
**STATE OF LOUISIANA
COASTAL PROTECTION AND RESTORATION
AUTHORITY**



**MISSISSIPPI RIVER DELTA
DELTA-WIDE CREVASSES (MR-0009)
ON PASS-A-LOUTRE WILDLIFE MANAGEMENT AREA (PALWMA)
AND DELTA NATIONAL WILDLIFE REFUGE (DNWR)
PLAQUEMINES PARISH, LOUISIANA**

FINAL REPORT

September 18, 2019

CPRA Contract No. 4400012421

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Survey Report

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1.0 INTRODUCTION

The project area is located in Plaquemines Parish, to the southeast of Venice, Louisiana on the active Mississippi River Delta (Figure 1). The project consists of maintaining existing crevasse-splays, the construction of new crevasse-splays, and future maintenance of selected crevasse-splays in both the Pass-A-Loutre Wildlife Management Area (PALWMA) and the Delta National Wildlife Refuge (DNWR). Crevasse are breaks in the levee that allow overbank deposition of sediments to occur in adjacent inter-distributary receiving bays. The PALWMA covers 115,000 acres between Pass-A-Loutre and Southwest Pass and is owned and managed by the Louisiana Department of Wildlife and Fisheries (LDWF). The DNWR covers 48,000 acres from just north of Main Pass southward to Pass- A-Loutre and is owned and managed by the U.S. Fish and Wildlife Service (USFWS).

2.0 PROJECT OVERVIEW

Eight (8) crevasses – six (6) are new, one (1) is a clean-out, and one (1) is reopening of an old crevasse – will be dredged along Octave Pass, Raphael Pass, Flatboat Pass, South Pass, and Loomis Pass. New crevasses will be dredged in South Pass, Loomis Pass, Octave Pass, Flatboat Pass, and Raphael Pass. The crevasse “cleanout” will occur along South Pass and the reopening of an old crevasse will occur along Raphael Pass. Surveying services are needed for the following:

Topographic Survey

- Two continuous, parallel transects on the total length of sub-aerial, natural ground along 6 new crevasse alignments in South Pass, Loomis Pass, Octave Pass, Flatboat Pass and Raphael Pass as well as along the old crevasse to be reopened in Raphael Pass.

Bathymetric Survey

- Two continuous, parallel transects along each new crevasse alignment, excluding the sub-aerial natural ground
- Centerline profile of crevasse listed as “Cleanout”
- Ten cross-sections at the proposed cleanout

Magnetometer survey

- Survey proposed alignment for the new and reopened crevasses, and for the cleanout crevasse.

3.0 DATA COLLECTION SUMMARY

3.1 GPS Control Survey

During the period of May 7th, 2019 through May 13th, 2019 MPH performed a static survey of MR09-SM-31, MR09-SM-38 and MR09-SM06 to verify the horizontal and vertical control on the monuments. For the purpose of this project, the elevation of the monuments are referenced to Geoid12B.

3.2 Topographic, Bathymetric and Magnetometer Survey

During the period of April 23rd, 2019 through August 30th, 2019, MPH collected field data throughout the MR-0009 project. All field work on the Topographic, Bathymetric, and Magnetometer Survey was completed on August 30th, 2019. The office work began in advance of the fieldwork. A total of eight (8) crevasses were surveyed at the locations provided. The transects were spaced at intervals with varying lengths as provided by CPRA. Survey transects were laid out in the open water and broken marsh. Position, elevation, and water depth were recorded at a minimum of every 25-ft or where elevations changes of greater than 0.5-ft occurred along each transect, where possible. An appropriate topo shoe was attached to the bottom of the survey rod to prevent the rod from sinking. The Conventional Survey Crews utilized an airboat and a Trimble RTK/GPS base and rover setup for positioning and real-time corrections.

A bathymetry survey was performed along the proposed crevasse alignments where water depths were greater than 2-ft. The bathymetry survey overlapped the topographic survey a minimum of 50-ft. The bathymetric survey points were collected utilizing Trimble SPS 461 DGPS rover and Odom HydroTrac Echo sounder in conjunction with the Hypack software. A sampling rate of 5 Hz (5 points/second) was used during data collection. The Hydrographic Survey Crew used a 16' boat with outboard marine engine.

MPH performed a magnetometer hazard survey along the same transects established during the topographic and bathymetric survey. The magnetometer lines were run during the same time frame as the bathymetry survey lines where possible. In the upland areas within the project, the magnetometer survey was performed utilizing an airboat. The magnetometer survey was completed utilizing a Trimble RTK/GPS and Geometrics G-882 Cesium Magnetometer. All data was collected and processed with Hypack software.

4.0 METHODOLOGY

4.1 Static GPS Network Planning

The Static GPS Network was designed to incorporate two (2) CORS “Continuously Operating Reference Stations” from the Center for GeoInformatics at LSU. The two CORS used for this survey were “GRIS” and “BVHS”. They are located in Grand Isle and Boothville, respectively. Since these stations are continuously collecting data, simultaneous data was collected for the two CORS during the time of the static survey of each of the three monuments “MR09-SM-31”, “MR09-SM-38” and “MR09-SM06”. A Static GPS Survey was run on one monument each day during the RTK Survey on a rotational basis throughout the job. On that day a three (3) minute observed control point was measured utilizing a bipod/tripod on the other monument at the beginning and ending of each day. [This process was repeated each day rotating the GPS Base for the ten (10) day project duration with the same static and RTK survey procedure described above used to measure the other monument at the beginning and ending each day.] This yielded sufficient data to correlate the 3 monuments to one another. Due to the project length being 10 days, we were able capture different site and atmospheric conditions in order to generate independent and redundant observations. The static surveys were performed concurrently with the field topographic cross sections. All data collected is referenced to the Lambert Conformal Conic Projection, Louisiana State Plane Coordinate System (South Zone), the North American Datum of 1983 (NAD83) and the North American Vertical Datum of 1988 (NAVD88), Geoid12B.

4.2 GPS Static Survey

The GPS Static Survey was performed using Trimble R10/R10 GPS receivers equipped with fixed height tripods. The GPS receivers were set to collect L1 and L2 data at a 15 second epoch rate with a 10-degree elevation mask. Static GPS data was collected at the benchmark for a minimum of 3 hours per session. Data collection sessions were performed on different days during the RTK Topographic Surveys as shown on the GPS Session Schedule in Appendix 2.

4.3 Data Processing and Network Adjustment

The static GPS data was downloaded from the receiver and imported into Trimble Business Center (TBC) for processing and QA/QC. Each setup was checked to verify that the antenna height and station name matched the corresponding field log sheet.

Each baseline was processed using a 15-degree elevation mask and all baselines achieved a fixed solution with no editing. This adjustment used Geoid12B as the basis for determining orthometric heights of adjusted ellipsoid heights. The network was found to fit existing control within acceptable limits, and all primary control was found to be consistent with respect to differences in published and computed elevation values. The Fully Constrained Network Adjustment report and final adjusted positions can be seen in Appendix 1.

5.0 SURVEY CONTROL

Benchmarks used as a control are tied into the CPRA – Louisiana Coastal Zone (LCZ) GPS Network. MPH conducted all surveying activities using the “MR09-SM-31” (Secondary LCZ control monument) and “MR09-SM-38” (Secondary LCZ control monument), and “MR09-SM-06” (Secondary LCZ control monument) which were updated by performing a GPS Network Adjustment into the LCZ GPS network using the Geoid12B model. These benchmarks are identified by the Louisiana State Plane Coordinate System (South Zone), the North American Horizontal Datum of 1983 (NAD 83), and the North American Vertical Datum of 1988 (NAVD88) geoid 12B. The information for the three monuments was gathered from CPRA’s CIMS website and existing LCZ GPS Network.

6.0 QA/QC Procedures

MPH conducted topographic, bathymetric, and magnetometer surveys for the Delta-Wide Crevasses (MR-0009) project as per the practices set forth in CPRA’s January 2016 version of “A Contractors Guide to the Standards of Practice”. MPH furnished the necessary equipment, software, supplies, labor and transportation, including fuel, needed to complete the work as outlined in the Reconnaissance Field Data Collection plan provided to CPRA prior to the commencement of the surveying activities within the fill area. All fieldwork associated with these surveys were conducted under the direct supervision of a Professional Land Surveyor.

All field and office work performed was completed utilizing the in-house developed Operating Procedures and Quality Control/Quality Assurance Manual. This manual was developed to define appropriate standards of practice and accepted operating procedures and performance criteria to be used to provide consistency, accuracy, and reliability of services and products. These practices included: checking into secondary monumentation at the beginning and ending of each day to ensure GPS quality assurance, performing bar checks and sound velocity checks at the beginning and ending of each day for the bathymetry surveys, performing a calibration line with the magnetometer to ensure proper functionality and offset values, etc. All equipment used on the project checked for proper calibration prior to the start of the project. Field survey data was also analyzed in the office on a daily basis to ensure accuracy and quality.

