

# JOINT PUBLIC NOTICE

April 29, 2019

United States Army  
Corps of Engineers  
New Orleans District  
Regulatory Branch  
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MVN-2017-00352-MG

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Department of Environmental Quality  
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Attn: Water Quality Certifications

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WQC Application Number  
WQC # 190429-01

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

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

## **ELM HALL MITIGATION BANK IN ASSUMPTION PARISH**

**NAME OF APPLICANT:** CSRS, Inc., obo Environmental Partners Group, L.L.C.; Attn: Curt Schaeffer; 6767 Perkins Road, Suite 200, Baton Rouge, Louisiana 70808.

**LOCATION OF WORK:** The 305.0 acre site is located approximately 1.5 miles to the west of the intersection of Louisiana Highway 1006 and Elm Hall Drive near the town of Napoleonville, Louisiana, as shown on attached drawings.

Center of Location: Latitude: 29.930374 ° N, Longitude: 91.078739° W.  
Hydrologic Unit Code: 08090302 – West Central Louisiana Coastal.

**CHARACTER OF WORK:** Environmental Partners Group, L.L.C., is proposing the re-establishment, rehabilitation, and enhancement of 305.0 acres of agricultural farm land for the development of Elm Hall Mitigation Bank. Site restoration activities will consist of removal of agricultural levees, land contouring, removal of culverts, backfilling of drainage features, and planting of desirable vegetation. Of the 305.0 acres proposed for Elm Hall Mitigation Bank, 33.4 acres are bottomland hardwood enhancement, 78.3 acres are bottomland hardwood re-establishment, 148.6 acres are cypress/tupelo swamp re-establishment, 29.1 acres are cypress/tupelo rehabilitation, and 10.3 acres are upland buffer.

The comment period for the Department of the Army Permit and the Louisiana Department of Environmental Quality WQC will close **30 days** from the date of this joint public notice. Written

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

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

### **Corps of Engineers Permit Criteria**

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

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

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

Our initial finding is that the proposed work would neither affect any species listed as endangered, nor affect any habitat designated as critical to the survival and recovery of any endangered species listed by the U.S. Department of Commerce,

Utilizing Standard Local Operating Procedure for Endangered Species in Louisiana (SLOPES), dated October 22, 2014, between the U.S. Army Corps of Engineers, New Orleans and U.S. Fish and Wildlife Service, Ecological Services Office, the Corps has determined that the proposed activity would have no effect on any species listed as endangered by the U.S. Department of the Interior.

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

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

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

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

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

for Martin S. Mayer  
Chief, Regulatory Branch

Enclosure

# Revised Prospectus for the Proposed Elm Hall Wetland Mitigation Bank

Assumption Parish, Louisiana

April 12, 2019

Sponsor:

Environmental Partners Group, LLC.

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Baton Rouge, LA 70816

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## 1.0 Introduction

Ecosystem Renewal, LLC on behalf of the mitigation bank Sponsor (Environmental Partners Group, LLC) submits this draft prospectus to the U.S. Army Corps of Engineers (USACE) New Orleans District and the Interagency Review Team (IRT) for evaluation of the proposed Elm Hall Mitigation Bank (EHMB) site for wetland mitigation banking purposes in accordance with 33 CFR 332.8(d)(2) through (5). This prospectus also contains the information and elements outlined by New Orleans District (CEMVN) mitigation bank policy and guidance as promulgated through the “Prospectus Checklist” and template, as most recently available and downloaded on February 15, 2018 from the USACE RIBBITS website (USACE, 2018). The description and proposed use of this site as a mitigation bank is described in this prospectus and will be included within the subsequent mitigation banking instrument (MBI) once the USACE and IRT has determined the site has the potential to offset impacts to Wetlands and Waters of the United States.

The EHMB site is proposed as compensatory offset for wetland impacts to aquatic resources regulated by the USACE under Section 404 of the Clean Water Act, Sections 9 and 10 of the Rivers and Harbors Act of 1899, the Louisiana State and Local Coastal Resources Management Act of 1978, and other applicable Federal and/or state rule requirements such as the Louisiana Coastal Protection and Restoration Authority (CPRA) National Resource Damage (NRD) Restoration Banking Program, and National Environmental Policy Act (NEPA) requiring environmental offsets to wetlands and other protected or regulated habitats.

### 1.1 Site Location

EHMB is  $\pm 305$  acres, is currently used for agriculture and located in Section 117, 118, 122, 143, & 144, Township 13 South, Range 14 East of Assumption Parish, Louisiana. The center point for the property is located at latitude 29.930374° N and longitude -91.078739° W. The site is located 1.5 miles west of the intersection of LA Highway 1006 and Elm Hall Drive near the town of Napoleonville (**Figure 1**). The EHMB location is also depicted on a composite of 2015 USGS quadrangle maps (**Figure 2**). Current land use of the property consists of agricultural crop fields, and recreational hunting land. Adjacent land use to the site consists of agricultural and forest/woodlands including forested conservation lands owned and managed by the Louisiana Department of Wildlife and Fisheries (LDWF) as the Elm Hall Wildlife Management Area (WMA).

The proposed bank site consists of approximately  $\pm 10.7$  acres of other waters of the US that make up the drainage ditches around the site,  $\pm 55$  acres of jurisdictional wetlands that comprise the northern corner of the property where agricultural practices were halted, and  $\pm 234.1$  acres of prior converted agricultural fields primarily used for the cultivation of sugar cane and soybeans, unimproved roads and spoil levees. The  $\pm 55$  acres of jurisdictional wetlands are scrub-shrub areas with an immature hardwood species composition that have established and persisted as a result of current drainage practices on the site, including the pumping of surface waters off site. The current conditions at the site are maintained by levees surrounding the site, on site drainage canals, and pumping activities. A Preliminary Jurisdictional Determination was issued by CEMVN for the site on May 8, 2017 confirming the extent of existing wetlands on the property (**Attachment A**). **Table 1** shows the existing habitat currently on the site.



**Table 1. Existing habitat types within the EHMB (pre-restoration).**

Existing Habitat Type	Acres
Scrub-Shrub and Bottomland Hardwood (Section 404 Wetlands)	54.9
Prior Converted Agricultural, Levees, and Unimproved Road	234.1
Other Surface Waters of the US (Section 404 Waters)	10.7
Pipeline ROW	1.4
Pump House Area and Road	3.9
<b>Total Site Area</b>	<b>305</b>

## 2.0 Project Goals and Objectives

### 2.1 Project Goals

The goal of the EHMB is to restore the ecological function of the site to a state similar to that of the adjacent Elm Hall Wildlife Management Area and to historic ecological function that existed, to the extent practicable, prior to conversion to agricultural land uses. The  $\pm 305$ -acre site will be reestablished and rehabilitated to cypress/tupelo swamp, and bottomland hardwood wetlands, with some upland hardwood inclusions. The EHMB proposes to enhance and restore the following wetland habitat types and acreages, as outlined below in **Table 2**. The mitigation area subtotal presented below in **Table 2** does not include a natural gas pipeline right of way (1.4 acres) that runs through a portion of the site to the south, or the pump house area and right of way access road in the norther corner of the site (3.9 acres). These areas are included in the non-mitigation acreage in **Table 2** below.

**Table 2. Proposed habitat types for the EHMB (post-restoration).**

Proposed Habitat Type	Mitigation Method	Acres
Bottomland Hardwood	Re-establishment	78.3
Bottomland Hardwood	Enhancement	33.4
Cypress/Tupelo Swamp	Re-establishment	148.6
Cypress/Tupelo Swamp	Rehabilitation	29.1
Upland Inclusion		10.3
<b>Total Mitigation Area Subtotal</b>		<b>299.7</b>
<b>Non-mitigation Acreage (Pipeline ROW, Road and Pumphouse Staging Area)</b>		<b>5.3</b>
<b>Total Acreage Under Servitude</b>		<b>305</b>



The sponsor proposes to restore hydrology to the site by removing the levee on the western boundary adjacent to the Elm Hall Wildlife Management Area, and backfilling ditches within the site boundary that currently impede the natural movement of water and sheet flow across the site. The levee proposed to be removed is partially within the property boundary of the Elm Hall Wildlife Management Area. Permission from the Louisiana Department of Wildlife and Fisheries (LDWF) for the proposed levee removal is secured, and LDWF issued letters of no objection and a letter of authorization for the proposed work to the bank sponsor (**Attachment B**). The canal and irrigation ditches that are proposed to be filled with the levee material are all within the EHMB property boundaries. These activities will allow for unimpeded overland flow of sheet water between the site and adjacent state-owned lands, which will seasonally inundate the site and restore hydrologic function. The site will also be removed from agricultural use and planted with species typical of forested wetlands appropriate for the area and intended habitat type. Long-term nuisance/exotic species control will be conducted on the site to prevent those species from establishing on the mitigation bank.

The areas surrounding the bank to the north, south and east are primarily agricultural, making the proposed bank valuable for water quality and wildlife. The vegetative and hydrologic restoration of the site will increase habitat for wildlife and improve water quality by filtering and eliminating agricultural discharges and reducing nutrient runoff into nearby waterways. The details of the EHMB proposed bank restoration are described in Section 4.1 of this prospectus.

## 2.2 Project Objectives

The site restoration plan that is conceptually detailed in Section 4.1, is intended to increase wetland and aquatic habitat hydrological, ecological and wildlife functions. These increased functions are defined in terms of the following project objectives:

- Increase Flood Storage and attenuation through the removal of the earthen levee along the western boarder of the site and backfilling of internal ditching;
- Increased improvements in water quality functions and values through the re-establishment of overland flow, and uptake of nutrients from re-established, and enhanced wetland community types;
- Restoration of cypress/tupelo swamp and bottomland hardwood native species assemblages, resulting in increased vegetative and wildlife species richness and diversity;
- Improved fish and wildlife habitat functions, values and utilization through the re-establishment, rehabilitation and enhancement of native wetland community types to adjacent, forested public and private lands, and to Waters of the United States into which the site discharges;
- Improvement in wildlife species movement (corridor function) and in nesting/spawning/breeding/feeding and loafing habitat through the restoration of hydrologic connectivity to existing forested wetland habitats on the Elm Hall Wildlife Management Area, located immediately west of the EHMB site.



## 3.0 Ecological Suitability of the Site

The EHMB site is a suitable property for meeting the goals and objectives of the proposed bank. The physical, chemical and biological characteristics of the site support targeted wetland habitats and wetland function planned for the bank. The site's physical properties (i.e. location, landscape position and topography) are well suited for the planned restoration efforts and mitigation habitat types of the bank due to its location adjacent to the relatively undisturbed Elm Hall WMA, with ground elevations that match those of the surrounding undisturbed areas (refer to subsection 3.1.3 for supporting detail). EHMB is also located within a suitable landscape position, with the majority of the site exhibiting suitable hydric soils. The site in its current condition only hydrologically differs from the surrounding landscape solely due to the anthropogenic alterations that have been made to the site and pumping to maintain agricultural operations. Restoration of the site will allow for improvements to the chemical processes associated with wetlands and floodplains and provide water quality improvements that will benefit receiving Waters of the United States through nutrient retention and uptake, reduced terrestrial impairments to surface water runoff, and sequestration. The bank site will also provide enhancement of existing biological resources and wetland community types, and re-establishment of historic forested wetland community types locally through the restoration activities and improve habitat connectivity to the surrounding lands, particularly the adjacent EHWMA. This connectivity, in turn, will also provide greater enhancements to habitat and aquatic and terrestrial fauna located on the EHWMA. The subsections below provide a more detailed discussion of the site's existing physical, chemical and biological conditions that make this an appropriate site for a wetland mitigation bank.

### 3.1 Land Use

#### 3.1.1 Historical Land Use

The lands included within the proposed EHMB historically consisted of cypress/tupelo swamp and bottomland hardwood wetlands and hardwood uplands that were cleared and drained for silvicultural and agricultural use prior to 1940. This timeframe is confirmed by aerial imaging maintained by Louisiana State University's Cartography Information Center (**Figure 3**). The historic composition of the site prior to alteration, based on currently existing habitat types within the neighboring WMA, was thought to be identical to the proposed wetland community types and species composition, which includes both cypress/tupelo and bottomland hardwood wetlands. The earliest aerial imagery (**Figure 3**) confirms that by the year 1940 the entirety of the project site was already converted for agricultural use. All significant alterations to the site, including the building of levees and interior ditches, and the establishment of a pumping regime were completed prior to the first available aerial images from 1940. These alterations included the establishment of drainage ditches running perpendicular to each other throughout the site and draining into a larger drainage ditch on the western edge of the property that was created in conjunction with the construction of the western levee that separates the site from the Elm Hall WMA. Water moves from these drainage ditches to the northwestern corner of the site where a pump was constructed to discharge water from the site into the Godchaux Canal that runs along the northern and northeastern border of the property and drains towards Lake Verret to the west.



Through historical aerial research, as early as 1998 (**Figure 4**) the areas in the northern corner of the site were removed from crop rotation and early signs of the establishment of the current scrub-shrub and bottomland hardwoods on the site are observable. Based on our site analysis, we believe the bottomland hardwoods were able to establish and persist in lower elevations of the site due to the pumping regime.

### **3.1.2 Existing Land Use and Habitat Types**

The majority of acreage on the proposed EHMB site is maintained as agricultural fields for the production of sugar cane and soybeans. The portion of the site that was allowed to reforest is currently maintained for recreational and hunting purposes. A current aerial of the site is provided as **Figure 5**. The forested area of the site is dominated by bottomland hardwood canopy and sub-canopy species. Representative photographic documentation of the site is provided as **Attachment C**.

The adjacent land use of to the site is agricultural with some privately-owned forested lands directly to the north, and state-owned public land adjacent to the western property boundary. A map of the current land use for the site and the adjacent properties within 1 mile of the site based on USGS data and ground truthing by Ecosystem Renewal staff is provided as **Figure 6**.

### **3.1.3 Existing Soils and Topography**

As classified by the United States Department of Agriculture (USDA) National Resource Conservation Service (NRCS), the on-site soils consist of a combination of Schriever clay (SkA) (100% hydric & occurring within 56.7% of site), Thibaut Clay (TbA) (95% hydric & occurring within 33.5% of site), Cancienne silt loam (CmA) (2% hydric & occurring within 9.5% of site), and Fausse association (FA) (100% Hydric & occurring within 0.3% of site) (**Figure 7**). All soil series and complexes mapped as occurring on the site, with the exception of Cancienne silt loam near the eastern corner, have 90% hydric ratings, verifying the suitability of the EHMB for wetland restoration and mitigation. The area with Cancienne silts will be incorporated into the proposed upland hardwood inclusion. A brief description of each series is given below. The high hydric-rating soils are also classified as Hydrologic Group D soils. Soils in the Hydrologic Group D have very slow infiltration rates, consisting chiefly of clayey soils.

Schriever Clay (0 to 1 percent slopes): The Schriever series consists of very deep, poorly drained, very slowly permeable soils that formed in clayey alluvium. These soils are on the lower parts of natural levees and in back swamp positions on the lower Mississippi River alluvial plain. Areas are used mostly for cropland; sugarcane, rice, soybeans, wheat, grain sorghum, and oats are the principal crops. Some areas are used for pasture, and hay crops. Frequently flooded areas are mainly in bottomland hardwoods stands.

Thibaut Clay (0 to 1 percent slopes): The Thibaut series consists of very deep, poorly drained, very slowly permeable soils that formed in clayey alluvium over fine-silty alluvium. These soils are on alluvial flats and on the lower parts of natural levees on the alluvial plain of the Mississippi River and its distributaries. Most areas of Thibaut soils are cultivated to sugarcane, soybeans, cotton, small grains, corn, hay, or pasture. A smaller amount of the total acreage is in bottomland hardwoods. In wooded areas, the overstory generally consists of cherrybark oak, eastern cottonwood, green ash, nuttall oak, sweetgum, American sycamore, American and cedar elm, water oak, Sugarberry, pecan, and water hickory.



Cancienne Silt Loam (0 to 1 percent slopes): The Cancienne series consists of very deep, level to gently undulating, somewhat poorly drained mineral soils that are moderately slowly permeable. These soils formed in loamy and clayey alluvium. They are on high and intermediate positions on natural levees and deltaic fans of the Mississippi River and its distributaries. Areas are used mainly for cropland; sugarcane, soybeans, corn, and wheat are the principal crops. Some acreage is in pasture and hay crops. A significant acreage has been developed for urban, industrial or residential uses.

Fausse association (0 to 1 percent slopes, frequently flooded): The Fausse series consists of very deep, very poorly drained, very slowly permeable soils that formed in clayey alluvium. These soils are in low, ponded back swamp areas of the lower Mississippi River alluvial plain. Slopes are less than 1 percent. These soils are mainly used for growing timber and for wildlife habitat. The vegetation is dominated by bald cypress, water tupelo, and red maple.

The EHMB site has a high elevation point (approximately 4ft NAVD 88) in the southeastern most corner, and the fall on the site is from east to west. The majority of the site lies below 2 ft., NAVD 88. Ground elevations within the site and extending 200ft west into the Elm Hall WMA were confirmed by survey, and topography on the site is depicted in **Figure 8**, with the detail survey provided as **Attachment D**. The areas proposed for restoration of cypress/tupelo are approximately equal in elevation to the adjacent Elm Hall WMA, where this wetland community is predominant. The southeast corner of the site has a gradual rise in elevation to approximately 4ft before reaching the site boundary. This area is where cancienne soils are located and is proposed for bottomland hardwood restoration.

### **3.3 Existing Hydrology**

#### **3.3.1 Contributing Watershed**

The EHMB site is within the central portion of the Terrebonne Basin. This basin is bordered by Bayou Lafourche to the east, the Atchafalaya Basin floodway to the west, and the Gulf of Mexico to the south. The northern portion of this basin is primarily agriculture lands existing within the historic floodplains of the Mississippi River and Bayou Lafourche. The EHMB site is located approximately three miles west of Bayou Lafourche and three miles east of Lake Verret. Although the Bayou Lafourche direction of flow is generally north to south, the overland water flow from the lands to the west of the bayou follow the natural elevation as it decreases towards the west and into Lake Verret. The two primary water sources that enter the Terrebonne Basin system are precipitation and flood water from the Atchafalaya river. Discharge from the Terrebonne Basin in turn inundates the southern coastal marshes of the basin (LaCoast, 2005).

#### **3.3.2 Historical Hydrology and Drainage Patterns**

Alterations to the hydrologic function of the EHMB have occurred prior to 1940 and are maintained to the present day. Had the site not been converted to agricultural use, it likely would have remained forested as bottomland hardwoods and cypress swamp, as is evident from the adjacent WMA lands to the west, which have remained relatively undisturbed. Waters from Lake Verret to the west keep the lands inundated through much of the year. Based on the topographic survey performed on the site, the EHMB





site would also be inundated seasonally and exhibit prolonged soil saturation if it wasn't for the current agricultural operations.

### 3.3.3 Existing/Current Hydrology and Drainage Patterns

Drainage alterations present on the EHMB include elevated levees, unimproved roadways, ditching and associated spoil disposal, and water pumping. The Sponsor has installed background water level monitors on the site, and with permission from the LDWF within the adjacent WMA, west of the levee that currently impedes hydrologic connectivity to the WMA. The predominant sources of hydrology to the site are direct precipitation and off-site runoff. Water losses are pumping of surface water, evapotranspiration, and infiltration. Mean annual precipitation for this region is approximately 64 inches per year, according to the Louisiana Department of Transportation (LDOT) Development Hydraulics Manual (2011).

Data from the background water level monitoring conducted since February 7, 2017 is provided as **Attachment E**. Background water level data will be used to inform the final design. The locations of each water level gauge are depicted on **Figure 10**. The data from the gauges on the Elm Hall WMA show fluctuations that are not directly affected by local precipitation. In contrast, the gauge that is located within the site boundaries shows that the water levels of the site are controlled by the existing hydrologic alterations and pumping. After or during rain events, water levels rise and are drawn down shortly thereafter from pumping of water off of the site. The current site drainage and surface water flow directions are presented in **Figure 11**. Proposed hydrologic restoration activities to the EHMB are depicted in **Figure 12** and described in further detail in subsection 4.1 of this prospectus.

### 3.3.4 Jurisdictional Wetlands

A preliminary jurisdictional wetland determination was performed on the site on January 4, 2017 to determine the extent and location of wetlands present on the site. The findings from this determination and data were approved by CEMVN on May 8, 2017. This determination found that the site currently contains 54.9 acres of jurisdictional wetlands and 10.7 acres of non-wetland waters. The wetland acres of the site are within the forested and scrub-shrub sections in the northern portion of the site. The remaining area of the site is prior converted agricultural lands. The wetland determination received from CEMVN is included as **Attachment A**.

## 3.4 Vegetation

### 3.4.1 Historic Plant community

The EHMB site has been under cultivation prior to 1940 and has remained in cultivation to the present day. Based on its proximity to the adjacent unmodified WMA with similar ground elevations to the site except for the southeast corner, it is reasonable to assume that the plant communities within the EHMB were the same as what existed in the adjacent WMA prior to anthropogenic modifications to the site. The historic plant community would have consisted of bald cypress (*Taxodium distichum*) green ash (*Fraxinus pennsylvanica*) water tupelo (*Nyssa aquatica*) as well as other bottomland hardwood species such as pumpkin ash (*Fraxinus profunda*) and swamp red maple (*Acer rubrum* var. *drummondii*) commonly found in association with these systems. The understory of this historic cypress tupelo swamp likely contained



maiden cane (*Panicum hemitomon*) lizard tail (*Saururus cernuus*) and other obligate plant species typical of the habitat type. All of the above listed species currently occur in the wildlife management area immediately adjacent to the site. The slightly higher elevated portions in the southern portion proposed as bottomland hardwood re-establishment would have contained bottomland hardwood species such as overcup oak (*Quercus lyrata*), water oak (*Quercus nigra*), willow oak (*Quercus phellos*), water hickory (*Carya aquatica*), and green ash. This is consistent with small areas of higher elevation within the Elm Hall WMA near the southwest boundary of the project site.

### 3.4.2 Existing Vegetative Composition

Approximately 234.1 acres of the EHMB is currently in agricultural use and is rotated between sugar cane (*Saccharum officinarum*) and soy beans (*Glycine max*) unless otherwise unplanted. The 54.9 acres of jurisdictional wetlands in the northern section of the proposed bank can be divided into two areas, a 30-acre area of mature forested hardwood, and a 24.9-acre scrub-shrub area. The forested hardwood area is located in the southern portion of the northwest section (refer to **Figure 10**) and contains mature bottomland hardwood vegetation dominated by canopy and sub-canopy species such as sugarberry (*Celtis laevigata*), American elm (*Ulmus americana*), red maple (*Acer rubrum*), willow oak (*Quercus phellos*), and water hickory (*Carya aquatica*). Many of the trees within the mature, forested area exceed six inches diameter at breast height (dbh) and are over 20 ft tall. The understory is dominated by dwarf palmetto (*Sabal minor*), and brome-like sedge (*Carex bromoides*).

The scrub-shrub area is located in the very northern portion of the site and consists of much younger shrub growth of tree species that are three-inch DBH or less. Species composition is dominated by green ash (*Fraxinus pennsylvanica*), red maple, and American elm in the shrub stratum, with blackberry (*Rubus arvensis*) and pepper vine (*Ampelopsis arborea*) in the herb stratum. The majority of trees in this scrub-shrub area are under three inches dbh and under 20 ft in height.

Because of the altered hydrology due to pumping of surface water off-site, this has resulted in altered hydroperiods conducive to the establishment and persistence of bottomland hardwood and scrub-shrub species. Once hydrology is returned to the site, areas of the scrub-shrub portion of the EHMB will become inundated for longer durations of time, making it unsuitable for the shorter hydroperiod adapted bottomland hardwood species, and better suited to cypress/tupelo swamp. The mature bottomland hardwood area is well established, with many trees growing on hummocks and diameters of trees generally exceeding 10 inches. We do not anticipate that the change in hydroperiod will result in a change of habitat type within the mature canopy area. Data sheets from the attached wetland determination (DP 2 in **Attachment A**) and from data collected at the site from Ecosystem Renewal staff (**Attachment F**), show the aerial coverage of canopy and sub-canopy species in this part of the site. Please also refer to the map of the existing vegetative conditions of the site (**Figure 10**).

## 3.5 General Need for the Project in this Area

The creation of the EHMB will generate the creation of high quality, compensatory mitigation credits that will offset unavoidable impacts that occur within the service area. This includes impacts to forested



wetland habitats such as bottomland hardwood and cypress-tupelo that occur in the Terrebonne Watershed Basin. Regionally, the area is experiencing a high demand for wetland mitigation due to increased industrial development, the oil and gas industry and infrastructure improvements. There are many threats to water quality and wildlife propagation within the basin. Sources of water quality problems include the following: non-irrigated crop production, pasture land, urban runoff, hydromodifications, combined sewers and unsewered areas, surface runoff, and spills (LDEQ 2004).

**Table 3. Water quality threats and sources of threats to the Terrebonne Basin (LDEQ, 2004)**

Source of Threat	Threat								
	Altered Composition/Structure	Altered Water Quality	Change in Land Use Practices	Competition for Resources	Habitat Disturbance	Habitat Fragmentation	Modification of Water Levels; Changes in Natural Flow Patterns	Nutrient Loading	Sedimentation
Channelization of rivers or streams		XXX			XXX		XXX		
Construction of ditches, drainage or diversion systems		XXX	XXX				XXX		XXX
Construction of navigable waterways						XXX	XXX		XXX
Conversion to agriculture or other forest types			XXX				XXX	XXX	XXX
Crop production practices		XXX	XXX				XXX	XXX	XXX
Development/maintenance of pipelines, roads or utilities									XXX
Industrial discharge		XXX						XXX	
Invasive/alien species				XXX					
Levee or dike construction	XXX	XXX	XXX				XXX	XXX	XXX
Oil or gas drilling						XXX	XXX		
Residential development		XXX	XXX				XXX		XXX

Restoration of the EHMB site will help improve water quality discharges into receiving waters through the removal of agricultural sources of nutrients, increasing natural water quality treatment by restoring overland flow of surface and floodwaters through vegetated areas and slowing flows thereby allowing for greater nutrient uptake. They hydrologic restoration will also result in a more natural flooding regime, allowing for removal of pollutants through sedimentation. All of these benefits to water quality from the restoration of the site will also help advance LDEQ and LDWF watershed goals for the Terrebonne Basin, and state-wide goals to increase natural resiliency to storm events and climate change through wetland restoration.

These benefits also work toward achieving the goals of the CPRA Coastal Master Plan for the state of Louisiana by promoting the sustainability of land, increase flood protection, providing support to oil and gas and major infrastructure activities, as well as providing high-quality critical habitat for threatened and endangered species, species of special concern, and domestic wildlife common to such environments. The EHMB sponsor plans to additionally submit this prospectus to the CPRA Banking Review Team for review as a potential NRD restoration bank. The bank could potentially facilitate the offset of wetland



losses due to the unauthorized discharge of oil in Louisiana coastal areas, under the NRD Restoration Banking framework.

## 4.0 Establishment of the Mitigation Bank

The EHMB site will potentially re-establish and rehabilitate 299.7 acres of cypress/tupelo swamp and bottomland hardwood wetlands. The entire 305-acre site will be protected and maintained by a conservation servitude. According to the NRCS soil survey and field verification during the jurisdictional determination, the underlying soils on the site are almost entirely hydric and appropriate for wetlands restoration (**Figure 7**). The site is adjacent to the Elm Hall WMA which is composed of cypress/tupelo swamp and fed by waters from Lake Verret. After hydrologic restoration occurs (i.e. levee removal and backfilling of ditches) waters from the adjacent WMA cypress tupelo swamps will freely exchange between the site and provide an additional source of hydrology in addition to direct precipitation, thereby restoring hydroperiods appropriate to the targeted habitat types. The acreage, mitigation methods and habit types proposed to be restored to the EHMB are depicted on **Figure 15** and were also previously presented in **Table 2**.

### 4.1 Site Restoration Plan

The site restoration plan outlined in the following sections describes the hydrologic and vegetative work to be performed at the site. The proposed work will restore and enhance the cypress/tupelo swamp and bottomland hardwood habitats targeted for restoration.

