pump Outlet (1)
- Culvert to Remain (10)
- Culvert to be Removed/Degraded (50)
- Install Low Water Crossing (3)
- Remove Culvert/Install Low Water Crossing (3)
- Earthen Plug to Remain (3)
- Culverts to be Added (3)
- 20' to 40' Earthen Plug To Be Installed
- Existing Road to Remain (3,884 L.F.)
- Existing Levee to Remain (7,231 L.F.)
- Degrade Levee (6,199 L.F.)
- Drainage to Remain Unaltered (11,295 L.F.)
- Degrade/Install Check Dams in Waterway (3,795 L.F.)
- Plug/Degrade for Swale (5,804 L.F.)
- Drainage Reroute (2,591 L.F.)
- New Levee (971 L.F.)

Project limits are approximate. The parcel data information/property boundaries depicted on this map is for prospect assessment purposes only. It is not to be used as final boundaries.
Source Data: Maxar

0 500 1,000
Feet

PCS: NAD 1983 UTM Zone 15N

EXHIBIT 14

PARISH LINE MITIGATION BANK
FIFTH LOUISIANA RESOURCE, L.L.C.
PROPOSED WORK PLAN

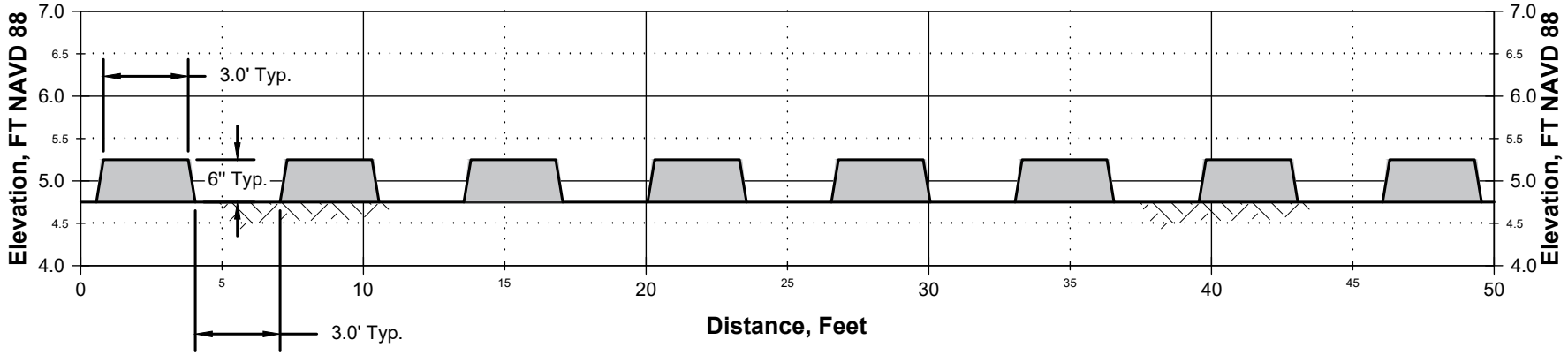
LAFORCHE AND TERREBONNE PARISHES, LOUISIANA

Date: 6/25/2021
Drawn by: blaprarie
Checked by: BM
Project No.: 102781

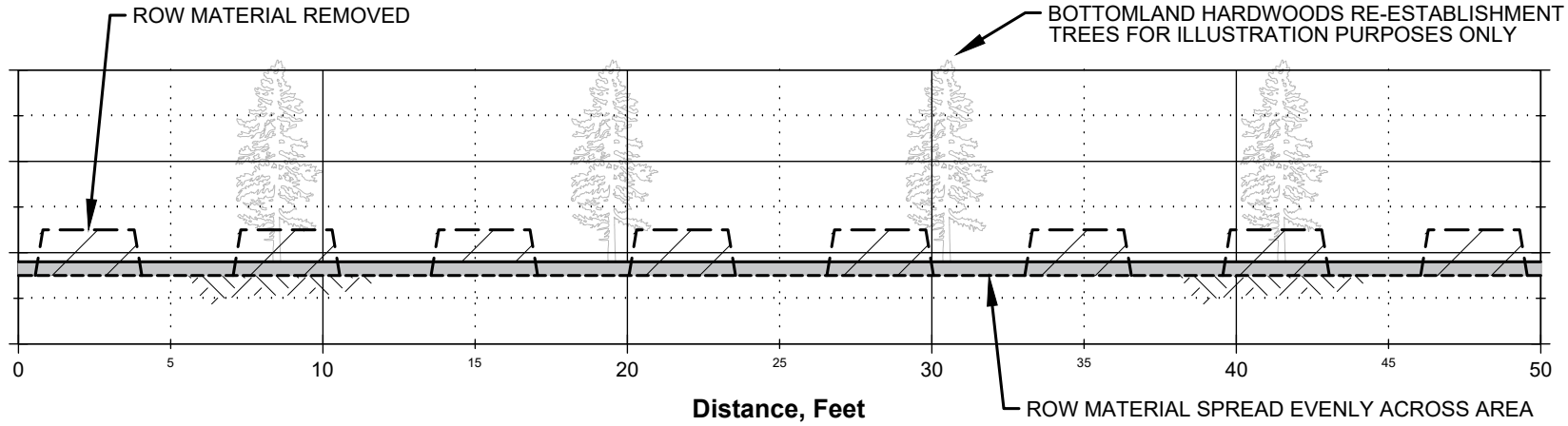
res

EXHIBITS 15a-15l

Construction Work Plan Cross-Sections



PRE-CONSTRUCTION EXISTING PLANTED ROW CROSS-SECTION A-A'



POST-CONSTRUCTION TYPICAL PLANTED ROWS REMOVED CROSS-SECTION A-A'

R:\Regional\gis\Projects\10278I_Parish_Line_Mitigation_Bank\CAD\REVISED_05132021\Exhibit15a_ParishLine_TypicalROW_CrossSection.dwg

0' 3' 6'

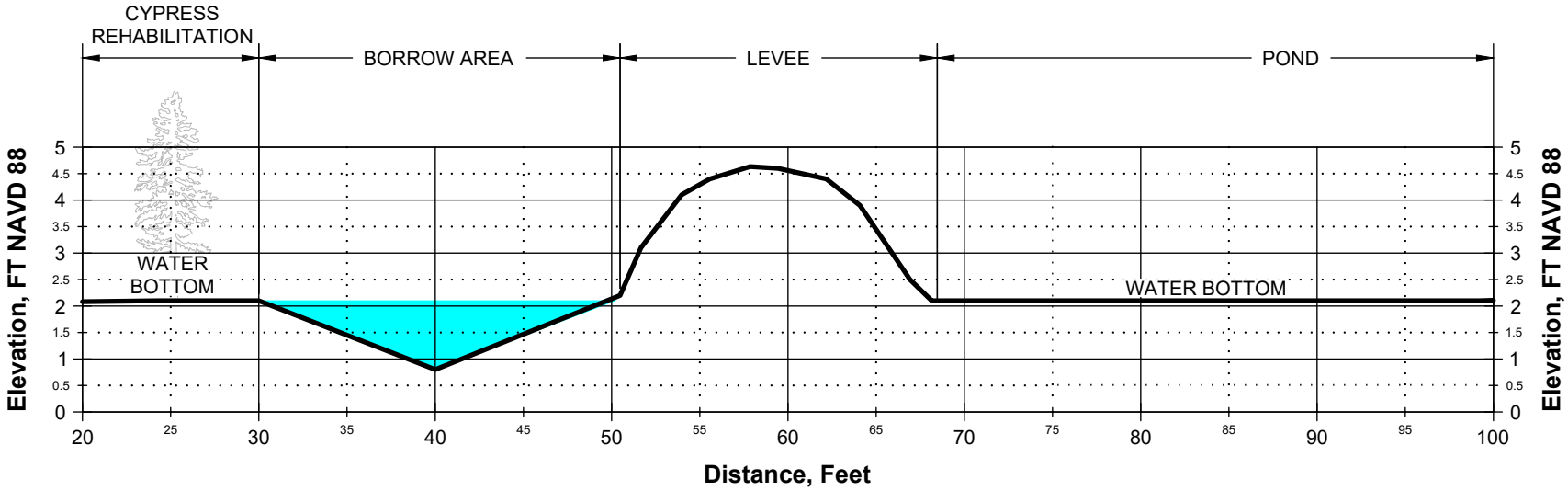
Horizontal Scale
Vertical Scale Is As Shown