7.0 HORIZONTAL AND VERTICAL CONTROL

MPH performed a GPS survey utilizing RTK OTF methods. The GPS Total Station survey equipment included the use of a Trimble R10 Dual Frequency receiver as a rover and a Trimble R10 Dual Frequency receiver as a base. The base station occupied one of the three survey control monuments “MR09-SM-31” (Secondary LCZ control monument) and “MR09-SM-38” (Secondary LCZ control monument), and “MR09-

SM-06” (Secondary LCZ control monument) and rover units were used to collect horizontal and vertical data along the transects. [For quality control, the GPS Base Receiver was set up on an existing project control point with an established horizontal position and elevation while the Rover Receiver was used to observe the other existing project control point checking. This observed position was checked against the newly established position of the control points to verify that it was within an accepted tolerance. This QA/QC process was performed daily throughout the duration of the project.] Survey data was downloaded and processed utilizing Trimble Business Center. The complete RTK Total Station survey method yields nominal accuracies of 1 cm horizontal and 2 cm vertical. The monuments which were used for control, are referenced to the Lambert Conformal Conic Projection, Louisiana State Plane Coordinate System (South Zone), the North American Datum of 1983 (NAD83) and the North American Vertical Datum of 1988 (NAVD88).

8.0 ALIGNMENT SURVEY

MPH performed topographic and bathymetric surveys along proposed crevasse alignments. The survey transects for the alignment and bathymetric survey that were performed and developed based on the information provided by CPRA. A total of (15) transects, were surveyed (Two at each proposed crevasse location and one at SP-12 with additional cross-sections) during this phase of the project. The transects were spaced at varying intervals and lengths as provided by CPRA. Survey transects were laid out in the open water, broken marsh, and across natural bayous. Position, elevation, and water depth were recorded at a minimum of every 25 ft. along each transect, where possible. The topographic survey was completed utilizing a Trimble RTK/GPS base and rover setup. A 6-inch diameter topo shoe was attached to the bottom of the survey rod to prevent the GPS antenna rod from sinking. In areas, where water depths were too deep for the use of the GPS antenna rod a level rod was used to take soundings.

9.0 MAGNETOMETER HAZARD SURVEY

MPH performed a magnetometer hazard survey along the same transects established during the alignment and bathymetric survey. The magnetometer survey was performed utilizing a Trimble SPS 461 DGPS and Geometrics G-882 Cesium Magnetometer. All data was collected and processed in Hypack software. At the start and end of each day a calibration line was performed in opposite directions to ensure proper functionality and offset values.

9.1 Hazard Investigation Survey

Once field data collection was completed, magnetic anomalies were determined from processing magnetometer data and interpretation. The magnetometer gamma baseline during the field geohazard survey was 46400 gammas. The Geometrics model G-882 last certified manufacturer (dated 3/13/18) depth calibration =

0.016483 (salt water) and bias = -1.65. The altimeter calibration scale = 0.01016 and bias = -1.27.

The magnetometer dataset was processed using the Single Beam Editor in HYPACK®. Magnetic anomalies were evaluated on the basis of one hundred (100) gammas or higher. There were Seven (7) magnetometer anomalies selected within the areas of the 8 crevasses surveyed. Six were on the Pass-A-Loutre Wildlife Management Area and one on Delta National Wildlife Refuge. A conventional survey crew investigated the six on the Pass-A-Loutre Wildlife Management Area being they were in areas of concern. Of the six located on Pass-A-Loutre Wildlife Management Area three were located on South Pass (SP-11), one was located on South Pass (SP-12), and two were located on Loomis Pass (LP-13) crevasse locations. The one anomaly in the Delta National Wildlife Refuge was not of concern because of the location being on the opposite bank northwest of the proposed Flat Boat Pass (FP-10) crevasse location.

For each magnetic anomaly the conventional survey crew ran a closed loop path with a gradiometer. The path completely enclosed the original finding location, while maintaining a distance of approximately 25 feet from the anomaly location. A 25 foot circular path was used around each of the anomaly locations with no other readings encountered.

10.0 Chronological Summary of Work

Project #	Group	Date
MR-0009	ALIGNMENT SURVEY	4/23-5/14/2019
MR-0009	CROSS SECTION SURVEY	5/14/2019
MR-0009	BATHYMETRY SURVEY	8/26/2019
MR-0009	MAGNETOMETER SURVEY	07/02- 08-27/2019
MR-0009	MAGNETOMETER INVESTIGATION SURVEY	8/30/2019

11.0 Deliverables

As requested in the CPRA of Louisiana Scope of Services the following deliverables are being submitted:

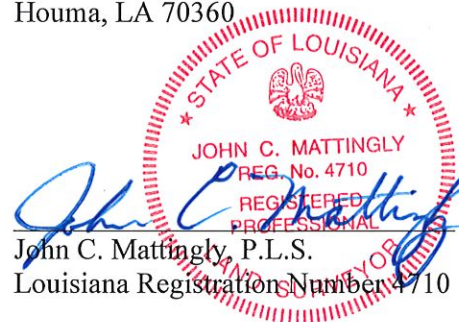
- 11.1 A report describing the survey methodology employed in the field.
- 11.2 Two sets of 11" x 17" size plan view drawings showing an overlay of the Lambert Conformal Conic Projection Louisiana State Plane Coordinate System South Zone NAD 83 and drawings showing all survey control points utilized in the survey. Two sets of 11" x 17" size plan and profile drawings, depicting the results of the topographic and bathymetric surveys.
- 11.3 Two digital copies of drawing files on separate CD disks or jump drives in AutoCAD (*.dwg) format.

- 11.4 A copy of the XYZ survey data will be provided in a coma-delimited ASCII format. The data is referenced to the Louisiana Coordinate System (South Zone) and North American Datum of 1983 (NAD 83) in U.S. Survey Feet. Elevations are referenced to the North American Vertical Datum of 1988 (NAVD 88) in feet.
- 11.5 Two printed copies of the survey data.
- 11.6 Two printed copies of the field notebook records.

12.0 CERTIFICATION

I hereby certify that the report, data and drawings referenced herein were prepared from a field survey conducted on the ground by me or under my direct supervision and control and that the report, data and drawings accurately depict the result of said survey.

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APPENDIX 1

Network Adjustment Report

CPRA/Coastal Protection and Restoration Authority
“MR09-SM-31”, “MR09-SM-38”, “MR09-SM-06, & “3/4” Iron Rod w/MPH Cap”
Survey Control For
Delta-Wide Crevasses (MR-0009)
On Pass-A-Loutre Wildlife Management Area (PALWMA)
and Delta National Wildlife Refuge (DNWR)
Plaquemines Parish, Louisiana



POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
1000	267445.484	3945645.4	5.494	MR09-SM-31
1001	276368.213	3947242.724	1.973	MR09-SM-38
1002	238749.078	3953567.719	2.716	MR09-SM-06
1004	234136.261	3959208.644	5.237	SET 3/4" IRON ROD w/MPH Cap

Project File Data		Coordinate System	
Name:	C:\Users\ldrennan\Documents\Trimble Business Center\13000-04 Static.vce	Name:	US State Plane 1983
Size:	457 KB	Datum:	NAD 1983 (Conus)
Modified:	5/14/2019 3:37:05 PM (UTC:-5)	Zone:	Louisiana South 1702
Time zone:		Geoid:	GEOID12B (Conus)
Reference number:		Vertical datum:	
Description:		Calibrated site:	
Comment 1:			
Comment 2:			
Comment 3:			

Additional Coordinate System Details

Local Site Settings			
Project latitude:	?	Ground scale factor:	1
Project longitude:	?	False northing offset:	0.000 ft
Project height:	0.000 ft	False easting offset:	0.000 ft

Network Adjustment Report

Adjustment Settings

Set-Up Errors

GNSS

Error in Height of Antenna: 0.006 ft

Centering Error: 0.018 ft

Covariance Display

Horizontal:

Propagated Linear Error [E]: U.S.

Constant Term [C]: 0.000 ft

Scale on Linear Error [S]: 1.960

Three-Dimensional

Propagated Linear Error [E]: U.S.