#### 4.1.1 Hydrologic Restoration

**Figure 12** depicts the proposed actions to restore and enhance the hydrologic function of the EHMB site. To restore sheet flow across the site and increase hydroperiods overall, the levee on the western edge of the project site will be removed and returned to an elevation matching the natural ground east of the levee/ditch and those on the adjacent Elm Hall WMA. Material from the deconstruction of the levee will be used to backfill the large borrow and drainage ditch that is currently adjacent to the entire length of the levee. A typical cross-section for spoil removal is provided as **Figure 13**. The levee along the northern border of the site that separates EHMB from the Godchaux Canal will remain intact. Use of the pump at the northwestern corner will be discontinued and the pump will be removed from the site entirely. The drainage ditches that were created to drain the fields for agricultural use will be backfilled to elevations matching surrounding natural ground levels. In order to ensure enough fill material is available for the backfilling of interior drainage features, a borrow area has been designated on the site (**Figure 12**). Material will be removed, and the area graded appropriately to match the surrounding elevation slopes and will be used around the site as fill material. Any deficit in fill material will be satisfied by the hauling in of offsite fill material. Additionally, all culverts within the site will be removed. After removal of each culvert the excavated area will be backfilled to match that of the surrounding natural ground elevation. By removing the western levee and ceasing regular pumping, inundation/saturation of the lowest elevations (the majority of the EHMB site) will occur with increased frequency, resulting in semi-permanent to seasonally inundated conditions.



Based on topographic survey and water level monitoring data from the three water level gauges located within the Elm Hall WMA, the average water surface elevations for the period of record from February 7, 2018 to June 7, 2018 were between 2.74 ft. at PZ1, 2.68 ft. at PZ2, and 2.88 ft., NAVD88 at PZ3 (refer to **Figure 10** for gauge locations). The current elevation of the site immediately east of the levee and canal that will be removed and backfilled is approximately between 0.02 and 1 ft., NAVD88 including within the existing bottomland hardwood forested area and scrub-shrub area. The elevations increase gradually to between 3 and 4ft, NAVD88 at the southeasternmost corner of the site. Thus, the removal of the western levee will allow for seasonal inundation depths of approximately 0.5 to 2.5 ft in the areas proposed for cypress/tupelo restoration and decreasing in depth and duration moving to the east and south through the property. Removal of drainage ditches and features designed to drain the site, as well as removal of hydrologic impediments will result in the restoration of natural overland flow and drainage patterns on the EHMB.

#### 4.1.2 Vegetative Restoration

The vegetative restoration of the EHMB will be accomplished by planting of appropriate and desirable wetland tree species typical of the targeted habitat types, control of nuisance and exotic invasive species, and through natural recruitment. After hydrologic restoration has occurred on the site vegetative restoration plantings of appropriate wetland vegetation for the intended habitat type will occur during the winter months (December, January, and/or February). Nuisance and exotic invasive species control will occur as needed during the development of the bank, with treatments generally taking place in late summer to early fall months (August-October). Additional details for each proposed habitat type are presented below.

##### 4.1.2.a Cypress/Tupelo Swamp Re-establishment and Rehabilitation

Approximately 148.6 acres of Cypress/Tupelo Swamp is proposed for re-establishment on the EHMB (**Figure 15**). The Existing agricultural field ditches will be backfilled and leveled, to allow for appropriate ground elevations for the establishment of *Taxodium distichum*, *Nyssa aquatica* and associated species. After the completion of the hydrologic restoration activities, any remaining crops will be cleared through mechanical harvest, and recruiting weedy/invasive herbaceous species will be controlled through the use of herbicides. After harvest and herbicide control, the site will be burned prior to planting. Additional site preparations prior to planting will also include disking and/or ripping to loosen any compacted soils resulting from years of cultivation. Re-vegetation will occur through bareroot plantings on 12-foot centers to achieve a minimum density of 302 trees per acre. The bareroot planting will occur with species selected from the species listed in **Table 4** below.

There are approximately 29.1 acres near the northwest corner of the EHMB site that is currently scrub-shrub area with bottomland hardwood vegetation, which is proposed for rehabilitation, returning the area to cypress/tupelo swamp. This area will be mechanically cleared of understory and shrub vegetation (woody species under three inches dbh) prior to the removal of the levee and backfilling of interior ditches. Woody species above three-inches dbh will be left in place. Interspersed bare root plantings of appropriate canopy and sub-canopy species will occur. The clearing of vegetation under three inches dbh will result in the majority of the existing scrub/shrub vegetation being removed. The species composition for planting will be chosen from those species listed below in **Table 4**.



**Table 4. Cypress/tupelo swamp species proposed for re-establishment areas.**

Common Name	Scientific Name	AGCP Wetland Indicator Status
Bald Cypress	<i>Taxodium distichum</i>	OBL
Tupelo gum	<i>Nyssa aquatica</i>	OBL
Pumpkin ash	<i>Fraxinus profunda</i>	OBL
Green ash	<i>Fraxinus pennsylvanica</i>	FACW
Swamp red maple	<i>Acer rubrum</i> var. <i>drummondii</i>	FAC
Overcup Oak	<i>Quercus lyrata</i>	OBL
Water hickory	<i>Carya aquatica</i>	OBL
Nuttall oak	<i>Quercus texana</i>	FACW

#### 4.1.2.b Bottomland hardwood Re-establishment and Enhancement

The 78.3 acres of proposed bottomland hardwood re-establishment will occur in the southern portions of the EHMB site and to the east of existing, mature BLH. These areas have a naturally higher elevation than the rest of the project area, occurring approximately 2 ft. higher in elevation than the proposed cypress/tupelo restoration area. A change in soil types also occurs that are more conducive to bottomland hardwood species. The cessation of agricultural activities and harvest/treatment of nuisance/weedy vegetation will occur simultaneously with the cypress/tupelo swamp re-establishment and rehabilitation. The areas will also be disked and/or ripped to break-up any soil compaction from years of cultivation. The bottomland hardwood re-establishment areas will be planted with bareroot seedlings on 9-foot centers to achieve a minimum density of 538 trees per acre. A combination of hard and soft mast trees will be planted in these areas to achieve a desirable ratio of 60:40 hard to soft mast species. **Table 5** below provides the bottomland hardwood species selection.

There are approximately 33.4 acres within the currently forested area near the northwest corner of the EHMB site proposed for enhancement. The bottomland hardwood enhancement area consists of the currently existing area of mature bottomland hardwood species with land elevations that will support the existing BLH habitat type after hydrologic restoration of the site occurs. Undesirable and nuisance/exotic vegetation will be cleared from this area to reduce competition with desirable species. The enhancement areas will be interplanted with bare root stock of appropriate bottomland hardwood canopy and sub canopy species listed below in **Table 5**.



**Table 5. Bottomland hardwood canopy and sub-canopy species proposed for restoration and enhancement.**

Common Name	Scientific Name	AGCP Wetland Indicator Status
Nuttall oak	<i>Quercus texana</i>	FACW
Water hickory	<i>Carya aquatica</i>	OBL
Water oak	<i>Quercus nigra</i>	FAC
Overcup oak	<i>Quercus lyrata</i>	OBL
Willow oak	<i>Quercus phellos</i>	FACW
Swamp chestnut oak	<i>Quercus michauxii</i>	FACW
Green ash	<i>Fraxinus pennsylvanica</i>	FACW
Sugarberry	<i>Celtis laevigata</i>	FACW
American elm	<i>Ulmus americana</i>	FAC
Common persimmon	<i>Diospyros virginiana</i>	FAC
Sweet-gum	<i>Liquidambar styraciflua</i>	FAC
Swamp red maple	<i>Acer rubrum</i> var. <i>drummondii</i>	FAC
Swamp dogwood	<i>Cornus foemina</i>	FACW
Deciduous holly	<i>Ilex decidua</i>	FACW

#### 4.1.2.c Upland Inclusions

The 10.3 acres of non-hydric soils will be planted with upland hardwood species and is intended to function as a hardwood upland buffer area. As with other proposed habitat types within existing agricultural lands, crops will be harvested, and weedy/nuisance or exotic herbaceous species will be chemically treated. Bare root canopy and sub-canopy mesic hardwood species will be planted at a density of 538 stems/acre. Proposed species will be chosen from those in **Table 5** that have a FAC or FACU wetland indicator status.

#### 4.1.2.d Invasive Species Control

Enhancement areas will be treated for nuisance/exotic species including but not limited to Chinese tallow (*Triadica sebifera*) honeylocust (*Gleditsia triacanthos*), and Chinese privet (*Ligustrum sinense*). Post





vegetative restoration, the site will be assessed for nuisance/exotic species cover at the same time as regular site monitoring occurs according to an approved monitoring plan incorporated into the Mitigation Banking Instrument (MBI). During these monitoring events, if the presence of nuisance/exotic species is determined to be adversely affecting the site and/or the site is not meeting nuisance and exotic species performance measures, then remedial action(s) will occur to remove and control these species to stipulated MBI performance thresholds. Control of nuisance and exotic species may occur through broadcast spraying, mechanical removal, or selective herbicide application, as appropriate. Frequent site reconnaissance and a minimum treatment frequency of annually will prevent nuisance/exotic species from becoming well established on the site. Very few occurrences of these species were observed on the site in its current condition, and a seed source is largely absent from the site and surrounding areas, verifying that an annual treatment frequency will be sufficient to control establishment below performance measure thresholds.

## **4.2 Technical Feasibility**

Proposed work is within an area of historically occurring cypress/tupelo swamp and bottomland hardwood wetlands, and the site exhibits a suitable landscape position and topography for the proposed habitat types. The site soils are also appropriate for wetlands restoration, and the majority of the bank area exhibits modern hydric soils, as confirmed by D&S Environmental Services, Inc. when performing fieldwork for the wetland determination and the subsequently issued Preliminary Jurisdictional Determination by the CEMVN.

The earthwork required to develop the bank site consists of minimal levee removal and ditch backfilling. Hydrologic restoration through these activities is technically feasible based on existing ground elevations, which are conducive to the wetland habitat types proposed for restoration. No significant excavation or alteration of natural grades are required. The removal of barriers to natural overland flow (levee) and ditches which artificially drain the site will result in restored hydroperiods appropriate to the habitat types proposed for restoration. The existence of cypress/tupelo swamp and bottomland hardwoods adjacent to the site, the limited alterations to site topography required, and the presence of hydric soils throughout the site makes it technically feasible for restoration as a mitigation bank. Site work will consist of minor earth work using conventional equipment and methods and result in self-sustaining hydrologic regimes. Thus, the proposed restoration plan outlined above is expected to result in the physical, chemical and biological conditions appropriate for the forested wetland habitat types proposed.

## **4.3 Current Site Risks**

Because of the EHMB location there is no immediate threat of conversion of the property to a more intensive land use, or of residential or commercial development adjacent to the site. Existing agricultural land uses on adjacent properties is expected to continue. The proposed use of the EHMB for wetland restoration and conservation purposes is consistent with existing, adjacent land uses. Zoning or existing ordinances are not present that could affect the proposed bank or operation. There is no proposed development adjacent to the bank.

An existing pipeline runs from east to west through a small portion (1.4 acres) of the site near the southern boundary. The easement for this pipeline is not included within the EHMB creditable mitigation acres.





The easement will remain as is during and after site restoration efforts. Because this easement matches the surrounding elevations as it crosses the site, it is not anticipated that this feature will have any effect on site hydrology and no vegetative restoration efforts will occur within this right-of-way. The levee to be removed is partially within the boundary of the Elm Hall WMA and permission was granted to the sponsor through both a letter of no objection and letter of authorization from LDWF (**Attachment B**) for removal of the boundary levee. .

#### **4.4 Long-term Sustainability of the Site**

The proposed hydrologic restoration at the EHMB is self-sustaining and does not require water control structures or any active management to achieve the goals of the restoration. Periodic treatment of nuisance/exotic species will occur to ensure the site is meeting the performance measures required in the MBI.

Draft construction, maintenance, and long-term financial assurances for the EHMB will be provided with the MBI submittal, along with estimated implementation, and long-term management costs. Short-term financial assurances (construction and maintenance) will be sufficient to cover construction and maintenance costs until achievement of the long-term performance standards. All financial assurances will be provided using one of the currently approved CEMVN methods, and documents will be prepared using currently approved CEMVN templates.

#### **5.0 Proposed Service Area**

The proposed EHMB is located within the West Central Louisiana Coastal USGS 8-digit Hydrologic cataloguing unit (HUC 08090302). The proposed service area (**Figure 16**) was determined using a watershed and ecoregion approach per existing CEMVN policy in the recently published Louisiana Rapid Assessment Method (LRAM). When considering offsets to bottomland hardwood, bald cypress/tupelo swamp and pine flatwoods savannah, the CEMVN utilizes the Louisiana watershed basins, as defined by the LDEQ source data (LOSCO, 2004). The EHMB location within the West Central Louisiana Coastal HUC falls within the LDEQ-defined Terrebonne Watershed. This watershed is comprised of the Lower Grand HUC (08070300) and the West Central Louisiana Coastal HUC. The bank's proposed service area for offset of bottomland hardwood and cypress/tupelo swamp impacts will be comprised of these two HUC units.

#### **6.0 Operation of the Mitigation Bank**

##### **6.1 Project Representatives**

**Sponsor:** Environmental Partners Group, LLC.  
Attn: Danny Moran  
4520 S. Sherwood Forest Blvd. #104-241  
Baton Rouge, Louisiana, 70816  
(225)-928-5678



**Agent(s):** Ecosystem Renewal, LLC.  
4520 S. Sherwood Forest Blvd. #104-241  
Baton Rouge, Louisiana, 70816  
(225)-928-5678

**Landowner:** Environmental Partners Group, LLC.  
Attn: Danny Moran  
4520 S. Sherwood Forest Blvd. #104-241  
Baton Rouge, Louisiana, 70816  
(225)-928-5678

## 6.2 Qualifications of the Sponsor

The owners of Environmental Partners Group LLC. are principals of EcoSystem Renewal, LLC. The principals, members, and managers of Ecosystem Renewal, LLC have extensive experience in environmental services, ecological restoration, engineering, construction, silviculture, and business management. All project construction; monitoring and short-term management will be accomplished by Ecosystem Renewal LLC, with ecoGENESIS, LLC providing technical support and CSRS, Inc. providing permitting support. EcoSystem Renewal, to date, has restored over 1,000 acres of bottomland hardwood wetlands in the form of both mitigation banks and large permittee-responsible mitigation areas, and created and maintained four sites within the New Orleans district under the Zachary Umbrella Mitigation Banking Instrument that have reached interim success criteria and are approaching their long-term credit releases. EcoSystem Renewal also currently manages and operates two bottomland hardwood banks in the Vicksburg District--Missouri Loop and Shreveport Mitigation Banks. Ecosystem Renewal currently has one other bottomland hardwood and stream bank in process in the USACE Galveston District. EcoSystem Renewal permitted, constructed, and currently also co-manages the 1,980-acre Gulf Coastal Plains Wetland Mitigation Bank (GCPWMB) just north of East Bay and south of Winnie, TX. The GCPWMB is the first coastal prairie and tidally influenced intermediate/brackish marsh and freshwater marsh mitigation bank permitted and operating in the USACE Galveston District USACE.

## 6.3 Proposed Long-term Ownership and Management

The landowner will be the initial designated Long-Term Steward charged with long-term management and maintenance responsibility once the long-term performance measures are attained. The Long-Term stewardship will be transferred to the Louisiana Department of Wildlife and Fisheries as a land donation, subject to LDWF's Letter of No Objection dated September 13, 2018 and Letter of Authorization dated April 11, 2019 (**Attachment B**). This transfer will occur after all performance measures are met or earlier. LDWF as the Long-Term Steward will be the recipient of the Long-Term Management Fund for use in addressing catastrophic or force majeure events, and for performing land management once all



monitoring is completed, the bank has attained the long-term performance measures and has entered into the long-term management phase.

The Louisiana Department of Wildlife and Fisheries (LDWF) will retain ownership of the western boundary of the mitigation bank where the levee is to be removed throughout the life of the bank and has agreed to take over as the Long-Term Steward of the project area and be the recipient of the EHMB site as a land donation, once the bank enters the long-term management phase. A written letter of no objection and conditions for transfer was provided to the sponsor outlining the terms under which LDWF will assume property ownership and long-term Stewardship of the bank in perpetuity (**Attachment B**). The sponsor intends to meet these terms and execute a final agreement between the sponsor and LDWF prior to MBI issuance.

## 6.4 Site Protection

Initially, the mitigation bank site will be protected by a covenant or deed restriction consistent with the concepts described in the Letter of No Objection from LDWF dated September 13, 2018 providing that the EHMB will comply with the terms of the mitigation banking instrument. The covenant may be modified or replaced with a perpetual conservation servitude (utilizing the USACE-MVN template) upon written agreement between the Sponsor, the landowner, the USACE in consultation with the IRT, or by fee simple transfer to LDWF consistent with the concepts described in the Letter of No Objection from LDWF. The mitigation bank area will be protected in perpetuity by fee simple transfer to LDWF per the terms of the no objection letter (**Attachment B**). Prior to transfer, the sponsor will provide title documentation back to patent. Acceptance of the transfer by LDWF is contingent on a final agreement being executed between the sponsor and LDWF prior to MBI issuance.

## 6.5 Long-term Strategy

Long-term management of the bank will include strategies for long-term vegetative and property management, enforcement of MBI provisions, as well as remedial actions, adaptive management and contingency measures that will be included in a long-term management plan in the approved MBI. Long-term management of the EHMB will be funded by the long-term management fund.

With the exception of force majeure or catastrophic events, the long-term management funds will not be available for use until after verification by the CEMVN and IRT that the EHMB has attained long-term performance measures for all habitat types restored to the bank. This Long-Term Management Fund will be transferred to the designated Long-Term Steward for use in addressing any future catastrophic events or long-term land management requirements upon bank closure.



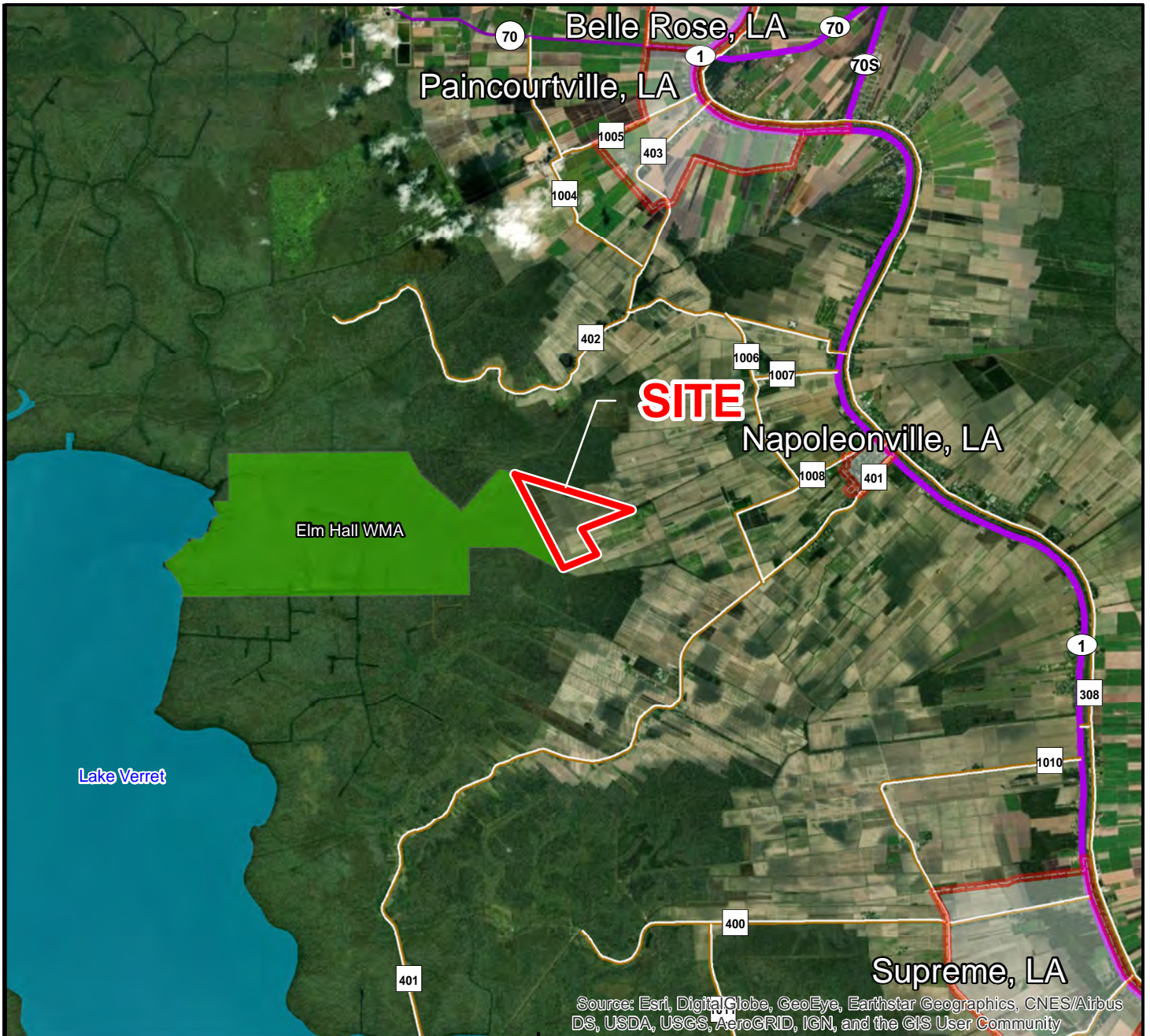
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## FIGURES



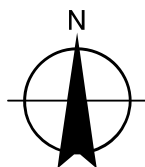


### Legend

- Survey Boundary
- Wildlife Management Areas
- Waterbody
- Parish Boundary

### **Major Roads**

- 2-Lane State Highway
- Urban State Highway
- Rural State Highway



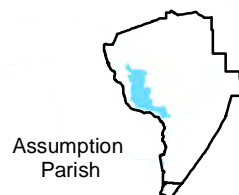
Elm Hall Mitigation Bank

FIGURE  
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## **General Site Overview Map**

ecosystem  
renewal LLC

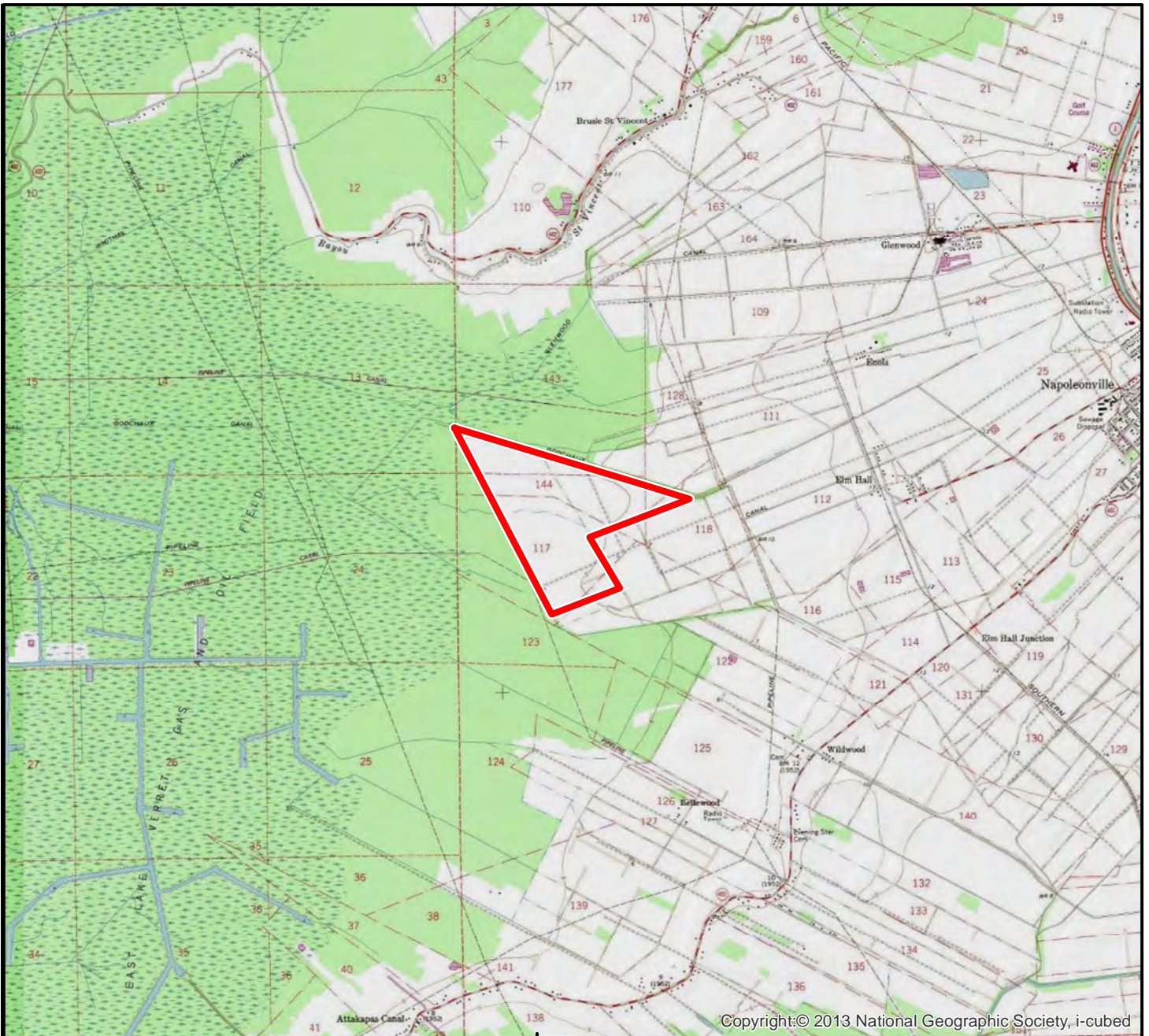


Assumption  
Parish


**CSRS**

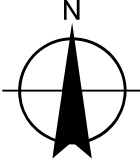
CSRS, Inc.  
6767 Perkins Road  
Baton Rouge, LA 70809

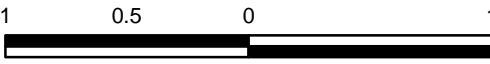






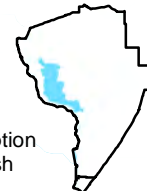

**Legend**

 Survey Boundary





Miles

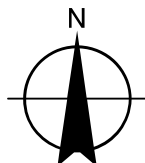
Elm Hall Mitigation Bank	
FIGURE NUMBER <b>2</b>	<b>Quadrangle Map</b>
	
	 <p>Assumption Parish</p>
 <div style="float: right; text-align: right;"> <p>CSRS, Inc. 6767 Perkins Road Baton Rouge, LA 70809</p> </div>	





**Legend**

Survey Boundary



Elm Hall Mitigation Bank

FIGURE  
NUMBER  
**3**

**Historical Aerial Map  
1940**

ecosystem  
renewal LLC



Assumption  
Parish

**CSRS**

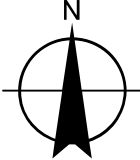
CSRS, Inc.  
6767 Perkins Road  
Baton Rouge, LA 70809









