



13 May 2016

Professional Engineering Consultants Corporation  
7600 Innovation Park Drive  
Baton Rouge, Louisiana 70820

Attention Mr. Gerald W. Babin, Jr., P.E.

Gentlemen:

Geotechnical Data Report  
Pointe Coupee Parish Police Jury  
False River Aquatic Resources Ecosystem Restoration Project  
Phase II  
North Flats  
Pointe Coupee Parish, Louisiana  
Eustis Engineering Project No. 23163

Transmitted are two copies (one bound and one unbound) of our geotechnical data report for the subject project. An electronic copy is also being provided.

Thank you for asking us to perform these services.

Yours very truly,

EUSTIS ENGINEERING L.L.C.


JAMES J. HANCE, P.E.

P. A. Thurmond:nfr/bar

---

GEOTECHNICAL DATA REPORT  
POINTE COUPEE PARISH POLICE JURY  
FALSE RIVER AQUATIC RESOURCES ECOSYSTEM RESTORATION PROJECT  
PHASE II  
NORTH FLATS  
POINTE COUPEE PARISH, LOUISIANA  
EUSTIS ENGINEERING PROJECT NO. 23163

FOR  
PROFESSIONAL ENGINEERING CONSULTANTS CORPORATION  
BATON ROUGE, LOUISIANA

By  
Eustis Engineering L.L.C.  
Metairie, Louisiana

---

13 MAY 2016

TABLE OF CONTENTS

	<u>PAGE</u>
INTRODUCTION . . . . .	1
SCOPE OF SERVICE . . . . .	2
SOIL BORINGS . . . . .	3
LABORATORY TESTS . . . . .	4
DESCRIPTION OF SITE CONDITIONS . . . . .	5
Water Depths . . . . .	6
GEOTECHNICAL ENGINEERING SERVICES . . . . .	6
GEOTECHNICAL SERVICES DURING CONSTRUCTION . . . . .	6
FIGURES 1 THROUGH 3	
APPENDIX	

GEOTECHNICAL DATA REPORT  
POINTE COUPEE PARISH POLICE JURY  
FALSE RIVER ECOSYSTEM RESTORATION  
PHASE II  
NORTH FLATS  
POINTE COUPEE PARISH, LOUISIANA  
EUSTIS ENGINEERING PROJECT NO. 23163

INTRODUCTION

1. This report contains the results of our geotechnical data collection for the proposed ecosystem restoration project to be located in the north flats of False River in Pointe Coupee Parish, Louisiana. Refer to Figure 1 for a site vicinity map. The exploration was performed in general accordance with Eustis Engineering Services, L.L.C.'s revised proposal dated 4 November 2015. This proposal proposed a reduced scope of work in comparison to a previous proposal dated 18 August 2015. The project was authorized on 30 March 2015 by Mr. Gerald Babin, Jr., P.E., Vice President of Professional Engineering Consultants, Corporation (PEC), the engineer for the project.
  
2. This report has been prepared in accordance with generally accepted geotechnical engineering practice for the exclusive use of PEC for specific application to the subject site. In the event of any changes in the nature, design, or location of the dredging, the geotechnical data contained in this report shall not be considered valid unless the changes are reviewed by Eustis Engineering. Should these data be used by anyone other than PEC, they should contact Eustis Engineering for interpretation of data and to secure any other information pertinent to this project.

3. The results of the borings and laboratory tests contained in the Appendix of this data report may be included in the plans and specifications. The construction contractor will then be obliged to make an independent interpretation of subsoil conditions at the site and their potential impact on means and methods used to achieve the plans and specifications.
4. The logs of the borings are considered representative of subsurface conditions at the locations of the borings on the dates completed. No warranty is given the logs of the borings are representative of subsurface conditions at other locations or times. The nature and extent of variations in subsurface conditions, between and away from the boring locations, may not become evident until construction. If such variations then appear, it may be necessary to collect additional data to assist the designers in potential modifications to address the variations encountered.