Constant Term [C]: 0.000 ft

Scale on Linear Error [S]: 1.960

Adjustment Statistics

Number of Iterations for Successful Adjustment: 2
 Network Reference Factor: 1.00
 Chi Square Test (95%): Passed
 Precision Confidence Level: 95%
 Degrees of Freedom: 52

Post Processed Vector Statistics

Reference Factor: 0.95
 Redundancy Number: 14.67
 A Priori Scalar: 1.00

RTK Vector Statistics

Reference Factor: 1.01
 Redundancy Number: 37.33
 A Priori Scalar: 1.29

Control Point Constraints

Point ID	Type	North σ (US survey foot)	East σ (US survey foot)	Height σ (US survey foot)	Elevation σ (US survey foot)
BVHS	Local	Fixed	Fixed	Fixed	
GRIS	Local	Fixed	Fixed	Fixed	
Fixed = 0.000003(US survey foot)					

Adjusted Grid Coordinates

Point ID	Northing (US survey foot)	Northing Error (US survey foot)	Easting (US survey foot)	Easting Error (US survey foot)	Elevation (US survey foot)	Elevation Error (US survey foot)	Constraint
1000	267445.484	0.042	3945645.400	0.042	5.494	0.059	
1001	276368.213	0.042	3947242.724	0.042	1.973	0.057	

1002	238749.078	0.045	3953567.719	0.046	2.716	0.056	
1004	234136.261	0.046	3959208.644	0.046	5.237	0.057	
BVHS	309482.269	?	3894798.478	?	31.546	?	LLh
GRIS	281033.474	?	3719590.183	?	27.375	?	LLh

Adjusted Geodetic Coordinates

Point ID	Latitude	Longitude	Height (US survey foot)	Height Error (US survey foot)	Constraint
1000	N29°13'07.59606"	W89°14'57.26701"	-72.002	0.059	
1001	N29°14'35.62473"	W89°14'37.40832"	-75.682	0.057	
1002	N29°08'22.12829"	W89°13'33.83471"	-74.446	0.056	
1004	N29°07'35.44046"	W89°12'31.20307"	-71.917	0.057	
BVHS	N29°20'12.48974"	W89°24'23.01021"	-46.745	?	LLh
GRIS	N29°15'55.88300"	W89°57'26.26226"	-51.286	?	LLh

Adjusted ECEF Coordinates

Point ID	X (US survey foot)	X Error (US survey foot)	Y (US survey foot)	Y Error (US survey foot)	Z (US survey foot)	Z Error (US survey foot)	3D Error (US survey foot)	Constraint
1000	239488.504	0.042	-18276027.568	0.056	10154429.697	0.046	0.084	
1001	241190.720	0.042	-18271659.348	0.054	10162187.569	0.046	0.082	
1002	247070.840	0.046	-18289984.332	0.054	10129252.167	0.048	0.085	
1004	252656.263	0.046	-18292206.379	0.055	10125134.023	0.049	0.087	
BVHS	189142.939	?	-18255649.118	?	10191879.302	?	?	LLh
GRIS	13616.876	?	-18269305.528	?	10169272.618	?	?	LLh

Error Ellipse Components

Point ID	Semi-major axis (US survey foot)	Semi-minor axis (US survey foot)	Azimuth
1000	0.053	0.052	101°
1001	0.053	0.052	83°
1002	0.057	0.056	86°
1004	0.058	0.057	115°

Adjusted GNSS Observations

Transformation Parameters

Azimuth Rotation: -0.010 sec (95%) 0.043 sec

Scale Factor: 1.00000012 (95%) 0.00000022

Observation ID		Observation	A-posteriori Error	Residual	Standardized Residual
1000-1001 (V13)	Az.	11°11'30"	0.565 sec	-1.640 sec	-2.104
	ΔHt.	-3.680 ft	0.038 ft	-0.063 ft	-1.589
	Ellip Dist.	9064.437 ft	0.025 ft	0.023 ft	0.663
1001-1000 (V210)	Az.	191°11'39"	0.565 sec	1.476 sec	1.761
	ΔHt.	3.680 ft	0.038 ft	0.096 ft	1.946
	Ellip Dist.	9064.437 ft	0.025 ft	0.043 ft	1.110
BVHS --> 1001 (PV2)	Az.	123°14'00"	0.116 sec	-0.045 sec	-0.672
	ΔHt.	-28.937 ft	0.057 ft	0.057 ft	1.603
	Ellip Dist.	62023.556 ft	0.035 ft	0.038 ft	1.901
1004-1002 (V843)	Az.	310°20'11"	0.853 sec	-1.816 sec	-1.744
	ΔHt.	-2.529 ft	0.045 ft	0.005 ft	0.089
	Ellip Dist.	7286.556 ft	0.030 ft	-0.014 ft	-0.360
1004-1002 (V842)	Az.	310°20'11"	0.853 sec	-1.601 sec	-1.710
	ΔHt.	-2.529 ft	0.045 ft	-0.016 ft	-0.430
	Ellip Dist.	7286.556 ft	0.030 ft	-0.010 ft	-0.289

1000-1001 (V356)	Az.	11°11'30"	0.565 sec	-1.504 sec	-1.692
	ΔHt.	-3.680 ft	0.038 ft	0.030 ft	0.502
	Ellip Dist.	9064.437 ft	0.025 ft	-0.031 ft	-0.726
BVHS --> 1002 (PV3)	Az.	141°14'34"	0.082 sec	-0.001 sec	-0.027
	ΔHt.	-27.700 ft	0.056 ft	0.064 ft	1.566
	Ellip Dist.	91960.680 ft	0.035 ft	-0.015 ft	-0.749
1002-1004 (V513)	Az.	130°19'41"	0.853 sec	1.099 sec	0.950
	ΔHt.	2.529 ft	0.045 ft	0.025 ft	0.410
	Ellip Dist.	7286.556 ft	0.030 ft	0.062 ft	1.519
1001-1000 (V101)	Az.	191°11'39"	0.565 sec	0.273 sec	0.285
	ΔHt.	3.680 ft	0.038 ft	0.002 ft	0.036
	Ellip Dist.	9064.437 ft	0.025 ft	-0.064 ft	-1.510
GRIS --> 1000 (PV6)	Az.	94°07'55"	0.032 sec	-0.012 sec	-0.649
	ΔHt.	-20.716 ft	0.059 ft	-0.066 ft	-1.162
	Ellip Dist.	226460.327 ft	0.038 ft	-0.034 ft	-1.480
1000-1001 (V100)	Az.	11°11'30"	0.565 sec	-1.206 sec	-1.435
	ΔHt.	-3.680 ft	0.038 ft	0.041 ft	0.860
	Ellip Dist.	9064.437 ft	0.025 ft	0.044 ft	1.242
1004-1002 (V646)	Az.	310°20'11"	0.853 sec	1.489 sec	1.362
	ΔHt.	-2.529 ft	0.045 ft	-0.013 ft	-0.233
	Ellip Dist.	7286.556 ft	0.030 ft	-0.043 ft	-1.191
BVHS --> 1000 (PV1)	Az.	130°32'45"	0.109 sec	0.002 sec	0.032
	ΔHt.	-25.257 ft	0.059 ft	0.003 ft	0.055
	Ellip Dist.	65973.151 ft	0.035 ft	-0.027 ft	-1.320
GRIS --> 1002 (PV10)	Az.	100°56'11"	0.031 sec	-0.021 sec	-1.208
	ΔHt.	-23.160 ft	0.056 ft	-0.033 ft	-0.745
	Ellip Dist.	237762.352 ft	0.039 ft	0.020 ft	0.824
1000-1001 (V895)	Az.	11°11'30"	0.565 sec	0.870 sec	0.929
	ΔHt.	-3.680 ft	0.038 ft	0.074 ft	0.993
	Ellip Dist.	9064.437 ft	0.025 ft	0.047 ft	1.178
GRIS --> 1001 (PV8)	Az.	91°51'58"	0.032 sec	0.020 sec	1.031
	ΔHt.	-24.397 ft	0.057 ft	-0.042 ft	-0.774
	Ellip Dist.	227698.057 ft	0.039 ft	0.016 ft	0.621
BVHS --> 1004 (PV4)	Az.	140°26'20"	0.074 sec	0.031 sec	0.794

	ΔHt.	-25.172 ft	0.057 ft	-0.019 ft	-0.491
	Ellip Dist.	99123.051 ft	0.035 ft	0.008 ft	0.434
GRIS --> 1004 (PV12)	Az.	101°45'58"	0.030 sec	0.012 sec	0.706
	ΔHt.	-20.631 ft	0.057 ft	-0.020 ft	-0.339
	Ellip Dist.	244158.770 ft	0.038 ft	0.004 ft	0.199
1000-1001 (V441)	Az.	11°11'30"	0.565 sec	-0.648 sec	-0.646
	ΔHt.	-3.680 ft	0.038 ft	0.020 ft	0.273
	Ellip Dist.	9064.437 ft	0.025 ft	-0.028 ft	-0.698
1001-1000 (V355)	Az.	191°11'39"	0.565 sec	0.358 sec	0.263
	ΔHt.	3.680 ft	0.038 ft	-0.036 ft	-0.289
	Ellip Dist.	9064.437 ft	0.025 ft	-0.028 ft	-0.524
1001-1000 (V211)	Az.	191°11'39"	0.565 sec	0.270 sec	0.276
	ΔHt.	3.680 ft	0.038 ft	-0.019 ft	-0.236
	Ellip Dist.	9064.437 ft	0.025 ft	0.021 ft	0.429
1004-1002 (V894)	Az.	310°20'11"	0.853 sec	-0.510 sec	-0.351
	ΔHt.	-2.529 ft	0.045 ft	0.012 ft	0.118
	Ellip Dist.	7286.556 ft	0.030 ft	-0.016 ft	-0.355

Covariance Terms

From Point	To Point		Components	A-posteriori Error	Horiz. Precision (Ratio)	3D Precision (Ratio)
1000	1001	Az.	11°11'30"	0.565 sec	1 : 366416	1 : 366436
		ΔHt.	-3.680 ft	0.038 ft		
		ΔElev.	-3.521 ft	0.038 ft		
		Ellip Dist.	9064.438 ft	0.025 ft		
1002	1004	Az.	130°19'41"	0.855 sec	1 : 244270	1 : 244403
		ΔHt.	2.529 ft	0.045 ft		
		ΔElev.	2.521 ft	0.045 ft		
		Ellip Dist.	7286.557 ft	0.030 ft		
BVHS	1000	Az.	130°32'45"	0.131 sec	1 : 1570571	1 : 1570742
		ΔHt.	-25.257 ft	0.059 ft		
		ΔElev.	-26.052 ft	0.059 ft		
		Ellip Dist.	65973.159 ft	0.042 ft		

