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**TERRACING & MARSH CREATION  
SOUTH OF BIG MAR  
PROJECT No. BS-24**

**SURVEY REPORT**

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**Prepared for:**



**United States Department of Agriculture  
Natural Resources Conservation Service**

**June 18, 2014**

**TBS Project Number 2014.0457**

**Submitted by:**



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# TERRACING & MARSH CREATION SOUTH OF BIG MAR PROJECT No. BS-24

## SURVEY REPORT

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#### **DIGITAL APPENDIX**

Project drawings (PDF & DWG format)  
 Survey point data (CSV format)  
 Survey Field Notes (PDF Format)

## **1.0 INTRODUCTION**

The purpose of the data collection task is to provide support information for planning and design of the Terracing and Marsh Creation South of Big Mar (BS-24). The services provided under this task order involved a magnetometer survey within the 333 acres of proposed marsh creation area. This work was outlined in the *Scope of Services for a Magnetometer Survey for a Terracing and Marsh Creation South of Big Mar BS-24, Plaquemines Parish, Louisiana* dated April 2014.

## **2.0 PROJECT OVERVIEW**

The Terracing and Marsh Creation South of Big Mar project has been approved for engineering and design by the United States Fish and Wildlife Services (USFWS) and Natural Resources Conservation Service (NRCS), in cooperation with the Louisiana Coastal Protection and Restoration Authority (CPRA). This project is funded through the Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA) on Priority List 22.

The objective of this project is to create 333 acres of marsh via hydraulically dredged material from Lake Lery and construct approximately 65,000 linear feet of earthen terraces with in-situ material to reduce erosion from wind driven waves. The magnetometer survey information is required to ensure that all areas where access routes, excavation and borings are planned are free of metallic objects that may present a hazard during construction.

## **3.0 DATA COLLECTION SUMMARY**

During the month of May 2014, TBS collected field data throughout the boring locations, access routes and cell areas. This data collection process consisted of topographic and geophysical surveys. Magnetometer surveys were performed on May 5<sup>th</sup>, 6<sup>th</sup> and 7<sup>th</sup>, 2014 to determine the location of any possible pipelines and other metal objects within the boring locations. On May 7<sup>th</sup>, 8<sup>th</sup> and 12<sup>th</sup>, 2014, the proposed access routes were surveyed looking for any possible pipelines and other metal objects within the two hundred foot corridor. Upon completion of the access route, the crew began the same

task within the four (4) cell areas. All transect lines were provided by Natural Resources Conservation Service (NRCS) and TBS maintained these lines with the exception of minor changes within the access route areas. These surveys were completed by a three-man survey crew aboard a 15' airboat. The crew mounted a proton magnetometer inside a kayak and towed the unit with a cable that was forty-five (45) feet behind the airboat.

### **3.1 Geotechnical Surveys**

A total of fifteen (15) geotechnical Boring locations were staked for position and surveyed for potential underground obstructions. The Boring locations were staked out with cane poles and transects were run on twenty five (25) foot line spacing to cover fifty (50) feet on both sides of the proposed center point. These lines were run with a proton magnetometer. Once the magnetometer data was processed, any anomalies that were fifty (50) gammas or greater, were provided to the Contracting Officer Representative (COR) for review. After reviewing the data, Boring BHMC-02-30 and BHT-06-30 were both moved slightly based on field findings and approval from the COR. Please refer to Map Sheets 2, 3, 4, and 5 of 14 for survey data information.

### **3.2 Magnetometer Surveys**

The magnetometer surveys were performed in the access route and the marsh creation cells. The purpose of this survey was to determine the location of any possible pipelines or other metallic objects. This survey was performed using a proton magnetometer secured in a kayak and towed with an airboat. Planned survey lines were provided by NRCS and set up in HyPack based on provided alignments in order to collect adequate data within each area. A total of 112 magnetic anomalies were detected within the cell boundaries during this survey. There were 18 magnetic anomalies that were detected within the access route corridor. The survey showed the existence of 5 possible pipelines crossing the project area. In cell area #1, there are two pipelines that exist within the proposed cell boundaries. In cell area #2, there are two pipelines that parallel the southeastern boundary and these same pipelines are present in cell #4. Please

refer to Map Sheets 6, 7 and 8 of 14 for information on these magnetic anomalies.

### **3.3 Pipeline Investigation Survey**

All magnetic anomalies were investigated using a gradiometer and water jet probe to determine the possible existence of pipelines. A minimum of two circles were run with the gradiometer around each target, one with a 25' radius and the other with a 50' radius. Five (5) pipelines were located within the project area. Please refer to Map Sheets 9, 10, 11 and 12 of 14 for information on these pipelines.

## **4.0 METHODOLOGY**

### **4.1 Survey Control and Datum Information**

During the field survey, TBS utilized the “**BS16-SM-02**” monument that was established for NRCS as the primary control point. The horizontal datum for all survey data collected is Louisiana State Plane, South Zone (1702), NAD 83, in U.S. Survey feet. The vertical datum for all data is NAVD 88 (Geoid 2012A), in U.S. Survey feet.

