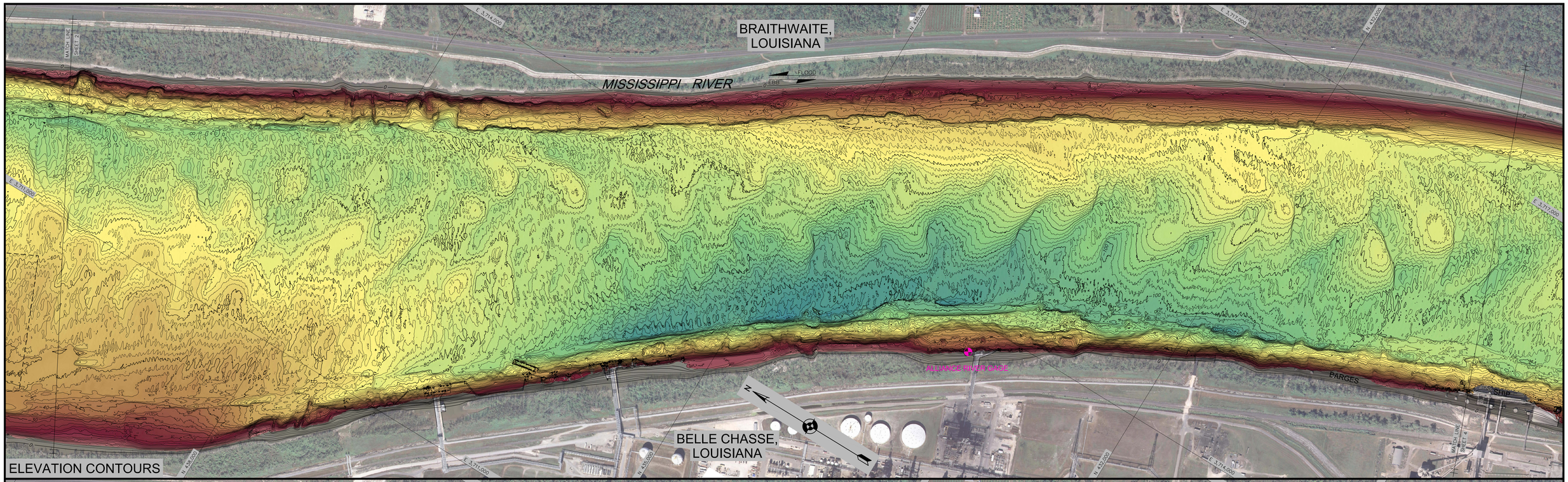
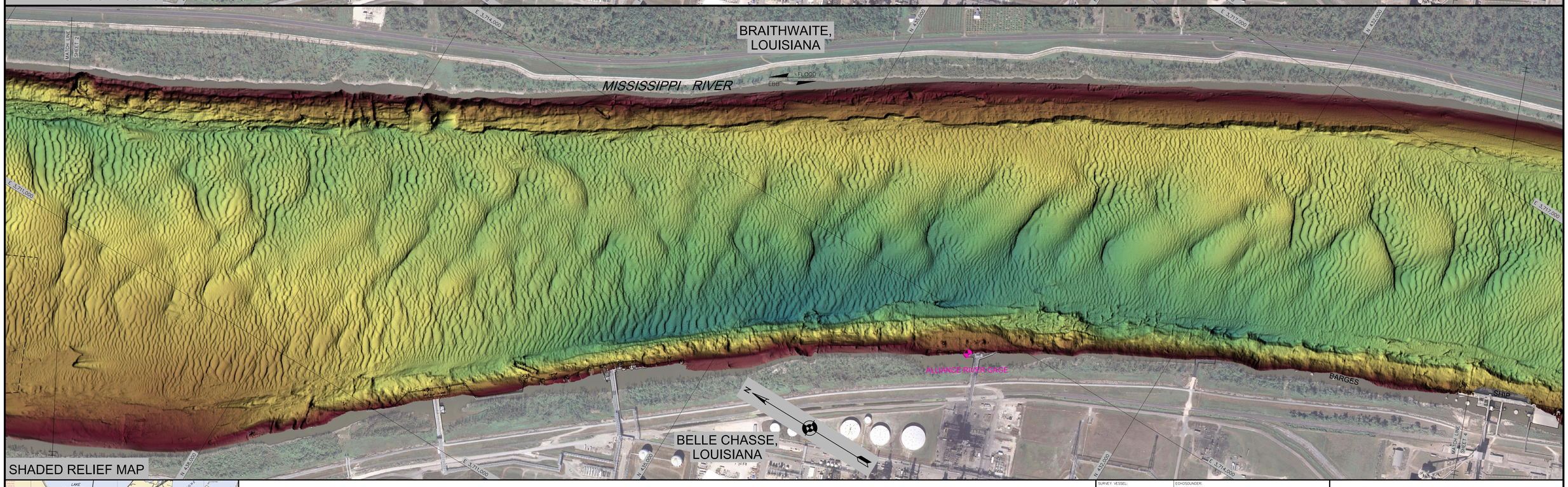
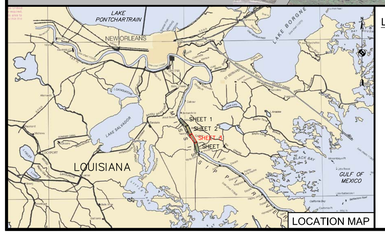






LEGEND

- A-53 — MAGNETIC ANOMALY
- BORROW AREA DREDGE LIMITS (AS PROVIDED BY MOFFATT & & NICHOL ON 30 AUGUST 2011)
- —40— TEN-FOOT CONTOUR
- —58— TWO-FOOT CONTOUR

SHADED RELIEF INFORMATION:
SUN POSITION
ALTITUDE: 55°
AZIMUTH: 340°

ELEVATIONS (NAVD 88)
FEET
−1
−30
−60
−90
−120
−150

NOTES

1. GRID SYSTEM IS THE LOUISIANA STATE PLANE COORDINATE SYSTEM, SOUTH ZONE (1702), NAD 83, U.S. SURVEY FEET.
2. ELEVATIONS ARE IN FEET AND ARE REFERENCED TO NORTH AMERICAN VERTICAL DATUM 1988 (NAVD 88–2004.65) BASED ON PRELIMINARY WATER LEVEL VALUES RECORDED AT THE U.S. ARMY CORPS OF ENGINEERS MISSISSIPPI RIVER WATER LEVEL GAUGE "ALLIANCE" (01390).
3. CONTOURS ARE IN FEET AND WERE GENERATED USING "QUICKSURF" OPERATING WITHIN AUTODESK "AUTOCAD". HYDROGRAPHIC CONTOURS WERE DEVELOPED FROM FOUR FOOT BY FOUR FOOT BINNED DATA WITH THE AVERAGE DEPTH WITHIN EACH BIN POSTED IN THE CENTER OF THE BIN.
5. SHORELINE AND ONSHORE FEATURES ARE APPROXIMATE AND WERE TAKEN FROM DIGITAL ORTHOPHOTO QUADRANGLES FLOWN IN 2006 AND OBTAINED FROM THE USGS SEAMLESS DATA WAREHOUSE.
6. THE INFORMATION PRESENTED ON THIS DRAWING REPRESENTS THE RESULTS OF A SURVEY PERFORMED BY OCEAN SURVEYS, INC. ON 4–17 AUGUST 2011 AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS EXISTING AT THAT TIME. REUSE OF THIS INFORMATION BY CLIENT OR OTHERS BEYOND THE SPECIFIC SCOPE OF WORK FOR WHICH IT WAS ACQUIRED SHALL BE AT THE SOLE RISK OF THE USER AND WITHOUT LIABILITY TO OSI.

SURVEY VESSEL: R/V ABLE II	ECHOSOUNDER: RESON 7101
NAVIGATION SYSTEM: APPLANIX POS MV IN REAL TIME KINEMATIC MODE	
MAGNETOMETER: GEOMETRICS 882	
SURVEY ACQUISITION SOFTWARE: HYPACK VERSION 2010	
SURVEY PROCESSING SOFTWARE: HYPACK MULTIBEAM & SINGLE BEAM EDITORS VERSION 2010	

SCALE: 1"=300'
300 0 300 600 900
CHECK GRAPHIC SCALE BEFORE USING

OCEAN SURVEYS, INC.
METAIRIE, LOUISIANA
www.oceansurveys.com

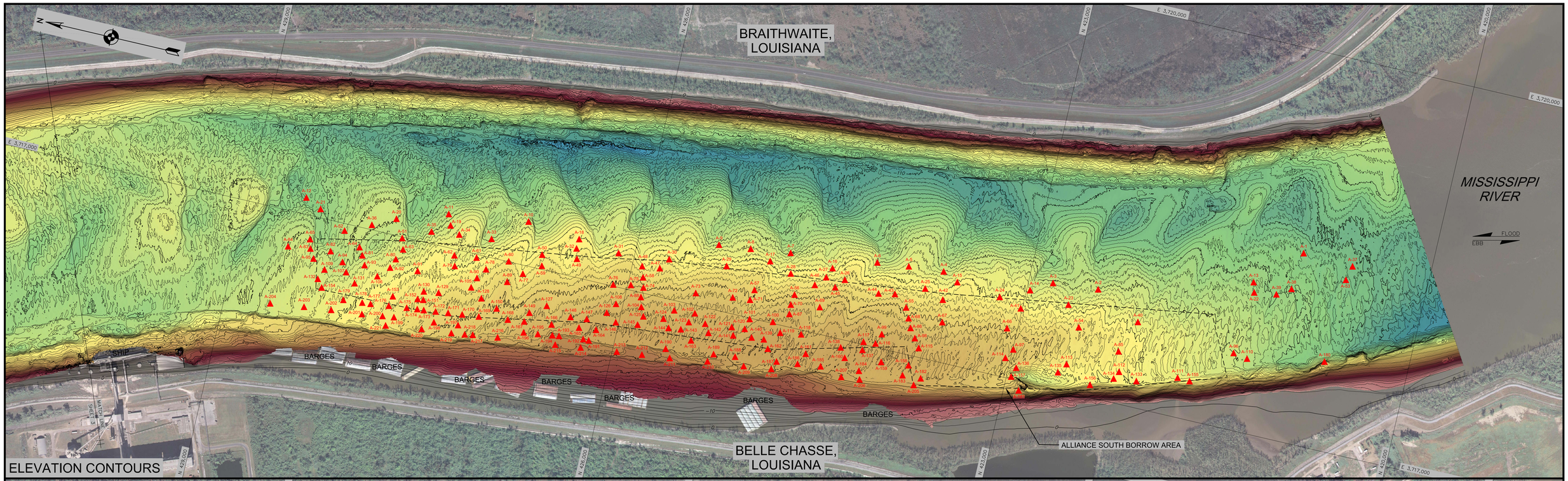
PREPARED FOR: MOFFATT & NICHOL

MULTIBEAM HYDROGRAPHIC SURVEY AND MAGNETOMETER SURVEY

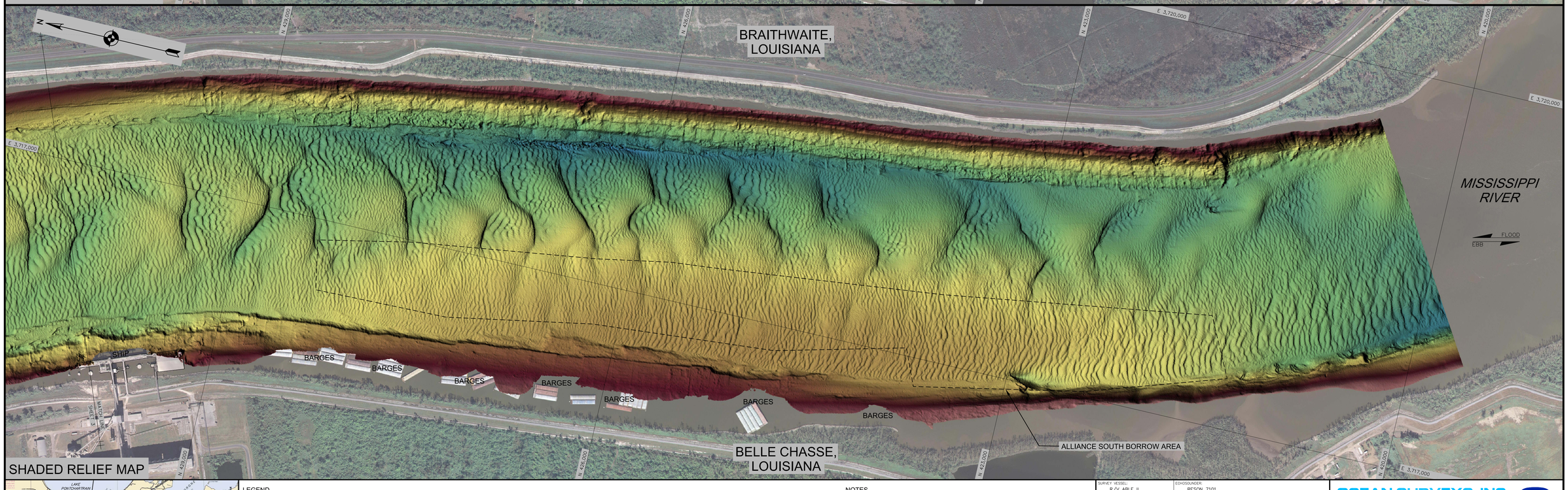
MISSISSIPPI RIVER LONG DISTANCE SEDIMENT PIPELINE PROJECT

MISSISSIPPI RIVER, BELLE CHASSE, LOUISIANA

PROJECT MANAGER:	SURVEY DATE:	PROJECT NUMBER:	
D. BELL	4–17 AUGUST 2011	11ES055	
DRAFTED BY: A. RIZZO	DATE: 9 SEPTEMBER 2011	DRAWING: 1	SHEET: 3 OF 4



ELEVATION CONTOURS



SHADED RELIEF MAP

LOCATION MAP

LEGEND

- A-63 — MAGNETIC ANOMALY
- BORROW AREA DREDGE LIMITS (AS PROVIDED BY MOFFATT & & NICHOL ON 30 AUGUST 2011)
- —40— TEN-FOOT CONTOUR
- —58— TWO-FOOT CONTOUR

SHADED RELIEF INFORMATION:

SUN POSITION
ALTITUDE: 55°
AZIMUTH: 340°

ELEVATIONS (NAVD 88)

FEET: −1, −30, −60, −90, −120, −150

NOTES

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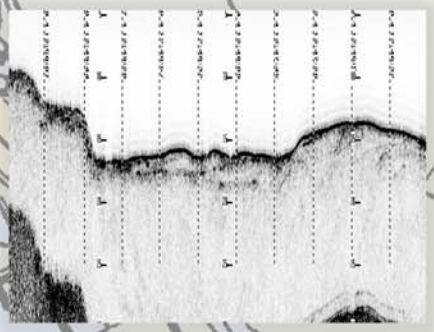
D. BELL	4–17 AUGUST 2011	11ES055	
DRAFTED BY:	DATE:	DRAWING:	SHEET:
A. RIZZO	9 SEPTEMBER 2011	1	4 OF 4

Final Report

Geophysical and Geotechnical Investigation

Long Distance Sediment Pipeline Project - Bayou Dupont Borrow Area
Mississippi River, Louisiana

OSI Report #11ES002



moffatt & nichol

Prepared For:
Moffatt & Nichol
104 West 40th Street, 14th Floor
New York, NY 10018

Prepared By:
Ocean Surveys, Inc.
3100 - 28th Street
Metairie, LA 70002

FINAL REPORT

GEOPHYSICAL AND GEOTECHNICAL INVESTIGATION
LONG DISTANCE SEDIMENT PIPELINE
BAYOU DUPONT BORROW AREA
MISSISSIPPI RIVER, LOUISIANA

OSI REPORT NO. 11ES002

Prepared For: Moffatt & Nichol
104 West 40th Street, 14th Floor
New York, NY 10018

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Metairie, LA 70002

21 March 2011

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GEOPHYSICAL AND GEOTECHNICAL INVESTIGATION
LONG DISTANCE SEDIMENT PIPELINE
BAYOU DUPONT BORROW AREA
MISSISSIPPI RIVER, LOUISIANA

1.0 INTRODUCTION

During the period 17-28 January 2011, Ocean Surveys, Inc. (OSI) performed vibratory coring, multibeam surveying, and subbottom profiling investigations in the Bayou Dupont borrow area located just south of Mile Marker 65 on the Mississippi River near Belle Chasse, Louisiana (Figure 1). These investigations were conducted under subcontract to Moffatt & Nichol (M&N) for the Louisiana Office of Coastal Protection and Restoration (OCPR) and were designed to support the Mississippi River Long Distance Sediment Pipeline (LDSP) project (M&N Project Number 6865).

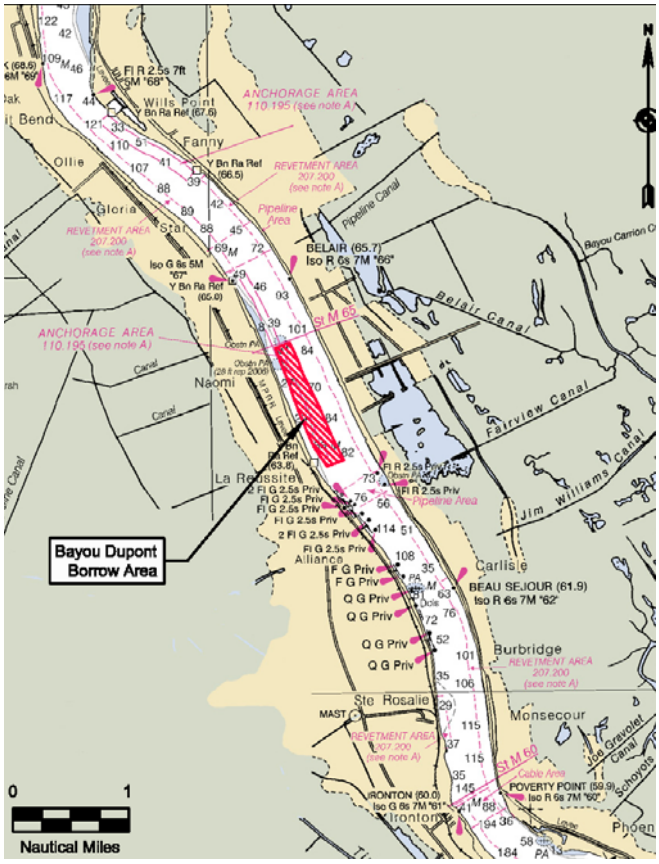


Figure 1. Location of project site.

2.0 PROJECT SUMMARY

2.1 Project Background and Objectives

The State of Louisiana, working with other local and federal agencies, is developing strategies to deal with coastal land loss and restoration of marsh areas. Sediment delivery is an effective method to restore eroding marshland. Mississippi River sediment is a renewable and consistently available resource in the area. The primary goal of the LDSP project is to establish a long distance pipeline capability for conveying Mississippi River sediments for land building (marsh and ridge) to strategic areas of the central Barataria Basin (personal communication, Santiago Alfageme, M&N).

The Bayou Dupont borrow area was designated as a sediment source area for a project to create/restore over 400 acres of marshland within the Barataria Basin ("Mississippi River Sediment Delivery System – Bayou Dupont," LA State Project Number BA-39).[1] As part of that project, Great Lakes Dredge and Dock (GLDD) was contracted to perform dredging operations within the designated borrow area. Dredging in the borrow area was initiated during the fall of 2009 and completed in the spring of 2010. During and following the conclusion of dredging in the borrow area the U.S. Army Corps of Engineers (USACE) performed several hydrographic surveys to document current conditions and rates of sediment infilling of the borrow area. OSI was tasked with identifying and characterizing the sediments that have infilled the borrow area since dredging was completed to provide project planners with data needed for the engineering and designing of the LDSP.

To meet these project objectives the following tasks were undertaken:

Task 1 – Vibratory Core Sampling
Task 2 – Multibeam Hydrographic Survey
Task 3 – Subbottom Profiling Survey
Task 4 –Vibratory Core Analysis including core description and grain size analysis

[1]Coastal Protection and Restoration Authority. 2011. Fiscal Year 2012 Annual Plan: Integrated Ecosystem Restoration and Hurricane Protection in Coastal Louisiana. Coastal Protection and Restoration Authority of Louisiana. Baton Rouge, LA.

This report presents a summary of Tasks 1, 3, and 4. Task 2 has been reported under separate cover in a letter report entitled "Multibeam Hydrographic Survey, Mississippi River Long Distance Sediment Pipeline Project, Bayou Dupont Borrow Area, Belle Chasse, Louisiana," dated 21 February 2011. This previous submittal will be referred herein as the "Task 2 Report."

2.2 Summary of Project Tasks and Equipment

Task 1

As illustrated in Figure 2, vibratory coring was planned at ten locations within the borrow area as identified by M&N. Proposed core locations were equally spaced along two river-parallel lines with three of the cores planned at pre-dredge boring locations. Core designations follow the naming convention provided by M&N ("B1-B, 2-B, B3-B" and "B1-P" – "B7-P"), where "-B" designated cores corresponding to pre-dredge boring locations.

Vibratory coring was performed on the OSI *R/V CanDu*, a self-propelled, shallow draft, 36-foot by 16-foot pontoon barge configured with a multi-point anchoring system, a mechanized A-frame for handling the vibratory corer and other geotechnical sampling and support gear (Figure 3).

A summary of the primary equipment installed on the sampling vessel to complete the coring included the following:

- Trimble differential global positioning system (DGPS) with a horizontal positioning accuracy of ±3 feet
- HYPACK navigation and data-logging computer system
- OSI vibratory corer (VC) equipped with a 20-foot long core barrel complete with support tools required for operation and maintenance of the VC
- OSI high pressure hydro-jet pump

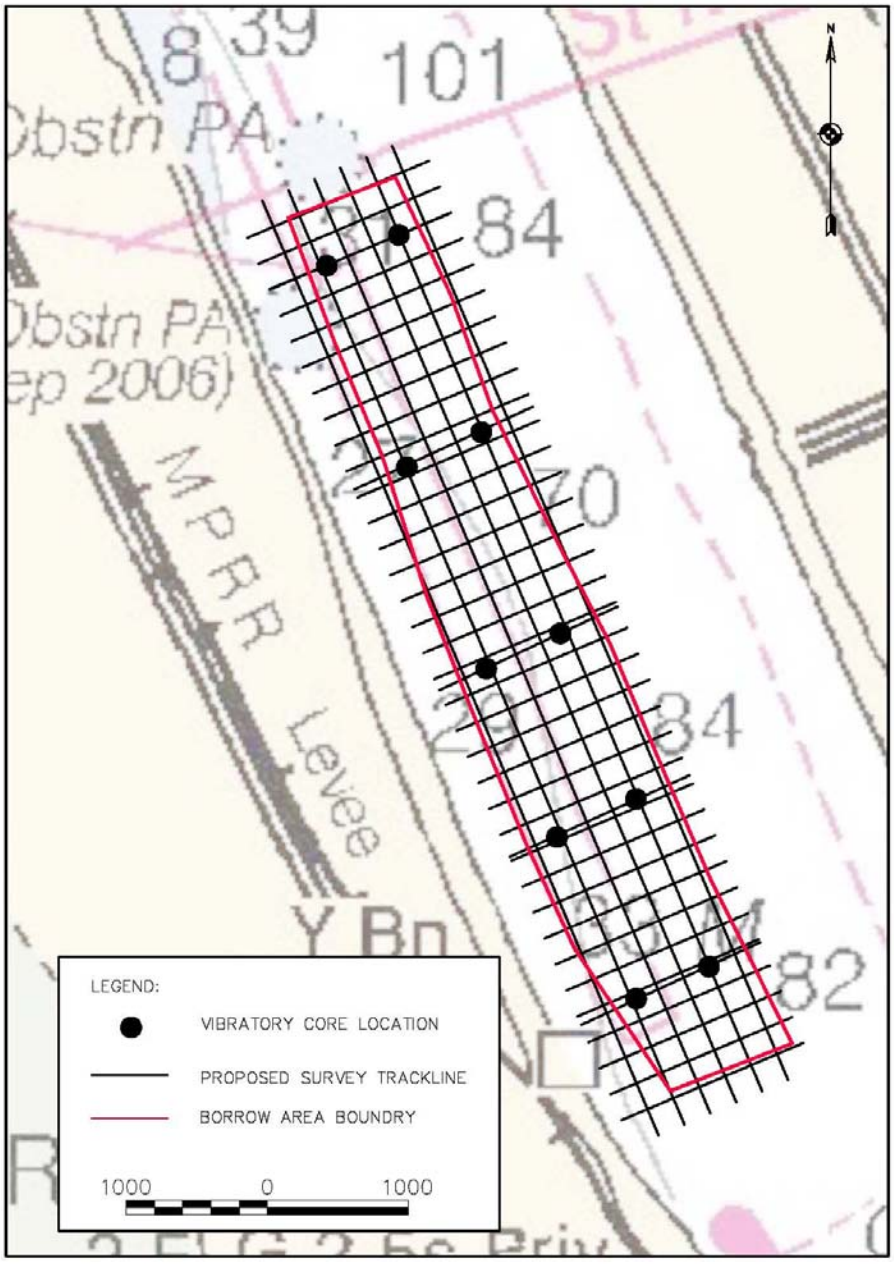


Figure 2. Bayou Dupont Borrow Area overview map. Vibratory core locations are identified as filled black circles. Task 2 survey tracklines, spaced 200 feet apart both parallel to and across the river, are represented by black lines.

Figure 3. OSI *R/V CanDu* utilized for coring operations.

The core rig consisted of a 4-inch diameter steel core barrel, a clear plastic Lexan liner, a cutter head or shoe, a core catcher, and a pneumatically driven vibratory head attached to the upper end of the core barrel. The core unit uses an air compressor to power a piston inside the head of the corer, which is the driving force of the system. All cores were planned to a target depth of 20 feet below the riverbed. Whenever initial coring attempts were unable to penetrate to the planned target depth in a single attempt (due to the compact nature of the sediment in the area), a two-step coring procedure was initiated. This two-step procedure consisted of vibratory coring until refusal was met in a first attempt (penetration rate of less than 1 foot in 3 minutes), recovering the corer and performing a jet retry attempt on station. The jet retry attempt consisted of lowering the corer to the riverbed (at a position slightly offset from the first core attempt) and injecting a high-pressure stream of water through the core barrel to fluidize the sediment just below the core barrel. During the jet process the downward progress of the core barrel into the fluidized sediment was monitored and

terminated approximately ½ foot above the previous attempt refusal depth. Once jetting was stopped, vibration was applied to the corer in an attempt to penetrate to the target depth. The jet process was repeated multiple times if needed, to penetrate to target depth. Upon recovery, all cores were cut into approximate 5-foot lengths for ease of handling and offloaded from the vessel each day and stored for transport to the laboratory.

Task 3

As illustrated in Figure 2, Task 3 consisted of the acquisition of subbottom profiler data along a grid of river-parallel and cross-river tracklines spaced 200 feet apart throughout the borrow area. Four additional survey tracklines were added to the planned program to ensure subbottom data were acquired directly over all core stations. Approximately 25 nm of subbottom data were acquired to complete this task.

Subbottom profiling was conducted aboard the University of New Orleans' *R/V Fisk* (Figure 4), a shallow draft survey vessel, approximately 26 feet in length, outfitted with an enclosed cabin and the necessary support equipment to safely perform the required survey. During acquisition, the subbottom profiler was deployed over the starboard side of the vessel and towed from a davit located approximately amidships.

Figure 4. *R/V Fisk* utilized to perform Task 2.

A summary of the primary equipment installed on the vessel included the following:

- Trimble differential global positioning system (DGPS) with a horizontal positioning accuracy of ±3 feet
- HYPACK navigation and data-logging computer system
- EdgeTech Chirp Subbottom Profiling System equipped with SB216 Tow Vehicle (2-16 kHz transducer)

The Chirp 2 to 16 kHz subbottom profiling system was chosen for its high-resolution profiling capabilities. Reports provided prior to the survey suggested that sediments within the borrow area were primarily comprised of fine-grained deposits, which would likely be penetrated using the selected chirp system. Once onsite, however, preliminary seismic results indicated that the surficial sediments in the site were generally coarser and more compact than originally expected and were limiting penetration of the acoustic signal into the sediments. Consequently, the profiler was adjusted to operate at its lowest frequency range (2-10 kHz) and at its highest power setting in an attempt to overcome limited penetration.

Task 4

All Task 4 core analyses were performed at OSI's sediment processing lab. Upon arrival at the facility, core sections from each station were organized and stored in an upright position. Cores were organized and analyzed on a station-by-station basis. Each set of core sections was laid out in the laboratory; split longitudinally and visually described, photographed and subsampled. Final core logs were prepared using the logging software package, *LogPlot* distributed by RockWare, Inc.

Subsamples were then analyzed by mechanically sieving in accordance with ASTM specifications, as citied in OCPR's general guidelines for exploration for offshore sand sources. Grain size data were entered into EXCEL spreadsheets and analyzed utilizing a custom MATLAB Version R12 sieve analysis routine, specifically designed to generate grain size distribution cumulative probability curves and perform statistical analyses.

2.3 Horizontal and Vertical Control

Project horizontal reference is the LA State Plane Coordinate System, South Zone (1702), NAD 83 in U.S. Survey Feet. Horizontal positioning of both the sampling and survey vessel was accomplished using a DGPS interfaced with a computer running a version of HYPACK PC-based navigation and data logging software package. Navigation checks were performed at the beginning and end of each survey day to ensure the positioning systems on the vessels were functioning properly and delivering the horizontal accuracy required for the project. Project vertical reference is North American Vertical Datum of 1988 (NAVD 88-2004.65, in feet). Water depths measured during field investigations were referenced to project datum during post processing based on the results of the Task 2 multibeam hydrographic survey. For further discussion of vertical control, see the Task 2 Report.

2.4 Chronology of Field Operations and Core Processing

The following table provides a general chronology of the field investigations and core processing. Appendix 1 provides additional information regarding equipment operations and procedures for the field investigations. Further details of the processing and analysis procedures are presented in Section 3, below.

Table 1
Chronology of Tasks

2011 Dates	Description
TASK 1	
13-16 January	OSI coring crew and vessel *R/V CanDu* transit from OSI office to Belle Chasse, LA.
17 January	Vessel and crew arrive onsite, begin mobilization of vessel and equipment.
18-28 January	Perform vibratory coring investigations at ten locations within the borrow area.
29 January	Demobilize and prepare vessel for travel back to OSI office.
30 January	Vessel, cores and crew transit from Belle Chasse, LA to office.
TASK 3	
25 January	Mobilize subbottom profiling survey equipment onboard *R/V Fisk* at UNO facility.
26-28 January	Crew and vessel transit from New Orleans to site and perform survey investigation.

2011 Dates	Description
29 January	Crew and vessel return to UNO facility and demobilize.
TASK 4	
30 January	Vibratory cores delivered to OSI sediment processing laboratory.
31 January–11 February	Core processing performed. Cores split, logged, subsampled, and photographed.
24 February	Preliminary core logs, photos, grain size analysis submitted.
12 February – 14 March	Grain size analysis on core subsamples performed. Tabular and graphical presentations of results prepared.

3.0 DATA PROCESSING AND PRODUCTS

Following completion of the field investigations, the acquired cores and subbottom profiler data were processed and interpreted. A preliminary submittal was prepared and posted to a project ftp site for review. This preliminary submittal included:

- Vibratory Core Logs
- Vibratory Core Photographs (2-ft intervals)
- Subsample Grain Size Analysis Data Tables and Cumulative Probability Curve Plots
- An Interpreted Cut Depth Comparison Table

A complete set of finalized core logs and the results of grain size analysis are presented in Appendix 2. Digital photographs for each core are included on a disc accompanying the original copy of this report.

Following submittal of preliminary core results, subbottom data were processed and examined closely with core logs and grain size analysis to attempt to identify the interface between recently infilled sediments and the undisturbed sediments. Subbottom profiling data were processed using the *Discover – Sub-Bottom Version 3.36* software package distributed by EdgeTech Corp. Each subbottom record was filtered, adjusted for gain and exported from the software package to .jpg format. Exported profiles were referenced to project vertical datum (NAVD 88) based on the multibeam hydrographic survey and overlain with graphical interpretations of the cores and the *cut horizon* or maximum dredge depth within the borrow area. This *cut horizon* was derived from a composite of all the USACE surveys performed in the borrow area during and after dredging and was provided by M&N. Per personal communication with Robert Hampson, M&N, the composite *cut horizon* actually represents

"the minimum depth value in each grid cell over the duration of the dredging and the first survey after all dredging was completed (April 6th, 2010)." Appendix 3 presents five cross-river subbottom profiles which best illustrate the characteristics of the subbottom data acquired in the borrow area. Note that each of these profiles passes through the location of two vibratory cores. Processed subbottom profiles (.jpg format) for all survey tracklines investigated are included on a disc accompanying the original copy of this report.

4.0 DATA ANALYSIS AND DISCUSSION

The primary objective of this investigation was to identify and characterize the sediments currently infilling the Bayou Dupont Borrow area since it was last dredged in the spring of 2010. It is important to note dredging did not occur as a single event to a specific dredge depth, instead dredging was performed multiple times and to varying depths at various locations, as documented by the series of USACE hydrographic surveys conducted between the fall of 2009 and spring of 2010.

Each core was examined to identify a transition that could be inferred as the interface between recently infilled sediments and those sediments *in-situ* undisturbed during dredging the borrow area (below the *cut horizon*). In general, as documented by grain size analysis, the cores were found to contain predominately fine sand (average 99.23%) with little to no variability in grain size (0.21-0.29 mm) with depth. The only noted variation with depth was a slight gradational color change from light brown to gray or darker brown. Figure 5 provides photographs of Core B-1P which illustrate the slight change in sand color with depth (interface at approximately 2.8 feet in core).

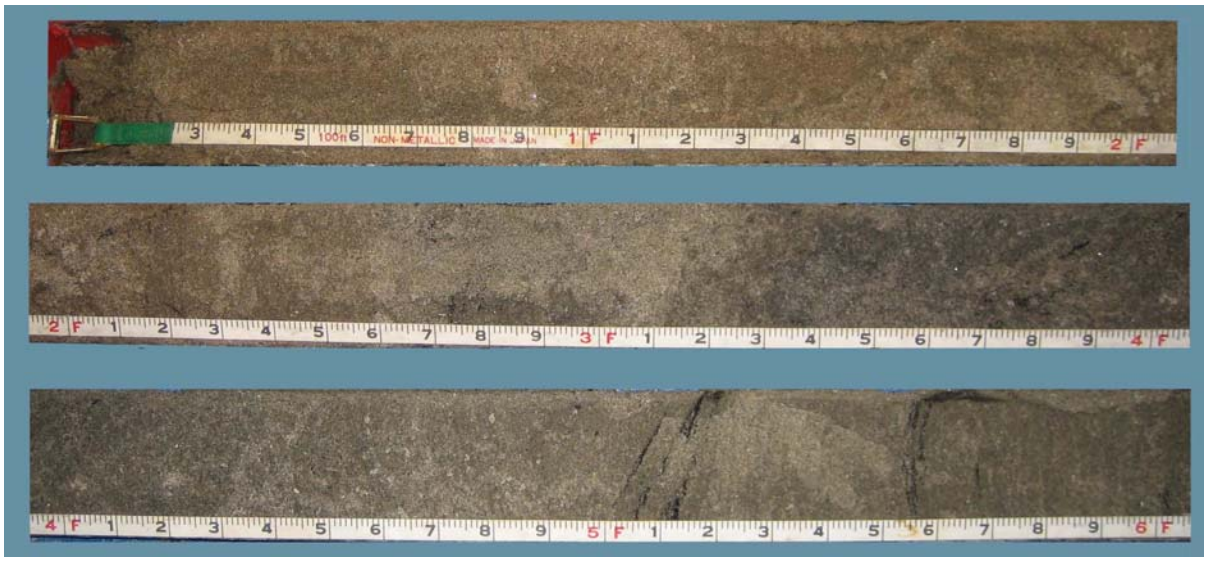


Figure 5. Vibratory Core B-1P showing the slight color change from generally light brown to light olive to gray sand with depth (interface is gradational, approximately 2.8 feet in core). The light brown sand is believed to be correlative with the sediment infilling the borrow area post dredging while the gray sand represents those sediments *in-situ* prior to dredging.

Minor layers (lenses) of organics, consisting primarily of wood fragments, were identified in many of the cores at varying depths. In core B-3B, an organic layer was found at the surface of the core, suggesting that these materials are currently being deposited in the borrow site along with sand (Figure 6). The varying depths at which the organic layers were identified in the cores suggest that these deposits are localized and not evenly distributed throughout the borrow area. Coal lenses or stringers were also identified in many of the cores. Although unverified, it is believed that the coal deposits are related to loss during the transport of coal in the river and not by natural processes. Layers of clay or mixed sediments (fine sand, slit, clay) were also recovered in several cores. These layers were generally recovered below the *cut horizon* depth, represent only a small fraction of the overall sediments recovered in the borrow area and do not appear to correlate between cores.

Figure 6. Vibratory Core B-3B, note organic material from 0.0-0.2 feet illustrating current organic deposition in the borrow area.

Pre-dredge borings (B-1, B-2, and B-3) acquired in May of 2007 by Louis J. Capozzoli & Associates, Inc. recovered a similar assemblage of surficial brown sands overlying gray sands. Based on the depth of the constructed *cut horizon* it appears that a portion of these light brown sands have been removed during the recent dredging. A comparative analysis was performed for each of the cores between the expected *cut horizon* and depth of the color change observed in the sands. Seven of the ten cores documented the color change within approximately six feet of the *cut horizon*. In most cases the interpreted dredge cut elevation based on gradational color change was found to be deeper than the *cut horizon*. These slight discrepancies between interpreted and expected depths of the *cut horizon* may be attributed to the timing of the hydrographic surveys after each dredge event, resolution of the hydrographic survey or the cell size used to generate the *cut horizon* surface. In two of the cores (B-4P and B-7P) a color change was not observed in the sands although expected based on the *cut horizon* at that location and in one core (B-6P) the *cut horizon* is projected to be deeper than the core penetrated the bottom. In general, the light brown sands recovered in the cores are correlative with post-dredge deposition, whereas the gray or dark brown sands are more likely associated with undisturbed sediments below. Table 2 provides a summary of the comparison between interpreted dredge cut elevation (based on color change noted in the cores) and the *cut horizon* based on the USACE surveys.

Subbottom profile data acquired in the borrow area were closely reviewed with respect to the interpreted dredge cut elevation based on color change and the composite *cut horizon.* Subsurface penetration below the riverbed was generally limited to less than 5 feet, due to signal attenuation in the sand-rich surficial sediment. Where subbottom penetration was

attained, subbottom reflectors appear to be weak and discontinuous both horizontally and vertically and no single reflector interpreted to be associated with the *cut horizon* could be identified. The subbottom profile sections presented in Appendix 3 provide illustration of the various discontinuous reflectors observed in the site and their relationship to the cores, the interpreted dredge cut elevation based on color change and the *cut horizon.*

In an effort to better understand conditions in the river, several survey tracklines were extended across the river to the eastern shore. The subbottom data acquired along these tracklines showed a thinning of the surficial sand layer and increase in subbottom penetration across the river. As the surficial sand layer thins toward the deeper portion of the river, reflectors indicative of fine-grain deposits of silt and clay were resolved. As illustrated in Figure 7, these fine-grain sediments were only detected in the subbottom record outside of the borrow area along the thalweg of the river.

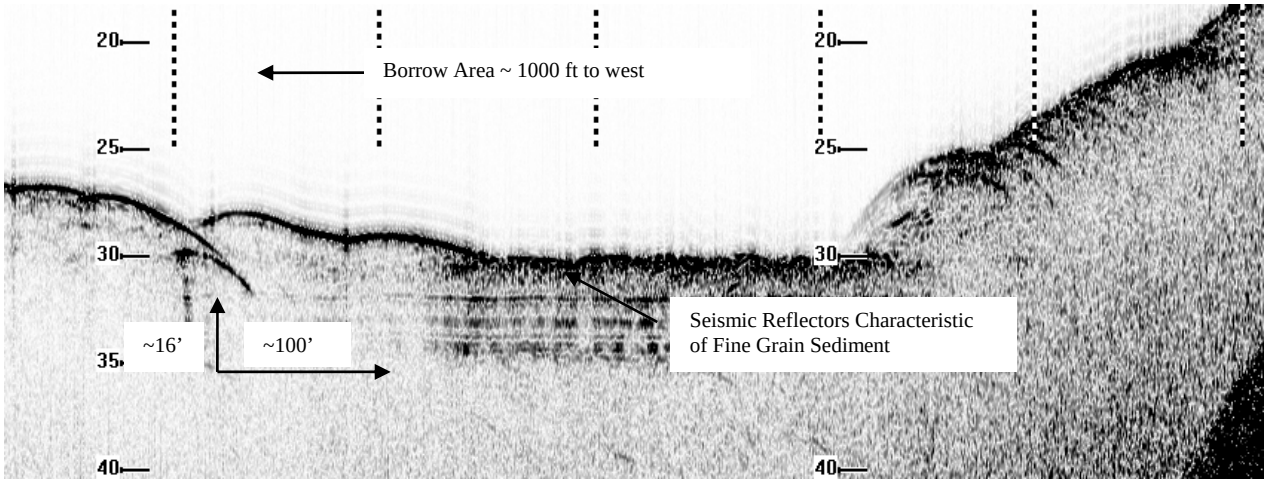


Figure 7. Section of subbottom profile record illustrating reflectors correlative with fine-grained sediment deposits observed along the eastern side of the river as the surficial sand deposits thin.

Table 2
USACE Cut Horizon and Core Color Change Comparison

Core ID	Easting[1]	Northing[1]	Core Recovery (Feet)	Riverbed Elevation[2]	USACE Max Cut Horizon Elevation[2]	Depth of Color Change (Feet)	Interpreted Cut Elevation[2,3]	Difference (Feet)
B-7P	3707772	444499	19.4	-45.2	-58.0	None	None	NA
B-3B	3708283	444717	19.5	-57.8	-69.7	11.8	-69.6	0.1
B-5P	3708341	443069	19.2	-55.9	-59.5	4.3	-60.2	-0.7
B-6P	3708870	443317	19.7	-46.4	-68.7	None	None	NA
B-4P	3708904	441640	19.7	-58.6	-60.6	None	None	NA
B-2B	3709431	441890	14.6	-53.7	-60.3	9.6	-63.3	-3.0
B-2P	3709407	440445	18.4	-58.8	-63.1	1.8	-60.6	2.5
B-3P	3709969	440715	10.7	-52.8	-52.4	5.3	-58.1	-5.7
B-1P	3709969	439300	19.5	-43.1	-42.6	2.8	-45.9	-3.3
B-1B	3710486	439526	17.4	-55.0	-56.2	7.2	-62.2	-6.0

[1] Coordinates are in U.S. Survey Feet and are in the LA State Plane Coordinate System, South Zone (1702), NAD 83. Coordinates represent the location of initial coring attempt.
[2] Elevations are feet and referenced to NAVD88.
[3] The interpreted cut elevation is calculated based on depth of color change in the core and riverbed elevation.

5.0 SUMMARY AND RECOMMENDATIONS

OSI conducted vibratory coring operations and subbottom profile surveys in the Bayou Dupont borrow area in the Mississippi River. The purpose of the investigations was to characterize the sediments that have infilled the borrow area since the conclusion of dredging that was completed as part of a project to create/restore nearby marshland. Ten cores and more than 25 trackline miles of subbottom profile data were acquired to complete this investigation.

In general, the cores indicate that the shallow subsurface sediments (upper 20 feet) are primarily comprised of fine sand with little variation in grain size both laterally and vertically. There was a gradational color change noted in the sands in several cores from light brown to gray or dark brown; however, the depth of this transition varied in each core. Correlation with data attained from borings taken prior to dredging indicates that the color change may be related to recent deposition, with the light brown fine sand representing the recently deposited (post-dredge) sediments and the gray or dark brown sands likely associated with undisturbed sediments. Other than the color change there does not appear to be significant difference between sediments currently infilling the borrow area and those sediments undisturbed during dredging the borrow area (below the maximum *cut horizon*).

As documented by the USACE hydrographic surveys, dredging did not occur as a single event to a specific dredge depth, instead dredging was performed during multiple events and to varying depths over the course of several months. The sand-rich sediments limited subbottom penetration and resolution of the underlying sediment sequences. Where penetration was attained subbottom reflectors appeared weak and discontinuous and no single reflector was recognized as the interface between sand infilling the borrow area and the *cut horizon.*

To better understand the mobility of sand and rates of infill into the Bayou Dupont Borrow area and its potential as a renewable source of suitable sediments for the Mississippi River

Long Distance Sediment Pipeline Project, future multibeam hydrographic surveys should be performed and results compared to those of the current survey. During these future investigations, the use of a lower frequency, higher power subbottom profiler might be considered to provide additional information regarding the underlying stratigraphy.

APPENDIX 1

EQUIPMENT OPERATIONS AND PROCEDURES

EQUIPMENT OPERATIONS AND PROCEDURES

Trimble DSM 212 Differential Global Positioning System

A Trimble DSM 212 differential global satellite positioning system (GPS) provides reliable, high-precision positioning and navigation for a wide variety of operations and environments. The unique feature of this system is its integration of a standard 12 channel GPS receiver with a U.S. Coast Guard beacon receiver all in one package. Both antennas are combined in a single housing and the receiver electronics are similarly contained within one topside control box. The complete system includes the topside control unit, a GPS volute antenna and cable, RS232 output and input data cables, and a 12 volt DC power cable. The proprietary MSK beacon receiver used in the system has been designed to provide enhanced signal reception at large distances from the reference station and under inclement weather conditions. The low noise MSK receiver is also an automatic, dual-channel system providing seamless switching between multiple beacons when necessary. The DSM 212 outputs one position per second to the HYPACK navigation computer. The manufacturer reports submeter accuracy of the system under suitable operating conditions.

HYPACK Navigation Software

Survey vessel trackline control and position fixing were obtained by utilizing an OSI computer-based data logging package running HYPACK navigation software. The computer is interfaced with the DGPS system onboard the survey vessel. Vessel position data from the DGPS were updated at 1.0-second intervals and input to the HYPACK navigation system which processes the geodetic positions into State Plane coordinates used to guide the survey vessel accurately along preselected tracklines. The incoming data are logged on disk and processed in real time allowing the vessel position to be displayed on a video monitor and compared to each pre-plotted trackline as the survey progresses. A nautical chart background shows the shoreline, general water depths, and locations of existing structures, buoys, and control points on the monitor in relation to the vessel position. The computer logging system

combined with the HYPACK software thus provide an accurate visual representation of survey vessel location in real time, combined with highly efficient data logging capability and post-survey data processing and plotting routines.

EdgeTech 2-16 kHz "Chirp" Subbottom Profiler

Information concerning subsurface stratigraphy was explored through use of an EdgeTech "Chirp" Subbottom Profiler system operating at frequencies of 2 to 16 kilohertz. The subbottom profiler consists of three components: the deck unit (topside computer, amplifier, monitor, keyboard, and trackball), an underwater cable, and a Model 216 towed vehicle housing the transducers. Data are acquired, logged, and displayed using the Discover Subbottom software and printed in real time on an EPC 1086 thermal printer.

The Chirp sonar is a versatile subbottom profiler that generates cross-sectional images and collects normal incidence reflection data over many frequency ranges. The system transmits and receives an FM pulse signal generated via a streamlined towed vehicle (subsurface transducer array). The outgoing FM pulse is linearly swept over a full spectrum range of 2-16 kHz for a period of approximately 20 milliseconds. The acoustic return received at the hydrophone array is cross-correlated with the outgoing FM pulse and sent to the deck unit for display and archiving, generating a high-resolution image of the subbottom stratigraphy. Because the FM pulse is generated by a converter with a wide dynamic range and a transmitter with linear components, the energy, amplitude, and phase characteristics of the acoustic pulse can be precisely controlled and enhanced.

The "chirp" subbottom profiler is designed for acquiring high-resolution subsurface data from the upper portions of the stratigraphic column (20-50 feet depending on site conditions). The higher end frequencies allow good resolution of subbottom layering while the lower end acoustic frequencies provide significant penetration. This particular system is capable of providing excellent acoustic imagery of the nearsurface in a wide variety of marine environments.

During data acquisition, all records were annotated with relevant supporting information, field observations, line number, run number, navigation event marks and numbers for later interpretation and correlation with vessel position data.

APPENDIX 2

VIBRATORY CORE LOGS
GRAIN SIZE RESULTS

Ocean Surveys, Inc.
129 Mill Rock Road East
Old Saybrook, CT 06475

CORE LOG

CORE NO. **B-7P**

COLLECTION DATE **1/24/11**

PROJECT: LDSP Project, Bayou Dupont Borrow Area
LOCATION: Mississippi River, Louisiana
CLIENT: Moffatt & Nichol

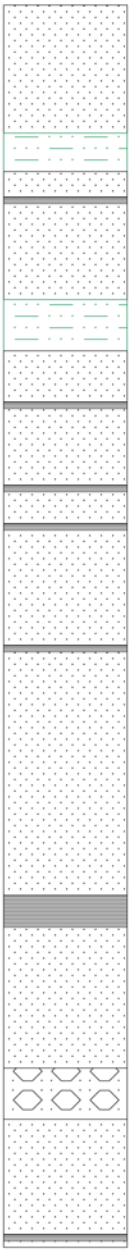
CORE OPERATOR: RMW
MODEL OF CORER: BH-5
CORE DIAMETER: 3.5"
ATTEMPTS ON STATION: 3
TOTAL PENETRATION: 20.0'
TOTAL RECOVERY: 19.4'

WATER DEPTH (uncorrected): 47.0'
RIVERBED ELEVATION (NAVD88): -45.2'

COORDINATES: LA SPCS (1702) NAD 83
UNITS: US Survey Feet

NORTHING: 444499
EASTING: 3707772

LATITUDE: 29 42.9235
LONGITUDE: 89 59.3003

ELEV. NAVD 88 (FEET)	DEPTH (FEET)	SEDIMENT LITHOLOGY	VISUAL DESCRIPTION AND REMARKS (REFERENCED TO DEPTH IN FEET)	SAMPLE ATTEMPTS	% SAND 0 — 100	SAMPLE ID AND INTERVAL (FEET)	DEPTH (FEET)
-45 to -65	0 to -20		0.0-2.0': Fine sand, light brown, compact. 2.0-2.6': Alternating layers of fine sand and silt, light brown, compact. 2.6-4.6': Fine sand, light brown, compact. Coal stringer at 3.0'. 4.6-5.4': Alternating layers of fine sand and silt, light brown, compact. 5.4-19.4': Fine sand, light brown, compact. Coal stringers at 6.2', 7.5', 8.1', 10.0', 13.9-14.4', and 19.2'. Shell fragments from 16.6-17.4'.	ATTEMPT 1 ATTEMPT 2 ATTEMPT 3	99.8% 99.8% 99.9% 99.9% 99.8% 99.9% 99.8% 99.9% 100.0% 99.9%	B-7P-1 (0.2-0.6') B-7P-2 (1.8-2.2') B-7P-3 (3.8-4.2') B-7P-4 (5.8-6.2') B-7P-5 (7.8-8.2') B-7P-6 JET1 (9.8-10.2') B-7P-7 JET1 (11.8-12.2') B-7P-8 JET2 (13.8-14.2') B-7P-9 JET2 (15.8-16.2') B-7P-10 JET2 (17.8-18.2')	0 to -20

Ocean Surveys, Inc.
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Old Saybrook, CT 06475

CORE LOG

CORE NO. **B-3B**

COLLECTION DATE **1/24/11**

PROJECT: LDSP Project, Bayou Dupont Borrow Area
LOCATION: Mississippi River, Louisiana
CLIENT: Moffatt & Nichol

CORE OPERATOR: RMW
MODEL OF CORER: B-5
CORE DIAMETER: 3.5"
ATTEMPTS ON STATION: 3
TOTAL PENETRATION: 20'
TOTAL RECOVERY: 19.5'

WATER DEPTH (uncorrected): 59.0'
RIVERBED ELEVATION (NAVD88): -57.8'

COORDINATES: LA SPCS (1702) NAD 83
UNITS: US Survey Feet

NORTHING: 444717
EASTING: 3708283

LATITUDE: 29 42.9585 N
LONGITUDE: 89 59.2033 W

ELEV. NAVD 88 (FEET)	DEPTH (FEET)	SEDIMENT LITHOLOGY	VISUAL DESCRIPTION AND REMARKS (REFERENCED TO DEPTH IN FEET)	SAMPLE ATTEMPTS	% SAND 0 — 100	SAMPLE ID AND INTERVAL (FEET)	DEPTH (FEET)
-58 to -77	0 to -20		0.0-0.3': Organics, wood fragments, and coal. 0.3-4.9': Fine sand, light brown, compact, few shell fragments.	ATTEMPT 1	99.7%	B-3B-1 (0.4-0.8')	0 to -20
			4.9-6.5': Fine sand, organics, wood fragments, and coal, light brown to black, compact.		99.7%	B-3B-2 (1.8-2.2')	
			6.5-10.4': Fine sand, little silt, light brown, compact. Coal stringers from 8.4-10.4' increasing in thickness with depth (0.01-0.1')	ATTEMPT 2 DISCARD	99.8%	B-3B-3 (3.8-4.2')	
					99.6%	B-3B-4 (6.6-7.0')	
					99.4%	B-3B-5 (7.8-8.2')	
			10.4-11.4': Fine sand, organics, wood fragments, and coal, light brown to black, compact. 11.4-11.8': Fine to med sand, light brown, firm, sharp bottom contact.		99.6%	B-3B-6 (9.8-10.2')	
			11.8-12.4': Med to fine sand, olive gray, compact.				
			12.4-14.0' No recovery.			No sample B-3B-7	
			14.0-17.0': Med to fine sand, olive gray, compact. Clay ball at 14.1'. Few shell fragments throughout sub section.	ATTEMPT 3	99.4%	B-3B-8 JET2 (14.0-14.4')	
					99.3%	B-3B-9 JET2 (15.8-16.2')	
			17.0-19.5': Fine sand, some silt, olive gray, firm. Few shell fragments throughout sub section.		99.7%	B-3B-10 JET2 (17.8-18.2')	

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Old Saybrook, CT 06475

CORE LOG

CORE NO. **B-5P**

COLLECTION DATE **1/23/11**

PROJECT: LDSP Project, Bayou Dupont Borrow Area
LOCATION: Mississippi River, Louisiana
CLIENT: Moffatt & Nichol

CORE OPERATOR: RMW
MODEL OF CORER: BH-5
CORE DIAMETER: 3.5"
ATTEMPTS ON STATION: 2
TOTAL PENETRATION: 20.0'
TOTAL RECOVERY: 19.2'

WATER DEPTH (uncorrected): 57.0'
RIVERBED ELEVATION (NAVD88): -55.9'

COORDINATES: LA SPCS (1702)
NAD 83
UNITS: US Survey Feet

NORTHING: 3708341
EASTING: 443069

LATITUDE: 29 42.6865 N
LONGITUDE: 89 59.1960 W

ELEV. NAVD 88 (FEET)	DEPTH (FEET)	SEDIMENT LITHOLOGY	VISUAL DESCRIPTION AND REMARKS (REFERENCED TO DEPTH IN FEET)	SAMPLE ATTEMPTS	% SAND 0 — 100	SAMPLE ID AND INTERVAL (FEET)	DEPTH (FEET)
-56 to -75	0 to -20		0.0-0.2': Clay, olive gray, firm. 0.2-4.3': Fine sand, light brown, firm.	ATTEMPT 1	99.6%	B-5P-1 (0.4-0.8')	0 to -20
					99.6%	B-5P-2 (1.8-2.2')	
					99.8%	B-5P-3 (3.8-4.2')	
			4.3-5.1': Silt, olive gray, compact.				
			5.1-6.4': Fine sand, olive gray, firm.		99.7%	B-5P-4 (5.8-6.2')	
			6.4-6.7': Clay, olive gray, firm. 6.7-10.0': Fine sand, olive gray, firm.		99.8%	B-5P-5 (7.8-8.2')	
					99.4%	B-5P-6 (9.8-10.2')	
					98.4%	B-5P-7 (11.8-12.2')	
			10.0-19.2': Silt, olive gray, compact. Transition gradual from unit above.	ATTEMPT 2	98.2%	B-5P-8 JET1 (13.8-14.2')	
					96.3%	B-5P-9 JET1 (15.8-16.2')	
					98.2%	B-5P-10 JET1 (17.8-18.2')	

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Old Saybrook, CT 06475

CORE LOG

CORE NO. **B-6P**

COLLECTION DATE **1/19/11**

PROJECT: LDSP Project, Bayou Dupont Borrow Area
LOCATION: Mississippi River, Louisiana
CLIENT: Moffatt & Nichol

CORE OPERATOR: RMW
MODEL OF CORER: BH-5
CORE DIAMETER: 3.5"
ATTEMPTS ON STATION: 2
TOTAL PENETRATION: 20.0'
TOTAL RECOVERY: 19.7'

WATER DEPTH (uncorrected): 50.0'
RIVERBED ELEVATION (NAVD88): -46.4'

COORDINATES: LA SPCS (1702)
NAD 83
UNITS: US Survey Feet

NORTHING: 443317
EASTING: 3708870

LATITUDE: 29 42.7264
LONGITUDE: 89 59.0954

ELEV. NAVD 88 (FEET)	DEPTH (FEET)	SEDIMENT LITHOLOGY	VISUAL DESCRIPTION AND REMARKS (REFERENCED TO DEPTH IN FEET)	SAMPLE ATTEMPTS	% SAND 0 — 100	SAMPLE ID AND INTERVAL (FEET)	DEPTH (FEET)
-47 to -66	0 to -20		0.0-19.7': Fine sand, light brown, compact. Coal stringers from 5.4-6.9', 14.4-14.6', 16.0', and 18.0'. Wood chips and twigs from 18.5-18.7' and 19.2-19.7'.	ATTEMPT 1	99.8%	B-6P-1 (0.2-0.6')	0 to -20
					99.9%	B-6P-2 (1.8-2.2')	
					99.7%	B-6P-3 (3.8-4.2')	
					99.5%	B-6P-4 (5.8-6.2')	
					99.9%	B-6P-5 (7.8-8.2')	
					99.8%	B-6P-6 (9.4-9.8')	
				ATTEMPT 2	99.8%	B-6P-7 JET1 (11.8-12.2')	
					99.8%	B-6P-8 JET1 (13.8-14.2')	
					99.7%	B-6P-9 JET1 (15.8-16.2')	
					99.9%	B-6P-10 JET1 (17.8-18.2')	

Ocean Surveys, Inc.
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Old Saybrook, CT 06475

CORE LOG

CORE NO. **B-4P**

COLLECTION DATE **1/21/11**

PROJECT: LDSP Project, Bayou Dupont Borrow Area
LOCATION: Mississippi River, Louisiana
CLIENT: Moffatt & Nichol

CORE OPERATOR: RMW
MODEL OF CORER: BH-5
CORE DIAMETER: 3.5"
ATTEMPTS ON STATION: 2
TOTAL PENETRATION: 20.0'
TOTAL RECOVERY: 19.7'

WATER DEPTH (uncorrected): 60.0'
RIVERBED ELEVATION (NAVD88): -58.6'

COORDINATES: LA SPCS (1702) NAD 83
UNITS: US Survey Feet

NORTHING: 441640
EASTING: 3708904

LATITUDE: 29 42.4497 N
LONGITUDE: 89 59.0927 W

ELEV. NAVD 88 (FEET)	DEPTH (FEET)	SEDIMENT LITHOLOGY	VISUAL DESCRIPTION AND REMARKS (REFERENCED TO DEPTH IN FEET)	SAMPLE ATTEMPTS	% SAND 0 — 100	SAMPLE ID AND INTERVAL (FEET)	DEPTH (FEET)
-59 to -78	0 to -20		0.0-0.2': Clay, olive gray, loose. 0.2-14.6': Fine sand,olive gray, compact. Clay ball at 3.0' (0.05' diameter). Organics from 4.8-5.0'. Clay fragment at 8.7' (0.2' diameter), firm. Light brown from 8.0-10.0' possibly due to dewatering.	ATTEMPT 1	99.0%	B-4P-1 (0.4-0.8')	0 to -20
					99.7%	B-4P-2 (1.8-2.2')	
					98.7%	B-4P-3 (3.8-4.2')	
					99.4%	B-4P-4 (5.8-6.2')	
					99.3%	B-4P-5 (7.8-8.2')	
			14.6-17.0': Alternating layers of fine sand and silt (0.02' thick), olive gray, compact.	ATTEMPT 2	99.7%	B-4P-6 JET1 (9.8-10.2')	
					99.1%	B-4P-7 JET1 (11.8-12.2')	
					99.1%	B-4P-8 JET1 (13.8-14.2')	
					98.8%	B-4P-9 JET1 (15.8-16.2')	
			17.0-19.7': Fine sand, olive gray, compact. Coal stringers (0.02' thick) throughout sub section.		98.7%	B-4P-10 JET1 (17.8-18.2')	

Ocean Surveys, Inc.
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Old Saybrook, CT 06475

CORE LOG

CORE NO. **B-2B**

COLLECTION DATE **1/23/11**

PROJECT: LDSP Project, Bayou Dupont Borrow Area
LOCATION: Mississippi River, Louisiana
CLIENT: Moffatt & Nichol

CORE OPERATOR: RMW
MODEL OF CORER: BH-5
CORE DIAMETER: 3.5"
ATTEMPTS ON STATION: 2
TOTAL PENETRATION: 20.0'
TOTAL RECOVERY: 14.6'

WATER DEPTH (uncorrected): 55.0'
RIVERBED ELEVATION (NAVD88): 53.7'

COORDINATES: LA SPCS (1702) NAD 83
UNITS: US Survey Feet

NORTHING: 441890
EASTING: 3709431

LATITUDE: 29 42.4899
LONGITUDE: 89 58.9926

ELEV. NAVD 88 (FEET)	DEPTH (FEET)	SEDIMENT LITHOLOGY	VISUAL DESCRIPTION AND REMARKS (REFERENCED TO DEPTH IN FEET)	SAMPLE ATTEMPTS	% SAND 0–100	SAMPLE ID AND INTERVAL (FEET)	DEPTH (FEET)
-54 to -73	0 to -20		0.0-0.2': Clay rich organics, wood fragments and coal; 0.2-3.5': Fine sand, yellowish orange, compact.	ATTEMPT 1	99.7%	B-2B-1 (0.2-0.6')	0 to -20
					99.7%	B-2B-2 (1.8-2.2')	
			3.5-4.2': Fine sand, wood fragments and roots, brown.				
			4.2-9.6': Fine sand, yellowish orange, compact.		99.7%	B-2B-3 (4.2-4.6')	
					99.8%	B-2B-4 (5.8-6.2')	
					99.7%	B-2B-5 (7.8-8.2')	
			9.6-11.3': Alternating layers of fine sand and silt, olive gray, compact.	ATTEMPT 2	98.7%	B-2B-6 (9.8-10.2')	
			11.3-13.9': Fine sand, olive gray, compact.		98.9%	B-2B-7 (11.8-12.2')	
					98.9%	B-2B-8 (13.4-13.8')	
			13.9-14.6': Clay, olive gray, firm.				