BVHS	1001	Az.	123°14'00"	0.139 sec	1 : 1478579	1 : 1478901
		ΔHt.	-28.937 ft	0.057 ft		
		ΔElev.	-29.573 ft	0.057 ft		
		Ellip Dist.	62023.563 ft	0.042 ft		
BVHS	1002	Az.	141°14'34"	0.102 sec	1 : 2033560	1 : 2034067
		ΔHt.	-27.700 ft	0.056 ft		
		ΔElev.	-28.830 ft	0.056 ft		
		Ellip Dist.	91960.691 ft	0.045 ft		
BVHS	1004	Az.	140°26'20"	0.096 sec	1 : 2134535	1 : 2134881
		ΔHt.	-25.172 ft	0.057 ft		
		ΔElev.	-26.309 ft	0.057 ft		
		Ellip Dist.	99123.062 ft	0.046 ft		
GRIS	1000	Az.	94°07'55"	0.038 sec	1 : 5380005	1 : 5379866
		ΔHt.	-20.716 ft	0.059 ft		
		ΔElev.	-21.881 ft	0.059 ft		
		Ellip Dist.	226460.353 ft	0.042 ft		
GRIS	1001	Az.	91°51'58"	0.038 sec	1 : 5397521	1 : 5397780
		ΔHt.	-24.396 ft	0.057 ft		
		ΔElev.	-25.402 ft	0.057 ft		
		Ellip Dist.	227698.083 ft	0.042 ft		
GRIS	1002	Az.	100°56'11"	0.039 sec	1 : 5206157	1 : 5206658
		ΔHt.	-23.160 ft	0.056 ft		
		ΔElev.	-24.658 ft	0.056 ft		
		Ellip Dist.	237762.380 ft	0.046 ft		
GRIS	1004	Az.	101°45'58"	0.039 sec	1 : 5250812	1 : 5250336
		ΔHt.	-20.631 ft	0.057 ft		
		ΔElev.	-22.138 ft	0.057 ft		
		Ellip Dist.	244158.798 ft	0.046 ft		

Date: 5/14/2019 3:57:30 PM	Project: C:\Users\ldrennan\Documents\Trimble Business Center\13000-04 Static.vce	Trimble Business Center
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APPENDIX 2

GPS Session Schedule

CPRA/Coastal Protection and Restoration Authority
GPS Network Adjustment
“MR09-SM-31”, “MR09-SM-38”, & “MR-SM-06”
For
Delta-Wide Crevasses (MR-0009)
On Pass-A-Loutre Wildlife Management Area (PALWMA)
and Delta National Wildlife Refuge (DNWR)
Plaquemines Parish, Louisiana



GPS SESSION SCHEDULE

Date	Monument	Operator/Crew	Session #	Start Time	End Time	Length
4/23/2019	MR09-SM-31	James Rowe	1	13:05:27	15:45:57	2:40:30
4/24/2019	MR09-SM-38	James Rowe	2	8:33:27	13:46:27	5:13:00
5/7/2019	MR09-SM-06	James Rowe	3	9:49:57	12:54:42	3:04:45
5/13/2019	Rebar w/MPH Cap	James Rowe	4	12:11:27	16:09:42	3:58:15