EXHIBIT 15a

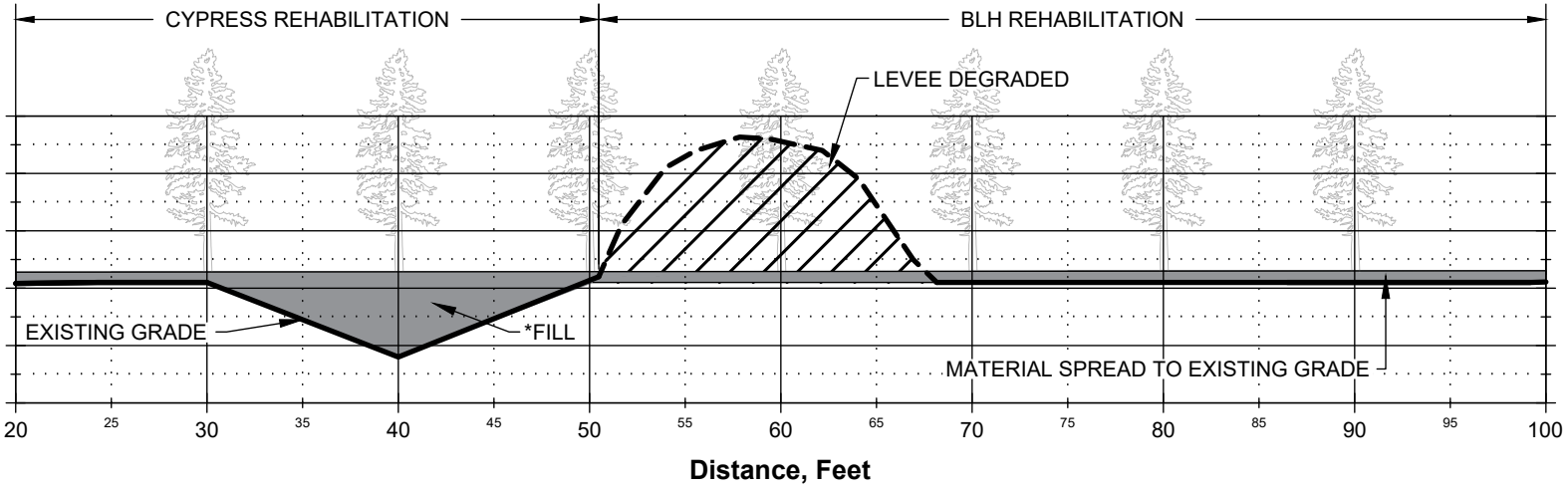
PARISH LINE MITIGATION BANK
FIFTH LOUISIANA RESOURCE, L.L.C.
TYPICAL ROW DEGRADING AND RECONTOURING CROSS-SECTION

LAFOURCHE AND TERREBONNE PARISHES, LOUISIANA

Date:	11/04/2020
Drawn by:	BL
Checked by:	BM



PRE-CONSTRUCTION EXISTING LEVEE CROSS-SECTION B-B'



POST-CONSTRUCTION TYPICAL LEVEE DEGRADED CROSS-SECTION B-B'

*Levee material to be used to fill borrow area to the extent the material will allow.

0' 4' 8'