Ocean Surveys, Inc.
129 Mill Rock Road East
Old Saybrook, CT 06475

CORE LOG

CORE NO. **B-2P**

COLLECTION DATE **1/19/11**

PROJECT: LDSP Project, Bayou Dupont Borrow Area
LOCATION: Mississippi River, Louisiana
CLIENT: Moffatt & Nichol

CORE OPERATOR: RMW
MODEL OF CORER: BH-5
CORE DIAMETER: 3.5"
ATTEMPTS ON STATION: 2
TOTAL PENETRATION: 20.0'
TOTAL RECOVERY: 18.4'

WATER DEPTH (uncorrected): 60.0'
RIVERBED ELEVATION (NAVD88): -58.8'

COORDINATES: LA SPCS (1702) NAD 83
UNITS: US Survey Feet

NORTHING: 440445
EASTING: 3709407

LATITUDE: 29 42.2515
LONGITUDE: 89 59.0003

ELEV. NAVD 88 (FEET)	DEPTH (FEET)	SEDIMENT LITHOLOGY	VISUAL DESCRIPTION AND REMARKS (REFERENCED TO DEPTH IN FEET)	SAMPLE ATTEMPTS	% SAND 0 — 100	SAMPLE ID AND INTERVAL (FEET)	DEPTH (FEET)
-59 to -78	0 to -20		0.0-1.8': Fine sand, light brown, firm.	ATTEMPT 1	98.2%	B-2P-1 (0.0-0.4')	0 to -20
			1.8-2.1': Clay, dark gray, firm. 2.1-3.3': Fine sand, light gray, firm.		98.2%	B-2P-2 (2.0-2.4')	
			3.3-3.5': Organics and wood chips. 3.5-5.0': Fine sand, light gray, firm.		99.3%	B-2P-3 (3.8-4.2')	
			5.0-5.7': Fine sand, light brown, firm.		98.7%	B-2P-4 (5.8-6.2')	
			5.7-6.7': Fine sand, light gray, firm.		99.1%	B-2P-5 (7.8-8.2')	
			6.7-7.0': Silty fine sand, dark gray, firm. 7.0-14.9': Fine sand, light gray, firm.	ATTEMPT 2	99.8%	B-2P-6 (9.8-10.2')	
					99.4%	B-2P-7 (11.8-12.2')	
					98.9%	B-2P-8 (13.8-14.2')	
			14.9-15.4': Alternating layers of fine sand and silt, light gray, compact.		98.9%	B-2P-9 (15.8-16.2')	
			15.4-18.4': Fine sand, light gray, firm.		98.8%	B-2P-10 (17.8-18.2')	

Ocean Surveys, Inc.
129 Mill Rock Road East
Old Saybrook, CT 06475

CORE LOG

CORE NO. **B-3P**

COLLECTION DATE **1/20/11**

PROJECT: LDSP Project, Bayou Dupont Borrow Area
LOCATION: Mississippi River, Louisiana
CLIENT: Moffatt & Nichol

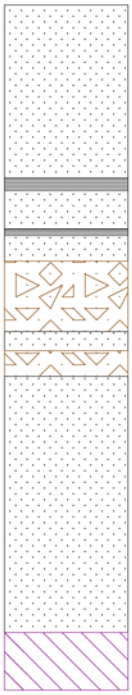
CORE OPERATOR: RMW
MODEL OF CORER: BH-5
CORE DIAMETER: 3.5"
ATTEMPTS ON STATION: 2
TOTAL PENETRATION: 20'
TOTAL RECOVERY: 10.7'

WATER DEPTH (uncorrected): -54.0'
RIVERBED ELEVATION (NAVD88): -52.8'

COORDINATES: LA SPCS (1702) NAD 83
UNITS: US Survey Feet

NORTHING: 440715
EASTING: 3709969

LATITUDE: 29 42.2950
LONGITUDE: 89 58.8935

ELEV. NAVD 88 (FEET)	DEPTH (FEET)	SEDIMENT LITHOLOGY	VISUAL DESCRIPTION AND REMARKS (REFERENCED TO DEPTH IN FEET)	SAMPLE ATTEMPTS	% SAND 0 — 100	SAMPLE ID AND INTERVAL (FEET)	DEPTH (FEET)
-53 to -72	0 to -20		0.0-5.3': Fine sand, light brown, firm. 2.7-2.9 and 3.5-3.6' Organic rich fine sand, black in color. 4.0-5.1' Organics, wood chips, and coal. 5.3-9.8' Fine sand, little silt, olive gray, compact. 5.4-5.8' Organics and wood fragments. 9.8-10.7' Clay, dark gray, firm.	ATTEMPT 1 (ATTEMPT 2 DISCARDED)	99.8% 99.8% 98.7% 98.1% 99.3% 99.5%	B-3P-1 (0.0-0.4') B-3P-2 (1.8-2.2') B-3P-3 (3.6-4.0') B-3P-4 (5.8-6.2') B-3P-5 (7.8-8.2') B-3P-6 (9.8-10.2')	0 to -20

Ocean Surveys, Inc.
129 Mill Rock Road East
Old Saybrook, CT 06475

CORE LOG

CORE NO. **B-1P**

COLLECTION DATE **1/18/11**

PROJECT: LDSP Project, Bayou Dupont Borrow Area
LOCATION: Mississippi River, Louisiana
CLIENT: Moffatt & Nichol

CORE OPERATOR: RMW
MODEL OF CORER: BH-5
CORE DIAMETER: 3.5"
ATTEMPTS ON STATION: 2
TOTAL PENETRATION: 20.0'
TOTAL RECOVERY: 19.5'

WATER DEPTH (uncorrected): 46.0'
RIVERBED ELEVATION (NAVD88): -43.1'

COORDINATES: LA SPCS (1702)
NAD 83
UNITS: US Survey Feet

NORTHING: 439300
EASTING: 3709969

LATITUDE: 29 42.0615
LONGITUDE: 89 58.8967

ELEV. NAVD 88 (FEET)	DEPTH (FEET)	SEDIMENT LITHOLOGY	VISUAL DESCRIPTION AND REMARKS (REFERENCED TO DEPTH IN FEET)	SAMPLE ATTEMPTS	% SAND 0 — 100	SAMPLE ID AND INTERVAL (FEET)	DEPTH (FEET)
-43 to -63	0 to -20		0.0-0.2': Clay, brown, little sand content; 0.2-2.8': Fine sand, brown, compact.	ATTEMPT 1	98.9%	B-1P-1 (0.1-0.5')	0 to -20
					99.6%	B-1P-2 (1.8-2.2')	
			2.8-8.7': Fine sand, olive gray, compact. Black organic lens at 5.2', 5.6', and 6.9'.		99.8%	B-1P-3 (3.8-4.2')	
					99.7%	B-1P-4 (5.8-6.2')	
					99.7%	B-1P-5 (7.8-8.2')	
			8.7-11.4': Clay, olive gray, firm. Wood chips from 11.35-11.40'.			B-1P-6 (9.8-10.2')	
			11.4-12.9': Fine sand, light brown, compact.		98.2%	B-1P-7 (11.8-12.2')	
			12.9-17.5': Fine sand and clay, dark brown, interbedded with organics and minor wood chips.		96.0%	B-1P-8 (13.8-14.2')	
					95.6%	B-1P-9 (15.8-16.2')	
			17.5-19.5': Fine sand, light gray to brown, trace lenses of wood chips and organics decreasing with depth.	ATTEMPT 2	96.9%	B-1P-10 (17.8-18.2')	
					96.5%	B-1P-11 (19.1-19.5')	

Ocean Surveys, Inc.
129 Mill Rock Road East
Old Saybrook, CT 06475

CORE LOG

CORE NO. **B-1B**

COLLECTION DATE **1/18/11**

PROJECT: LDSP Project, Bayou Dupont Borrow
LOCATION: Mississippi River, Louisiana
CLIENT: Moffatt & Nichol

CORE OPERATOR: RMW
MODEL OF CORER: B-5
CORE DIAMETER: 3.5"
ATTEMPTS ON STATION: 3
TOTAL PENETRATION: 20.0'
TOTAL RECOVERY: 17.4'

WATER DEPTH (uncorrected): 56.0'
RIVERBED ELEVATION (NAVD88): -55.0'

COORDINATES: LA SPCS (1702) NAD 83
UNITS: US Survey Feet

NORTHING: 439526
EASTING: 3710486

LATITUDE: 29 42.0978
LONGITUDE: 89 58.7985

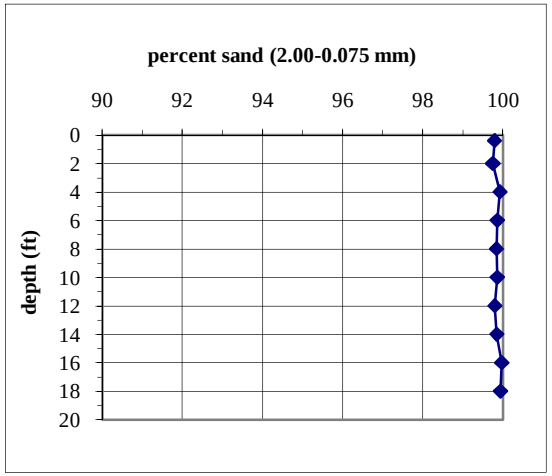
ELEV. NAVD 88 (FEET)	DEPTH (FEET)	SEDIMENT LITHOLOGY	VISUAL DESCRIPTION AND REMARKS (REFERENCED TO DEPTH IN FEET)	SAMPLE ATTEMPTS	% SAND 0–100	SAMPLE ID AND INTERVAL (FEET)	DEPTH (FEET)
-55 to -75	0 to -20		0.0-2.1': Fine sand, light brown, compact.	ATTEMPT 1	99.8%	B-1B-1 (0.0-0.4')	0 to -20
			2.1-3.4': Alternating layers of fine sand and wood chips (<0.05' thick).		99.6%	B-1B-2 (1.8-2.2')	
			3.4-7.2': Fine sand, light brown, compact.		99.7%	B-1B-3 (3.8-4.2')	
					99.8%	B-1B-4 (5.8-6.2')	
			7.2-7.5': Wood chips, dark brown; 7.5-8.9' Fine sand, light brown to brown, compact.	ATTEMPT 2	99.8%	B-1B-5 (7.8-8.2')	
			8.9-9.4': Alternating layers of fine sand and wood chips (<0.05' thick).				
			9.4-12.5': Fine sand, dark brown, compact.		99.8%	B-1B-6 (9.8-10.2')	
					99.7%	B-1B-7 (11.8-12.2')	
			12.5-13.0': Fine sand and wood chips, dark brown.				
			13.0-15.5': Fine sand, dark brown, compact. Clay ball at 13.5'.	ATTEMPT 3	99.8%	B-1B-8 (13.8-14.2')	
			15.5-16.9': Alternating layers of fine sand and wood chips (<0.05' thick), brown; 16.9-17.4': Fine sand with wood chips and shell fragments, dark brown .		99.1%	B-1B-9 (15.8-16.2')	
					98.3%	B-1B-10 (16.8-17.2')	

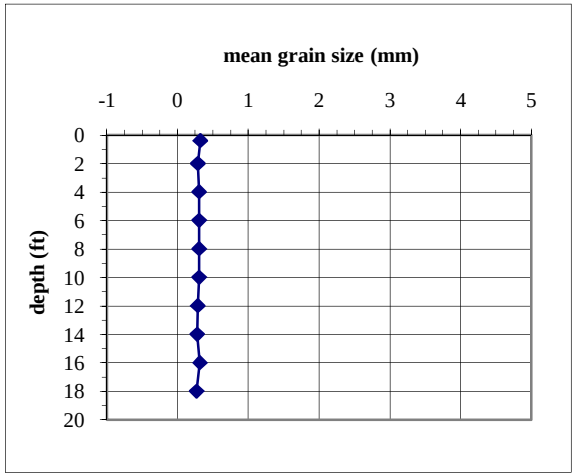
Long Distance Sediment Pipeline Project, Bayou Dupont Borrow Area **Ocean Surveys, Inc.**

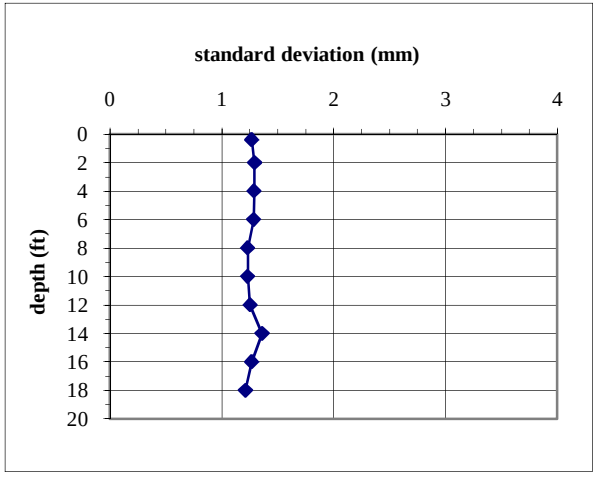
Grainsize Data Table

Core ID B-7P

Sample I.D.	Sample depth in core(ft)	Units	5% sample finer than	10% sample finer than	16% sample finer than	25% sample finer than	30% sample finer than	50% sample finer than	60% sample finer than	75% sample finer than	84% sample finer than	95% sample finer than	Sample mean grain size	Standard Deviation	%Gravel	%Sand	%Fines
B-7P-1	0.4	mm	0.212	0.237	0.255	0.279	0.290	0.324	0.344	0.375	0.394	0.455	0.319	1.266	0.00	99.79	0.21
		phi	2.240	2.080	1.970	1.840	1.788	1.627	1.538	1.140	1.340	1.137	1.647	-0.340			
B-7P-2	2.0	mm	0.190	0.210	0.226	0.241	0.261	0.288	0.306	0.342	0.368	0.425	0.288	1.292	0.00	99.75	0.25
		phi	2.398	2.248	2.147	2.054	1.995	1.794	1.708	1.547	1.444	1.235	1.795	-0.370			
B-7P-3	4.0	mm	0.198	0.222	0.239	0.262	0.273	0.309	0.329	0.366	0.383	0.444	0.305	1.288	0.00	99.93	0.07
		phi	2.339	2.172	2.067	1.933	1.871	1.692	1.604	1.449	1.385	1.172	1.715	-0.365			
B-7P-4	6.0	mm	0.179	2.180	0.249	0.273	0.283	0.309	0.322	0.355	0.374	0.437	0.306	1.285	0.00	99.86	0.14
		phi	2.482	2.199	2.007	1.874	1.823	1.695	1.634	1.496	1.419	1.196	1.707	-0.362			
B-7P-5	8.0	mm	0.211	0.240	0.258	0.278	0.285	0.306	0.316	0.342	0.366	0.435	0.307	1.231	0.00	99.84	0.16
		phi	2.245	2.058	1.952	1.849	1.809	1.710	1.662	1.546	1.451	1.200	1.705	-0.299			
B-7P-6	10.0	mm	0.208	0.238	0.257	0.277	0.285	0.306	0.317	0.343	0.366	0.427	0.306	1.231	0.00	99.86	0.14
		phi	2.268	2.070	1.959	1.852	1.811	1.708	1.659	1.542	1.452	1.227	1.706	-0.300			
B-7P-7	12.0	mm	0.183	0.211	2.233	0.256	0.265	0.289	0.299	0.320	0.342	0.398	0.285	1.253	0.00	99.80	0.20
		phi	2.448	2.244	2.102	1.968	1.913	1.788	1.742	1.642	1.546	1.329	1.812	-0.325			
B-7P-8	14.0	mm	0.163	0.183	0.207	0.235	0.249	0.287	0.301	0.333	0.362	0.442	0.278	1.359	0.40	99.85	0.15
		phi	2.621	2.454	2.274	2.087	2.006	1.803	1.731	1.588	1.465	1.178	1.847	-0.443			
B-7P-9	16.0	mm	0.215	0.247	0.266	0.286	0.294	0.317	0.330	0.363	0.380	0.443	0.317	1.266	0.00	99.97	0.03
		phi	2.217	2.016	1.911	1.807	1.767	1.659	1.599	1.463	1.397	1.176	1.656	-0.302			
B-7P-10	18.0	mm	0.183	0.207	0.227	0.247	0.257	0.279	0.286	0.301	0.317	0.350	0.272	1.212	0.00	99.94	0.06
		phi	2.453	2.273	2.141	2.018	1.959	1.840	1.807	1.734	1.656	1.513	1.879	-0.278			

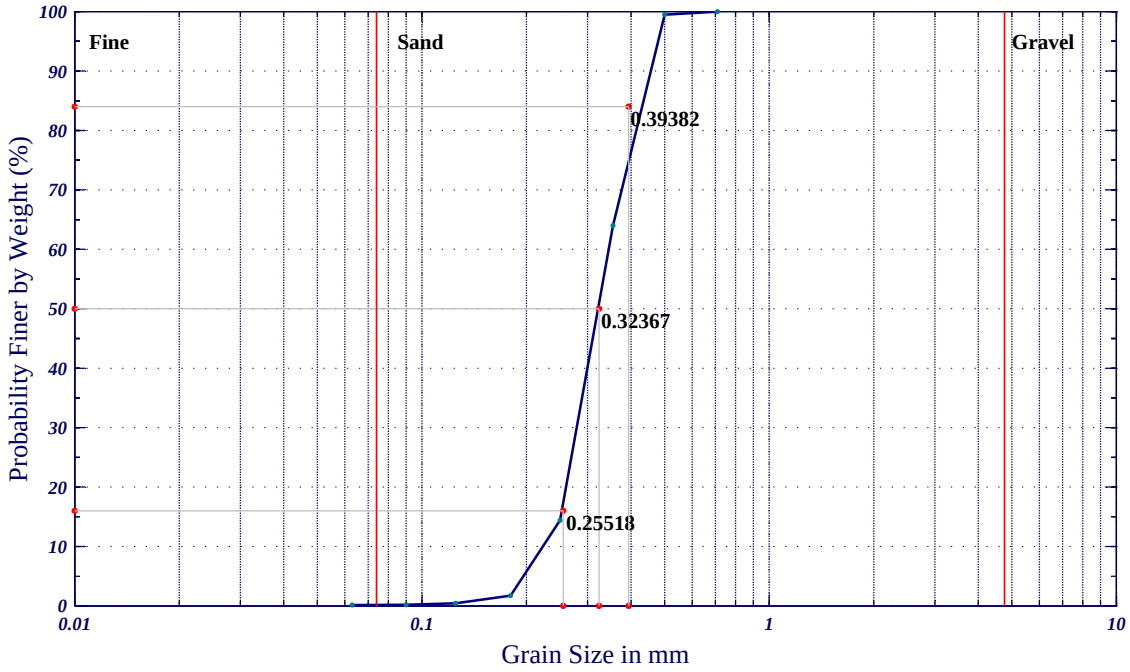






Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.212	2.240
D10:	0.237	2.080
D16:	0.255	1.970
D25:	0.279	1.840
D30:	0.290	1.788
D50:	0.324	1.627
D60:	0.344	1.538
D75:	0.375	1.414
D84:	0.394	1.344
D95:	0.455	1.137
Mean Grain Size:	0.319	1.647
Standard Deviation:	1.266	-0.340

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 99.79
Percent of Fines (<= 0.074mm): 0.21
Classification: Fine sand(sp)

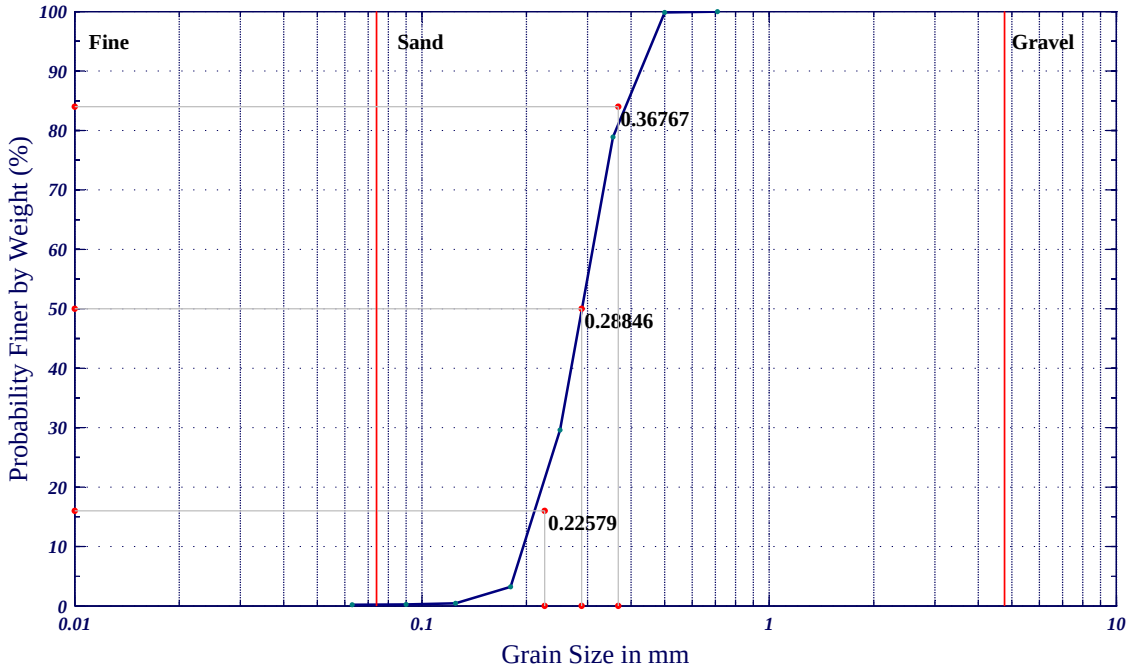
Sample ID: B-7P-1
Sample Depth: 0.2-0.6ft

Easting: 3,707,772*
Northing: 444,499*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.190	2.398
D10:	0.210	2.248
D16:	0.226	2.147
D25:	0.241	2.054
D30:	0.251	1.995
D50:	0.288	1.794
D60:	0.306	1.708
D75:	0.342	1.547
D84:	0.368	1.444
D95:	0.425	1.235
Mean Grain Size:	0.288	1.795
Standard Deviation:	1.292	-0.370

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 99.75
Percent of Fines (<= 0.074mm): 0.25
Classification: Fine sand(sp)

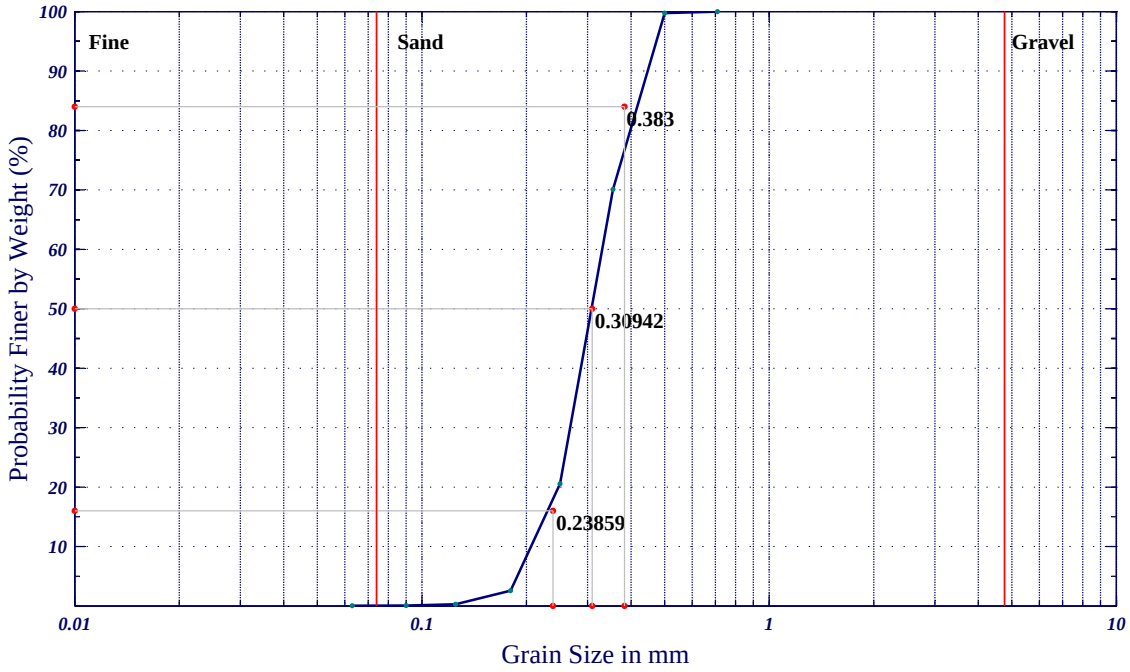
Sample ID: B-7P-2
Sample Depth: 1.8-2.2ft

Easting: 3,707,772*
Northing: 444,499*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.198	2.339
D10:	0.222	2.172
D16:	0.239	2.067
D25:	0.262	1.933
D30:	0.273	1.871
D50:	0.309	1.692
D60:	0.329	1.604
D75:	0.366	1.449
D84:	0.383	1.385
D95:	0.444	1.172
Mean Grain Size:	0.305	1.715
Standard Deviation:	1.288	-0.365

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 99.93
Percent of Fines (<= 0.074mm): 0.07
Classification: Fine sand(sp)

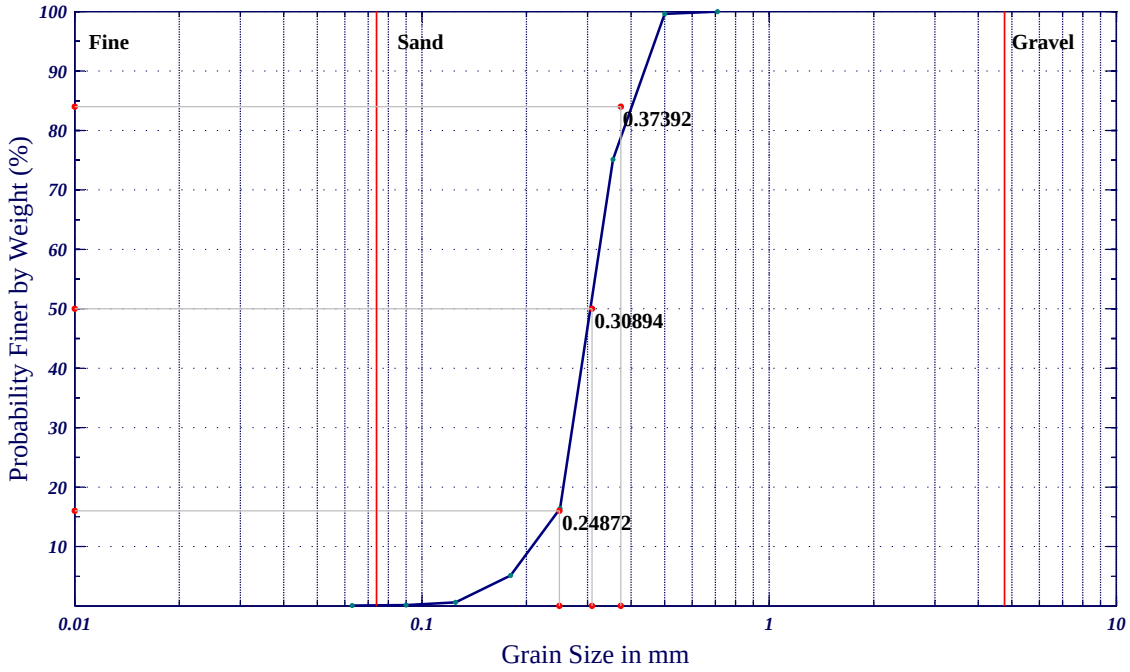
Sample ID: B-7P-3
Sample Depth: 3.8-4.2ft

Easting: 3,707,772*
Northing: 444,499*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.179	2.482
D10:	0.218	2.199
D16:	0.249	2.007
D25:	0.273	1.874
D30:	0.283	1.823
D50:	0.309	1.695
D60:	0.322	1.634
D75:	0.355	1.496
D84:	0.374	1.419
D95:	0.437	1.196
Mean Grain Size:	0.306	1.707
Standard Deviation:	1.285	-0.362

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 99.86
Percent of Fines (<= 0.074mm): 0.14
Classification: Fine sand(sp)

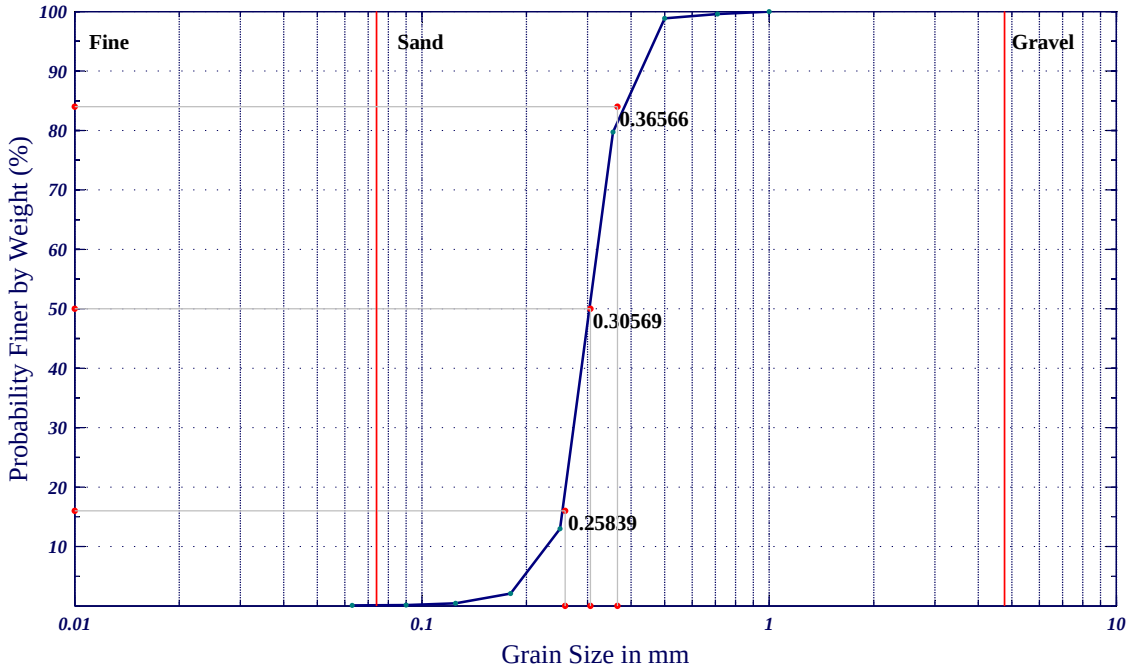
Sample ID: B-7P-4
Sample Depth: 5.8-6.2ft

Easting: 3,707,772*
Northing: 444,499*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.211	2.245
D10:	0.240	2.058
D16:	0.258	1.952
D25:	0.278	1.849
D30:	0.285	1.809
D50:	0.306	1.710
D60:	0.316	1.662
D75:	0.342	1.546
D84:	0.366	1.451
D95:	0.435	1.200
Mean Grain Size:	0.307	1.705
Standard Deviation:	1.231	-0.299

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 99.84
Percent of Fines (<= 0.074mm): 0.16
Classification: Fine sand(sp)

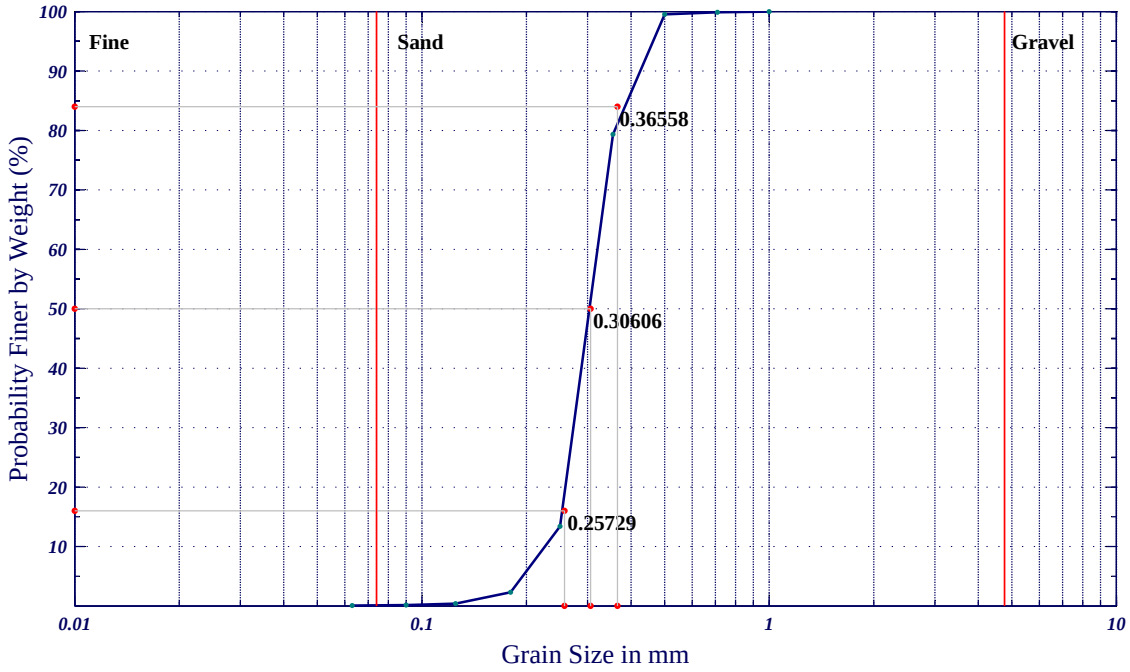
Sample ID: B-7P-5
Sample Depth: 7.8-8.2ft

Easting: 3,707,772*
Northing: 444,499*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.208	2.268
D10:	0.238	2.070
D16:	0.257	1.959
D25:	0.277	1.852
D30:	0.285	1.811
D50:	0.306	1.708
D60:	0.317	1.659
D75:	0.343	1.542
D84:	0.366	1.452
D95:	0.427	1.227
Mean Grain Size:	0.306	1.706
Standard Deviation:	1.231	-0.300

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 99.86
Percent of Fines (<= 0.074mm): 0.14
Classification: Fine sand(sp)

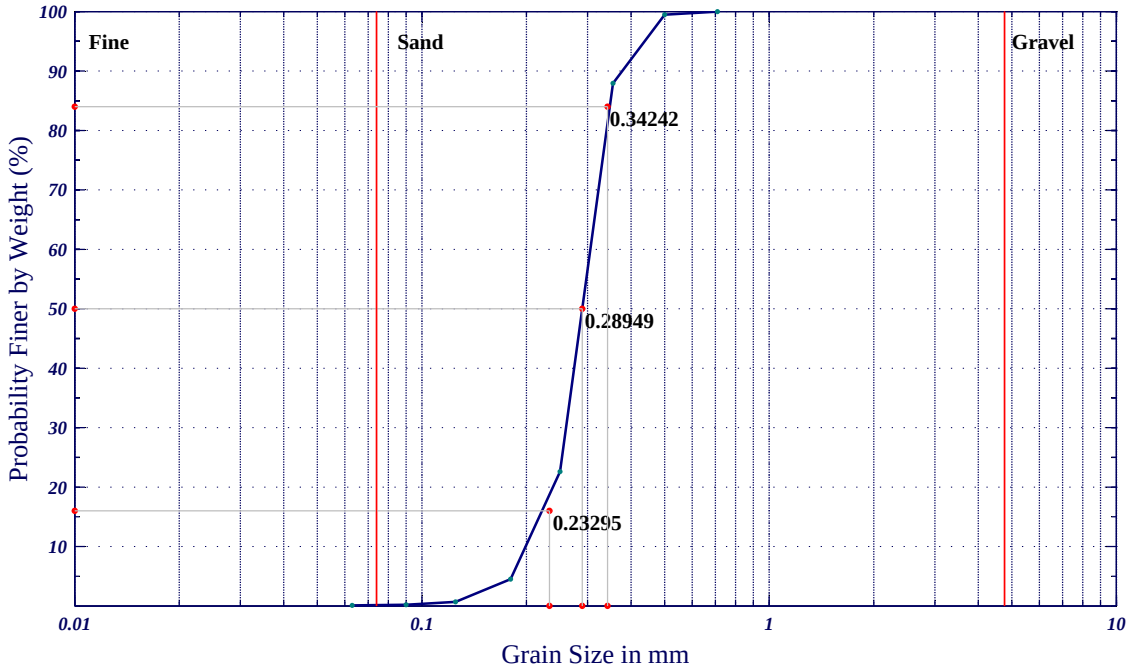
Sample ID: B-7P-6
Sample Depth: 9.8-10.2ft

Easting: 3,707,772*
Northing: 444,499*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results:

	(mm)	(phi)
D5:	0.183	2.448
D10:	0.211	2.244
D16:	0.233	2.102
D25:	0.256	1.968
D30:	0.265	1.913
D50:	0.289	1.788
D60:	0.299	1.742
D75:	0.320	1.642
D84:	0.342	1.546
D95:	0.398	1.329
Mean Grain Size:	0.285	1.812
Standard Deviation:	1.253	-0.325

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 99.80
Percent of Fines (<= 0.074mm): 0.20
Classification: Fine sand(sp)

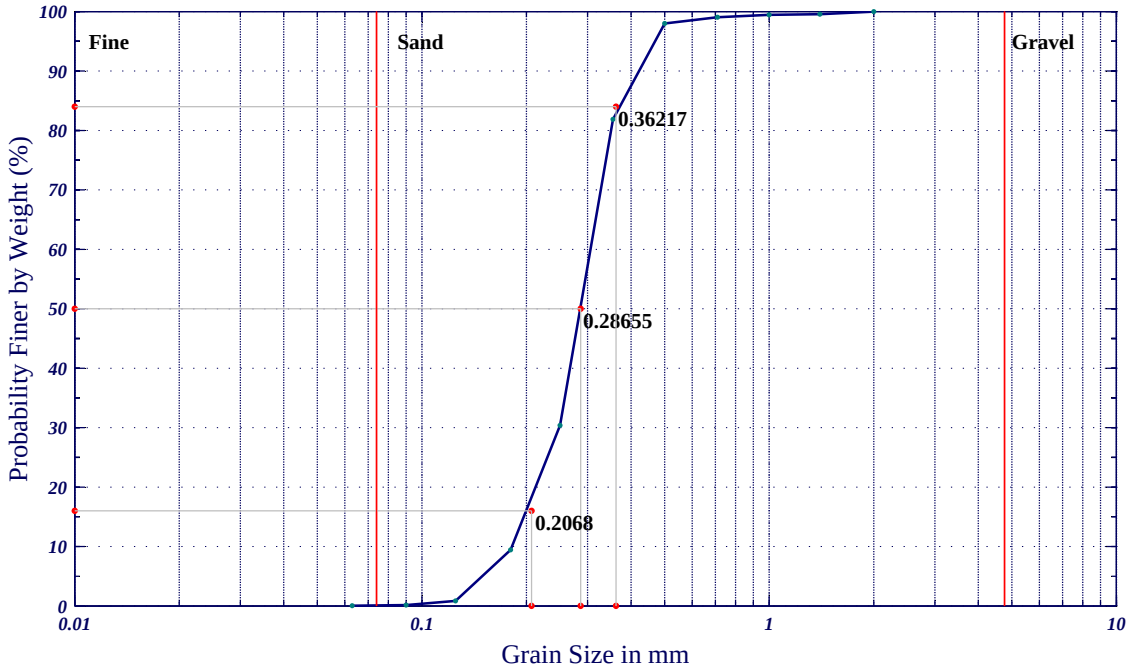
Sample ID: B-7P-7
Sample Depth: 11.8-12.2ft

Easting: 3,707,772*
Northing: 444,499*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.163	2.621
D10:	0.183	2.454
D16:	0.207	2.274
D25:	0.235	2.087
D30:	0.249	2.006
D50:	0.287	1.803
D60:	0.301	1.731
D75:	0.333	1.588
D84:	0.362	1.465
D95:	0.442	1.178
Mean Grain Size:	0.278	1.847
Standard Deviation:	1.359	-0.443

Percent of Gravel (16mm-2.00mm): 0.40
Percent of Sand (2.00mm-0.075mm): 99.85
Percent of Fines (<= 0.074mm): 0.15
Classification: Fine sand(sp)

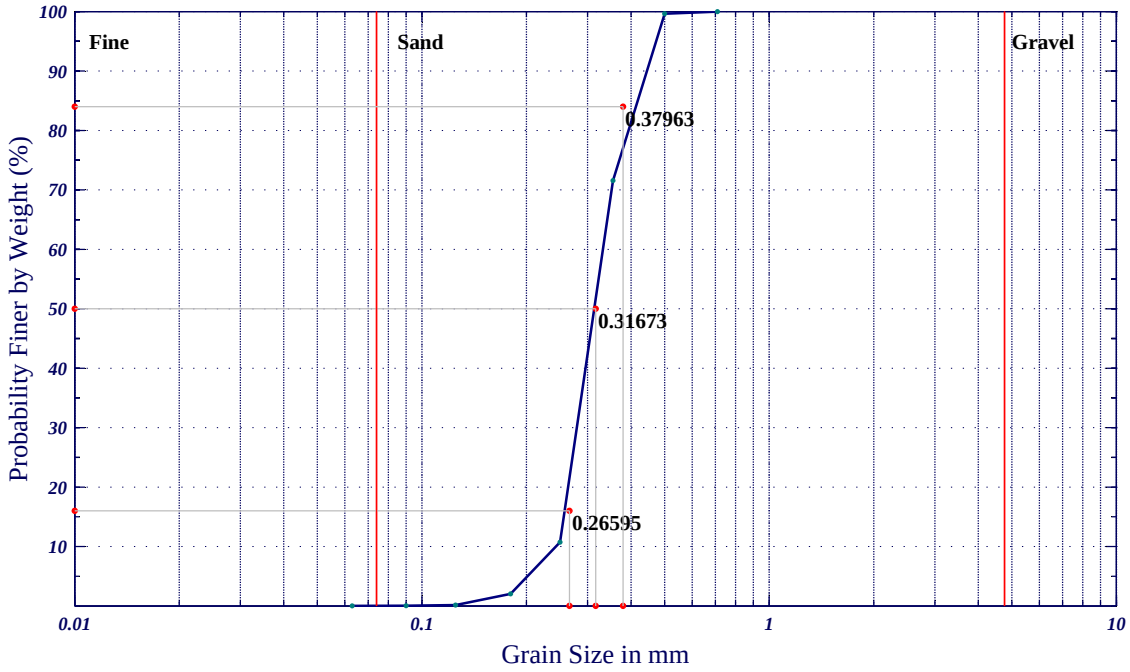
Sample ID: B-7P-8
Sample Depth: 13.8-14.2ft

Easting: 3,707,772*
Northing: 444,499*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.215	2.217
D10:	0.247	2.016
D16:	0.266	1.911
D25:	0.286	1.807
D30:	0.294	1.767
D50:	0.317	1.659
D60:	0.330	1.599
D75:	0.363	1.463
D84:	0.380	1.397
D95:	0.443	1.176
Mean Grain Size:	0.317	1.656
Standard Deviation:	1.233	-0.302

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 99.97
Percent of Fines (<= 0.074mm): 0.03
Classification: Fine sand(sp)

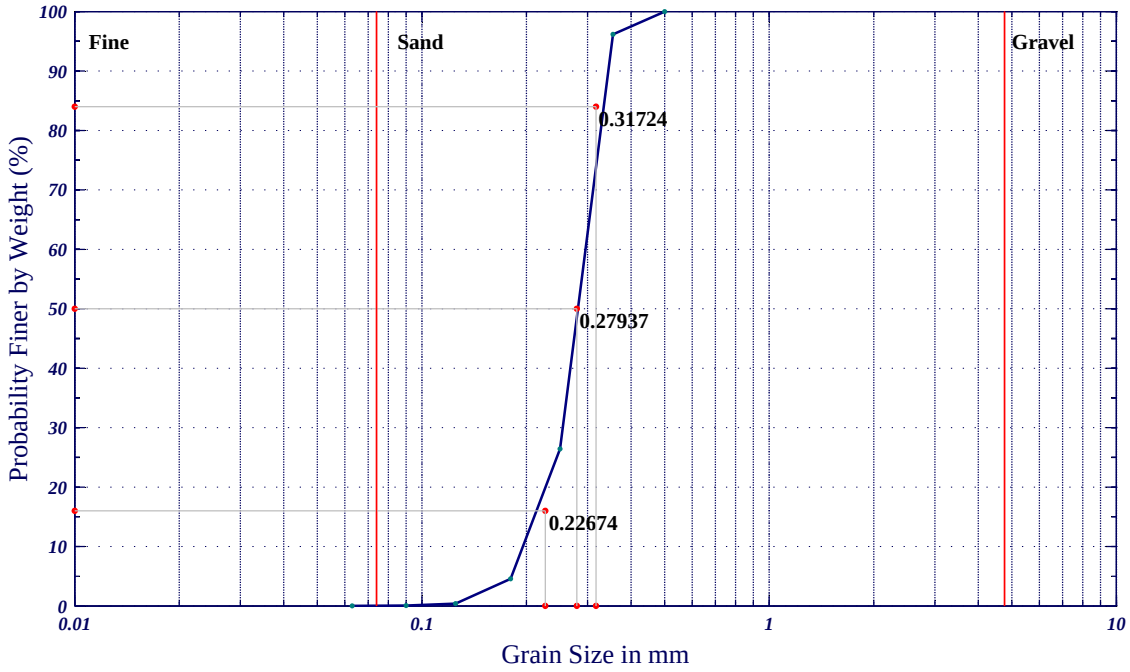
Sample ID: B-7P-9
Sample Depth: 15.8-16.2ft

Easting: 3,707,772*
Northing: 444,499*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.183	2.453
D10:	0.207	2.273
D16:	0.227	2.141
D25:	0.247	2.018
D30:	0.257	1.959
D50:	0.279	1.840
D60:	0.286	1.807
D75:	0.301	1.734
D84:	0.317	1.656
D95:	0.350	1.513
Mean Grain Size:	0.272	1.879
Standard Deviation:	1.212	-0.278

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 99.94
Percent of Fines (<= 0.074mm): 0.06
Classification: Fine sand(sp)

Sample ID: B-7P-10
Sample Depth: 17.8-18.2ft

Easting: 3,707,772*
Northing: 444,499*
*Coordinates are feet, LA-1702

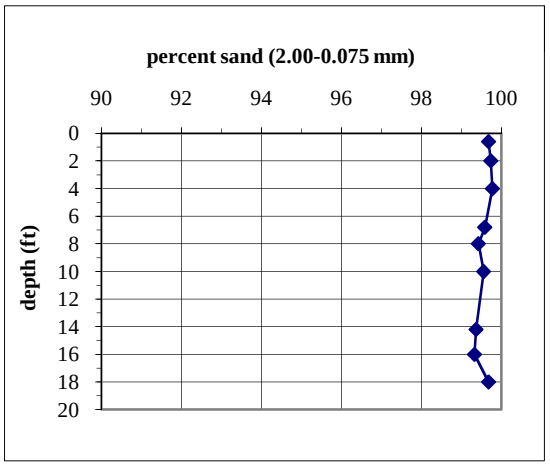
OSI No.: 11ES002

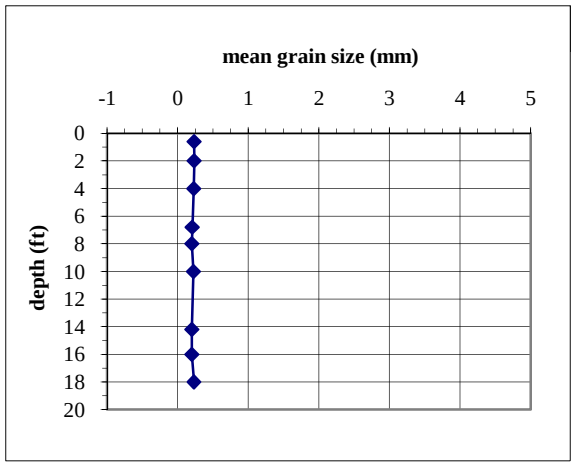
Long Distance Sediment Pipeline Project, Bayou Dupont Borrow Area **Ocean Surveys, Inc.**

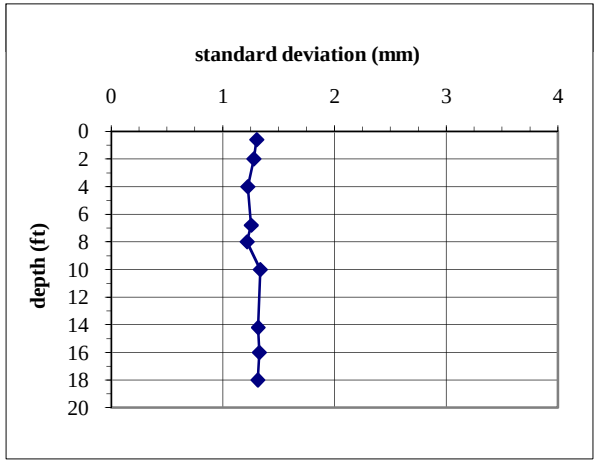
Grainsize Data Table

Core ID B-3B

Sample I.D.	Sample depth in core(ft)	Units	5% sample finer than	10% sample finer than	16% sample finer than	25% sample finer than	30% sample finer than	50% sample finer than	60% sample finer than	75% sample finer than	84% sample finer than	95% sample finer than	Sample mean grain size	Standard Deviation	%Gravel	%Sand	%Fines
B-3B-1	0.6	mm	0.153	0.170	0.184	0.201	0.208	0.234	0.251	0.277	0.301	0.357	0.234	1.303	0.00	99.68	0.32
		phi	2.711	2.554	2.445	2.315	2.263	2.098	1.995	1.853	1.733	1.485	2.092	-0.382			
B-3B-2	2.0	mm	0.160	0.176	0.190	0.205	0.211	0.232	0.248	0.274	0.298	0.355	0.236	1.278	0.06	99.74	0.26
		phi	2.648	2.506	2.397	2.285	2.242	2.105	2.014	1.869	1.749	1.494	2.084	-0.354			
B-3B-3	4.0	mm	0.164	0.181	0.194	0.208	0.213	0.229	0.241	0.262	0.277	0.324	0.231	1.224	0.00	99.78	0.22
		phi	2.607	2.465	2.366	2.269	2.231	2.124	2.054	1.931	1.852	1.625	2.114	-0.292			
B-3B-4	6.8	mm	0.143	0.162	0.174	0.189	0.195	0.209	0.216	0.232	0.249	0.326	0.209	1.254	0.30	99.59	0.41
		phi	2.801	2.624	2.520	2.406	2.360	2.255	2.211	2.106	2.003	1.616	2.260	-0.327			
B-3B-5	8.0	mm	0.139	0.157	0.169	0.181	0.188	0.204	0.210	0.224	0.238	0.270	0.202	1.217	0.00	99.43	0.57
		phi	2.844	2.673	2.568	2.465	2.411	2.291	2.249	2.158	2.070	1.890	2.310	-0.283			
B-3B-6	10.0	mm	0.149	0.170	0.184	0.198	0.204	0.219	0.227	0.252	0.284	0.443	0.225	1.336	0.45	99.56	0.41
		phi	2.743	2.554	2.444	2.337	2.297	2.194	2.136	1.988	1.816	1.175	2.151	-0.418			
B-3B-8	14.2	mm	0.123	0.141	0.158	0.177	0.185	0.207	0.212	0.237	0.256	0.311	0.203	1.317	0.00	99.37	0.63
		phi	3.027	2.822	2.659	2.500	2.431	2.269	2.208	2.079	1.967	1.685	2.298	-0.397			
B-3B-9	16.0	mm	0.123	0.140	0.156	0.174	0.182	0.205	0.215	0.235	0.255	0.321	0.202	1.327	0.14	99.33	0.67
		phi	3.027	2.831	2.677	2.526	2.456	2.284	2.220	2.088	1.969	1.641	2.310	-0.408			
B-3B-10	18.0	mm	0.141	0.165	0.182	0.201	0.208	0.233	0.249	0.274	0.296	0.350	0.233	1.314	0.00	99.68	0.32
		phi	2.830	2.601	2.455	2.318	2.265	2.103	2.003	1.866	1.755	1.515	2.104	-0.394			

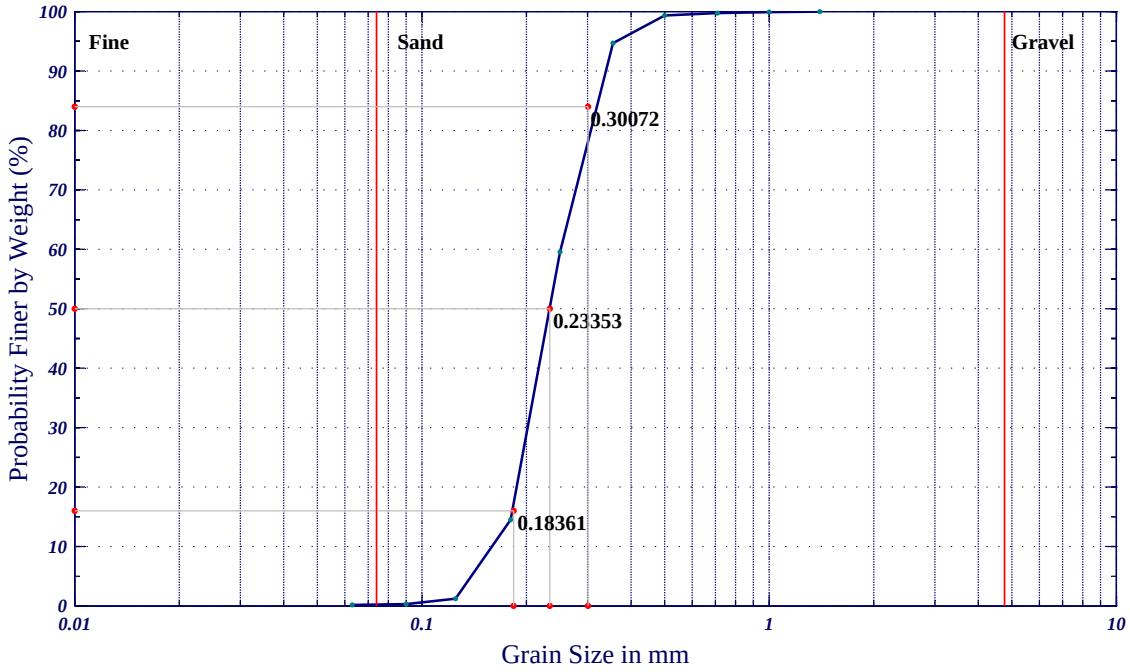






Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.153	2.711
D10:	0.170	2.554
D16:	0.184	2.445
D25:	0.201	2.315
D30:	0.208	2.263
D50:	0.234	2.098
D60:	0.251	1.995
D75:	0.277	1.853
D84:	0.301	1.733
D95:	0.357	1.485
Mean Grain Size:	0.234	2.092
Standard Deviation:	1.303	-0.382