#### SCOPE OF SERVICE

5. The purpose of this project is to create an environment to facilitate spawning of fish. This is required as the northern portion of the False River has water depths too shallow for spawning. Following conversations with the client, we understand that dredging is being proposed to increase the water depths and it is preferable to pump these dredged sediments to an undetermined receiving area on land. Therefore, this report only transmits the results of our field exploration and laboratory testing. If land cannot be acquired for storing the dredged sediments, these sediments will have to be contained by a dike constructed in False River. Eustis Engineering will be contacted by PEC in this event so the geotechnical design for sediment storage in the water can be completed.

6. Our field exploration within the False River oxbow lake included the drilling of five undisturbed sample type soil test borings to determine subsoil conditions and stratification and to obtain samples of the various strata encountered. Soil mechanics laboratory tests, performed on samples obtained from the borings, are summarized on the logs.
  
7. Limitations to Scope of Service. The scope of our service does not include an environmental assessment or an investigation for the presence or absence of wetlands and hazardous or toxic materials in the soil; surface water; ground water; or air on, below, or adjacent to the subject property. Furthermore, the scope does not include the investigation or detection of biological pollutants at the site. The term “biological pollutants” includes, but is not limited to, molds, fungi, spores, bacteria, viruses, and the byproducts of any such biological organisms.

#### SOIL BORINGS

8. The five undisturbed sample type soil test borings, designated as B-1 through B-5, were performed at the site from 18 to 20 April 2016. These borings were drilled with a pontoon mounted drill rig with a support airboat. Three borings (B-1, B-2, and B-5) were drilled to depths of 60, 40, and 40 feet beneath the mudline, respectively, in order to define the strength and compressibility of foundation materials for a potential island terrace project if the dredged spoils cannot be placed on land. An additional two borings, Borings B-3 and B-4, were drilled to a depth of 15 feet each to provide a better characterization of the dredge sediments. Upon completion of drilling operations, the borings were backfilled with cement-bentonite grout mix in accordance with current regulatory requirements. GPS coordinates were obtained for the boring locations using a handheld device and, therefore, should be considered as approximate. These coordinates are shown in terms of latitude and longitude on the boring logs. Approximate locations of the borings are shown on

Figure 2. Detailed descriptive logs of the borings are shown in both tabular and graphical form in the Appendix. Please note, the boring logs are shown in depth below the mudline.

9. Samples of cohesive or semi-cohesive subsoils were obtained at close intervals or changes in stratum using a 3-in. diameter thinwall Shelby tube sampling barrel. The samples were transported to our laboratory and then extruded from the sampling barrel, inspected, and visually classified by Eustis Engineering's soil technician. Representative portions were then promptly placed in moisture proof containers and sealed for preservation of their natural moisture content.
10. Samples of cohesionless and semi-cohesive materials were obtained during the performance of in situ Standard Penetration Tests. This test consists of driving a 2-in. diameter sampler 1 foot into the soil after first seating it 6 inches. A 140-lb weight dropped 30 inches is used to advance the sampler. The number of blows required to drive the sampler is indicative of the relative density of cohesionless soils and the consistency of cohesive soils. The samples were retained in moisture proof containers for preservation of their natural moisture content. The results of the Standard Penetration Tests are shown on the boring logs under the column heading "SPT."

#### LABORATORY TESTS

11. Soil mechanics laboratory tests generally consisted of classification tests including natural water content, unit weight, and either unconfined compressive shear (UC) or one-point unconsolidated undrained triaxial compression shear (OB) on undisturbed samples obtained from the borings. In addition, Atterberg limits and determination of percent (by weight) of soil passing the No. 200 sieve (-#200) were performed on samples in the proposed dredging areas to provide additional soil classification information. The results

of the laboratory tests are tabulated on the borings logs or separate particle size distribution reports in the Appendix.