Horizontal Scale
Vertical Scale Is As Shown

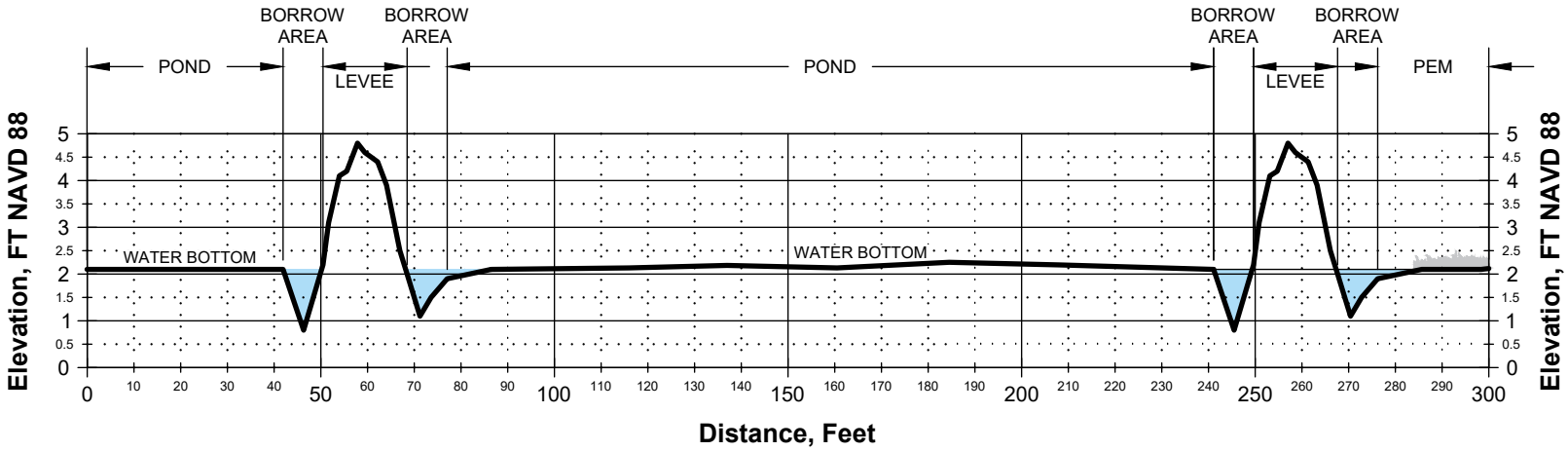
EXHIBIT 15b

PARISH LINE MITIGATION BANK
FIFTH LOUISIANA RESOURCE, L.L.C.
TYPICAL LEVEE DEGRADED CROSS-SECTION

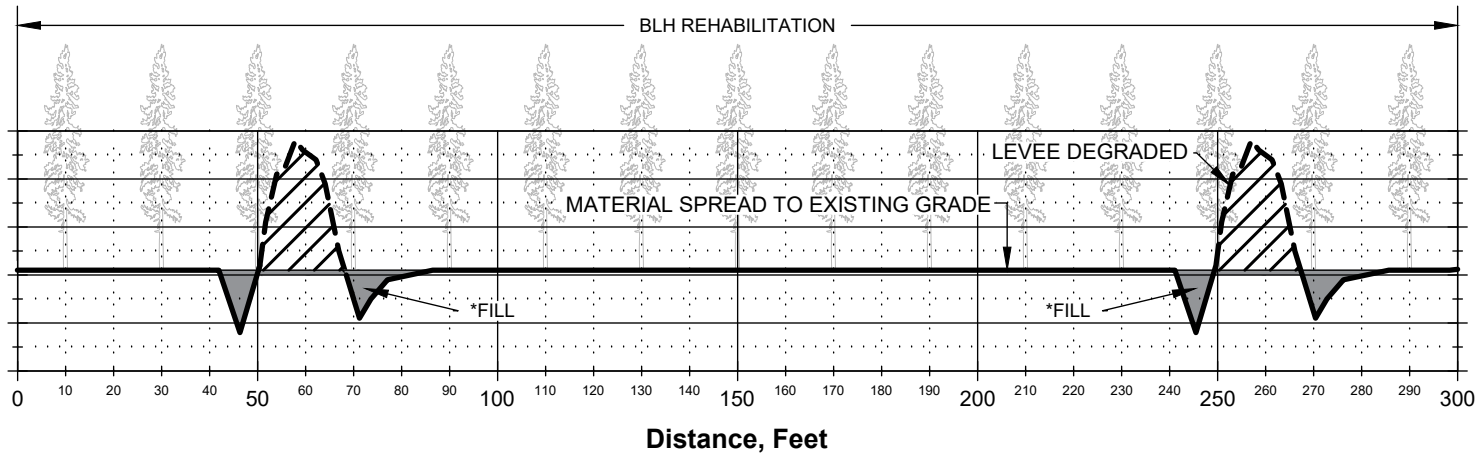
LAFOURCHE AND TERREBONNE PARISHES, LOUISIANA

Date:	11/04/2020
Drawn by:	BL
Checked by:	BM

R:\Regional\gis\Projects\102781_Parish_Line_Mitigation_Bank\CAD\REVISED_05132021\Exhibit15b_ParishLine_Levee_XSection.dwg



PRE-CONSTRUCTION TYPICAL EXISTING LEVEE IN AQUACULTURE PONDS CROSS-SECTION C-C'



POST-CONSTRUCTION TYPICAL LEVEE IN AQUACULTURE PONDS DEGRADED CROSS-SECTION C-C'

*Levee material to be used to fill borrow area and excess to be spread to adjacent grade.

0' 20' 40'

Horizontal Scale
Vertical Scale Is As Shown

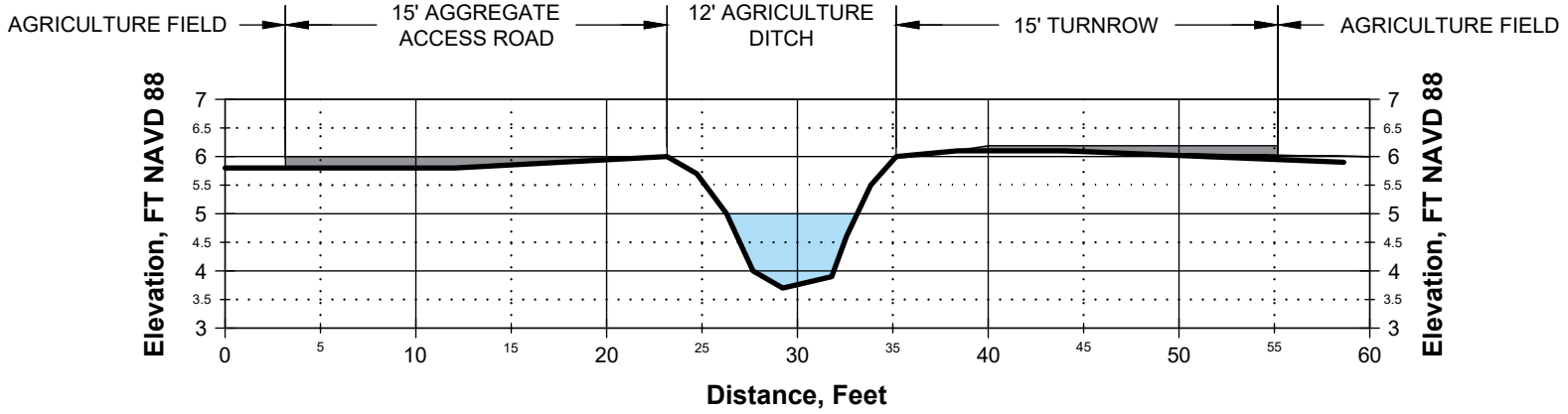
EXHIBIT 15c

PARISH LINE MITIGATION BANK
FIFTH LOUISIANA RESOURCE, L.L.C.
TYPICAL LEVEE DEGRADING & RECONTOURING CROSS-SECTION

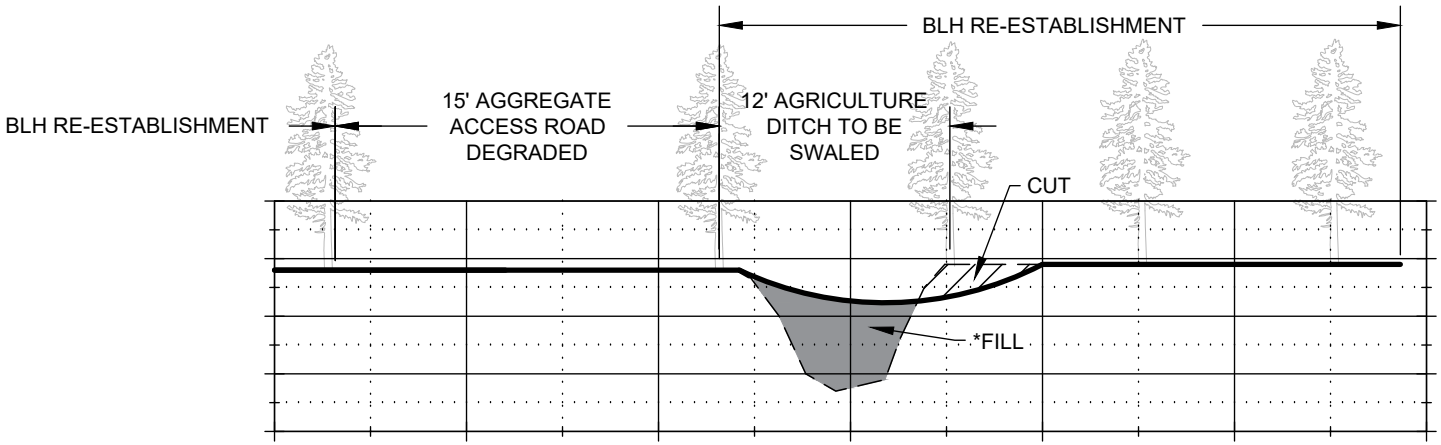
LAFOURCHE AND TERREBONNE PARISHES, LOUISIANA

Date: 11/04/2020
Drawn by: BL
Checked by: BM

R:\Regional\gis\Projects\102781_Parish_Line_Mitigation_Bank\CAD\REVISED_05132021\Exhibit15c_ParishLine_TypicalLeveeDegrading&Recontouring_XSection.dwg



PRE-CONSTRUCTION EXISTING ROAD AND AGRICULTURE DITCH CROSS-SECTION D-D'



POST-CONSTRUCTION TYPICAL EXISTING ROAD TO REMAIN AND AGRICULTURE DITCH TO BE SWALED CROSS-SECTION D-D'

*Ditch to be filled to the extent that adjacent cut material will allow.