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 99.68
Percent of Fines (<= 0.074mm): 0.32
Classification: Fine sand(sp)

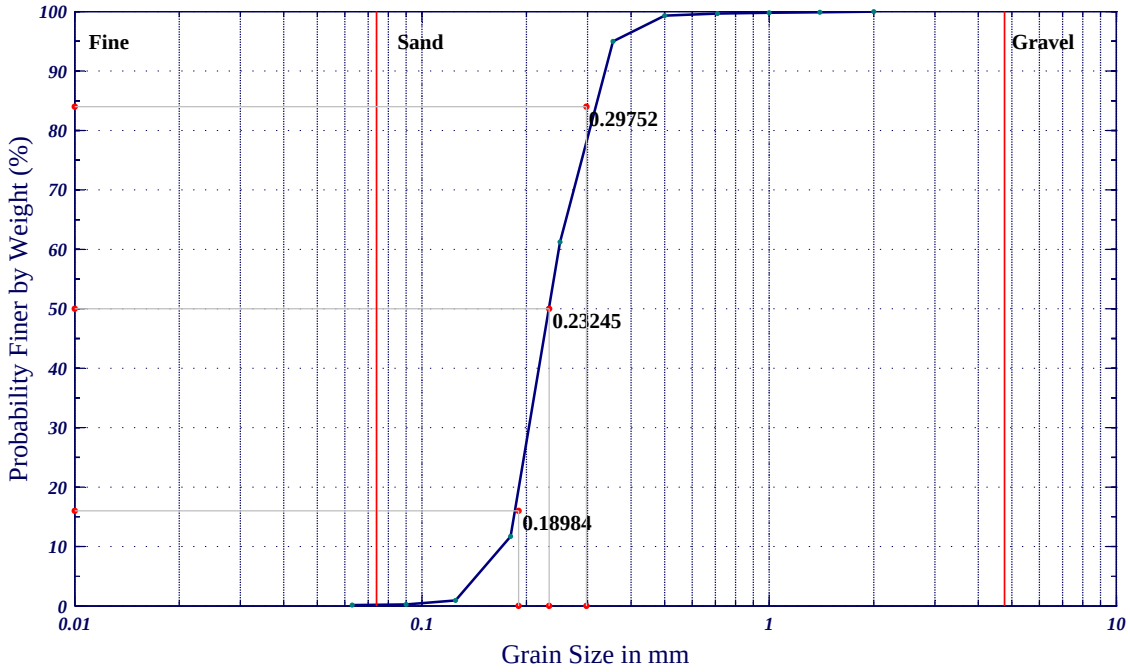
Sample ID: B-3B-1
Sample Depth: 0.4-0.8ft

Easting: 3,708,283*
Northing: 444,716*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.160	2.648
D10:	0.176	2.506
D16:	0.190	2.397
D25:	0.205	2.285
D30:	0.211	2.242
D50:	0.232	2.105
D60:	0.248	2.014
D75:	0.274	1.869
D84:	0.298	1.749
D95:	0.355	1.494
Mean Grain Size:	0.236	2.084
Standard Deviation:	1.278	-0.354

Percent of Gravel (16mm-2.00mm): 0.06
Percent of Sand (2.00mm-0.075mm): 99.74
Percent of Fines (<= 0.074mm): 0.26
Classification: Fine sand(sp)

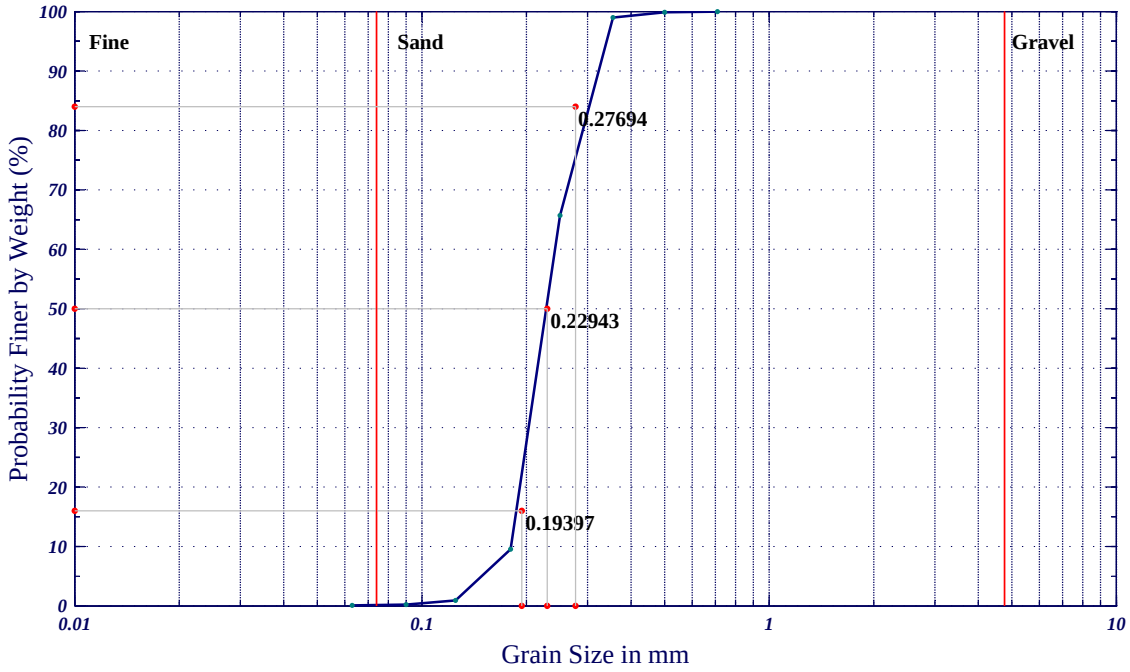
Sample ID: B-3B-2
Sample Depth: 1.8-2.2ft

Easting: 3,708,283*
Northing: 444,716*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.164	2.607
D10:	0.181	2.465
D16:	0.194	2.366
D25:	0.208	2.269
D30:	0.213	2.231
D50:	0.229	2.124
D60:	0.241	2.054
D75:	0.262	1.931
D84:	0.277	1.852
D95:	0.324	1.625
Mean Grain Size:	0.231	2.114
Standard Deviation:	1.224	-0.292

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 99.78
Percent of Fines (<= 0.074mm): 0.22
Classification: Fine sand(sp)

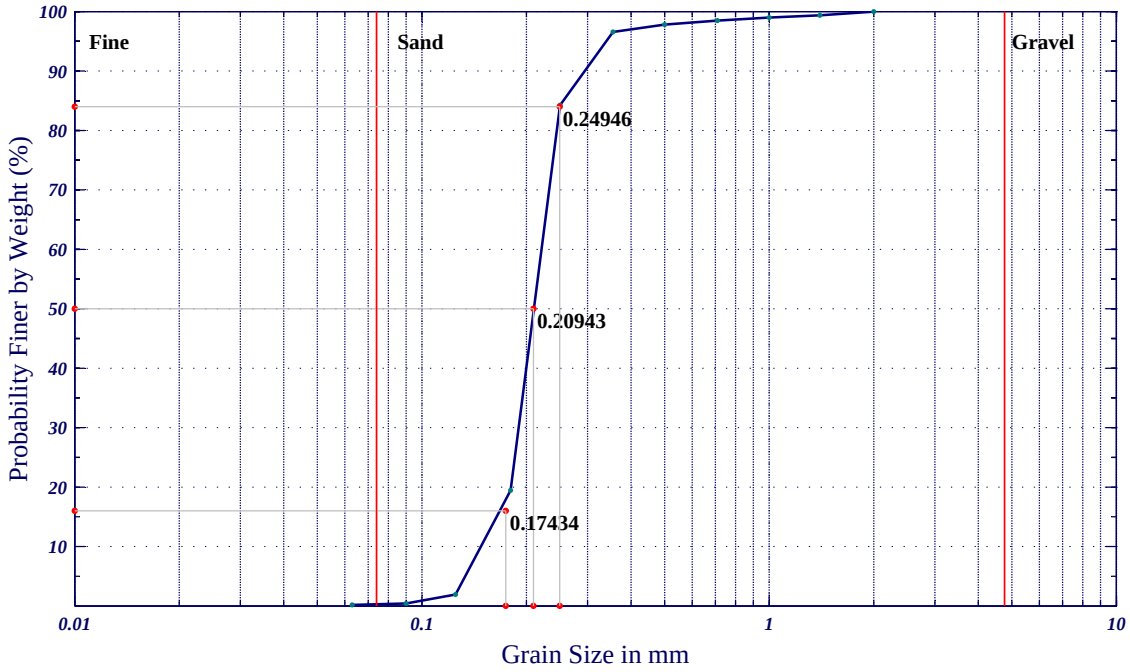
Sample ID: B-3B-3
Sample Depth: 3.8-4.2ft

Easting: 3,708,283*
Northing: 444,716*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.143	2.801
D10:	0.162	2.624
D16:	0.174	2.520
D25:	0.189	2.406
D30:	0.195	2.360
D50:	0.209	2.255
D60:	0.216	2.211
D75:	0.232	2.106
D84:	0.249	2.003
D95:	0.326	1.616
Mean Grain Size:	0.209	2.260
Standard Deviation:	1.254	-0.327

Percent of Gravel (16mm-2.00mm): 0.30
Percent of Sand (2.00mm-0.075mm): 99.59
Percent of Fines (<= 0.074mm): 0.41
Classification: Fine sand(sp)

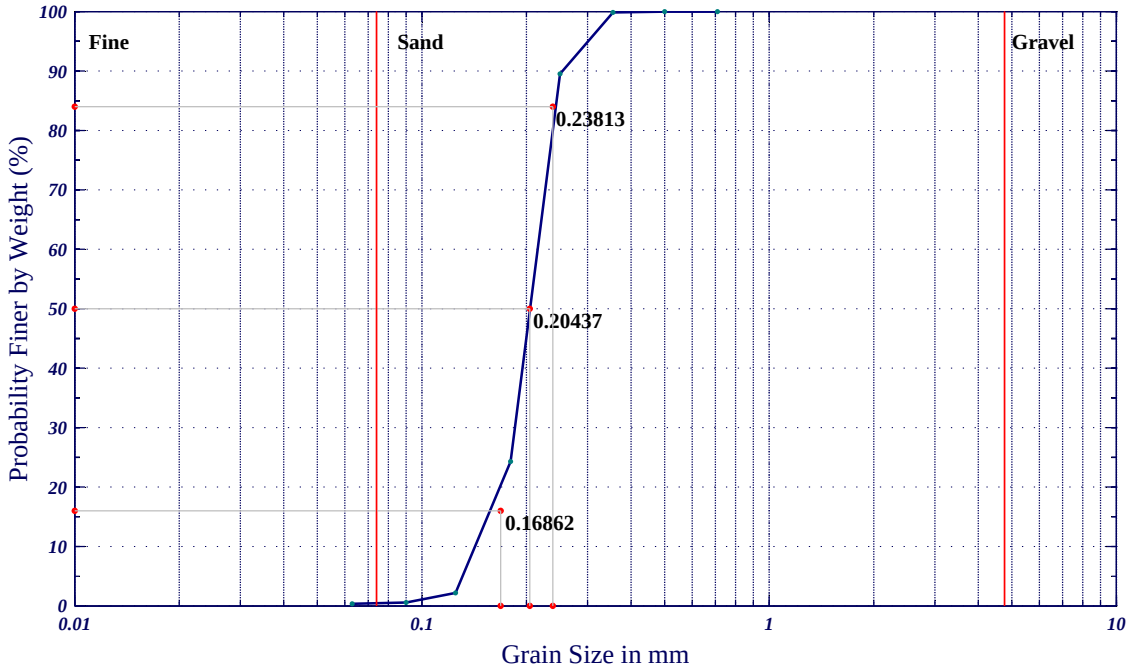
Sample ID: B-3B-4
Sample Depth: 6.6-7.0ft

Easting: 3,708,283*
Northing: 444,716*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.139	2.844
D10:	0.157	2.673
D16:	0.169	2.568
D25:	0.181	2.465
D30:	0.188	2.411
D50:	0.204	2.291
D60:	0.210	2.249
D75:	0.224	2.158
D84:	0.238	2.070
D95:	0.270	1.890
Mean Grain Size:	0.202	2.310
Standard Deviation:	1.217	-0.283

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 99.43
Percent of Fines (<= 0.074mm): 0.57
Classification: Fine sand(sp)

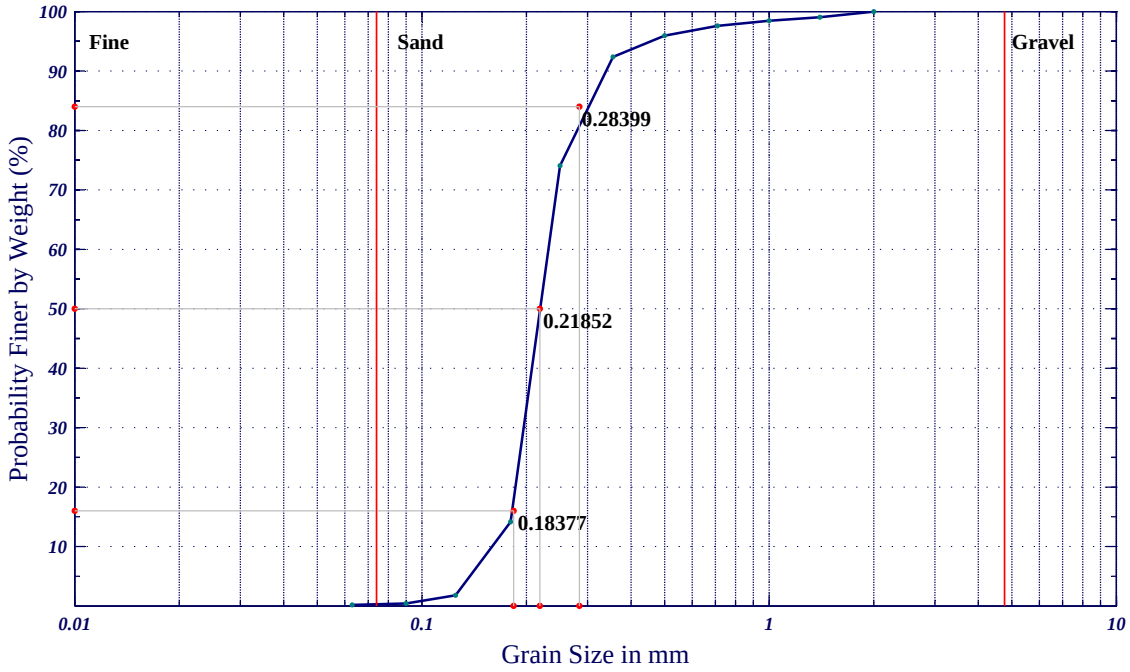
Sample ID: B-3B-5
Sample Depth: 7.8-8.2ft

Easting: 3,708,283*
Northing: 444,716*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results:

	(mm)	(phi)
D5:	0.149	2.743
D10:	0.170	2.554
D16:	0.184	2.444
D25:	0.198	2.337
D30:	0.204	2.297
D50:	0.219	2.194
D60:	0.227	2.136
D75:	0.252	1.988
D84:	0.284	1.816
D95:	0.443	1.175
Mean Grain Size:	0.225	2.151
Standard Deviation:	1.336	-0.418

Percent of Gravel (16mm-2.00mm): 0.45
Percent of Sand (2.00mm-0.075mm): 99.59
Percent of Fines (<= 0.074mm): 0.41
Classification: Fine sand(sp)

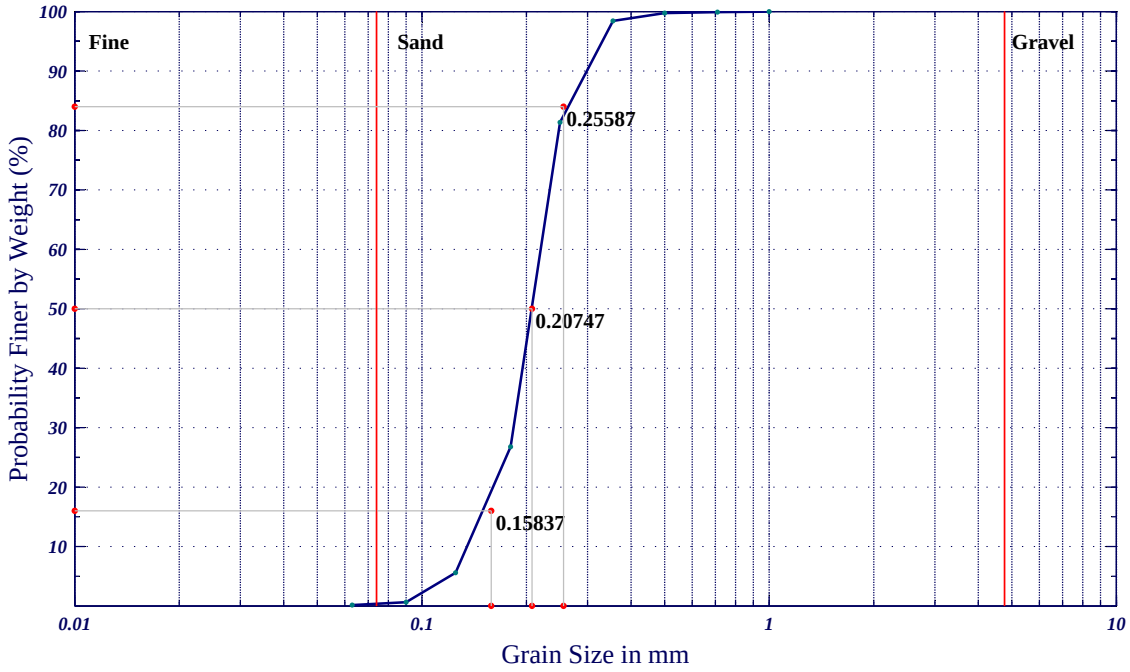
Sample ID: B-3B-6
Sample Depth: 9.8-10.2ft

Easting: 3,708,283*
Northing: 444,716*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results:	(mm)	(phi)
D5:	0.123	3.027
D10:	0.141	2.822
D16:	0.158	2.659
D25:	0.177	2.500
D30:	0.185	2.431
D50:	0.207	2.269
D60:	0.216	2.208
D75:	0.237	2.079
D84:	0.256	1.967
D95:	0.311	1.685
Mean Grain Size:	0.203	2.298
Standard Deviation:	1.317	-0.397

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 99.37
Percent of Fines (<= 0.074mm): 0.63
Classification: Fine sand(sp)

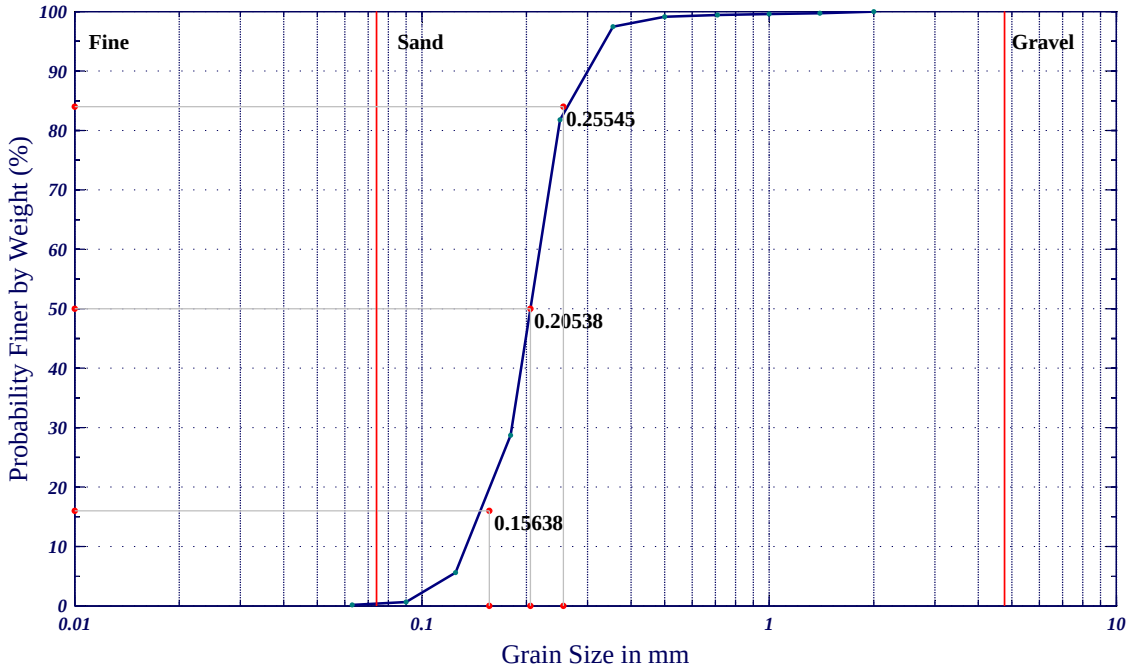
Sample ID: B-3B-8
Sample Depth: 14.0-14.4ft

Easting: 3,708,283*
Northing: 444,716*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.123	3.027
D10:	0.140	2.831
D16:	0.156	2.677
D25:	0.174	2.526
D30:	0.182	2.456
D50:	0.205	2.284
D60:	0.215	2.220
D75:	0.235	2.088
D84:	0.255	1.969
D95:	0.321	1.641
Mean Grain Size:	0.202	2.310
Standard Deviation:	1.327	-0.408

Percent of Gravel (16mm-2.00mm): 0.14
Percent of Sand (2.00mm-0.075mm): 99.33
Percent of Fines (<= 0.074mm): 0.67
Classification: Fine sand(sp)

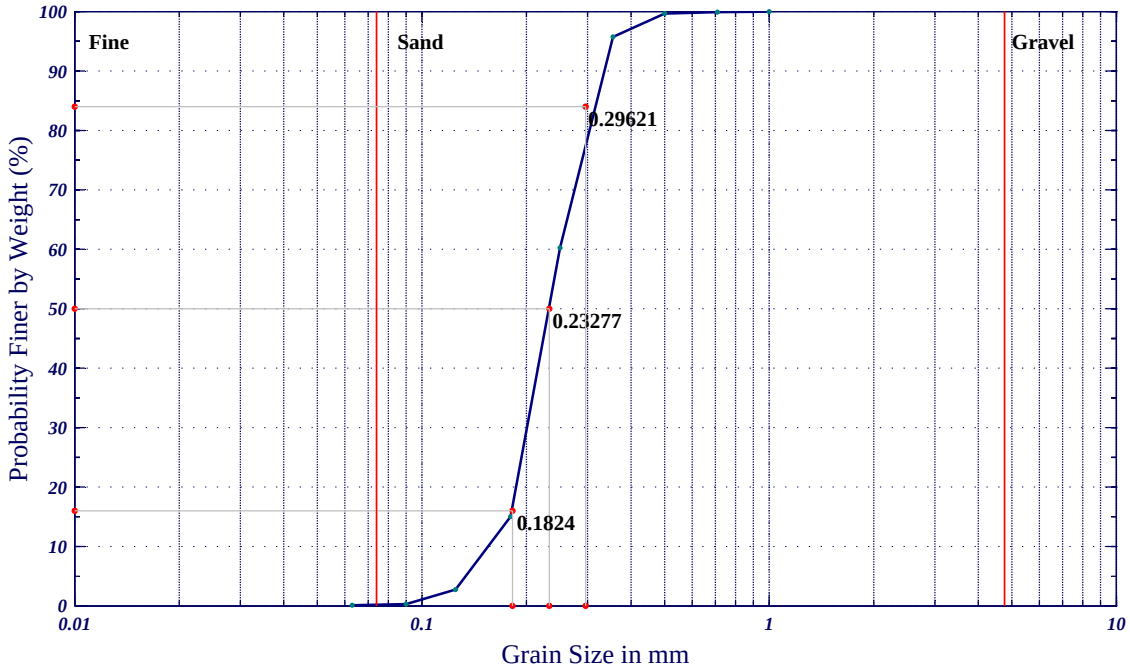
Sample ID: B-3B-9
Sample Depth: 15.8-16.2ft

Easting: 3,708,283*
Northing: 444,716*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.141	2.830
D10:	0.165	2.601
D16:	0.182	2.455
D25:	0.201	2.318
D30:	0.208	2.265
D50:	0.233	2.103
D60:	0.249	2.003
D75:	0.274	1.866
D84:	0.296	1.755
D95:	0.350	1.515
Mean Grain Size:	0.233	2.104
Standard Deviation:	1.314	-0.394

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 99.68
Percent of Fines (<= 0.074mm): 0.32
Classification: Fine sand(sp)

Sample ID: B-3B-10
Sample Depth: 17.8-18.2ft

Easting: 3,708,283*
Northing: 444,716*
*Coordinates are feet, LA-1702

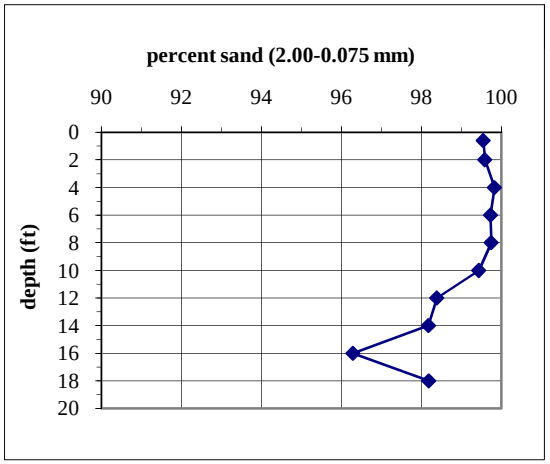
OSI No.: 11ES002

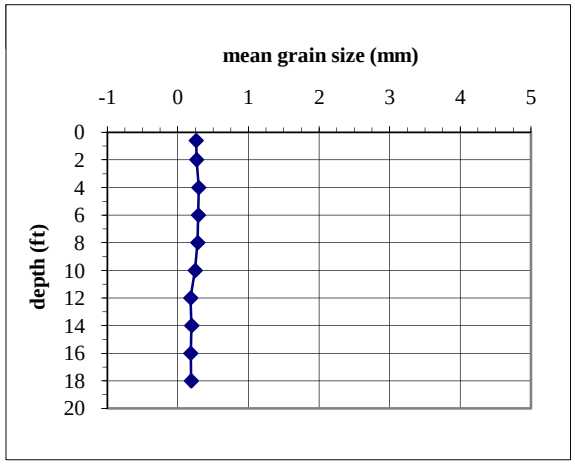
Long Distance Sediment Pipeline Project, Bayou Dupont Borrow Area **Ocean Surveys, Inc.**

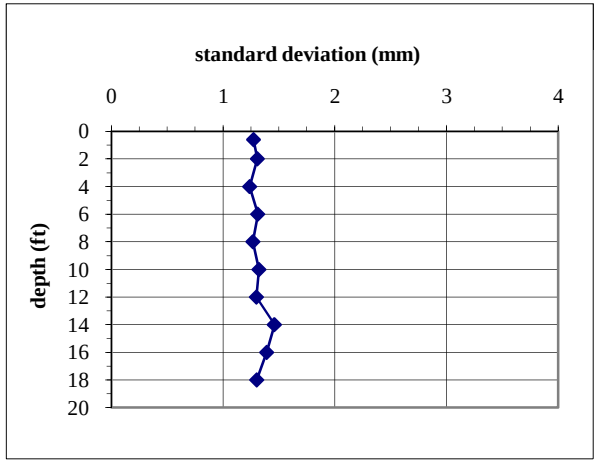
Grainsize Data Table

Core ID B-5P

Sample I.D.	Sample depth in core(ft)	Units	5% sample finer than	10% sample finer than	16% sample finer than	25% sample finer than	30% sample finer than	50% sample finer than	60% sample finer than	75% sample finer than	84% sample finer than	95% sample finer than	Sample mean grain size	Standard Deviation	%Gravel	%Sand	%Fines
B-5P-1	0.6	mm	0.172	0.190	0.207	0.223	0.230	0.264	0.277	0.300	0.324	0.372	0.260	1.273	0.00	99.55	0.45
		phi	2.543	2.394	2.274	2.163	2.117	1.924	1.854	1.737	1.627	1.426	1.972	-0.348			
B-5P-2	2.0	mm	0.170	0.189	0.206	0.223	0.231	0.267	0.283	0.313	0.341	0.400	0.266	1.308	0.00	99.59	0.41
		phi	2.557	2.402	2.279	2.163	2.115	1.907	1.823	1.677	1.550	1.322	1.912	-0.388			
B-5P-3	4.0	mm	0.186	0.222	0.248	0.269	0.278	0.298	0.307	0.328	0.350	0.401	0.296	1.239	0.00	99.83	0.17
		phi	2.429	2.174	2.011	1.893	1.848	1.745	1.704	1.608	1.515	1.318	1.757	-0.309			
B-5P-4	6.0	mm	0.177	0.204	0.226	0.248	0.260	0.293	0.308	0.340	0.367	0.434	0.290	1.312	0.22	99.73	0.27
		phi	2.500	2.294	2.149	2.009	1.941	1.769	1.698	1.555	1.447	1.204	1.788	-0.391			
B-5P-5	8.0	mm	0.179	0.205	0.226	0.247	0.258	0.285	0.296	0.319	0.342	0.400	0.280	1.268	0.00	99.75	0.25
		phi	2.479	2.286	2.149	2.020	1.957	1.810	1.758	1.649	1.548	1.323	1.835	-0.343			
B-5P-6	10.0	mm	0.148	0.172	0.189	0.208	0.215	0.245	0.263	0.289	0.315	0.370	0.244	1.323	0.00	99.44	0.56
		phi	2.752	2.539	2.402	2.268	2.215	2.030	1.925	1.788	1.665	1.436	2.033	-0.404			
B-5P-7	12.0	mm	0.110	0.123	0.138	0.156	0.164	0.191	0.199	0.211	0.225	0.256	0.181	1.299	0.00	98.39	1.61
		phi	3.181	3.018	2.857	2.684	2.611	2.387	2.330	2.243	2.155	1.968	2.466	-0.378			
B-5P-8	14.0	mm	0.110	0.126	0.141	0.158	0.166	0.196	0.208	0.234	0.264	0.418	0.194	1.461	2.56	98.18	1.82
		phi	3.179	2.992	2.829	2.664	2.593	2.350	2.265	2.095	1.922	1.259	2.367	-0.547			
B-5P-9	16.0	mm	0.097	0.115	0.131	0.152	0.163	0.195	0.204	0.222	0.239	0.286	0.183	1.392	0.00	96.29	3.71
		phi	3.360	3.115	2.934	2.715	2.620	2.361	2.291	2.174	2.063	1.804	2.453	-0.477			
B-5P-10	18.0	mm	0.114	0.131	0.146	0.163	0.170	0.196	0.204	0.219	0.235	0.271	0.189	1.302	0.00	98.19	1.81
		phi	3.136	2.934	2.775	2.620	2.555	2.352	2.294	2.189	2.088	1.881	2.405	-0.381			

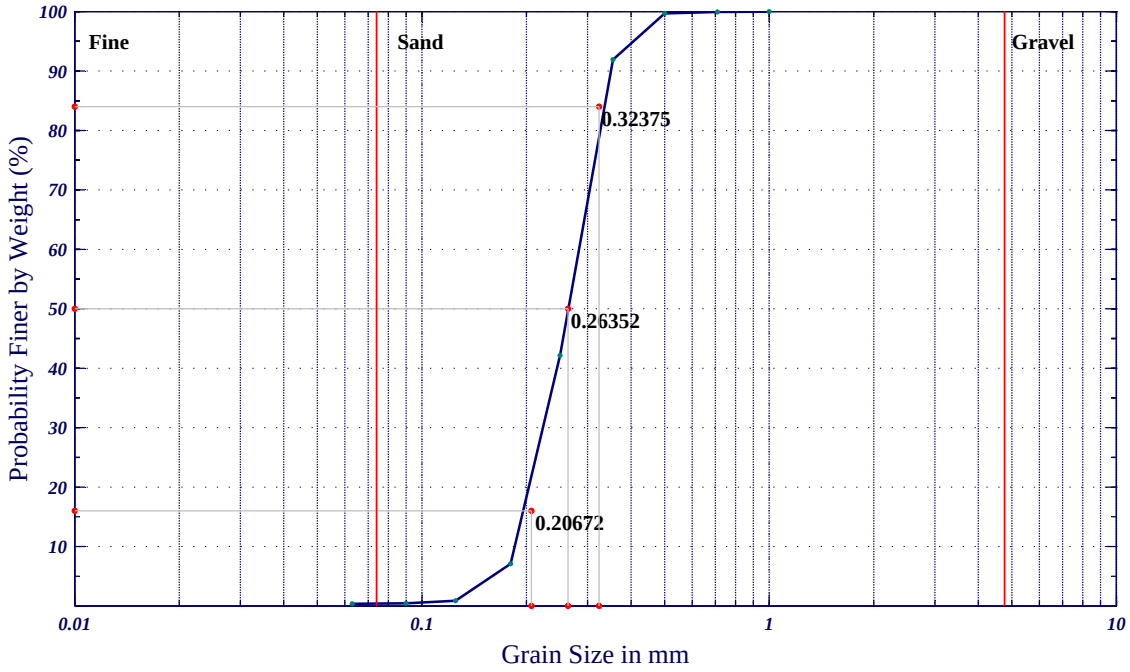






Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.172	2.543
D10:	0.190	2.394
D16:	0.207	2.274
D25:	0.223	2.163
D30:	0.230	2.117
D50:	0.264	1.924
D60:	0.277	1.854
D75:	0.300	1.737
D84:	0.324	1.627
D95:	0.372	1.426
Mean Grain Size:	0.260	1.942
Standard Deviation:	1.273	-0.348

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 99.55
Percent of Fines (<= 0.074mm): 0.45
Classification: Fine sand(sp)

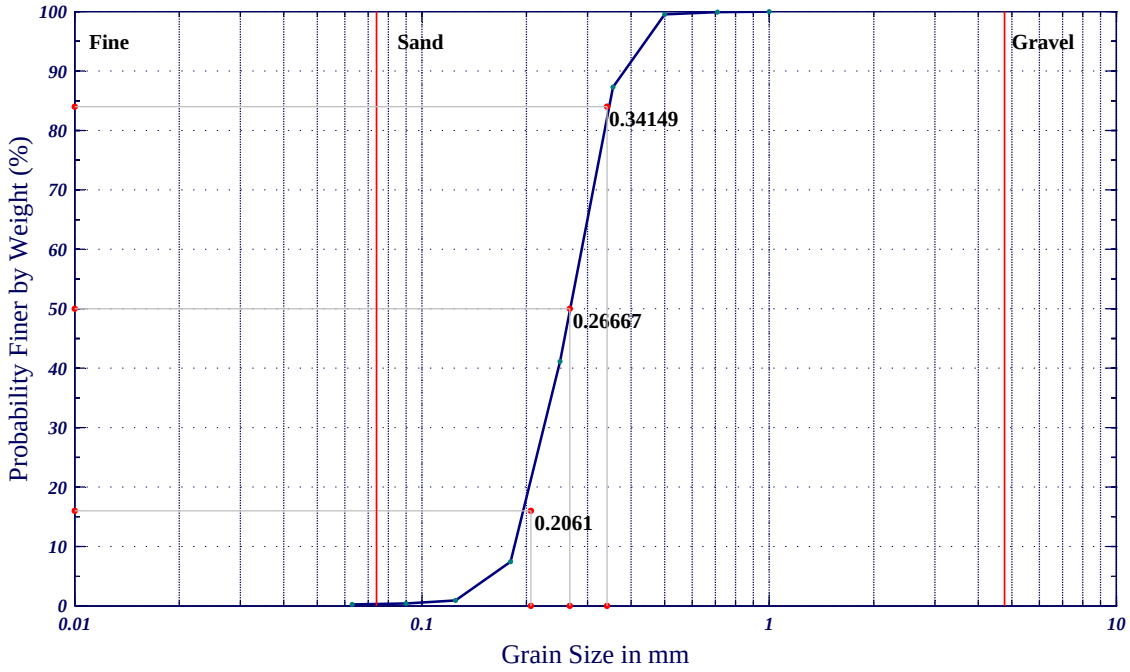
Sample ID: B-5P-1
Sample Depth: 0.4-0.8ft

Easting: 3,708,341*
Northing: 443,069*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: **(mm)** **(phi)**

D5:	0.170	2.557
D10:	0.189	2.402
D16:	0.206	2.279
D25:	0.223	2.163
D30:	0.231	2.115
D50:	0.267	1.907
D60:	0.283	1.823
D75:	0.313	1.677
D84:	0.341	1.550
D95:	0.400	1.322
Mean Grain Size:	0.266	1.912
Standard Deviation:	1.308	-0.388

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 99.59
Percent of Fines (<= 0.074mm): 0.41
Classification: Fine sand(sp)

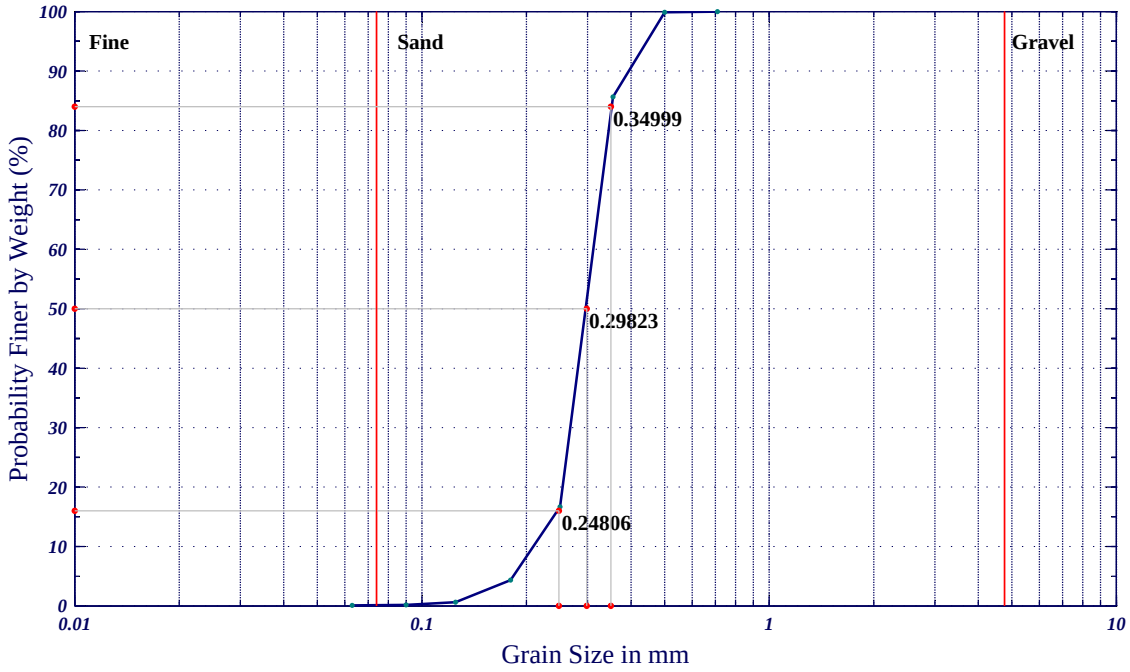
Sample ID: B-5P-2
Sample Depth: 1.8-2.2ft

Easting: 3,708,341*
Northing: 443,069*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.186	2.429
D10:	0.222	2.174
D16:	0.248	2.011
D25:	0.269	1.893
D30:	0.278	1.848
D50:	0.298	1.745
D60:	0.307	1.704
D75:	0.328	1.608
D84:	0.350	1.515
D95:	0.401	1.318
Mean Grain Size:	0.296	1.757
Standard Deviation:	1.239	-0.309

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 99.83
Percent of Fines (<= 0.074mm): 0.17
Classification: Fine sand(sp)

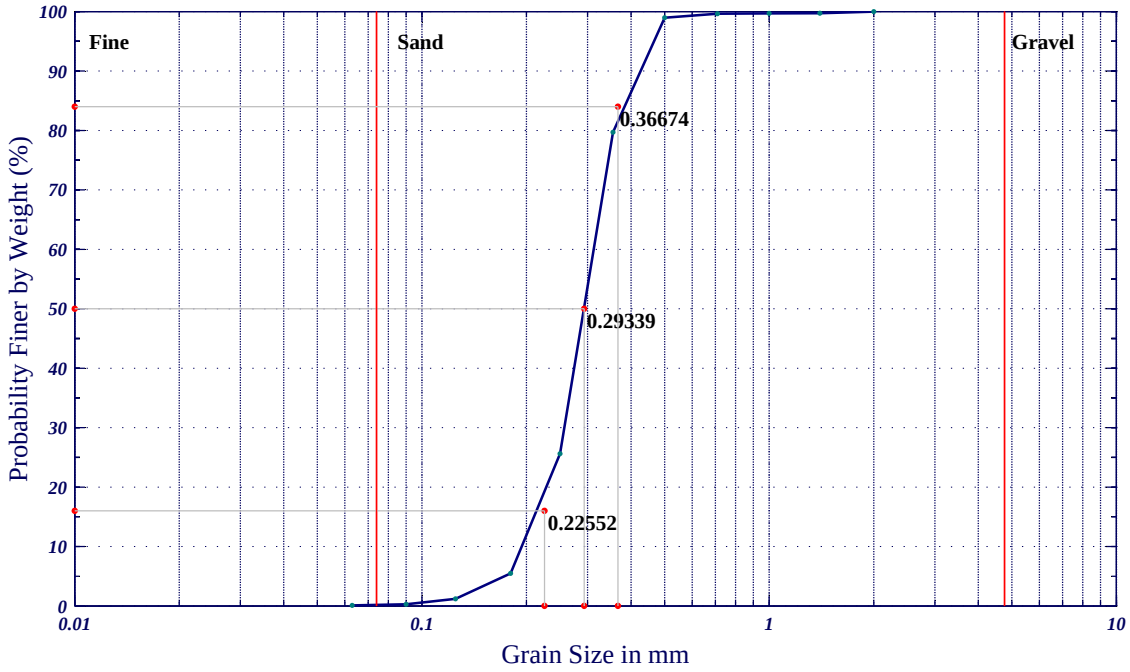
Sample ID: B-5P-3
Sample Depth: 3.8-4.2ft

Easting: 3,708,341*
Northing: 443,069*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results:	(mm)	(phi)
D5:	0.177	2.500
D10:	0.204	2.294
D16:	0.226	2.149
D25:	0.248	2.009
D30:	0.260	1.941
D50:	0.293	1.769
D60:	0.308	1.698
D75:	0.340	1.555
D84:	0.367	1.447
D95:	0.434	1.204
Mean Grain Size:	0.290	1.788
Standard Deviation:	1.312	-0.391

Percent of Gravel (16mm-2.00mm): 0.22
Percent of Sand (2.00mm-0.075mm): 99.73
Percent of Fines (<= 0.074mm): 0.27
Classification: Fine sand(sp)

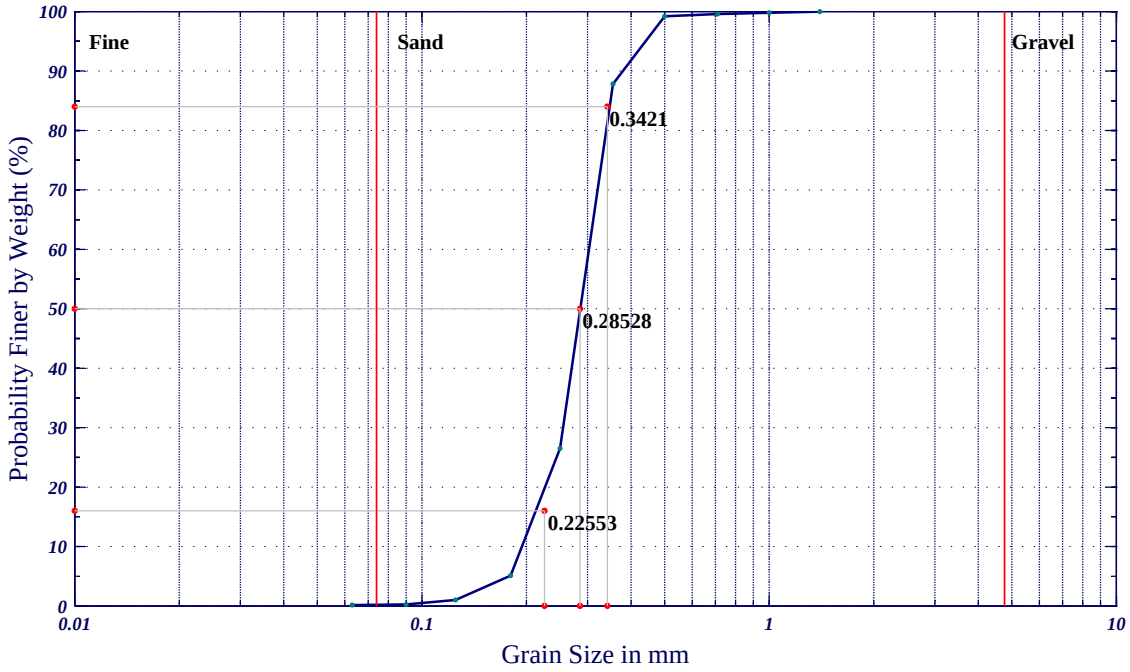
Sample ID: B-5P-4
Sample Depth: 5.8-6.2ft

Easting: 3,708,341*
Northing: 443,069*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.179	2.479
D10:	0.205	2.286
D16:	0.226	2.149
D25:	0.247	2.020
D30:	0.258	1.957
D50:	0.285	1.810
D60:	0.296	1.758
D75:	0.319	1.649
D84:	0.342	1.548
D95:	0.400	1.323
Mean Grain Size:	0.280	1.835
Standard Deviation:	1.268	-0.343

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 99.75
Percent of Fines (<= 0.074mm): 0.25
Classification: Fine sand(sp)

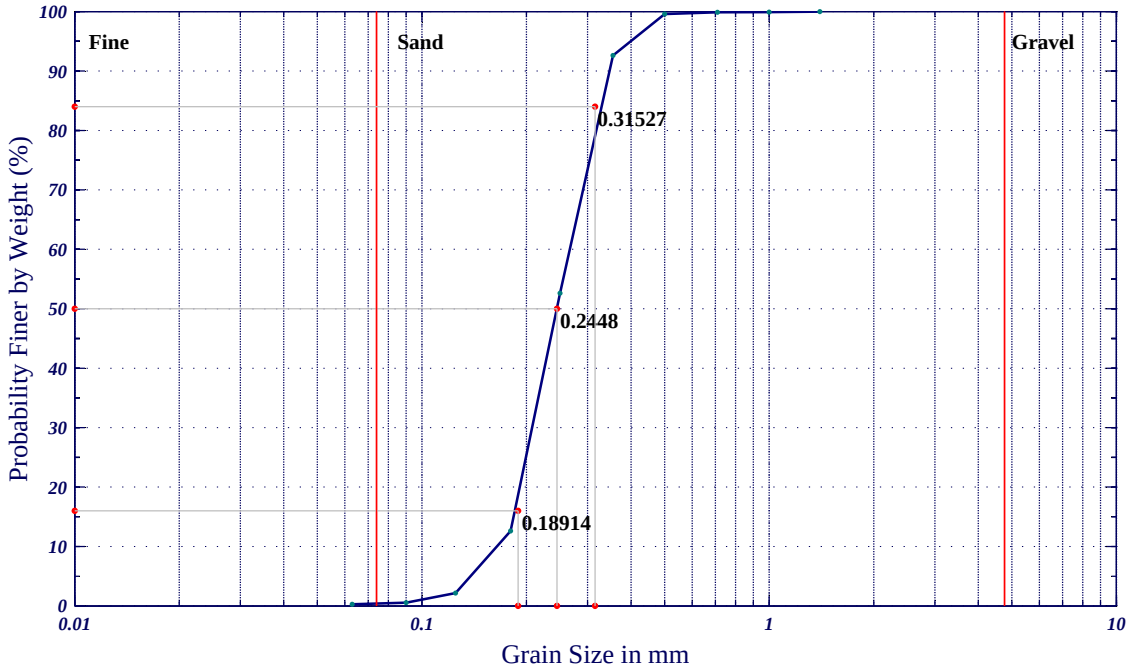
Sample ID: B-5P-5
Sample Depth: 7.8-8.2ft

Easting: 3,708,341*
Northing: 443,069*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.148	2.752
D10:	0.172	2.539
D16:	0.189	2.402
D25:	0.208	2.268
D30:	0.215	2.215
D50:	0.245	2.030
D60:	0.263	1.925
D75:	0.289	1.788
D84:	0.315	1.665
D95:	0.370	1.436
Mean Grain Size:	0.244	2.033
Standard Deviation:	1.323	-0.404

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 99.44
Percent of Fines (<= 0.074mm): 0.56
Classification: Fine sand(sp)

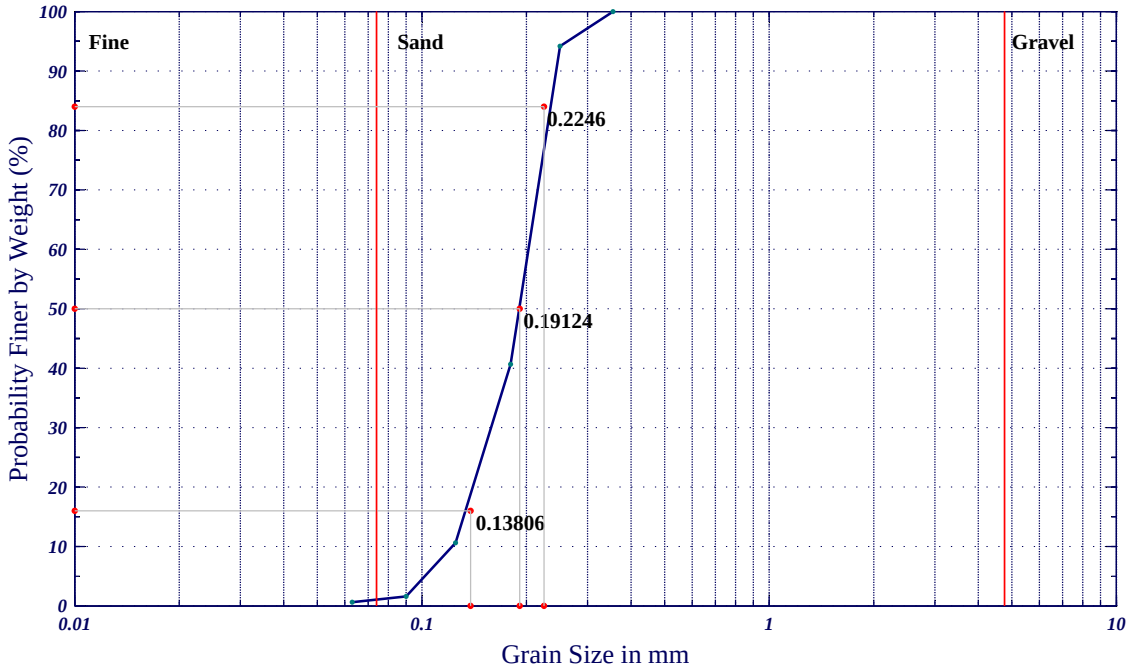
Sample ID: B-5P-6
Sample Depth: 9.8-10.2ft

Easting: 3,708,341*
Northing: 443,069*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.110	3.181
D10:	0.123	3.018
D16:	0.138	2.857
D25:	0.156	2.684
D30:	0.164	2.611
D50:	0.191	2.387
D60:	0.199	2.330
D75:	0.211	2.243
D84:	0.225	2.155
D95:	0.256	1.968
Mean Grain Size:	0.181	2.466
Standard Deviation:	1.299	-0.378

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 98.39
Percent of Fines (<= 0.074mm): 1.61
Classification: Fine sand(sp)

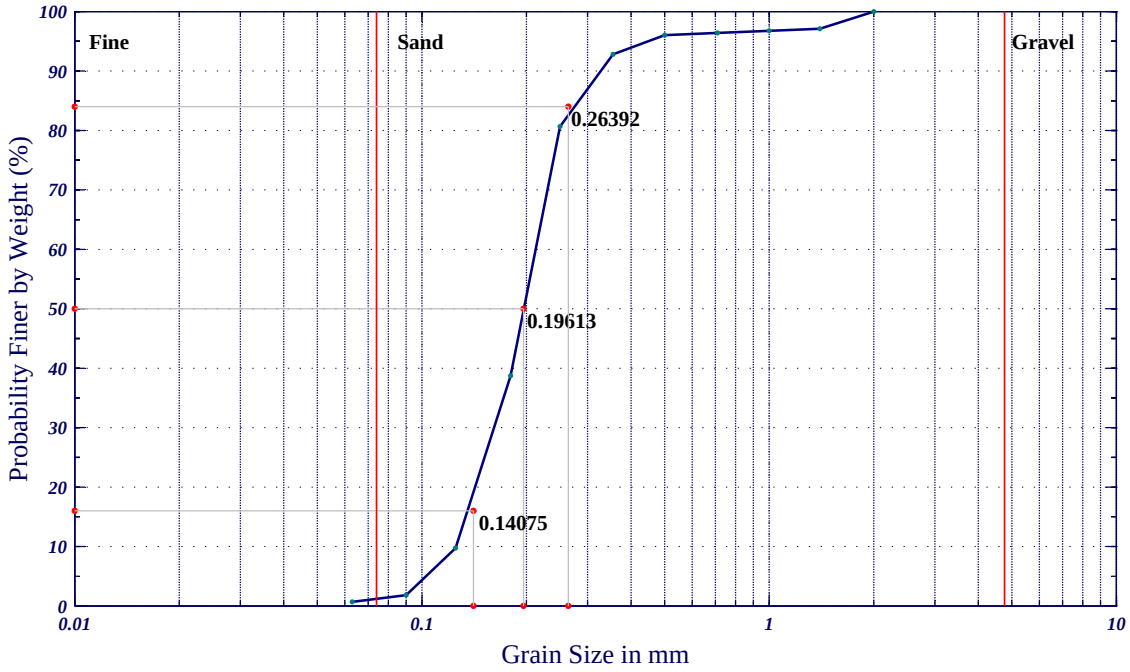
Sample ID: B-5P-7
Sample Depth: 11.8-12.2ft

Easting: 3,708,341*
Northing: 443,069*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.110	3.179
D10:	0.126	2.992
D16:	0.141	2.829
D25:	0.158	2.664
D30:	0.166	2.593
D50:	0.196	2.350
D60:	0.208	2.265
D75:	0.234	2.095
D84:	0.264	1.922
D95:	0.418	1.259
Mean Grain Size:	0.194	2.367
Standard Deviation:	1.461	-0.547

Percent of Gravel (16mm-2.00mm): 2.56
Percent of Sand (2.00mm-0.075mm): 98.18
Percent of Fines (<= 0.074mm): 1.82
Classification: Fine sand(sp)

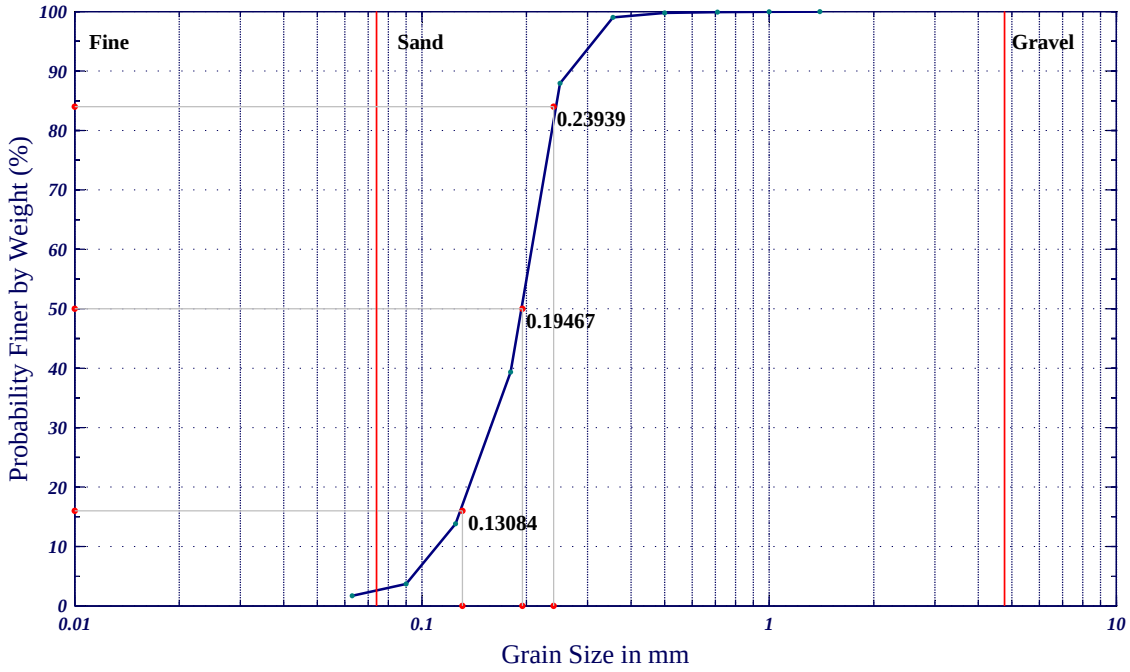
Sample ID: B-5P-8
Sample Depth: 13.8-14.2ft

Easting: 3,708,341*
Northing: 443,069*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.097	3.360
D10:	0.115	3.115
D16:	0.131	2.934
D25:	0.152	2.715
D30:	0.163	2.620
D50:	0.195	2.361
D60:	0.204	2.291
D75:	0.222	2.174
D84:	0.239	2.063
D95:	0.286	1.804
Mean Grain Size:	0.183	2.453
Standard Deviation:	1.392	-0.477

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 96.29
Percent of Fines (<= 0.074mm): 3.71
Classification: Fine sand(sp)