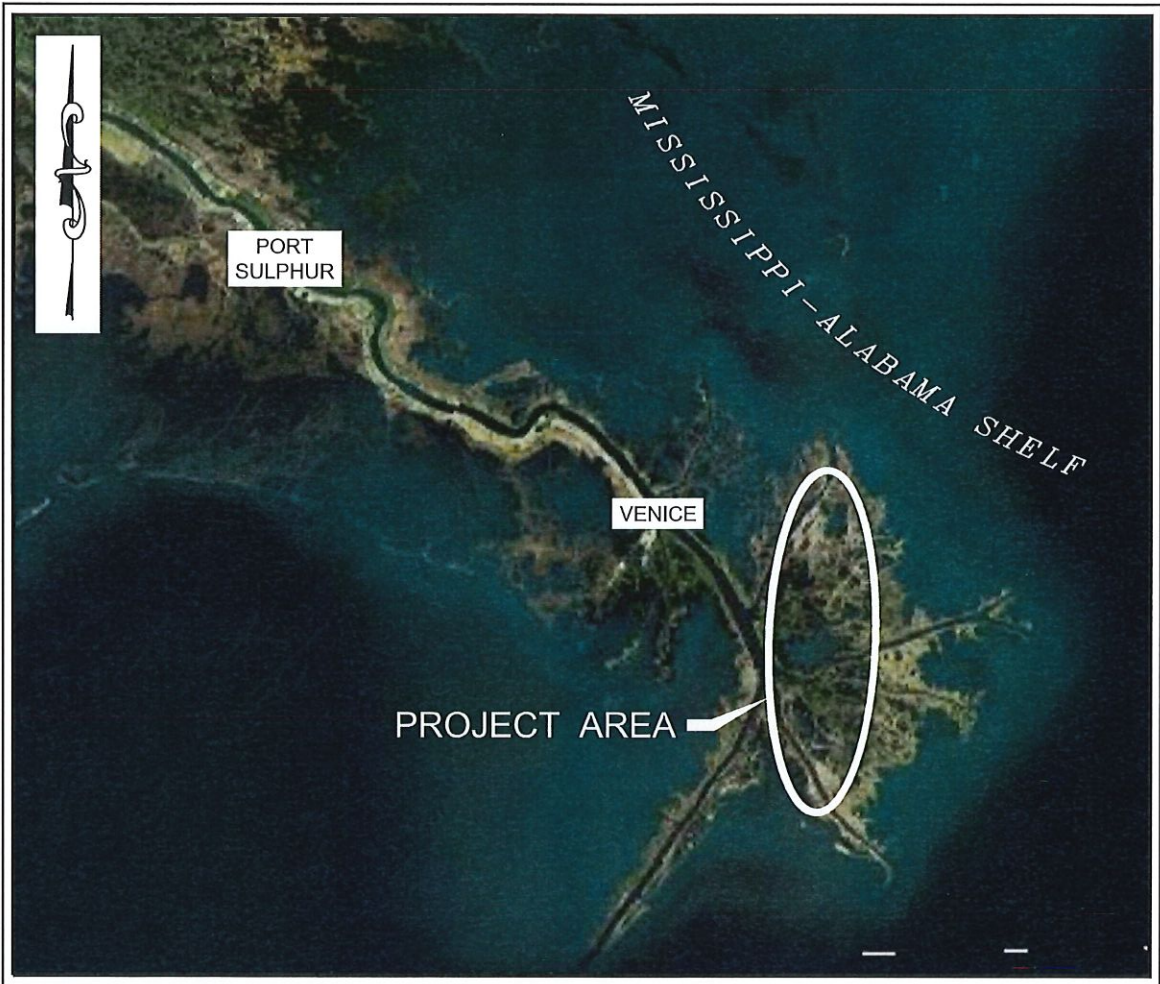
APPENDIX 3

Original Contract Drawings

Office of Coastal Protection and Restoration Authority of Louisiana

DELTA WIDE CREVASSES SURVEYING SERVICES

MR-0009
PLAQUEMINES PARISH, LOUISIANA



PROJECT AREA

PROJECT LOCATION MAP
NOT TO SCALE



INDEX TO SHEETS

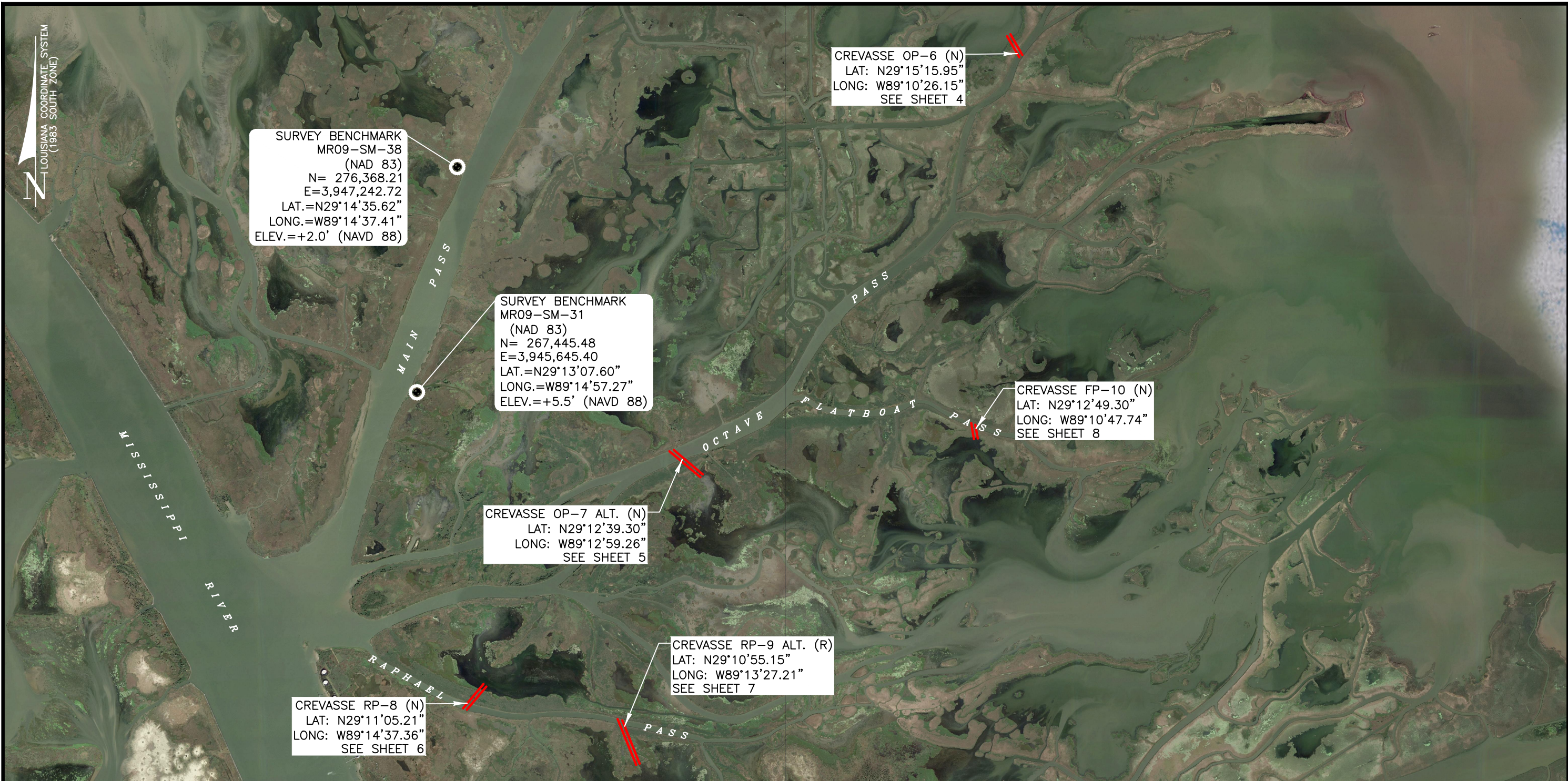
SHEET NO.	DESCRIPTION
1	TITLE SHEET - STATE & LOCAL VICINITY MAP
2	VICINITY MAP - CREVASSES OP-6 (N), OP-7 ALT. (N), RP-8 (N), RP-9 ALT. (R), & FP-10 (N)
3	VICINITY MAP - CREVASSES SP-11 (N), SP-12 (C), & LP-13 (N)
4	DELTA WIDE CREVASSES - CREVASSE OP-6 (N) OVERVIEW
5	DELTA WIDE CREVASSES - CREVASSE OP-7 ALT. (N) OVERVIEW
6	DELTA WIDE CREVASSES - CREVASSE RP-8 (N) OVERVIEW
7	DELTA WIDE CREVASSES - CREVASSE RP-9 ALT. (R) OVERVIEW
8	DELTA WIDE CREVASSES - CREVASSE FP-10 (N) OVERVIEW
9	DELTA WIDE CREVASSES - CREVASSE SP-11 (N) OVERVIEW
10	DELTA WIDE CREVASSES - CREVASSE SP-12 (C) OVERVIEW
11	DELTA WIDE CREVASSES - CREVASSE LP-13 (N) OVERVIEW
12	DELTA WIDE CREVASSES - OP-6 (N) TRANSECTS 1-2 & OP-7 ALT. (N) TRANSECTS 1 - 2
13	DELTA WIDE CREVASSES - RP-8 (N) TRANSECTS 1-2 & RP-9 ALT. (R) TRANSECTS 1 - 2
14	DELTA WIDE CREVASSES - FP-10 (N) TRANSECTS 1-2, & SP-11 (N) TRANSECT 1 - 2
15	DELTA WIDE CREVASSES - SP-12 (C) TRANSECTS 1 THRU 12
16	DELTA WIDE CREVASSES - LP-13 (N) TRANSECTS 1-2



APPROVED: 
JOHN C. MATTINGLY, P.E., LICENSE NO. 4710
THIS DOCUMENT VALID ONLY WHEN EITHER AN ORIGINAL CERTIFICATION STAMP OR AN EMBOSSING SEAL IS IMPRESSED OVER AN ORIGINAL SIGNATURE.

SET NO. _____

P:\01-Survey_Projects\State of Louisiana\13000-04 - MR-09 Delta Wide Crevasse\CAD Files\08-28-19\13000-04-trans002a0.dwg PLOT DATE: 9/17/19 2:23:13pm



AN ON-THE-GROUND EFFORT WAS MADE TO LOCATE AND INDICATE ALL BELOW GROUND FERROUS METAL CABLES, PIPELINES AND UTILITIES IN THE AREAS DESCRIBED ABOVE; HOWEVER, DUE TO THE INHERENT LIMITATIONS OF ELECTRONIC MAGNETIC LOCATING EQUIPMENT, MORRIS P. HEBERT, INC. IS NOT RESPONSIBLE FOR ANY CABLES, PIPELINES, UTILITIES OR ANY OTHER BELOW GROUND STRUCTURES (INCLUDING PVC) NOT LOCATED DURING THE COURSE OF THE SURVEY. MPH'S EFFORTS DO NOT RELIEVE THE LA ONE CALL RESPONSIBILITY PRIOR TO MOBILIZATION OF EQUIPMENT AND OR EXCAVATION.



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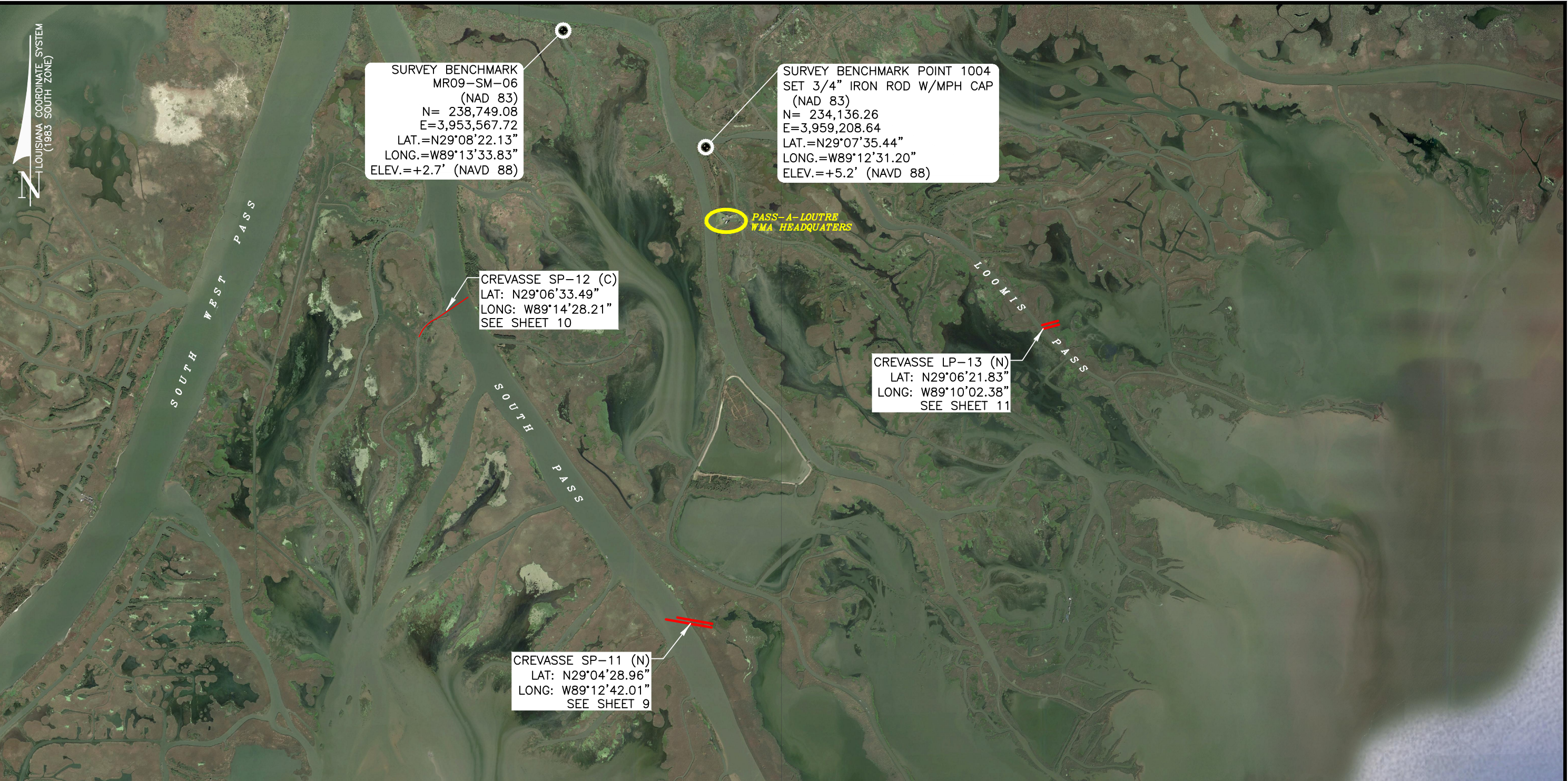
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HOUMA, LA. • HOUSTON, TX. • SAN ANTONIO, TX. • MIDLAND, TX.
TEXAS SURVEY FIRM REGISTRATION NUMBER: 10193786 (HOUMA OFFICE)