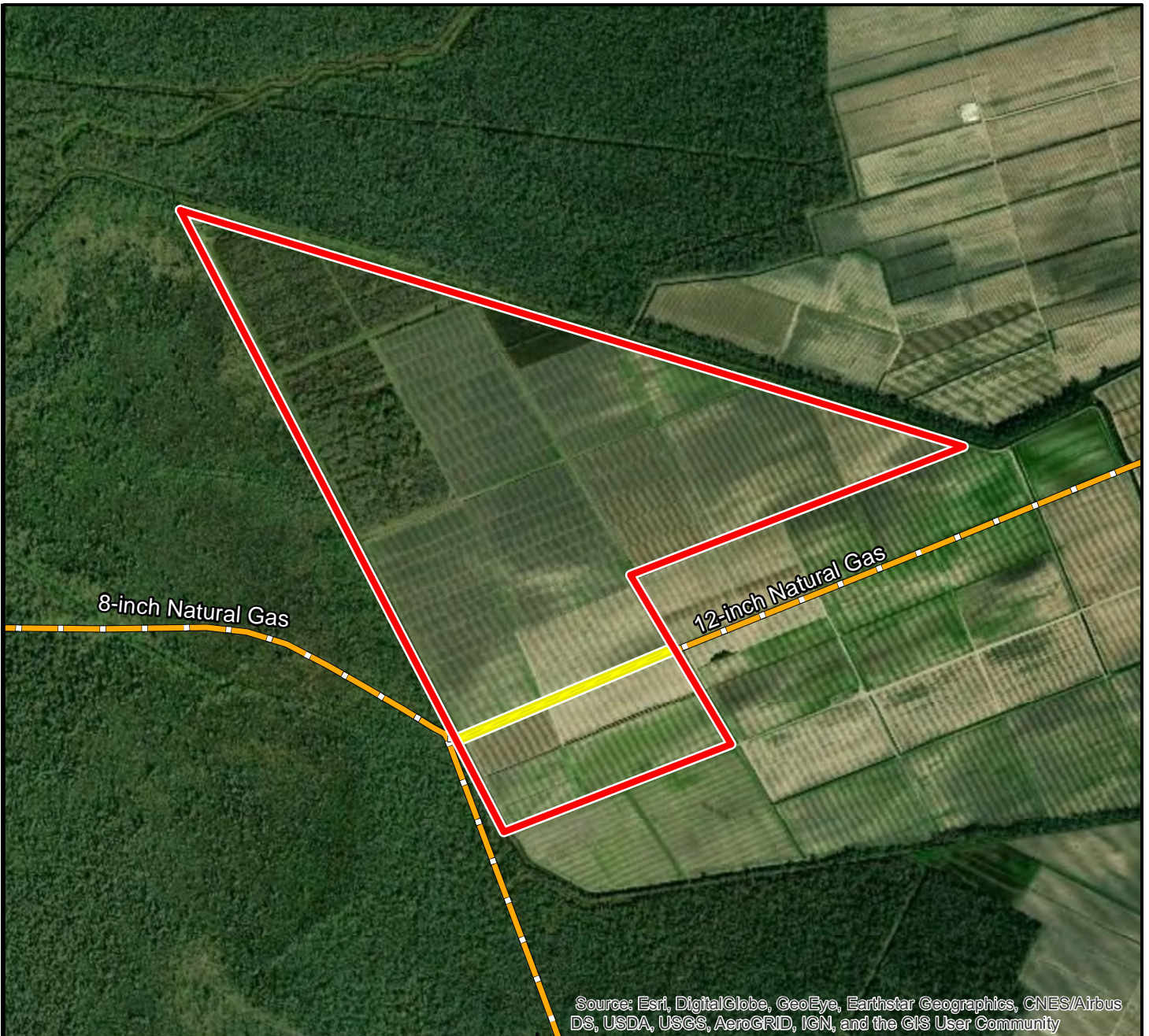
**Legend**

Survey Boundary






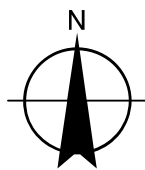
Elm Hall Mitigation Bank	
FIGURE NUMBER <b>4</b>	<b>Historical Aerial Map 1998</b>
	
	 <p>Assumption Parish</p>
 <div style="float: right;"> CSRS, Inc.  6767 Perkins Road  Baton Rouge, LA 70809 </div>	





### Legend

-  Survey Boundary
-  Pipeline ROW
-  Existing Pipelines



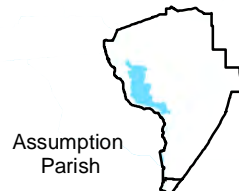
Elm Hall Mitigation Bank

FIGURE  
NUMBER

5

## Current Aerial Map

ecosystem  
renewal LLC

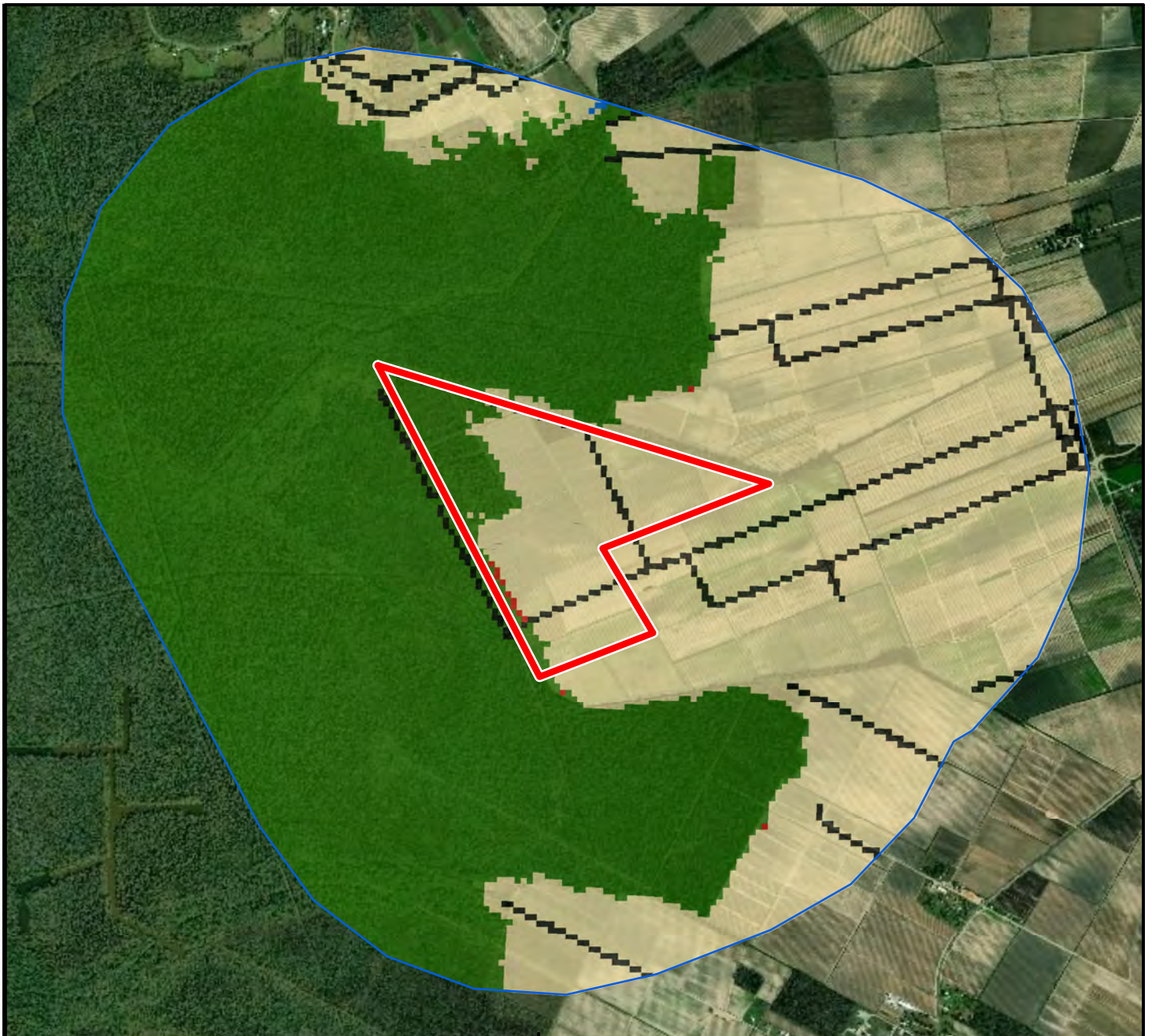


Assumption  
Parish

CSRS

CSRS, Inc.  
6767 Perkins Road  
Baton Rouge, LA 70809





### Legend

Survey Boundary

One-Mile Buffer

### USGS Land Use Cover Data (ground truthed)

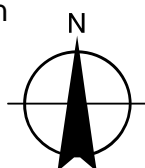
Recently Disturbed or Modified

Introduced & Semi Natural Vegetation

Forested & Woodland

Agricultural/Developed Vegetation

Developed & Other Human Use



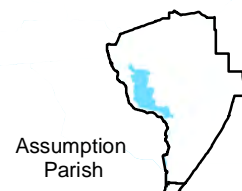
Elm Hall Mitigation Bank

FIGURE  
NUMBER

6

## Land Use Map

ecosystem  
renewal LLC

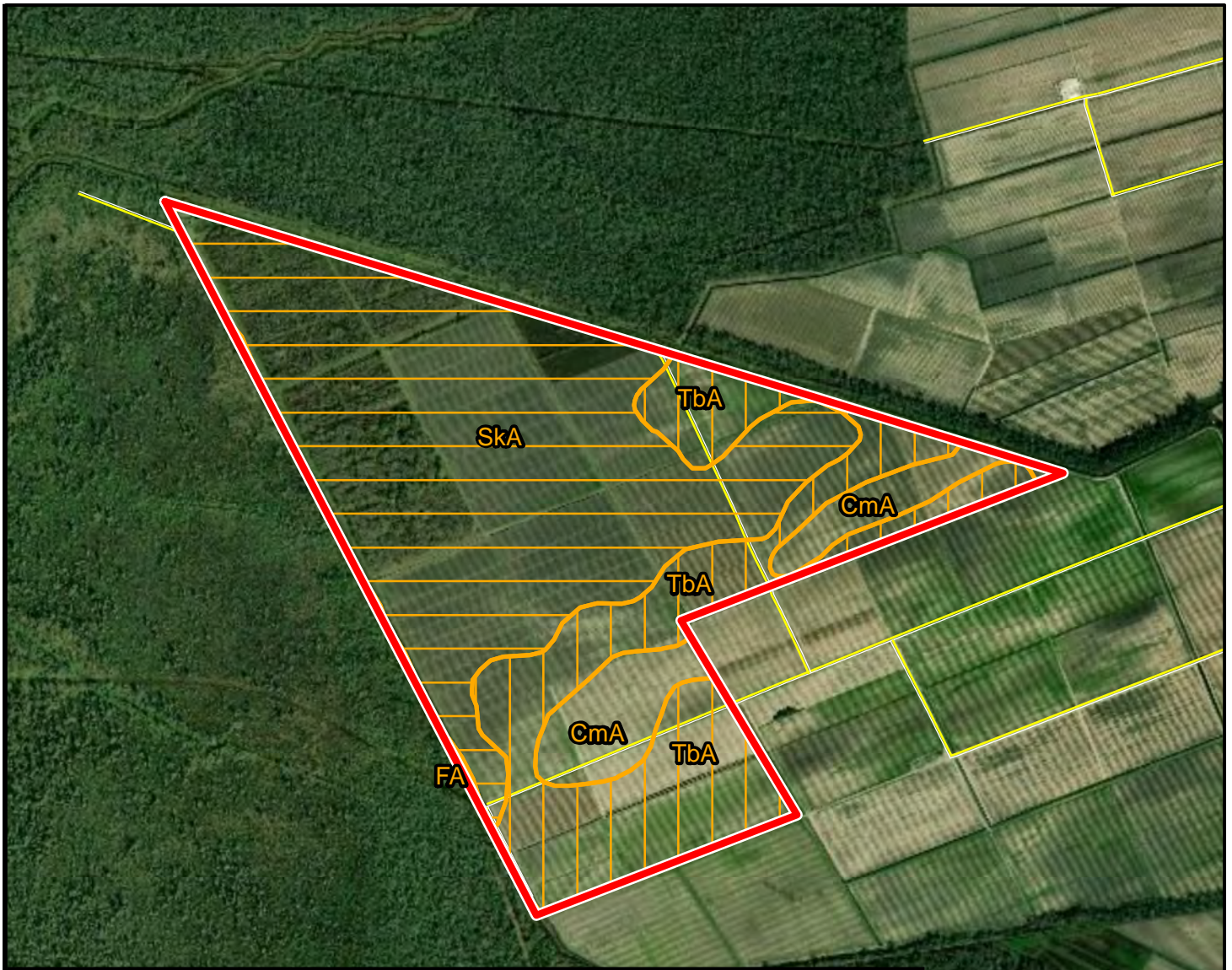


Assumption  
Parish

CSRS

CSRS, Inc.  
6767 Perkins Road  
Baton Rouge, LA 70809





### Key Site Points:

- Because soil boundaries can seldom be shown with complete accuracy on soil maps, parts and pieces of adjacent polypedons are inadvertently included or excluded from delineations.

### Legend

Survey Boundary

### Soil Type

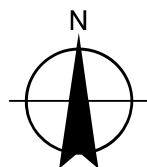
CmA - Cancienne silt loam, 0 to 1 percent slopes (2% hydric)

FA - Fausse association, 0 to 1 percent slopes, frequently flooded (100% hydric)

SkA - Schriever clay, 0 to 1 percent slopes (98% hydric)

TbA - Thibaut clay, 0 to 1 percent slopes (95% hydric)

Local Roads



Elm Hall Mitigation Bank

FIGURE  
NUMBER

7

### Soils Map

ecosystem  
renewal LLC



Assumption  
Parish

CSRS

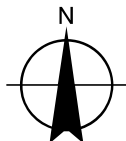
CSRS, Inc.  
6767 Perkins Road  
Baton Rouge, LA 70809





### Legend

- ▬ Survey Boundary
- Ground elevations above 5-ft contour (0.4 Ac. ±)
- Ground elevations below 5-ft contour (304.6 Ac. ±)



0.25      0.125      0      0.25

Miles

Notes: Survey elevation data derived from A Limited Topographic Survey of a 305± acre tract located in sections 117, 118, 122, 128, 143, and 144, Township 13 South, Range 14 East, Assumption Parish Louisiana conducted by Pan American Engineers, LLC on behalf of Ecosystem Renewal, LLC.

Elm Hall Mitigation Bank

FIGURE  
NUMBER

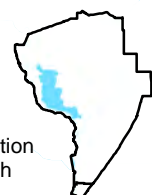
8

## Surveyed Elevations Map

ecosystem  
renewal LLC



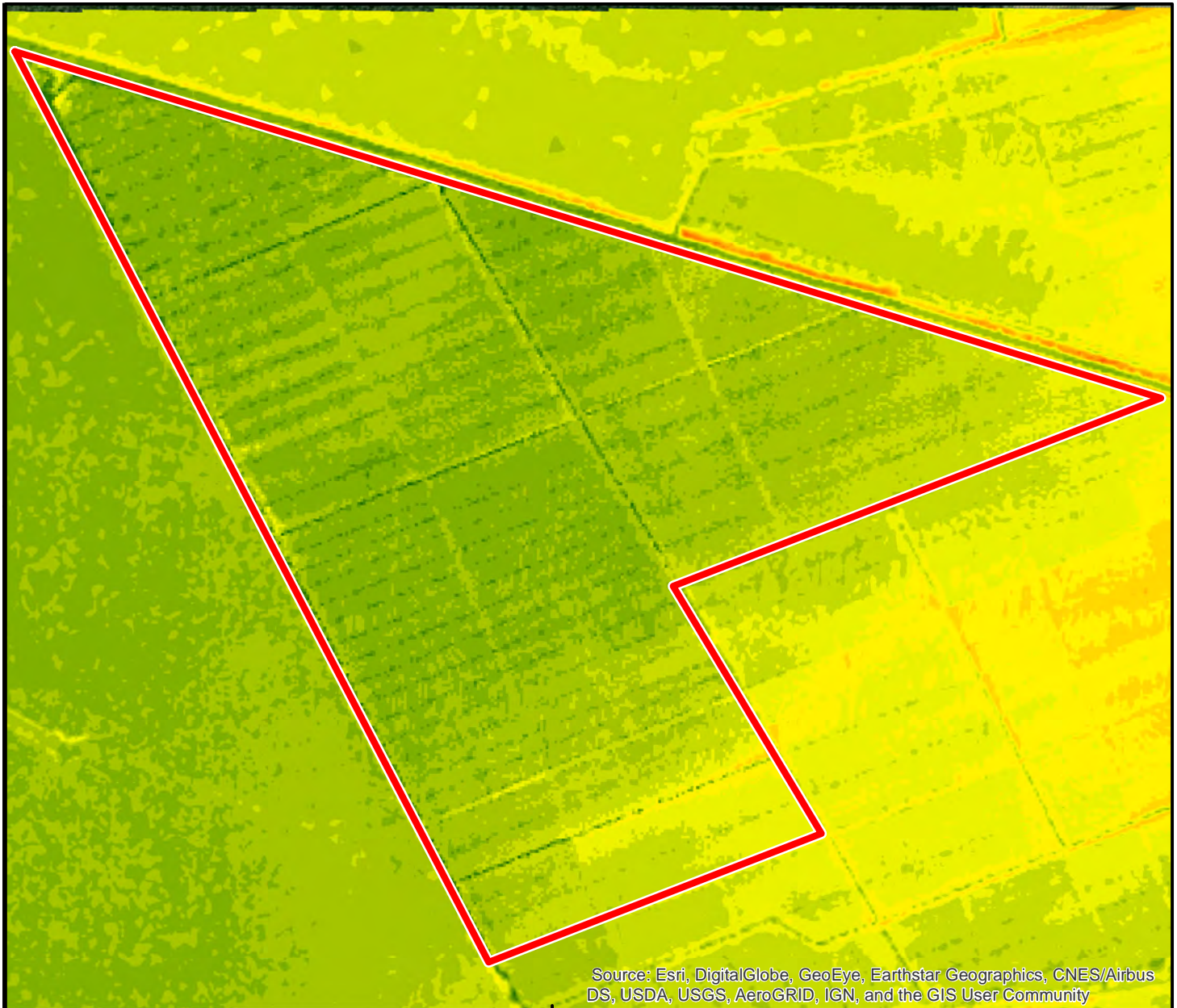
Assumption  
Parish



**CSRS**

CSRS, Inc.  
6767 Perkins Road  
Baton Rouge, LA 70809



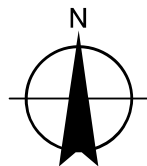
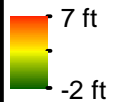


### Legend

 Survey Boundary

### LiDAR Data

LiDAR elevation within Survey Boundary



0.25 0.125 0 0.25



Miles

LiDAR data dervied from: <https://maps.ga.lsu.edu/lidar2000/>

Elm Hall Mitigation Bank

FIGURE  
NUMBER

9

LiDAR Map

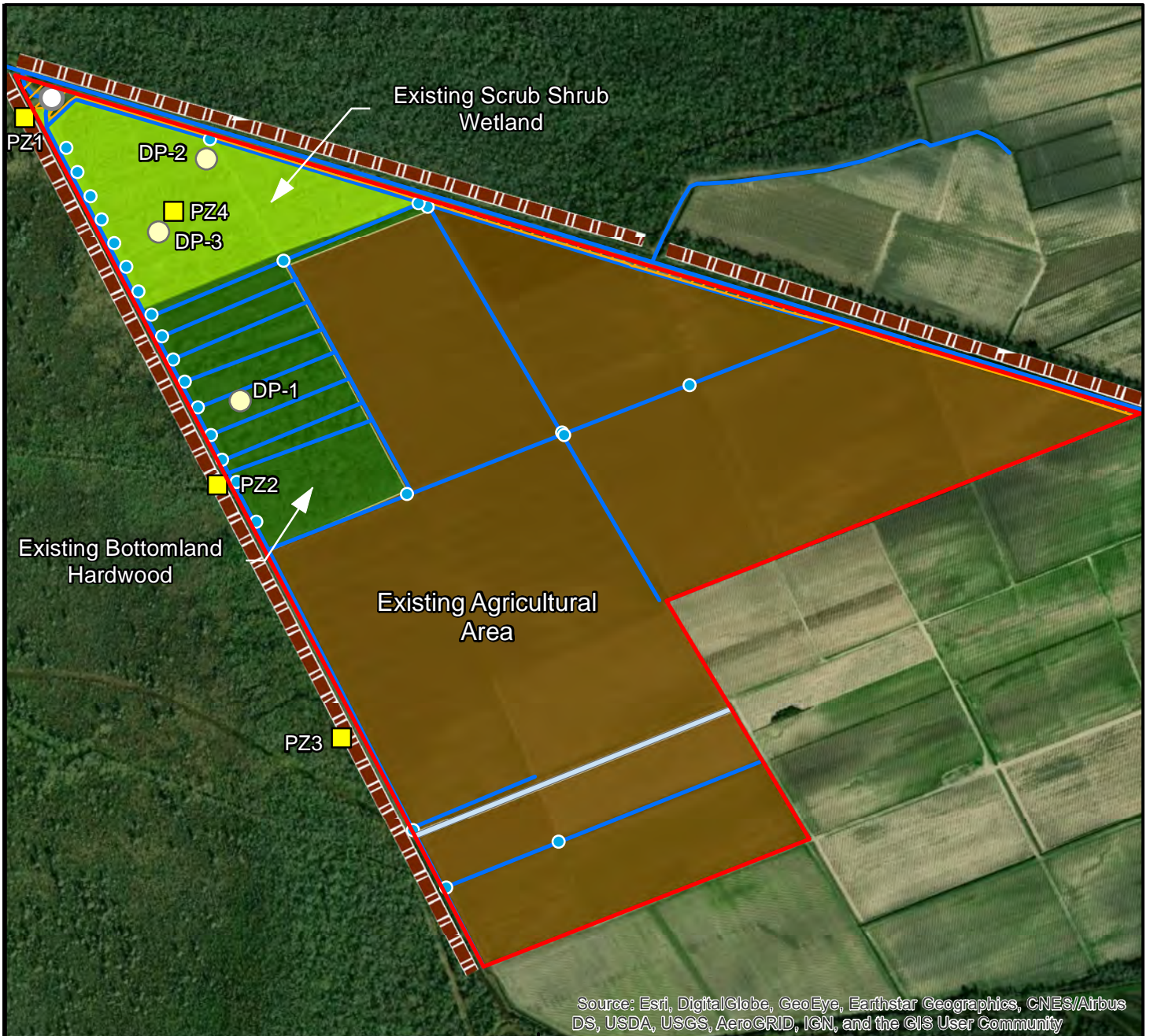
ecosystem  
renewal LLC



CSRS

CSRS, Inc.  
6767 Perkins Road  
Baton Rouge, LA 70809

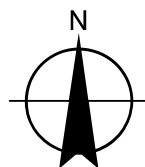




Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

#### Legend

- |                                                                                                                                                                          |                                                                                                                                                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <span style="border: 2px solid red; padding: 2px;"> </span> Site Boundary (305 Ac. ±)                                                                                    | <span style="background-color: brown; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Existing Agricultural Areas (234.1 Ac. ±)   |
| <span style="border: 1px solid blue; padding: 2px;"> </span> Existing Pipeline ROW (1.4 Ac. ±)                                                                           | <span style="color: blue;">●</span> Existing Culverts (to be removed)                                                                                                 |
| <span style="background-color: orange; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Pump House Road (3.9 Ac. ±)                   | <span style="background-color: yellow; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Water Level Gauges                         |
| <span style="color: blue;">—</span> Existing Drainage Features (10.7 Ac. ±)                                                                                              | <span style="border: 1px solid gray; border-radius: 50%; width: 15px; height: 10px; display: inline-block;"></span> Existing Pump                                     |
| <span style="background-color: lightgreen; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Existing Scrub Shrub Wetland (24.9 Ac. ±) | <span style="background-color: brown; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Existing Levee System (outside of boundary) |
| <span style="background-color: darkgreen; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Existing Bottomland Hardwood (30 Ac. ±)    |                                                                                                                                                                       |



#### Elm Hall Mitigation Bank

FIGURE  
NUMBER  
**10**

### Existing Conditions Map

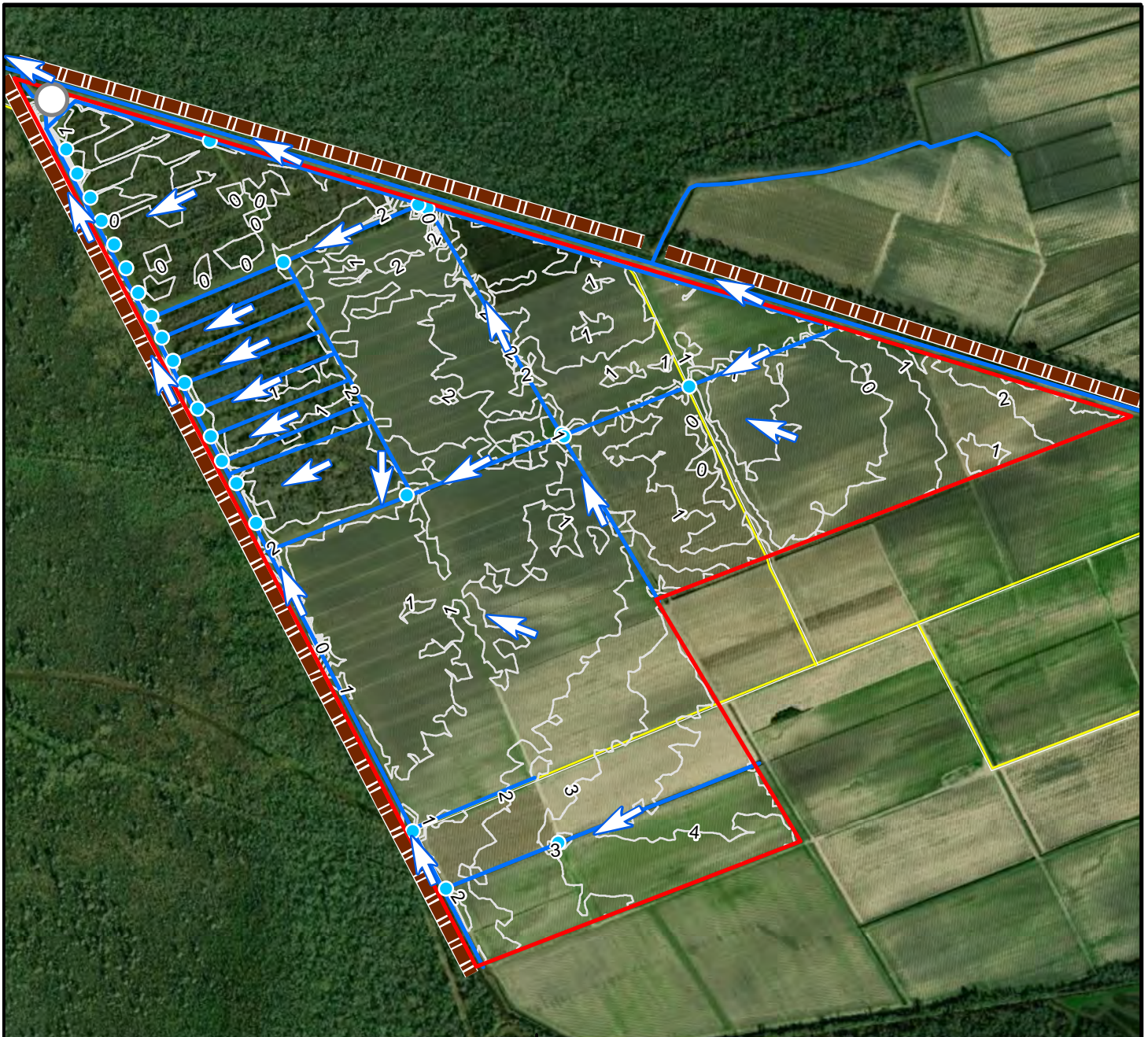


Assumption  
Parish

**CSRS**

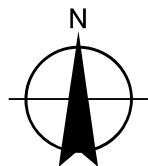
CSRS, Inc.  
6767 Perkins Road  
Baton Rouge, LA 70809





# Legend

- Existing Pump
- Existing Culverts (to be removed)
- Survey Boundary
- Existing Drainage Features
- Ground Elevation Contours
- Existing Levee System
- Local Roads



0.25 0.125 0 0.25  
Miles

Notes: Survey elevation data derived from A Limited Topographic Survey of a 305± acre tract located in sections 117, 118, 122, 128, 143, and 144, Township 13 South, Range 14 East, Assumption Parish Louisiana conducted by Pan American Engineers, LLC on behalf of Ecosystem Renewal, LLC.