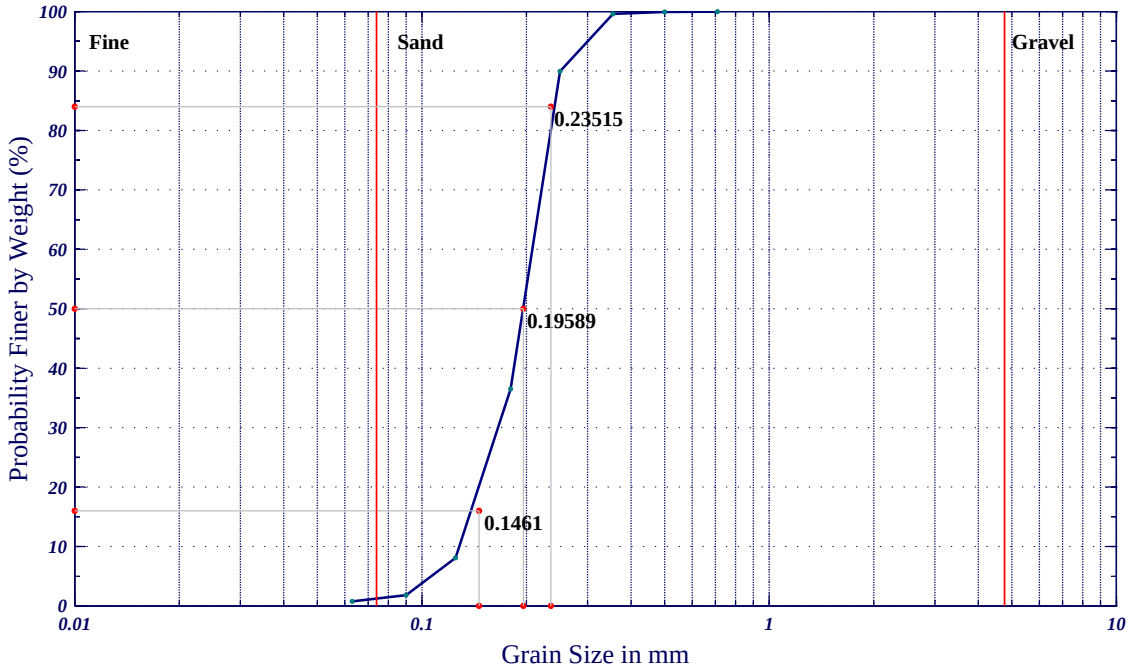
Sample ID: B-5P-9
Sample Depth: 15.8-16.2ft

Easting: 3,708,341*
Northing: 443,069*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.114	3.136
D10:	0.131	2.934
D16:	0.146	2.775
D25:	0.163	2.620
D30:	0.170	2.555
D50:	0.196	2.352
D60:	0.204	2.294
D75:	0.219	2.189
D84:	0.235	2.088
D95:	0.271	1.881
Mean Grain Size:	0.189	2.405
Standard Deviation:	1.302	-0.381

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 98.19
Percent of Fines (<= 0.074mm): 1.81
Classification: Fine sand(sp)

Sample ID: B-5P-10
Sample Depth: 17.8-18.2ft

Easting: 3,708,341*
Northing: 443,069*
*Coordinates are feet, LA-1702

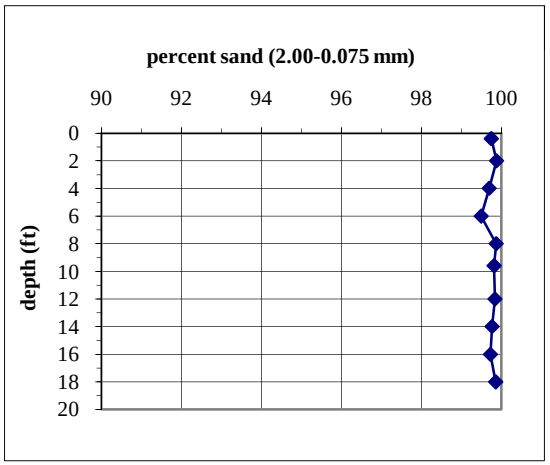
OSI No.: 11ES002

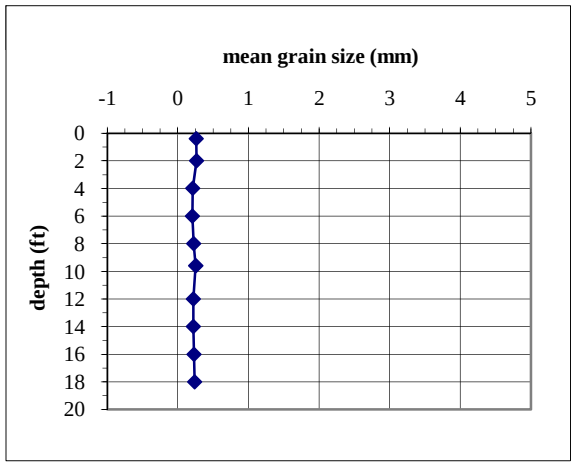
Long Distance Sediment Pipeline Project, Bayou Dupont Borrow Area **Ocean Surveys, Inc.**

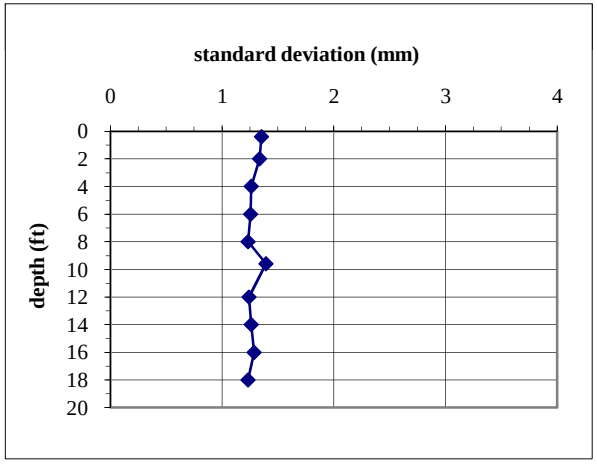
Grainsize Data Table

Core ID B-6P

Sample I.D.	Sample depth in core(ft)	Units	5% sample finer than	10% sample finer than	16% sample finer than	25% sample finer than	30% sample finer than	50% sample finer than	60% sample finer than	75% sample finer than	84% sample finer than	95% sample finer than	Sample mean grain size	Standard Deviation	%Gravel	%Sand	%Fines
B-6P-1	0.4	mm	0.166	0.181	0.198	0.216	0.224	0.259	0.276	0.309	0.341	0.450	0.260	1.353	0.20	99.75	0.25
		phi	2.590	2.467	2.338	2.213	2.161	1.948	1.855	1.696	1.552	1.153	1.946	-0.436			
B-6P-2	2.0	mm	0.172	0.188	0.203	0.219	0.227	0.261	0.279	0.313	0.347	0.436	0.264	1.335	0.42	99.88	0.12
		phi	2.542	2.415	2.298	2.188	2.142	1.938	1.842	1.674	1.529	1.197	1.922	-0.416			
B-6P-3	4.0	mm	0.145	0.161	0.171	0.184	0.191	0.211	0.221	0.242	0.260	0.312	0.211	1.262	0.00	99.70	0.30
		phi	2.782	2.632	2.548	2.445	2.389	2.244	2.181	2.044	1.942	1.679	2.245	-0.335			
B-6P-4	6.0	mm	0.142	0.159	0.169	0.181	0.188	0.208	0.216	0.235	0.254	0.304	0.207	1.256	0.00	99.50	0.50
		phi	2.814	2.656	2.563	2.466	2.408	2.267	2.210	2.087	1.980	1.719	2.270	-0.328			
B-6P-5	8.0	mm	0.160	0.175	0.187	0.201	0.207	0.224	0.234	0.257	0.271	0.320	0.225	1.233	0.00	99.87	0.13
		phi	2.648	2.514	2.417	2.312	2.272	2.159	2.096	1.959	1.881	1.642	2.152	-0.302			
B-6P-6	9.6	mm	0.514	0.172	0.186	0.204	0.211	0.240	0.264	0.318	0.362	0.415	0.253	1.393	0.00	99.82	0.18
		phi	2.696	2.543	2.426	2.297	2.245	2.059	1.921	1.651	1.466	1.269	1.984	-0.478			
B-6P-7	12.0	mm	0.153	0.169	0.180	0.195	0.201	0.219	0.229	0.252	0.265	0.312	0.219	1.241	0.00	99.84	0.16
		phi	2.710	2.562	2.476	2.359	2.314	2.191	2.130	1.990	1.915	1.680	2.194	-0.312			
B-6P-8	14.0	mm	0.150	0.167	0.178	0.194	0.201	0.222	0.234	0.258	0.271	0.319	0.220	1.261	0.14	99.77	0.23
		phi	2.741	2.583	2.491	2.364	2.314	2.172	2.098	1.954	1.882	1.650	2.182	-0.334			
B-6P-9	16.0	mm	0.151	0.170	0.184	0.200	0.206	0.226	0.239	0.266	0.288	0.349	0.229	1.288	0.00	99.73	0.27
		phi	2.732	2.556	2.445	2.325	2.279	2.144	2.064	1.911	1.793	1.518	2.127	-0.365			
B-6P-10	18.0	mm	0.170	0.186	0.199	0.212	0.217	0.236	0.250	0.270	0.289	0.340	0.238	1.233	0.15	99.86	0.14
		phi	2.557	2.430	2.332	2.237	2.201	2.086	1.999	1.887	1.789	1.558	2.069	-0.302			

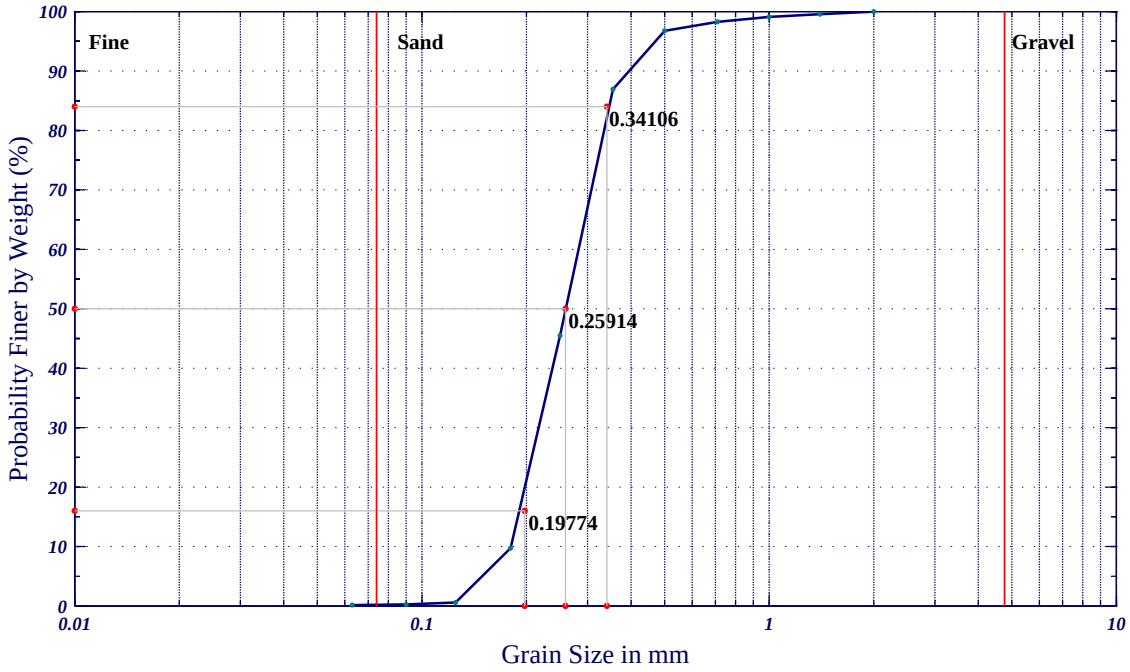






Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.166	2.590
D10:	0.181	2.467
D16:	0.198	2.338
D25:	0.216	2.213
D30:	0.224	2.161
D50:	0.259	1.948
D60:	0.276	1.855
D75:	0.309	1.696
D84:	0.341	1.552
D95:	0.450	1.153
Mean Grain Size:	0.260	1.946
Standard Deviation:	1.353	-0.436

Percent of Gravel (16mm-2.00mm): 0.20
Percent of Sand (2.00mm-0.075mm): 99.75
Percent of Fines (<= 0.074mm): 0.25
Classification: Fine sand(sp)

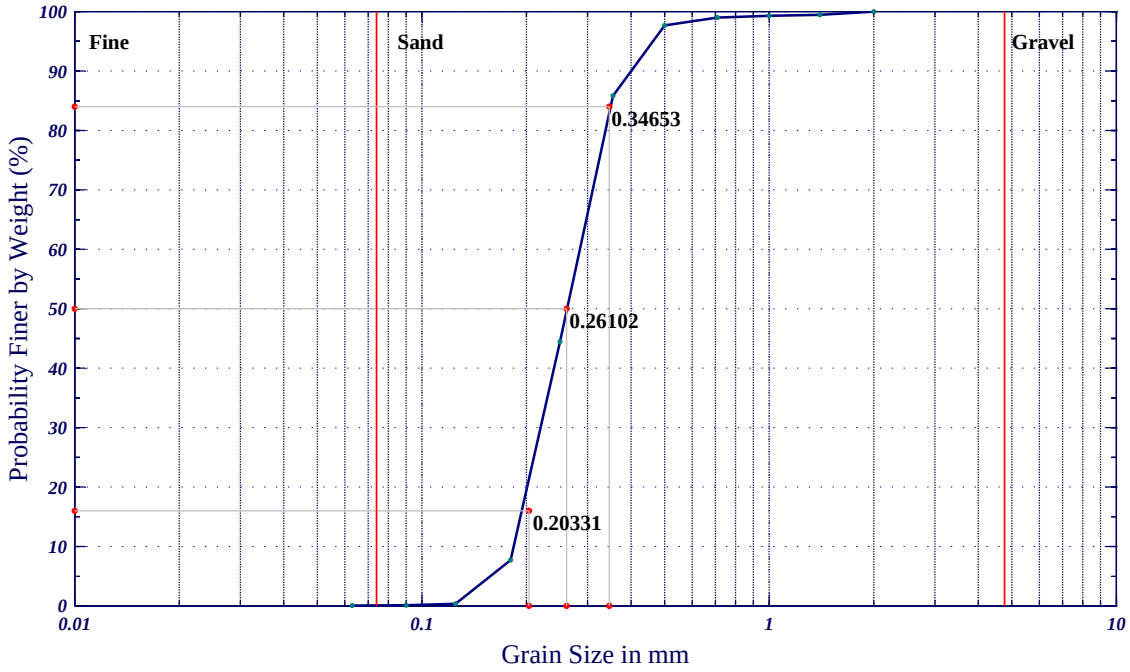
Sample ID: B-6P-1
Sample Depth: 0.2-0.6ft

Easting: 3,708,870*
Northing: 443,317*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.172	2.542
D10:	0.188	2.415
D16:	0.203	2.298
D25:	0.219	2.188
D30:	0.227	2.142
D50:	0.261	1.938
D60:	0.279	1.842
D75:	0.313	1.674
D84:	0.347	1.529
D95:	0.436	1.197
Mean Grain Size:	0.264	1.922
Standard Deviation:	1.335	-0.416

Percent of Gravel (16mm-2.00mm): 0.42
Percent of Sand (2.00mm-0.075mm): 99.88
Percent of Fines (<= 0.074mm): 0.12
Classification: Fine sand(sp)

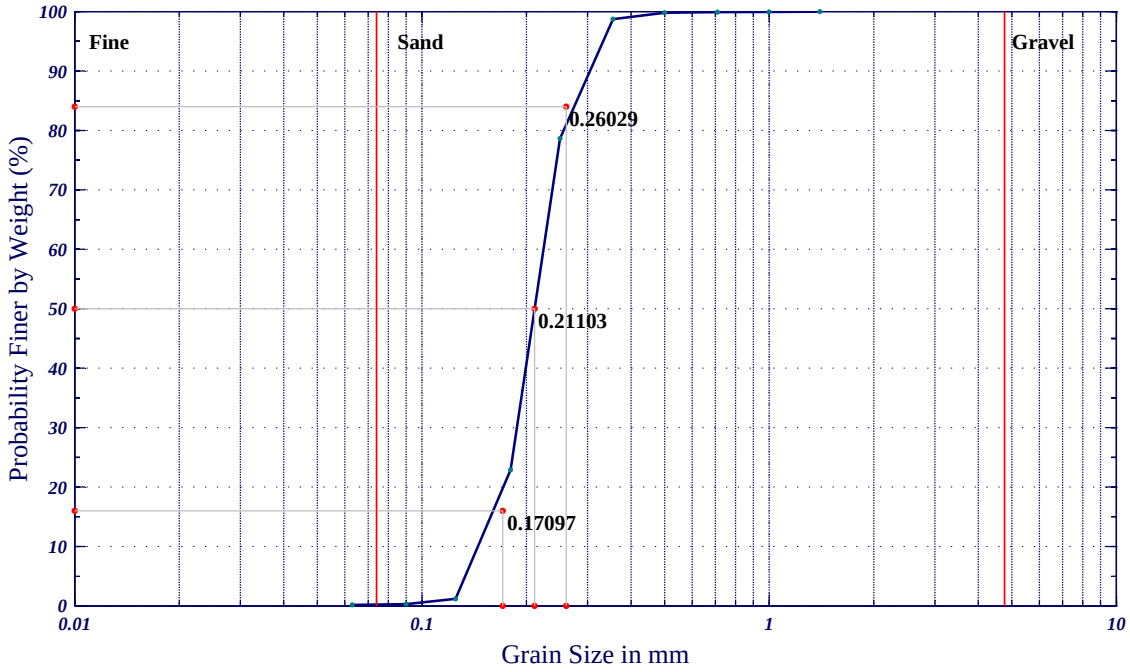
Sample ID: B-6P-2
Sample Depth: 1.8-2.2ft

Easting: 3,708,870*
Northing: 443,317*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.145	2.782
D10:	0.161	2.632
D16:	0.171	2.548
D25:	0.184	2.445
D30:	0.191	2.389
D50:	0.211	2.244
D60:	0.221	2.181
D75:	0.242	2.044
D84:	0.260	1.942
D95:	0.312	1.679
Mean Grain Size:	0.211	2.245
Standard Deviation:	1.262	-0.335

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 99.70
Percent of Fines (<= 0.074mm): 0.30
Classification: Fine sand(sp)

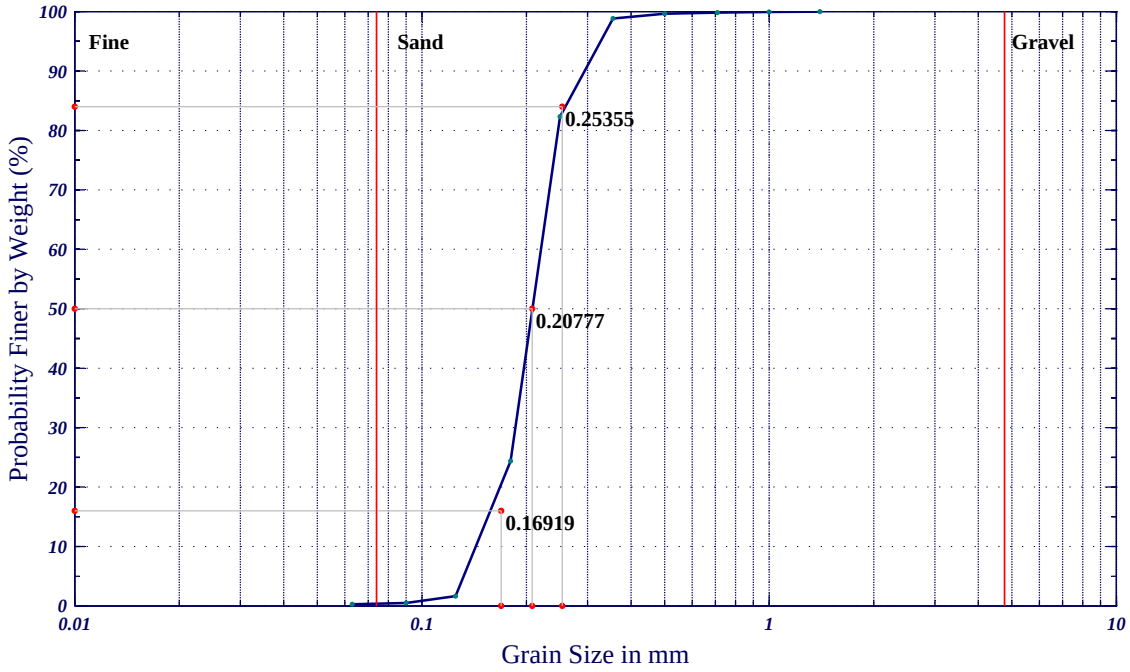
Sample ID: B-6P-3
Sample Depth: 3.8-4.2ft

Easting: 3,708,870*
Northing: 443,317*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.142	2.814
D10:	0.159	2.656
D16:	0.169	2.563
D25:	0.181	2.466
D30:	0.188	2.408
D50:	0.208	2.267
D60:	0.216	2.210
D75:	0.235	2.087
D84:	0.254	1.980
D95:	0.304	1.719
Mean Grain Size:	0.207	2.270
Standard Deviation:	1.256	-0.328

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 99.50
Percent of Fines (<= 0.074mm): 0.50
Classification: Fine sand(sp)

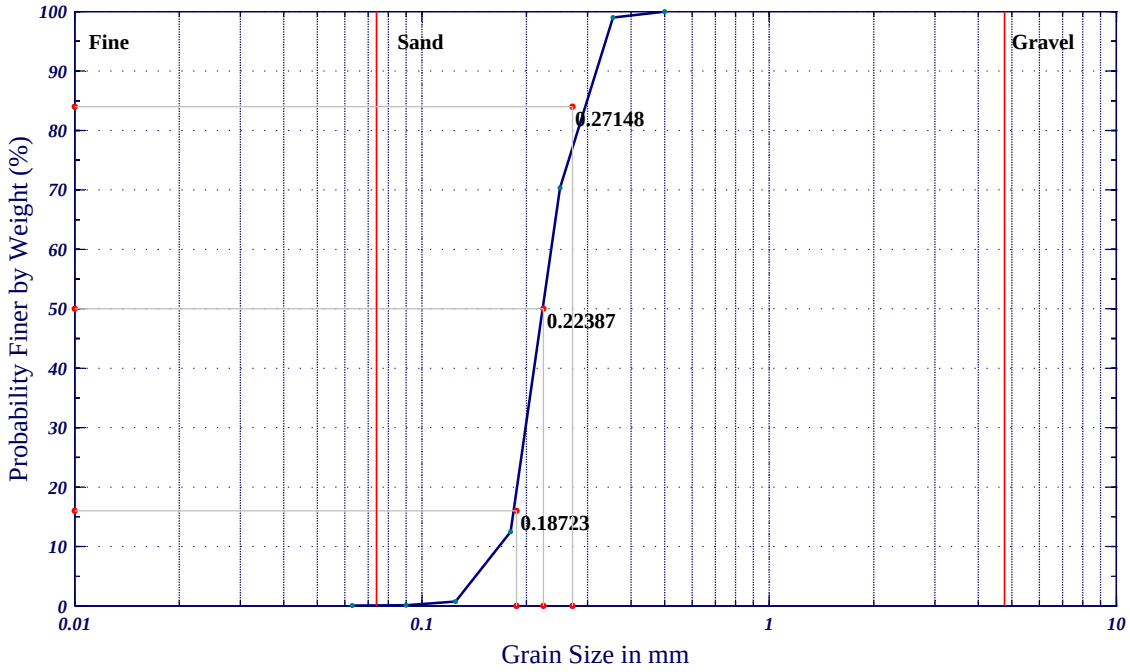
Sample ID: B-6P-4
Sample Depth: 5.8-6.2ft

Easting: 3,708,870*
Northing: 443,317*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.160	2.648
D10:	0.175	2.514
D16:	0.187	2.417
D25:	0.201	2.312
D30:	0.207	2.272
D50:	0.224	2.159
D60:	0.234	2.096
D75:	0.257	1.959
D84:	0.271	1.881
D95:	0.320	1.642
Mean Grain Size:	0.225	2.152
Standard Deviation:	1.233	-0.302

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 99.87
Percent of Fines (<= 0.074mm): 0.13
Classification: Fine sand(sp)

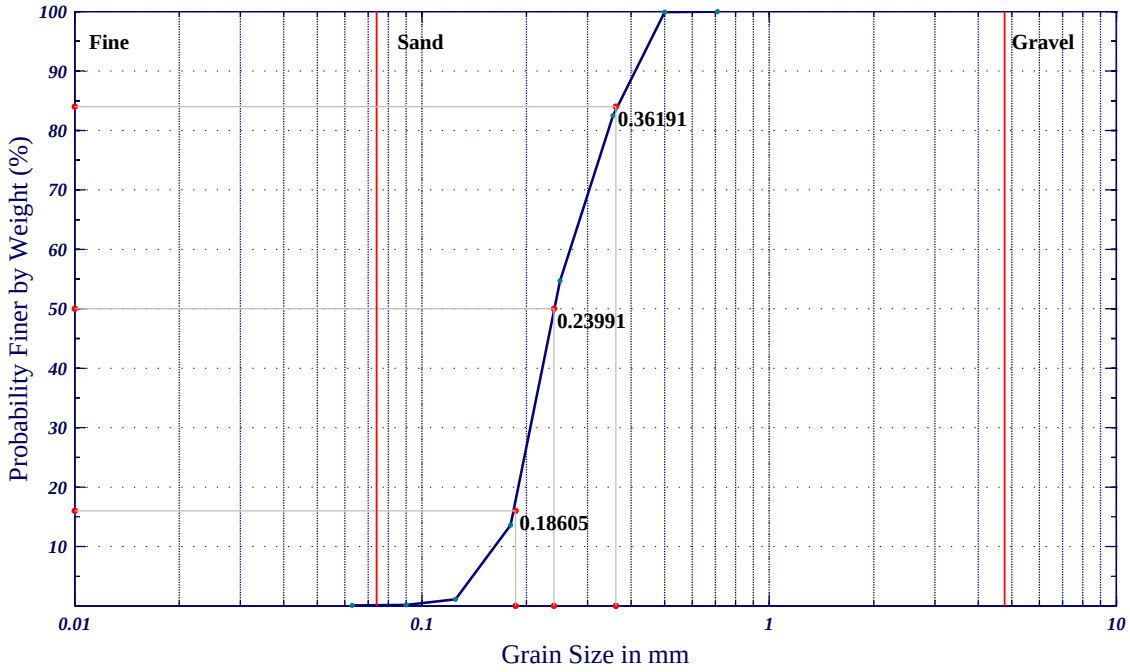
Sample ID: B-6P-5
Sample Depth: 7.8-8.2ft

Easting: 3,708,870*
Northing: 443,317*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.154	2.696
D10:	0.172	2.543
D16:	0.186	2.426
D25:	0.204	2.297
D30:	0.211	2.245
D50:	0.240	2.059
D60:	0.264	1.921
D75:	0.318	1.651
D84:	0.362	1.466
D95:	0.415	1.269
Mean Grain Size:	0.253	1.984
Standard Deviation:	1.393	-0.478

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 99.82
Percent of Fines (<= 0.074mm): 0.18
Classification: Fine sand(sp)

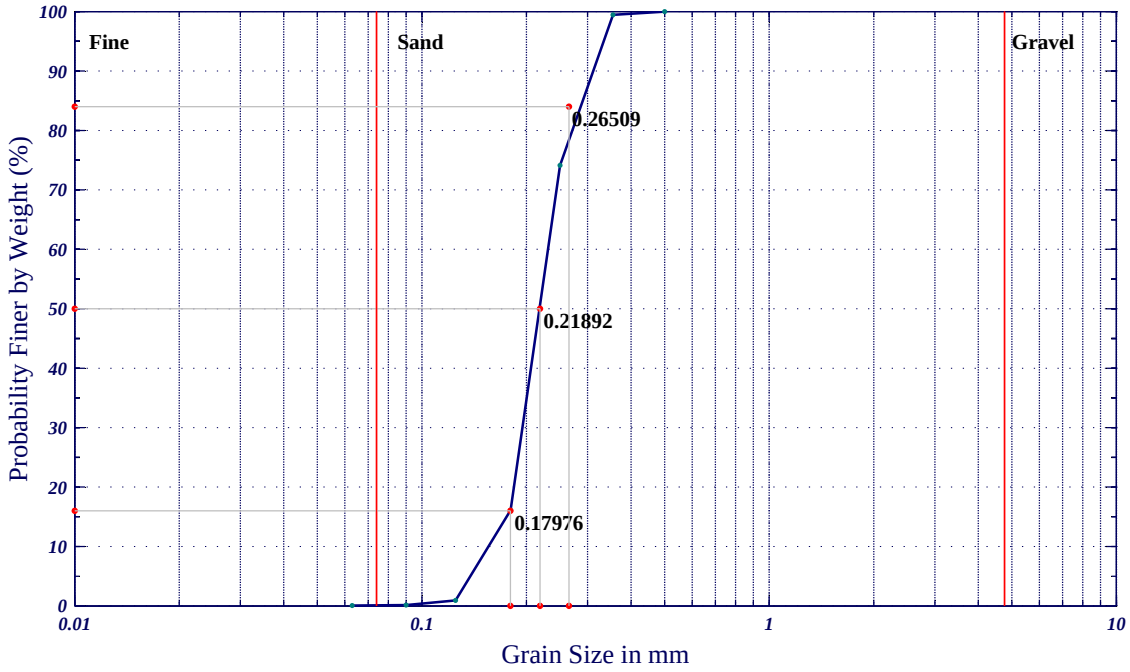
Sample ID: B-6P-6
Sample Depth: 9.4-9.8ft

Easting: 3,708,870*
Northing: 443,317*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.153	2.710
D10:	0.169	2.562
D16:	0.180	2.476
D25:	0.195	2.359
D30:	0.201	2.314
D50:	0.219	2.191
D60:	0.229	2.130
D75:	0.252	1.990
D84:	0.265	1.915
D95:	0.312	1.680
Mean Grain Size:	0.219	2.194
Standard Deviation:	1.241	-0.312

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 99.84
Percent of Fines (<= 0.074mm): 0.16
Classification: Fine sand(sp)

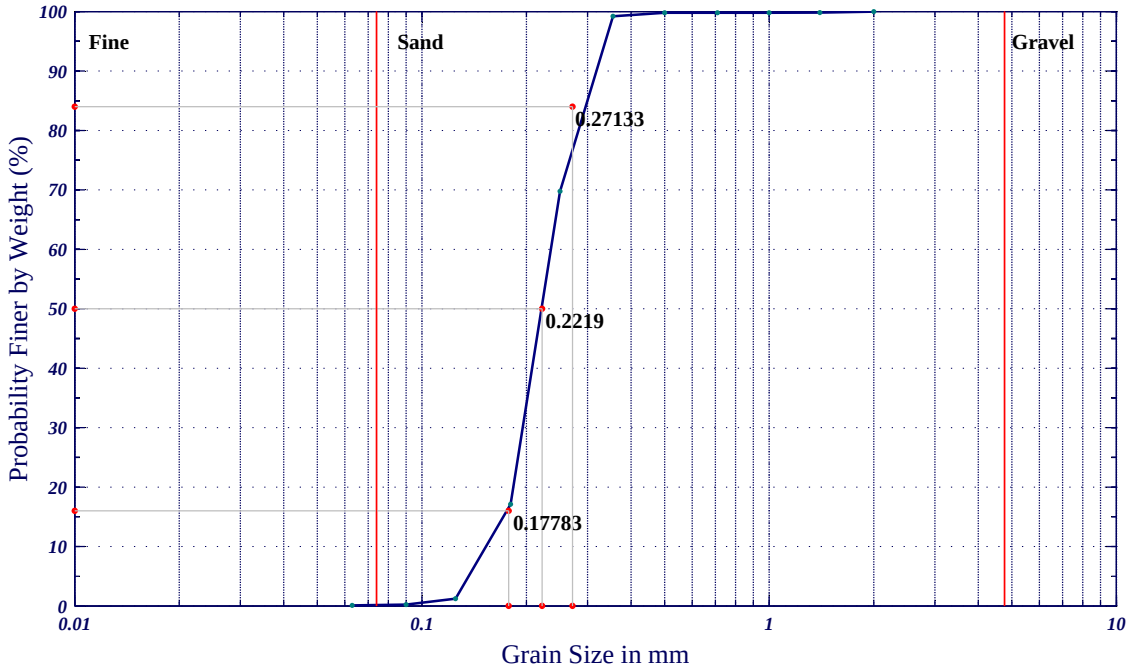
Sample ID: B-6P-7
Sample Depth: 11.8-12.2ft

Easting: 3,708,870*
Northing: 443,317*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results:

	(mm)	(phi)
D5:	0.150	2.741
D10:	0.167	2.583
D16:	0.178	2.491
D25:	0.194	2.365
D30:	0.201	2.314
D50:	0.222	2.172
D60:	0.234	2.098
D75:	0.258	1.954
D84:	0.271	1.882
D95:	0.319	1.650
Mean Grain Size:	0.220	2.182
Standard Deviation:	1.261	-0.334

Percent of Gravel (16mm-2.00mm): 0.14
Percent of Sand (2.00mm-0.075mm): 99.77
Percent of Fines (<= 0.074mm): 0.23
Classification: Fine sand(sp)

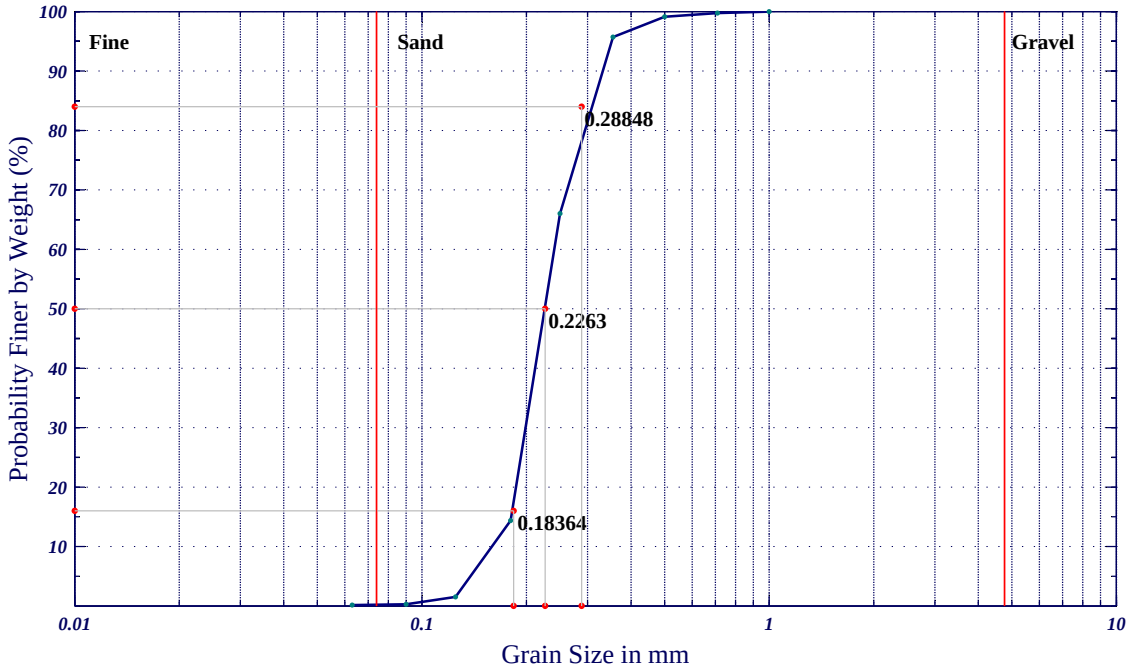
Sample ID: B-6P-8
Sample Depth: 13.8-14.2ft

Easting: 3,708,870*
Northing: 443,317*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results:	(mm)	(phi)
D5:	0.151	2.732
D10:	0.170	2.556
D16:	0.184	2.445
D25:	0.200	2.325
D30:	0.206	2.279
D50:	0.226	2.144
D60:	0.239	2.064
D75:	0.266	1.911
D84:	0.288	1.793
D95:	0.349	1.518
Mean Grain Size:	0.229	2.127
Standard Deviation:	1.288	-0.365

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 99.73
Percent of Fines (<= 0.074mm): 0.27
Classification: Fine sand(sp)

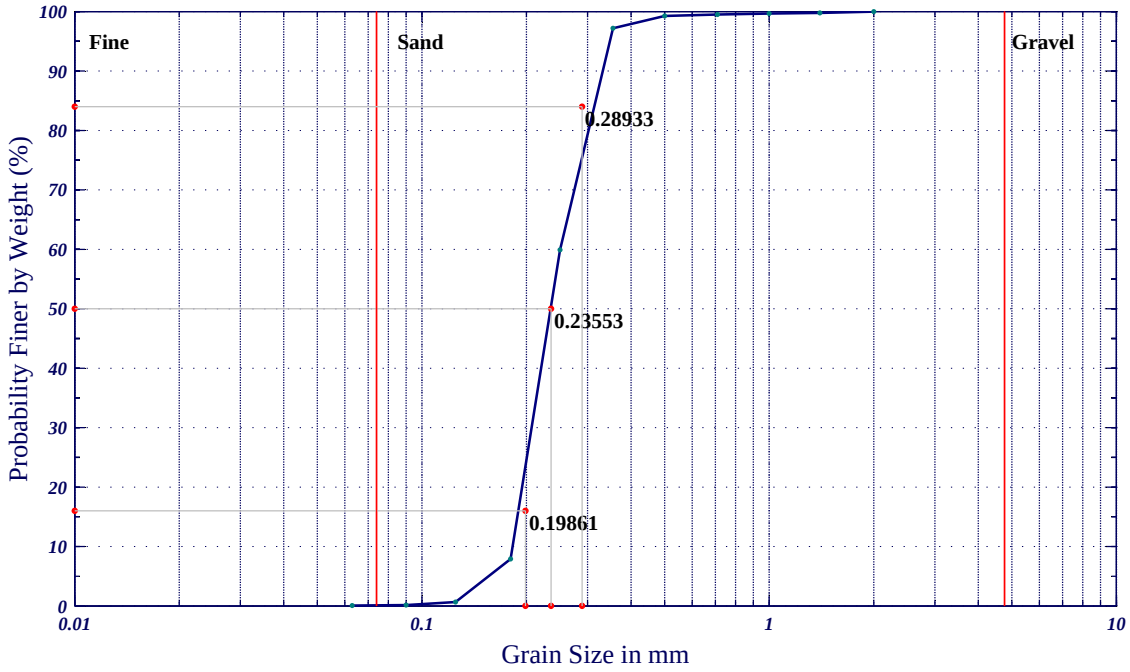
Sample ID: B-6P-9
Sample Depth: 15.8-16.2ft

Easting: 3,708,870*
Northing: 443,317*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.170	2.557
D10:	0.186	2.430
D16:	0.199	2.332
D25:	0.212	2.237
D30:	0.217	2.201
D50:	0.236	2.086
D60:	0.250	1.999
D75:	0.270	1.887
D84:	0.289	1.789
D95:	0.340	1.558
Mean Grain Size:	0.238	2.069
Standard Deviation:	1.233	-0.302

Percent of Gravel (16mm-2.00mm): 0.15
Percent of Sand (2.00mm-0.075mm): 99.86
Percent of Fines (<= 0.074mm): 0.14
Classification: Fine sand(sp)

Sample ID: B-6P-10
Sample Depth: 17.8-18.2ft

Easting: 3,708,870*
Northing: 443,317*
*Coordinates are feet, LA-1702

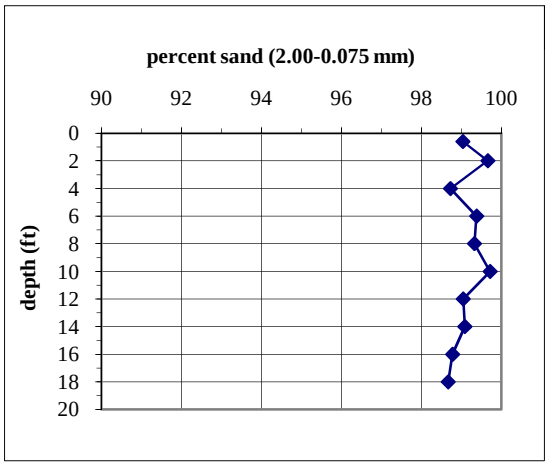
OSI No.: 11ES002

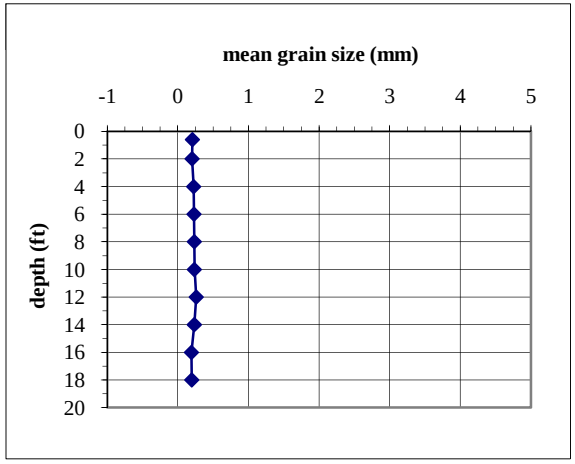
Long Distance Sediment Pipeline Project, Bayou Dupont Borrow Area **Ocean Surveys, Inc.**

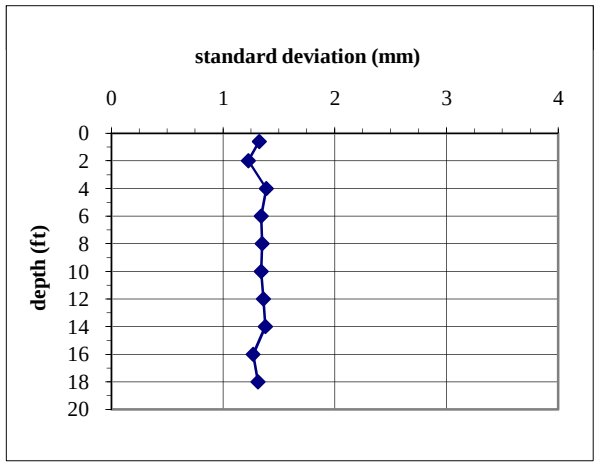
Grainsize Data Table

Core ID B-4P

Sample I.D.	Sample depth in core(ft)	Units	5% sample finer than	10% sample finer than	16% sample finer than	25% sample finer than	30% sample finer than	50% sample finer than	60% sample finer than	75% sample finer than	84% sample finer than	95% sample finer than	Sample mean grain size	Standard Deviation	%Gravel	%Sand	%Fines
B-4P-1	0.6	mm	0.134	0.150	0.161	0.172	0.178	0.206	0.219	2.470	0.270	0.334	0.208	1.325	0.00	99.04	0.96
		phi	2.903	2.740	2.634	2.542	2.487	2.279	2.191	2.017	1.890	1.584	2.268	-0.406			
B-4P-2	2.0	mm	0.142	0.158	0.168	0.178	0.185	0.203	0.210	0.226	0.241	0.282	0.202	1.226	0.00	99.66	0.34
		phi	2.813	2.663	2.574	2.492	2.434	2.298	2.250	2.148	2.052	1.829	2.308	-0.295			
B-4P-3	4.0	mm	0.129	0.150	0.165	0.184	0.194	0.224	0.241	0.274	0.304	0.373	0.224	1.389	0.06	98.73	1.27
		phi	2.957	2.741	2.596	2.442	2.369	2.162	2.053	1.866	1.720	1.424	2.159	-0.475			
B-4P-4	6.0	mm	0.140	0.161	0.175	0.193	0.201	0.228	0.244	0.275	0.302	0.362	0.229	1.343	0.00	99.38	0.62
		phi	2.833	2.638	2.517	2.372	2.312	2.135	2.034	1.863	1.728	1.466	2.127	-0.425			
B-4P-5	8.0	mm	0.140	0.162	0.178	0.198	0.206	0.234	0.253	0.283	0.310	0.368	0.235	1.350	0.00	99.33	0.67
		phi	2.840	2.627	2.489	2.340	2.280	2.096	1.984	1.823	1.688	1.444	2.091	-0.433			
B-4P-6	10.0	mm	0.148	0.166	0.179	0.198	0.206	0.235	0.254	0.286	0.315	0.373	0.236	1.343	0.00	99.72	0.28
		phi	2.756	2.590	2.483	2.338	2.279	2.090	1.974	1.807	1.668	1.424	2.080	-0.426			
B-4P-7	12.0	mm	0.150	0.177	0.196	0.270	0.226	0.265	0.283	0.315	0.346	0.411	0.262	1.363	0.00	99.05	0.95
		phi	2.739	2502.000	2.349	2.204	2.145	1.914	1.823	1.660	1.533	1.284	1.932	-0.447			
B-4P-8	14.0	mm	0.133	0.156	0.174	0.195	0.204	0.234	0.254	0.285	0.314	0.379	0.234	1.380	0.60	99.09	0.91
		phi	2.908	2.677	2.524	2.362	2.296	2.096	1.978	1.811	1.670	1.399	2.097	-0.465			
B-4P-9	16.0	mm	0.124	0.140	0.154	0.167	0.174	0.197	0.205	0.220	0.236	0.271	0.193	1.269	0.00	98.78	1.22
		phi	3.017	2.839	2.703	2.579	2.525	2.342	2.287	2.184	2.085	1.881	2.377	-0.344			
B-4P-10	18.0	mm	0.122	0.140	0.155	0.171	0.178	0.202	0.210	0.228	0.246	0.311	0.197	1.313	0.03	98.67	1.33
		phi	3.038	2.839	2.690	2.551	2.487	2.310	2.253	2.134	2.022	1.684	2.341	-0.393			

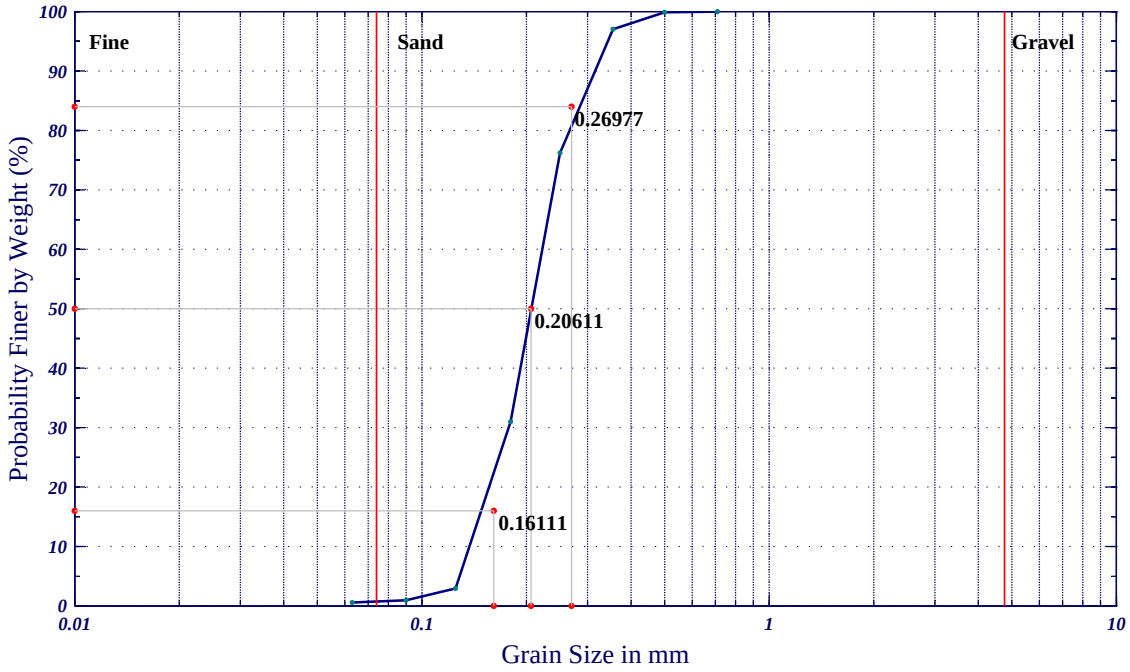






Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.134	2.903
D10:	0.150	2.742
D16:	0.161	2.634
D25:	0.172	2.542
D30:	0.178	2.487
D50:	0.206	2.279
D60:	0.219	2.191
D75:	0.247	2.017
D84:	0.270	1.890
D95:	0.334	1.584
Mean Grain Size:	0.208	2.268
Standard Deviation:	1.325	-0.406

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 99.04
Percent of Fines (<= 0.074mm): 0.96
Classification: Fine sand(sp)

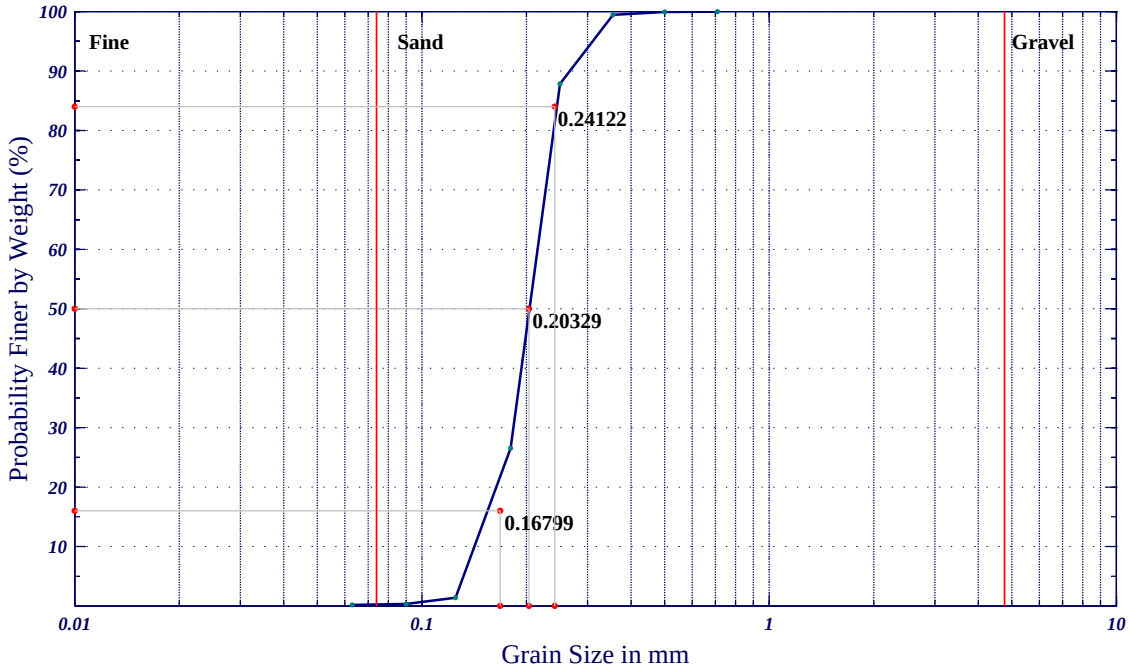
Sample ID: B-4P-1
Sample Depth: 0.4-0.8ft

Easting: 3,708,904*
Northing: 441,640*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.142	2.813
D10:	0.158	2.663
D16:	0.168	2.574
D25:	0.178	2.492
D30:	0.185	2.434
D50:	0.203	2.298
D60:	0.210	2.250
D75:	0.226	2.148
D84:	0.241	2.052
D95:	0.282	1.829
Mean Grain Size:	0.202	2.308
Standard Deviation:	1.226	-0.295

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 99.66
Percent of Fines (<= 0.074mm): 0.34
Classification: Fine sand(sp)

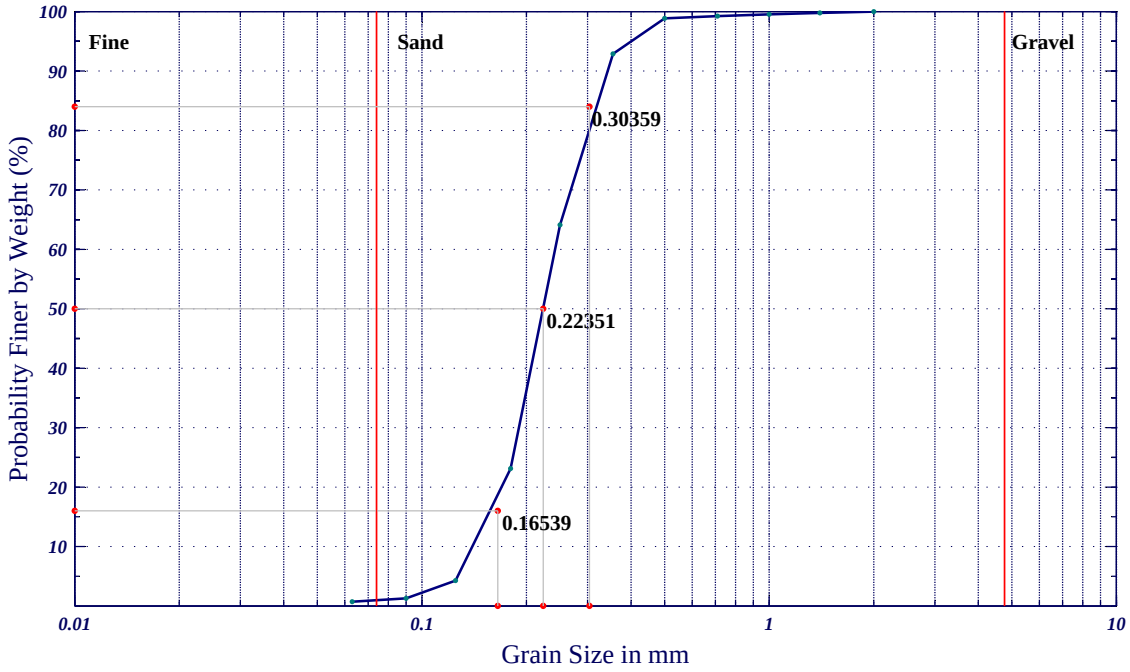
Sample ID: B-4P-2
Sample Depth: 1.8-2.2ft

Easting: 3,708,904*
Northing: 441,640*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.129	2.957
D10:	0.150	2.741
D16:	0.165	2.596
D25:	0.184	2.442
D30:	0.194	2.369
D50:	0.224	2.162
D60:	0.241	2.053
D75:	0.274	1.866
D84:	0.304	1.720
D95:	0.373	1.424
Mean Grain Size:	0.224	2.159
Standard Deviation:	1.389	-0.475

Percent of Gravel (16mm-2.00mm): 0.06
Percent of Sand (2.00mm-0.075mm): 98.73
Percent of Fines (<= 0.074mm): 1.27
Classification: Fine sand(sp)

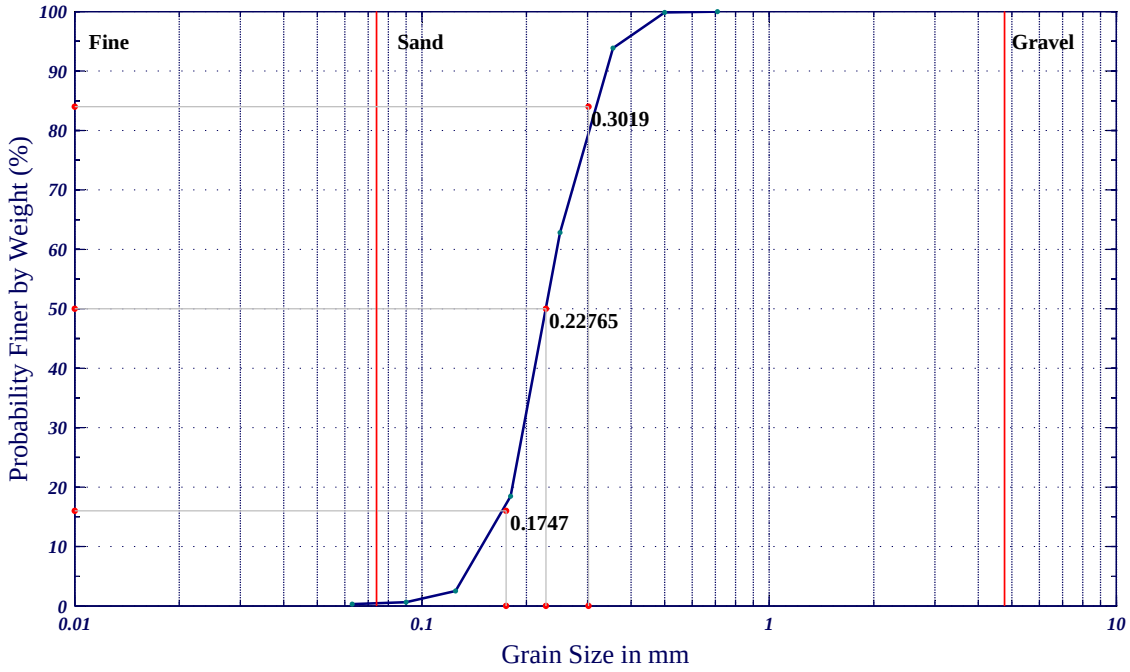
Sample ID: B-4P-3
Sample Depth: 3.8-4.2ft

Easting: 3,708,904*
Northing: 441,640*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.140	2.833
D10:	0.161	2.638
D16:	0.175	2.517
D25:	0.193	2.372
D30:	0.201	2.312
D50:	0.228	2.135
D60:	0.244	2.034
D75:	0.275	1.863
D84:	0.302	1.728
D95:	0.362	1.466
Mean Grain Size:	0.229	2.127
Standard Deviation:	1.343	-0.425

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 99.38
Percent of Fines (<= 0.074mm): 0.62
Classification: Fine sand(sp)

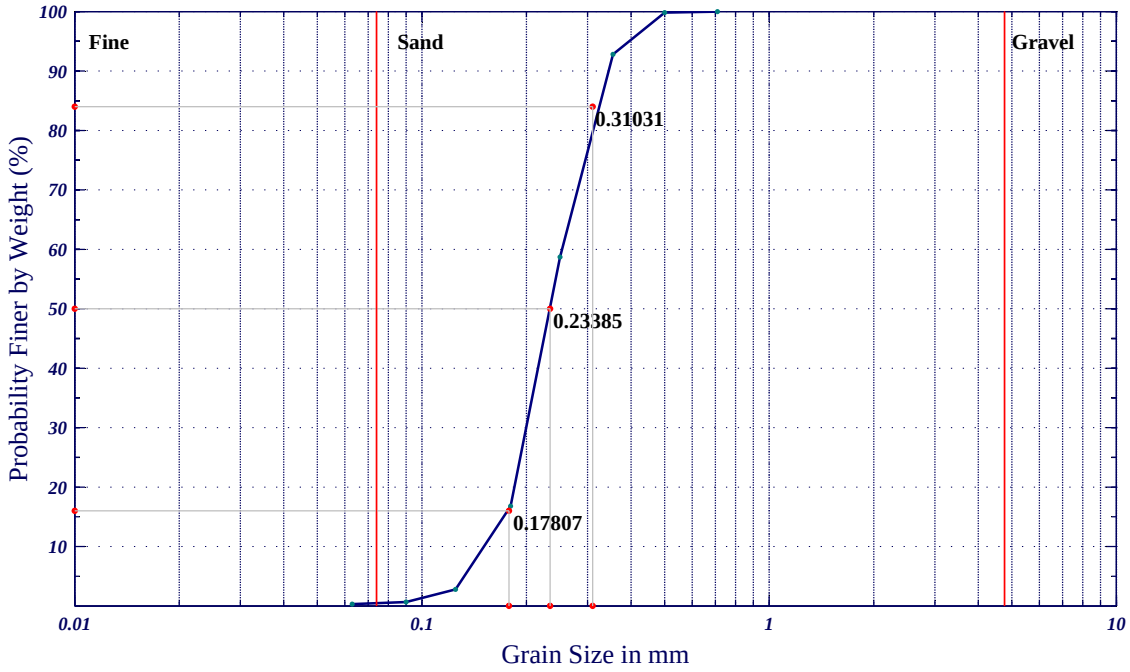
Sample ID: B-4P-4
Sample Depth: 5.8-6.2ft