OFFICE OF COASTAL PROTECTION RESTORATION AUTHORITY OF LOUISIANA

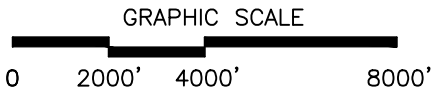
VICINITY MAP - CREVASSES OP-6 (N), OP-7 ALT. (N), RP-8 (N), RP-9 ALT. (R), & FP-10 (N)
DELTA WIDE CREVASSES SURVEYING SERVICES
MR-0009
PLAQUEMINES PARISH, LOUISIANA

DRAWN BY:	TJW & TPC	SHEET:	2 OF 16
CHKD./APPD. BY:	JCM	SCALE:	1" = 4000'
UPDATED BY:		DATE:	08/28/2019
DATA BASE:	13000-04	JOB NO.	13000-04
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AN ON-THE-GROUND EFFORT WAS MADE TO LOCATE AND INDICATE ALL BELOW GROUND FERROUS METAL CABLES, PIPELINES AND UTILITIES IN THE AREAS DESCRIBED ABOVE; HOWEVER, DUE TO THE INHERENT LIMITATIONS OF ELECTRONIC MAGNETIC LOCATING EQUIPMENT, MORRIS P. HEBERT, INC. IS NOT RESPONSIBLE FOR ANY CABLES, PIPELINES, UTILITIES OR ANY OTHER BELOW GROUND STRUCTURES (INCLUDING PVC) NOT LOCATED DURING THE COURSE OF THE SURVEY. MPH'S EFFORTS DO NOT RELIEVE THE LA ONE CALL RESPONSIBILITY PRIOR TO MOBILIZATION OF EQUIPMENT AND OR EXCAVATION.



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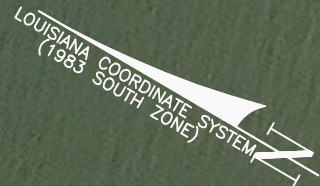
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TEXAS SURVEY FIRM REGISTRATION NUMBER: 10193786 (HOUMA OFFICE)

OFFICE OF COASTAL PROTECTION RESTORATION AUTHORITY OF LOUISIANA

VICINITY MAP – CREVASSES SP-11 (N), SP-12 (C), & LP-13 (N)
DELTA WIDE CREVASSES SURVEYING SERVICES
MR-0009
PLAQUEMINES PARISH, LOUISIANA

DRAWN BY:	TJW & TPC	SHEET:	3 OF 16
CHKD./APPD. BY:	JCM	SCALE:	1" = 4000'
UPDATED BY:		DATE:	08/28/2019
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P.O.E.
(NAD 83)
N=281,621.41
E=3,969,151.68

9+51

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E=3,969,021.78

9+68

5+00

5+00

N 30°00'00" W

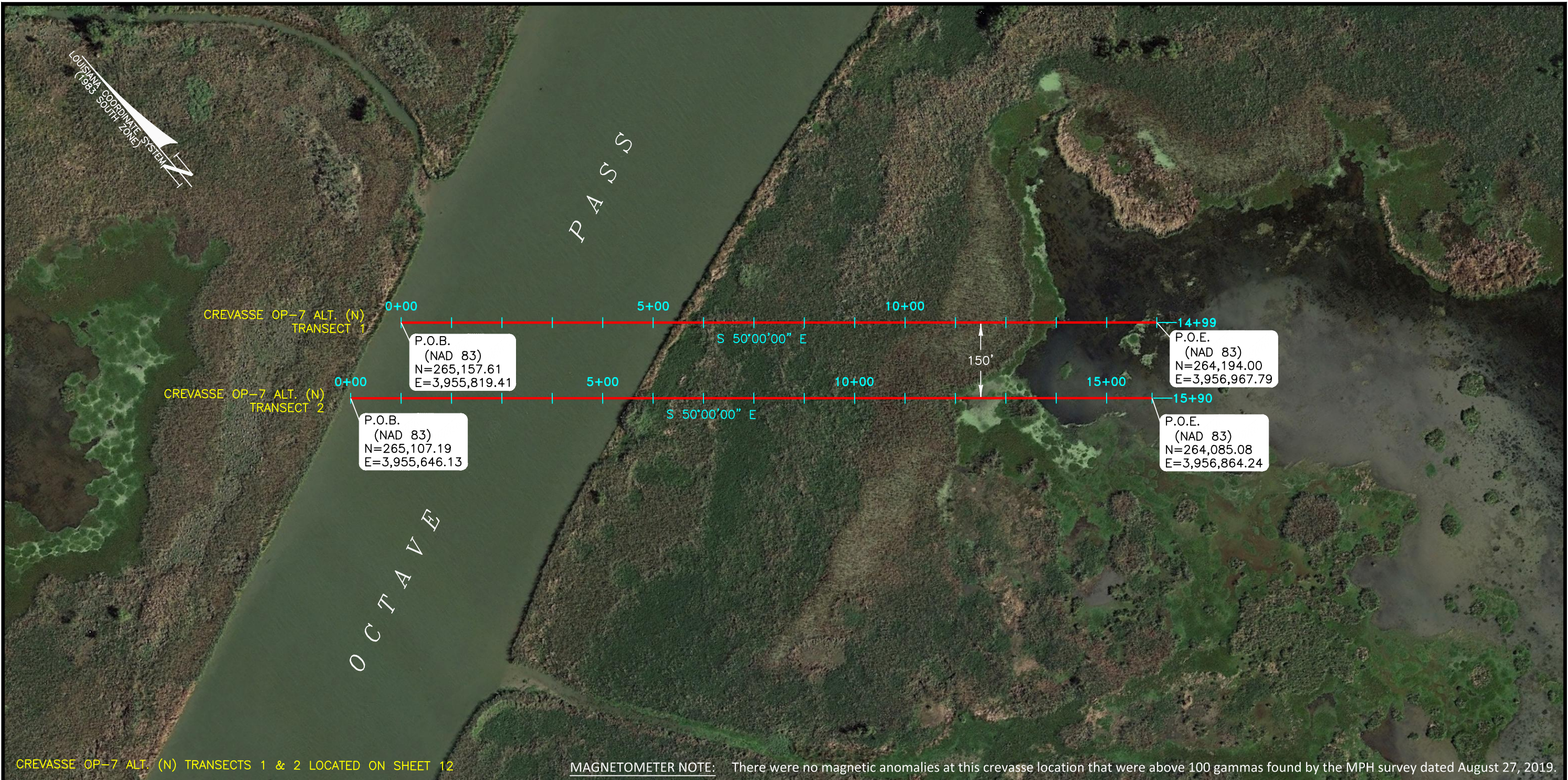
N 30°00'00" W

150'

P.O.B.
(NAD 83)
N=280,797.65
E=3,969,627.28

CREVASSE OP-6 (N)
TRANSECT 2

P:\01-Survey_Projects\State of Louisiana\13000-04 - MR-09 Delta Wide Crevasses\CAD Files\08-28-19\13000-04-trans005a0.dwg PLOT DATE: 9/17/19 3:55:25pm



CREVASSE OP-7 ALT. (N) TRANSECTS 1 & 2 LOCATED ON SHEET 12

MAGNETOMETER NOTE: There were no magnetic anomalies at this crevasse location that were above 100 gammas found by the MPH survey dated August 27, 2019.

AN ON-THE-GROUND EFFORT WILL BE MADE TO LOCATE AND INDICATE ALL BELOW GROUND FERROUS METAL CABLES, PIPELINES AND UTILITIES IN THE AREAS DESCRIBED ABOVE; HOWEVER, DUE TO THE INHERENT LIMITATIONS OF ELECTRONIC MAGNETIC LOCATING EQUIPMENT, MORRIS P. HEBERT, INC. IS NOT RESPONSIBLE FOR ANY CABLES, PIPELINES, UTILITIES OR ANY OTHER BELOW GROUND STRUCTURES (INCLUDING PVC) NOT LOCATED DURING THE COURSE OF THE SURVEY. MPH'S EFFORTS DO NOT RELIEVE THE LA ONE CALL RESPONSIBILITY PRIOR TO MOBILIZATION OF EQUIPMENT AND OR EXCAVATION.