0' 10'
Horizontal Scale
Vertical Scale Is As Shown

EXHIBIT 15d

PARISH LINE MITIGATION BANK
FIFTH LOUISIANA RESOURCE, L.L.C.
TYPICAL EXISTING ROAD AND AGRICULTURE DITCH TO BE SWALED CROSS-SECTION

LAFOURCHE AND TERREBONNE PARISHES, LOUISIANA

Date:	11/04/2020
Drawn by:	BL
Checked by:	BM

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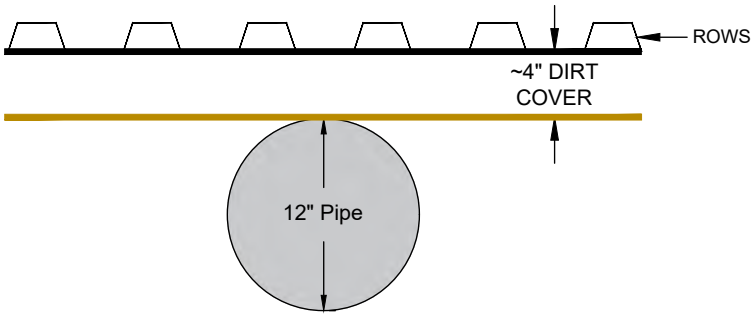
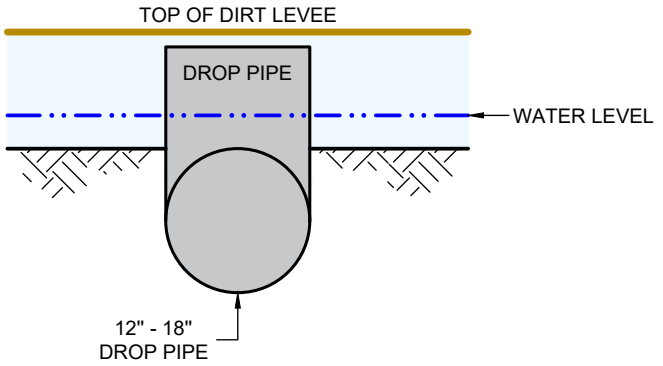
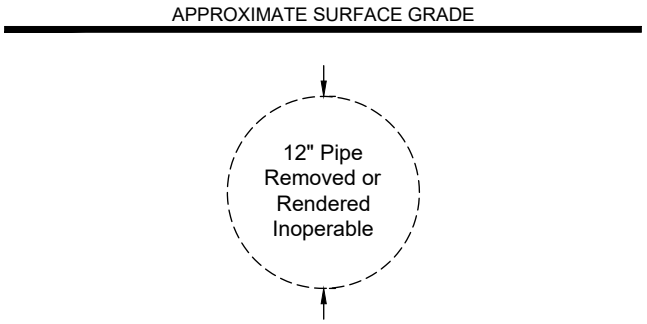
PRE-CONSTRUCTION TYPICAL EXISTING AG FIELD CULVERT CROSS-SECTION E-E'



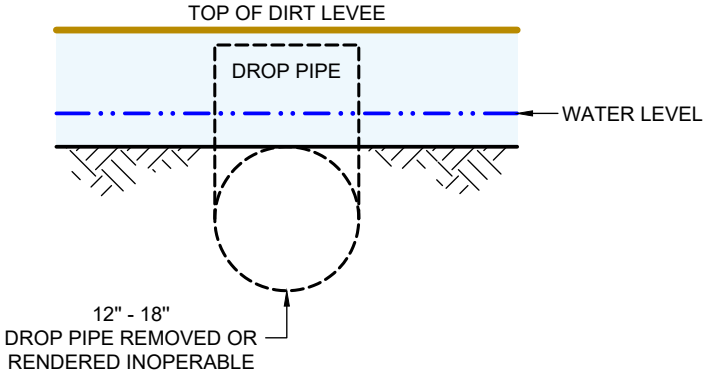
PRE-CONSTRUCTION TYPICAL EXISTING DROP PIPE CROSS-SECTION E-E'



POST-CONSTRUCTION TYPICAL EXISTING AG FIELD CULVERT CROSS-SECTION E-E'



POST-CONSTRUCTION TYPICAL EXISTING DROP PIPE CROSS-SECTION E-E'



0' 4' 8'

Horizontal Scale
Vertical Scale Is As Shown

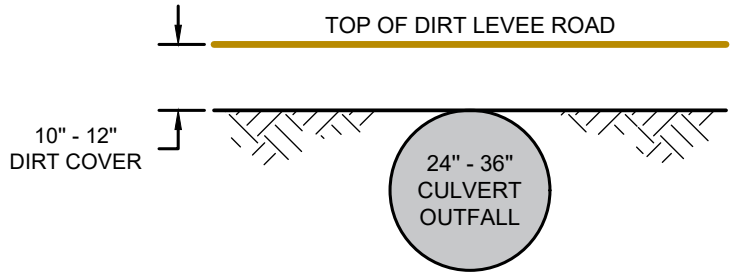
EXHIBIT 15e

PARISH LINE MITIGATION BANK
FIFTH LOUISIANA RESOURCE, L.L.C.
CULVERT/DROP PIPE REMOVED OR DECOMMISSIONED CROSS-SECTION

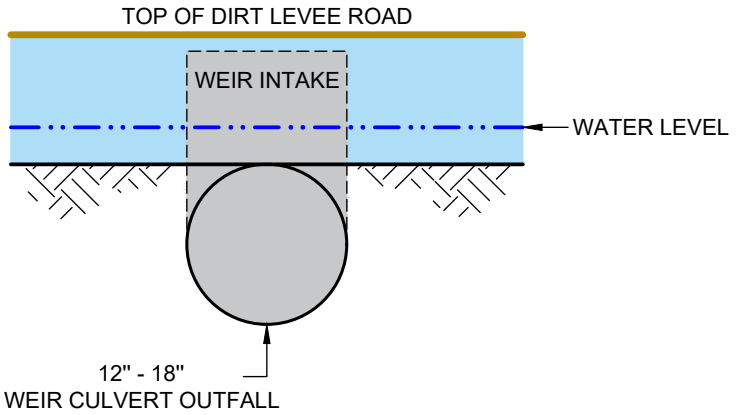
LAFOURCHE AND TERREBONNE PARISHES, LOUISIANA

Date:	11/04/2020
Drawn by:	BL
Checked by:	BM

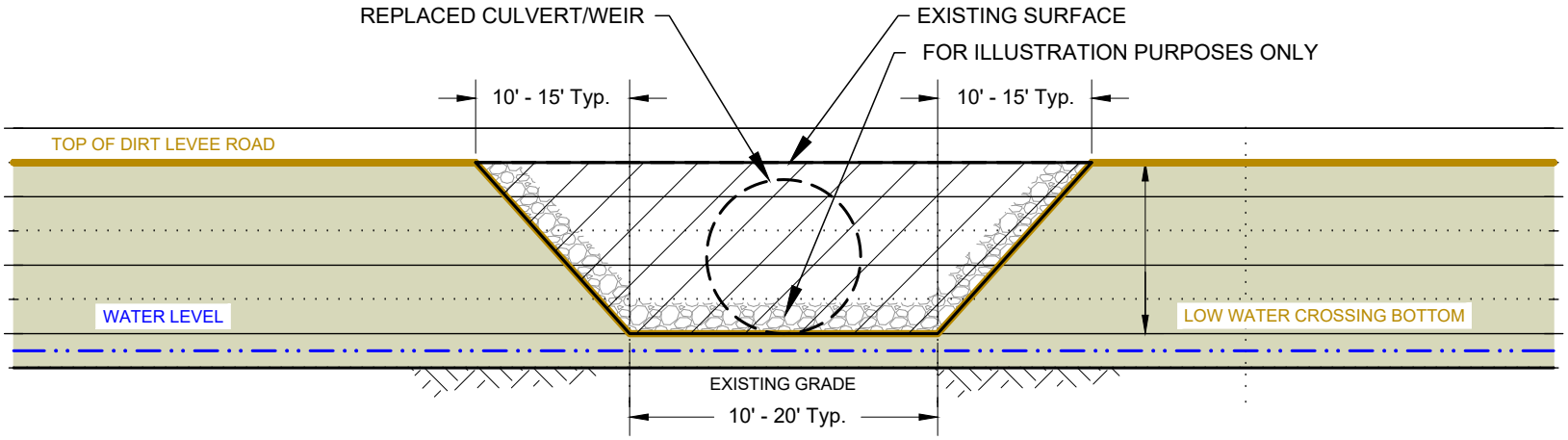
Exhibit15e_ParishLine_Culvert_DropPipeRemoved_XSection.dwg