Elm Hall Mitigation Bank

FIGURE  
NUMBER

11

## Existing Drainage Map

ecosystem  
renewal LLC



Assumption  
Parish

CSRS

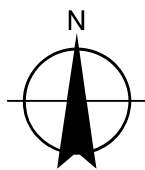
CSRS, Inc.  
6767 Perkins Road  
Baton Rouge, LA 70809





**Legend**

- Existing Pump
- Survey Boundary
- Existing culverts to be removed
- Proposed Borrow Area (18.6 Ac. ±)
- Levee to be removed
- Levee to remain
- Drainage to be backfilled to grade
- Drainage to remain
- Pipeline ROW (1.4 Ac. ±)
- Stream



Elm Hall Mitigation Bank

FIGURE  
NUMBER

12

**Proposed Hydrologic  
Restoration Map**

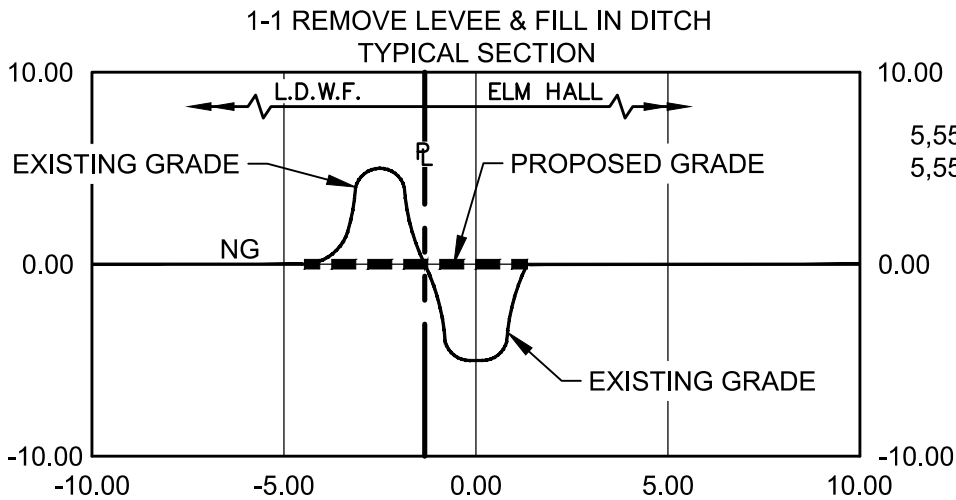
ecosystem  
renewal LLC



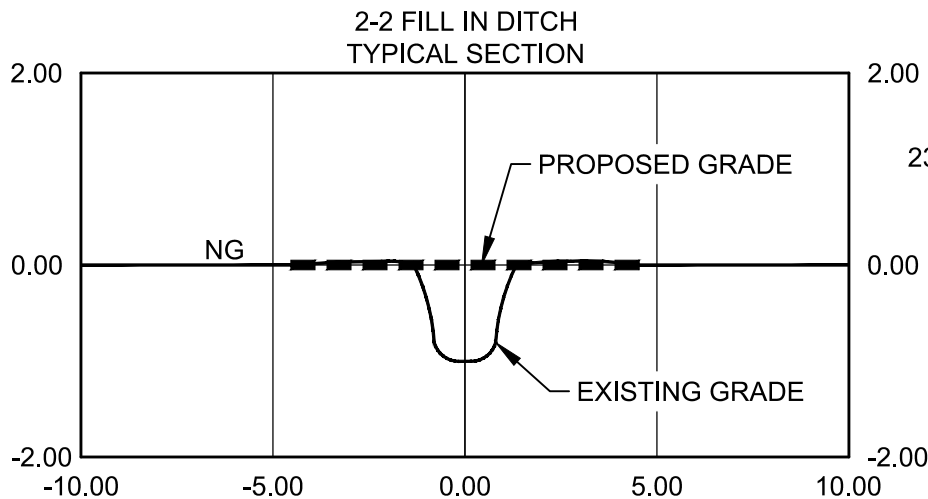
Assumption  
Parish

**CSRS**

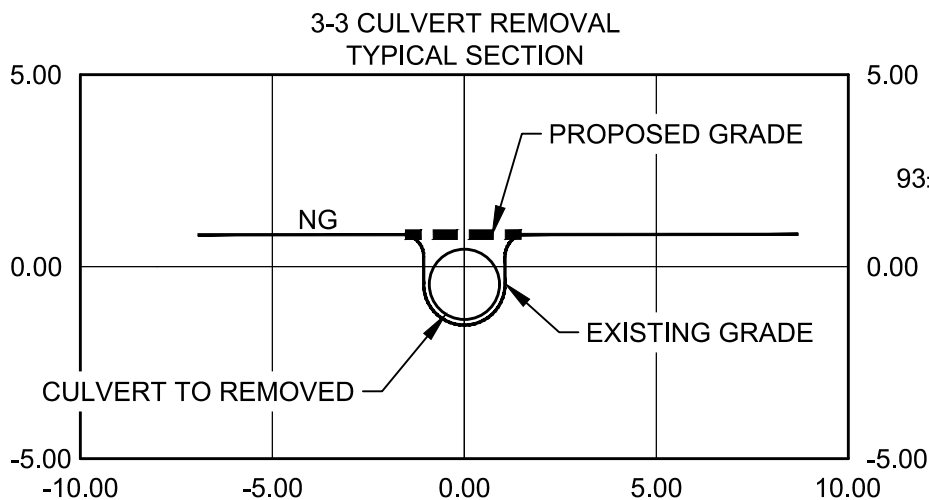
CSRS, Inc.  
6767 Perkins Road  
Baton Rouge, LA 70809



5,551 L.F± OF DITCH TO BE FILLED  
5,551 LF± OF LEVEE TO BE REMOVED

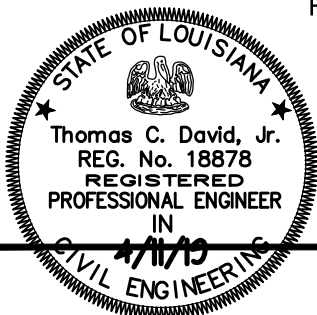


23,238± L.F OF DITCH TO BE FILLED



93± CULVERTS TO BE REMOVED

NATURAL GROUND, PROPOSED GRADES AND PROPERTY LINE SHOWN  
FOR INFORMATIONAL PURPOSES ONLY, ACTUAL MAY VARY



### Elm Hall Mitigation Bank

Lat: 29.9311, Long: -91.07777  
Sec. 117, 118, 122, 128, 143 & 144,  
T13S-R14E  
Assumption Parish, Louisiana

### TYPICAL CROSS-SECTIONS

Scale: N.T.S.

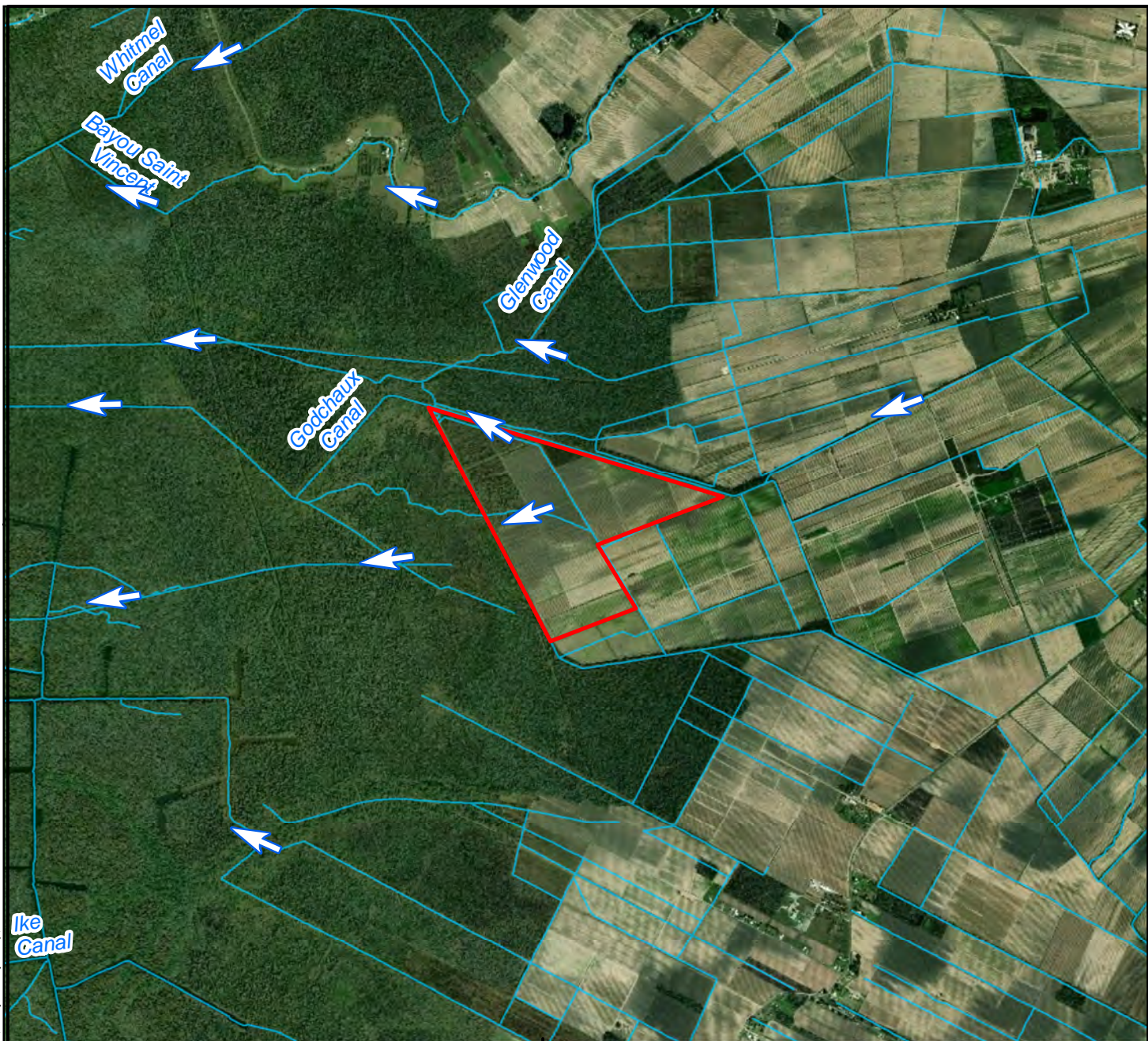
Date: 4/11/19

Figure  
No.



13

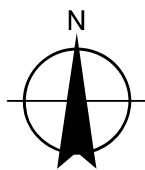


P:\217138\15\Permitting\GIS\8.5x11 figures\Figure 14 - Proposed Hydrologic Restoration Wide Map.mxd; Analyst: Mary Sharp; Date: 4/4/2019 3:49:41 PM



**Legend**

-  Survey Boundary
-  Stream



Elm Hall Mitigation Bank

FIGURE  
NUMBER  
**14**

**Regional Surface Water  
Regime Map**

ecosystem  
renewal LLC

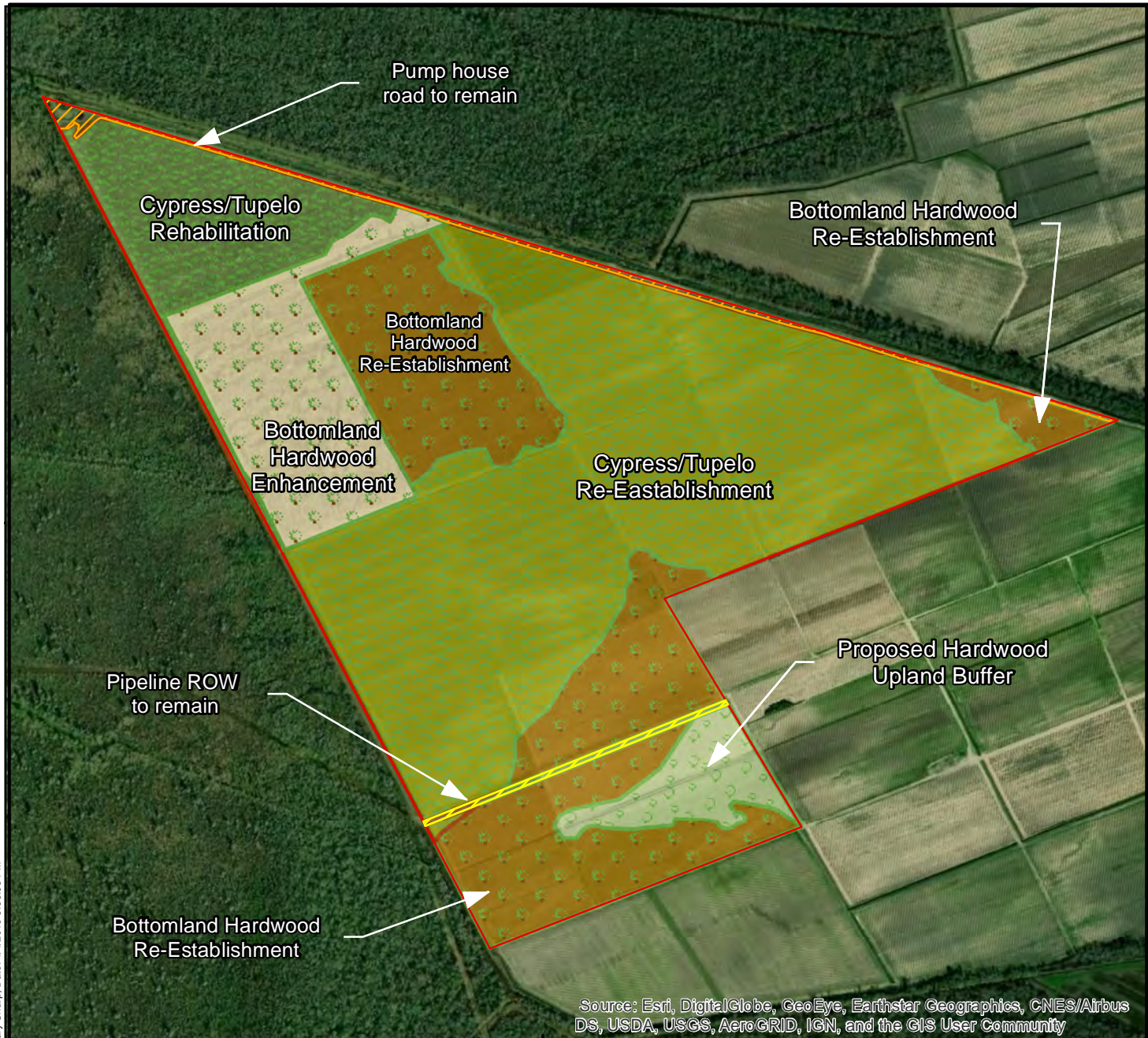


Assumption  
Parish

**CSRS**

CSRS, Inc.  
6767 Perkins Road  
Baton Rouge, LA 70809





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

#### Legend

- Pipeline ROW (1.4 Ac. ±)
- Site Boundary (305.0 Ac. ±)
- Pump House Road (3.9 Ac. ±)

#### Proposed Mitigation Type Vegetation

- Bottomland Hardwood Enhancement (33.4 Ac. ±)
- Bottomland Hardwood Re-Establishment (78.3 Ac. ±)
- Cypress/Tupelo Re-Establishment (148.6 Ac. ±)
- Cypress/Tupelo Rehabilitation (29.1 Ac. ±)
- Hardwood Upland Buffer (10.3 Ac. ±)



Elm Hall Mitigation Bank

FIGURE  
NUMBER

15

## Proposed Mitigation Type Map

ecosystem  
renewal LLC



Assumption  
Parish

**CSRS**

CSRS, Inc.  
6767 Perkins Road  
Baton Rouge, LA 70809

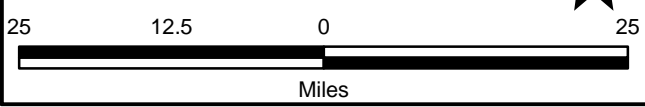
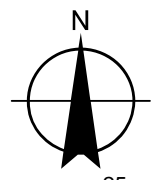


P:\21713815\Permitting\GIS\8.5x11 figures\Figure 16 - Proposed Service Area Map.mxd; Analyst: Mary Sharp; Date: 2/25/2019 2:54:23 PM



**Legend**

- ★ Site Boundary
- Terrebonne Watershed (HUC8: 08070300)
- Terrebonne Watershed (HUC8: 08090302)
- Louisiana Watersheds (HUC8)
- Major Waterbodies



Elm Hall Mitigation Bank

FIGURE  
NUMBER  
**16**

**Proposed Service  
Area Map**



Assumption  
Parish



CSRS, Inc.  
6767 Perkins Road  
Baton Rouge, LA 70809

# **ATTACHMENT A**

## **Approved Preliminary Jurisdictional Determination**





REPLY TO  
ATTENTION OF

**DEPARTMENT OF THE ARMY**  
**CORPS OF ENGINEERS, NEW ORLEANS DISTRICT**  
7400 LEAKE AVENUE  
NEW ORLEANS, LOUISIANA 70118

May 8, 2017

Operations Division  
Surveillance and Enforcement Section

Mr. David Templet  
D&S Environmental Services, Inc.  
PO Box 510  
French Settlement, LA 70733

Dear Mr. Templet:

Reference is made to your request, on behalf of Environmental Partners Group, LLC, for a U.S. Army Corps of Engineers' jurisdictional determination on property located in Section 13, Township 13 South, Range 13 East, and sections 117, 122, 128, 143, and 144, Township 13 South, Range 14 East, Assumption Parish, Louisiana (enclosed map). Specifically, this property is identified as Tract A of ELM Hall Trinity Plantation.

Based on review of recent maps, aerial photography, soils data, and information provided with your request, we have determined that part of the property is wetland and may be subject to Corps' jurisdiction. The approximate limits of the wetland are designated in red on the map. A Department of the Army (DA) permit under Section 404 of the Clean Water Act will be required prior to the deposition or redistribution of dredged or fill material into wetlands that are waters of the United States. Additionally, a DA permit will be required if you propose to deposit dredged or fill material into other waters subject to Corps' jurisdiction. Other waters that may be subject to Corps' jurisdiction are indicated in blue on the map.

You and your client are advised that this preliminary jurisdictional determination is valid for a period of 5 years from the date of this letter unless new information warrants revision prior to the expiration date or the District Commander has identified, after public notice and comment, that specific geographic areas with rapidly changing environmental conditions merit re-verification on a more frequent basis.

Should there be any questions concerning these matters, please contact Mr. Bill Nethery at (504) 862 1267 and reference our Account No. MVN 2017-00352-SQ. If you have specific questions regarding the permit process or permit applications, please contact our Central Evaluation Section at (504) 862 1581.

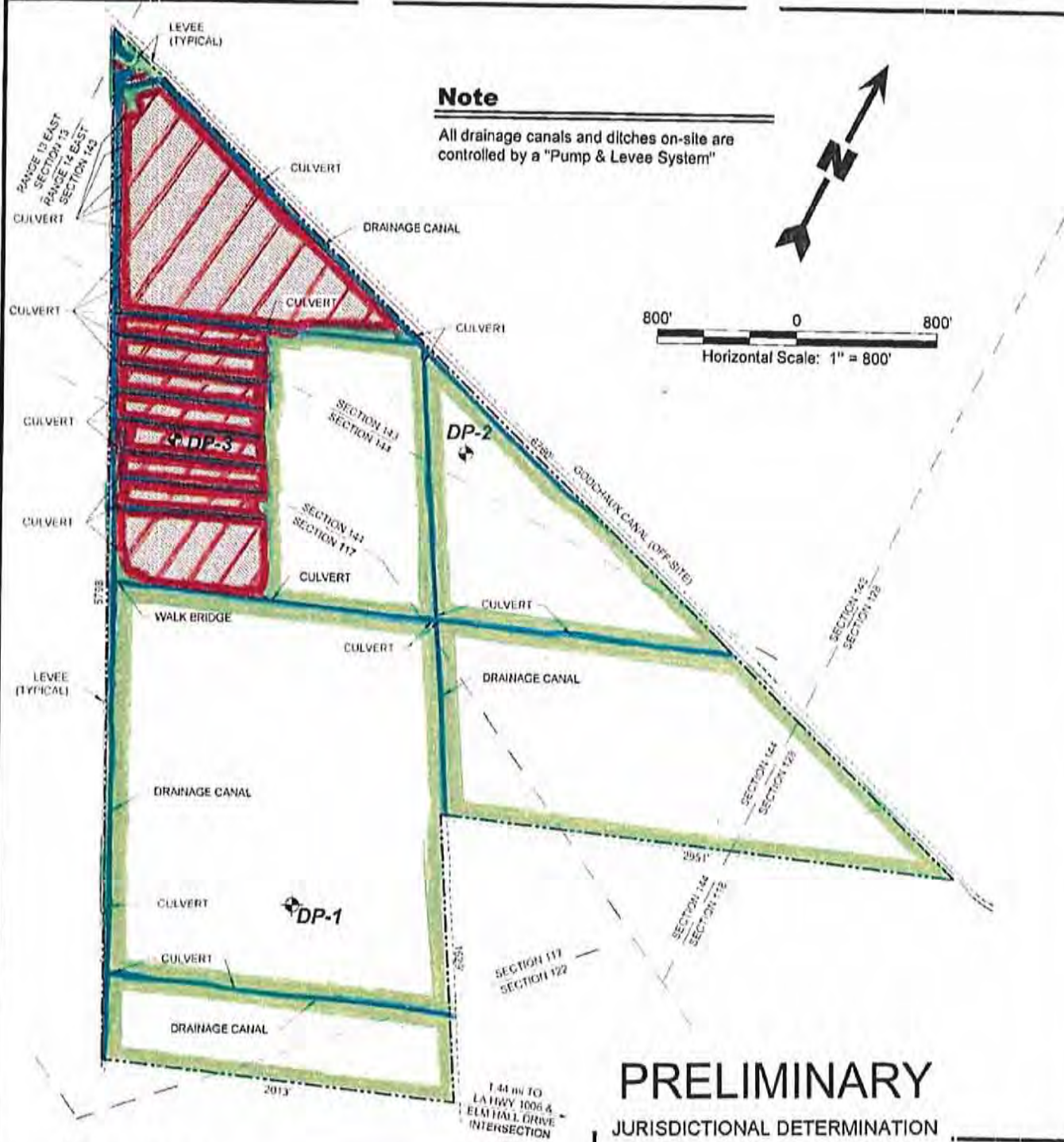
Sincerely,  
**OBERLIES.BRIAN.MC**  
**INNIS.1230779739**

for Martin S. Mayer  
Chief, Regulatory Branch

Digitally signed by OBERLIES.BRIAN.MC  
INNIS.1230779739  
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI,  
ou=USA, cn=OBERLIES.BRIAN.MC  
INNIS.1230779739  
Date: 2017.05.08 08:30:48 -05'00'

Enclosures

Y  
TION



**Leg**

**USACE**

FSV / IH x Date: April 26, 2017

Botanist: William Nethery

Requestor: David Templet obo Env. Partn. Group

# MVN- MVN 2017-00352-SQ

**DP**

**WETLAND**

**- Non-Jurisdictional**

**- non-wetland waters**

# PRELIMINARY

JURISDICTIONAL DETERMINATION

Environmental Partners Group, L.L.C.

Tract A - Elm Hall Trinity Plantation

## Overall Jurisdictional Wetlands Map

Assumption Parish, Louisiana

**D & S**  
ENVIRONMENTAL SERVICES, INC.

Project No.: 02-2017-JDM

Date: 01-11-2017

Figure No.: 2



**APPENDIX II**

**SITE PHOTOGRAPHS**



Vegetation indicative of Data Plot-1 (non-wetland).



Hydric soil indicative of the Schriever series found within Data Plot-1.





Vegetation indicative of Data Plot-2 (jurisdictional wetland).



Hydric soil indicative of the Schriever series found within Data Plot-2.





Vegetation indicative of Data Plot-3 (non-wetland).



Hydric soil indicative of the Schriever series found within Data Plot-3.





"Other Waters of the U.S." (Section 404) found on-site (primary pump canal).



"Other Waters of the U.S." (Section 404) found on-site (secondary pump canal).



"Other Waters of the U.S." (Section 404) found on-site (secondary pump canal).



"Other Waters of the U.S." (Section 404) found on-site (secondary pump canal).





"Other Waters of the U.S." (Section 404) found on-site (remnant functioning pump canal).



Pump station found on-site.





Pumping station gated discharge.



Primary pump canal depth gauge.





Remnant pumping station (non-functioning).

# Elm Hall

Historic Aerial 1940

## Legend

Elm Hall option

Google earth

© 2016 Google





(a)  $20^\circ$  (b)  $20^\circ$  (c)  $20^\circ$  (d)  $20^\circ$

## **ATTACHMENT B**

**Louisiana Department of  
Wildlife and Fisheries Letter  
of No Objection and Letter  
of Authorization**



**JOHN BEL EDWARDS  
GOVERNOR**



**JACK MONToucET  
SECRETARY**

PO BOX 98000 | BATON ROUGE LA | 70898

September 13, 2018

**VIA EMAIL AND U.S. MAIL**

Environmental Partners Group, LLC  
Mr. Danny Moran, Manager  
4520 S. Sherwood Forest Blvd.  
#104-241  
Baton Rouge, LA 70816

**Re: LDWF's Letter of No Objection to the proposed donation of mitigation property  
and to the removal of the levee from tract located within Elm Hall WMA**

Sirs:

The Louisiana Department of Wildlife and Fisheries ("LDWF") hereby supports the proposed donation of the mitigation property by applicant Ecosystem Renewal and its subsequent incorporation into Elm Hall Wildlife Management Area (WMA). Further, LDWF does not have any objection to the removal of some or all of the existing levee located partially or wholly within Elm Hall WMA so long as the following is agreed upon:

- mitigation bank long-term maintenance and protection endowment is transferred to LDWF;
- property is donated to LDWF with clear title to patent;
- LDWF supplied signage is placed around new boundary per LDWF direction;
- location where levee is removed and associated ditch filled shall be restored to appropriate bottomland hardwoods and/or cypress tupelo swamp, under consultation and guidance from LDWF Forestry Program;
- LDWF has no liability for any failure of bottomland reforestation on the mitigation project site; and,
- LDWF is to manage the succeeding forest structure on the mitigation project site according to its General Forest Management Plan for Wildlife Management Areas.

LDWF only issues this Letter of No Objection pending a final and executed agreement between Ecosystem Renewal and LDWF on the mitigation bank property donation. If Ecosystem Renewal and LDWF do not come to a final agreement on this mitigation bank property donation, then all outstanding proposed activities by Environmental Partners Group, LLC and/or LDWF in furtherance of this endeavor will cease.

If you have any questions or would like to set up a meeting, please feel free to contact Mr. Kyle Balkum at 225-765-2819.

Sincerely,

A handwritten signature in black ink, appearing to read "Jack Montoucet", with a long horizontal flourish extending to the right.

Jack Montoucet  
Secretary

JM/afl

Attachment

cc: Mr. Randell Myers  
Mr. Kyle Balkum  
Mr. Kenny Ribbeck  
Ms. Yolanda Martin



JOHN BEL EDWARDS  
GOVERNOR



JACK MONToucET  
SECRETARY

PO BOX 98000 | BATON ROUGE LA | 70898

April 11, 2019

CSRS, Inc.  
6767 Perkins Road, Suite 200  
Baton Rouge, LA 70808  
Attn: Curt Schaeffer, C.E.

RE: Letter of Authorization  
Environmental Partners Group, LLC - Elm Hall Mitigation Bank levee and culvert removal  
Elm Hall Wildlife Management Area

Dear Mr. Schaeffer:


This is in response to your project proposal to conduct earthwork on Elm Hall Wildlife Management Area (WMA) in Assumption Parish. The Department has reviewed your request and will have no objection to proceeding with your proposal provided that the following conditions are met:

1. Prior to any activities on the WMA, Environmental Partners Group shall coordinate all activities with WMA Manager, Mr. Tony Vidrine, or his assigns. Mr. Vidrine can be reached by phone at 337-735-8682 or by email at [tvidrine@wlf.la.gov](mailto:tvidrine@wlf.la.gov).
2. No activities will be allowed within the hunting seasons unless specifically approved by Mr. Vidrine or his assigns.
3. Environmental Partners Group shall be responsible for repairing any damages to the WMA as a result of their operations.
4. GRANTEE (i.e., Environmental Partners Group) shall hold harmless, defend and indemnify GRANTOR, the state, the Louisiana Wildlife and Fisheries Commission, their assigns, agents, and employees (including volunteers) against any and all claims for property damage and bodily injury (including death) which may arise as a result of the proposed project, including all claims which are alleged to be a result of the negligence of the GRANTOR, the state, the Wildlife and Fisheries Commission, their assigns, agents, or employees (including volunteers).