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OFFICE OF COASTAL PROTECTION RESTORATION AUTHORITY OF LOUISIANA

DELTA WIDE CREVASSES – CREVASSE OP-7 ALT. (N) OVERVIEW
DELTA WIDE CREVASSES SURVEYING SERVICES
MR-0009
PLAQUEMINES PARISH, LOUISIANA

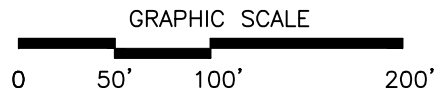
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DATA BASE:	13000-04	JOB NO.	13000-04
MPH CAD FILE: 13000-04-TRANS005A0.DWG			

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AN ON-THE-GROUND EFFORT WAS MADE TO LOCATE AND INDICATE ALL BELOW GROUND FERROUS METAL CABLES, PIPELINES AND UTILITIES IN THE AREAS DESCRIBED ABOVE; HOWEVER, DUE TO THE INHERENT LIMITATIONS OF ELECTRONIC MAGNETIC LOCATING EQUIPMENT, MORRIS P. HEBERT, INC. IS NOT RESPONSIBLE FOR ANY CABLES, PIPELINES, UTILITIES OR ANY OTHER BELOW GROUND STRUCTURES (INCLUDING PVC) NOT LOCATED DURING THE COURSE OF THE SURVEY. MPH'S EFFORTS DO NOT RELIEVE THE LA ONE CALL RESPONSIBILITY PRIOR TO MOBILIZATION OF EQUIPMENT AND OR EXCAVATION.

MAGNETOMETER NOTE: There were no magnetic anomalies at this crevasse location that were above 100 gammas found by the MPH survey dated August 27, 2019.



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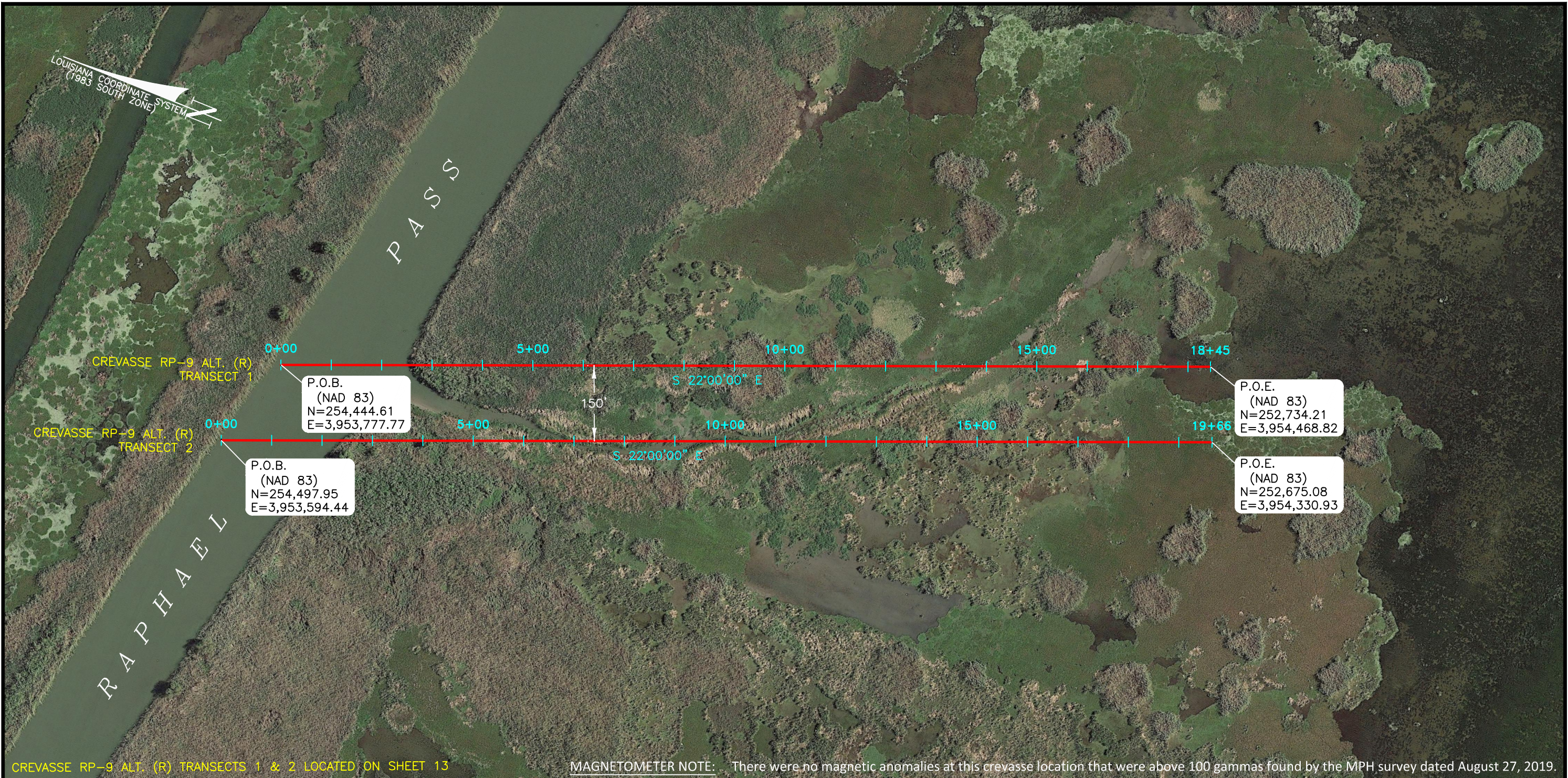
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OFFICE OF COASTAL PROTECTION RESTORATION AUTHORITY OF LOUISIANA

DELTA WIDE CREVASSES – CREVASSE RP-8 (N) OVERVIEW
DELTA WIDE CREVASSES SURVEYING SERVICES
MR-0009
PLAQUEMINES PARISH, LOUISIANA

DRAWN BY:	TJW & TPC	SHEET:	6 OF 16
CHKD./APPD. BY:	JCM	SCALE:	1" = 100'
UPDATED BY:		DATE:	08/28/2019
DATA BASE:	13000-04	JOB NO.	13000-04
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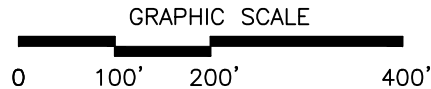
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CREVASSE RP-9 ALT. (R) TRANSECTS 1 & 2 LOCATED ON SHEET 13

MAGNETOMETER NOTE: There were no magnetic anomalies at this crevasse location that were above 100 gammas found by the MPH survey dated August 27, 2019.

AN ON-THE-GROUND EFFORT WAS MADE TO LOCATE AND INDICATE ALL BELOW GROUND FERROUS METAL CABLES, PIPELINES AND UTILITIES IN THE AREAS DESCRIBED ABOVE; HOWEVER, DUE TO THE INHERENT LIMITATIONS OF ELECTRONIC MAGNETIC LOCATING EQUIPMENT, MORRIS P. HEBERT, INC. IS NOT RESPONSIBLE FOR ANY CABLES, PIPELINES, UTILITIES OR ANY OTHER BELOW GROUND STRUCTURES (INCLUDING PVC) NOT LOCATED DURING THE COURSE OF THE SURVEY. MPH'S EFFORTS DO NOT RELIEVE THE LA ONE CALL RESPONSIBILITY PRIOR TO MOBILIZATION OF EQUIPMENT AND OR EXCAVATION.



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TEXAS SURVEY FIRM REGISTRATION NUMBER: 10193786 (HOUMA OFFICE)

OFFICE OF COASTAL PROTECTION RESTORATION AUTHORITY OF LOUISIANA

DELTA WIDE CREVASSES – CREVASSE RP-9 ALT. (R) OVERVIEW
DELTA WIDE CREVASSES SURVEYING SERVICES
MR-0009
PLAQUEMINES PARISH, LOUISIANA

DRAWN BY:	TJW & TPC	SHEET:	7 OF 16
CHKD./APPD. BY:	JCM	SCALE:	1" = 200'
UPDATED BY:		DATE:	08/28/2019
DATA BASE:	13000-04	JOB NO.	13000-04
MPH CAD FILE: 13000-04-TRANS007A0.DWG			

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LOUISIANA COORDINATE SYSTEM
(1983 SOUTH ZONE)

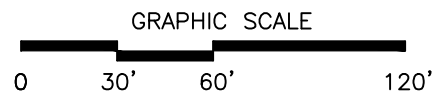


Point Number	X	Y	Latitude	Longitude	Line Name	Signature	Gamma Peak	Intensity	Time Elapsed (sec.)	Distance Over Ground (ft.)	Date Aquired	Inflection Level
100106	3967512.48	266276.4	29 12 52.023 N	089 10 50.7911 W	001_1303	d	46539	166.8	4.6	32.7	27-Aug-19	Low

MAGNETOMETER NOTE: MPH identified all inflections (anomalies) above 100 gammas. Lower inflections (<250 gammas) signify small to moderate ferrous objects, medium inflections (250 to 500 gammas) signify moderate to large ferrous objects and high inflections (>500 gammas) indicate large ferrous objects.