Easting: 3,708,904*
Northing: 441,640*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results:

	(mm)	(phi)
D5:	0.140	2.840
D10:	0.162	2.627
D16:	0.178	2.489
D25:	0.198	2.340
D30:	0.206	2.280
D50:	0.234	2.096
D60:	0.253	1.984
D75:	0.283	1.823
D84:	0.310	1.688
D95:	0.368	1.444
Mean Grain Size:	0.235	2.091
Standard Deviation:	1.350	-0.433

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 99.33
Percent of Fines (<= 0.074mm): 0.67
Classification: Fine sand(sp)

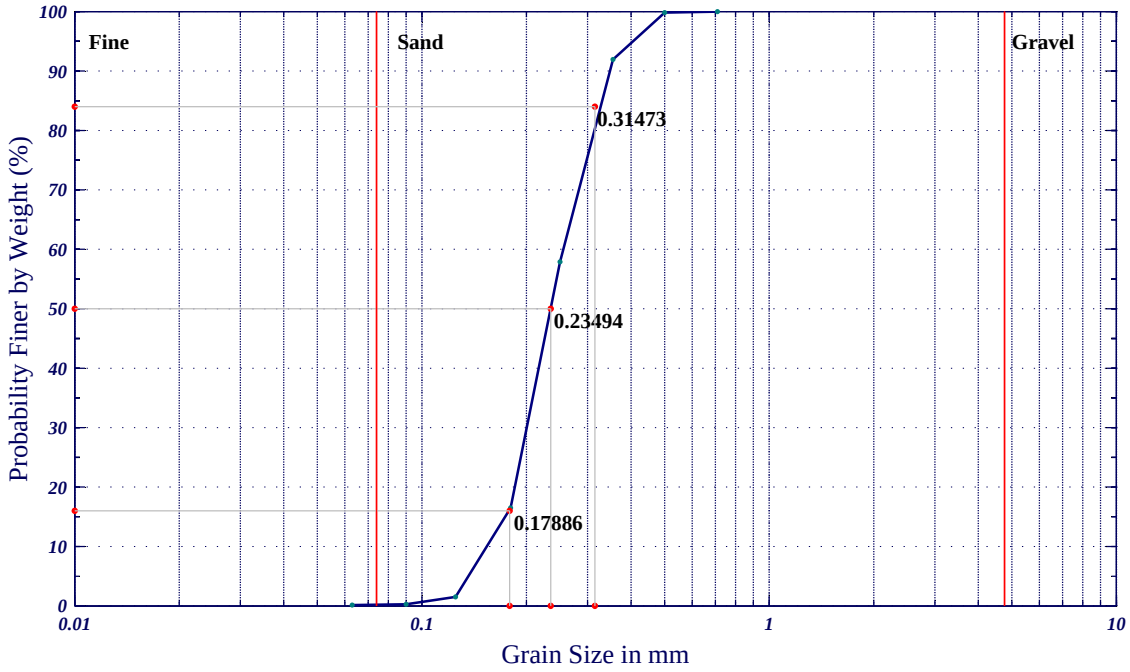
Sample ID: B-4P-5
Sample Depth: 7.8-8.2ft

Easting: 3,708,904*
Northing: 441,640*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.148	2.756
D10:	0.166	2.590
D16:	0.179	2.483
D25:	0.198	2.338
D30:	0.206	2.279
D50:	0.235	2.090
D60:	0.254	1.974
D75:	0.286	1.807
D84:	0.315	1.668
D95:	0.373	1.424
Mean Grain Size:	0.236	2.080
Standard Deviation:	1.343	-0.426

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 99.72
Percent of Fines (<= 0.074mm): 0.28
Classification: Fine sand(sp)

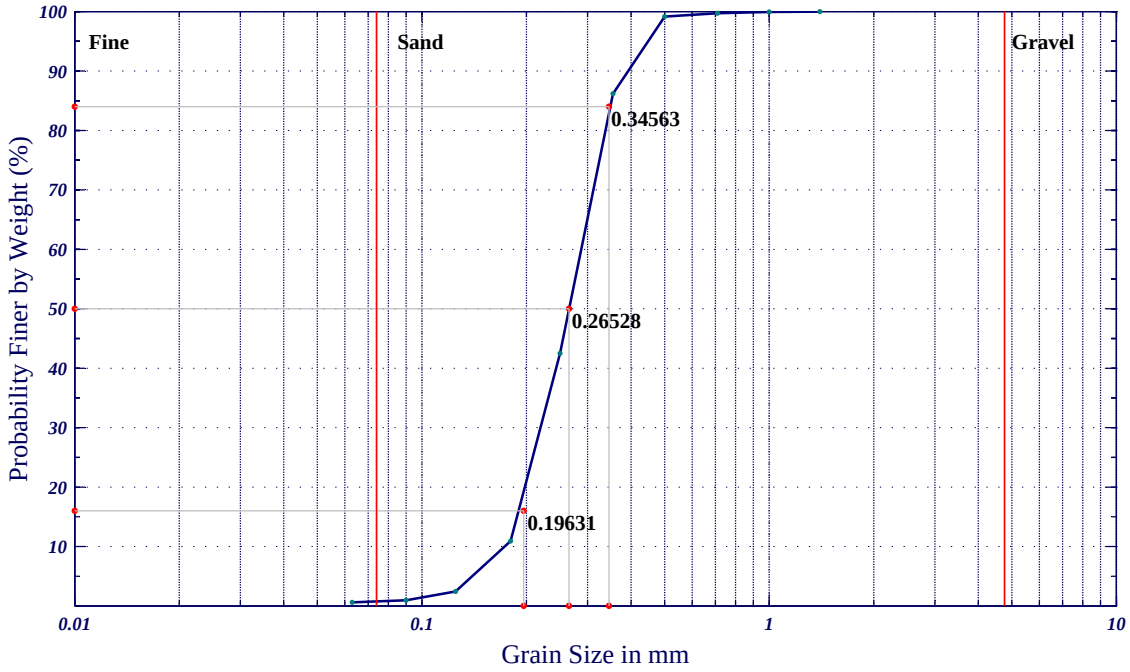
Sample ID: B-4P-6
Sample Depth: 9.8-10.2ft

Easting: 3,708,904*
Northing: 441,640*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results:

	(mm)	(phi)
D5:	0.150	2.739
D10:	0.177	2.502
D16:	0.196	2.349
D25:	0.217	2.204
D30:	0.226	2.145
D50:	0.265	1.914
D60:	0.283	1.823
D75:	0.315	1.666
D84:	0.346	1.533
D95:	0.411	1.284
Mean Grain Size:	0.262	1.932
Standard Deviation:	1.363	-0.447

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 99.05
Percent of Fines (<= 0.074mm): 0.95
Classification: Fine sand(sp)

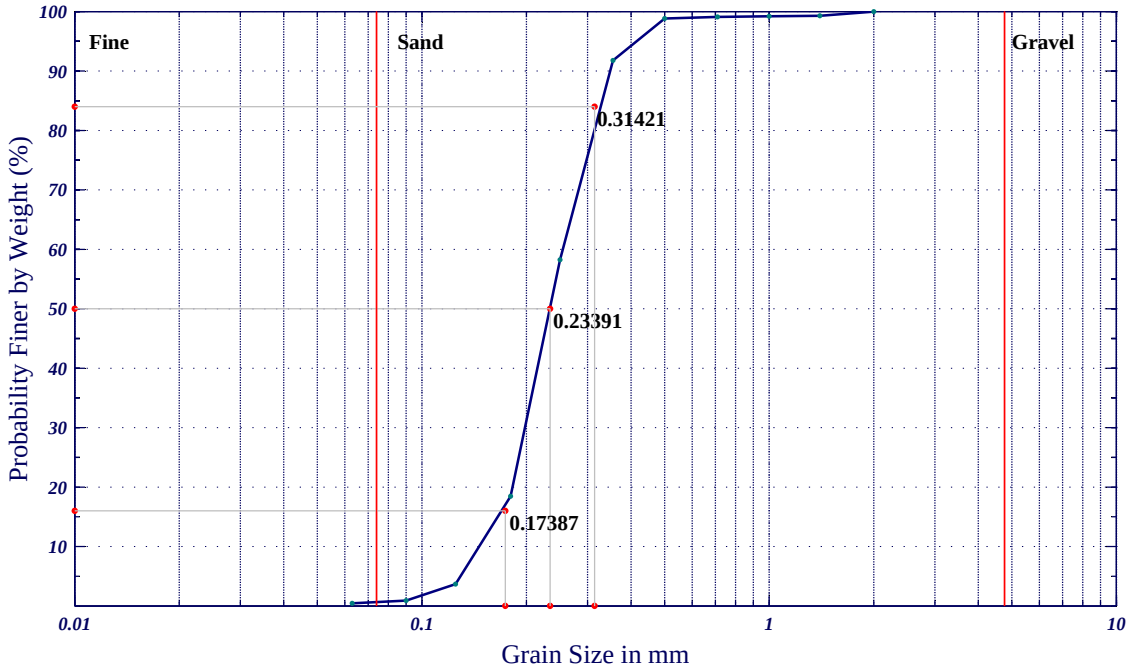
Sample ID: B-4P-7
Sample Depth: 11.8-12.2ft

Easting: 3,708,904*
Northing: 441,640*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.133	2.908
D10:	0.156	2.677
D16:	0.174	2.524
D25:	0.195	2.362
D30:	0.204	2.296
D50:	0.234	2.096
D60:	0.254	1.978
D75:	0.285	1.811
D84:	0.314	1.670
D95:	0.379	1.399
Mean Grain Size:	0.234	2.097
Standard Deviation:	1.380	-0.465

Percent of Gravel (16mm-2.00mm): 0.60
Percent of Sand (2.00mm-0.075mm): 99.09
Percent of Fines (<= 0.074mm): 0.91
Classification: Fine sand(sp)

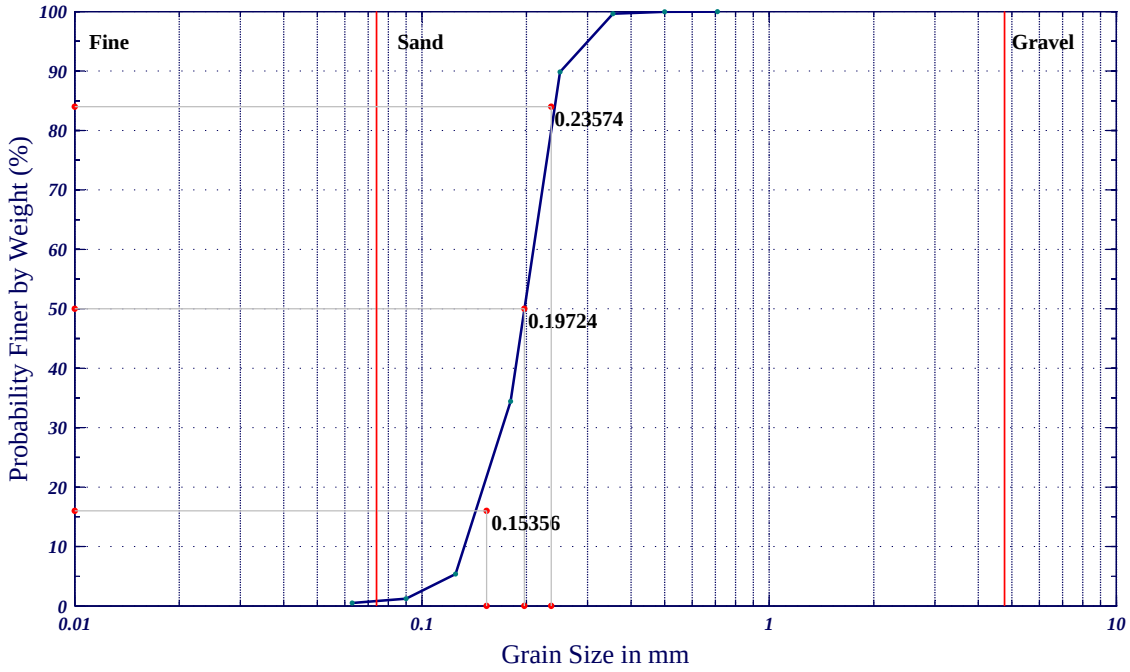
Sample ID: B-4P-8
Sample Depth: 13.8-14.2ft

Easting: 3,708,904*
Northing: 441,640*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.124	3.017
D10:	0.140	2.839
D16:	0.154	2.703
D25:	0.167	2.579
D30:	0.174	2.525
D50:	0.197	2.342
D60:	0.205	2.287
D75:	0.220	2.184
D84:	0.236	2.085
D95:	0.271	1.881
Mean Grain Size:	0.193	2.377
Standard Deviation:	1.269	-0.344

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 98.78
Percent of Fines (<= 0.074mm): 1.22
Classification: Fine sand(sp)

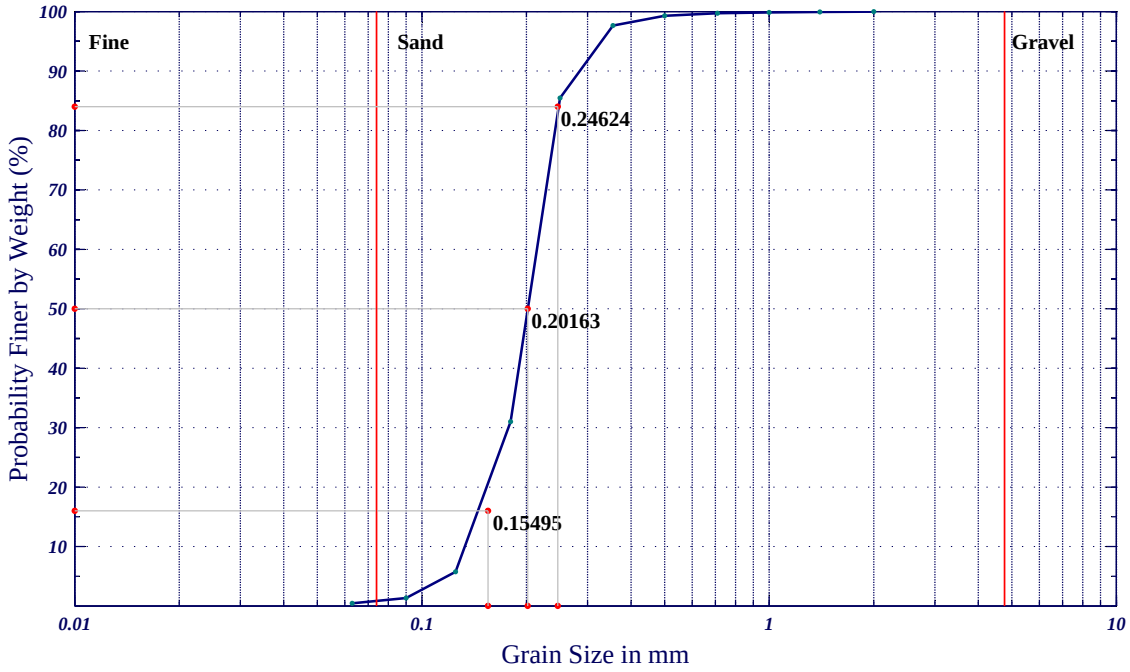
Sample ID: B-4P-9
Sample Depth: 15.8-16.2ft

Easting: 3,708,904*
Northing: 441,640*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.122	3.038
D10:	0.140	2.839
D16:	0.155	2.690
D25:	0.171	2.551
D30:	0.178	2.487
D50:	0.202	2.310
D60:	0.210	2.253
D75:	0.228	2.134
D84:	0.246	2.022
D95:	0.311	1.684
Mean Grain Size:	0.197	2.341
Standard Deviation:	1.313	-0.393

Percent of Gravel (16mm-2.00mm): 0.03
Percent of Sand (2.00mm-0.075mm): 98.67
Percent of Fines (<= 0.074mm): 1.33
Classification: Fine sand(sp)

Sample ID: B-4P-10
Sample Depth: 17.8-18.2ft

Easting: 3,708,904*
Northing: 441,640*
*Coordinates are feet, LA-1702

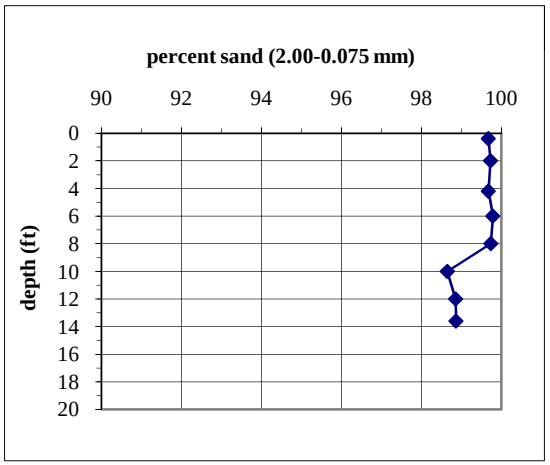
OSI No.: 11ES002

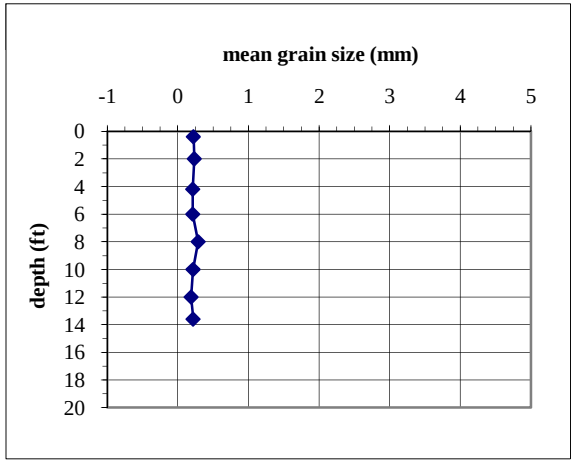
Long Distance Sediment Pipeline Project, Bayou Dupont Borrow Area **Ocean Surveys, Inc.**

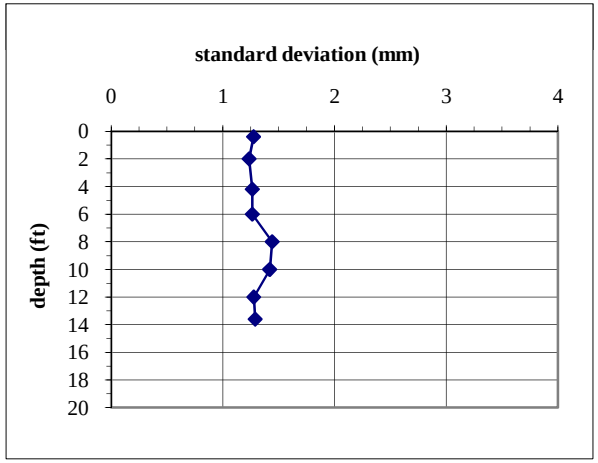
Grainsize Data Table

Core ID B-2B

Sample I.D.	Sample depth in core(ft)	Units	5% sample finer than	10% sample finer than	16% sample finer than	25% sample finer than	30% sample finer than	50% sample finer than	60% sample finer than	75% sample finer than	84% sample finer than	95% sample finer than	Sample mean grain size	Standard Deviation	%Gravel	%Sand	%Fines
B-2B-1	0.4	mm	0.148	0.166	0.177	0.194	0.202	0.225	0.239	0.263	0.277	0.325	0.223	1.276	0.02	99.68	0.32
		phi	2.757	2.594	2.497	2.363	2.309	2.150	2.064	1.927	1.850	1.622	2.166	-0.351			
B-2B-2	2.0	mm	0.164	0.180	0.193	0.208	0.213	0.232	0.246	0.266	0.282	0.330	0.233	1.236	0.00	99.73	0.27
		phi	2.610	2.476	2.371	2.268	2.228	2.107	2.026	1.909	1.824	1.599	2.101	-0.305			
B-2B-3	4.2	mm	0.146	0.164	0.175	0.190	0.196	0.213	0.221	0.241	0.261	0.328	0.213	1.265	0.15	99.68	0.32
		phi	2.779	2.611	2.514	2.397	2.350	2.231	2.176	2.050	1.938	1.607	2.228	0.339			
B-2B-4	6.0	mm	0.145	0.162	0.172	0.186	0.193	0.211	0.220	0.240	0.259	0.322	0.211	1.265	0.18	99.79	0.21
		phi	2.782	2.625	2.536	2.424	2.372	2.243	2.186	2.058	1.947	1.634	2.242	-0.339			
B-2B-5	8.0	mm	0.179	0.200	0.217	0.234	0.243	0.285	0.307	0.353	0.393	0.665	0.290	1.443	3.39	99.74	0.26
		phi	2.481	2.321	2.205	2.098	2.043	1.810	1.706	1.501	1.349	0.588	1.788	-0.529			
B-2B-6	10.0	mm	0.116	0.135	0.155	0.178	0.189	0.220	0.237	0.269	0.296	0.361	0.216	1.421	0.02	98.65	1.35
		phi	3.113	2.892	2.691	2.488	2.404	2.185	2.080	1.893	1.757	1.470	2.211	-0.507			
B-2B-7	12.0	mm	0.120	0.137	0.151	0.166	0.173	0.195	0.202	0.214	0.229	0.281	0.189	1.278	0.02	98.86	1.14
		phi	3.054	2.873	2.729	2.593	2.535	2.356	2.311	2.222	2.127	1.832	2.404	-0.354			
B-2B-8	13.6	mm	0.135	0.162	0.180	0.195	0.201	0.216	0.223	0.243	0.266	0.348	0.218	1.291	0.09	98.87	1.13
		phi	2.893	2.626	2.471	2.322	2.312	2.211	2.162	2.039	1.913	1.521	2.198	-0.368			

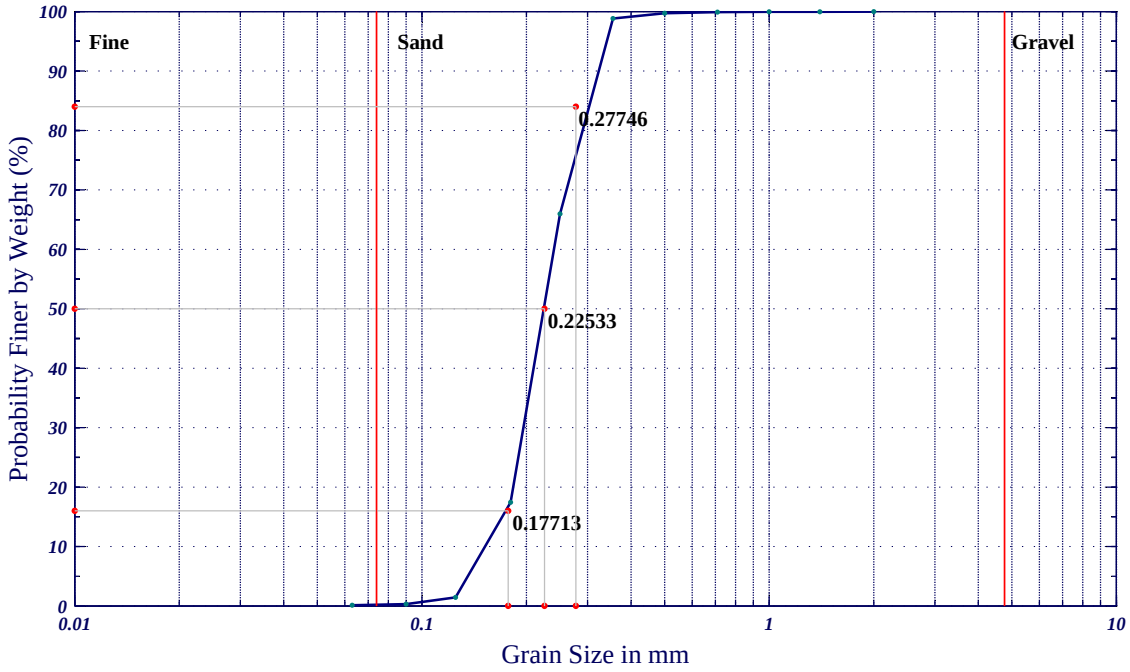






Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.148	2.757
D10:	0.166	2.594
D16:	0.177	2.497
D25:	0.194	2.363
D30:	0.202	2.309
D50:	0.225	2.150
D60:	0.239	2.064
D75:	0.263	1.927
D84:	0.277	1.850
D95:	0.325	1.622
Mean Grain Size:	0.223	2.166
Standard Deviation:	1.276	-0.351

Percent of Gravel (16mm-2.00mm): 0.02
Percent of Sand (2.00mm-0.075mm): 99.68
Percent of Fines (<= 0.074mm): 0.32
Classification: Fine sand(sp)

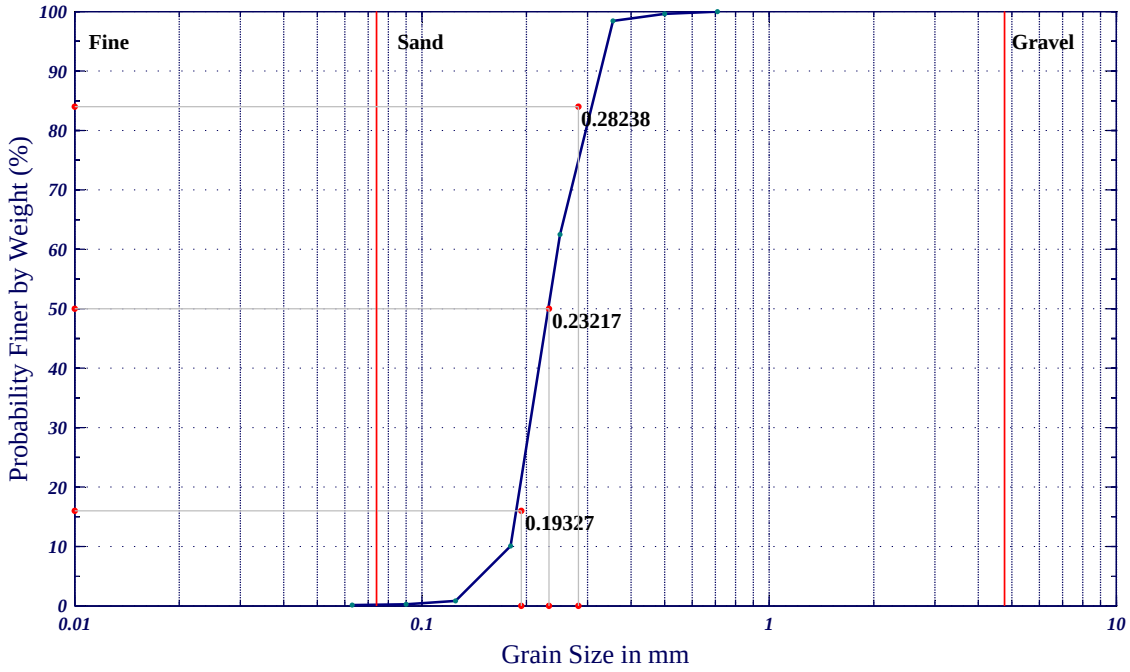
Sample ID: B-2B-1
Sample Depth: 0.2-0.6ft

Easting: 3,709,431*
Northing: 441,890*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results:

	(mm)	(phi)
D5:	0.164	2.610
D10:	0.180	2.476
D16:	0.193	2.371
D25:	0.208	2.268
D30:	0.213	2.228
D50:	0.232	2.107
D60:	0.246	2.026
D75:	0.266	1.909
D84:	0.282	1.824
D95:	0.330	1.599
Mean Grain Size:	0.233	2.101
Standard Deviation:	1.236	-0.305

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 99.73
Percent of Fines (<= 0.074mm): 0.27
Classification: Fine sand(sp)

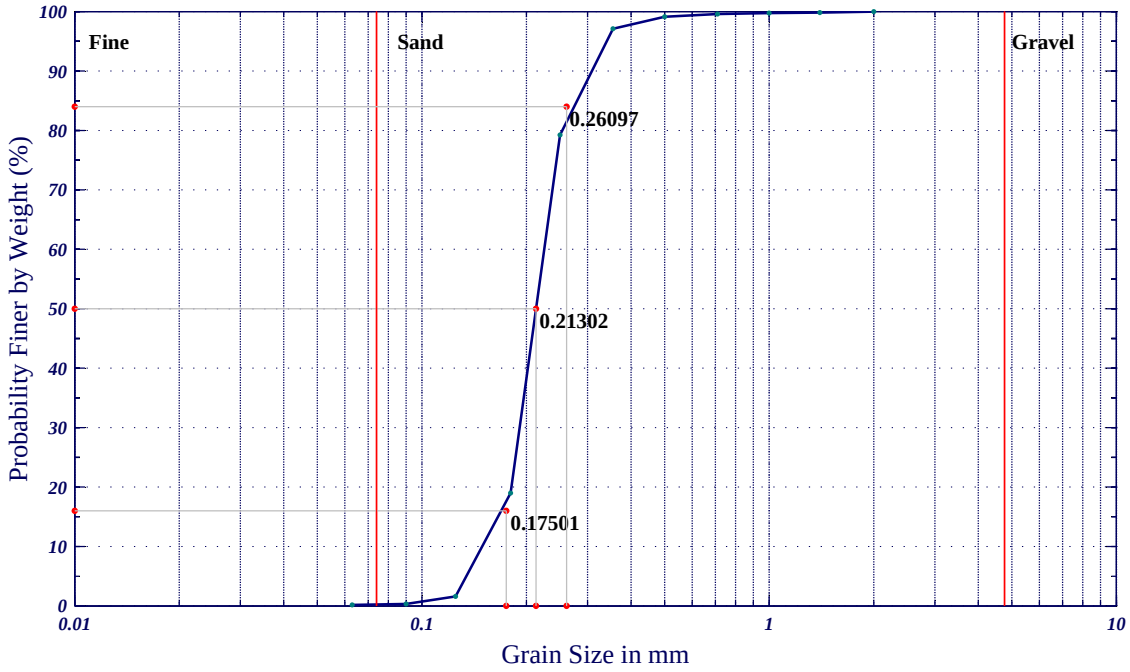
Sample ID: B-2B-2
Sample Depth: 1.8-2.2ft

Easting: 3,709,431*
Northing: 441,890*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.146	2.779
D10:	0.164	2.611
D16:	0.175	2.514
D25:	0.190	2.397
D30:	0.196	2.350
D50:	0.213	2.231
D60:	0.221	2.176
D75:	0.241	2.050
D84:	0.261	1.938
D95:	0.328	1.607
Mean Grain Size:	0.213	2.228
Standard Deviation:	1.265	-0.339

Percent of Gravel (16mm-2.00mm): 0.15
Percent of Sand (2.00mm-0.075mm): 99.68
Percent of Fines (<= 0.074mm): 0.32
Classification: Fine sand(sp)

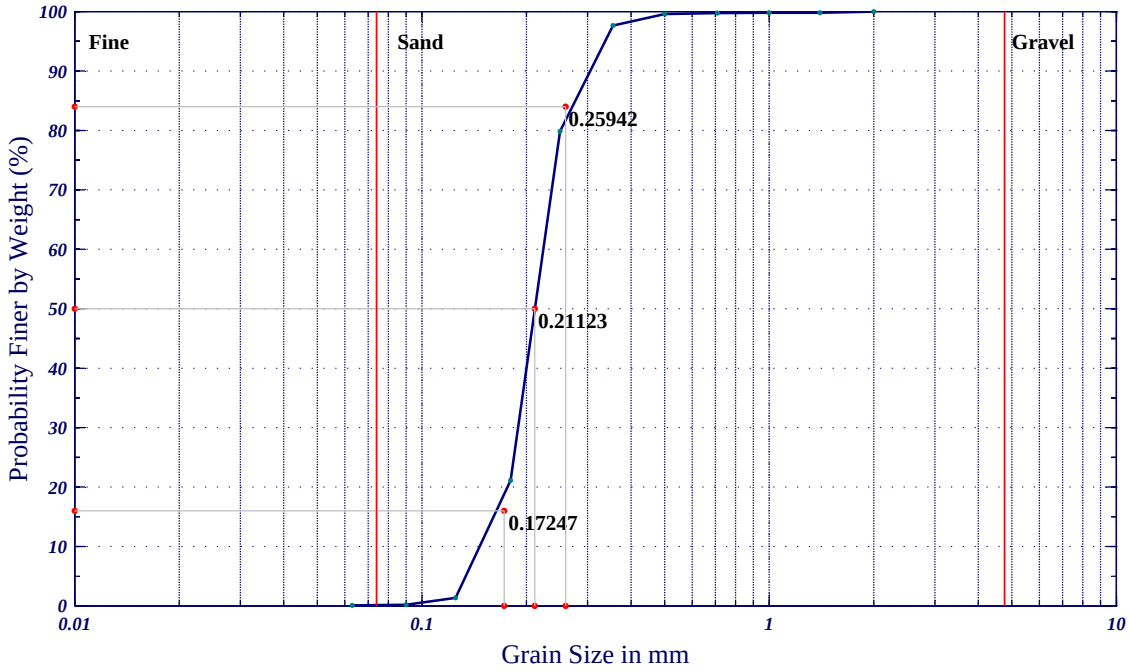
Sample ID: B-2B-3
Sample Depth: 4.2-4.6ft

Easting: 3,709,431*
Northing: 441,890*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.145	2.782
D10:	0.162	2.625
D16:	0.172	2.536
D25:	0.186	2.424
D30:	0.193	2.372
D50:	0.211	2.243
D60:	0.220	2.186
D75:	0.240	2.058
D84:	0.259	1.947
D95:	0.322	1.634
Mean Grain Size:	0.211	2.242
Standard Deviation:	1.265	-0.339

Percent of Gravel (16mm-2.00mm): 0.18
Percent of Sand (2.00mm-0.075mm): 99.79
Percent of Fines (<= 0.074mm): 0.21
Classification: Fine sand(sp)

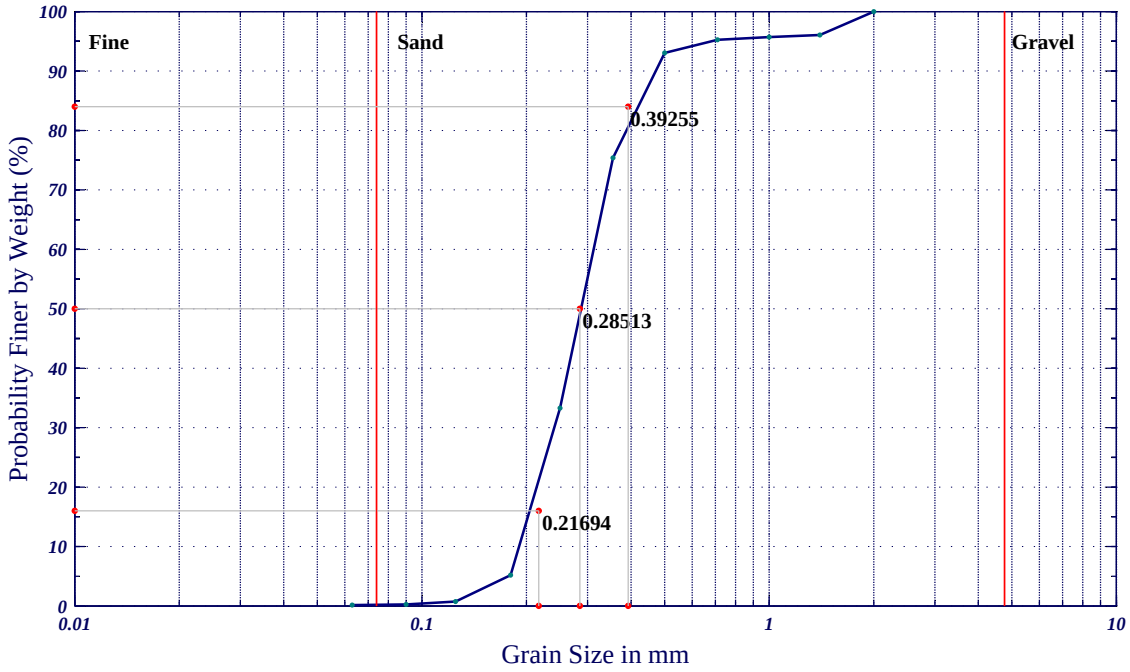
Sample ID: B-2B-4
Sample Depth: 5.8-6.2ft

Easting: 3,709,431*
Northing: 441,890*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: **(mm)** **(phi)**

D5:	0.179	2.481
D10:	0.200	2.321
D16:	0.217	2.205
D25:	0.234	2.098
D30:	0.243	2.043
D50:	0.285	1.810
D60:	0.307	1.706
D75:	0.353	1.501
D84:	0.393	1.349
D95:	0.665	0.588
Mean Grain Size:	0.290	1.788
Standard Deviation:	1.443	-0.529

Percent of Gravel (16mm-2.00mm): 3.39
Percent of Sand (2.00mm-0.075mm): 99.74
Percent of Fines (<= 0.074mm): 0.26
Classification: Fine sand(sp)

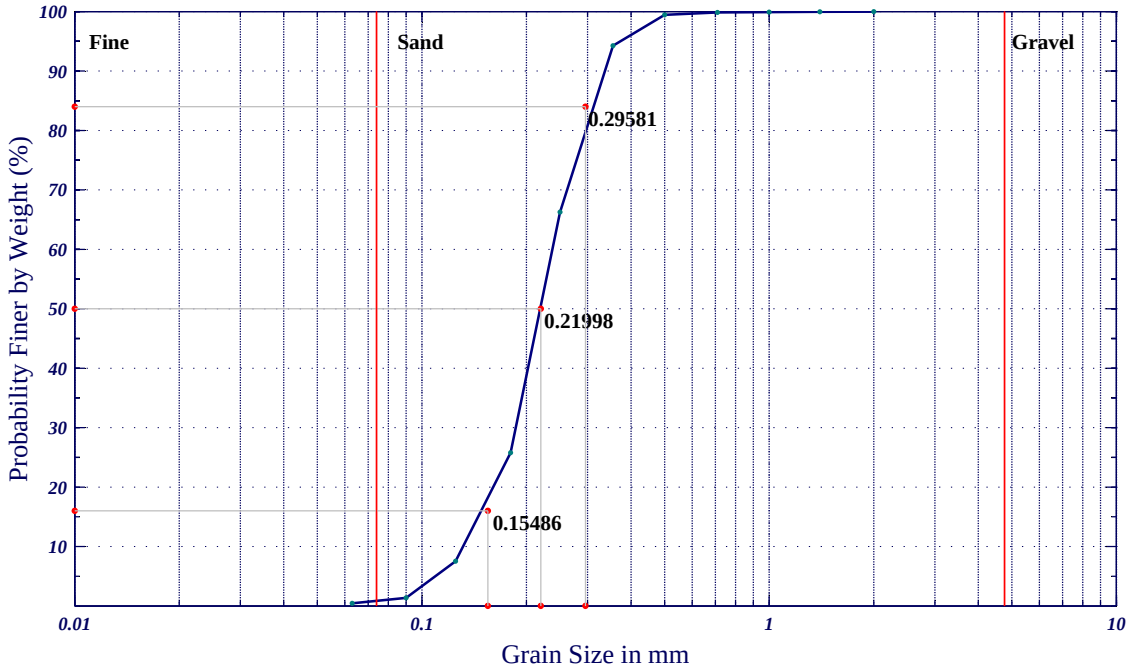
Sample ID: B-2B-5
Sample Depth: 7.8-8.2ft

Easting: 3,709,431*
Northing: 441,890*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results:	(mm)	(phi)
D5:	0.116	3.113
D10:	0.135	2.892
D16:	0.155	2.691
D25:	0.178	2.488
D30:	0.189	2.404
D50:	0.220	2.185
D60:	0.237	2.080
D75:	0.269	1.893
D84:	0.296	1.757
D95:	0.361	1.470
Mean Grain Size:	0.216	2.211
Standard Deviation:	1.421	-0.507

Percent of Gravel (16mm-2.00mm): 0.02
Percent of Sand (2.00mm-0.075mm): 98.65
Percent of Fines (<= 0.074mm): 1.35
Classification: Fine sand(sp)

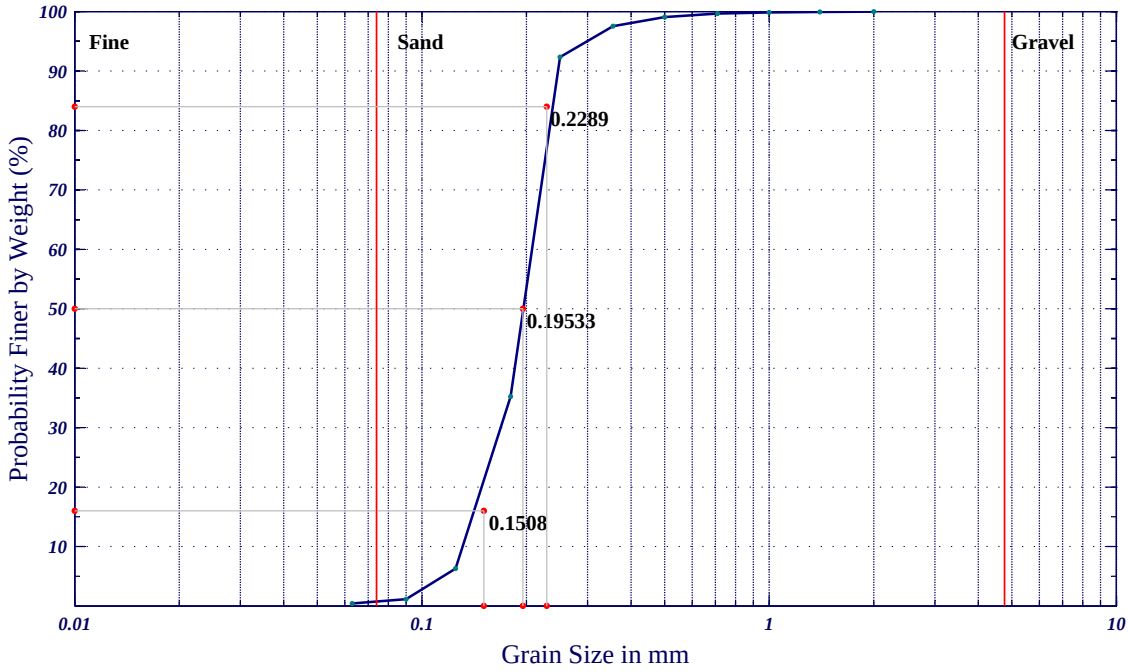
Sample ID: B-2B-6
Sample Depth: 9.8-10.2ft

Easting: 3,709,431*
Northing: 441,890*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results:	(mm)	(phi)
D5:	0.120	3.054
D10:	0.137	2.873
D16:	0.151	2.729
D25:	0.166	2.593
D30:	0.173	2.535
D50:	0.195	2.356
D60:	0.202	2.311
D75:	0.214	2.222
D84:	0.229	2.127
D95:	0.281	1.832
Mean Grain Size:	0.189	2.404
Standard Deviation:	1.278	-0.354

Percent of Gravel (16mm-2.00mm): 0.02
Percent of Sand (2.00mm-0.075mm): 98.86
Percent of Fines (<= 0.074mm): 1.14
Classification: Fine sand(sp)

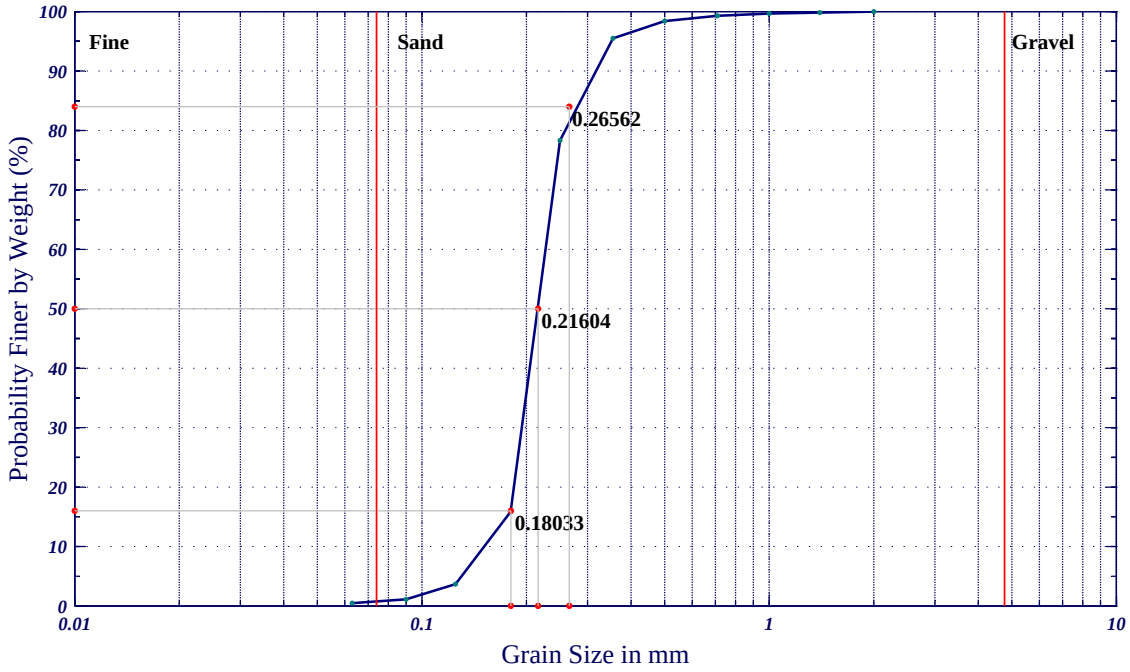
Sample ID: B-2B-7
Sample Depth: 11.8-12.2ft

Easting: 3,709,431*
Northing: 441,890*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.135	2.893
D10:	0.162	2.626
D16:	0.180	2.471
D25:	0.195	2.355
D30:	0.201	2.312
D50:	0.216	2.211
D60:	0.223	2.162
D75:	0.243	2.039
D84:	0.266	1.913
D95:	0.348	1.521
Mean Grain Size:	0.218	2.198
Standard Deviation:	1.291	-0.368

Percent of Gravel (16mm-2.00mm): 0.09
Percent of Sand (2.00mm-0.075mm): 98.87
Percent of Fines (<= 0.074mm): 1.13
Classification: Fine sand(sp)

Sample ID: B-2B-8
Sample Depth: 13.4-13.8ft

Easting: 3,709,431*
Northing: 441,890*
*Coordinates are feet, LA-1702

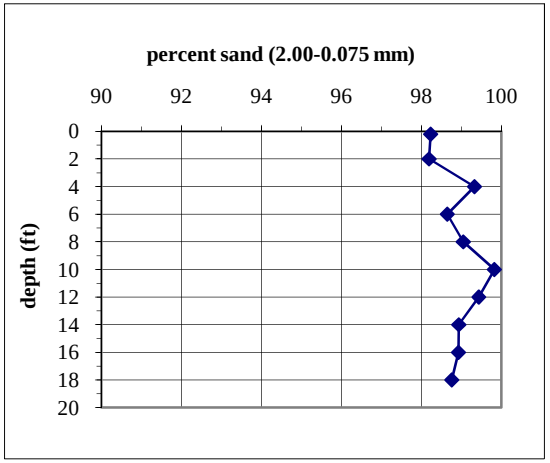
OSI No.: 11ES002

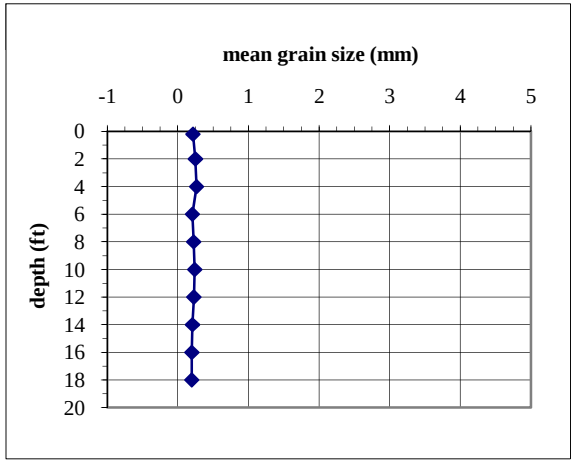
Long Distance Sediment Pipeline Project, Bayou Dupont Borrow Area **Ocean Surveys, Inc.**

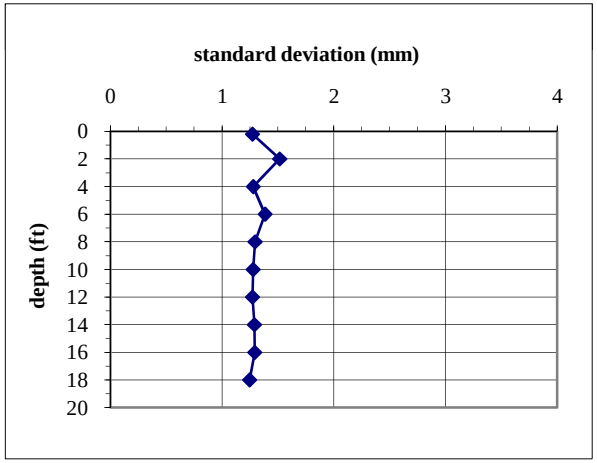
Grainsize Data Table

Core ID B-2P

Sample I.D.	Sample depth in core(ft)	Units	5% sample finer than	10% sample finer than	16% sample finer than	25% sample finer than	30% sample finer than	50% sample finer than	60% sample finer than	75% sample finer than	84% sample finer than	95% sample finer than	Sample mean grain size	Standard Deviation	%Gravel	%Sand	%Fines
B-2P-1	0.2	mm	0.146	0.167	0.177	0.192	0.198	0.213	0.220	0.239	0.260	0.347	0.214	1.272	0.00	98.23	1.77
		phi	2.780	2.584	2.496	2.392	2.338	2.233	2.185	2.067	1.944	1.526	2.224	-0.347			
B-2P-2	2.0	mm	0.147	0.177	0.193	0.209	0.215	0.237	0.256	0.292	0.336	0.781	0.249	1.518	0.69	98.19	1.81
		phi	2.765	2.502	2.376	2.260	2.218	2.075	1.963	1.774	1.572	0.356	2.007	-0.602			
B-2P-3	4.0	mm	0.165	0.189	0.208	0.227	0.236	0.270	0.282	0.303	0.326	0.370	0.264	1.280	0.00	99.33	0.67
		phi	2.601	2.402	2.264	2.137	2.084	1.888	1.828	1.720	1.618	1.436	1.923	-0.356			
B-2P-4	6.0	mm	0.116	0.134	0.152	0.173	0.183	0.212	0.226	0.256	0.275	0.340	0.207	1.386	0.47	98.65	1.35
		phi	3.102	2.898	2.717	2.534	2.452	2.236	2.144	1.964	1.862	1.557	2.272	-0.471			
B-2P-5	8.0	mm	0.136	0.161	0.179	0.197	0.204	0.227	0.240	0.264	0.280	0.328	0.225	1.295	0.00	99.05	0.95
		phi	2.874	2.632	2.481	2.344	2.290	2.140	2.057	1.920	1.836	1.607	2.152	-0.373			
B-2P-6	10.0	mm	0.160	0.176	0.190	0.207	0.214	0.240	0.257	0.279	0.301	0.350	0.239	1.278	0.00	99.83	0.17
		phi	2.648	2.510	2.395	2.273	2.224	2.060	1.958	1.840	1.734	1.513	2.063	-0.354			
B-2P-7	12.0	mm	0.144	0.166	0.182	0.200	0.207	0.231	0.246	0.266	0.279	0.321	0.227	1.272	0.00	99.44	0.56
		phi	2.796	2.589	2.459	2.325	2.271	2.113	2.021	1.913	1.843	1.638	2.138	-0.347			
B-2P-8	14.0	mm	0.130	0.150	0.165	0.181	0.189	0.211	0.221	0.243	0.260	0.303	0.208	1.290	0.00	98.94	1.06
		phi	2.945	2.740	2.600	2.464	2.401	2.243	2.177	2.039	1.946	1.722	2.263	-0.367			
B-2P-9	16.0	mm	0.123	0.141	0.156	0.172	0.180	0.203	0.212	0.229	0.247	0.286	0.199	1.292	0.00	98.93	1.07
		phi	3.028	2.831	2.680	2.537	2.471	2.299	2.240	2.124	2.016	1.804	2.332	-0.370			
B-2P-10	18.0	mm	0.126	0.146	0.163	0.179	0.187	0.204	0.209	0.222	0.236	0.271	0.198	1.246	0.00	98.76	1.24
		phi	2.988	2.774	2.620	2.481	2.422	2.296	2.257	2.171	2.084	1.885	2.333	-0.318			

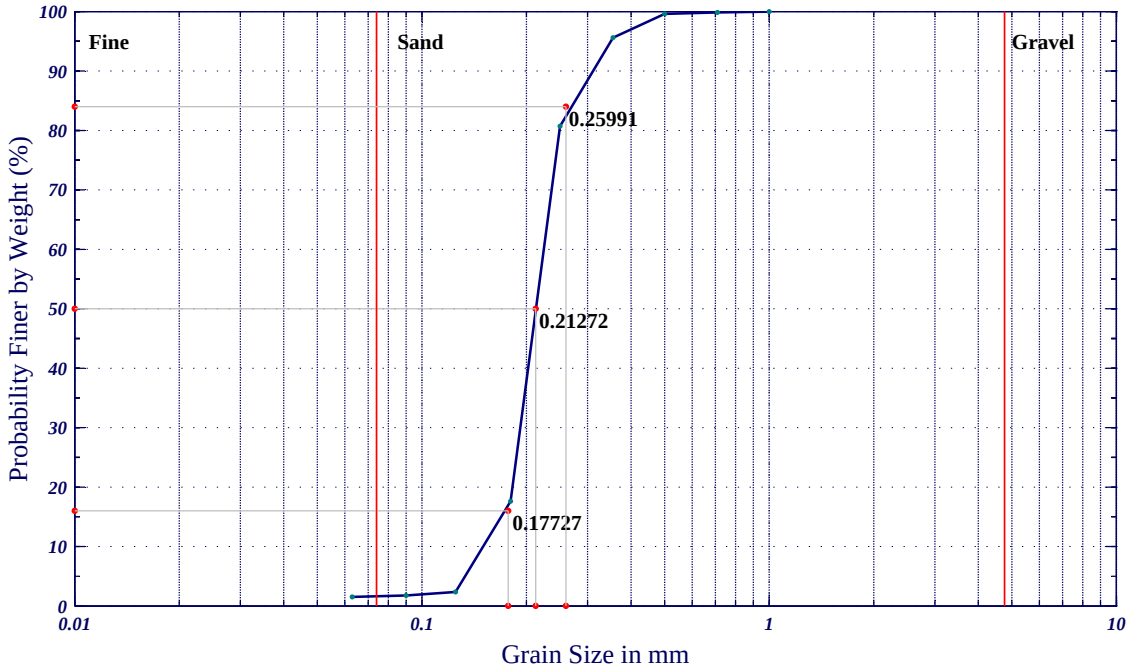






Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.146	2.780
D10:	0.167	2.584
D16:	0.177	2.496
D25:	0.192	2.382
D30:	0.198	2.338
D50:	0.213	2.233
D60:	0.220	2.185
D75:	0.239	2.067
D84:	0.260	1.944
D95:	0.347	1.526
Mean Grain Size:	0.214	2.224
Standard Deviation:	1.272	-0.347

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 98.23
Percent of Fines (<= 0.074mm): 1.77
Classification: Fine sand(sp)

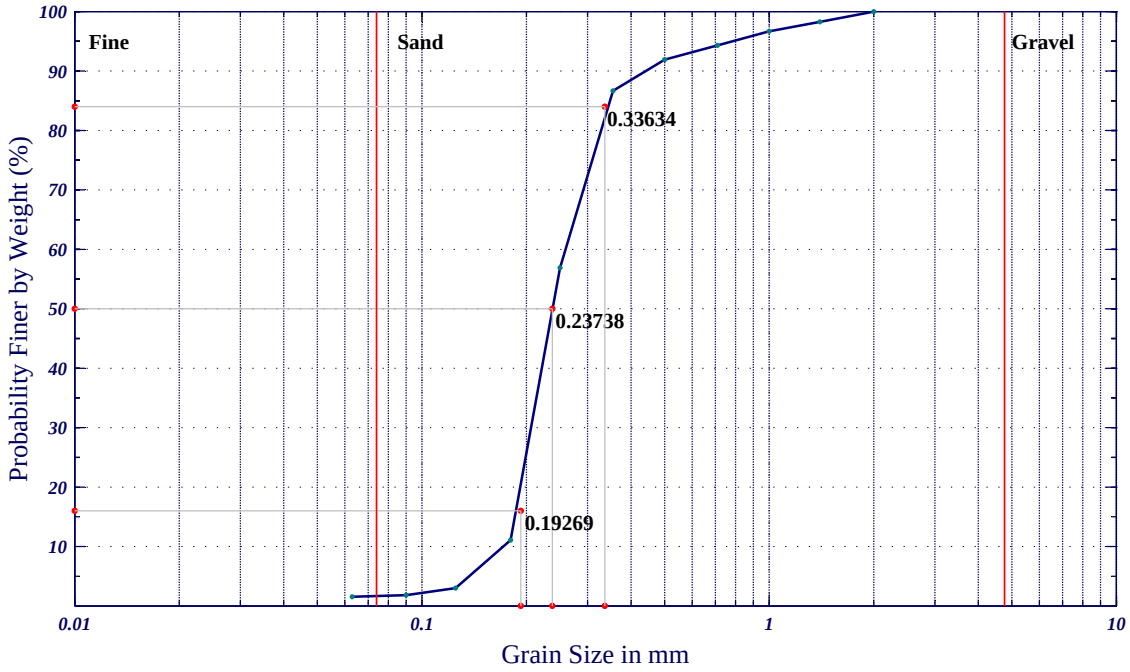
Sample ID: B-2P-1
Sample Depth: 0.0-0.4ft

Easting: 3,709,407*
Northing: 440,445*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.147	2.765
D10:	0.177	2.502
D16:	0.193	2.376
D25:	0.209	2.260
D30:	0.215	2.218
D50:	0.237	2.075
D60:	0.256	1.963
D75:	0.292	1.774
D84:	0.336	1.572
D95:	0.781	0.356
Mean Grain Size:	0.249	2.007
Standard Deviation:	1.518	-0.602

Percent of Gravel (16mm-2.00mm): 0.69
Percent of Sand (2.00mm-0.075mm): 98.19
Percent of Fines (<= 0.074mm): 1.81
Classification: Fine sand(sp)