#### DESCRIPTION OF SITE CONDITIONS

12. Geology. The site is located within the northern end of False River, an oxbow lake that was once the main channel of the Mississippi River. The geology can be characterized as Holocene lacustrine clay deposits overlying granular channel fill deposits to the termination of the borings.
13. Stratigraphy. Refer to Figure 3 for a subsoil profile. Review of the boring logs for Borings B-1 through B-4 indicates the surficial deposits comprise interbedded strata of extremely soft gray clay and very loose silty sand with silt and clay lenses and pockets extending to a depth of approximately 8 feet below the existing mudline. A stratum of clayey silt was found to the 3-ft depth in Boring B-1. These lacustrine deposits were found to be underlain by a medium dense gray and tan sand with clay pockets and traces of organic matter extending from 18 to 20 feet. This sand was in turn found to be underlain by dense to very dense gray silty sand deposits with clay pockets and traces of organic matter and gravel to the termination of the borings.
14. The stratigraphy of Boring B-5 varied somewhat from Boring B-1 through B-4, with extremely soft to very soft gray clay with silt pockets and traces of concretions and organic matter extending to a depth of 20 feet beneath the existing mudline. Underlying these soils are dense gray and tan silty sand deposits with traces of clay pockets, which becomes very dense at a depth of 26 feet, and extends to the termination of the boring at 40 feet.

## Water Depths

15. All borings were positioned over water to a depth of 6 feet. The water level in the lake will vary with climatic conditions, stages in the adjacent Mississippi River, and other factors. The water level should be investigated by those persons responsible for construction immediately prior to beginning work.