**This letter of authorization shall expire if the authorized activity has not begun within 24 months of the date of this letter.**

If you have any questions concerning the above matters please contact Mr. Cornelius Williams at 225-763-8807.

Sincerely,



Randall S. Myers  
Assistant Secretary

Attachment

c: Tony Vidrine – LDWF Manager  
Steven David – LDWF Supervisor  
Danny Moran - Environmental Partners Group

# **ATTACHMENT C**

## **Photographic Documentation**





Photo 1: Aerial drone image from south west corner of property, facing north.



Photo 2: Aerial drone image from northwest corner, facing south.





Photo 3: Representative photo of existing forested area on the site.



Photo 4: Representative photo of Agricultural fields on the site.



Photo 5: Representative photo of Elm Hall Wildlife Management Area just west of the property levee.

# **ATTACHMENT D**

## **Topographic Survey**





VICINITY MAP  
NOT TO SCALE

#### SURVEY REFERENCE:

- PLAT SHOWING SUBDIVISION OF A PORTION OF PROPERTY OWNED BY ELM HALL PARTNERSHIP INTO TRACT A AND THE REMAINDER OF PROPERTY OWNED BY ELM HALL PARTNERSHIP, BY: ACADIA LAND SURVEYING, LLC.

#### BASIS OF BEARINGS:

- ELEVATIONS INDICATED HEREON ARE RELATIVE TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVOD88), GEOID12A, AND WERE DERIVED USING GULFNET REAL-TIME NETWORK (RTN) IN CONJUNCTION WITH DONALDSONVILLE LA CORS MIP (AWES), A CONTINUOUSLY OPERATING REFERENCE STATION (CORS).

#### FLOOD NOTE:

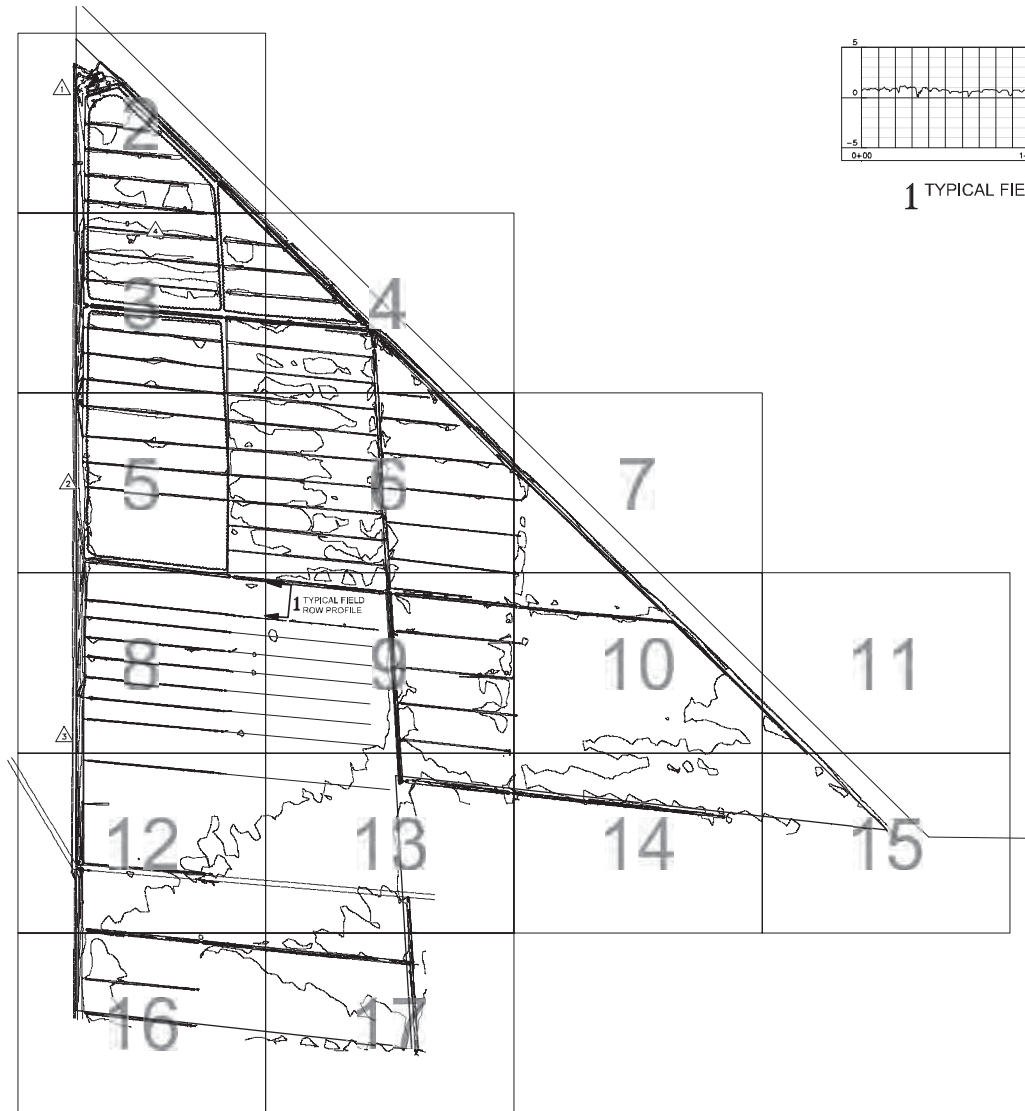
- THE SURVEYED LOTS ARE LOCATED IN ZONE "AH" (SHADED) PER THE FEMA FLOOD INSURANCE RATE MAP FOR ASSUMPTION PARISH, LOUISIANA (UNINCORPORATED AREAS), COMMUNITY PANEL NUMBER 22001701500, EFFECTIVE DATE: NOVEMBER 5, 1997.
- ZONE "AH" (SHADED) - AREAS OF 100-YEAR SHALLOW FLOODING WHERE DEPTHS ARE BETWEEN ONE (1) AND THREE (3) FEET; BASE FLOOD ELEVATIONS ARE SHOWN, BUT NO FLOOD HAZARD FACTORS ARE DETERMINED.

#### NOTES:

- RESEARCH OF THE RECORDS OF ASSUMPTION PARISH FOR SERVITUDES OR RIGHT-OF-WAYS WHICH MAY ENCUMBER THE SURVEYED TRACT WAS NOT PERFORMED BY, NOR REQUESTED OF PAN AMERICAN ENGINEERS, LLC.
- INFORMATION REGARDING THE PRESENCE, SIZE AND LOCATION OF UNDERGROUND UTILITIES IS SHOWN HEREON. THIS INFORMATION HAS BEEN SHOWN BASED ON THE LOCATION OF THE ABOVE-GROUND APPURTENANCES, AVAILABLE DESIGN PLANS, AND FLAGS AND PAINT PLACED BY THE UTILITY PROTECTION SERVICE. NO CERTIFICATION IS MADE AS TO THE ACCURACY OR THOROUGHNESS OF THE INFORMATION CONCERNING UNDERGROUND UTILITIES AND STRUCTURES SHOWN HEREON. PER LOUISIANA LAW, THE UNDERGROUND UTILITIES PROTECTION SERVICE MUST BE CALLED PRIOR TO THE COMMENCEMENT OF ANY AND ALL EARTH DISTURBING ACTIVITIES.
- OPEN FIELD AREA ELEVATIONS WERE OBTAINED BY PAN AMERICAN ENGINEERS, LLC BETWEEN MARCH 5, 2018 AND MARCH 9, 2018.
- OPEN FIELD AREA ELEVATIONS WERE OBTAINED BY RU FUSELIER & ASSOCIATES, LLC, USING PHOTOGRAMMETRY BETWEEN MARCH 9, 2019 AND MARCH 10, 2019.
- PROPERTY LINES SHOWN HEREON ARE APPROXIMATE AND WERE TAKEN FROM THE ABOVE REFERENCED SURVEY AND WERE NOT FIELD VERIFIED.

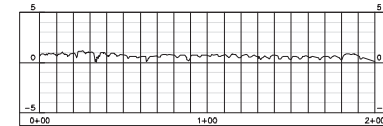
#### LEGEND:

	APPARENT PROPERTY LINE
	APPARENT EASEMENT
	CONTOUR LINE
	WOODS EDGE
	SPOT ELEVATION
	CORRUGATED METAL PIPE
	REINFORCED CONCRETE PIPE
	STEEL
	PVC
	PIEZOMETER LOCATION AND DESIGNATOR



#### PIEZOMETER SCHEDULE

PIEZOMETER #	TOP OF PIPE ELEVATION	WATER SURFACE ELEVATION	NATURAL GROUND LEVEL	LATITUDE	LONGITUDE	DATE
1	5.57'	1.65'	0.76'	29.93605	-91.08733	MARCH 5-9, 2018
2	5.26'	1.74'	0.62'	29.93035	-91.08382	MARCH 5-9, 2018
3	5.54'	1.77'	0.74'	29.92663	-91.08169	MARCH 5-9, 2018
4	3.80'	N/A	-0.04'	29.93468	-91.08454	MARCH 5-9, 2018



1 TYPICAL FIELD ROW PROFILE

300 0 300 600 900 Feet  
BAR SCALE NOT INTENDED FOR CRITICAL DIMENSIONS



THOMAS C. DAVIS  
SURVEYOR  
STATE OF LOUISIANA  
NO. 438  
EXP. 9-30-2023

FIELD DATE: 3/9/18

DRAWN BY: T.C.D.

CHECKED: T.C.D.

JOB NO.: 11001

DWG. NO.: 10313

FILE NO.: 2018-02

SCALE: SHOWN

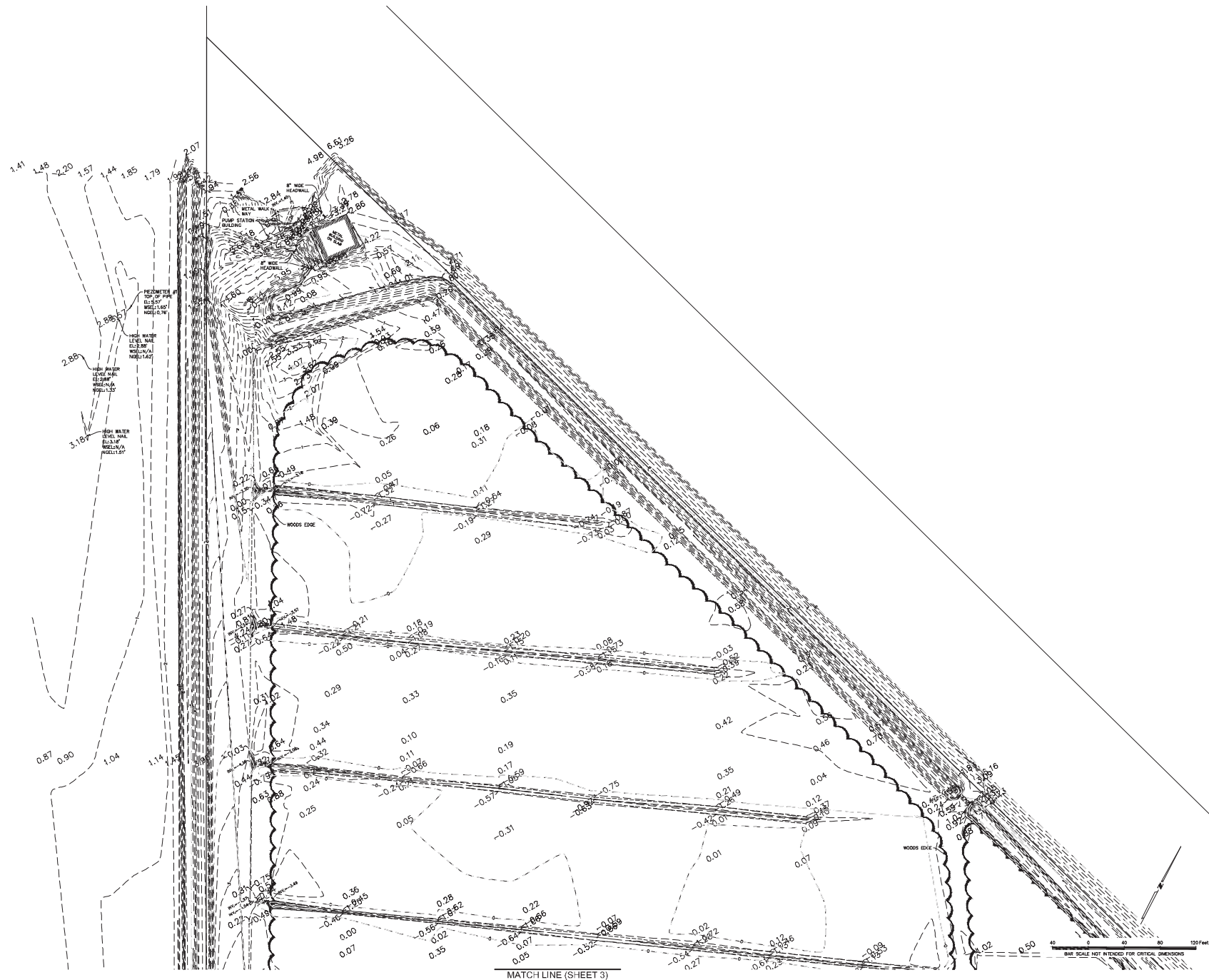
REVISION: DATE:

OWNER: ECO SYSTEM RENEWAL, LLC  
PROJECT: A LIMITED TOPOGRAPHIC SURVEY OF A 305+/- ACRE TRACT LOCATED IN SECTIONS 117, 118, 122, 128, 143, AND 144, TOWNSHIP 13 SOUTH, RANGE 14 EAST, ASSUMPTION PARISH, LOUISIANA

SHEET NUMBER

1  
OF 19

FILE PATH: S:\11001 Ecogystem Renewal Eia\fig1\TOP.dwg



THOMAS C. DAVIS  
LICENSE NO. 4033  
STATE OF LOUISIANA  
REGISTERED PROFESSIONAL ENGINEER  
MECHANICAL ENGINEERING  
EXPIRATION DATE 12/31/2018  
OFFICE: 1717 JACKSON STREET, ALEXANDRIA, LA 71301  
PHONE: (504) 833-1111  
FAX: (504) 833-1112  
EMAIL: TCD@PANAMERICANENGINEERS.COM

FIELD DATE	3/9/18
DRAWN BY	T.C.D.
CHECKED	T.C.D.
JOB NO.	11001
DWG. NO.	10313
FILE NO.	2018-02
SCALE	SHOWN

REVISION	DATE

OWNER: ECO SYSTEM RENEWAL, LLC  
PROJECT: A LIMITED TOPOGRAPHIC SURVEY OF A 305+ ACRE TRACT LOCATED IN SECTIONS 117, 118, 122, 128, 143, AND 144, TOWNSHIP 13 SOUTH, RANGE 14 EAST, ASSUMPTION PARISH, LOUISIANA

SHEET NUMBER  
**2**  
OF 19

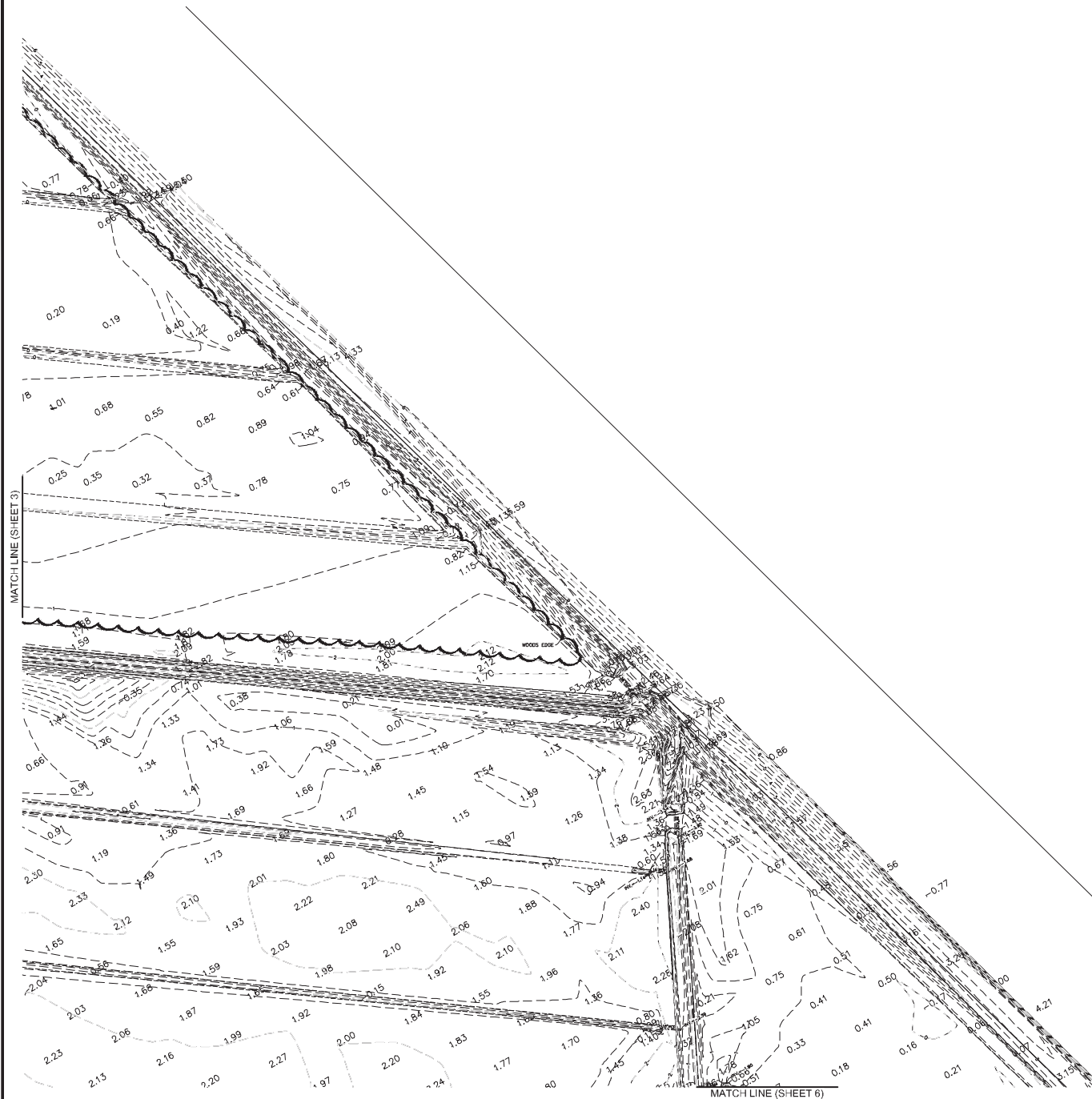


**PAN AMERICAN ENGINEERS, LLC**  
P.O. BOX 8889 / 1717 JACKSON STREET  
ALEXANDRIA, LA. 71301  
713-833-1111





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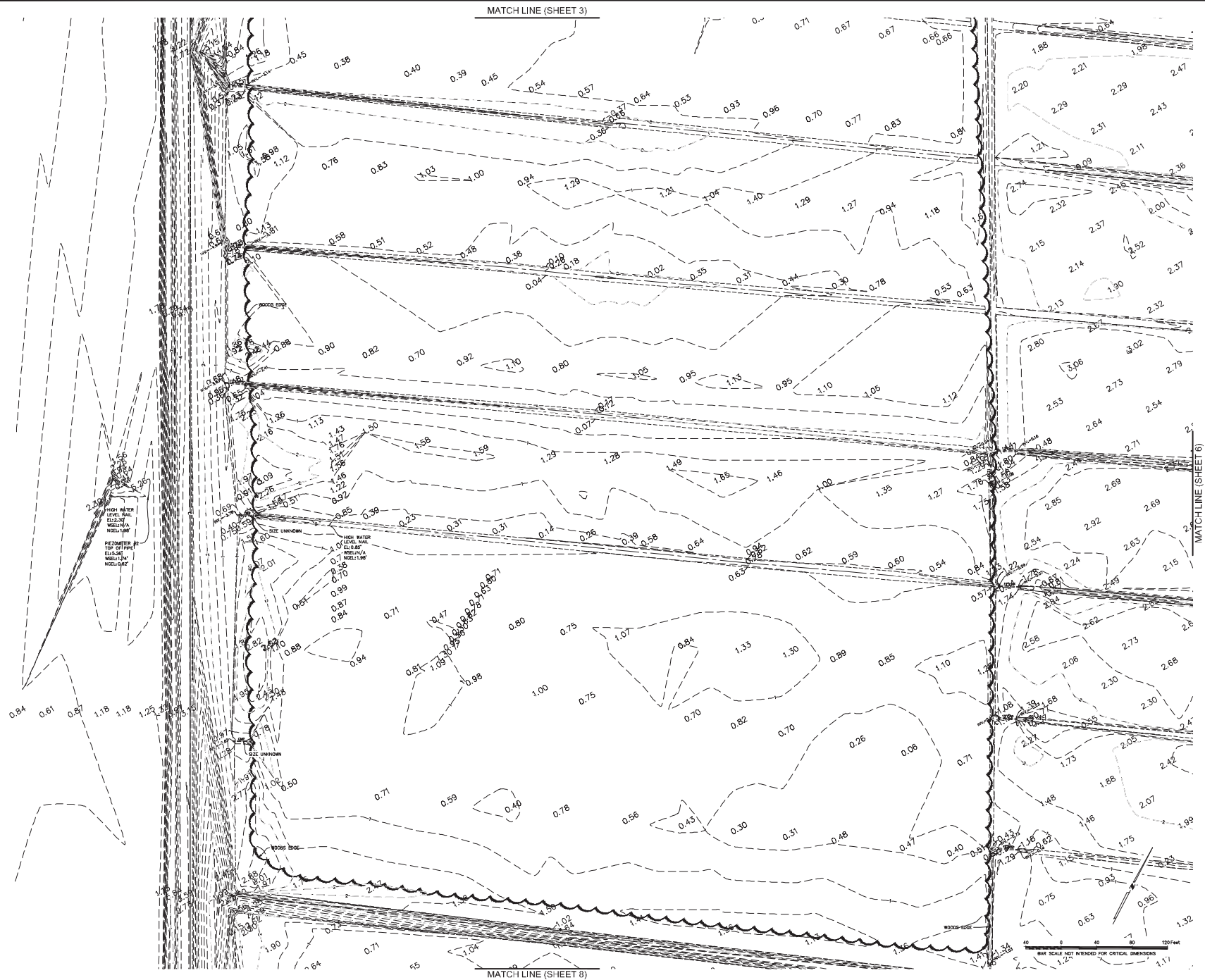
THOMAS C. DAVIS  
No. 433  
STATE OF LOUISIANA  
REGISTERED PROFESSIONAL ENGINEER  
CIVIL ENGINEERING  
EXPIRATION DATE 12/31/2018  
OFFICE: 1717 JACKSON STREET, ALEXANDRIA, LA 71304  
PHONE: (504) 833-1111  
FAX: (504) 833-1112  
CELL: (504) 833-1113  
EMAIL: tcdavis@panameng.com

FIELD DATE	3/9/18
DRAWN BY	T.C.D.
CHECKED	T.C.D.
JOB NO.	11001
DWG. NO.	10313
FILE NO.	2018-02
SCALE	SHOWN

REVISION	DATE

OWNER: ECO SYSTEM RENEWAL, LLC  
PROJECT: A LIMITED TOPOGRAPHIC SURVEY OF A 305± ACRE TRACT LOCATED IN SECTIONS 117, 118, 122, 128, 143, AND 144, TOWNSHIP 13 SOUTH, RANGE 14 EAST, ASSUMPTION PARISH, LOUISIANA

SHEET NUMBER  
**4**  
OF 19



THOMAS C. DAVIS  
No. 403  
State of Louisiana  
Mechanical Engineering

FIELD DATE: 3/9/18  
DRAWN BY: T.C.D.  
CHECKED: T.C.D.  
JOB NO.: 11001  
DWS. NO.: 10313  
FILE NO.: 2018-02  
SCALE: SHOWN

REVISION	DATE

OWNER: ECO SYSTEM RENEWAL, LLC  
PROJECT: A LIMITED TOPOGRAPHIC SURVEY OF A 305+ ACRE TRACT LOCATED IN SECTIONS 117, 118, 122, 128, 143, AND 144, TOWNSHIP 13 SOUTH, RANGE 14 EAST, ASSUMPTION PARISH, LOUISIANA

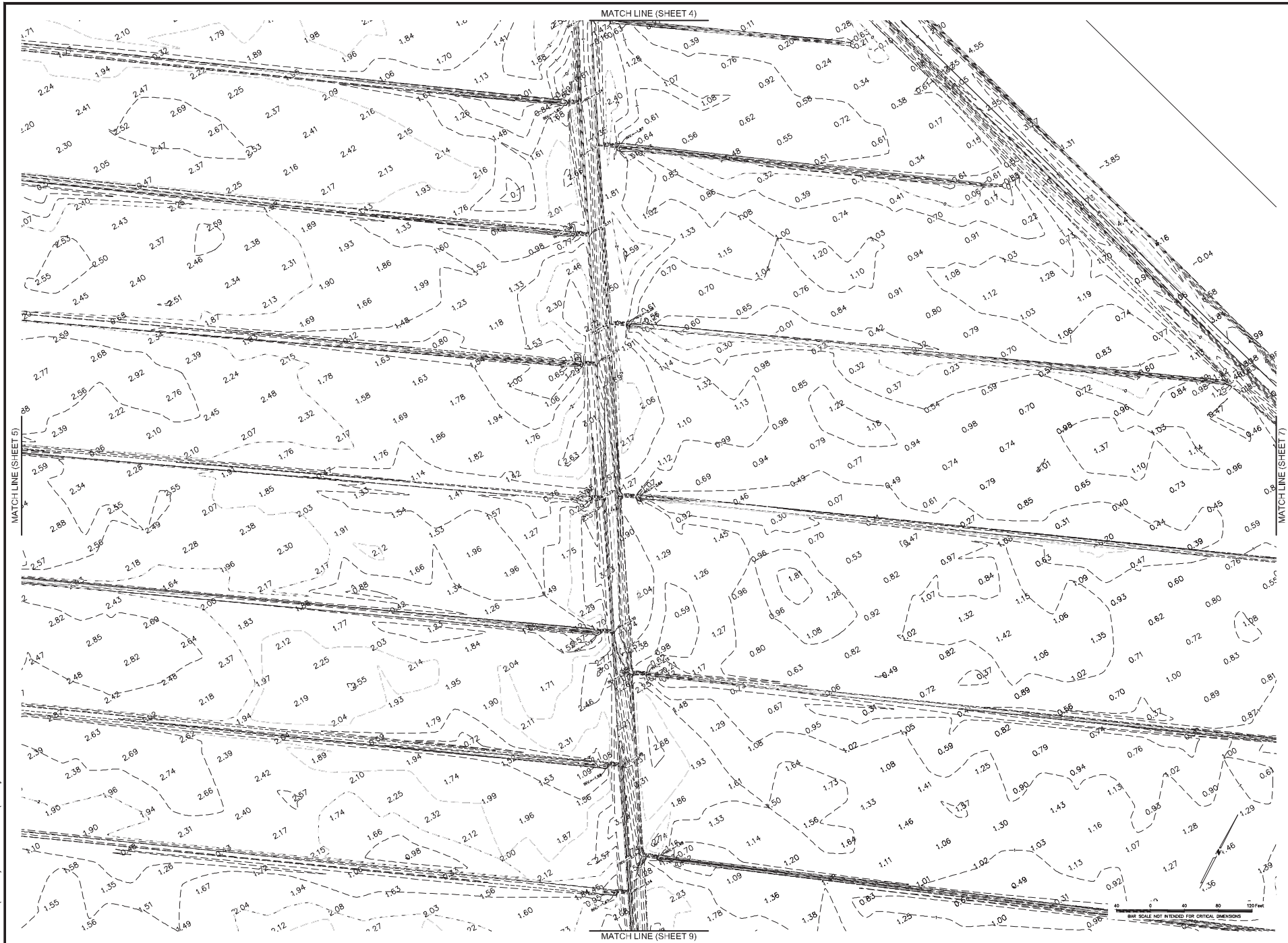
OWNER: ECO SYSTEM RENEWAL, LLC  
PROJECT: A LIMITED TOPOGRAPHIC SURVEY OF A 305+ ACRE TRACT LOCATED IN SECTIONS 117, 118, 122, 128, 143, AND 144, TOWNSHIP 13 SOUTH, RANGE 14 EAST, ASSUMPTION PARISH, LOUISIANA