PRE-CONSTRUCTION TYPICAL CULVERT TO LOW WATER CROSSING PROFILE F-F'



PRE-CONSTRUCTION TYPICAL DROP PIPE/WEIR TO LOW WATER CROSSING PROFILE F-F'



POST-CONSTRUCTION TYPICAL LOW WATER CROSSING PROFILE F-F'

EXHIBIT 15f

PARISH LINE MITIGATION BANK
FIFTH LOUISIANA RESOURCE, L.L.C.
TYPICAL CULVERT/WEIR REPLACEMENT WITH LOW WATER CROSSING PROFILE

LAFOURCHE AND TERREBONNE PARISHES, LOUISIANA

Date:	11/04/2020
Drawn by:	BL
Checked by:	BM

res

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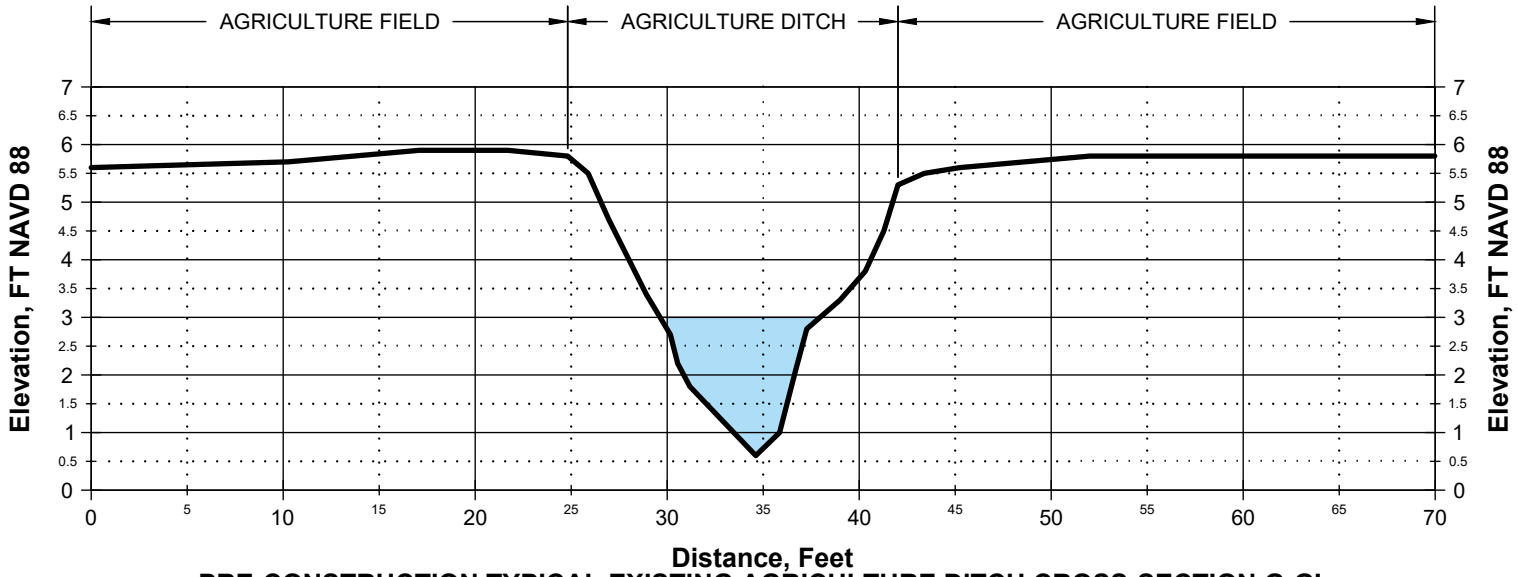
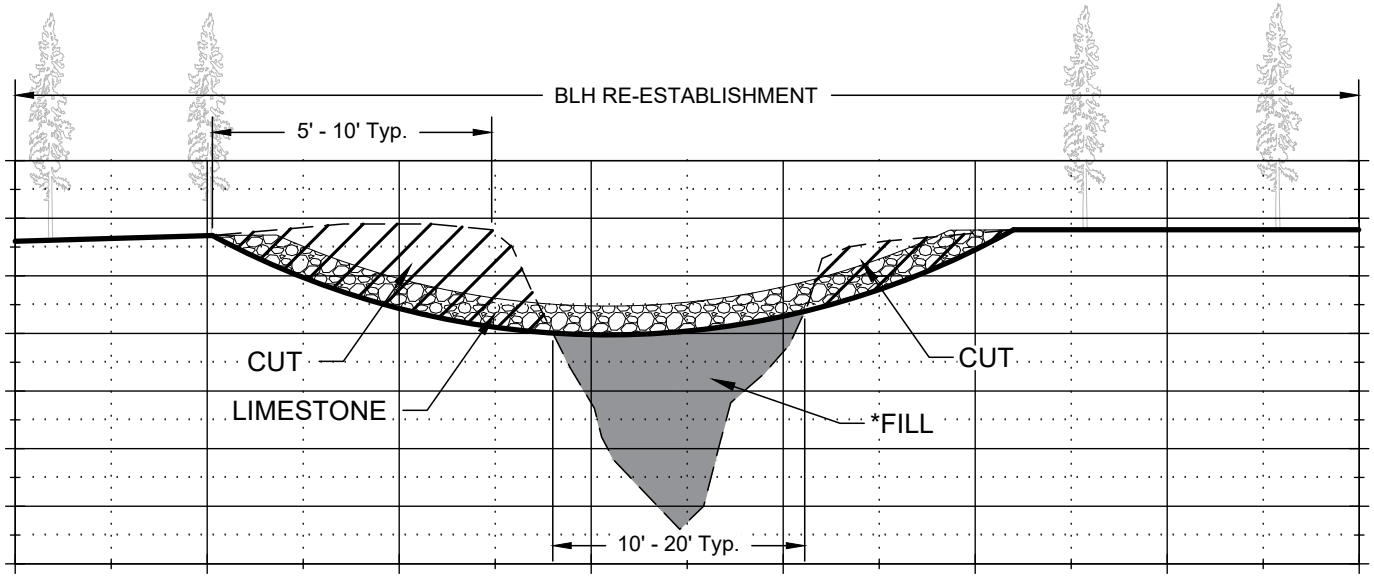


PRE-CONSTRUCTION TYPICAL EXISTING AGRICULTURE DITCH CROSS-SECTION G-G'



*Ditch to be filled to the extent that adjacent cut material will allow.