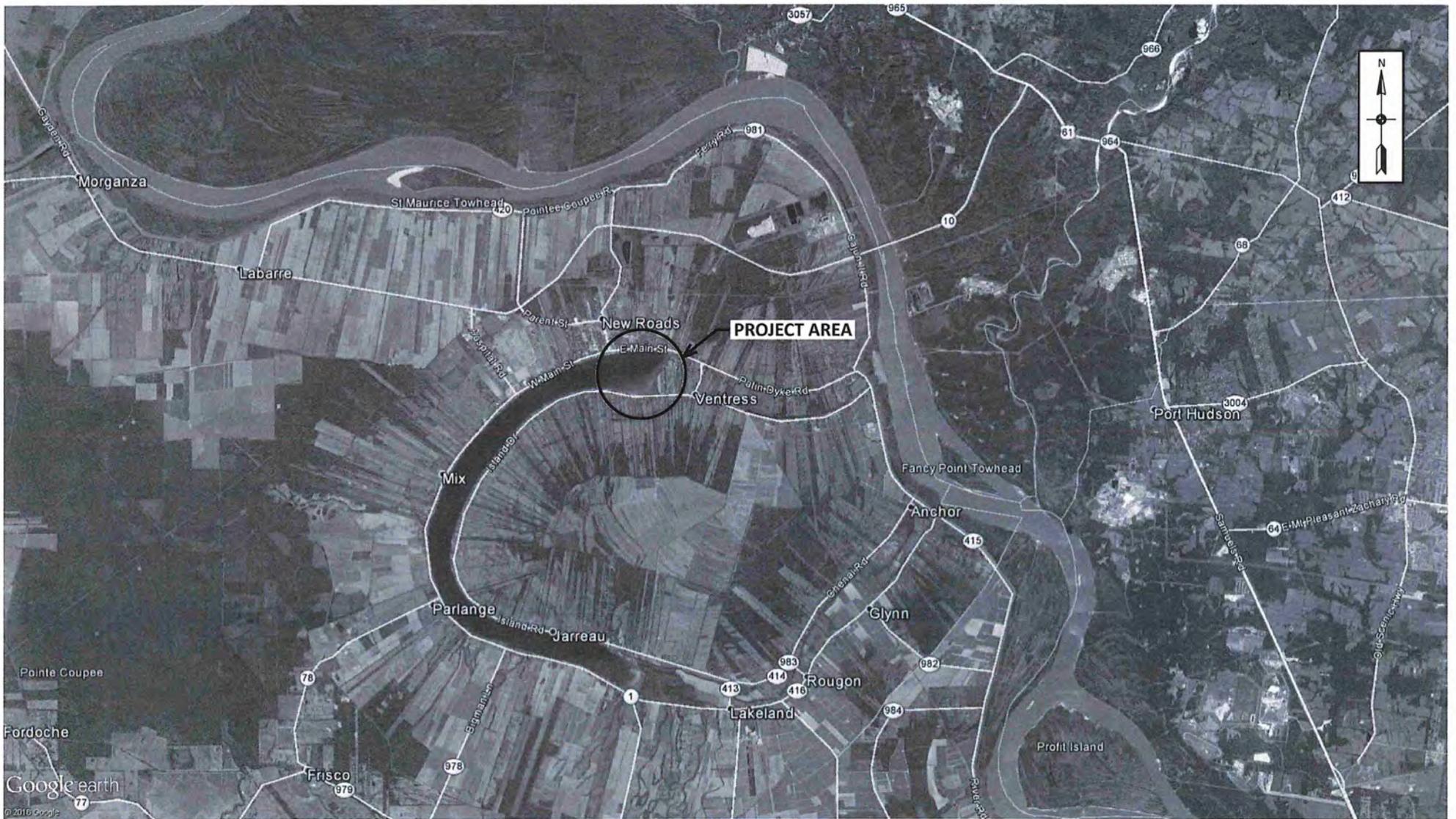
## GEOTECHNICAL ENGINEERING SERVICES

16. Eustis Engineering has not provided any geotechnical engineering services for this project. Once a decision is made to store the dredged deposits from False River behind a containment dike in the water or at an off-site location on land, Eustis Engineering should be contacted to provide the geotechnical design services required to develop the plans and specifications. If a land area is acquired to receive the dredged sediment, Eustis Engineering will need to perform another field and laboratory testing program. Eustis Engineering should be contacted once PEC knows the direction the project will go.

## GEOTECHNICAL SERVICES DURING CONSTRUCTION

17. To provide continuity among the exploration, design, and construction phases, Eustis Engineering should also be retained to provide additional services during construction of the project. These services may include consultation during construction of either the island terrace or land-based receiving site, further testing of dredged materials, and any other soils and materials testing services.
18. In summary, Eustis Engineering should be retained to monitor all geotechnical related work performed by the contractor. If construction problems arise, Eustis Engineering should be

notified to participate in the development of solutions. This participation permits the geotechnical engineer to evaluate the effects of unanticipated conditions and propose solutions on the geotechnical design assumptions particular to the project. The design geotechnical engineer may also be able to judge how site specific soil and ground water conditions will affect the success of a proposed construction.



**NOT TO SCALE**

**SITE VICINITY MAP**

POINTE COUPEE PARISH POLICE JURY  
 FALSE RIVER AQUATIC RESOURCES  
 ECOSYSTEM RESTORATION PROJECT  
 PHASE II, NORTH FLATS  
 POINTE COUPEE PARISH, LOUISIANA



DRAWN BY: J.L.S.	JOB NO.: 23163
CHECKED BY: P.A.T.	DATE: 4 MAY 2016
CADD FILE: SITE MAP.DGN	FIGURE 1



**NOT TO SCALE**

⊕ DENOTES LOCATIONS OF UNDISTURBED SOIL BORINGS DRILLED 18 THROUGH 20 APRIL 2016

**BORING LOCATION PLAN**

POINTE COUPEE PARISH POLICE JURY  
 FALSE RIVER AQUATIC RESOURCES  
 ECOSYSTEM RESTORATION PROJECT  
 PHASE II, NORTH FLATS  
 POINTE COUPEE PARISH, LOUISIANA