### **4.2 Geophysical Surveys**

Geophysical instruments used during this survey consisted of a Marine Magnetics SeaSPY magnetometer. Horizontal positioning of the survey vessel was accomplished using HyPack® navigation software with a Trimble R8 GNSS (RTK) global positioning receiver. Horizontal accuracy of this positioning as stated by the manufacturer is  $\pm 2-3$  centimeters. The magnetometer sensor was deployed 45 feet behind the positioning antenna during the field survey. The magnetometer sensor was mounted inside a kayak and towed behind the Airboat (see Figure 1). This method allows the operator to survey continuously through both open water and low-elevation marsh. The magnetometer sensor was set at .1sec/gamma. All Magnetometer data was digitally recorded by an onboard laptop computer using the SeaSPY interface linked with the *HYPACK MAX* survey navigation software mentioned above. The magnetic data was processed in HyPack to obtain the

position, signature type and strength of each anomaly. The HyPack processing software allows the user to view the magnetic data as actual magnetic field values along a continuous line. The user is able to easily pinpoint anomalies as deflections from the normal magnetic field and note the position based on the center of the signature. Each magnetic anomaly is interpreted based on its size, signature type and actual field observations.



**Figure 1. Proton magnetometer sensor mounted inside a kayak being towed behind Airboat.**

#### **4.3 Pipeline Investigation Surveys**

Pipeline investigation surveys were performed using a standard three-man survey crew, accessing the survey area by airboat. A Trimble© model R8 GNSS GPS RTK unit was used to collect the topographic field data. The manufacturer's stated accuracy of this unit is 2-3 cm horizontal, and 3-4 cm vertical. All RTK GPS Survey information was stored digitally using a Trimble TSC-2 Data Collector. Topographic survey data was downloaded from the Trimble TSC-2 Data Collector

into the Trimble Business Center software for processing. This software allows for QA/QC of GPS data and was used to check for instrument setup errors, antenna height errors and other errors. These points were then exported and entered into AutoCAD Civil 3D for further processing. The processed survey data was also exported to one complete digital text file containing point numbers X, Y, Z coordinates and point descriptions using the DOTD survey feature code list.

**APPENDIX 1**

**Survey Benchmark Data Sheet**



**VICINITY MAP**

Not to Scale

Reproduced from 2010 DOQQ Aerial Photography

**Station Name: "BS16-SM-02"**

**Monument Location:** Monument is located on the western bank of a location canal south of Lake Lery. Monument is located approximately 0.25 miles south of the intersection of Lake Lery and the location canal. It is approximately 0.6 miles north of the intersection of the location canal with another canal. Monument is located in Plaquemines Parish, northwest of the town of Delacroix.

**Monument Description:** NGS style floating sleeve monument; datum point set on 9/16" stainless steel sectional rods driven 84 feet to refusal, set in sand filled 6" PVC pipe with access cover set in concrete, flush with the ground.

**Installation Date:** August 2013

**Date of Survey:** August 2013

**Monument Established By:** T. Baker Smith, LLC

**For:** *Natural Resources Conservation Service*

**Adjusted NAD 83 (2011) Geodetic Position**

Lat. 29° 46' 31.97" N

Long. 89° 51' 50.31" W

**Adjusted NAD 83 Datum LSZ (1702) Feet**

N= 466,857.617

E= 3,746,965.627

**Adjusted NAVD88 (2010.0) Height**

Elevation = 1.761 feet (0.537 mtrs.) (Geoid12A)

Ellipsoid Height = -24.924 mtrs.

Geoid12A Height = -25.461 mtrs.

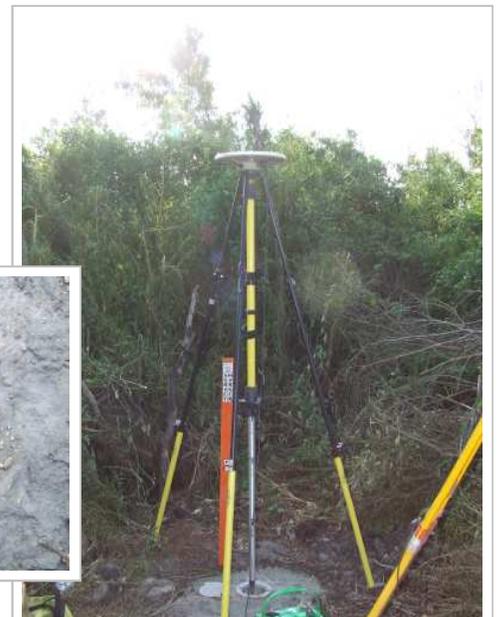
**FOR REFERENCE ONLY**

Adjusted NAVD88 Height (2006.81) (Geoid03)

Elevation = 1.574 feet (0.480 mtrs)

Ellipsoid Height = -81.903 feet (-24.964 mtrs)

Geoid 03 Height = -83.477 feet (-25.444 mtrs) (2004.65)



## **APPENDIX 2**

### **Magnetometer Survey Exhibits**