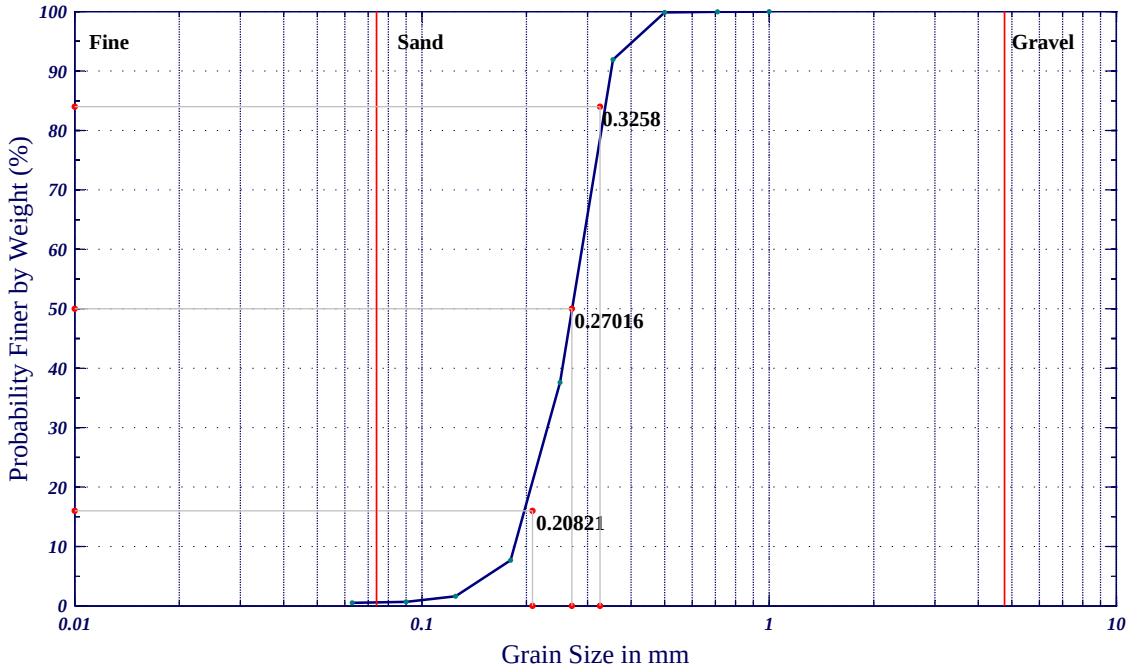
Sample ID: B-2P-2
Sample Depth: 2.0-2.4ft

Easting: 3,709,407*
Northing: 440,445*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results:

	(mm)	(phi)
D5:	0.165	2.601
D10:	0.189	2.402
D16:	0.208	2.264
D25:	0.227	2.137
D30:	0.236	2.084
D50:	0.270	1.888
D60:	0.282	1.828
D75:	0.303	1.720
D84:	0.326	1.618
D95:	0.370	1.436
Mean Grain Size:	0.264	1.923
Standard Deviation:	1.280	-0.356

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 99.33
Percent of Fines (<= 0.074mm): 0.67
Classification: Fine sand(sp)

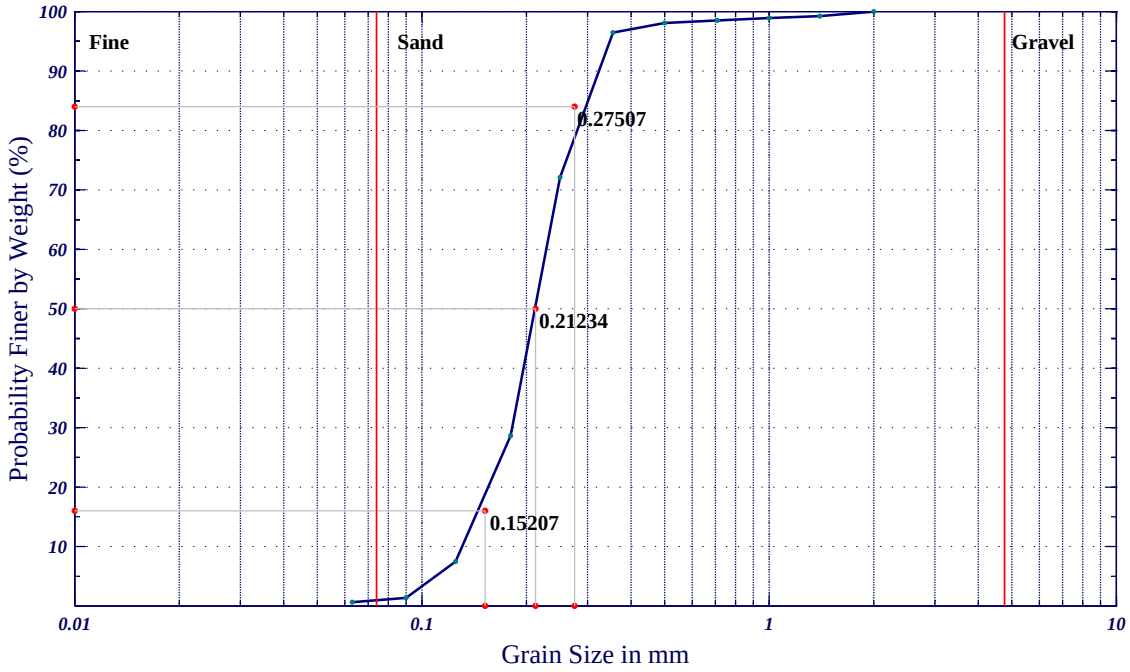
Sample ID: B-2P-3
Sample Depth: 3.8-4.2ft

Easting: 3,709,407*
Northing: 440,445*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.116	3.102
D10:	0.134	2.898
D16:	0.152	2.717
D25:	0.173	2.534
D30:	0.183	2.452
D50:	0.212	2.236
D60:	0.226	2.144
D75:	0.256	1.964
D84:	0.275	1.862
D95:	0.340	1.557
Mean Grain Size:	0.207	2.272
Standard Deviation:	1.386	-0.471

Percent of Gravel (16mm-2.00mm): 0.47
Percent of Sand (2.00mm-0.075mm): 98.65
Percent of Fines (<= 0.074mm): 1.35
Classification: Fine sand(sp)

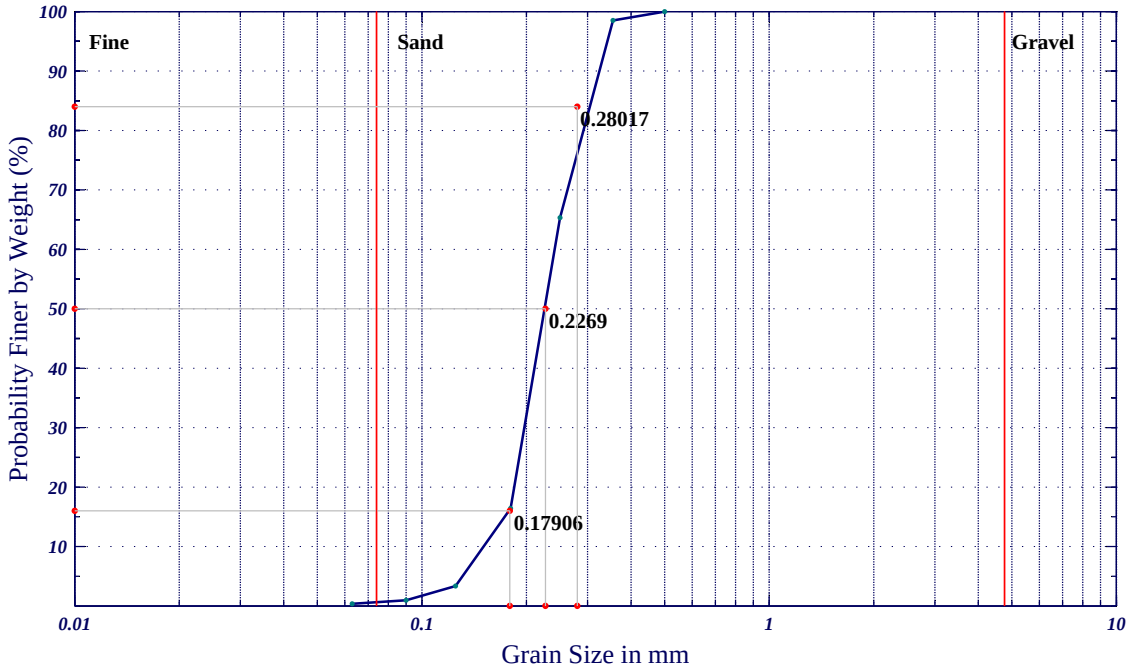
Sample ID: B-2P-4
Sample Depth: 5.8-6.2ft

Easting: 3,709,407*
Northing: 440,445*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.136	2.874
D10:	0.161	2.632
D16:	0.179	2.481
D25:	0.197	2.344
D30:	0.204	2.290
D50:	0.227	2.140
D60:	0.240	2.057
D75:	0.264	1.920
D84:	0.280	1.836
D95:	0.328	1.607
Mean Grain Size:	0.225	2.152
Standard Deviation:	1.295	-0.373

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 99.05
Percent of Fines (<= 0.074mm): 0.95
Classification: Fine sand(sp)

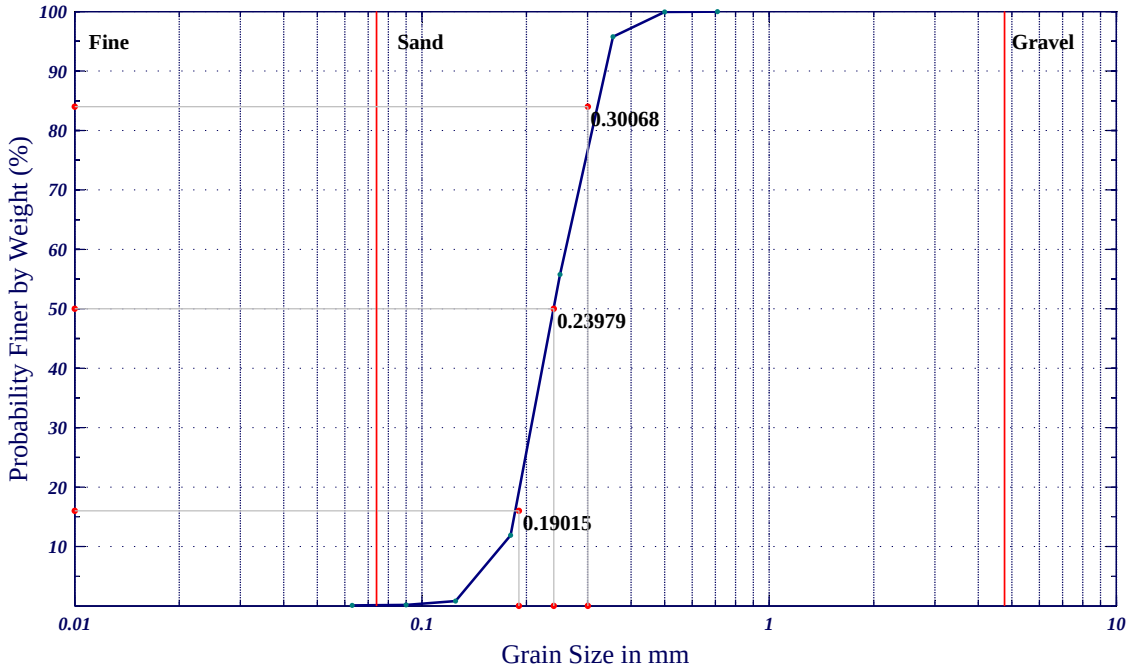
Sample ID: B-2P-5
Sample Depth: 7.8-8.2ft

Easting: 3,709,407*
Northing: 440,445*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results:	(mm)	(phi)
D5:	0.160	2.648
D10:	0.176	2.510
D16:	0.190	2.395
D25:	0.207	2.273
D30:	0.214	2.224
D50:	0.240	2.060
D60:	0.257	1.958
D75:	0.279	1.840
D84:	0.301	1.734
D95:	0.350	1.513
Mean Grain Size:	0.239	2.063
Standard Deviation:	1.278	-0.354

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 99.83
Percent of Fines (<= 0.074mm): 0.17
Classification: Fine sand(sp)

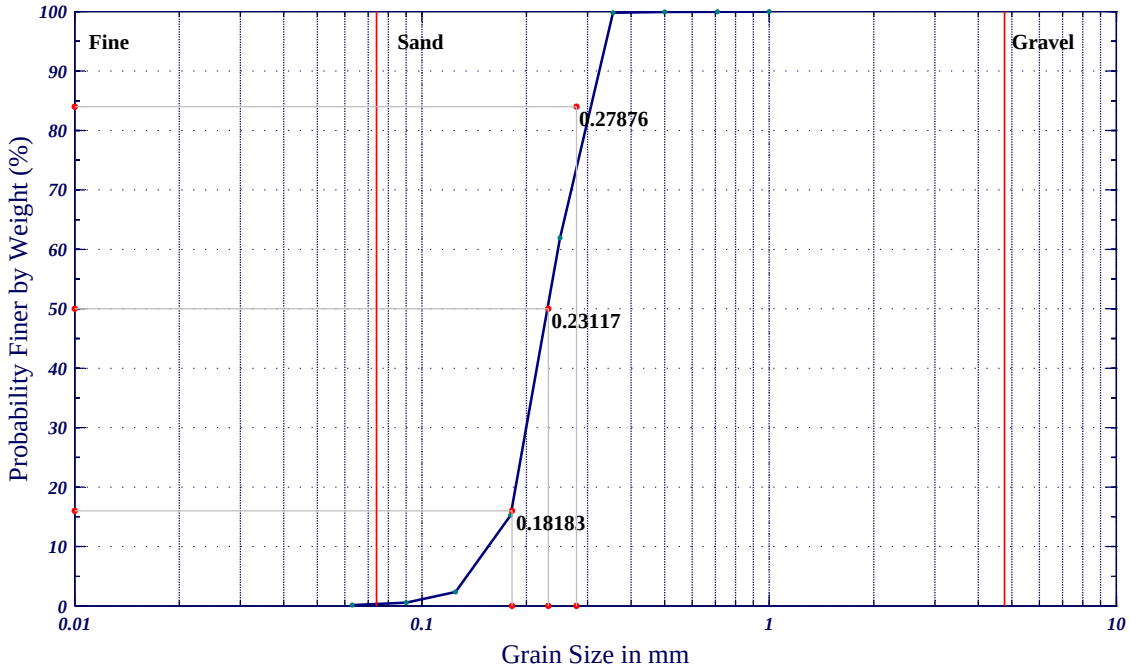
Sample ID: B-2P-6
Sample Depth: 9.8-10.2ft

Easting: 3,709,407*
Northing: 440,445*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.144	2.796
D10:	0.166	2.589
D16:	0.182	2.459
D25:	0.200	2.325
D30:	0.207	2.271
D50:	0.231	2.113
D60:	0.246	2.021
D75:	0.266	1.913
D84:	0.279	1.843
D95:	0.321	1.638
Mean Grain Size:	0.227	2.138
Standard Deviation:	1.272	-0.347

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 99.44
Percent of Fines (<= 0.074mm): 0.56
Classification: Fine sand(sp)

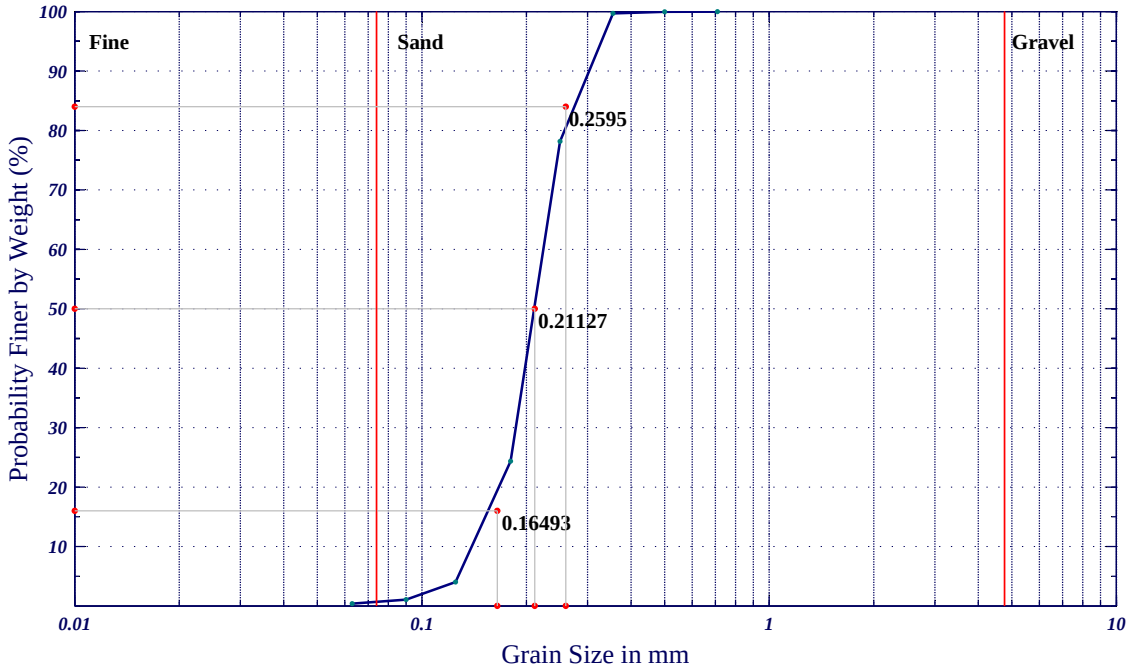
Sample ID: B-2P-7
Sample Depth: 11.8-12.2ft

Easting: 3,709,407*
Northing: 440,445*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results:

	(mm)	(phi)
D5:	0.130	2.945
D10:	0.150	2.740
D16:	0.165	2.600
D25:	0.181	2.464
D30:	0.189	2.401
D50:	0.211	2.243
D60:	0.221	2.177
D75:	0.243	2.039
D84:	0.260	1.946
D95:	0.303	1.722
Mean Grain Size:	0.208	2.263
Standard Deviation:	1.290	-0.367

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 98.94
Percent of Fines (<= 0.074mm): 1.06
Classification: Fine sand(sp)

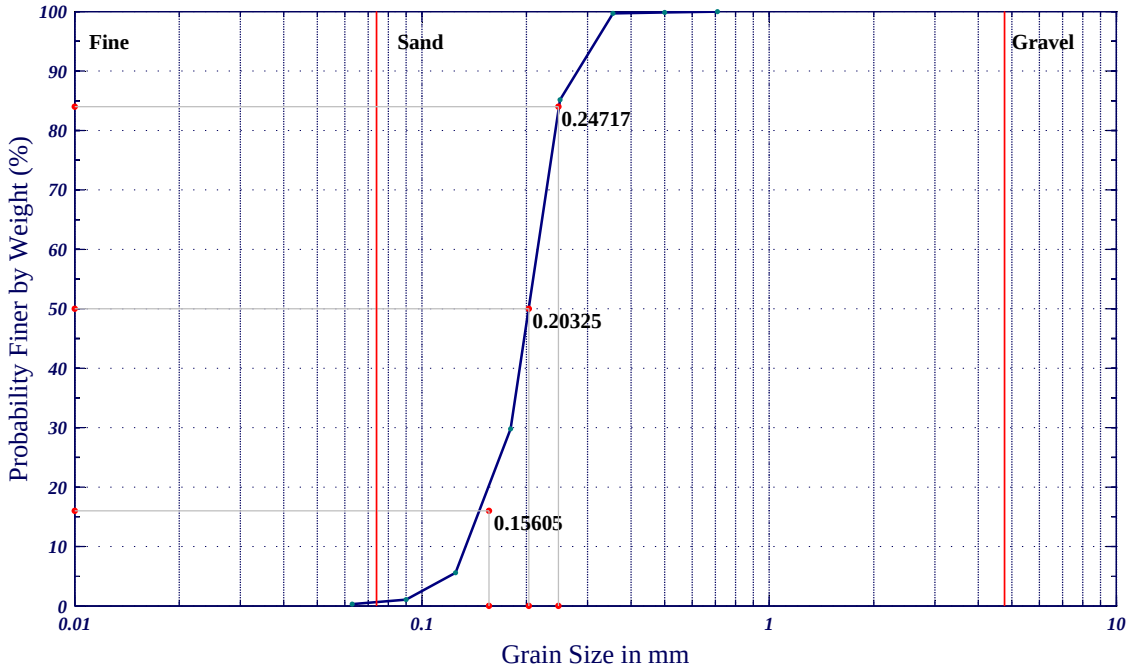
Sample ID: B-2P-8
Sample Depth: 13.8-14.2ft

Easting: 3,709,407*
Northing: 440,445*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.123	3.028
D10:	0.141	2.831
D16:	0.156	2.680
D25:	0.172	2.537
D30:	0.180	2.471
D50:	0.203	2.299
D60:	0.212	2.240
D75:	0.229	2.124
D84:	0.247	2.016
D95:	0.286	1.804
Mean Grain Size:	0.199	2.332
Standard Deviation:	1.292	-0.370

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 98.93
Percent of Fines (<= 0.074mm): 1.07
Classification: Fine sand(sp)

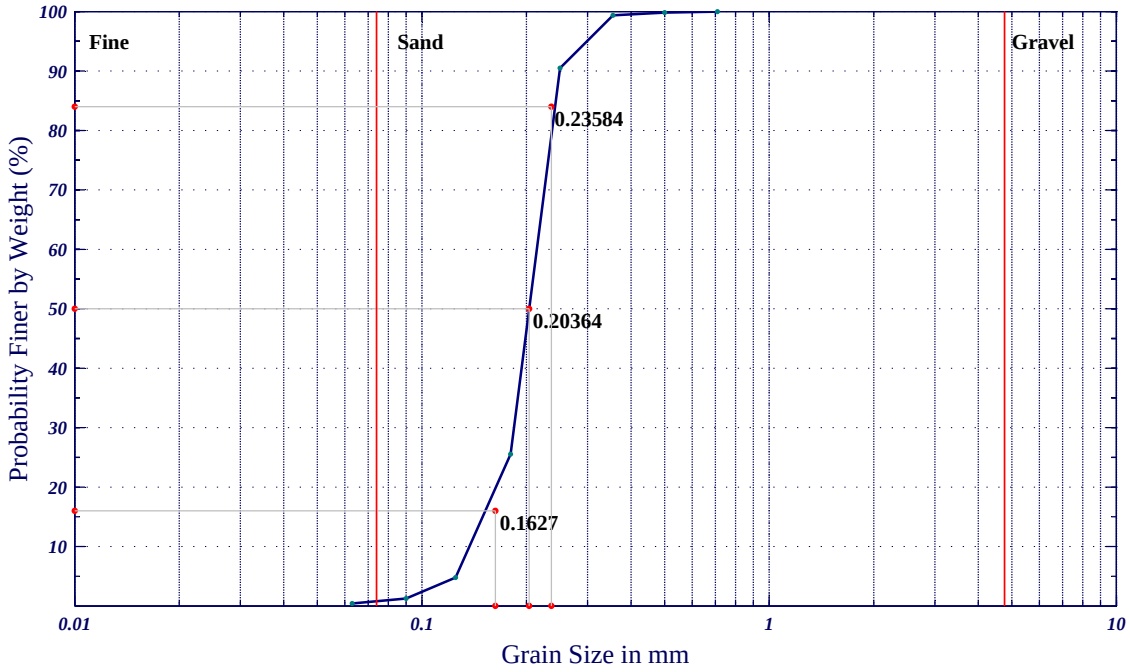
Sample ID: B-2P-9
Sample Depth: 15.8-16.2ft

Easting: 3,709,407*
Northing: 440,445*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.126	2.988
D10:	0.146	2.774
D16:	0.163	2.620
D25:	0.179	2.481
D30:	0.187	2.422
D50:	0.204	2.296
D60:	0.209	2.257
D75:	0.222	2.171
D84:	0.236	2.084
D95:	0.271	1.885
Mean Grain Size:	0.198	2.333
Standard Deviation:	1.246	-0.318

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 98.76
Percent of Fines (<= 0.074mm): 1.24
Classification: Fine sand(sp)

Sample ID: B-2P-10
Sample Depth: 17.8-18.2ft

Easting: 3,709,407*
Northing: 440,445*
*Coordinates are feet, LA-1702

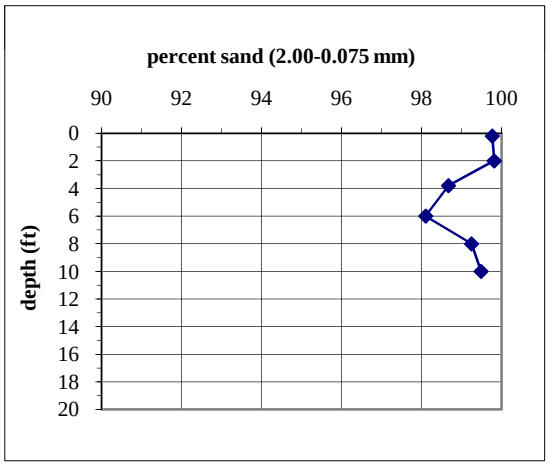
OSI No.: 11ES002

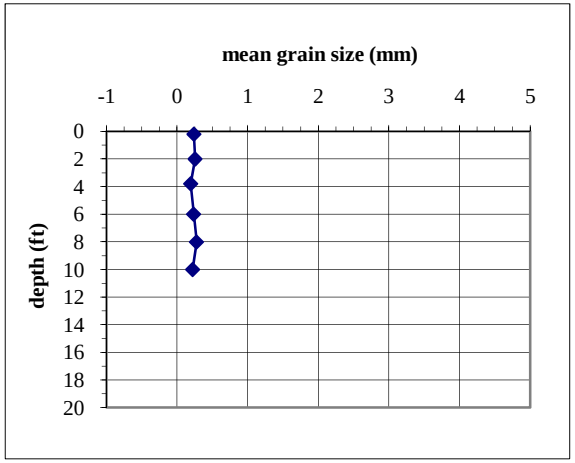
Long Distance Sediment Pipeline Project, Bayou Dupont Borrow Area **Ocean Surveys, Inc.**

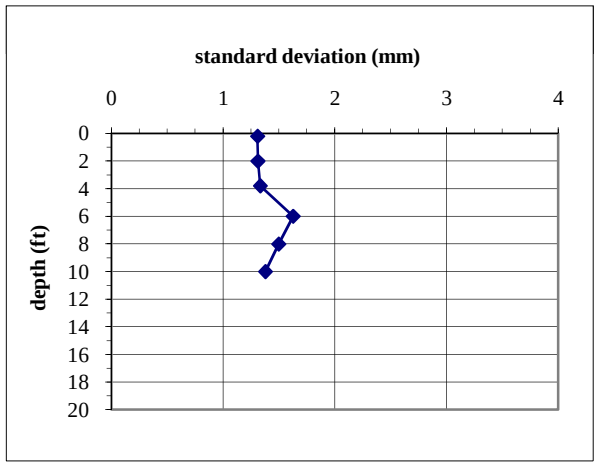
Grainsize Data Table

Core ID B-3P

Sample I.D.	Sample depth in core(ft)	Units	5% sample finer than	10% sample finer than	16% sample finer than	25% sample finer than	30% sample finer than	50% sample finer than	60% sample finer than	75% sample finer than	84% sample finer than	95% sample finer than	Sample mean grain size	Standard Deviation	%Gravel	%Sand	%Fines
B-3P-1	0.2	mm	0.145	0.169	0.187	0.206	0.214	0.243	0.261	0.282	0.304	0.353	0.240	1.309	0.03	99.77	0.23
		phi	2.789	2.562	2.417	2.278	2.223	2.039	1.937	1.825	1.719	1.503	2.058	-0.389			
B-3P-2	2.0	mm	0.165	0.182	0.198	0.216	0.223	0.257	0.273	0.300	0.328	0.398	0.256	1.313	0.50	99.82	0.18
		phi	2.603	2.459	2.333	2.212	2.162	1.960	1.874	1.736	1.609	1.331	1.968	-0.393			
B-3P-3	3.8	mm	0.124	0.139	0.151	0.163	0.168	0.193	0.203	0.223	0.244	0.342	0.193	1.334	0.00	98.67	1.33
		phi	3.009	2.848	2.725	2.615	2.570	2.372	2.301	2.164	2.034	1.549	2.377	-0.416			
B-3P-4	6.0	mm	0.108	0.122	0.137	0.155	0.165	0.259	0.290	0.333	0.370	0.459	0.236	1.629	0.76	98.10	1.90
		phi	3.205	3.035	2.864	2.693	2.598	1.949	1.788	1.588	1.435	1.124	2.083	-0.704			
B-3P-5	8.0	mm	0.123	0.149	0.178	0.254	0.271	0.311	0.327	0.364	0.382	0.446	0.277	1.500	0.03	99.25	0.75
		phi	3.023	2.751	2.489	1.979	1.882	1.685	1.614	1.459	1.388	1.164	1.854	-0.585			
B-3P-6	10.0	mm	0.134	0.151	0.165	0.181	0.190	0.221	0.238	0.273	0.303	0.370	0.222	1.380	0.00	99.49	0.51
		phi	2.903	2.723	2.602	2.469	2.394	2.180	2.071	1.875	1.724	1.433	2.169	-0.465			

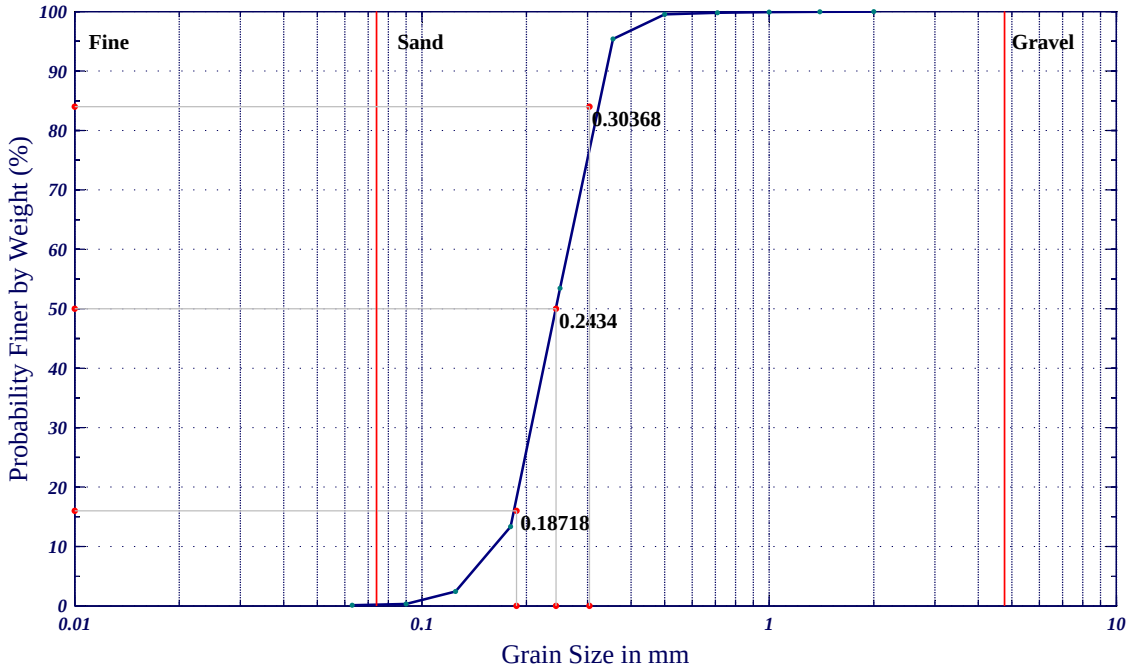






Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.145	2.789
D10:	0.169	2.562
D16:	0.187	2.417
D25:	0.206	2.278
D30:	0.214	2.223
D50:	0.243	2.039
D60:	0.261	1.937
D75:	0.282	1.825
D84:	0.304	1.719
D95:	0.353	1.503
Mean Grain Size:	0.240	2.058
Standard Deviation:	1.309	-0.389

Percent of Gravel (16mm-2.00mm): 0.05
Percent of Sand (2.00mm-0.075mm): 99.67
Percent of Fines (<= 0.074mm): 0.33
Classification: Fine sand(sp)

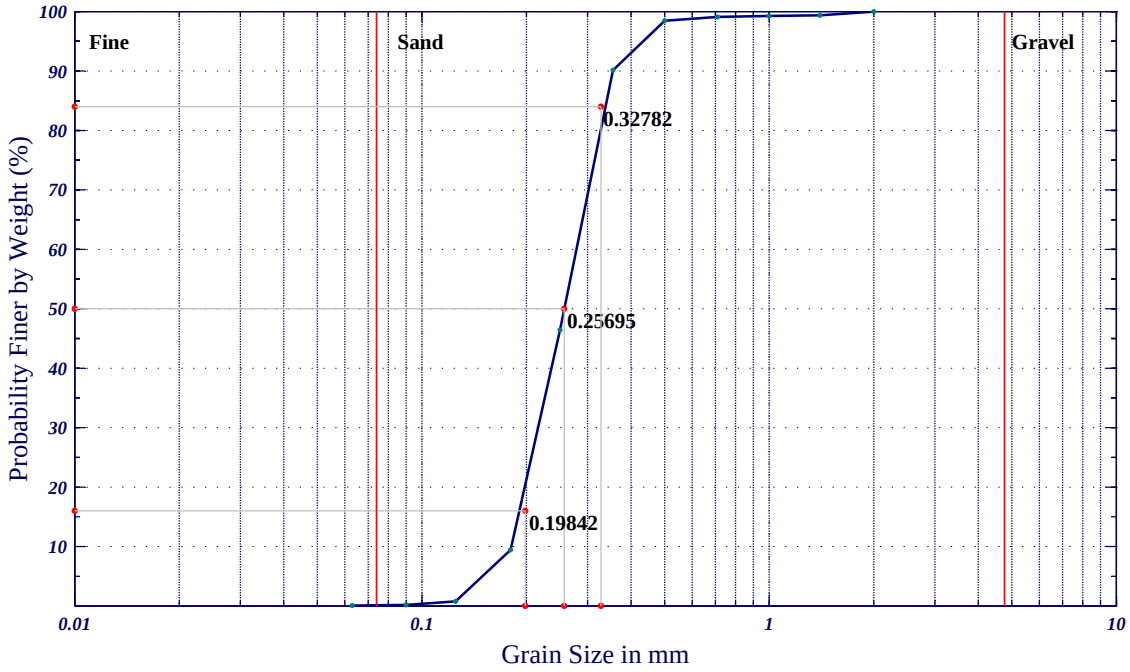
Sample ID: B-3P-1
Sample Depth: 0.0-0.4ft

Easting: 3,709,968*
Northing: 440,715*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.165	2.603
D10:	0.182	2.459
D16:	0.198	2.333
D25:	0.216	2.212
D30:	0.223	2.162
D50:	0.257	1.960
D60:	0.273	1.874
D75:	0.300	1.736
D84:	0.328	1.609
D95:	0.398	1.331
Mean Grain Size:	0.256	1.968
Standard Deviation:	1.313	-0.393

Percent of Gravel (16mm-2.00mm): 0.50
Percent of Sand (2.00mm-0.075mm): 99.82
Percent of Fines (<= 0.074mm): 0.18
Classification: Fine sand(sp)

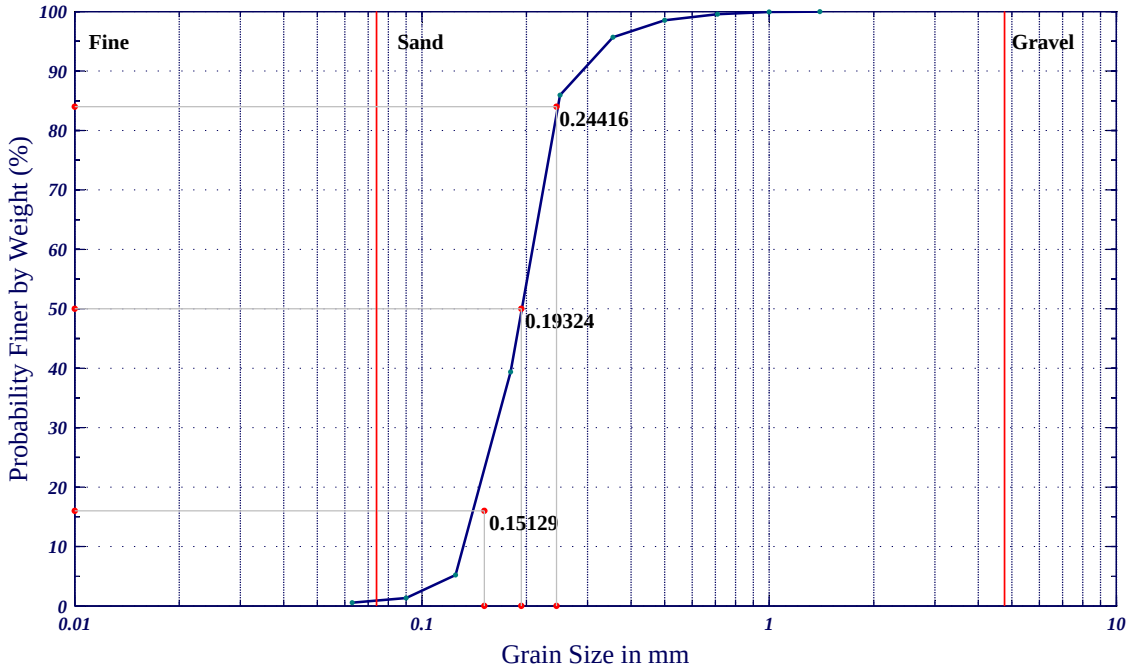
Sample ID: B-3P-2
Sample Depth: 1.8-2.2ft

Easting: 3,709,968*
Northing: 440,715*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.124	3.009
D10:	0.139	2.848
D16:	0.151	2.725
D25:	0.163	2.615
D30:	0.168	2.570
D50:	0.193	2.372
D60:	0.203	2.301
D75:	0.223	2.164
D84:	0.244	2.034
D95:	0.342	1.549
Mean Grain Size:	0.193	2.377
Standard Deviation:	1.334	-0.416

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 98.67
Percent of Fines (<= 0.074mm): 1.33
Classification: Fine sand(sp)

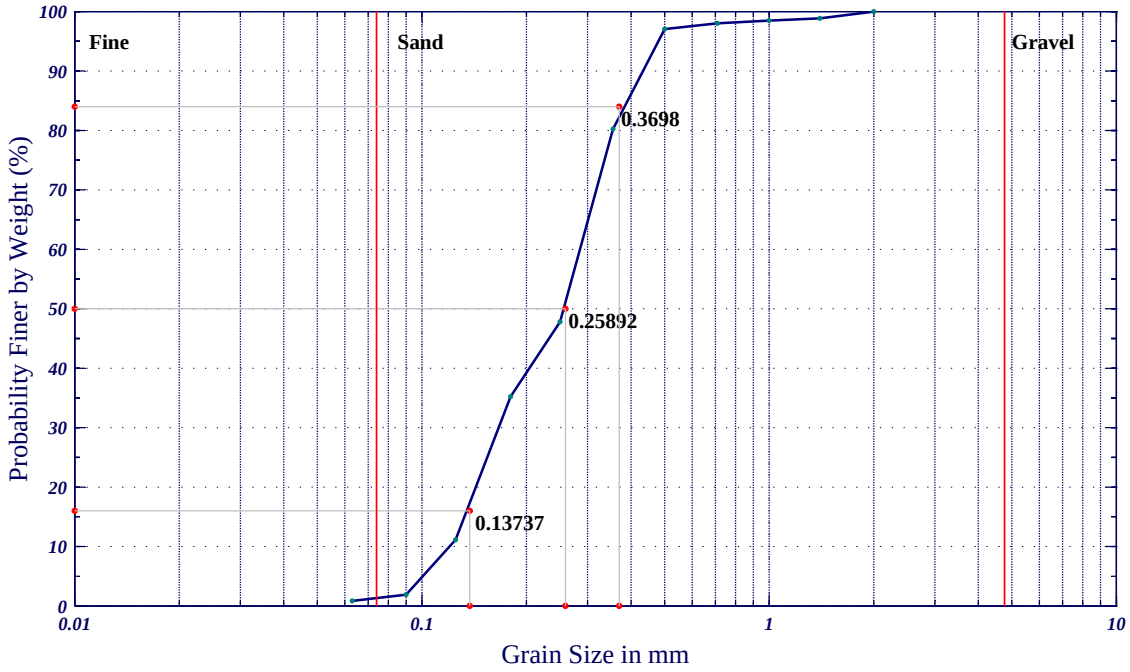
Sample ID: B-3P-3
Sample Depth: 3.6-4.0ft

Easting: 3,709,968*
Northing: 440,715*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.108	3.205
D10:	0.122	3.035
D16:	0.137	2.864
D25:	0.155	2.693
D30:	0.165	2.598
D50:	0.259	1.949
D60:	0.290	1.788
D75:	0.333	1.588
D84:	0.370	1.435
D95:	0.459	1.124
Mean Grain Size:	0.236	2.083
Standard Deviation:	1.629	-0.704

Percent of Gravel (16mm-2.00mm): 0.76
Percent of Sand (2.00mm-0.075mm): 98.10
Percent of Fines (<= 0.074mm): 1.90
Classification: Fine sand(sp)

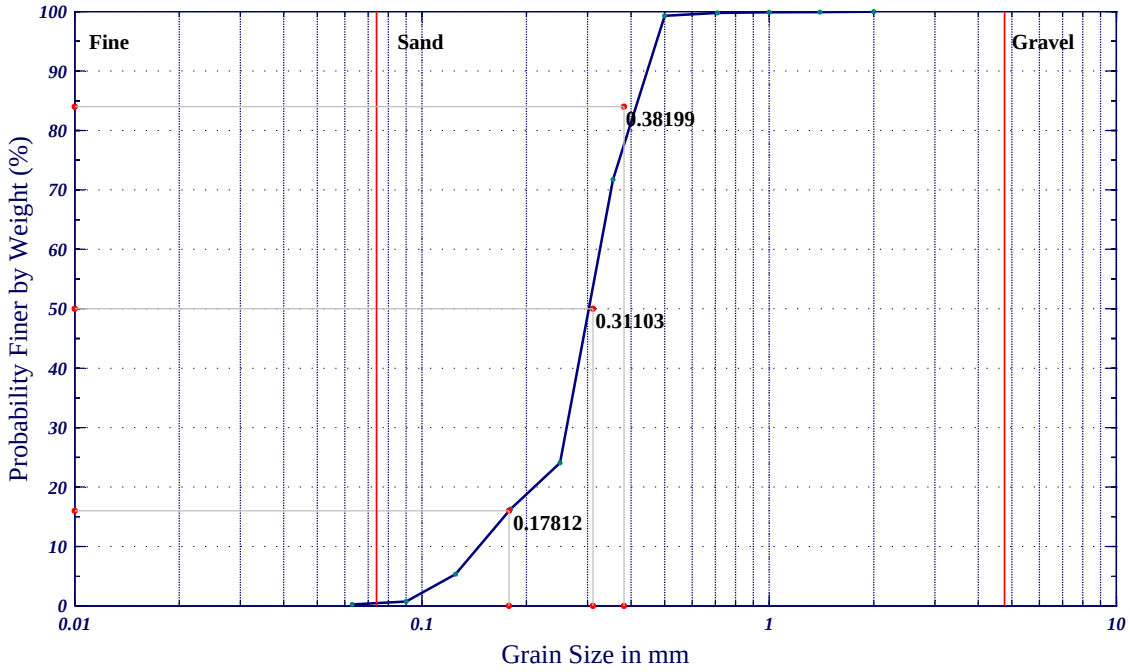
Sample ID: B-3P-4
Sample Depth: 5.8-6.2ft

Easting: 3,709,968*
Northing: 440,715*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.123	3.023
D10:	0.149	2.751
D16:	0.178	2.489
D25:	0.254	1.979
D30:	0.271	1.882
D50:	0.311	1.685
D60:	0.327	1.614
D75:	0.364	1.459
D84:	0.382	1.388
D95:	0.446	1.164
Mean Grain Size:	0.277	1.854
Standard Deviation:	1.500	-0.585

Percent of Gravel (16mm-2.00mm): 0.03
Percent of Sand (2.00mm-0.075mm): 99.25
Percent of Fines (<= 0.074mm): 0.75
Classification: Fine sand(sp)

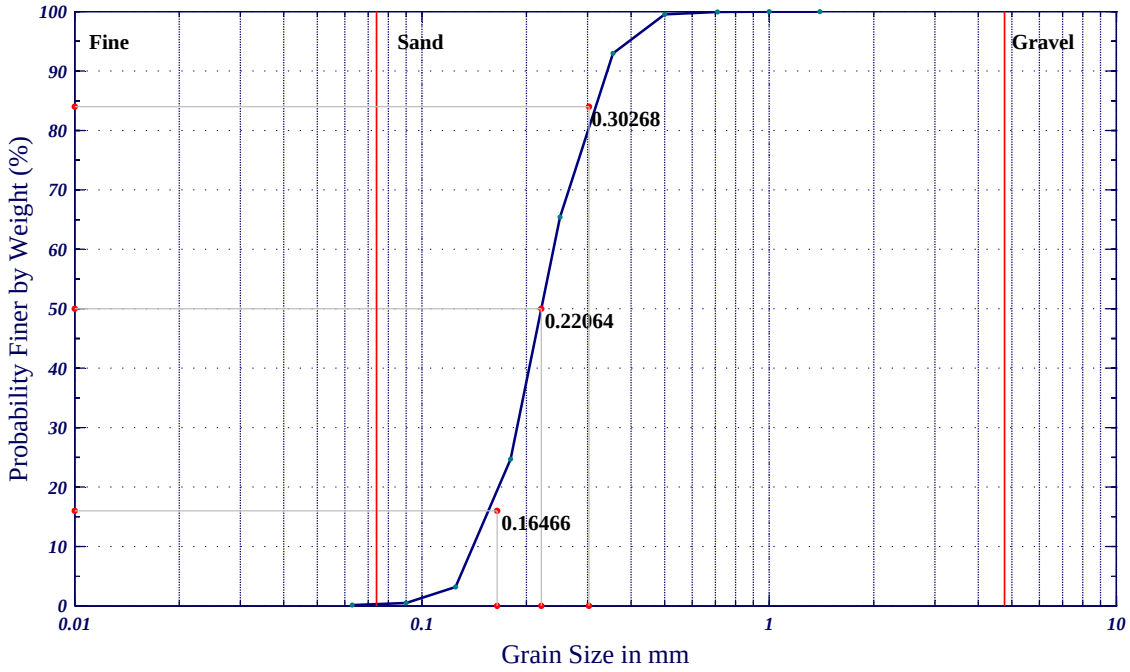
Sample ID: B-3P-5
Sample Depth: 7.8-8.2ft

Easting: 3,709,968*
Northing: 440,715*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.134	2.903
D10:	0.151	2.723
D16:	0.165	2.602
D25:	0.181	2.469
D30:	0.190	2.394
D50:	0.221	2.180
D60:	0.238	2.071
D75:	0.273	1.875
D84:	0.303	1.724
D95:	0.370	1.433
Mean Grain Size:	0.222	2.169
Standard Deviation:	1.380	-0.465

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 99.49
Percent of Fines (<= 0.074mm): 0.51
Classification: Fine sand(sp)

Sample ID: B-3P-6
Sample Depth: 9.8-10.2ft

Easting: 3,709,968*
Northing: 440,715*
*Coordinates are feet, LA-1702

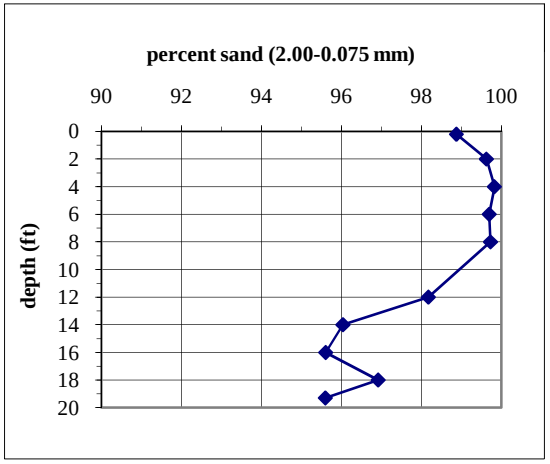
OSI No.: 11ES002

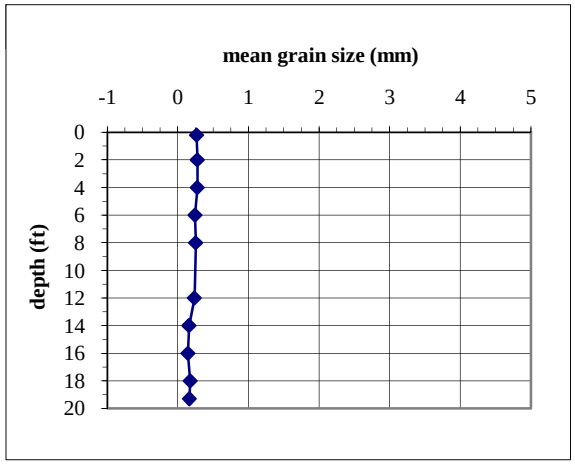
Long Distance Sediment Pipeline Project, Bayou Dupont Borrow Area **Ocean Surveys, Inc.**

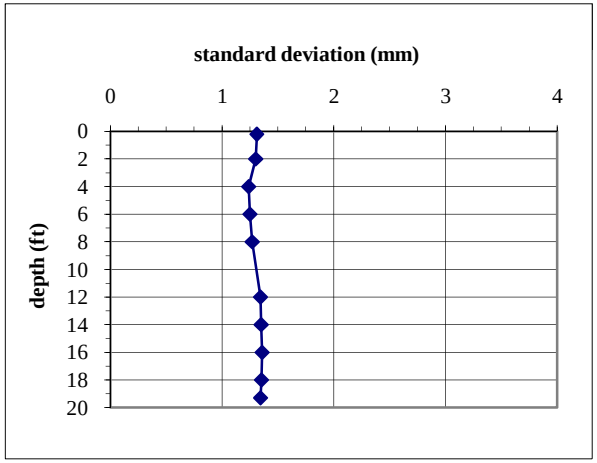
Grainsize Data Table

Core ID B-1P

Sample I.D.	Sample depth in core(ft)	Units	5% sample finer than	10% sample finer than	16% sample finer than	25% sample finer than	30% sample finer than	50% sample finer than	60% sample finer than	75% sample finer than	84% sample finer than	95% sample finer than	Sample mean grain size	Standard Deviation	%Gravel	%Sand	%Fines
B-1P-1	0.2	mm	0.160	0.183	0.204	0.227	0.237	0.274	0.286	0.311	0.335	0.388	0.266	1.312	0.05	98.88	1.12
		phi	2.643	2.448	2.291	2.141	2.077	1.869	1.804	1.686	1.577	1.366	1.912	-0.391			
B-1P-2	2.0	mm	0.169	0.193	0.215	0.238	0.250	0.283	0.296	0.322	0.348	0.400	0.277	1.302	0.00	99.63	0.37
		phi	2.564	2.373	2.219	2.070	2.002	1.820	1.757	1.635	1.525	1.322	1.854	-0.381			
B-1P-3	4.0	mm	0.185	0.209	0.226	0.244	0.254	0.281	0.291	0.311	0.332	0.376	0.277	1.238	0.00	99.83	0.17
		phi	2.431	2.261	2.143	2.035	1.974	1.830	1.783	1.685	1.590	1.411	1.854	-0.308			
B-1P-4	6.0	mm	0.160	0.182	0.198	0.215	0.222	0.250	0.264	0.278	0.295	0.336	0.244	1.250	0.00	99.70	0.30
		phi	2.640	2.460	2.338	2.220	2.173	2.001	1.924	1.846	1.761	1.576	2.033	-0.322			
B-1P-5	8.0	mm	0.162	0.182	0.201	0.220	0.229	0.263	0.274	0.292	0.311	0.352	0.254	1.271	0.00	99.73	0.27
		phi	2.628	2.454	2.316	2.182	2.127	1.925	1.867	1.776	1.683	1.505	1.975	-0.346			
B-1P-7	12.0	mm	0.137	0.164	0.181	0.201	0.210	0.238	0.257	0.280	0.303	0.373	0.236	1.344	0.06	98.18	1.82
		phi	2.866	2.610	2.463	2.313	2.254	2.068	1.959	1.839	1.721	1.422	2.084	-0.426			
B-1P-8	14.0	mm	0.094	0.109	0.118	0.132	0.139	0.162	0.175	0.194	0.208	0.246	0.159	1.350	0.00	96.04	3.96
		phi	3.409	3.204	3.077	2.921	2.848	2.626	2.514	2.365	2.267	2.024	2.657	-0.433			
B-1P-9	16.0	mm	0.092	0.100	0.111	0.119	0.124	0.142	0.150	0.169	0.187	0.266	0.144	1.360	0.02	95.61	4.39
		phi	3.447	3.282	3.169	3.072	3.016	2.814	2.732	2.565	2.419	1.912	2.801	-0.443			
B-1P-10	18.0	mm	0.099	0.114	0.127	0.146	0.155	0.188	0.197	0.210	0.225	0.259	0.175	1.353	0.02	96.92	3.08
		phi	3.333	3.129	2.977	2.776	2.687	2.414	2.344	2.249	2.153	1.950	2.515	-0.437			
B-1P-11	19.3	mm	0.093	0.109	0.122	0.139	0.147	0.175	0.188	0.200	0.211	0.241	0.165	1.346	0.00	95.60	4.40
		phi	3.431	3.191	3.037	2.851	2.769	2.513	2.409	2.324	2.243	2.053	2.598	-0.428			

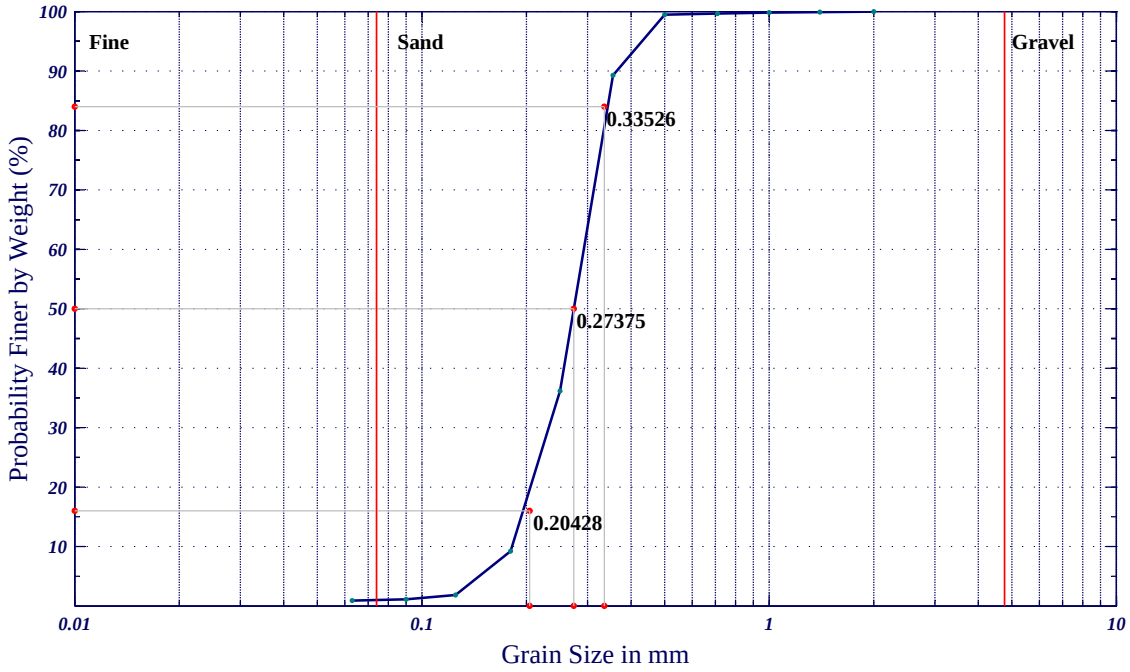






Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results:

	(mm)	(phi)
D5:	0.160	2.643
D10:	0.183	2.448
D16:	0.204	2.291
D25:	0.227	2.141
D30:	0.237	2.077
D50:	0.274	1.869
D60:	0.286	1.804
D75:	0.311	1.686
D84:	0.335	1.577
D95:	0.388	1.366
Mean Grain Size:	0.266	1.912
Standard Deviation:	1.312	-0.391

Percent of Gravel (16mm-2.00mm): 0.05
Percent of Sand (2.00mm-0.075mm): 98.88
Percent of Fines (<= 0.074mm): 1.12
Classification: Fine sand(sp)

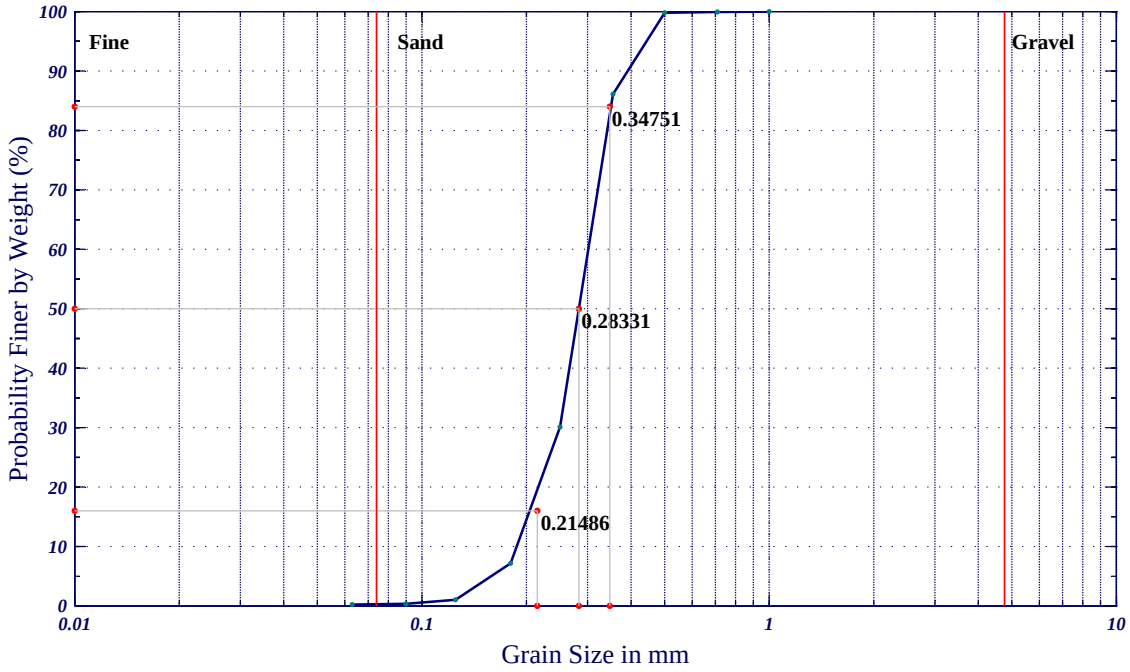
Sample ID: B-1P-1
Sample Depth: 0.1-0.5ft