POST-CONSTRUCTION TYPICAL LOW WATER CROSSING INSTALLATION IN DITCH TO BE SWALED CROSS-SECTION G-G'

0' 5'
Horizontal Scale
Vertical Scale Is As Shown

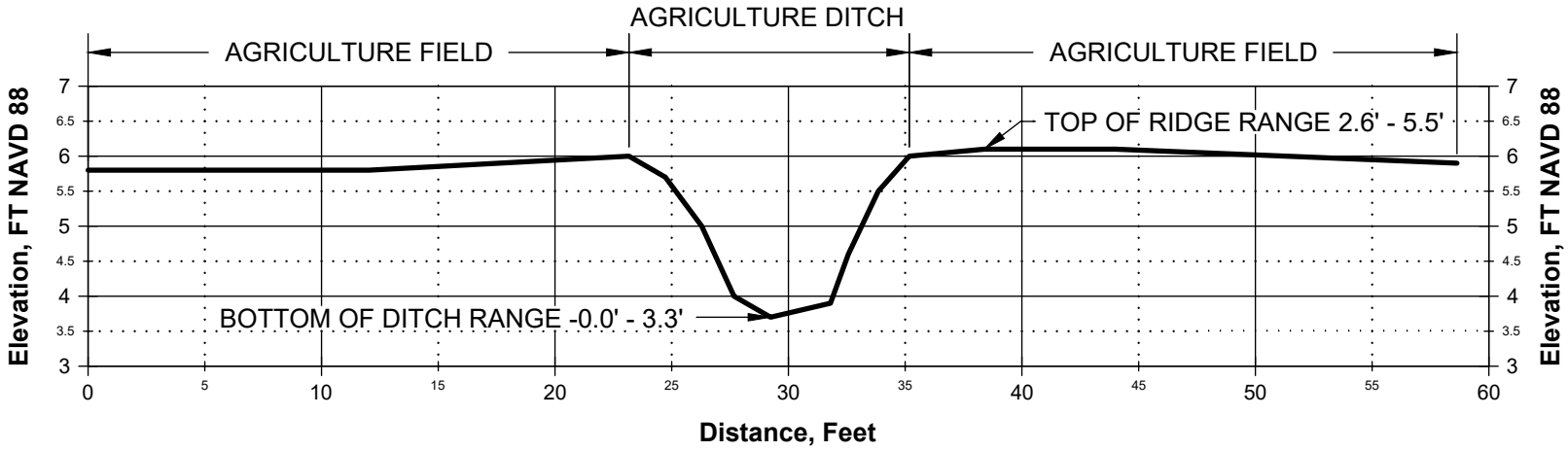
EXHIBIT 15g

PARISH LINE MITIGATION BANK
FIFTH LOUISIANA RESOURCE, L.L.C.
TYPICAL LOW WATER CROSSING IN AGRICULTURE DITCH TO BE SWALED CROSS-SECTION

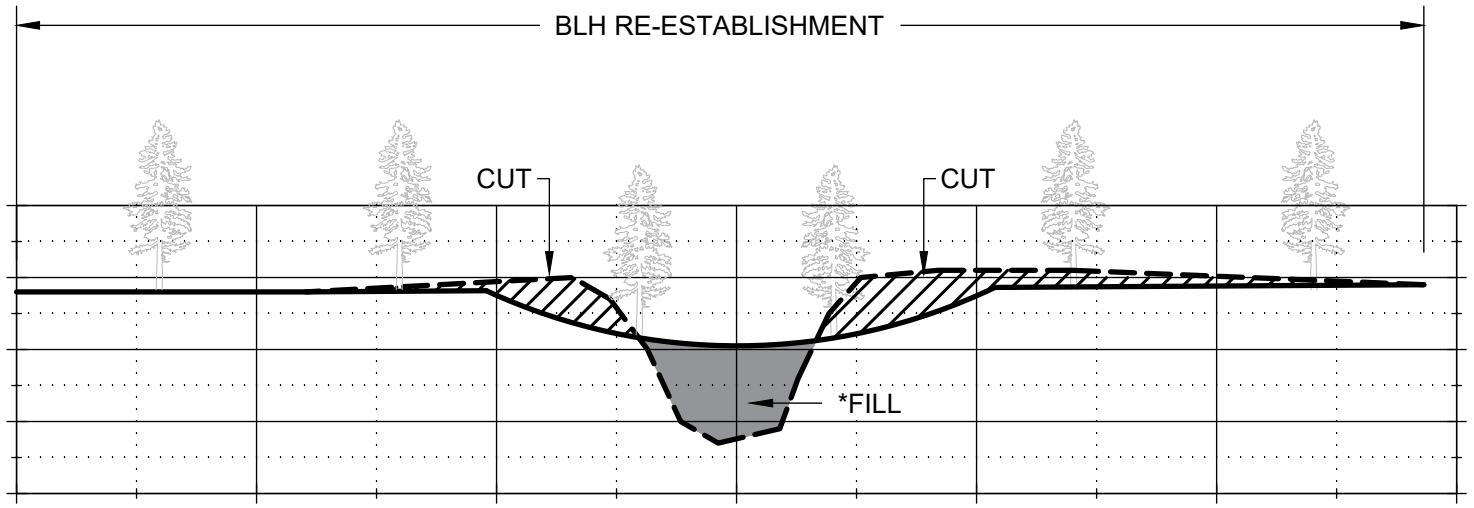
LAFORCHE PARISH AND TERREBONNE PARISH, LOUISIANA

Date:	11/04/2020
Drawn by:	BL
Checked by:	BM

R:\Regional\gis\Projects\102781_Parish_Line_Mitigation_Bank\CAD\REVISED_05132021\Exhibit15g_TypicalLowWaterInSwaledDitch_Profile.dwg



PRE-CONSTRUCTION TYPICAL AGRICULTURE DITCH CROSS-SECTION H-H'



POST-CONSTRUCTION TYPICAL AGRICULTURE DITCH TO BE SWALED CROSS-SECTION H-H'

*Ditch to be filled to the extent that adjacent cut material will allow.

0' 4' 8'

Horizontal Scale
Vertical Scale Is As Shown

EXHIBIT 15h

PARISH LINE MITIGATION BANK
FIFTH LOUISIANA RESOURCE, L.L.C.
TYPICAL AGRICULTURE DITCH TO BE SWALED CROSS-SECTION

LAFOURCHE AND TERREBONNE PARISHES, LOUISIANA

Date:	11/04/2020
Drawn by:	BL
Checked by:	BM

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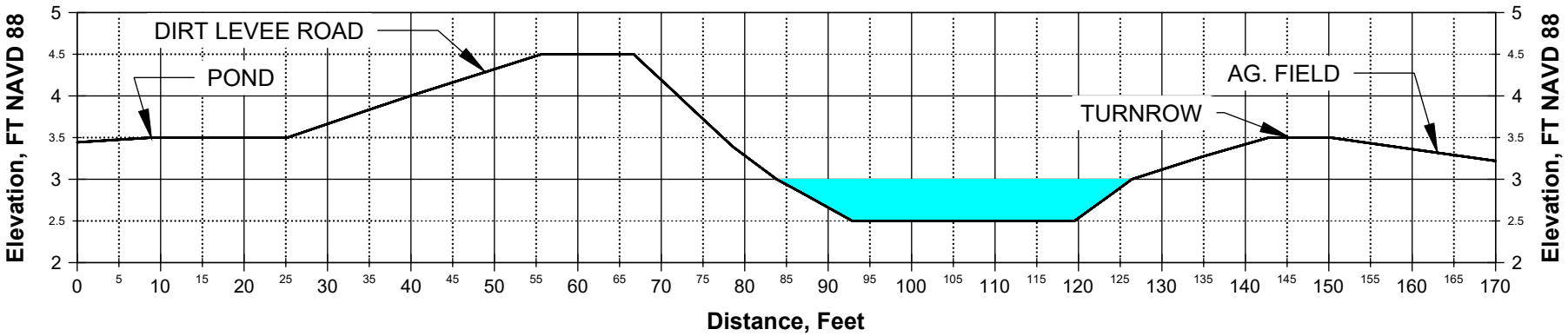
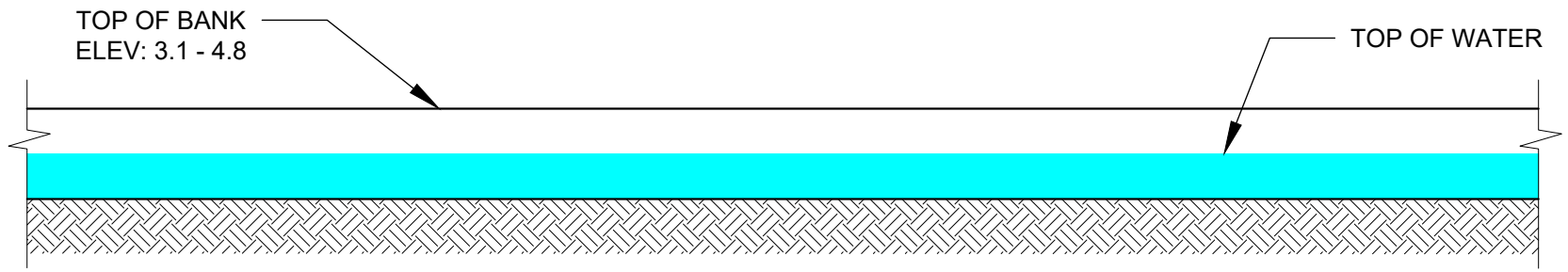