DRAWN BY: J.L.S.	JOB NO.: 23163
CHECKED BY: P.A.T.	DATE: 4 MAY 2016
CADD FILE: LOCATION PLAN.DGN	FIGURE 2

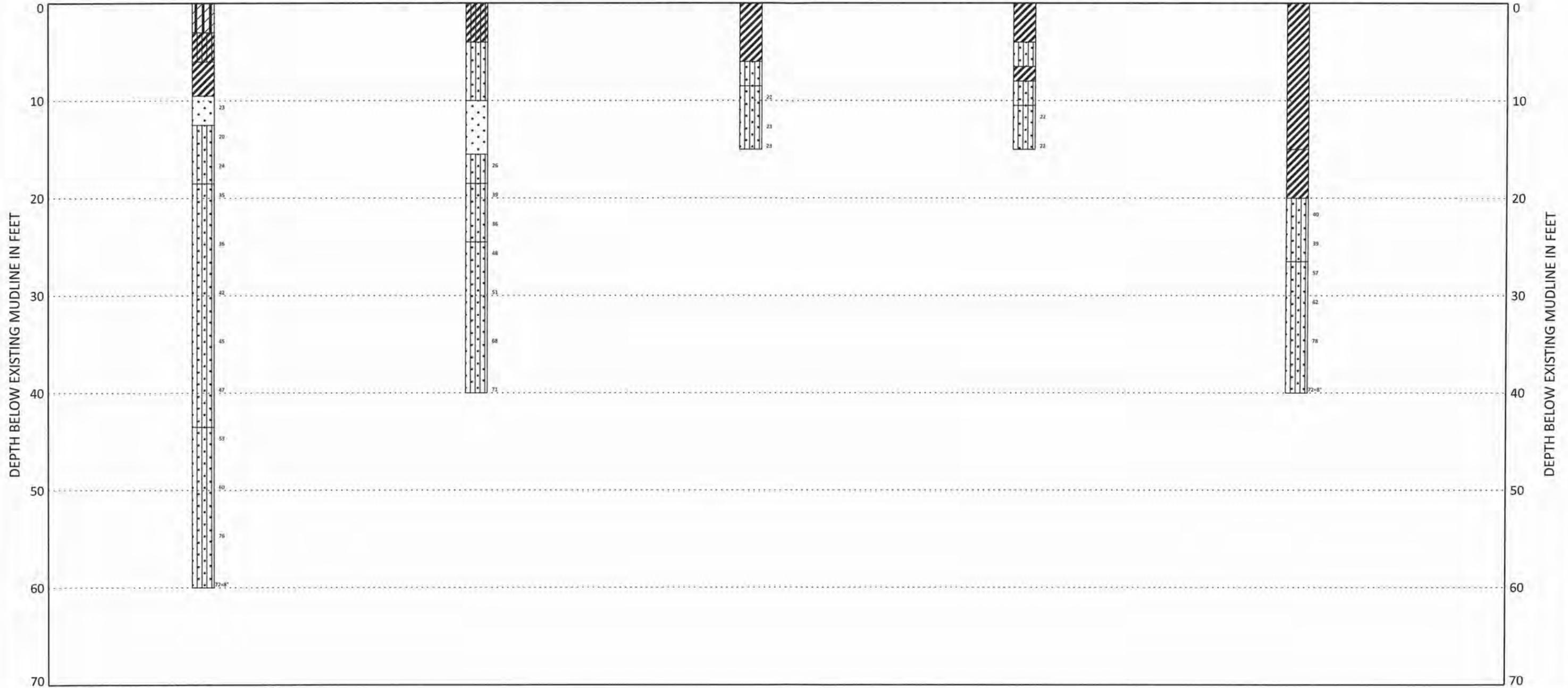
B-1  
20 APR 16  
30°41'6.108" -91°25'44.832"

B-2  
19 APR 16  
30°41'11.688" -91°25'36.192"

B-3  
18 APR 16  
30°41'8.232" -91°25'26.652"

B-4  
18 APR 16  
30°41'12.84" -91°25'21.756"

B-5  
19 APR 16  
30°41'15.288" -91°25'12.54"



**BORING MATERIAL GRAPHICS**

-  CLAY
-  SILTY CLAY
-  SAND
-  SILTY SAND
-  CLAYEY SILT

**NOTE:**

NUMBERS TO THE RIGHT OF THE BORING LOGS REPRESENT RESULTS OF STANDARD PENETRATION TESTS.