Easting: 3,709,969*
Northing: 439,300*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.169	2.564
D10:	0.193	2.373
D16:	0.215	2.219
D25:	0.238	2.070
D30:	0.250	2.002
D50:	0.283	1.820
D60:	0.296	1.757
D75:	0.322	1.635
D84:	0.348	1.525
D95:	0.400	1.322
Mean Grain Size:	0.277	1.854
Standard Deviation:	1.302	-0.381

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 99.63
Percent of Fines (<= 0.074mm): 0.37
Classification: Fine sand(sp)

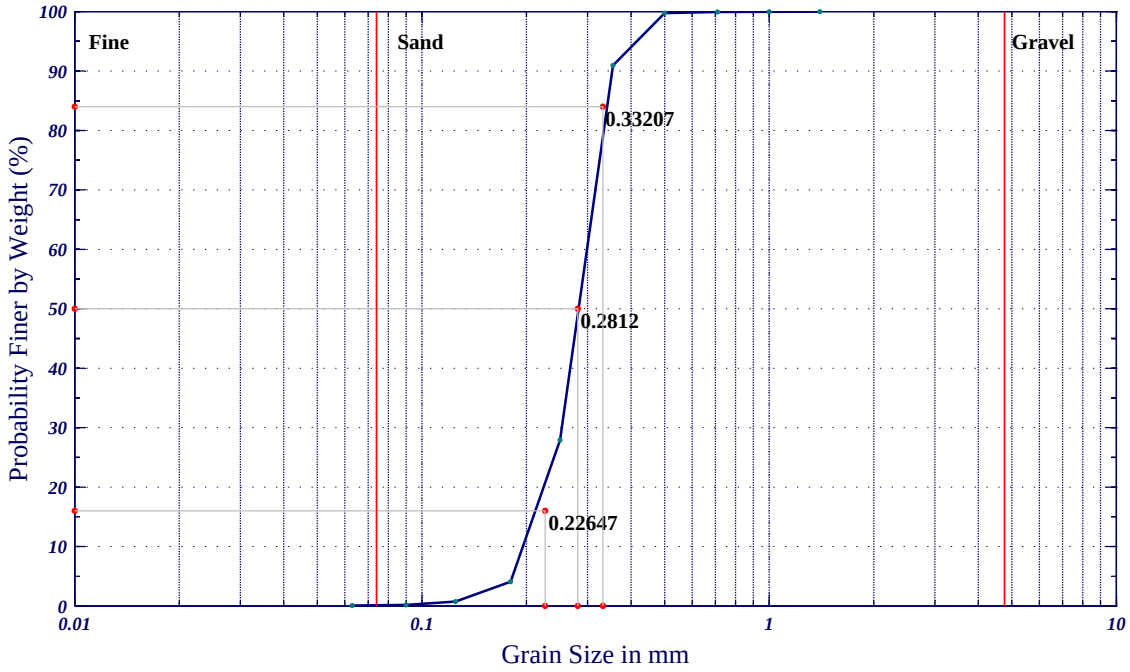
Sample ID: B-1P-2
Sample Depth: 1.8-2.2ft

Easting: 3,709,969*
Northing: 439,300*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.185	2.431
D10:	0.209	2.261
D16:	0.226	2.143
D25:	0.244	2.035
D30:	0.254	1.974
D50:	0.281	1.830
D60:	0.291	1.783
D75:	0.311	1.685
D84:	0.332	1.590
D95:	0.376	1.411
Mean Grain Size:	0.277	1.854
Standard Deviation:	1.238	-0.308

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 99.83
Percent of Fines (<= 0.074mm): 0.17
Classification: Fine sand(sp)

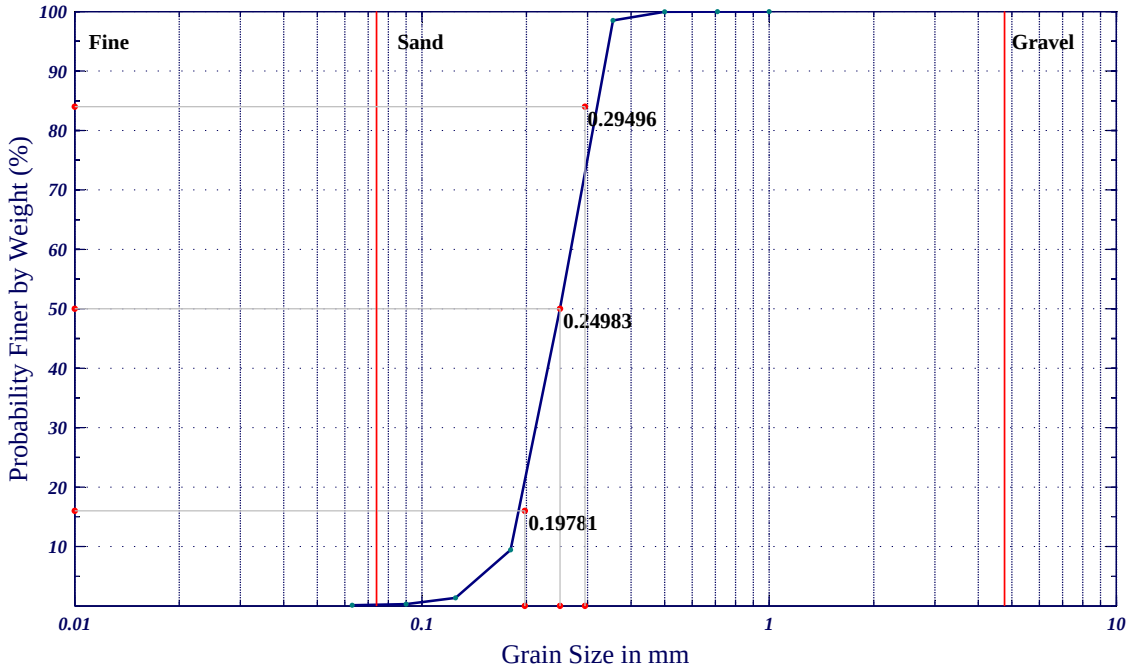
Sample ID: B-1P-3
Sample Depth: 3.8-4.2ft

Easting: 3,709,969*
Northing: 439,300*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results:	(mm)	(phi)
D5:	0.160	2.640
D10:	0.182	2.460
D16:	0.198	2.338
D25:	0.215	2.220
D30:	0.222	2.173
D50:	0.250	2.001
D60:	0.264	1.924
D75:	0.278	1.846
D84:	0.295	1.761
D95:	0.336	1.576
Mean Grain Size:	0.244	2.033
Standard Deviation:	1.250	-0.322

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 99.70
Percent of Fines (<= 0.074mm): 0.30
Classification: Fine sand(sp)

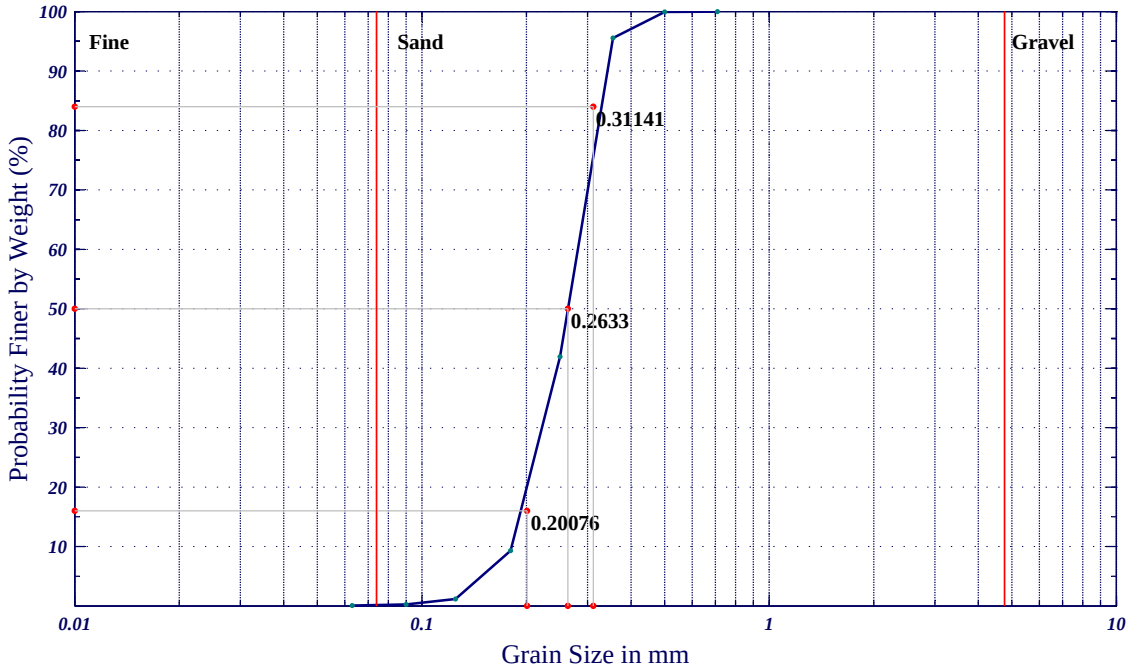
Sample ID: B-1P-4
Sample Depth: 5.8-6.2ft

Easting: 3,709,969*
Northing: 439,300*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results:	(mm)	(phi)
D5:	0.162	2.628
D10:	0.182	2.454
D16:	0.201	2.316
D25:	0.220	2.182
D30:	0.229	2.127
D50:	0.263	1.925
D60:	0.274	1.867
D75:	0.292	1.776
D84:	0.311	1.683
D95:	0.352	1.505
Mean Grain Size:	0.254	1.975
Standard Deviation:	1.271	-0.346

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 99.73
Percent of Fines (<= 0.074mm): 0.27
Classification: Fine sand(sp)

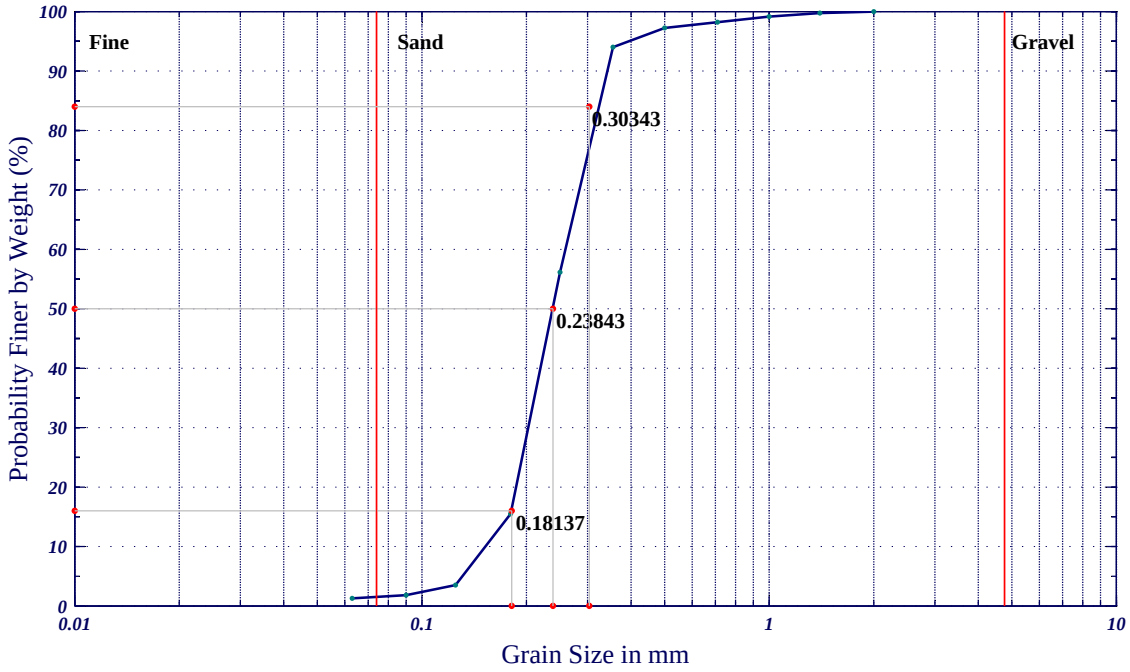
Sample ID: B-1P-5
Sample Depth: 7.8-8.2ft

Easting: 3,709,969*
Northing: 439,300*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.137	2.866
D10:	0.164	2.610
D16:	0.181	2.463
D25:	0.201	2.313
D30:	0.210	2.254
D50:	0.238	2.068
D60:	0.257	1.959
D75:	0.280	1.839
D84:	0.303	1.721
D95:	0.373	1.422
Mean Grain Size:	0.236	2.084
Standard Deviation:	1.344	-0.426

Percent of Gravel (16mm-2.00mm): 0.06
Percent of Sand (2.00mm-0.075mm): 98.18
Percent of Fines (<= 0.074mm): 1.82
Classification: Fine sand(sp)

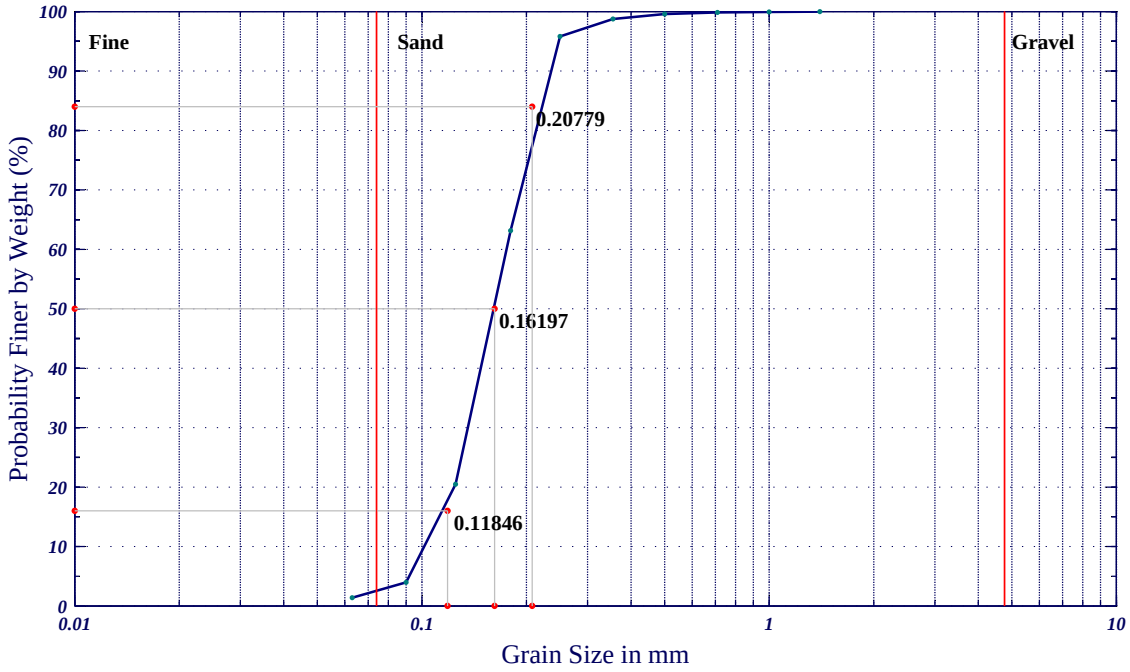
Sample ID: B-1P-7
Sample Depth: 11.8-12.2ft

Easting: 3,709,969*
Northing: 439,300*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results:	(mm)	(phi)
D5:	0.094	3.409
D10:	0.109	3.204
D16:	0.118	3.077
D25:	0.132	2.921
D30:	0.139	2.848
D50:	0.162	2.626
D60:	0.175	2.514
D75:	0.194	2.365
D84:	0.208	2.267
D95:	0.246	2.024
Mean Grain Size:	0.159	2.657
Standard Deviation:	1.350	-0.433

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 96.04
Percent of Fines (<= 0.074mm): 3.96
Classification: Fine sand(sp)

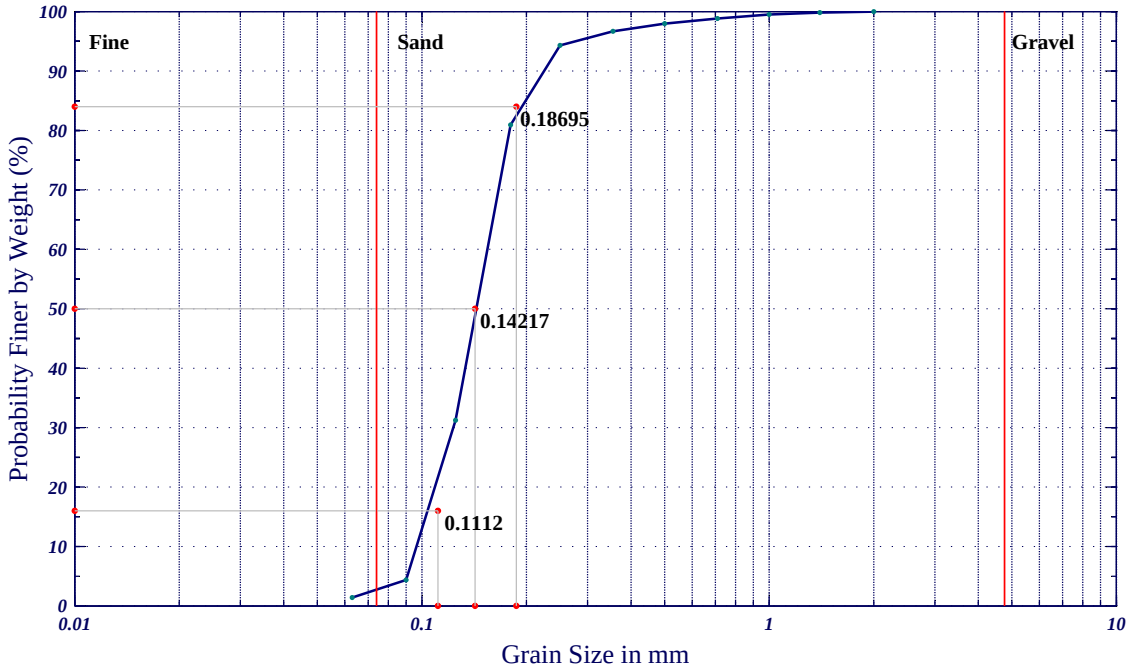
Sample ID: B-1P-8
Sample Depth: 13.8-14.2ft

Easting: 3,709,969*
Northing: 439,300*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results:	(mm)	(phi)
D5:	0.092	3.447
D10:	0.103	3.282
D16:	0.111	3.169
D25:	0.119	3.072
D30:	0.124	3.016
D50:	0.142	2.814
D60:	0.150	2.732
D75:	0.169	2.565
D84:	0.187	2.419
D95:	0.266	1.912
Mean Grain Size:	0.144	2.801
Standard Deviation:	1.360	-0.443

Percent of Gravel (16mm-2.00mm): 0.02
Percent of Sand (2.00mm-0.075mm): 95.61
Percent of Fines (<= 0.074mm): 4.39
Classification: Fine sand(sp)

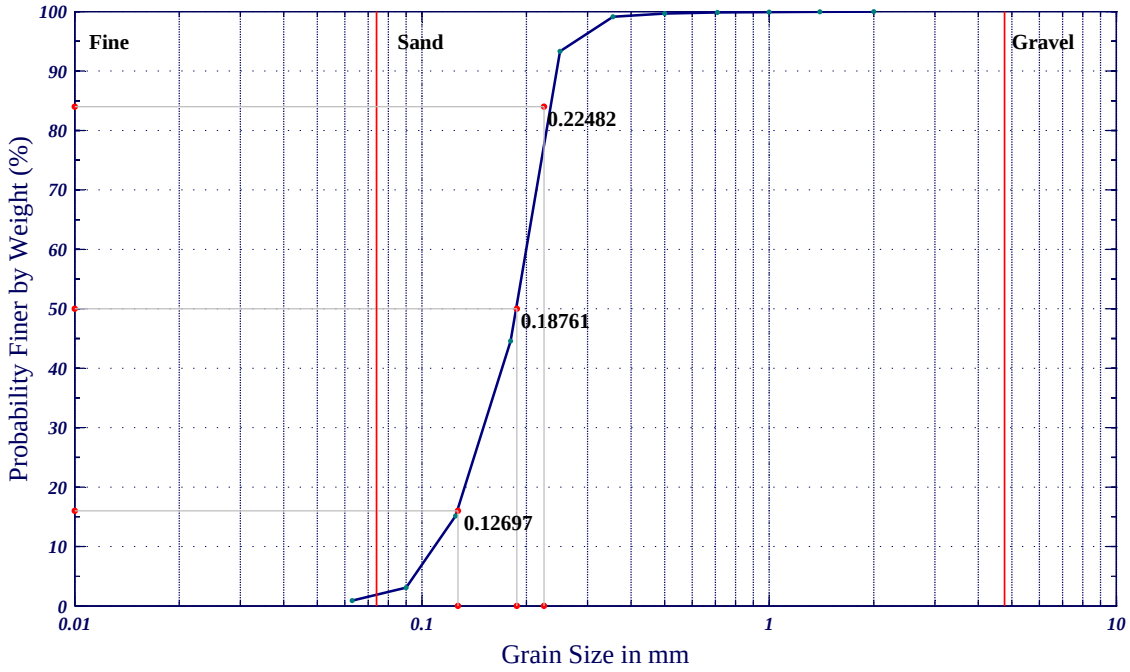
Sample ID: B-1P-9
Sample Depth: 15.8-16.0ft

Easting: 3,709,969*
Northing: 439,300*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.099	3.333
D10:	0.114	3.129
D16:	0.127	2.977
D25:	0.146	2.776
D30:	0.155	2.687
D50:	0.188	2.414
D60:	0.197	2.344
D75:	0.210	2.249
D84:	0.225	2.153
D95:	0.259	1.950
Mean Grain Size:	0.175	2.515
Standard Deviation:	1.353	-0.437

Percent of Gravel (16mm-2.00mm): 0.02
Percent of Sand (2.00mm-0.075mm): 96.92
Percent of Fines (<= 0.074mm): 3.08
Classification: Fine sand(sp)

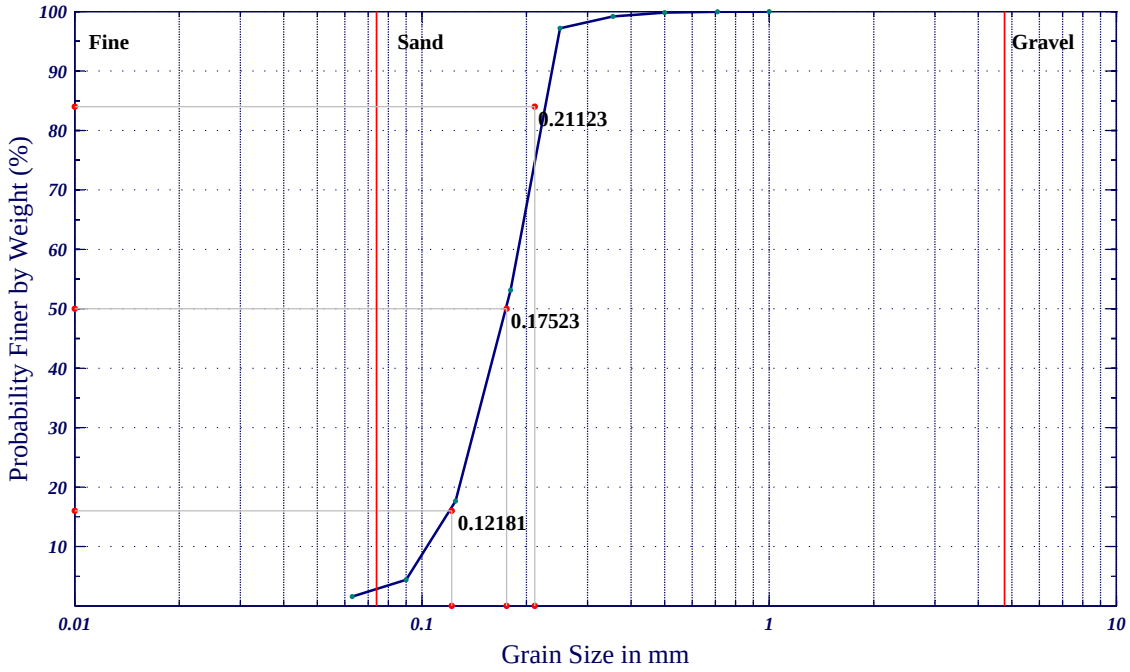
Sample ID: B-1P-10
Sample Depth: 17.8-18.2ft

Easting: 3,709,969*
Northing: 439,300*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: **(mm)** **(phi)**

D5:	0.093	3.431
D10:	0.109	3.191
D16:	0.122	3.037
D25:	0.139	2.851
D30:	0.147	2.769
D50:	0.175	2.513
D60:	0.188	2.409
D75:	0.200	2.324
D84:	0.211	2.243
D95:	0.241	2.053
Mean Grain Size:	0.165	2.598
Standard Deviation:	1.346	-0.428

Percent of Gravel (16mm-2.00mm): 0.00
Percent of Sand (2.00mm-0.075mm): 95.60
Percent of Fines (<= 0.074mm): 4.40
Classification: Fine sand(sp)

Sample ID: B-1P-11
Sample Depth: 19.2-19.5ft

Easting: 3,709,969*
Northing: 439,300*
*Coordinates are feet, LA-1702

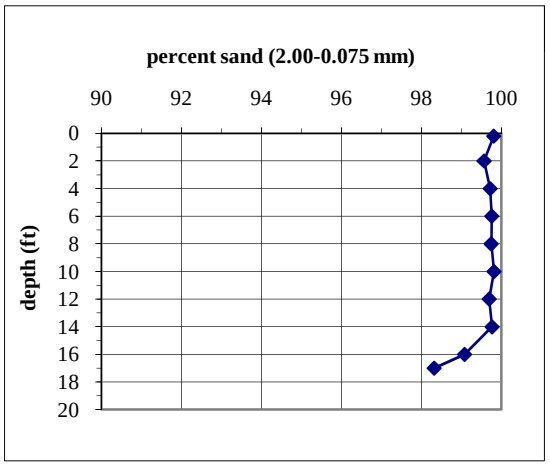
OSI No.: 11ES002

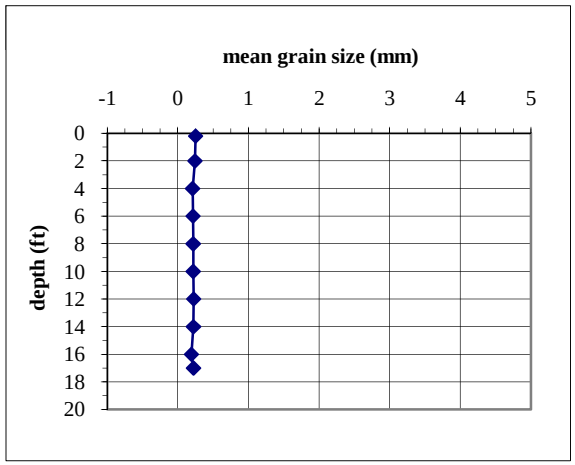
Long Distance Sediment Pipeline Project, Bayou Dupont Borrow Area **Ocean Surveys, Inc.**

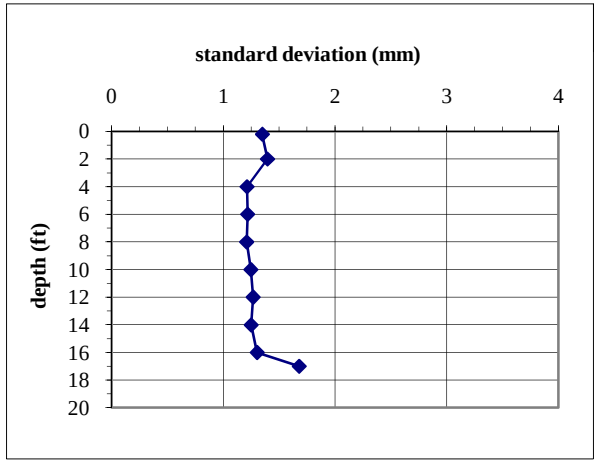
Grainsize Data Table

Core ID B-1B

Sample I.D.	Sample depth in core(ft)	Units	5% sample finer than	10% sample finer than	16% sample finer than	25% sample finer than	30% sample finer than	50% sample finer than	60% sample finer than	75% sample finer than	84% sample finer than	95% sample finer than	Sample mean grain size	Standard Deviation	%Gravel	%Sand	%Fines
B-1B-1	0.2	mm	0.161	0.174	0.189	0.208	0.216	0.249	0.269	0.304	0.337	0.407	0.251	1.349	0.05	99.81	0.19
		phi	2.639	2.519	2.401	2.268	2.214	2.008	1.894	1.717	1.569	1.296	1.993	-0.432			
B-1B-2	2.0	mm	0.149	0.166	0.178	0.197	0.206	0.235	0.257	0.297	0.336	0.424	0.242	1.395	0.14	99.57	0.43
		phi	2.747	2.587	2.488	2.341	2.282	2.087	1.962	1.750	1.574	1.237	2.050	-0.480			
B-1B-3	4.0	mm	0.148	0.166	0.176	0.190	0.196	0.210	0.216	0.231	0.246	0.285	0.209	1.213	0.02	99.72	0.28
		phi	2.757	2.594	2.505	2.397	2.353	2.252	2.211	2.116	2.024	1.810	2.260	-0.278			
B-1B-4	6.0	mm	0.151	0.171	0.183	0.197	0.202	0.215	0.222	0.239	0.255	0.301	0.216	1.219	0.20	99.76	0.24
		phi	2.732	2.551	2.448	2.346	2.308	2.214	2.171	2.066	1.973	1.730	2.212	-0.286			
B-1B-5	8.0	mm	0.154	0.174	0.186	0.199	0.204	0.217	0.223	0.240	0.255	0.300	0.218	1.209	0.01	99.75	0.25
		phi	2.696	2.523	2.426	2.330	2.294	2.206	2.164	2.061	1.970	1.737	2.201	-0.274			
B-1B-6	10.0	mm	0.150	0.169	0.181	0.196	0.201	0.217	0.224	0.244	0.263	0.324	0.218	1.248	0.01	99.82	0.18
		phi	2.736	2.564	2.463	2.354	2.312	2.207	2.156	2.032	1.926	1.626	2.199	-0.319			
B-1B-7	12.0	mm	0.153	0.171	0.183	0.198	0.204	0.220	0.230	0.254	0.277	0.344	0.224	1.268	0.08	99.70	0.30
		phi	2.705	2.545	2.447	2.337	2.295	2.184	2.123	1.978	1.853	1.538	2.161	-0.343			
B-1B-8	14.0	mm	0.155	0.173	0.185	0.198	0.204	0.219	0.227	0.248	0.269	0.336	0.222	1.250	0.04	99.77	0.23
		phi	2.690	2.532	2.435	2.333	2.294	2.194	2.141	2.011	1.894	1.572	2.174	-0.322			
B-1B-9	16.0	mm	0.127	0.142	0.155	0.167	0.173	0.197	0.205	0.222	0.241	0.321	0.194	1.303	0.01	99.08	0.92
		phi	2.977	2.813	2.690	2.580	2.531	2.346	2.288	2.170	2.055	1.640	2.364	-0.381			
B-1B-10	17.0	mm	0.122	0.142	0.157	0.173	0.183	0.209	0.223	0.263	0.336	0.738	0.223	1.631	1.55	98.32	1.68
		phi	3.030	2.820	2.669	2.528	2.453	2.258	2.165	1.926	1.573	0.438	2.167	-0.706			

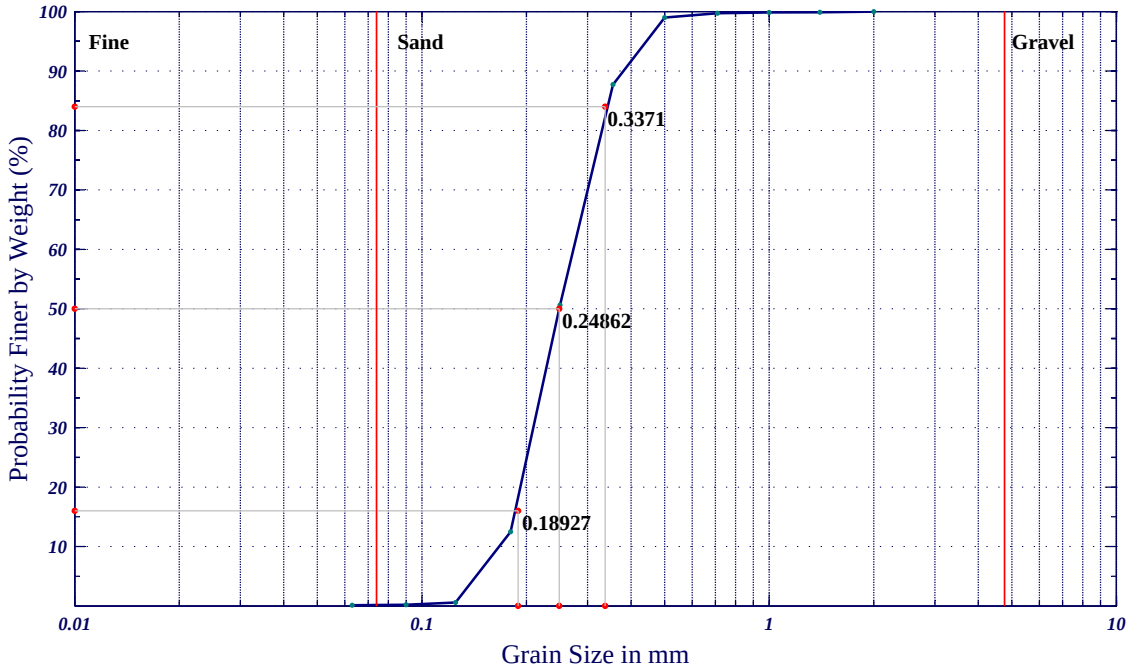






Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: **(mm)** **(phi)**

D5:	0.161	2.639
D10:	0.174	2.519
D16:	0.189	2.401
D25:	0.208	2.268
D30:	0.216	2.214
D50:	0.249	2.008
D60:	0.269	1.894
D75:	0.304	1.717
D84:	0.337	1.569
D95:	0.407	1.296
Mean Grain Size:	0.251	1.993
Standard Deviation:	1.349	-0.432

Percent of Gravel (16mm-2.00mm): 0.05
Percent of Sand (2.00mm-0.075mm): 99.81
Percent of Fines (<= 0.074mm): 0.19
Classification: Fine sand(sp)

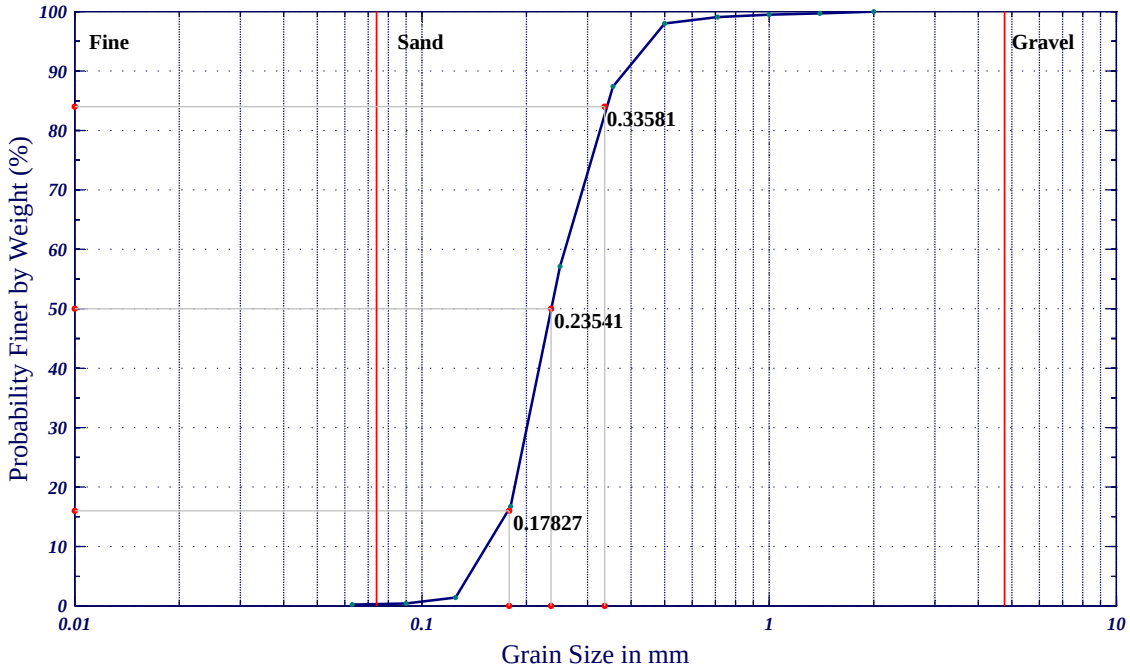
Sample ID: B-1B-1
Sample Depth: 0.0-0.4ft

Easting: 3,710,486*
Northing: 439,526*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results:

	(mm)	(phi)
D5:	0.149	2.747
D10:	0.166	2.587
D16:	0.178	2.488
D25:	0.197	2.341
D30:	0.206	2.282
D50:	0.235	2.087
D60:	0.257	1.962
D75:	0.297	1.750
D84:	0.336	1.574
D95:	0.424	1.237
Mean Grain Size:	0.242	2.050
Standard Deviation:	1.395	-0.480

Percent of Gravel (16mm-2.00mm): 0.14
Percent of Sand (2.00mm-0.075mm): 99.57
Percent of Fines (<= 0.074mm): 0.43
Classification: Fine sand(sp)

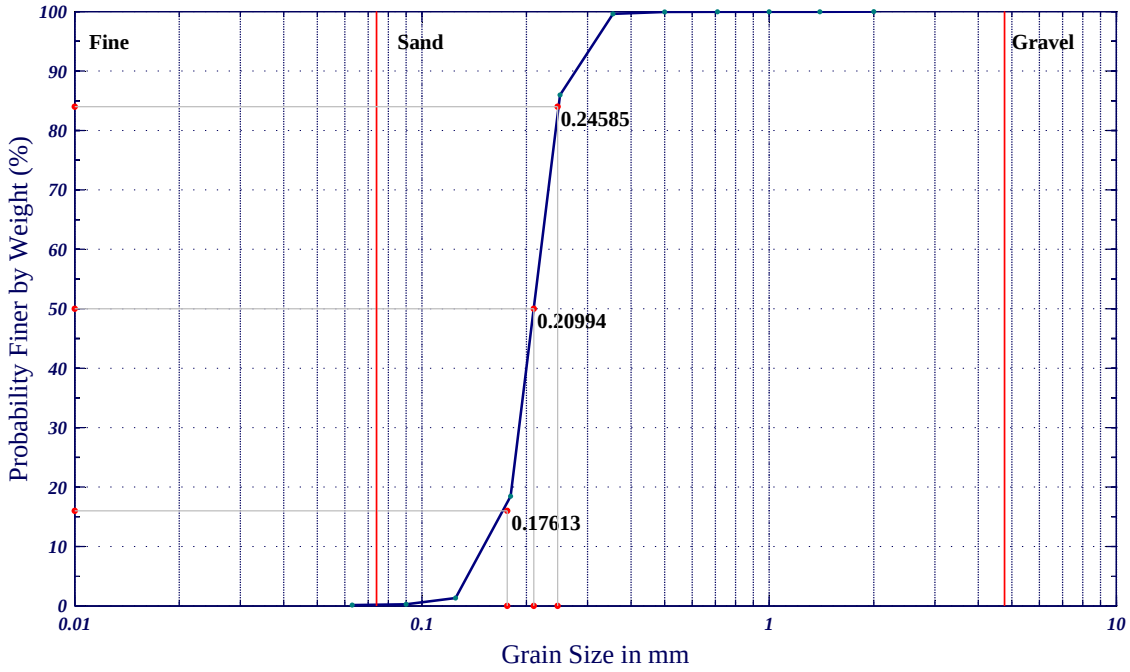
Sample ID: B-1B-2
Sample Depth: 1.8-2.2ft

Easting: 3,710,486*
Northing: 439,526*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.148	2.757
D10:	0.166	2.594
D16:	0.176	2.505
D25:	0.190	2.397
D30:	0.196	2.353
D50:	0.210	2.252
D60:	0.216	2.211
D75:	0.231	2.116
D84:	0.246	2.024
D95:	0.285	1.810
Mean Grain Size:	0.209	2.260
Standard Deviation:	1.213	-0.278

Percent of Gravel (16mm-2.00mm): 0.02
Percent of Sand (2.00mm-0.075mm): 99.72
Percent of Fines (<= 0.074mm): 0.28
Classification: Fine sand(sp)

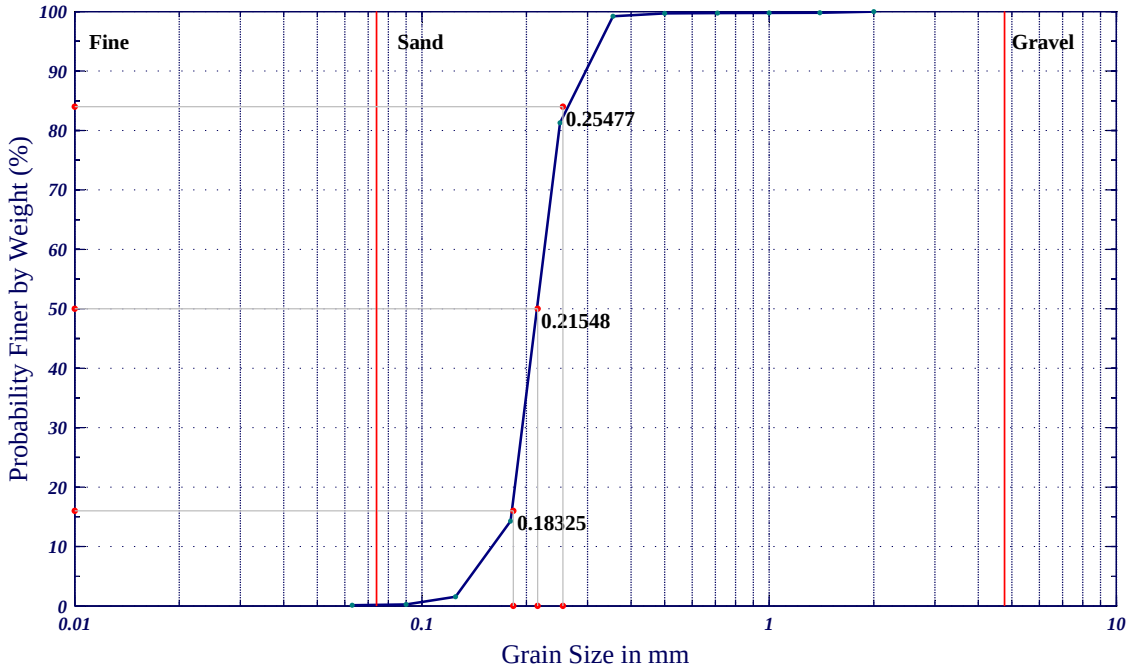
Sample ID: B-1B-3
Sample Depth: 3.8-4.2ft

Easting: 3,710,486*
Northing: 439,526*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.151	2.732
D10:	0.171	2.551
D16:	0.183	2.448
D25:	0.197	2.346
D30:	0.202	2.308
D50:	0.215	2.214
D60:	0.222	2.171
D75:	0.239	2.066
D84:	0.255	1.973
D95:	0.301	1.730
Mean Grain Size:	0.216	2.212
Standard Deviation:	1.219	-0.286

Percent of Gravel (16mm-2.00mm): 0.20
Percent of Sand (2.00mm-0.075mm): 99.76
Percent of Fines (<= 0.074mm): 0.24
Classification: Fine sand(sp)

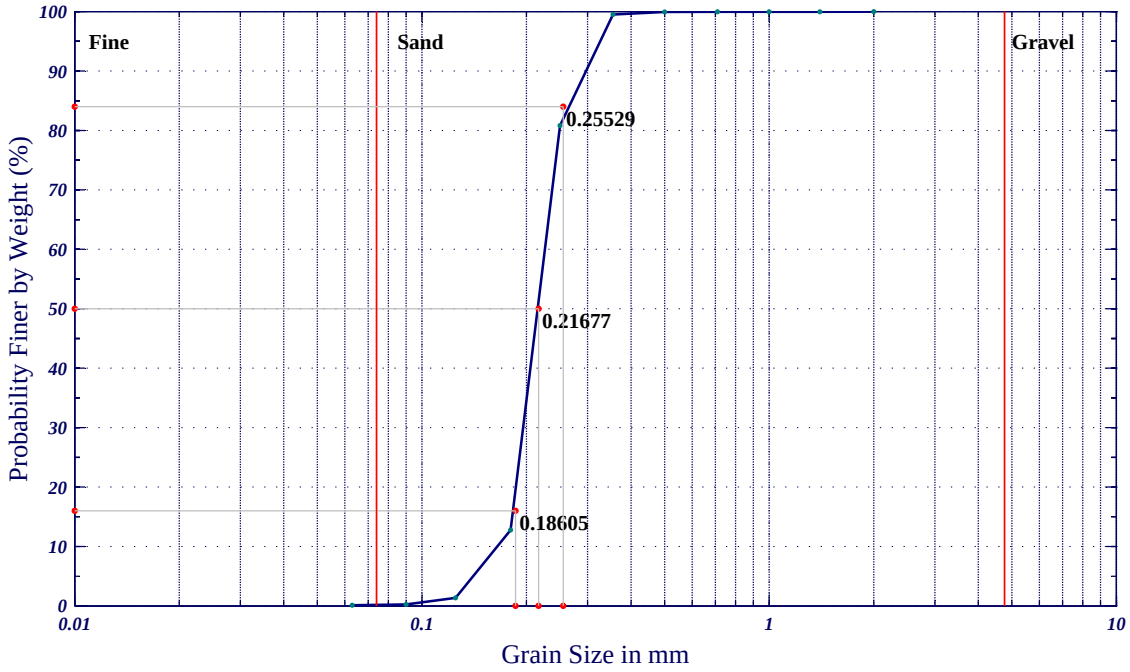
Sample ID: B-1B-4
Sample Depth: 5.8-6.2ft

Easting: 3,710,486*
Northing: 439,526*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.154	2.696
D10:	0.174	2.523
D16:	0.186	2.426
D25:	0.199	2.330
D30:	0.204	2.294
D50:	0.217	2.206
D60:	0.223	2.164
D75:	0.240	2.061
D84:	0.255	1.970
D95:	0.300	1.737
Mean Grain Size:	0.218	2.201
Standard Deviation:	1.209	-0.274

Percent of Gravel (16mm-2.00mm): 0.01
Percent of Sand (2.00mm-0.075mm): 99.75
Percent of Fines (<= 0.074mm): 0.25
Classification: Fine sand(sp)

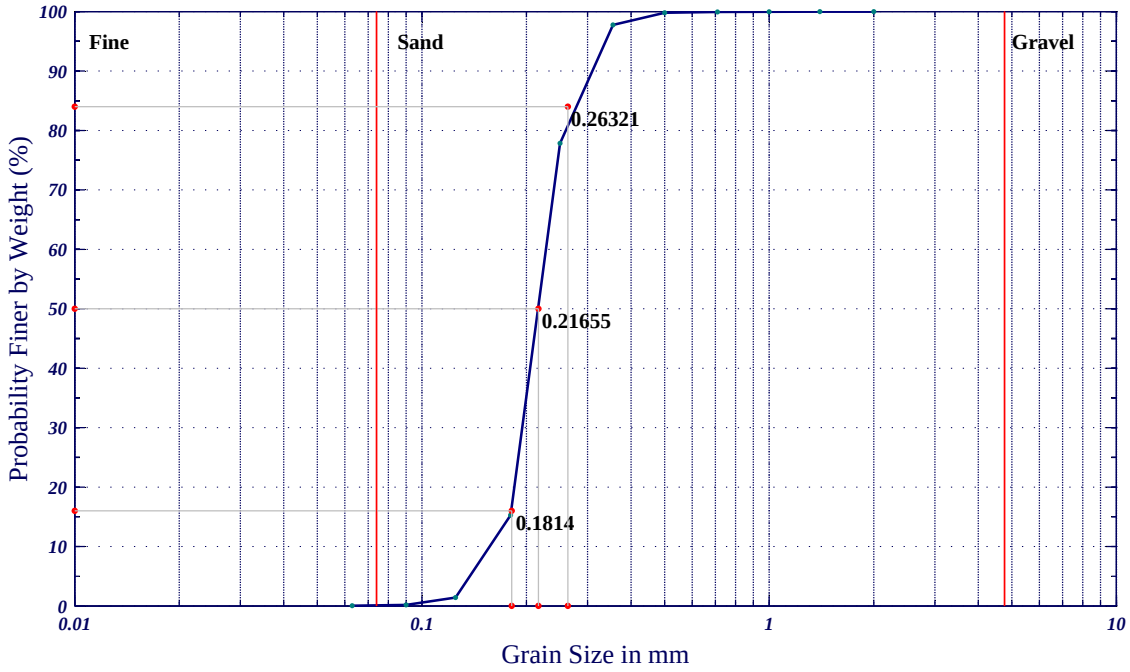
Sample ID: B-1B-5
Sample Depth: 7.8-8.2ft

Easting: 3,710,486*
Northing: 439,526*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: **(mm)** **(phi)**

D5:	0.150	2.736
D10:	0.169	2.564
D16:	0.181	2.463
D25:	0.196	2.354
D30:	0.201	2.312
D50:	0.217	2.207
D60:	0.224	2.156
D75:	0.244	2.032
D84:	0.263	1.926
D95:	0.324	1.626
Mean Grain Size:	0.218	2.199
Standard Deviation:	1.248	-0.319

Percent of Gravel (16mm-2.00mm): 0.01
Percent of Sand (2.00mm-0.075mm): 99.82
Percent of Fines (<= 0.074mm): 0.18
Classification: Fine sand(sp)

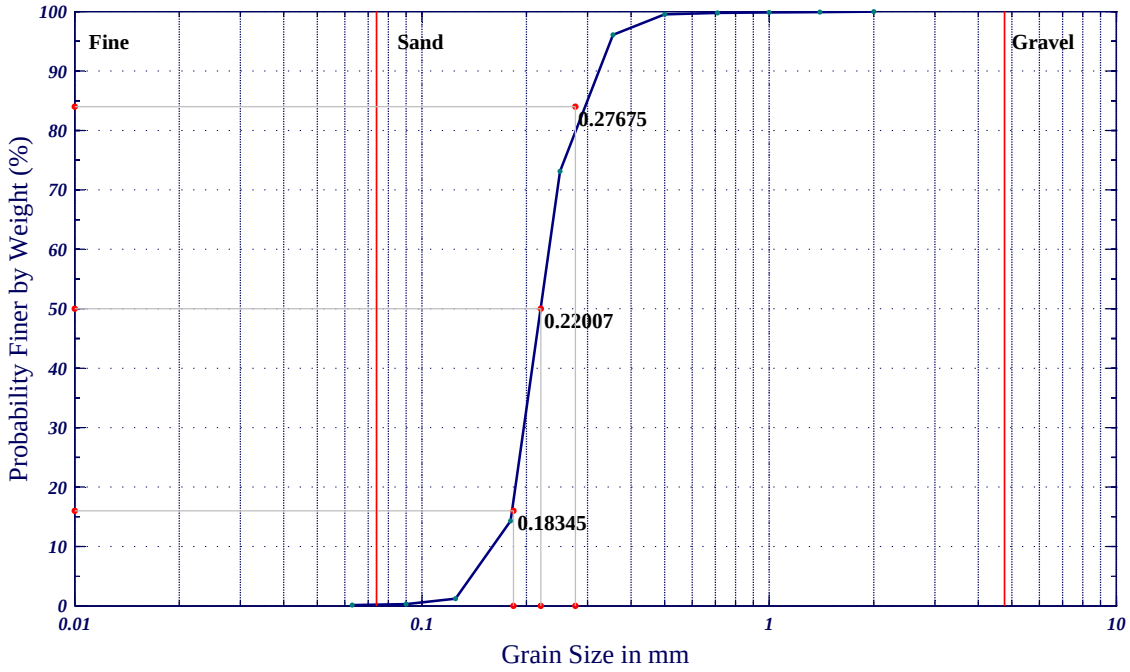
Sample ID: B-1B-6
Sample Depth: 9.8-10.2ft

Easting: 3,710,486*
Northing: 439,526*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.153	2.705
D10:	0.171	2.545
D16:	0.183	2.447
D25:	0.198	2.337
D30:	0.204	2.295
D50:	0.220	2.184
D60:	0.230	2.123
D75:	0.254	1.978
D84:	0.277	1.853
D95:	0.344	1.538
Mean Grain Size:	0.224	2.161
Standard Deviation:	1.268	-0.343

Percent of Gravel (16mm-2.00mm): 0.08
Percent of Sand (2.00mm-0.075mm): 99.70
Percent of Fines (<= 0.074mm): 0.30
Classification: Fine sand(sp)

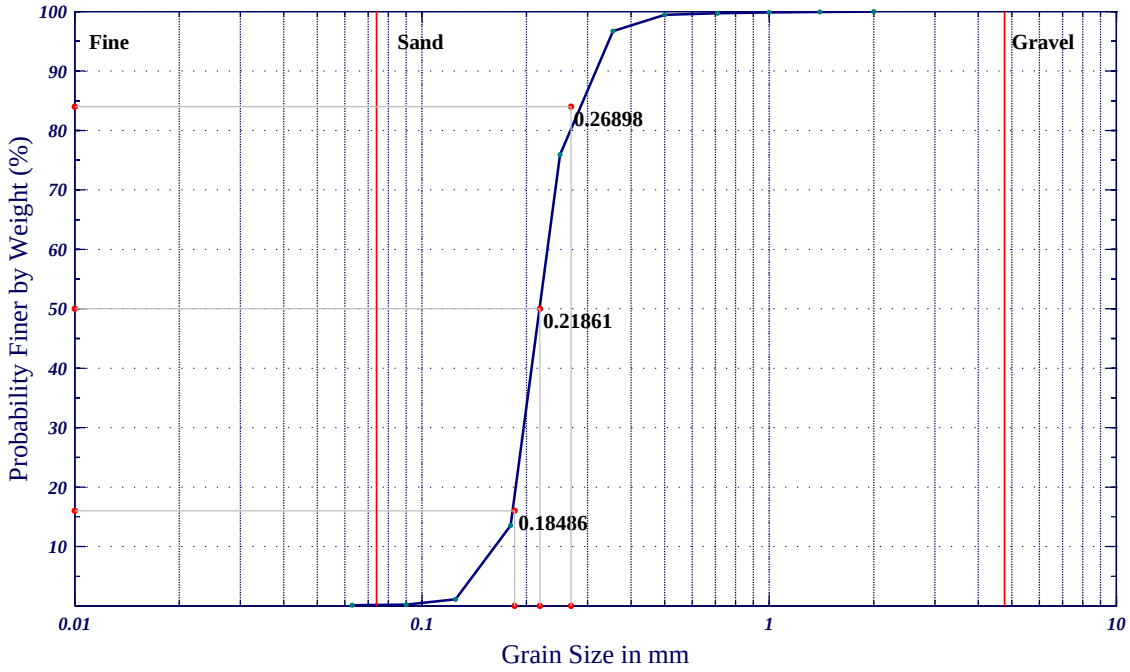
Sample ID: B-1B-7
Sample Depth: 11.8-12.2ft

Easting: 3,710,486*
Northing: 439,526*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results:	(mm)	(phi)
D5:	0.155	2.690
D10:	0.173	2.532
D16:	0.185	2.435
D25:	0.198	2.333
D30:	0.204	2.294
D50:	0.219	2.194
D60:	0.227	2.141
D75:	0.248	2.011
D84:	0.269	1.894
D95:	0.336	1.572
Mean Grain Size:	0.222	2.174
Standard Deviation:	1.250	-0.322

Percent of Gravel (16mm-2.00mm): 0.04
Percent of Sand (2.00mm-0.075mm): 99.77
Percent of Fines (<= 0.074mm): 0.23
Classification: Fine sand(sp)

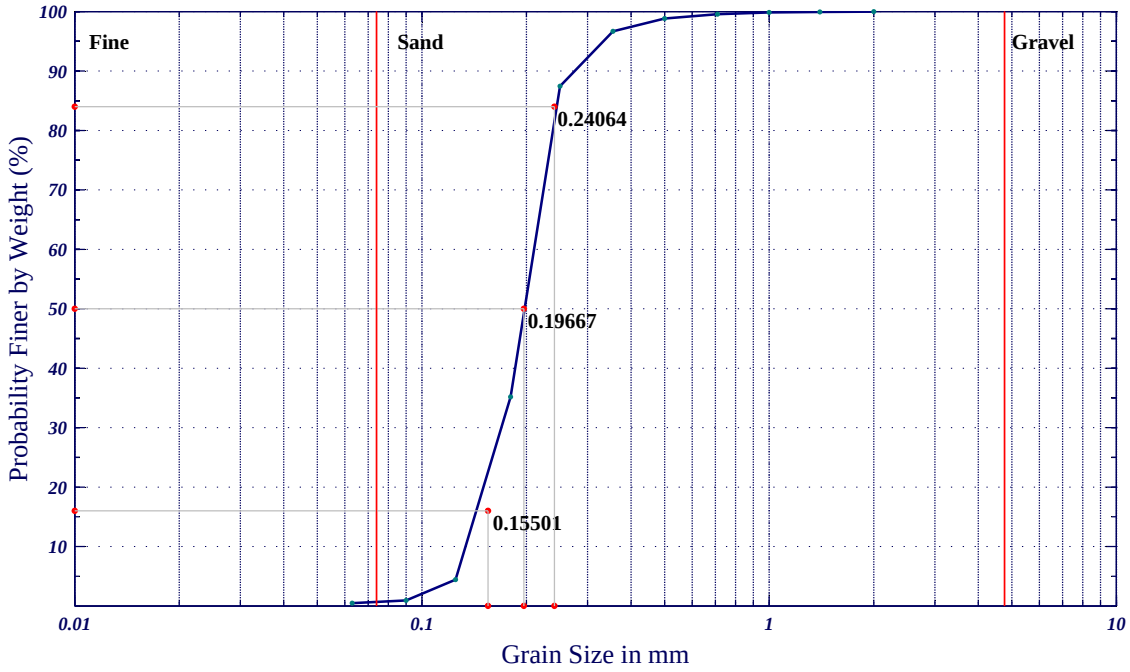
Sample ID: B-1B-8
Sample Depth: 13.8-14.2ft

Easting: 3,710,486*
Northing: 439,526*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: (mm) (phi)

D5:	0.127	2.977
D10:	0.142	2.813
D16:	0.155	2.690
D25:	0.167	2.580
D30:	0.173	2.531
D50:	0.197	2.346
D60:	0.205	2.288
D75:	0.222	2.170
D84:	0.241	2.055
D95:	0.321	1.640
Mean Grain Size:	0.194	2.364
Standard Deviation:	1.303	-0.381

Percent of Gravel (16mm-2.00mm): 0.01
Percent of Sand (2.00mm-0.075mm): 99.08
Percent of Fines (<= 0.074mm): 0.92
Classification: Fine sand(sp)

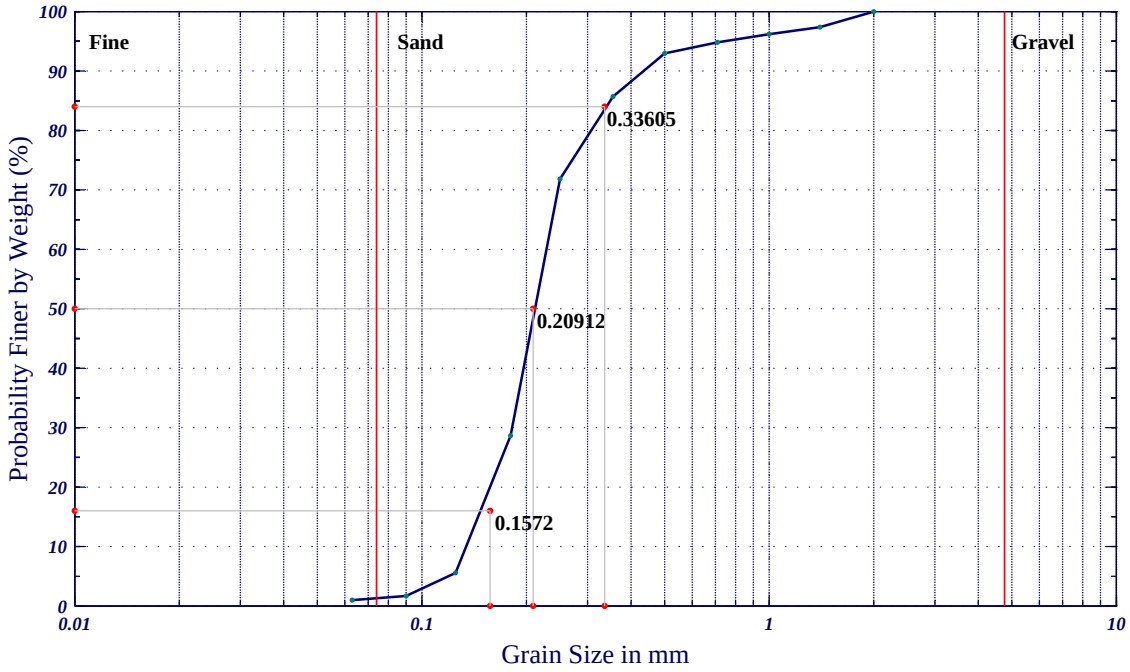
Sample ID: B-1B-9
Sample Depth: 15.8-16.2ft

Easting: 3,710,486*
Northing: 439,526*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

Long Distance Sediment Pipeline Project, Bayou Dupont Burrow Area

Grain Size Distribution-Cumulative Probability Curve



Sieve Analysis Results: **(mm)** **(phi)**

D5:	0.122	3.030
D10:	0.142	2.820
D16:	0.157	2.669
D25:	0.173	2.528
D30:	0.183	2.453
D50:	0.209	2.258
D60:	0.223	2.165
D75:	0.263	1.926
D84:	0.336	1.573
D95:	0.738	0.438
Mean Grain Size:	0.223	2.167
Standard Deviation:	1.631	-0.706

Percent of Gravel (16mm-2.00mm): 1.55
Percent of Sand (2.00mm-0.075mm): 98.32
Percent of Fines (<= 0.074mm): 1.68
Classification: Fine sand(sp)

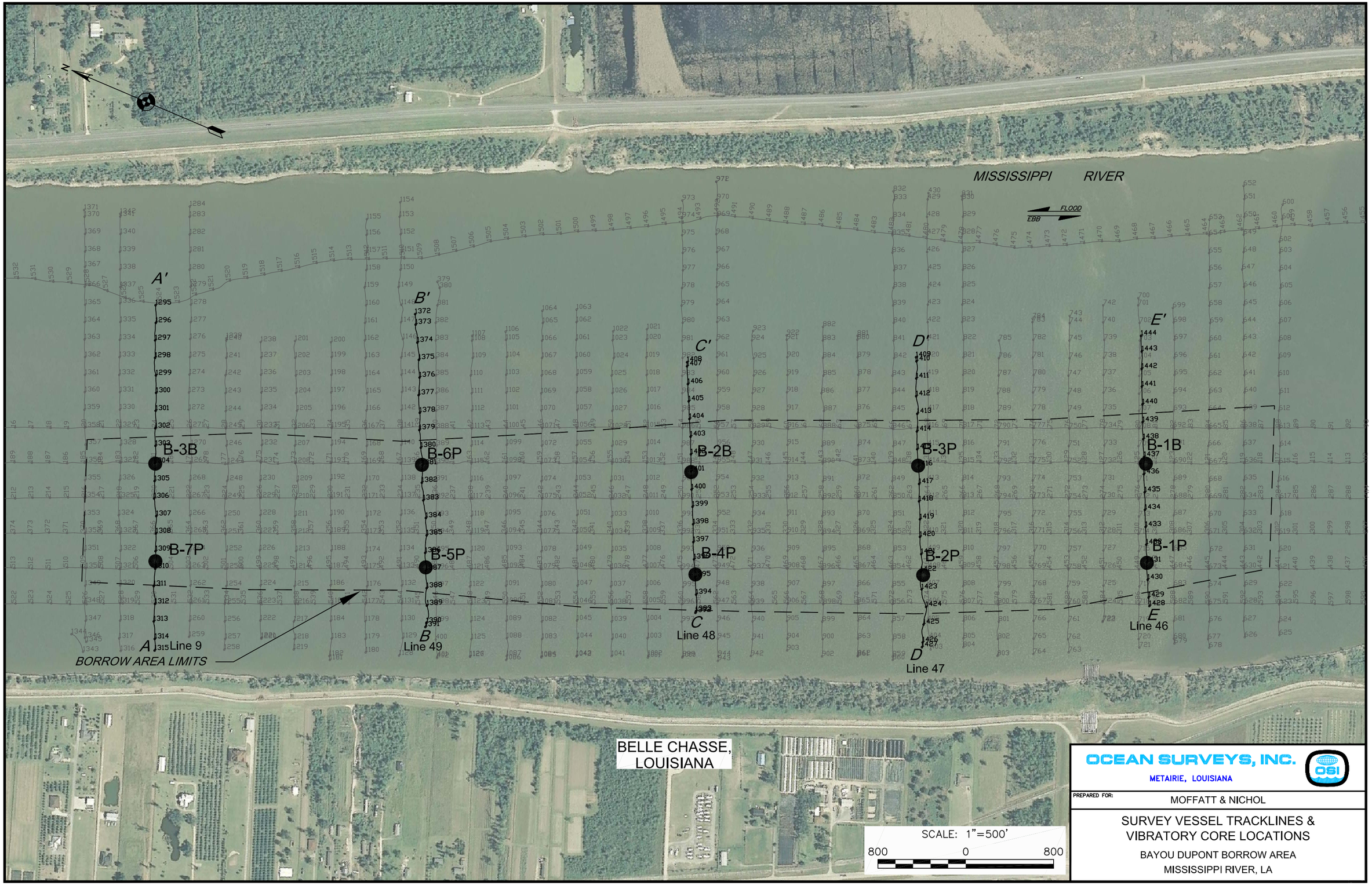
Sample ID: B-1B-10
Sample Depth: 16.8-17.2ft

Easting: 3,710,486*
Northing: 439,526*
*Coordinates are feet, LA-1702

OSI No.: 11ES002

APPENDIX 3

REPRESENTATIVE SUBBOTTOM PROFILES



OCEAN SURVEYS, INC.