SHEET NUMBER  
5  
OF 19



**PAN AMERICAN ENGINEERS, L.L.C.**  
P.O. BOX 888 / 7717 JACKSON STREET  
ALEXANDRIA, LA. 71308

FILE PATH: S:\11001 Ecogreen Renewal Lin Imp\TOPG.dwg



THOMAS C. DAVIS  
No. 453  
State of Louisiana  
Mechanical Engineering  
Exp. 12/31/2020

FIELD DATE: 3/9/18  
DRAWN BY: T.C.D.  
CHECKED: T.C.D.  
JOB NO.: 11001  
DWS. NO.: 10313  
FILE NO.: 2018-02  
SCALE: SHOWN

REVISION	DATE

OWNER: ECO SYSTEM RENEWAL, LLC  
PROJECT: A LIMITED TOPOGRAPHIC SURVEY OF A 305+ ACRE TRACT LOCATED IN SECTIONS 117, 118, 122, 128, 143, AND 144, TOWNSHIP 13 SOUTH, RANGE 14 EAST, ASSUMPTION PARISH, LOUISIANA

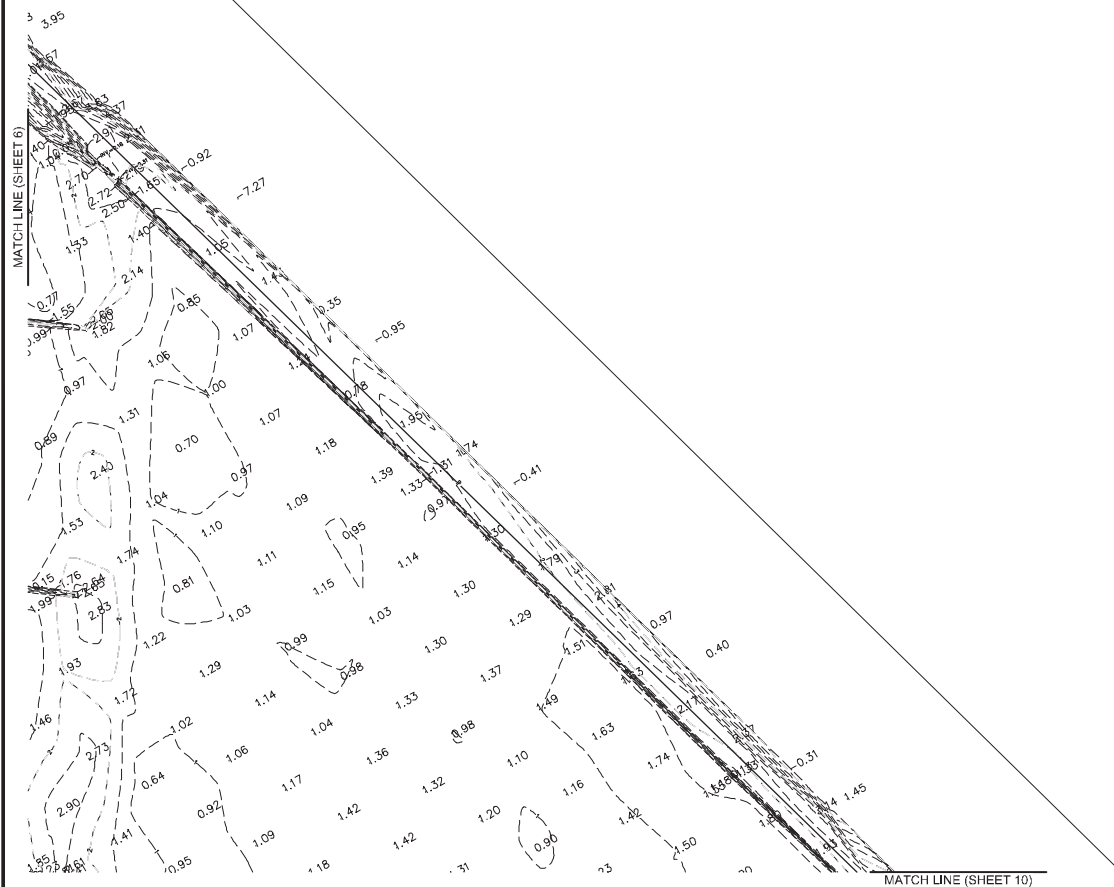
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**6**  
OF 19



**PAN AMERICAN ENGINEERS, L.L.C.**  
P.O. BOX 889 / 7717 JACKSON STREET  
ALEXANDRIA, LA. 71308



FILE PATH: S:\11001 EcologyRenewal\11001.dwg



40 0 80 120 Feet  
BAR SCALE NOT INTENDED FOR CRITICAL DIMENSIONS



THOMAS C. DAVIS  
No. 433  
STATE OF LOUISIANA  
Professional Engineer  
Civil Engineering  
My Commission Expires 12/31/2018  
I hereby certify that I am the author of the design and drawings herein and that I am a duly Licensed Professional Engineer in the State of Louisiana.  
THOMAS C. DAVIS  
11/1/2018

FIELD DATE	3/9/18
DRAWN BY	T.C.D.
CHECKED	T.C.D.
JOB NO.	11001
DWG. NO.	10313
FILE NO.	2018-02
SCALE	SHOWN

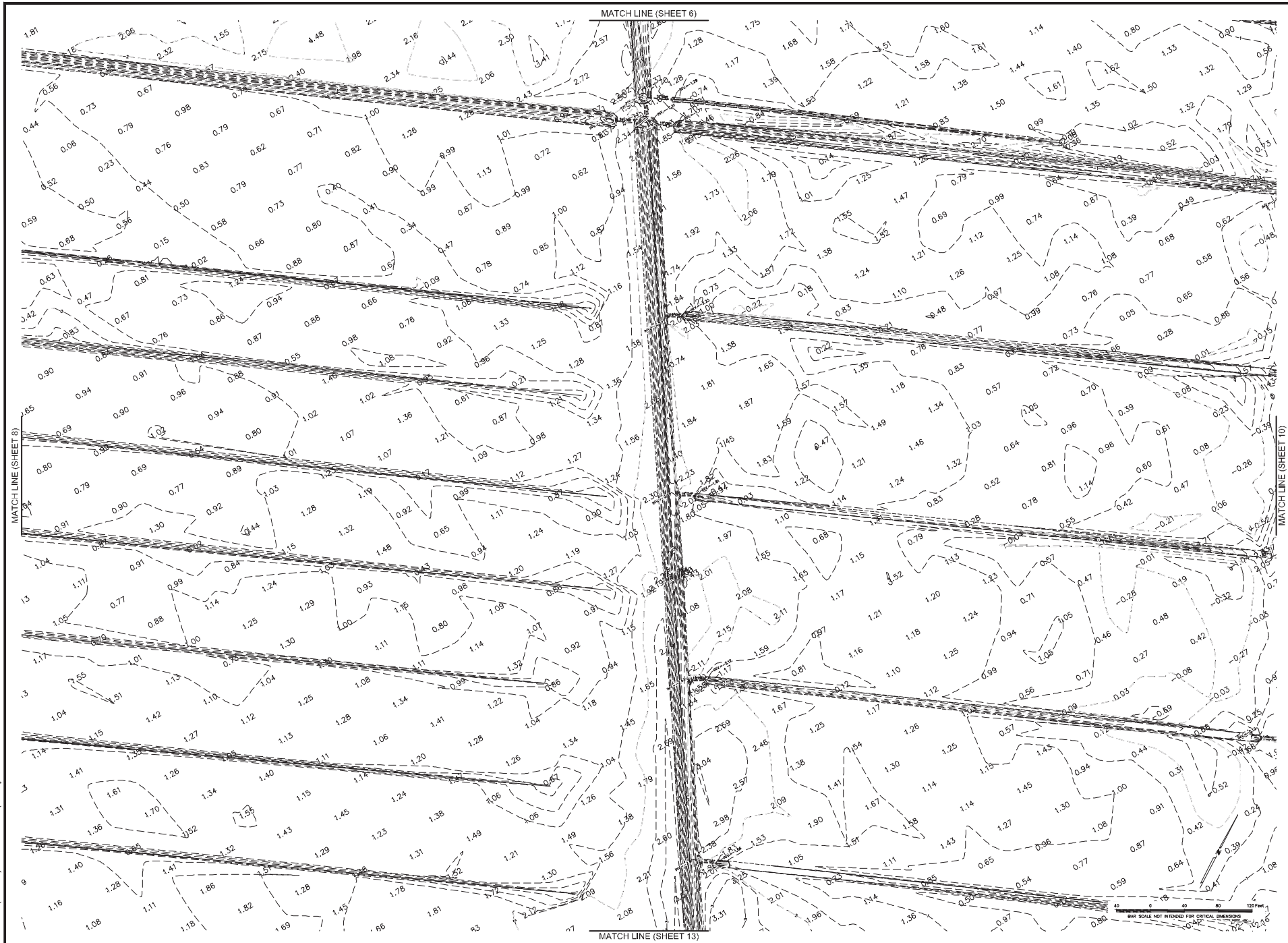
REVISION	DATE

OWNER: ECO SYSTEM RENEWAL, LLC  
PROJECT: A LIMITED TOPOGRAPHIC SURVEY OF A 305± ACRE TRACT LOCATED IN SECTIONS 117, 118, 122, 128, 143, AND 144, TOWNSHIP 13 SOUTH, RANGE 14 EAST, ASSUMPTION PARISH, LOUISIANA

SHEET NUMBER  
7  
OF 19



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**PROJECT INFORMATION**

FIELD DATE: 3/9/18

DRAWN BY: T.C.D.

CHECKED: T.C.D.

JOB NO.: 11001

DWS. NO.: 10313

FILE NO.: 2018-02

SCALE: SHOWN

**REVISION**

REVISION	DATE

**OWNER:** ECO SYSTEM RENEWAL, LLC

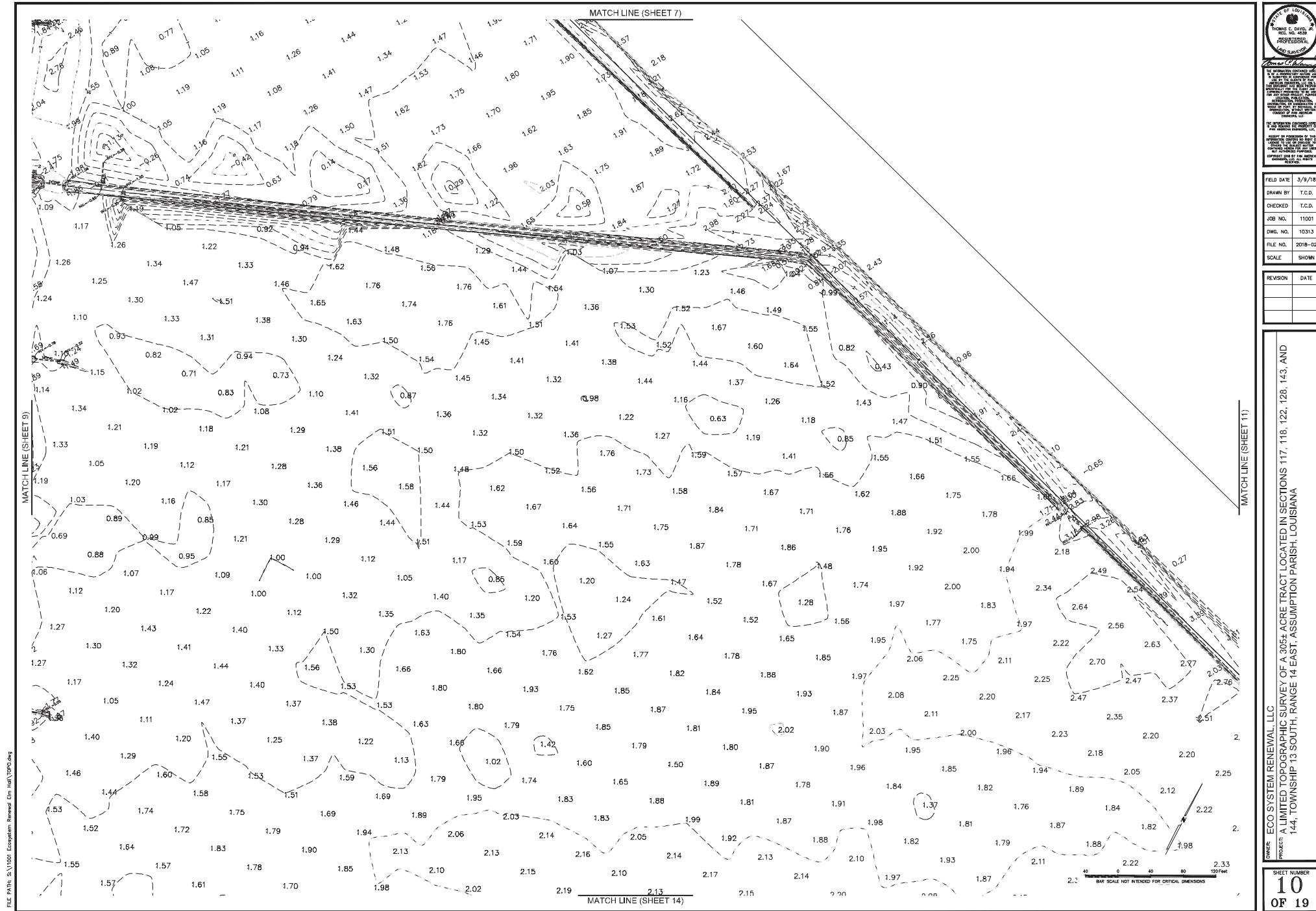
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**SHEET NUMBER**

9

**OF 19**





FILE PATH: S:\11001 Ecogystem Renewal Eia\11001.dwg



THOMAS C. DAVIS  
No. 11001  
STATE OF LOUISIANA  
Professional Engineer  
Civil Engineering  
My Commission Expires 12/31/2018  
I hereby certify that I am the author of the design, calculation, or report herein, or that I am a duly Licensed Professional Engineer in the State of Louisiana, and that I am not providing my services to the client under the supervision of another Professional Engineer.

FIELD DATE	3/9/18
DRAWN BY	T.C.D.
CHECKED	T.C.D.
JOB NO.	11001
DWG. NO.	10313
FILE NO.	2018-02
SCALE	SHOWN

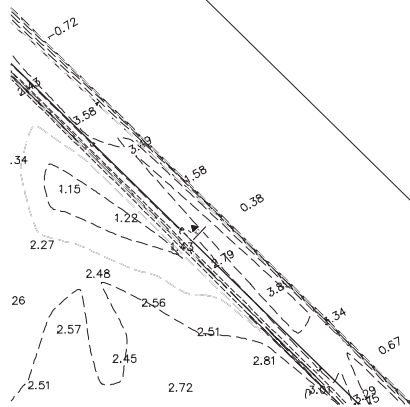
REVISION	DATE

OWNER: ECO SYSTEM RENEWAL, LLC  
PROJECT: A LIMITED TOPOGRAPHIC SURVEY OF A 305+ ACRE TRACT LOCATED IN SECTIONS 117, 118, 122, 128, 143, AND 144, TOWNSHIP 13 SOUTH, RANGE 14 EAST, ASSUMPTION PARISH, LOUISIANA

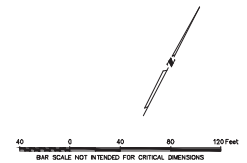
SHEET NUMBER  
**10**  
OF 19

FILE PATH: S:\11001 EcologyRenewal\En\_half\TOP.dwg

MATCH LINE (SHEET 10)



MATCH LINE (SHEET 15)



THOMAS C. DAVIS  
No. 433  
State of Louisiana  
Mechanical Engineering  
Professional Engineer  
My Commission Expires 12/31/2018  
I hereby certify that I am a duly Licensed Professional Engineer in the State of Louisiana, and I am qualified to perform the duties of a Professional Engineer in the State of Louisiana.

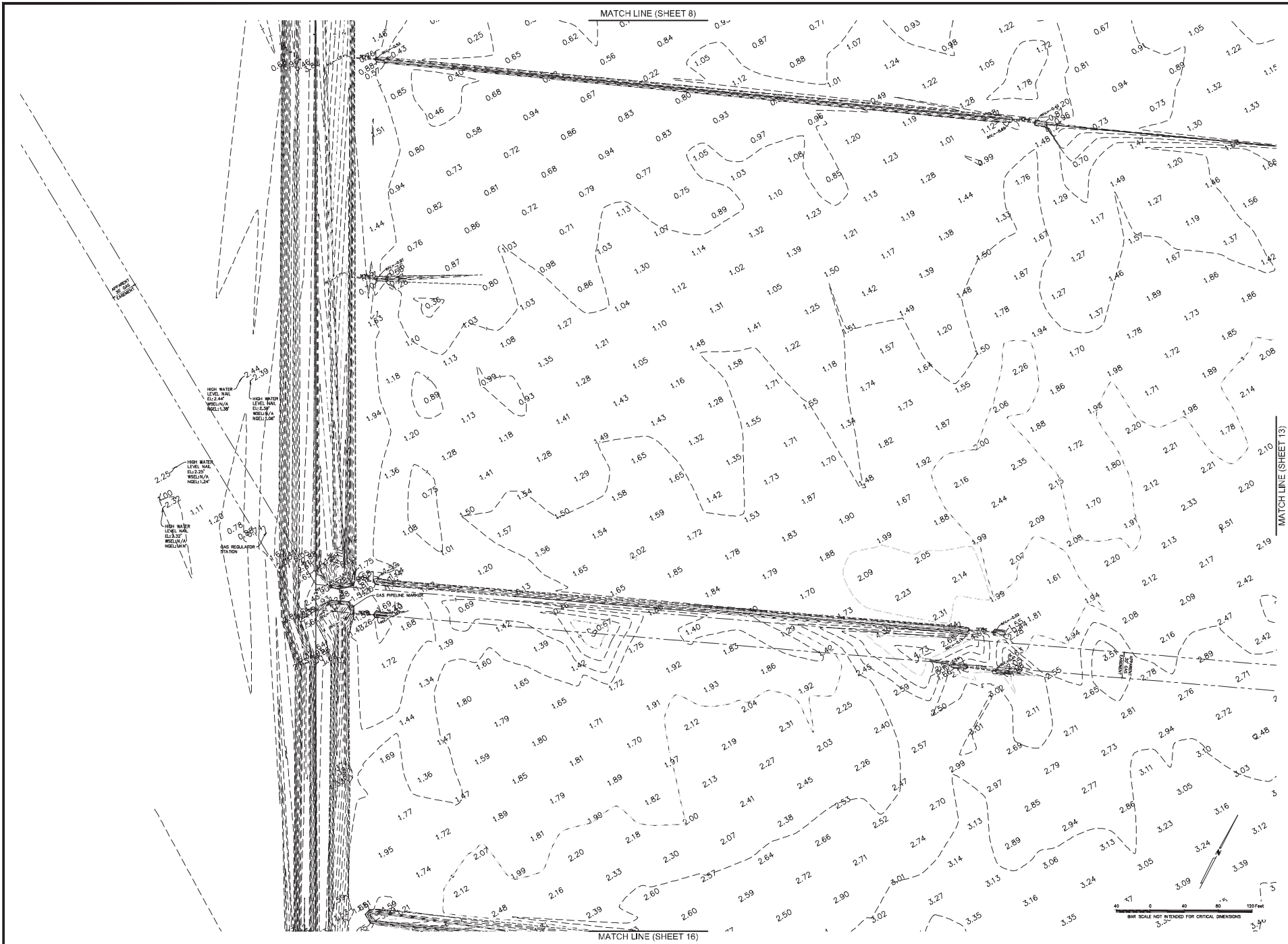
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CHECKED	T.C.D.
JOB NO.	11001
DWG. NO.	10313
FILE NO.	2018-02
SCALE	SHOWN

REVISION	DATE

OWNER: ECO SYSTEM RENEWAL, LLC  
PROJECT: A LIMITED TOPOGRAPHIC SURVEY OF A 305+ ACRE TRACT LOCATED IN SECTIONS 117, 118, 122, 128, 143, AND 144, TOWNSHIP 13 SOUTH, RANGE 14 EAST, ASSUMPTION PARISH, LOUISIANA

SHEET NUMBER  
**11**  
OF 19

FILE PATH: S:\11001 Ecogreym Renewal 1m half\TOP.dwg



THOMAS C. DAVIS  
No. 453  
State of Louisiana  
Mechanical Engineering

FIELD DATE: 3/9/18  
DRAWN BY: T.C.D.  
CHECKED: T.C.D.  
JOB NO.: 11001  
DWS. NO.: 10313  
FILE NO.: 2018-02  
SCALE: SHOWN

REVISION	DATE

OWNER: ECO SYSTEM RENEWAL, LLC  
PROJECT: A LIMITED TOPOGRAPHIC SURVEY OF A 305+ ACRE TRACT LOCATED IN SECTIONS 117, 118, 122, 128, 143, AND 144, TOWNSHIP 13 SOUTH, RANGE 14 EAST, ASSUMPTION PARISH, LOUISIANA

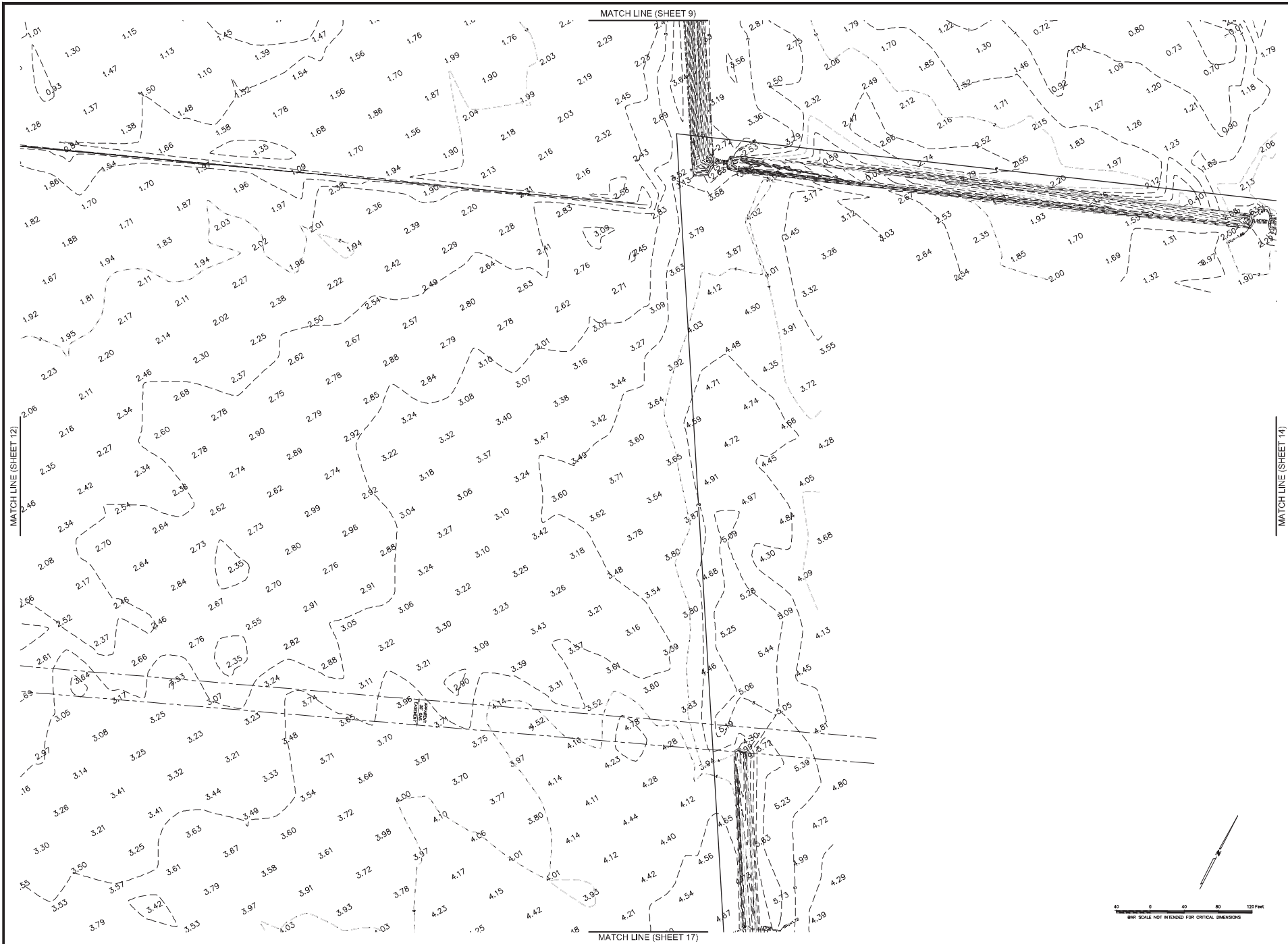
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**12**  
OF 19



**PAN AMERICAN ENGINEERS, L.L.C.**  
P.O. BOX 888 / 7717 JACKSON STREET  
ALEXANDRIA, LA. 71308



FILE PATH: S:\11001 Ecogarden Renewal 12m half\TOP.dwg



THOMAS C. DAVIS  
No. 425  
State of Louisiana  
Mechanical Engineering  
Exp. 12/31/2018

FIELD DATE: 3/9/18  
DRAWN BY: T.C.D.  
CHECKED: T.C.D.  
JOB NO.: 11001  
DWS. NO.: 10313  
FILE NO.: 2018-02  
SCALE: SHOWN

REVISION	DATE

OWNER: ECO SYSTEM RENEWAL, LLC  
PROJECT: A LIMITED TOPOGRAPHIC SURVEY OF A 305+ ACRE TRACT LOCATED IN SECTIONS 117, 118, 122, 128, 143, AND 144, TOWNSHIP 13 SOUTH, RANGE 14 EAST, ASSUMPTION PARISH, LOUISIANA

SHEET NUMBER  
**13**  
OF 19



**PAN AMERICAN ENGINEERS, L.L.C.**  
P.O. BOX 8888 / 7717 JACKSON STREET  
ALEXANDRIA, LA. 71308

FILE PATH: S:\11001 Ecogarden Renewal\Drawings\TOP.dwg

MATCH LINE (SHEET 13)

MATCH LINE (SHEET 10)

MATCH LINE (SHEET 15)

40 0 40 80 120 Feet  
BAR SCALE NOT INTENDED FOR CRITICAL DIMENSIONS



THOMAS C. DAVIS  
No. 11001  
State of Louisiana  
Mechanical Engineering  
Exp. 12/31/2018

FIELD DATE: 3/9/18  
DRAWN BY: T.C.D.  
CHECKED: T.C.D.  
JOB NO.: 11001  
DWS. NO.: 10313  
FILE NO.: 2018-02  
SCALE: SHOWN

REVISION	DATE

OWNER: ECO SYSTEM RENEWAL, LLC  
PROJECT: A LIMITED TOPOGRAPHIC SURVEY OF A 305+ ACRE TRACT LOCATED IN SECTIONS 117, 118, 122, 128, 143, AND 144, TOWNSHIP 13 SOUTH, RANGE 14 EAST, ASSUMPTION PARISH, LOUISIANA