**SUBSOIL PROFILE**

POINTE COUPEE PARISH POLICE JURY  
FALSE RIVER AQUATIC RESOURCES  
ECOSYSTEMS RESTORATION PROJECT  
PHASE II, NORTH FLATS  
POINTE COUPEE PARISH, LOUISIANA



DRAWN BY: J.L.S.	JOB NO.: 23163
CHECKED BY: P.A.T.	DATE: 12 MAY 2016
CADD FILE: PROFILE.DGN	FIGURE 3

APPENDIX

PP Pocket penetrometer: Resistance in tons per square foot

SPT Standard Penetration Test: Number of blows of a 140-lb hammer dropped 30 inches required to drive 2-in. O.D., 1.4-in. I.D. sampler a distance of 1 foot into the soil after first seating it 6 inches

SPLR Type of Sampling  Shelby  SPT  Auger  Vibracore  No sample

SYMBOL Clay  Silt  Sand  Peat/Humus  Shells  Stone/Gravel   
Predominant type shown heavy; Modifying type shown light

USC Unified Soil Classification

DENSITY Unit weight in pounds per cubic foot

#### SHEAR TESTS

##### TYPE

- UC Unconfined compression shear
- OB Unconsolidated undrained triaxial compression shear on one specimen confined at the approximate overburden pressure
- UU Unconsolidated undrained triaxial compression shear
- CU Consolidated undrained triaxial compression shear
- DS Direct shear

$\phi$  Angle of internal friction in degrees

c Cohesion in pounds per square foot

#### ATTERBERG LIMITS

- LL Liquid Limit
- PL Plastic Limit
- PI Plasticity Index

#### OTHER TESTS

- CON Consolidation
- PD Particle size distribution (sieve and/or hydrometer)
- k Coefficient of permeability in centimeters per second
- SP Swelling pressure in pounds per square foot

Other laboratory test results reported on separate figures

#### GENERAL NOTES

- (1) If a ground water depth is shown on the boring log, these observations were made at the time of drilling and were measured below the existing ground surface. These observations are shown on the boring logs. However, ground water levels may vary due to seasonal fluctuations and other factors. If important to construction, the depth to ground water should be determined by those persons responsible for construction immediately prior to beginning work.
- (2) While the individual logs of borings are considered to be representative of subsurface conditions at their respective locations on the dates shown, it is not warranted that they are representative of subsurface conditions at other locations and times.



Pointe Coupee Parish Police Jury  
False River Aquatic Resources  
Ecosystem Restoration Project,  
Phase II, North Flats  
Pointe Coupee Parish, Louisiana

**LOG OF BORING AND TEST RESULTS**

**Boring: B-1**

Project No: 23163  
Date: 04/20/2016  
Latitude: 30.68503°  
Longitude: -91.42912°

Elevation: 0.0  
Datum:  
Water Depth: See Text  
Total Depth: 60.0 ft

Scale in Feet	PP	SPT	S P L R Symbol	Visual Classification	USC	Sample Number	Depth in Feet	Water Content %	Density		Shear Tests			Atterberg Limits			Other Tests
									Dry pcf	Wet pcf	Type	φ	C pcf	LL	PL	PI	
0				Very loose gray clayey silt	ML	T-1	1	26	100	125	OB	0	1981				
5				Very soft gray silty clay w/trace of silt lenses	CL	T-2	4	48	74	109	UC	-	98	33	14	19	
				Very soft gray clay w/few organic matter & trace of clay pockets	CH	T-3	7	74	56	98	OB	0	105	63	21	42	
10		23		Medium dense gray fine sand w/few organic matter, trace of clay pockets, & wood	SP	PB-4	9.5	25									
		20		Medium dense gray silty sand w/some clay pockets & trace of organic matter	SM	PB-5	12.5	19									
15		24				PB-6	15.5	21									
20		35		Dense gray silty sand w/some clay pockets & trace of organic matter	SM	PB-7	18.5	20									
25		36				PB-8	23.5	22									
30		42		w/trace of clay pockets & gravel		PB-9	28.5	19									
35		45				PB-10	33.5	19									
40		47				PB-11	38.5	16									
45		53		Very dense gray silty sand w/trace of clay pockets	SM	PB-12	43.5	18									
50		60				PB-13	48.5	17									

EUSTIS GINT LIBRARY02316.GLB EE STANDARD BORING LOG 23163.GPJ 5/13/16

NOTES:

**LOG OF BORING AND TEST RESULTS**



Pointe Coupee Parish Police Jury  
False River Aquatic Resources  
Ecosystem Restoration Project,  
Phase II, North Flats  
Pointe Coupee Parish, Louisiana

**Boring: B-1**

Project No: 23163  
Date: 04/20/2016  
Latitude: 30.68503°  
Longitude: -91.42912°

Elevation: 0.0  
Datum:  
Water Depth: See Text  
Total Depth: 60.0 ft

Scale in Feet	PP	SPT	S P L R Symbol	Visual Classification	USC	Sample Number	Depth in Feet	Water Content %	Density		Shear Tests			Atterberg Limits			Other Tests	
									Dry pcf	Wet pcf	Type	φ	C psf	LL	PL	PI		
50				Very dense gray silty sand w/trace of clay pockets	SM													
55		76	⊗			PB-14	53.5	15										
60		72=8"	⊗			PB-15	58.5	15										-#200 = 4.9%, SV
65																		
70																		
75																		
80																		
85																		
90																		
95																		
100																		

EUSTIS GINT LIBRARY022316.GLB EE STANDARD BORING LOG 23163.GPJ 5/13/16

NOTES:



Pointe Coupee Parish Police Jury  
False River Aquatic Resources  
Ecosystem Restoration Project,  
Phase II, North Flats  
Pointe Coupee Parish, Louisiana

LOG OF BORING AND TEST RESULTS

**Boring: B-2**

Project No: 23163  
Date: 04/19/2016  
Latitude: 30.68658°  
Longitude: -91.42672°

Elevation: 0.0  
Datum:  
Water Depth: See Text  
Total Depth: 40.0 ft

Scale in Feet	PP	SPT	S P L R Symbol	Visual Classification	USC	Sample Number	Depth in Feet	Water Content %	Density		Shear Tests			Atterberg Limits			Other Tests
									Dry pcf	Wet pcf	Type	φ	C <sub>psf</sub>	LL	PL	PI	
0				Very soft gray silty clay w/trace of concretions	CL	T-1	1	48	73	108	OB	0	130				
						T-2	3	26	98	123	OB	0	2065				
5				Very loose gray silty sand w/trace of clay pockets	SM	T-3	6	25	100	125	OB	0	1980	NP	NP	NP	
						T-4	9	25									
10				Loose gray & tan fine sand w/silt, some clay layers & lenses, & trace of medium sand	SP-SM	T-5	12	17									#200 = 8.0%
15		26		Medium dense gray & tan silty sand w/few clay pockets	SM	PB-6	15.5	24									
		39		Dense gray & tan silty sand w/few clay pockets	SM	PB-7	18.5	18									
20		36				PB-8	21.5	24									
25		48				PB-9	24.5	17									
30		51		Very dense gray silty sand w/trace of clay pockets & shells	SM	PB-10	28.5	18									
35		68				PB-11	33.5	20									
40		71				PB-12	38.5	19									

EUSTIS GINT LIBRARY022316.GLB EE STANDARD BORING LOG 23163.GPJ 5/13/16

NOTES:



Pointe Coupee Parish Police Jury  
False River Aquatic Resources  
Ecosystem Restoration Project,  
Phase II, North Flats  
Pointe Coupee Parish, Louisiana

**LOG OF BORING AND TEST RESULTS**

**Boring: B-3**

Project No: 23163  
Date: 04/18/2016  
Latitude: 30.68562°  
Longitude: -91.42407°

Elevation: 0.0  
Datum:  
Water Depth: See Text  
Total Depth: 15.0 ft

Scale in Feet	PP	SPT	S P L R Symbol	Visual Classification	USC	Sample Number	Depth in Feet	Water Content %	Density		Shear Tests			Atterberg Limits			Other Tests	
									Dry pcf	Wet pcf	Type	φ	C pcf	LL	PL	PI		
0			[Diagonal Hatching]	Very soft gray clay w/sand layers	CH	T-1	0	53	69	105	OB	0	141					
						T-2	2	25	100	125	OB	0	3496					
5						T-3	4	60	64	102	OB	0	187	64	22	42		
			[Vertical Lines]	Loose gray & tan silty sand w/few clay pockets & layers	SM	T-4	6	18										
10		22				PB-5	8.5	22										
		23				PB-6	11.5	27										
15		23				PB-7	13.5	23										
			[Vertical Lines]	Medium dense gray & tan silty sand w/trace of clay pockets	SM													
20																		
25																		
30																		
35																		
40																		
45																		
50																		