METAIRIE, LOUISIANA

PREPARED FOR: MOFFATT & NICHOL

SURVEY VESSEL TRACKLINES & VIBRATORY CORE LOCATIONS

BAYOU DUPONT BORROW AREA

MISSISSIPPI RIVER, LA

OSI JOB NO. 11ES002

LINE 9

A
SW

BORROW AREA LIMITS

A′
NE

EVENTS 1315 1310 1305 1300 1295

-20 -30 -40 -50 -60 -70 -80 -90 -100

ELEVATION NAVD 88 (FEET)

B-7P

B-3B

RIVER BED

LEGEND

COMPOSITE DREDGE *CUT HORIZON* BASED ON USACE HYDROGRAPHIC SURVEYS (FALL 2009-SPRING 2010)

INTERPRETED CUT ELEVATION

VIBRATORY CORE DESCRIPTION - PREDOMINATE SEDIMENTS

- NO RECOVERY
- MED-FINE SAND (LIGHT BROWN)
- ORGANICS
- MED-FINE SAND (GRAY TO DARK BROWN)
- MIXED SEDIMENTS
- CLAY

OCEAN SURVEYS, INC.
Metairie, Louisiana

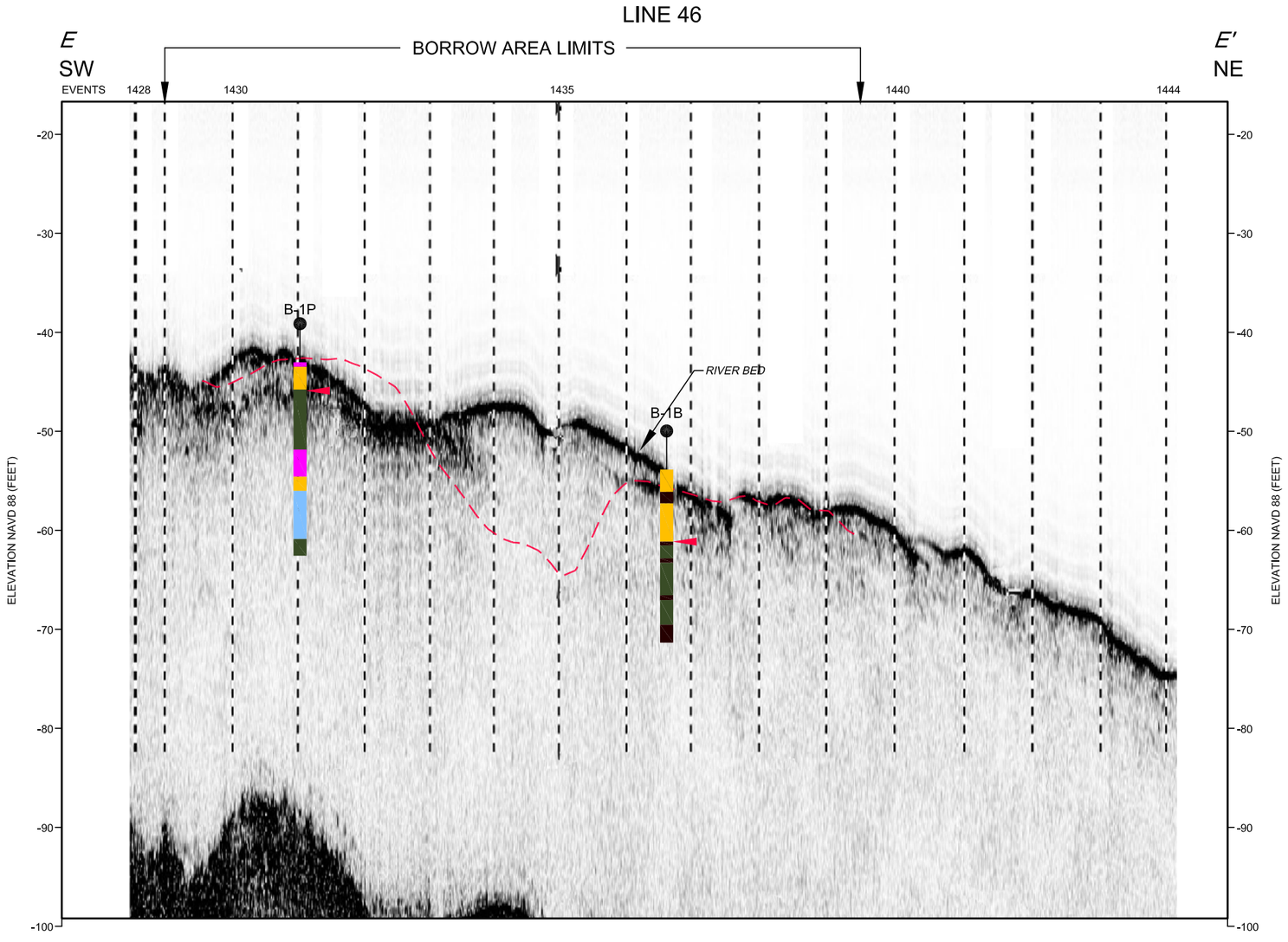
PREPARED FOR: MOFFATT & NICHOL

SUBBOTTOM PROFILE
LINE 9

BAYOU DUPONT BORROW AREA
MISSISSIPPI RIVER, LA

OSI JOB NO. 11ES002

LINE 46



LEGEND

COMPOSITE DREDGE *CUT HORIZON* BASED ON USACE HYDROGRAPHIC SURVEYS (FALL 2009-SPRING 2010)

INTERPRETED CUT ELEVATION

VIBRATORY CORE DESCRIPTION - PREDOMINATE SEDIMENTS

- NO RECOVERY
- FINE SAND (LIGHT BROWN)
- ORGANICS
- MED-FINE SAND (GRAY TO DARK BROWN)
- MIXED SEDIMENTS
- CLAY

OCEAN SURVEYS, INC.
Metairie, Louisiana

PREPARED FOR: MOFFATT & NICHOL

SUBBOTTOM PROFILE
LINE 46

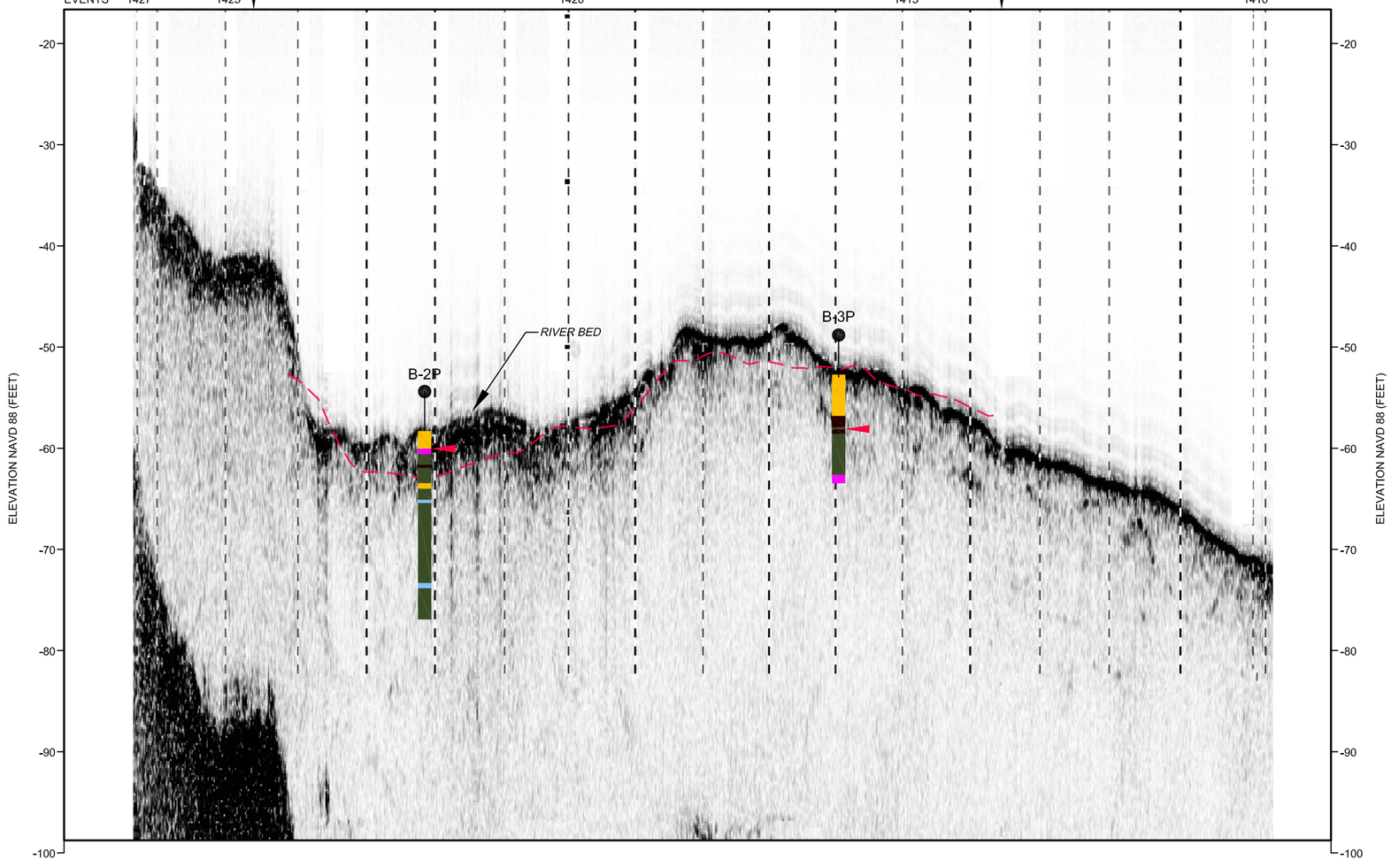
BAYOU DUPONT BORROW AREA
MISSISSIPPI RIVER, LA

OSI JOB NO. 11ES002

LINE 47

BORROW AREA LIMITS

D SW — *D′* NE



LEGEND

COMPOSITE DREDGE *CUT HORIZON* BASED ON USACE HYDROGRAPHIC SURVEYS (FALL 2009-SPRING 2010)

INTERPRETED CUT ELEVATION

VIBRATORY CORE DESCRIPTION - PREDOMINATE SEDIMENTS

- NO RECOVERY
- FINE SAND (LIGHT BROWN)
- ORGANICS
- MED-FINE SAND (GRAY TO DARK BROWN)
- MIXED SEDIMENTS
- CLAY

OCEAN SURVEYS, INC.
Metairie, Louisiana

PREPARED FOR: MOFFATT & NICHOL

SUBBOTTOM PROFILE
LINE 47

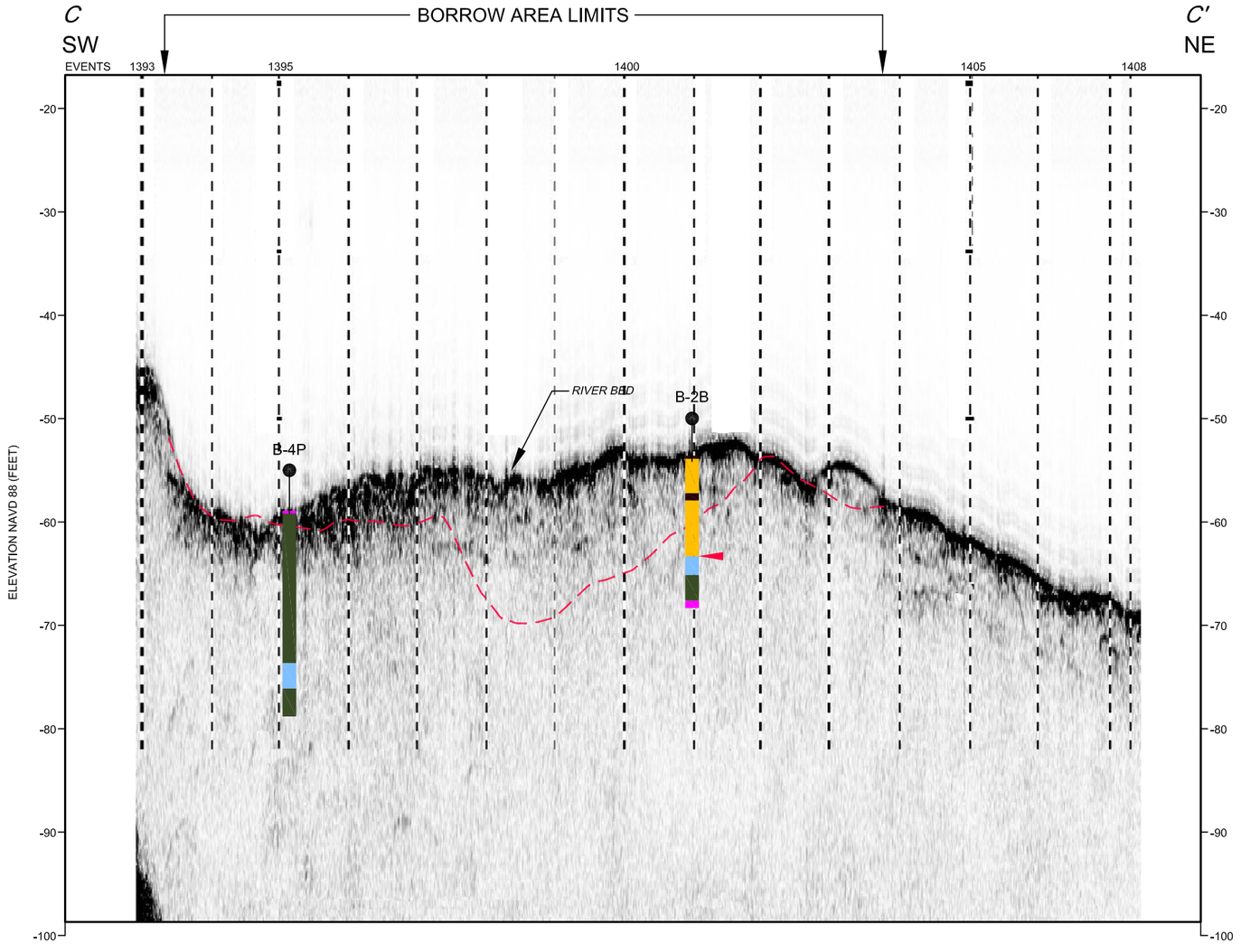
BAYOU DUPONT BORROW AREA
MISSISSIPPI RIVER, LA

OSI JOB NO. 11ES002

LINE 48

BORROW AREA LIMITS

C SW — C′ NE



LEGEND

COMPOSITE DREDGE *CUT HORIZON* BASED ON USACE HYDROGRAPHIC SURVEYS (FALL 2009-SPRING 2010)

INTERPRETED CUT ELEVATION

VIBRATORY CORE DESCRIPTION - PREDOMINATE SEDIMENTS

- NO RECOVERY
- MED-FINE SAND (LIGHT BROWN)
- ORGANICS
- MED-FINE SAND (GRAY TO DARK BROWN)
- MIXED SEDIMENTS
- CLAY

OCEAN SURVEYS, INC.
Metairie, Louisiana

PREPARED FOR: MOFFATT & NICHOL

SUBBOTTOM PROFILE
LINE 48

BAYOU DUPONT BORROW AREA
MISSISSIPPI RIVER, LA

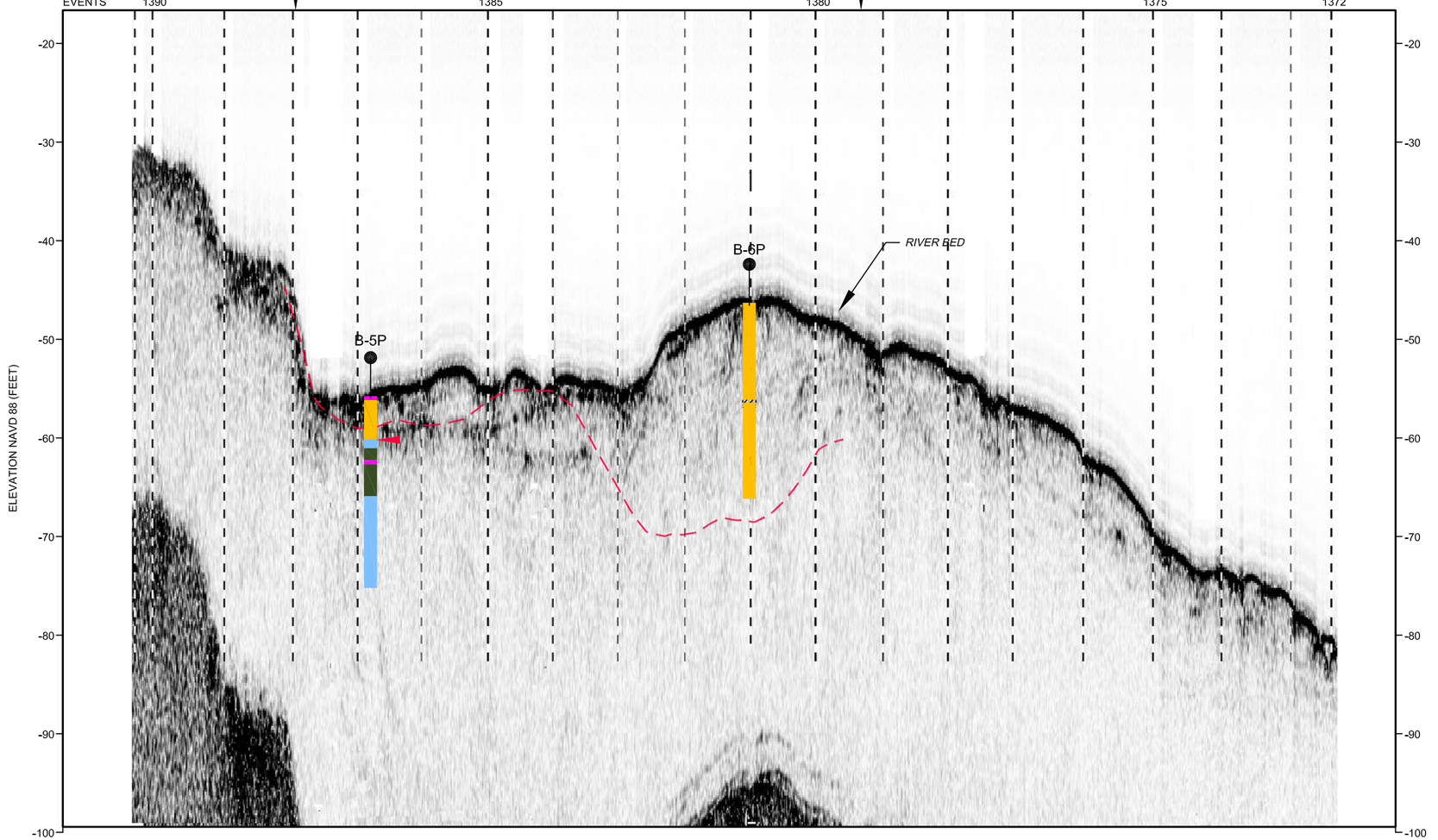
OSI JOB NO. 11ES002

LINE 49

B
SW

BORROW AREA LIMITS

B′
NE



LEGEND

COMPOSITE DREDGE *CUT HORIZON* BASED ON USACE HYDROGRAPHIC SURVEYS (FALL 2009-SPRING 2010)

INTERPRETED CUT ELEVATION

VIBRATORY CORE DESCRIPTION - PREDOMINATE SEDIMENTS

- NO RECOVERY
- MED-FINE SAND (LIGHT BROWN)
- ORGANICS
- MED-FINE SAND (GRAY TO DARK BROWN)
- MIXED SEDIMENTS
- CLAY

OCEAN SURVEYS, INC.
Metairie, Louisiana

PREPARED FOR: MOFFATT & NICHOL

SUBBOTTOM PROFILE
LINE 49

BAYOU DUPONT BORROW AREA
MISSISSIPPI RIVER, LA

OSI JOB NO. 11ES002

RESULTS OF BAYOU DUPONT GEOPHYSICAL SURVEY

By

Harry H. Roberts
Coastal Studies Institute
Department of Oceanography and Coastal Sciences
Louisiana State University
Baton Rouge, Louisiana 70803

Report Submitted to:

Louisiana Department of Natural Resources
Coastal Engineering Division

Project Support: LADNR Purchase Order No. 3145209
Louisiana State University

September 28, 2007

MISSISSIPPI RIVER SEDIMENT DELIVERY SYSTEM – BAYOU DUPONT (BA-39)

INTRODUCTION

The Mississippi River Sediment Delivery System – Bayou Dupont Project (Project No. BA-39) is located in the Barataria Basin about 3.7 miles (5.9 km) northwest of Myrtle Grove as shown in Figure 1.

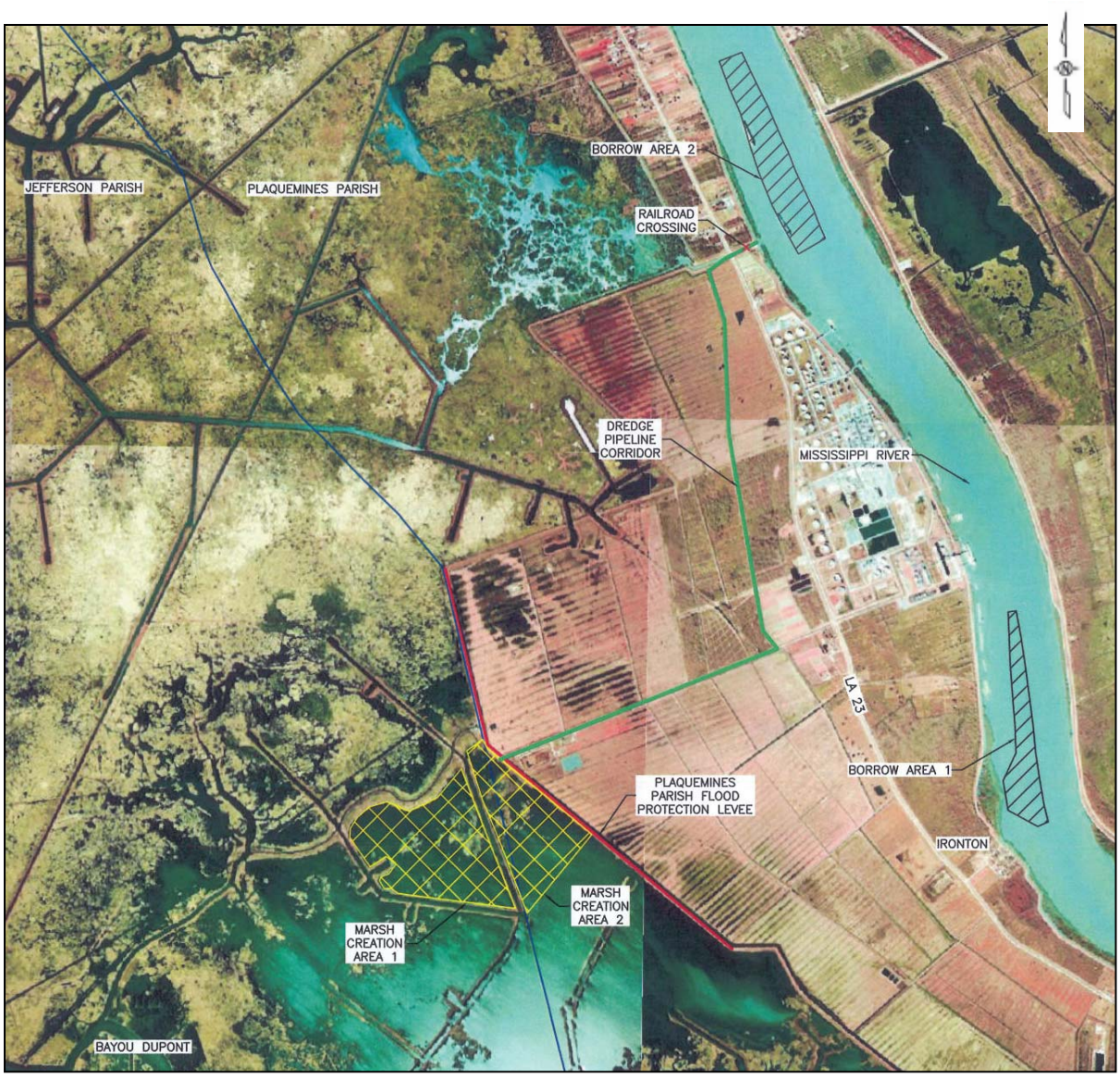


Figure 1 – Proposed Project Area and Features

The objective of the project is to create approximately 493 acres of sustainable marsh using the renewable resources of Mississippi River sediment. The project area is at present is mostly open water. The project area is located near the Mississippi River. The intent is to create

marsh by hydraulically dredging sediment from the Mississippi River to fill the open water and broken marsh areas west of the Plaquemines parish flood protection levee. (Figure1). Availability of compatible and adequate sediment and its location is critical to the success of the project. Approximately 3.5 million cubic yards of sediment are required for restoration.

Approximately 8.4 line miles (13.5 km) of bathymetric, side-scan sonar, high resolution seismic, and magnetic data were collected along preselected tracklines on August 2, 2007. This narrative describes the methodology and the results of the survey in the borrow area.

METHODS OF DATA COLLECTION AND ANALYSIS

A high resolution acoustic and magnetometer data collection survey was conducted for the proposed Bayou Dupont sand borrow area (Figure 1). Magnetometer data were collected simultaneously with side-scan sonar data, chirp sonar subbottom profiles, and bathymetry using standard procedures for riverine and shallow marine geophysical surveys (Roberts et al., 1999; Roberts et al., 2000, Finkl et al., 2006). The magnetometer was deployed approximately 100 ft (30 m) off the stern of the survey vessel. A full spectrum subbottom profiler was deployed just below the waterline on the starboard around mid-vessel position. The side-scan fish was deployed on a bowsprit 5 ft (1.5 m) ahead of the vessel in order to minimize turbulence and cavitation. This configuration mitigates vessel related noise in the acoustic data. Geographical coordinates were recorded for all the geophysical data collected, which is essential for integration of the various data sets.

Survey Vessel – R/V Coastal Profiler

The survey was accomplished using the R/V Coastal Profiler. Figure 2 shows this vessel which has an overall length of 41 ft (12.5 m) and a beam of 17 ft (5.2 m). The Profiler is a Lafitte Skiff style vessel designed primarily for shallow water operations. From the outset, this vessel was custom built for shallow water geophysical data acquisition and vibracoring. Special ribbing and other supports were included in the construction to accommodate lifting heavy loads and withstanding substantial sea states. Booms, davits, and wenches were custom built and located on the vessel at optimal sites for towing a variety of data-collection systems. The cabin was built to specifications for accomodation of our computer-based data acquisition units. Two 450 hp Catepillar (model 3126 B) engines power the Profiler. The vessel is equipped with a Simrad Auto Pilot which is essential for running straight survey lines. A 750 gallon fuel tank provides the capacity to run several days without refueling. The hull design and two diesel engines allow us to quickly run to the field sites (cruising speed ~ 22 kts). The Profiler can work comfortably on the continental shelf as well as in Louisiana's shallow bays and rivers. This vessel can operate in water depths as shallow as ~ 3 ft (1 m).

Navigation

Geographical coordinates were recorded simultaneously with all the geophysical data collected. Navigation data were acquired via a C&C Technologies GPS receiver system utilizing SatLoc3 differential GPS with sub-meter accuracy. The navigational data were delivered in real-time and these data were incorporated in the header information magnetometer, echo sounder, side-scan sonar and chirp digital data sets. The GPS-fix data were sent to the data acquisition

systems at a rate of one fix per second. Navigational control was maintained on an IBM compatible PC running ChartView Pro and ArcGIS software. A navigational chart with the plot of the survey plan was displayed by ChartView Pro along with the vessel's position, orientation, course, and speed.

Figure 2. The R/V Coastal Profiler, a custom built vessel for shallow water geophysical survey work and coring.

Magnetometer

A Geometrics Model G882 marine cesium magnetometer was used on the Bayou Dupont survey. The cesium magnetometer sensor and associated electronics modules are housed in a waterproof non-magnetic fiberglass tow body approximately 5 ft (1.5 m) length. This tow body or "fish" is easy to deploy and is equipped with 200 ft (61 m) of tow cable. The system has Maglog software which allows the operator to receive, display, and otherwise manage data from the fish on a PC. In addition, this software allows for integration of magnetometer data with GPS-derived location data.

The raw magnetometer data files were exported as text files to the Geometric software Magmap 2000 and the significant anomalies were flagged. The positions of these flagged anomalies were exported as text files and then imported into ArcGIS for mapping purposes. The offset related to magnetometer sensor position relative to the GPS antenna location on the vessel was calculated for each flagged position exported to ArcGIS. The magnetic anomalies were then superimposed along the tracklines of the side-scan sonar mosaic of the survey area. A table of magnetic anomaly positions and amplitudes was created and included in the Results section of this report (Table 1).

Table 1
Magnetometer Anomaly Summary

Number	Signature Type	Description	Amplitude	Counts	Longitude	Latitude	Interpretation
			Relative (nT)	(Seconds)	(dec deg)	(dec deg)	
1	**Monopolar**	**Extra large negative**	**900.820**	**160**	**-89.9772010**	**29.6945820**	**Dock, Pipelines and Cables**
2	**Dipolar**	**Small**	**24.310**	**30.6**	**-89.9801610**	**29.6995700**	**Unknown**
3	**Complex**	**Medium**	**37.180**	**48.9**	**-89.9836570**	**29.7071140**	**Unknown**
4	**Monopolar**	**Medium -**	**28.410**	**35.2**	**-89.9846110**	**29.7091890**	**Unknown**
5	**Monopolar**	**Medium -**	**31.110**	**34**	**-89.9862830**	**29.7127460**	**Unknown**
6	**Monopolar**	**Medium +**	**11.110**	**21.5**	**-89.9878920**	**29.7161480**	**Unknown**
7	**Complex**	**Medium**	**13.000**	**28**	**-89.9872280**	**29.7174120**	**Unknown**
8	**Monopolar**	**Small -**	**36.130**	**89.5**	**-89.9852070**	**29.7132880**	**Unknown**
9	**Monopolar**	**Small +**	**17.780**	**39**	**-89.9833200**	**29.7092630**	**Unknown**
10	Dipolar	Small	9.120	28.7	-89.9816450	29.7059580	Unknown
11	**Monopolar**	**Small -**	**14.070**	**19.4**	**-89.9803660**	**29.7036800**	Unknown
12	**Monopolar**	**Large -**	**107.870**	**80.3**	**-89.9765060**	**29.6953950**	**Dock, Pipelines and Cables**
13	**Monopolar**	**Medium -**	**26.010**	**51**	**-89.9759620**	**29.6976100**	**Pipelines and Cables**
14	Monopolar	Small -	6.960	35.8	-89.9777410	29.7011480	Unknown
15	Monopolar	Small -	5.740	33.6	-89.9793100	29.7042670	Unknown
16	Complex	Very Small	4.610	80.2	-89.9840420	29.7137020	Unknown
17	**Dipolar (Complex)**	**Medium**	**13.730**	**59.4**	**-89.9854780**	**29.7107010**	**Unknown**
18	Complex	Small -	9.690	25	-89.9870590	29.7104750	Unknown
19	Monopolar	Small -	5.540	32	-89.9861300	29.7112740	Unknown
20	**Monopolar**	**Small +**	**14.820**	**62.4**	**-89.9821570**	**29.7038670**	Unknown
21	**Dipole**	**Large**	**78.270**	**48.4**	**-89.9797380**	**29.6996410**	**Siphon Possible**
22	**Monopolar (Incomplete)**	**Large -**	**293.630**	**79.7**	**-89.9774350**	**29.6952010**	**Dock, Pipelines and Cables**
23	**Negative Drift**	**Small -**	**8.680**	**132.9**	**-89.9761070**	**29.6990370**	**Cable Crossing**
24	Monopolar	Small +	5.940	15.7	-89.9887680	29.7151040	Unknown

Side-Scan Sonar

Side-scan sonar efficiently maps the water bottom, producing an image of the various features and sediment texture that occur there. Side-scan data show reflection amplitudes from acoustic energy output by the side-scan fish and reflected back from the water bottom. Bottom features such as sand waves and ripples are clearly imaged in side-scan data. Also, differences in bottom sediment types can be distinguished from reflection amplitude signatures. With ground truth calibration, discrimination and identification of bottom sediments, such as sand versus clay, is possible from reflection differences.

Side-scan data were acquired simultaneously on port and starboard channels using a Klein model 2260NV digital dual frequency (100 kHz/500 kHz) tow fish and a high fidelity, low loss armored single conductor coaxial tow cable, using methods described in Allen et al. (2005). The swath range of the sonograph was 200 m. Isis software was used for data acquisition and processing (Version 6.9.29.0, Triton Elics International Inc.). Slant, layback, and boat speed corrections were made with data collected during side-scan data acquisition. For these analyses, the 500 kHz channel data were used, since they provide better spatial surface resolution. The individual side-scan lines were converted to a georeferenced TIFF image with 0.7 ft (0.2 m) resolution in both latitude and longitude for representing the river bed of the potential borrow area.

Full Spectrum Subbottom Profiler

High frequency chirp subbottom profiling systems produce high resolution imaging of the shallow subsurface without strong “multiples” associated with other high resolution seismic sources such as boomers and sparkers. This feature makes the chirp sonar an ideal tool for imaging the shallow subsurface in sand searches. Different sediment types reflect the acoustic signal with different strengths, recorded in the chirp data. Therefore, bottom “hardness” can be interpreted from the amplitude of the sediment-water interface or initial bottom reflector. Subbottom data are useful for: 1) discrimination of shallow subsurface stratigraphy, different sediment types, and interpretation of deposition and erosion; and 2) improving the interpretation of geological controls of surface reflectance (side-scan sonar) data.

The EdgeTech SB512i towfish (frequency of 5-12 kHz) and Model FS 5B Signal Processor constitutes the chirp sonar system used on the survey. The subbottom data were acquired by selecting the frequency range of 2-12 kHz at 20 ms. This system is augmented with a CODA DA50 portable computer-based seismic data acquisition system. The system is equipped with a FSSB Network Interface, an analog acquisition card (for use with any analog SBP system), internal 60GB hard drive, and a DVD-RAM storage drive. CODA Geosurvey Windows Office Replay software was used as a digital data acquisition system and for displaying the data in real-time during the acquisition phase.

Subbottom data were saved in the industry standard SEG-Y format. Navigational data were retained for each shotpoint in the SEG-Y data.

RESULTS

Borings of the proposed Bayou Dupont sand borrow site indicate an abundance of sand (Figure 3). The boring logs indicate two distinctive sand types: (1) firm brown sand with occasional seams and disseminated woody organic particles and (2) firm gray sand containing both clay partings and layers of woody organics. It is unclear if both units represent channel sand or if the lower unit is distributary mouth bar sand associated with early progradation of the latest phase of Mississippi River delta-building. For the purpose of restoration, it is not important. What is important is that adequate sand resources are available for the Bayou Dupont project needs. Geophysical data from this survey certainly support the contention that adequate sand resources exist in the project area.

The side-scan sonar mosaic of Figure 4 images a dynamic channel bottom with sands moving down-river primarily as bedload transport by migrating bedforms of various dimensions. Analysis of echo-sounder profiles, chirp sonar profiles (Figure 5), and swaths of side-scan sonar images indicate that the most prevalent bedforms in the area are sand waves. Bigger waves**,** in general, are confined and best defined mostly to the western part of the potential borrow area as seen in the side sonar scan mosaic (Figure - 5). They are both symmetrical and asymmetrical. Slip faces of asymmetrical waves indicate downstream direction. In the western portion of the area these waves range in height from about 3 feet (1 m) to more than 6.5 feet (2 m) with a wave length of about 130 feet (40 m). These mobile bedforms are of a smaller dimension in the eastern part of the area with the height ranging from 1 to 3 feet (0.3 to 1 m) and amplitude 16 to 50 feet (5 to 15 m). The lighter reflection tone observed on the side scan sonar mosaic also indicates the sand. No prominent man-made sonar targets were observed within the study area except for a short section of the BP pipeline in the southwestern part of the site (Figure 4).

Figure 5 illustrates the chirp sonar subbottom profiles acquired along the middle NW-SE oriented survey line shown in the side-scan sonar mosaic of Figure 4. The chirp sonar profile illustrates little subbottom structure. This response on subbottom records in common in sand-dominated settings where sediments have a rather uniform grain size and therefore there are few internal horizons to create the acoustic impedance difference necessary to create reflection horizons. In addition, sand is very reflective. So, much of the energy is simply reflected at he sediment-water interface. Regardless, the response recorded on the chirp sonar records further substantiates the presence of sand throughout the project's proposed borrow area as documented by the borings of Figure 3.

Analysis of the magnetometer data generated by the Bayou Dupont survey identified 24 magnetic anomalies (Table 1). Close inspection of the side-scan sonar data associated with each survey line indicated that the only "hard target" corresponding to a magnetic anomaly was the western portions of the 20 inch and 24 inch BP pipelines (see Figure 4). No side-scan sonar targets were found for the other 23 magnetic anomalies. Because the river bed is composed of highly mobile sand deposits, burial of scattered magnetic debris is highly probable.

Figure 6 is a plot of the locations and relative strengths of the magnetic anomalies superimposed on the side-scan sonar mosaic. Table 1 summarizes the location data, amplitudes shapes, and durations of the anomalies. As is very clear from these data, magnetic anomalies 1,

12, and 22 (Figure 6) are very large deflections that reflect the combined magnetic deviations related to the massive steel dock at the Alliance Refinery and the two pipelines (20 inch and 24 inch BP pipelines) that cross the river in the southeastern part of the survey area. The very strong magnetic anomalies (1, 12, 22 in Table 1) associated with the massive steel dock had durations or peak widths (counts in Table 1) that obscure more subtle deflections associated with the BP pipelines. Rather uniform depression of the survey line oriented NE-SW that crosses the area of interest roughly parallel to and overlapping the Entergy cable crossing is uniformly depressed below background levels and either is responding to the cables (if they are metallic) or perhaps the neighboring pipelines.

Magnetic anomalies 2-11, 13-20, and 24 are small to medium sized deflections that are scattered throughout the survey area with no compelling trend. Figure 6 illustrates the distribution of these anomalies and the associated color coding provides an indicator of relative amplitude. These anomalies have monoploar, dipolar, or complex signatures and are of limited amplitude and duration when compared to anomalies 1, 12, and 22. They have characteristics consistent with isolated ferrous objects such as anchors, lengths of pipe, chains vessel equipment, trawl gear, discarded cable, and other metallic objects. Aside from the large magnetic deflections caused by the combined influence of the Alliance Refinery docking facility and the two BP pipelines, anomaly 21 stands out. This anomaly has a dipolar signature and occurs near the western margin of the survey area between the Entergy cable crossing and the siphons along the western bank of the river (see Figures 3 and 6). No targets were identified from the side-scan sonar data at this site and the site seems too far from the siphons to be strongly affected. This anomaly is isolated, but should be treated with respect if dredging operations are initiated in the proposed borrow area. In my opinion, there are no indications of shipwrecks, sunken barges, or other large-scale metallic objects in the proposed borrow area.

SUMMARY

High resolution acoustic data collected on the Bayou Dupont survey underscore that this site has abundant sand resources. The primary data set from this survey, the magnetometer data, identify 24 magnetic anomalies within the project area. Three of the anomalies are huge (1, 12, and 22). The peaks of these anomalies are so large that they are interpreted to incorporate several features, the Alliance Refiner docking facility as well as the two BP pipelines and possibly the Entergy cables. Certainly, extraction of sand resources for the Bayou Dupont project should be confined to areas well north of the pipeline and cable crossings.

Except for anomaly 21, the remaining magnetic anomalies north of the cable crossing are small scattered throughout the project area. These anomalies are consistent with localized metallic debris such as pieces of pipe, anchors, etc. and do not represent large-scale obstructions to dredging. However, anomaly 21 is large enough to warrant concern in a dredging operation. There are no indictors of man-made debris on the side-scan or chirp sonar records for anomaly 21 or any of the other anomalies north of the cable crossing. Therefore, they are considered to be buried by the migrating sand waves common to this part of the Mississippi River channel.

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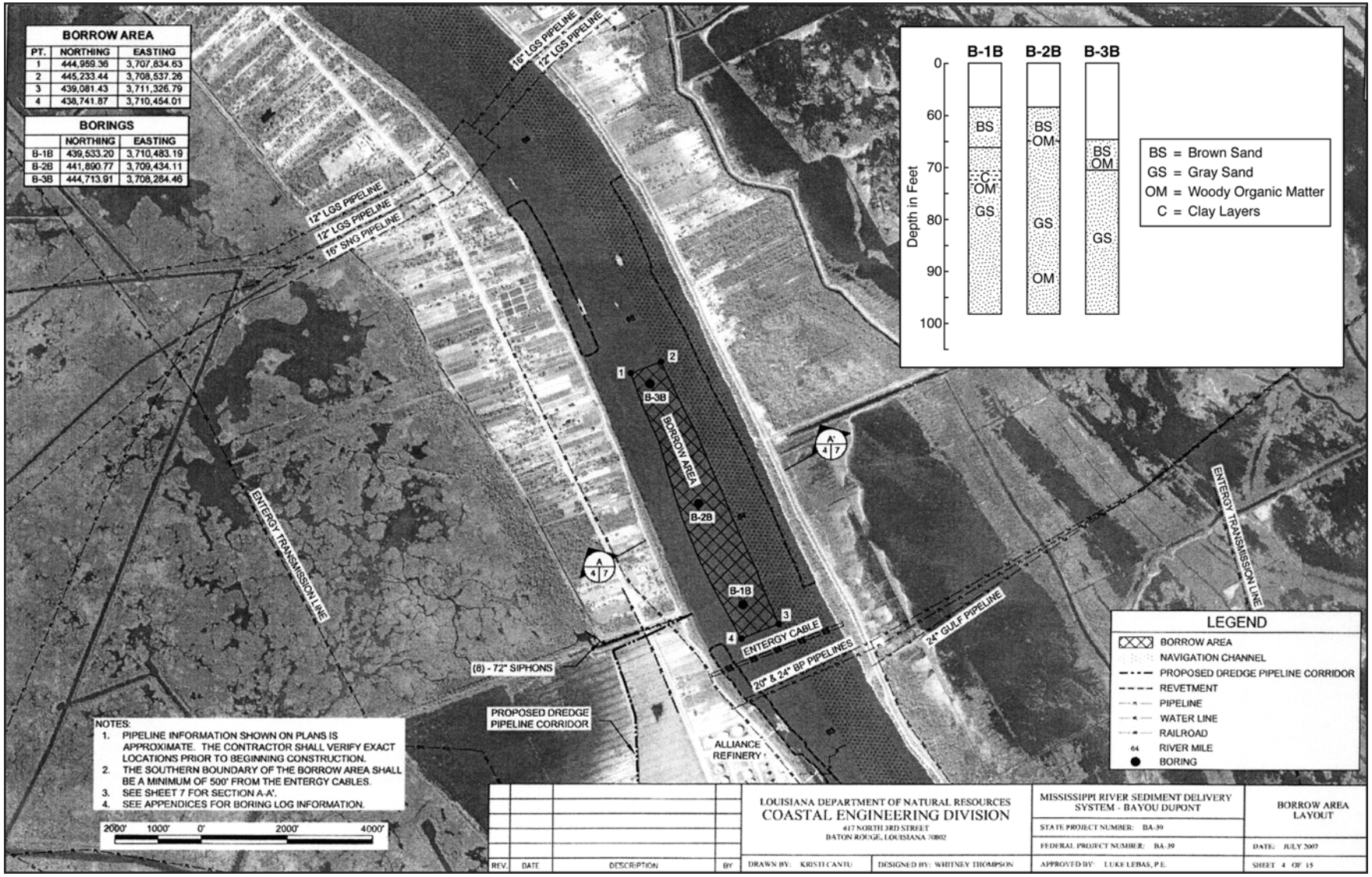

Figure 3. Project Site and Boring Characteristics.

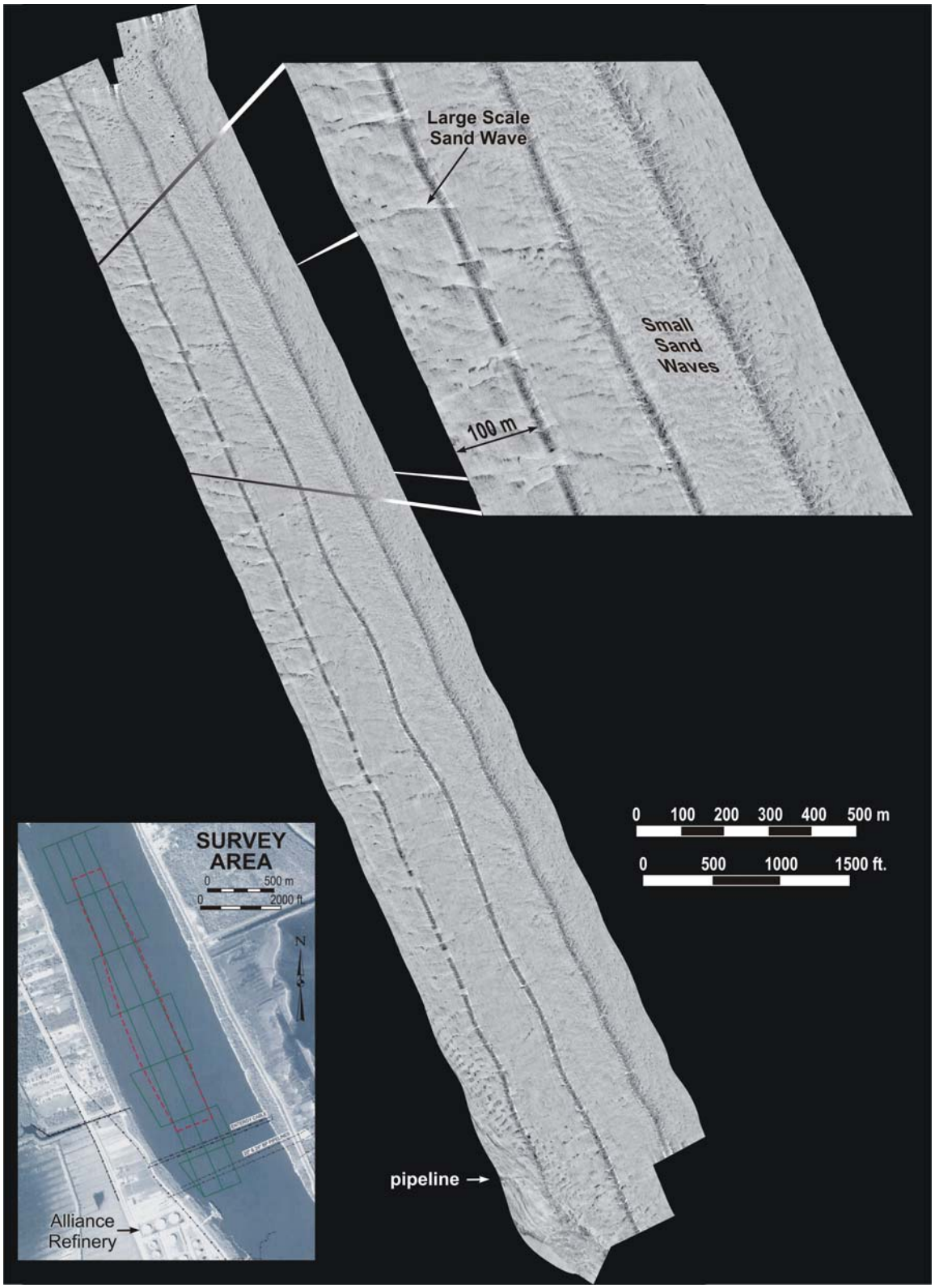

Figure 4. Side-Scan Sonar Mosaic.

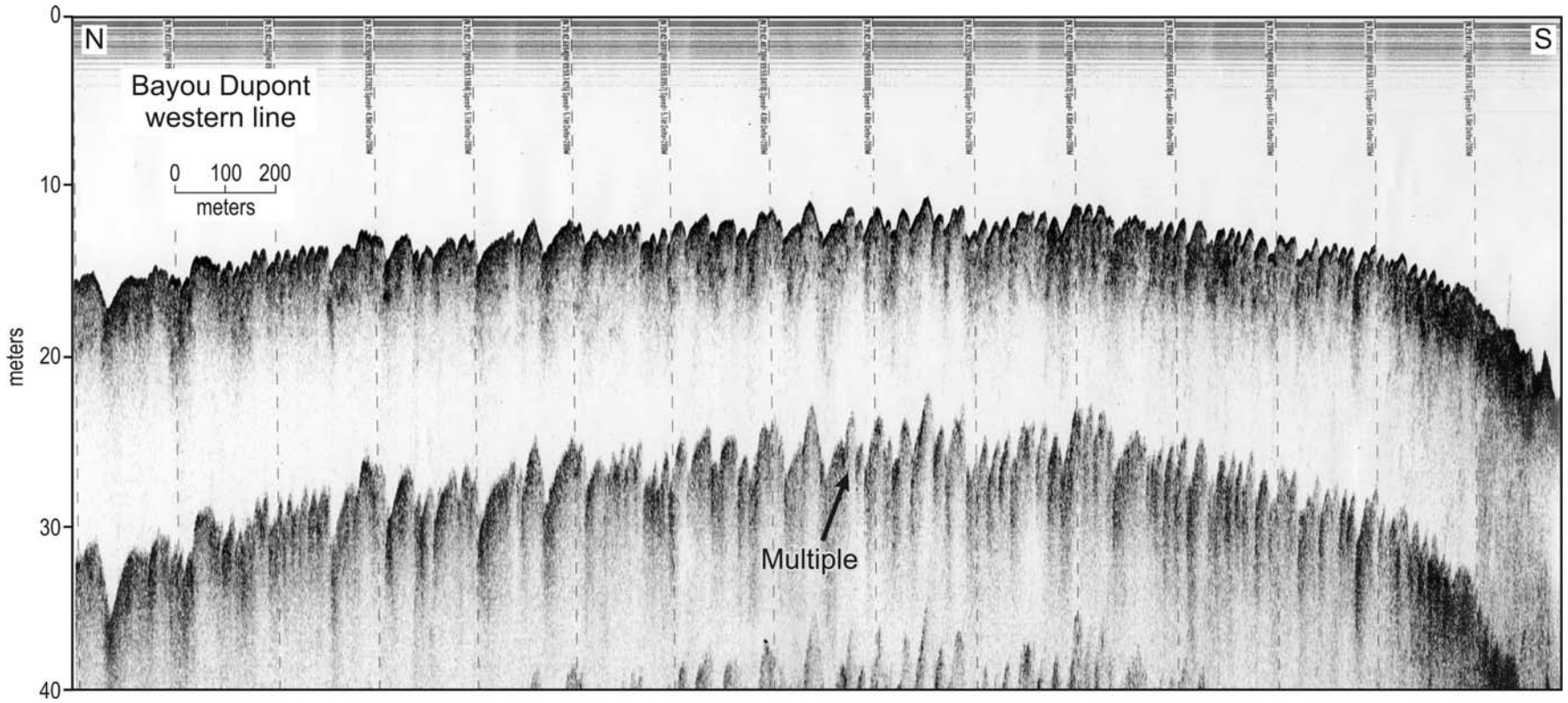

Figure 5. Chirp Sonar Profile (Middle Survey Line of Figure 4).

Bayou Dupont Magnetometer and Sidescan Survey

Magnetometer and Sidescan Survey August 1-3 2007
Coastal Studies Institute, Louisiana State University
Datum: NAD 83 Projection: UTM Zone 15 N