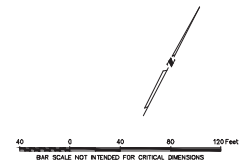
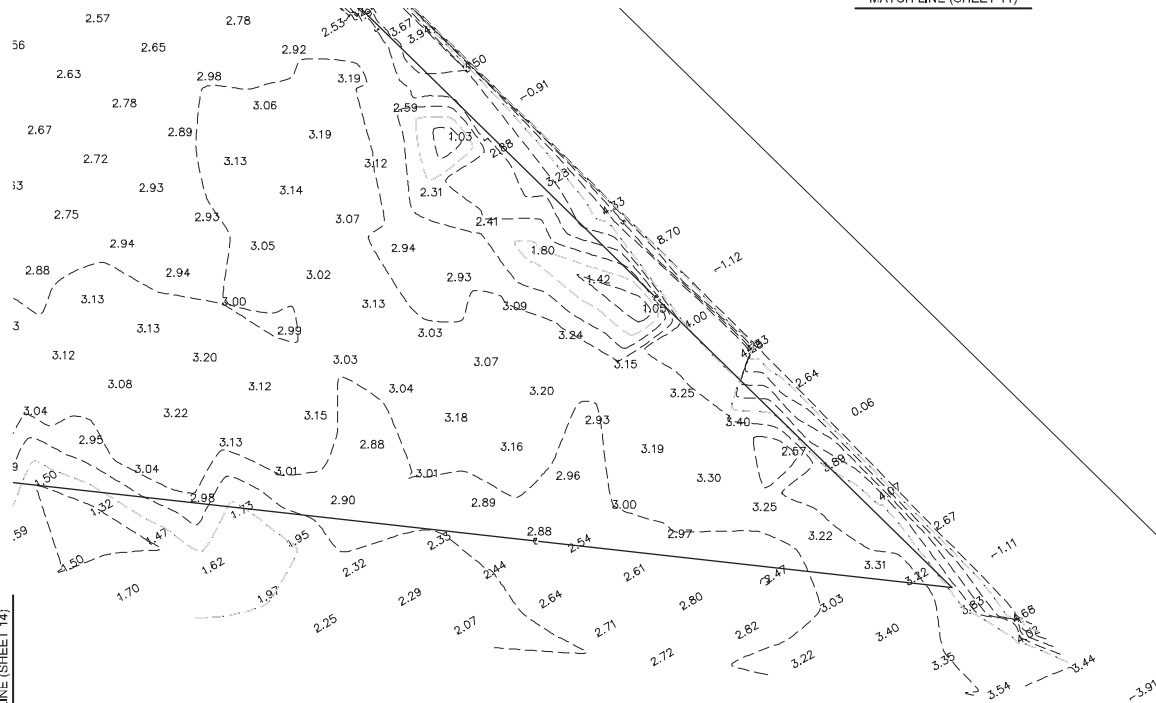
SHEET NUMBER  
**14**  
OF 19

**PAN AMERICAN ENGINEERS, LLC**  
P.O. BOX 888 / 1717 JACKSON STREET  
ALEXANDRIA, LA. 71303  
713-835-7500

FILE PATH: S:\11001 Ecogystem Renewal\11001.dwg

MATCH LINE (SHEET 14)

MATCH LINE (SHEET 11)



THOMAS C. DAVIS  
No. 433  
STATE OF LOUISIANA  
MECHANICAL ENGINEERING  
LICENSE NO. 94002

FIELD DATE	3/9/18
DRAWN BY	T.C.D.
CHECKED	T.C.D.
JOB NO.	11001
DWG. NO.	10313
FILE NO.	2018-02
SCALE	SHOWN

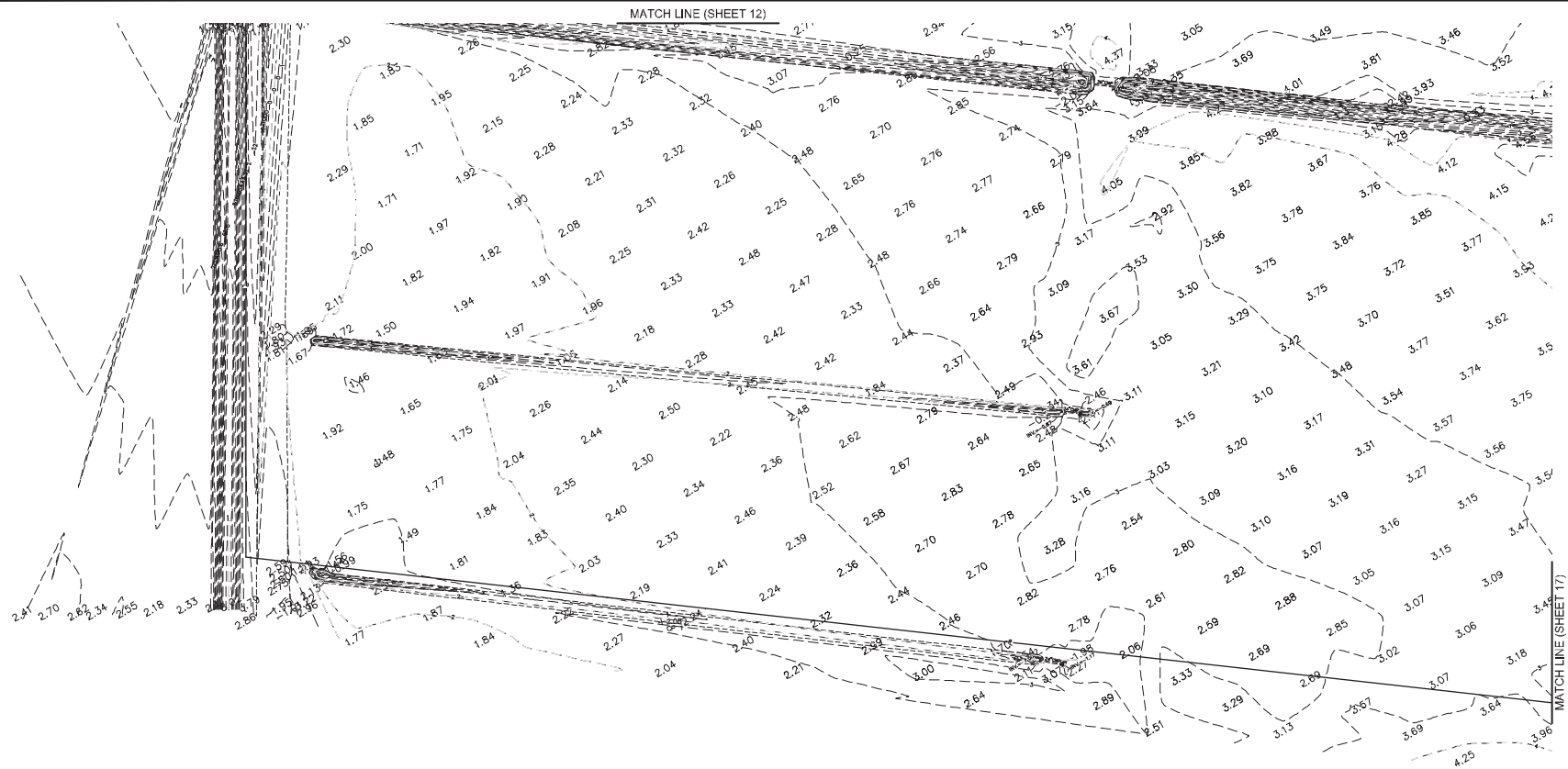
REVISION	DATE

OWNER: ECO SYSTEM RENEWAL, LLC  
PROJECT: A LIMITED TOPOGRAPHIC SURVEY OF A 305+ ACRE TRACT LOCATED IN SECTIONS 117, 118, 122, 128, 143, AND 144, TOWNSHIP 13 SOUTH, RANGE 14 EAST, ASSUMPTION PARISH, LOUISIANA

SHEET NUMBER  
**15**  
OF 19



FILE PATH: S:\11001 Ecogystem Renewal\En\_half\TOP.dwg



40 0 80 120 Feet  
BAR SCALE NOT INTENDED FOR CRITICAL DIMENSIONS



THOMAS C. DAVIS  
No. 403  
State of Louisiana  
Mechanical Engineering  
Exp. 12/31/2022

FIELD DATE	3/9/18
DRAWN BY	T.C.D.
CHECKED	T.C.D.
JOB NO.	11001
DWS. NO.	10313
FILE NO.	2018-02
SCALE	SHOWN

REVISION	DATE

OWNER: ECO SYSTEM RENEWAL, LLC  
PROJECT: A LIMITED TOPOGRAPHIC SURVEY OF A 305+ ACRE TRACT LOCATED IN SECTIONS 117, 118, 122, 128, 143, AND 144, TOWNSHIP 13 SOUTH, RANGE 14 EAST, ASSUMPTION PARISH, LOUISIANA

SHEET NUMBER  
**16**  
OF 19



**PAN AMERICAN ENGINEERS, L.L.C.**  
P.O. BOX 8889 / 1717 JACKSON STREET  
ALEXANDRIA, LA. 71303

FILE PATH: S:\11001 Ecogystem Renewal\1m\_half\TOP.dwg



40 0 80 120 Feet  
BAR SCALE NOT INTENDED FOR CRITICAL DIMENSIONS



THOMAS C. DAVIS  
No. 433  
STATE OF LOUISIANA  
MECHANICAL ENGINEERING

FIELD DATE	3/9/18
DRAWN BY	T.C.D.
CHECKED	T.C.D.
JOB NO.	11001
DWG. NO.	10313
FILE NO.	2018-02
SCALE	SHOWN

REVISION	DATE

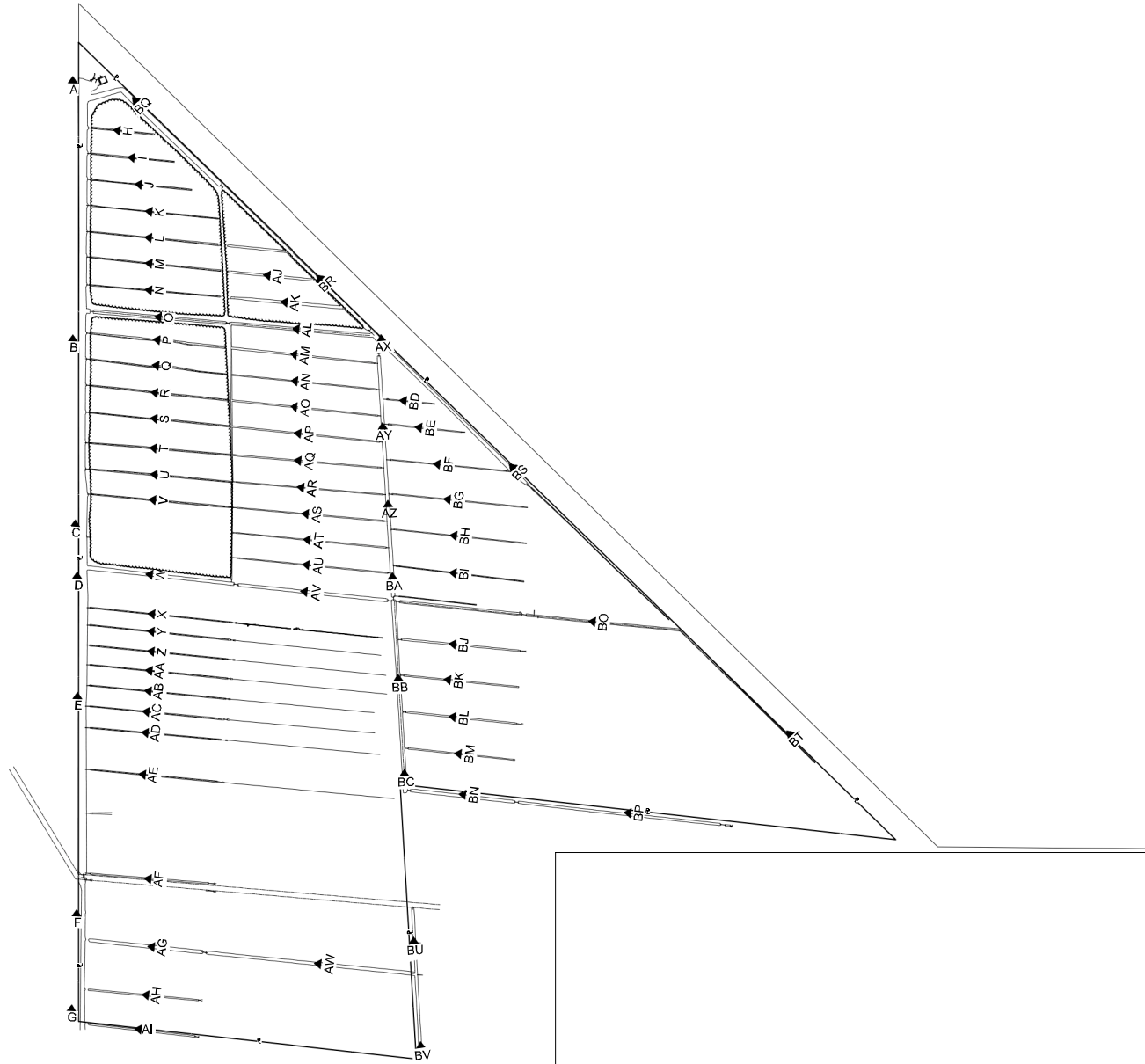
OWNER: ECO SYSTEM RENEWAL, LLC  
PROJECT: A LIMITED TOPOGRAPHIC SURVEY OF A 305+ ACRE TRACT LOCATED IN SECTIONS 117, 118, 122, 128, 143, AND 144, TOWNSHIP 13 SOUTH, RANGE 14 EAST, ASSUMPTION PARISH, LOUISIANA

SHEET NUMBER  
**17**  
OF 19



**PAN AMERICAN ENGINEERS, LLC**  
P.O. BOX 8888 / 7717 JACKSON STREET  
ALEXANDRIA, LA. 71308

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APPENDIX A1 ENLARGEMENT OF SHEET 18 OF 19



**PAN AMERICAN ENGINEERS, LLC**  
P.O. BOX 899 / 1717 JACKSON STREET  
ALEXANDRIA, LA.  
71303



STATE OF LOUISIANA  
THOMAS C. DAVIS  
No. 103  
10/15/2018  
Professional Engineer Seal

FIELD DATE	3/9/18
DRAWN BY	T.C.D.
CHECKED	T.C.D.
JOB NO.	11001
DWG. NO.	10313
FILE NO.	2018-09
SCALE	SHOWN

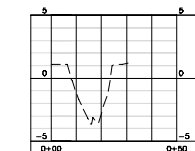
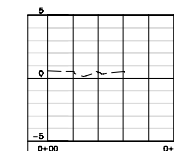
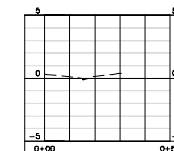
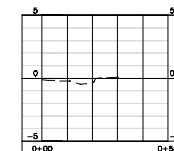
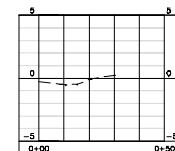
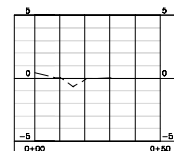
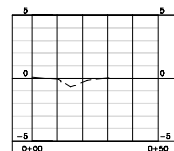
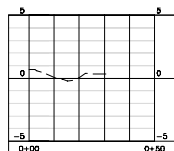
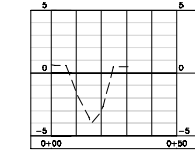
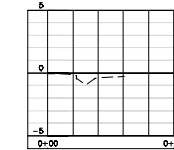
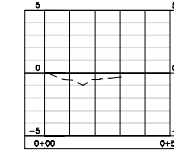
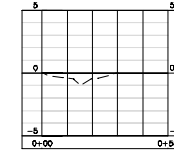
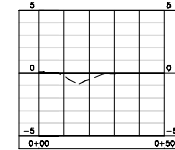
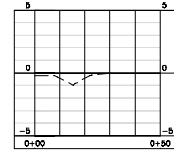
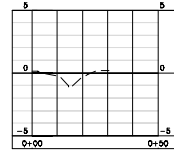
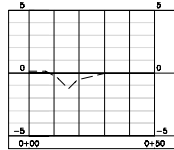
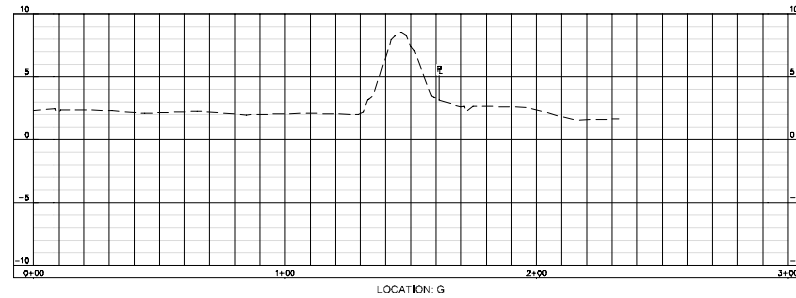
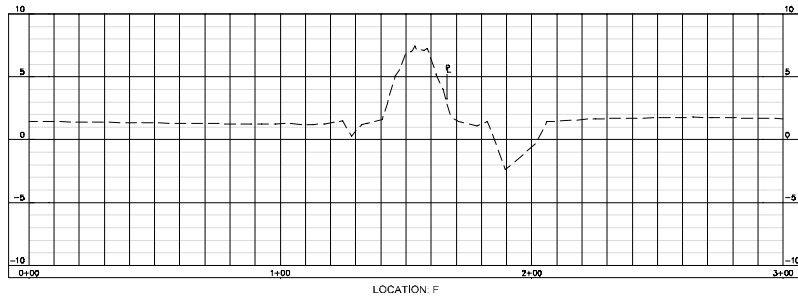
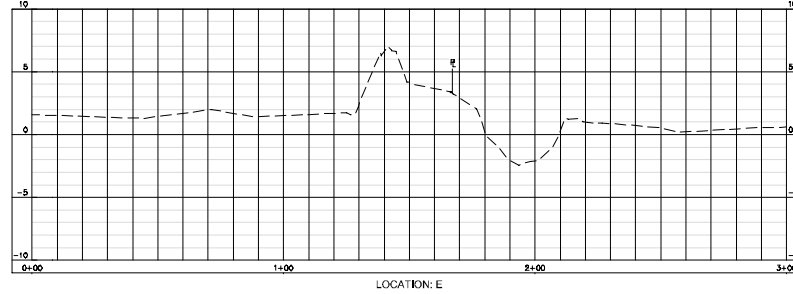
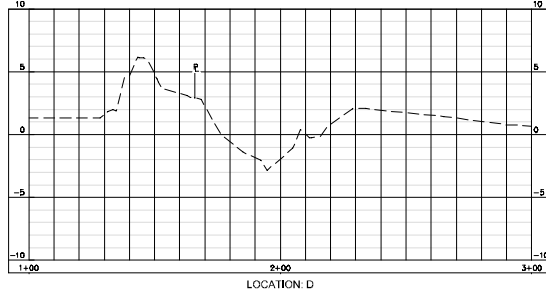
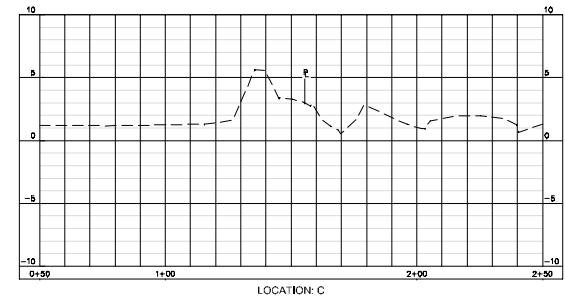
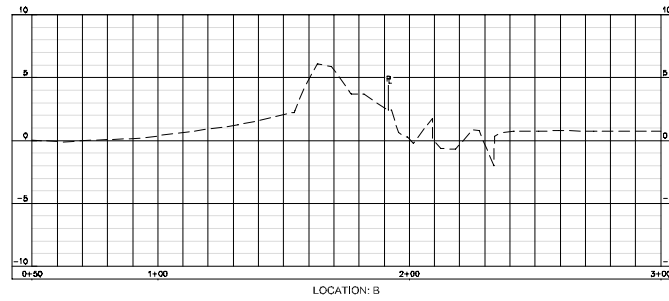
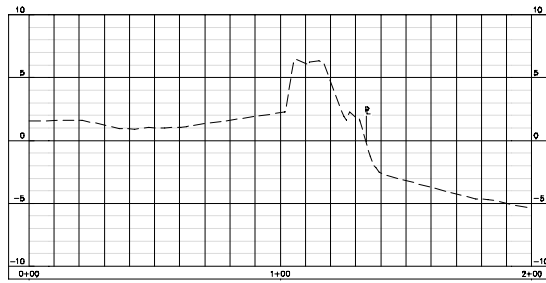
REVISION	DATE

OWNER: ECO SYSTEM RENEWAL, LLC  
PROJECT: A LIMITED TOPOGRAPHIC SURVEY OF A 305+ ACRE TRACT LOCATED IN SECTIONS 117, 118, 122, 128, 143, AND 144, TOWNSHIP 13 SOUTH, RANGE 14 EAST, ASSUMPTION PARISH, LOUISIANA

SHEET NUMBER  
**A1**  
OF 3



FILE NAME: N:\11001 ECO SYSTEM RENEWAL ELM HALL SURVEY DRAWING\A211 Profile Sheets\TOPOLING



NOTE:  
PROPERTY LINES SHOWN HEREON ARE APPROXIMATE AND WERE TAKEN FROM  
A PLAT SHOWING SUBDIVISION OF A PORTION OF PROPERTY OWNED BY ELM  
HALL PARTNERSHIP INTO TRACT A AND THE REMAINDER OF PROPERTY  
OWNED BY ELM HALL PARTNERSHIP, BY ACADIA LAND SURVEYING, LLC, AND  
WERE NOT FIELD VERIFIED.

APPENDIX A2 ENLARGEMENT SHEET 19 OF 19

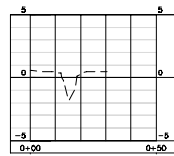


FIELD DATE: 3/9/18  
DRAWN BY: T.C.D.  
CHECKED: T.C.D.  
JOB NO.: 11001  
DWG. NO.: 10313  
FILE NO.: 2018-09  
SCALE: SHOWN

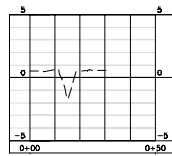
REVISION	DATE

OWNER: ECO SYSTEM RENEWAL, LLC  
PROJECT: A LIMITED TOPOGRAPHIC SURVEY OF A 305+ ACRE TRACT LOCATED IN SECTIONS 117, 118, 122, 128, 143, AND 144, TOWNSHIP 13 SOUTH, RANGE 14 EAST, ASSUMPTION PARISH, LOUISIANA

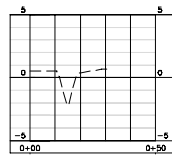
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**A2**  
OF 3



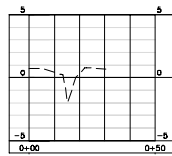
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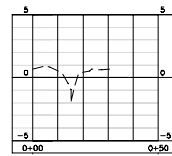
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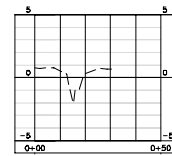
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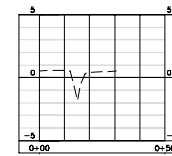
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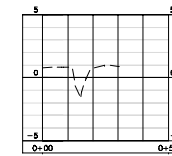
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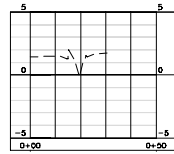
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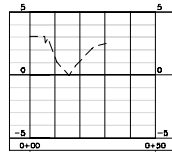
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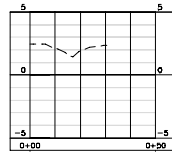
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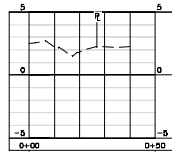
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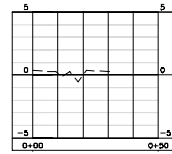
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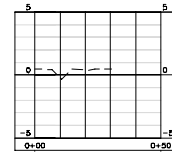
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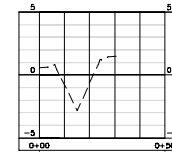
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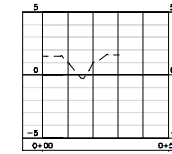
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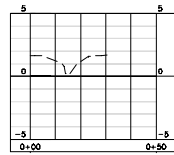
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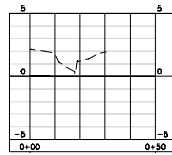
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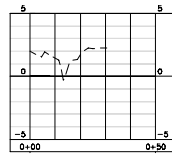
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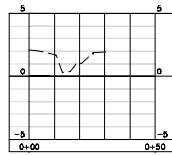
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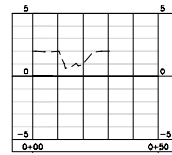
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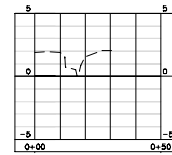
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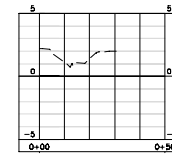
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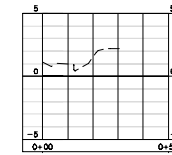
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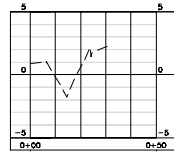
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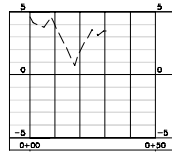
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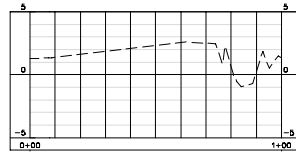
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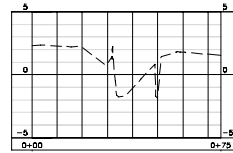
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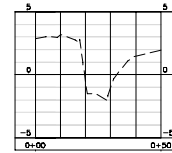
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LOCATION: AX



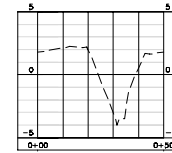
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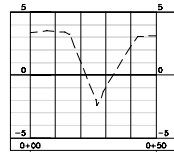
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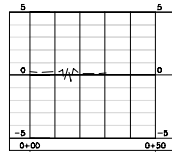
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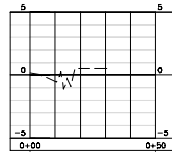
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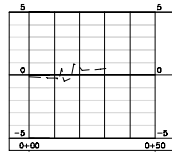
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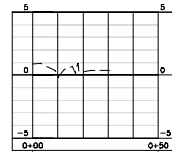
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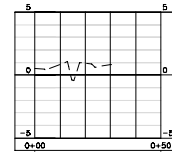
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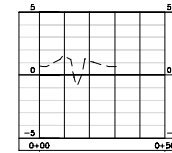
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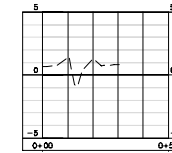
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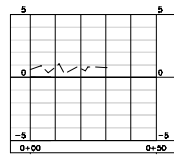
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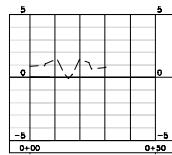
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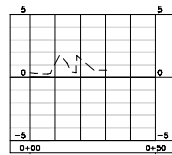
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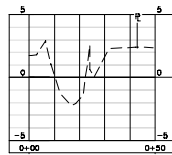
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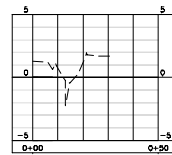
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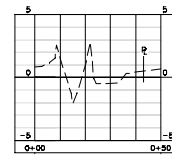
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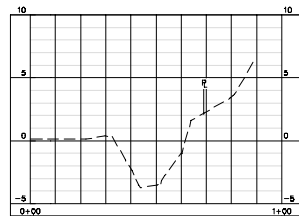
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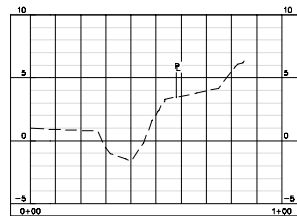
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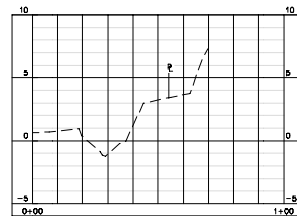
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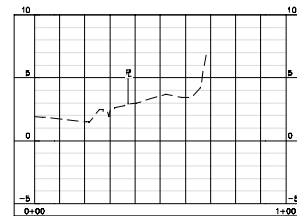
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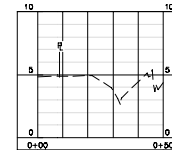
LOCATION: BR



LOCATION: BS



LOCATION: BT



LOCATION: BU



LOCATION: BV

NOTE:  
PROPERTY LINES SHOWN HEREON ARE APPROXIMATE AND WERE TAKEN FROM  
A PLAT SHOWING SUBDIVISION OF A PORTION OF PROPERTY OWNED BY ELM  
HALL PARTNERSHIP INTO TRACT A AND THE REMAINDER OF PROPERTY  
OWNED BY ELM HALL PARTNERSHIP, BY: ACADIA LAND SURVEYING, LLC, AND  
WERE NOT FIELD VERIFIED.