-#200 = 49.6%, PD

NOTES:

EUSTIS GINT LIBRARY02316.GLB EE STANDARD BORING LOG 23163.GPJ 5/13/16



Pointe Coupee Parish Police Jury  
False River Aquatic Resources  
Ecosystem Restoration Project,  
Phase II, North Flats  
Pointe Coupee Parish, Louisiana

LOG OF BORING AND TEST RESULTS

**Boring: B-4**

Project No: 23163  
Date: 04/18/2016  
Latitude: 30.68690°  
Longitude: -91.42271°

Elevation: 0.0  
Datum:  
Water Depth: See Text  
Total Depth: 15.0 ft

Scale in Feet	PP	SPT	S P L R	Symbol	Visual Classification	USC	Sample Number	Depth in Feet	Water Content %	Density		Shear Tests			Atterberg Limits			Other Tests
										Dry pcf	Wet pcf	Type	φ	C psf	LL	PL	PI	
0					Very soft gray clay w/some silt pockets & lenses	CH	T-1	0	82	53	96	OB	0	99				
							T-2	2	59	65	104	UC	--	106	61	21	40	
5					Loose gray silty sand	SM	T-3	4	25	94	118	OB	0	1715				
					Very soft gray clay w/silt pockets	CH	T-4	6	61	64	103	OB	0	98	60	24	36	
					Loose gray & tan silty sand w/trace of clay pockets	SM	T-5	8	23									
10		22			Medium dense gray & tan silty sand w/trace of clay pockets	SM	T-6	10.5	21									
15		22			w/some organic matter		PB-7	13.5	21									
20																		
25																		
30																		
35																		
40																		
45																		
50																		

EUSTIS GINT LIBRARY022316.GLB EE STANDARD BORING LOG 23163.GPJ 5/13/16

NOTES:



Pointe Coupee Parish Police Jury  
False River Aquatic Resources  
Ecosystem Restoration Project,  
Phase II, North Flats  
Pointe Coupee Parish, Louisiana

**LOG OF BORING AND TEST RESULTS**

**Boring: B-5**

Project No: 23163  
Date: 04/19/2016  
Latitude: 30.68758°  
Longitude: -91.42015°

Elevation: 0.0  
Datum:  
Water Depth: See Text  
Total Depth: 40.0 ft

Scale in Feet	PP	SPT	S P L R	Symbol	Visual Classification	USC	Sample Number	Depth in Feet	Water Content %	Density		Shear Tests			Atterberg Limits			Other Tests
										Dry pcf	Wet pcf	Type	φ	C pcf	LL	PL	PI	
0					Very soft gray clay w/some silt pockets & trace of concretions	CH	T-1	0	85	52	95	OB	0	53				
							T-2	2	80	53	96	UC	--	24	90	25	65	
							T-3	4	120	40	88	OB	0	61				
5							T-4	6	96	47	93	UC	--	56	90	30	60	
					w/trace of organic matter		T-5	8	83	52	96	OB	0	102				
							T-6	10.5	58	65	103	OB	0	191	67	24	43	
							PB-7	13.5	21									
15					Very soft gray clay w/silt pockets	CH												
20		40			Dense gray & tan silty sand w/trace of clay pockets	SM												
		39					PB-8	23.5	22									
25		57			Very dense gray & tan silty sand w/trace of clay pockets	SM												
		62					PB-9	26.5	19									
30		78					PB-10	29.5	20									
							PB-11	33.5	19									
35		72=8"					PB-12	38.5	19									
40																		
45																		
50																		

-#200 = 5.3%, SV

EUSTIS GINT LIBRARY022316.GLB EE STANDARD BORING LOG 23163.GPJ 5/13/16

NOTES:



# Particle Size Distribution Report