PRE-CONSTRUCTION EXISTING CENTRAL DITCH CROSS SECTION I-I'



LATERAL VIEW

PLAN VIEW

0' 10' 20' 30'

Horizontal Scale
Vertical Scale Is As Shown

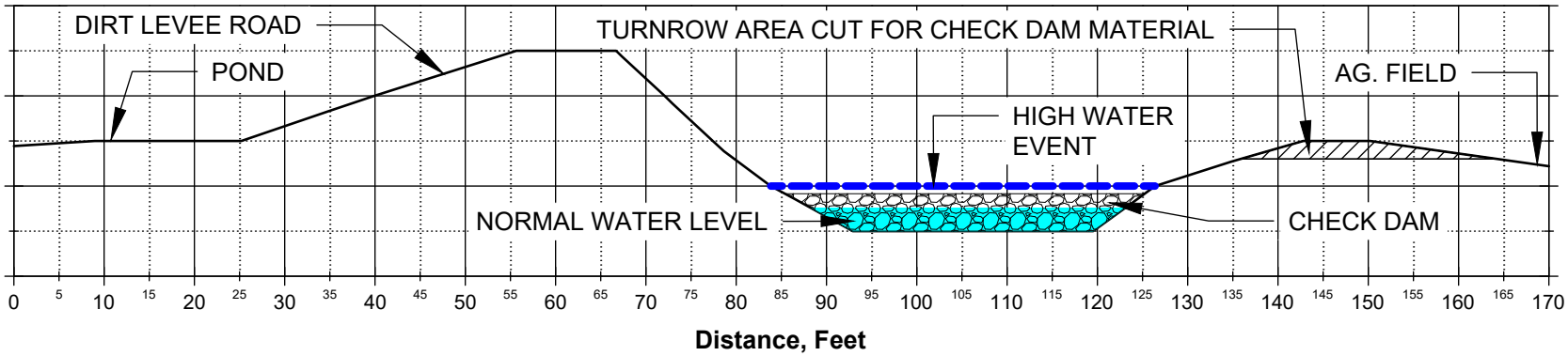
EXHIBIT 15i

PARISH LINE MITIGATION BANK
FIFTH LOUISIANA RESOURCE, L.L.C.
PRE-CONSTRUCTION DETAILS

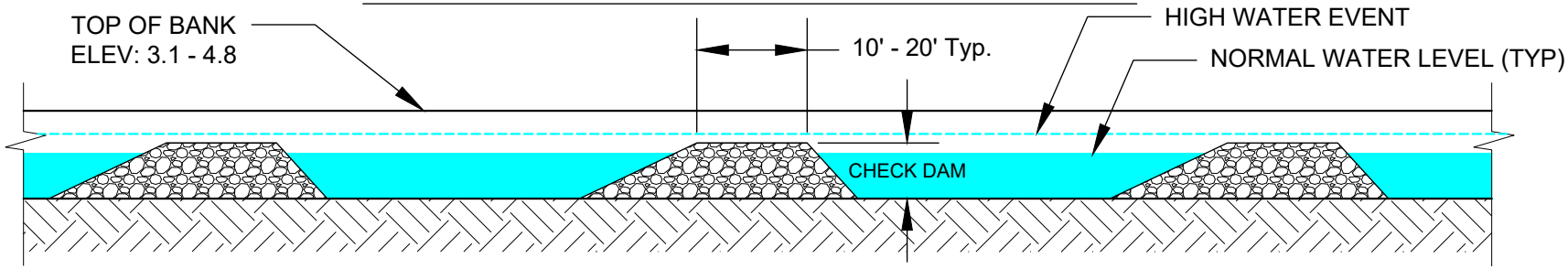
LAFORCHE PARISH AND TERREBONNE PARISH, LOUISIANA

Date: 11/04/2020
Drawn by: EJT
Checked by: BM

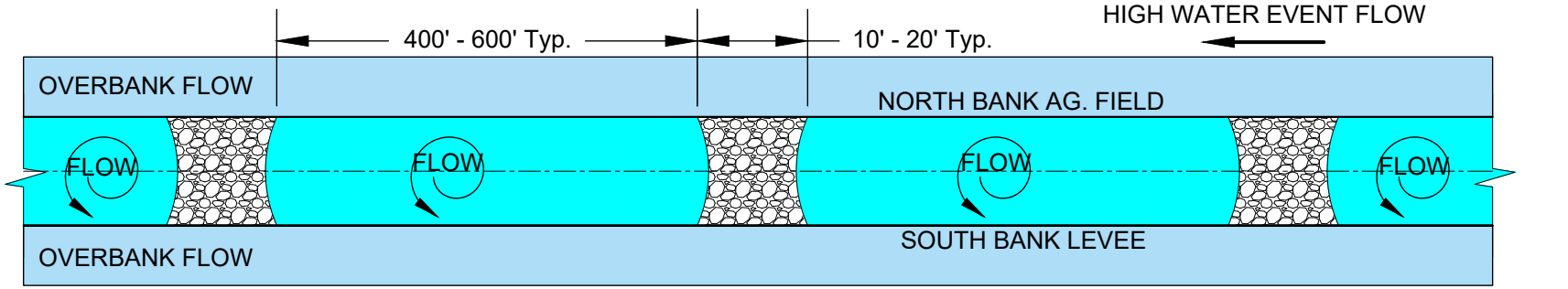
res



POST-CONSTRUCTION CROSS SECTION I-I'



LATERAL VIEW



PLAN VIEW

0' 10' 20' 30'