FIELD DATE	3/9/18
DRAWN BY	T.C.D.
CHECKED	T.C.D.
JOB NO.	11001
DWG. NO.	1031.3
FILE NO.	2018-09
SCALE	SHOWN

REVISION	DATE

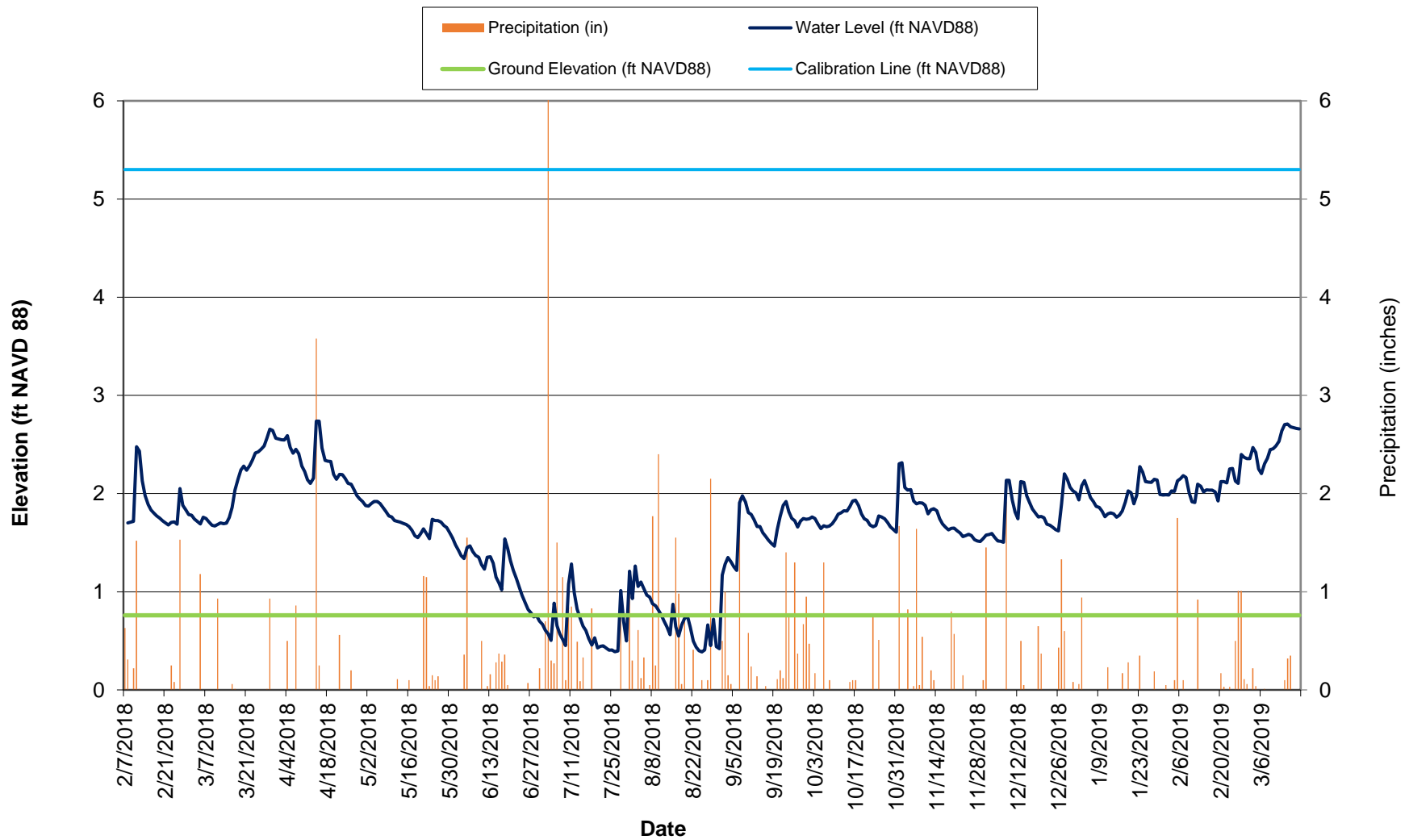
OWNER: ECO SYSTEM RENEWAL, LLC  
PROJECT: A LIMITED TOPOGRAPHIC SURVEY OF A 305+/- ACRE TRACT LOCATED IN SECTIONS 117, 118, 122, 128, 143, AND 144, TOWNSHIP 13 SOUTH, RANGE 14 EAST, ASSUMPTION PARISH, LOUISIANA

# **ATTACHMENT E**

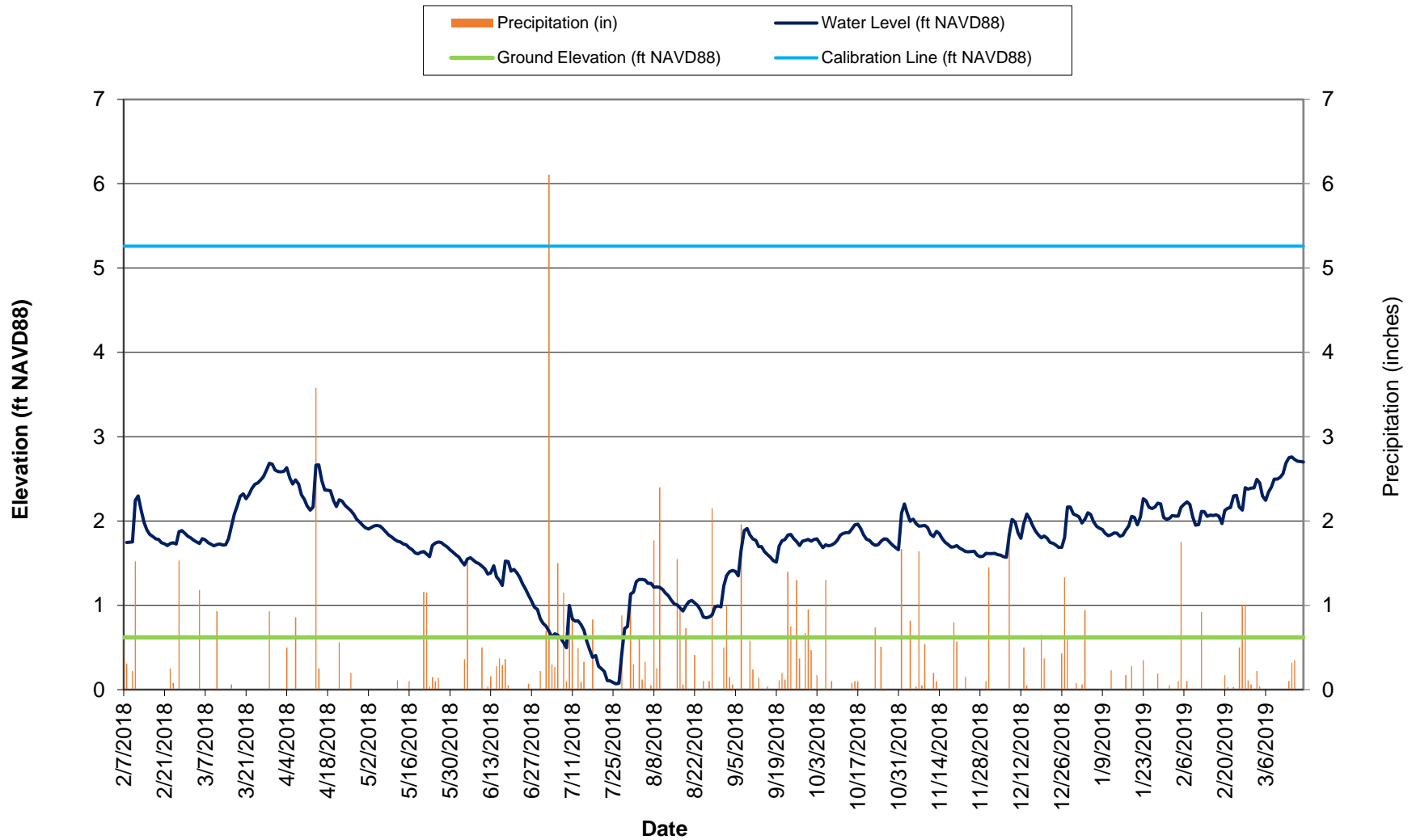
## **Water Level Monitoring Data**



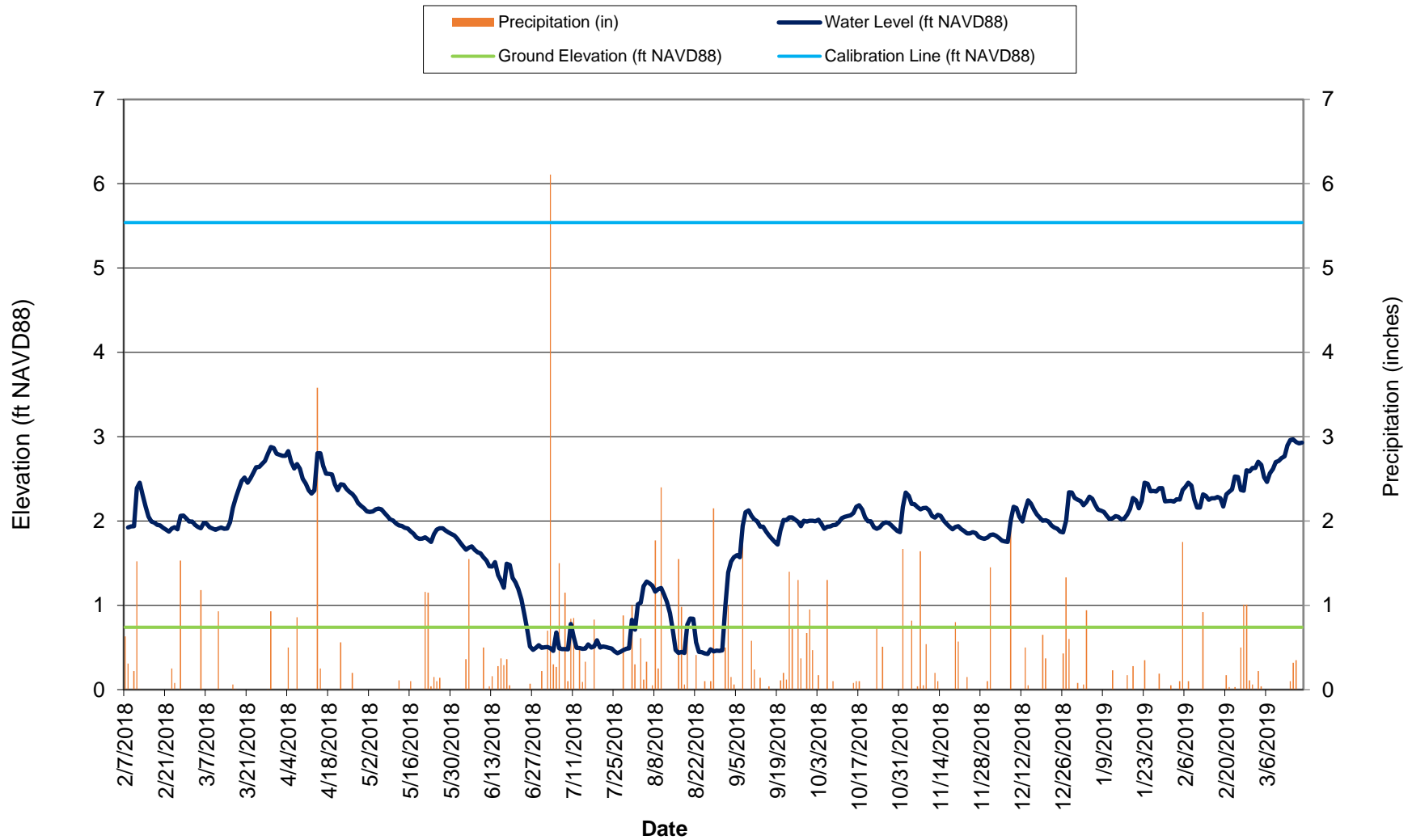
**Elm Hall  
Piezometer 1  
Maximum Daily Surface Water Level Data and Total Daily Precipitation**



**Elm Hall  
Piezometer 2  
Maximum Daily Surface Water Level Data and Total Daily Precipitation**

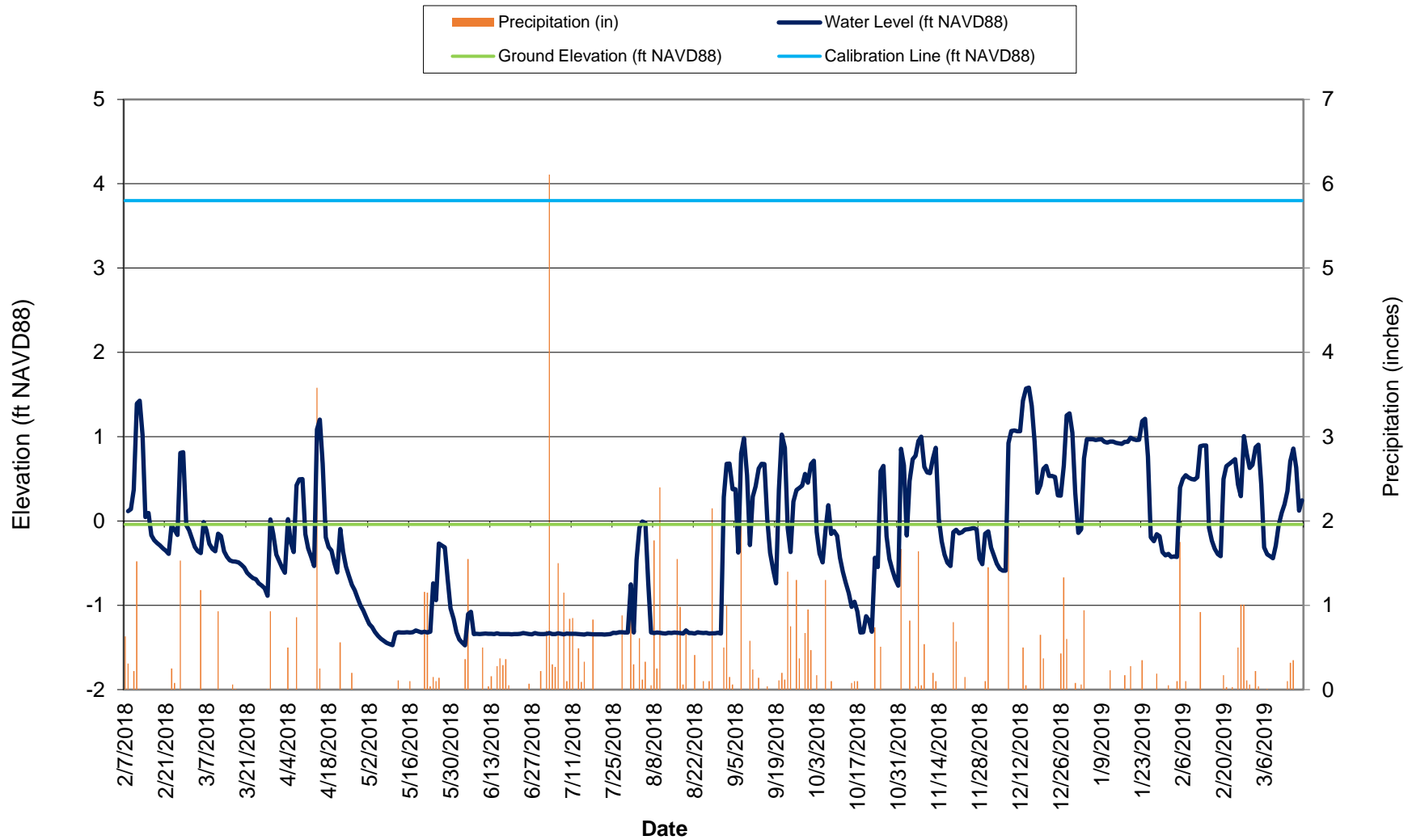


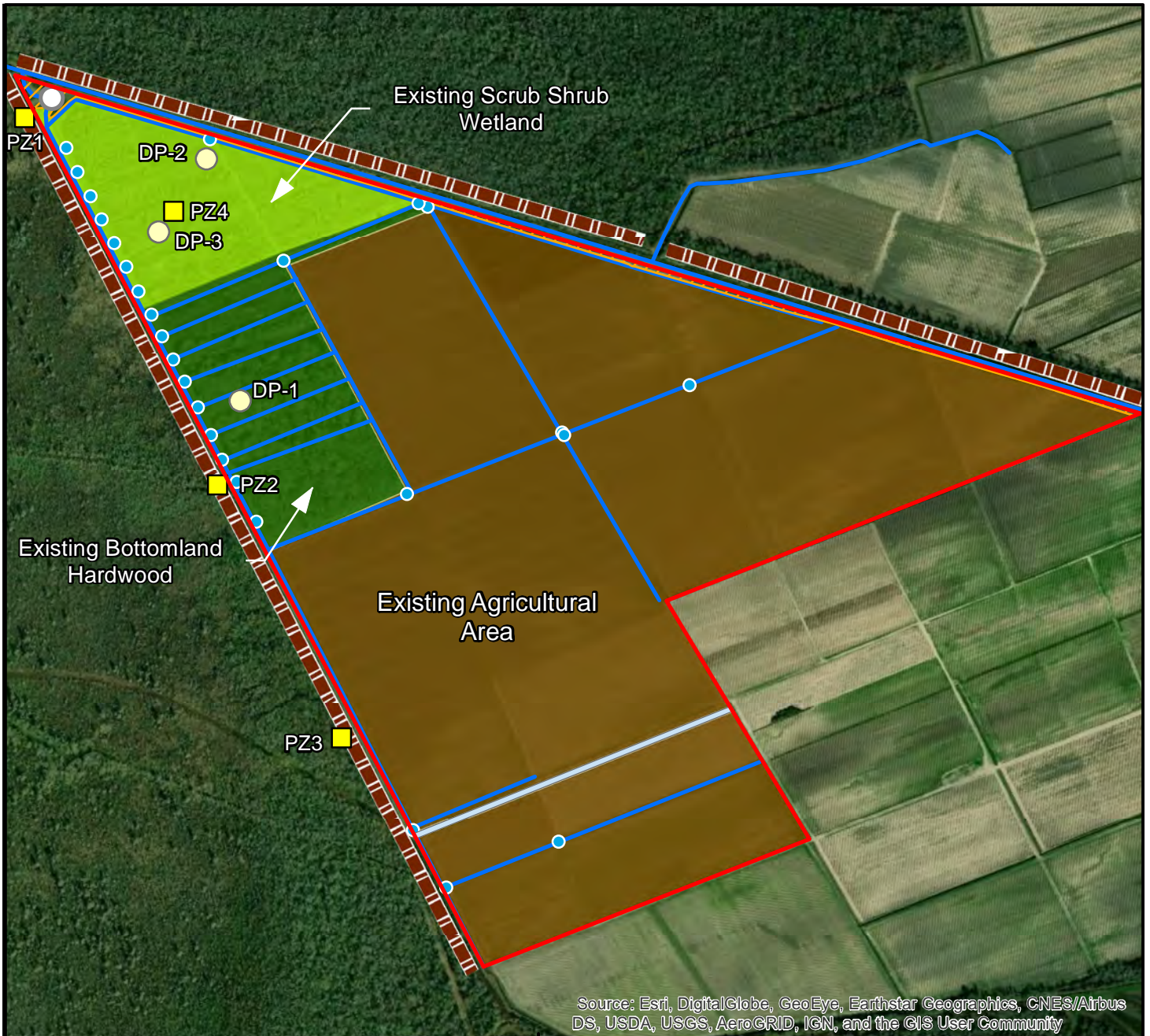
**Elm Hall  
Piezometer 3  
Maximum Daily Surface Water Level Data and Total Daily Precipitation**





**Elm Hall  
Piezometer 4  
Maximum Daily Surface Water Level Data and Total Daily Precipitation**

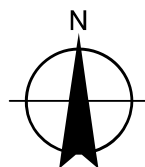




Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

#### Legend

- ▬ Site Boundary (305 Ac. ±)
- ▬ Existing Pipeline ROW (1.4 Ac. ±)
- ▬ Pump House Road (3.9 Ac. ±)
- ▬ Existing Drainage Features (10.7 Ac. ±)
- ▬ Existing Scrub Shrub Wetland (24.9 Ac. ±)
- ▬ Existing Bottomland Hardwood (30 Ac. ±)
- ▬ Existing Agricultural Areas (234.1 Ac. ±)
- Existing Culverts (to be removed)
- Water Level Gauges
- Existing Pump
- ▬ Existing Levee System (outside of boundary)



#### Elm Hall Mitigation Bank

FIGURE  
NUMBER  
**10**

### Existing Conditions Map



Assumption  
Parish

**CSRS**

CSRS, Inc.  
6767 Perkins Road  
Baton Rouge, LA 70809

## **ATTACHMENT F**

### **Vegetative Sampling Data**



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

 Sampling Point: DP1

Tree Stratum (Plot size: <u>30'</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Ulmus americana</u>	<u>60</u>	<u>Yes</u>	<u>FAC</u>	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>6</u> (A)  Total Number of Dominant Species Across All Strata: <u>6</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
2. <u>Acer negundo</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	
3. <u>Quercus nigra</u>	<u>15</u>		<u>FAC</u>	
4. <u>Acer rubrum</u>	<u>5</u>		<u>FAC</u>	
5. _____				
6. _____				
7. _____				
8. _____				
<u>100</u> = Total Cover 50% of total cover: <u>50</u> 20% of total cover: <u>20</u>				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A)      _____ (B)  Prevalence Index = B/A = _____
<b>Sapling/Shrub Stratum (Plot size: <u>30'</u> )</b>				
1. <u>Sabal minor</u>	<u>10</u>	<u>Yes</u>	<u>FACW</u>	
2. <u>Ulmus americana</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	
3. <u>Acer rubrum</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	
4. _____				
5. _____				
6. _____				
<u>20</u> = Total Cover 50% of total cover: <u>10</u> 20% of total cover: <u>4</u>				<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
<b>Herb Stratum (Plot size: <u>30'</u> )</b>				
1. <u>Sabal palmetto</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
<u>5</u> = Total Cover 50% of total cover: <u>3</u> 20% of total cover: <u>1</u>				<b>Definitions of Four Vegetation Strata:</b>  <b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.  <b>Sapling/Shrub</b> – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.  <b>Herb</b> – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  <b>Woody vine</b> – All woody vines greater than 3.28 ft in height.
<b>Woody Vine Stratum (Plot size: <u>30</u> )</b>				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
<u>0</u> = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				
<b>Remarks: (If observed, list morphological adaptations below).</b> <u>Acer negundo - 5-10"DBH, 50' height</u> <u>Ulmus americana - 1-5"DBH, 30' height</u> <u>Acer rubrum - 1-3"DBH</u> <u>Quercus nigra - 20"DBH, 60' height</u>				<b>Hydrophytic Vegetation Present?</b> Yes <u>X</u> No _____  <div style="text-align: right;">                         JJ 6/7/2018                          29.31455                          -91.082952                     </div>

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

 Sampling Point: Dp2

Tree Stratum (Plot size: <u>30'</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Fraxinus pennsylvanica</u>	<u>45</u>	<u>Yes</u>	<u>FACW</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A)  Total Number of Dominant Species Across All Strata: <u>5</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>80%</u> (A/B)
2. <u>Acer rubrum</u>	<u>5</u>		<u>FAC</u>	
3. <u>Ulmus americana</u>	<u>5</u>		<u>FAC</u>	
4. _____				
5. _____				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B)  Prevalence Index = B/A = _____
6. _____				
7. _____				
8. _____				
<u>55</u> = Total Cover 50% of total cover: <u>28</u> 20% of total cover: <u>11</u>				<b>Hydrophytic Vegetation Indicators:</b> ___ 1 - Rapid Test for Hydrophytic Vegetation ___ 2 - Dominance Test is >50% ___ 3 - Prevalence Index is ≤3.0 <sup>1</sup> ___ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
<b>Sapling/Shrub Stratum (Plot size: <u>30'</u> )</b>				
1. <u>Acer rubrum</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Fraxinus pennsylvanica</u>	<u>30</u>	<u>Yes</u>	<u>FACW</u>	
3. _____				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
4. _____				
5. _____				
6. _____				
7. _____				<b>Definitions of Four Vegetation Strata:</b>  <b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.  <b>Sapling/Shrub</b> – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.  <b>Herb</b> – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  <b>Woody vine</b> – All woody vines greater than 3.28 ft in height.
8. _____				
9. _____				
10. _____				
<u>65</u> = Total Cover 50% of total cover: <u>33</u> 20% of total cover: <u>13</u>				<b>Hydrophytic Vegetation Present?</b> Yes <u>X</u> No _____
<b>Herb Stratum (Plot size: <u>30'</u> )</b>				
1. <u>Ampelopsis arborea</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Rubus trivialis</u>	<u>40</u>	<u>Yes</u>	<u>FACU</u>	
3. <u>Cyperus difformis</u>	<u>10</u>		<u>OBL</u>	
4. <u>Persicaria punctata</u>	<u>5</u>		<u>OBL</u>	
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
<u>95</u> = Total Cover 50% of total cover: <u>48</u> 20% of total cover: <u>19</u>				
<b>Woody Vine Stratum (Plot size: <u>30'</u> )</b>				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
<u>0</u> = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				
Remarks: (If observed, list morphological adaptations below). <b>Canopy: Fraxinus- 1in dbh, Acerbic Rubrum- 2in dbh, Ulmus Americana- 3in dbh</b>				
<div style="text-align: right;">                         JJ 6/7/2018                          29.935281                          -91.083990                     </div>				

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

 Sampling Point: Dp 3

Tree Stratum (Plot size: <u>30'</u> radius )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Fraxinus pennsylvanica</u>	<u>10</u>	<u>Yes</u>	<u>FACW</u>	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>7</u> (A)  Total Number of Dominant Species Across All Strata: <u>7</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
<u>10</u> = Total Cover 50% of total cover: <u>5</u> 20% of total cover: <u>2</u>				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A)      _____ (B)  Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: <u>30'</u> )				
1. <u>Fraxinus pennsylvanica</u>	<u>10</u>	_____	<u>FACW</u>	
2. <u>Acer rubrum</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	
3. <u>Ligustrum japonicum</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	
4. <u>Ulmus americana</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
<u>80</u> = Total Cover 50% of total cover: <u>40</u> 20% of total cover: <u>16</u>				<b>Hydrophytic Vegetation Indicators:</b> ___ 1 - Rapid Test for Hydrophytic Vegetation ___ 2 - Dominance Test is >50% ___ 3 - Prevalence Index is ≤3.0 <sup>1</sup> ___ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)  <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Herb Stratum (Plot size: <u>30'</u> radius )				
1. <u>Toxicodendron radicans</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Cyperus sp.</u>	<u>5</u>	<u>Yes</u>	_____	
3. <u>Rubus arvensis</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	
4. <u>Persicaria hydropiperoides</u>	<u>1</u>	_____	<u>OBL</u>	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
<u>16</u> = Total Cover 50% of total cover: <u>8</u> 20% of total cover: <u>3</u>				<b>Definitions of Four Vegetation Strata:</b>  <b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.  <b>Sapling/Shrub</b> – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.  <b>Herb</b> – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  <b>Woody vine</b> – All woody vines greater than 3.28 ft in height.
Woody Vine Stratum (Plot size: <u>30</u> )				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>0</u> = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				
Remarks: (If observed, list morphological adaptations below).				<b>Hydrophytic Vegetation Present?</b> Yes <u>X</u> No _____
<u>Fraxinus pennsylvanica - 3" DBH</u>				
JJ 6/7/2018 29.934361 -91.085013				