Horizontal Scale
Vertical Scale Is As Shown

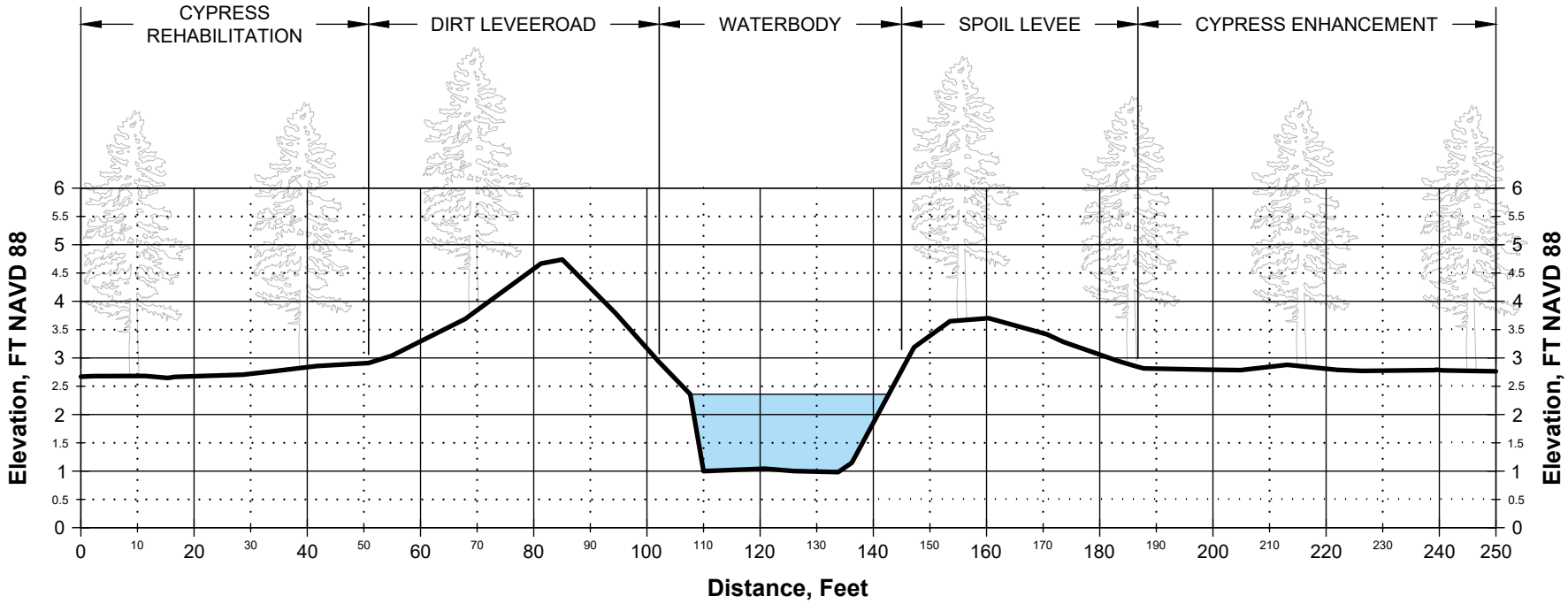
EXHIBIT 15j

PARISH LINE MITIGATION BANK
FIFTH LOUISIANA RESOURCE, L.L.C.
POST-CONSTRUCTION DETAILS

LAFORCHE PARISH AND TERREBONNE PARISH, LOUISIANA

Date:	11/04/2020
Drawn by:	EJT
Checked by:	BM

res



EXISTING WATERBODY CROSS-SECTION J-J'

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0' 15' 30'

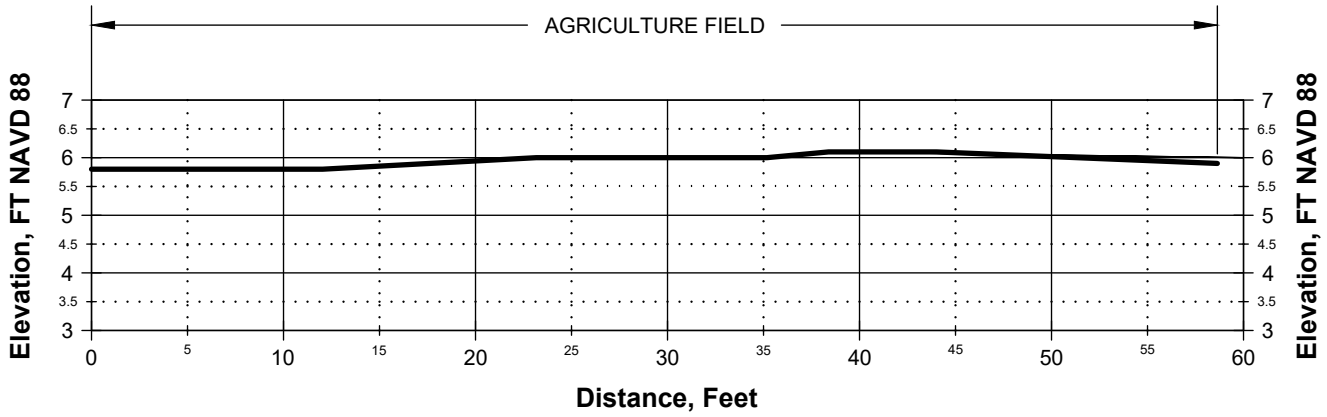
Horizontal Scale
Vertical Scale Is As Shown

EXHIBIT 15k

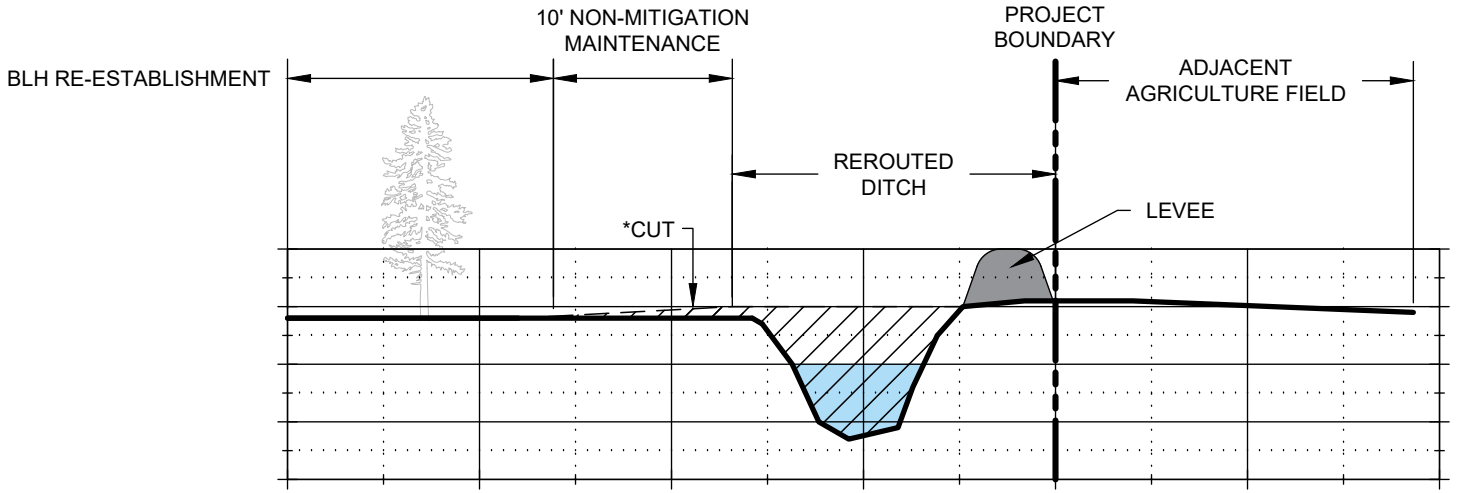
PARISH LINE MITIGATION BANK
FIFTH LOUISIANA RESOURCE, L.L.C.
TYPICAL WATERBODY CROSS-SECTION

LAFOURCHE AND TERREBONNE PARISHES, LOUISIANA

Date:	11/04/2020
Drawn by:	BL
Checked by:	BM



PRE-CONSTRUCTION EXISTING AGRICULTURE FIELD CROSS-SECTION K-K'



POST-CONSTRUCTION TYPICAL REROUTED DITCH CROSS-SECTION K-K'

*Material to be used to build boundary levee,
with excess material to be used as needed throughout site.

0' 4' 8'

Horizontal Scale
Vertical Scale Is As Shown

EXHIBIT 15I

PARISH LINE MITIGATION BANK
FIFTH LOUISIANA RESOURCE, L.L.C.
REROUTED DITCH CROSS-SECTION

LAFOURCHE AND TERREBONNE PARISHES, LOUISIANA

Date:	11/04/2020
Drawn by:	BL
Checked by:	BM

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