CREVASSE FP-10 (N) TRANSECTS 1 & 2 LOCATED ON SHEET 14

AN ON-THE-GROUND EFFORT WAS MADE TO LOCATE AND INDICATE ALL BELOW GROUND FERROUS METAL CABLES, PIPELINES AND UTILITIES IN THE AREAS DESCRIBED ABOVE; HOWEVER, DUE TO THE INHERENT LIMITATIONS OF ELECTRONIC MAGNETIC LOCATING EQUIPMENT, MORRIS P. HEBERT, INC. IS NOT RESPONSIBLE FOR ANY CABLES, PIPELINES, UTILITIES OR ANY OTHER BELOW GROUND STRUCTURES (INCLUDING PVC) NOT LOCATED DURING THE COURSE OF THE SURVEY. MPH'S EFFORTS DO NOT RELIEVE THE LA ONE CALL RESPONSIBILITY PRIOR TO MOBILIZATION OF EQUIPMENT AND OR EXCAVATION.



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OFFICE OF COASTAL PROTECTION RESTORATION AUTHORITY OF LOUISIANA

DELTA WIDE CREVASSES – CREVASSE FP-10 (N) OVERVIEW
DELTA WIDE CREVASSES SURVEYING SERVICES
MR-0009
PLAQUEMINES PARISH, LOUISIANA

DRAWN BY:	TJW & TPC	SHEET:	8 OF 16
CHKD./APPD. BY:	JCM	SCALE:	1" = 60'
UPDATED BY:		DATE:	08/28/2019
DATA BASE:	13000-04	JOB NO.	13000-04
MPH CAD FILE: 13000-04-TRANS008A0.DWG			

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SOUTH

SP-11

100102
MAGNETOMETER HIT

CREVASSE SP-11 (N)
TRANSECT 1

P.O.B.
(NAD 83)
N=215,455.54
E=3,957,627.74

CREVASSE SP-11 (N)
TRANSECT 2

P.O.B.
(NAD 83)
N=215,527.21
E=3,958,085.05

100101
MAGNETOMETER HIT

100100
MAGNETOMETER HIT

P.O.E.
(NAD 83)
N=215,284.39
E=3,959,462.18

P.O.E.
(NAD 83)
N=215,136.67
E=3,959,436.13

Point Number	X	Y	Latitude	Longitude	Line Name	Signature	Gamma Peak	Intensity	Time Elapsed (sec.)	Distance Over Ground (ft.)	Date Aquired	Inflection Level
100100	3959289.48	215291.25	29 04 28.9025 N	089 12 34.2296 W	002_0936	m-	46730	316.1	8.7	65.8	27-Aug-19	Medium
100101	3958707.65	215416.8	29 04 30.2518 N	089 12 40.7587 W	002_0936	m+	46426	100	2.8	26.5	27-Aug-19	Low
100102	3957459.67	215646.42	29 04 32.7531 N	089 12 54.7717 W	001A1001	m+	46396	254.1	17.9	147.6	27-Aug-19	Medium

MAGNETOMETER NOTE: MPH identified all inflections (anomalies) above 100 gammas. Lower inflections (<250 gammas) signify small to moderate ferrous objects, medium inflections (250 to 500 gammas) signify moderate to large ferrous objects and high inflections (>500 gammas) indicate large ferrous objects.

CREVASSE SP-11 (N) TRANSECTS 1 & 2 LOCATED ON SHEET 14

AN ON-THE-GROUND EFFORT WAS MADE TO LOCATE AND INDICATE ALL BELOW GROUND FERROUS METAL CABLES, PIPELINES AND UTILITIES IN THE AREAS DESCRIBED ABOVE; HOWEVER, DUE TO THE INHERENT LIMITATIONS OF ELECTRONIC MAGNETIC LOCATING EQUIPMENT, MORRIS P. HEBERT, INC. IS NOT RESPONSIBLE FOR ANY CABLES, PIPELINES, UTILITIES OR ANY OTHER BELOW GROUND STRUCTURES (INCLUDING PVC) NOT LOCATED DURING THE COURSE OF THE SURVEY. MPH'S EFFORTS DO NOT RELIEVE THE LA ONE CALL RESPONSIBILITY PRIOR TO MOBILIZATION OF EQUIPMENT AND OR EXCAVATION.

GRAPHIC SCALE

0 100' 200' 400'

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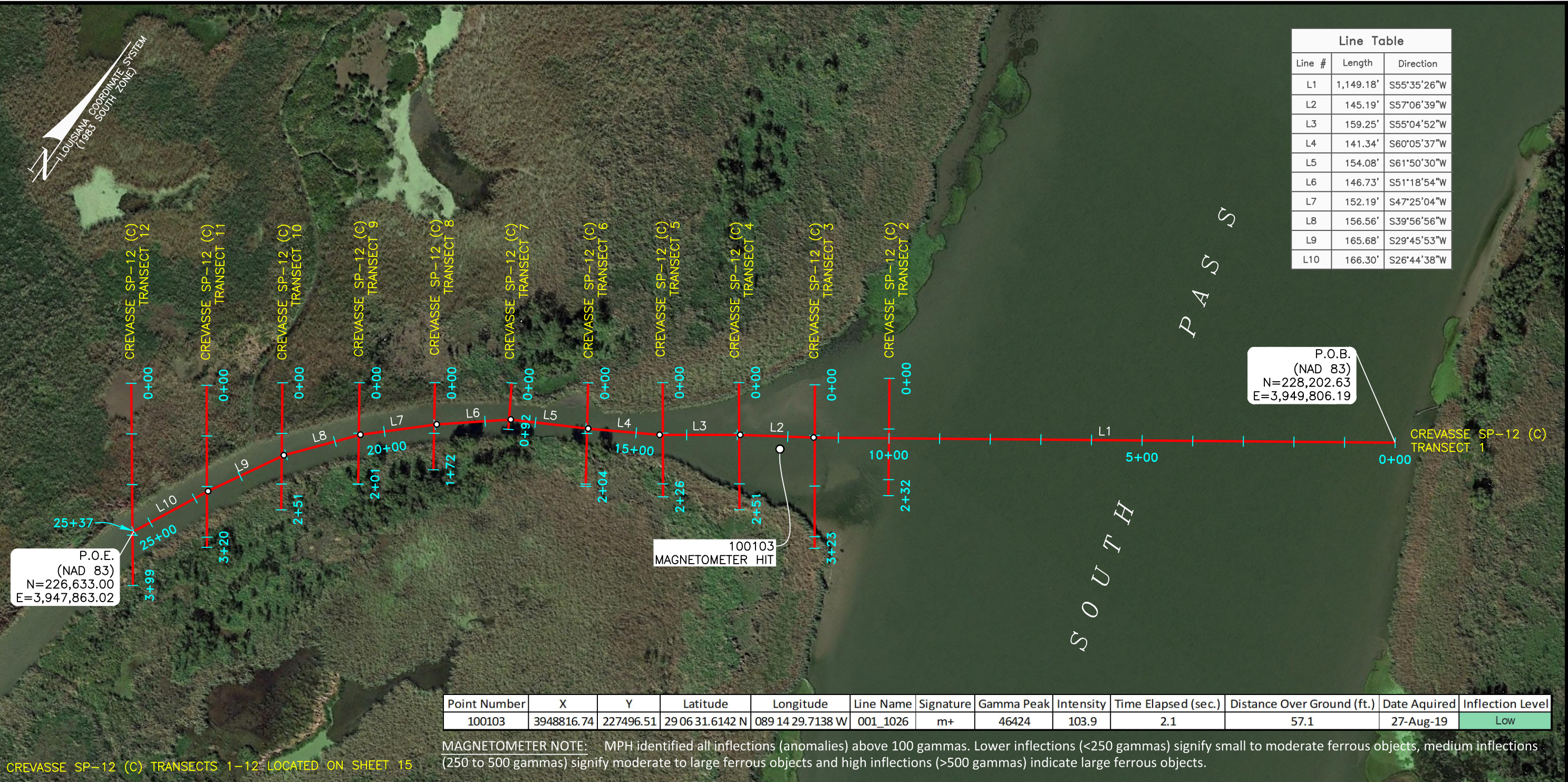


OFFICE OF COASTAL PROTECTION RESTORATION AUTHORITY OF LOUISIANA

DELTA WIDE CREVASSES – CREVASSE SP-11 (N) OVERVIEW
DELTA WIDE CREVASSES SURVEYING SERVICES
MR-0009
PLAQUEMINES PARISH, LOUISIANA

DRAWN BY:	TJW & TPC	SHEET:	9 OF 16
CHKD./APPD. BY:	JCM	SCALE:	1" = 200'
UPDATED BY:		DATE:	08/28/2019
DATA BASE:	13000-04	JOB NO.	13000-04
MPH CAD FILE: 13000-04-TRANS009A0.DWG			

P:\01-Survey_Projects\State of Louisiana\13000-04 - MR-09 Delta Wide Crevasses\CAD Files\08-28-19\13000-04-trans010a0.dwg PLOT DATE: 9/18/19 10:40:31 am



Point Number	X	Y	Latitude	Longitude	Line Name	Signature	Gamma Peak	Intensity	Time Elapsed (sec.)	Distance Over Ground (ft.)	Date Aquired	Inflection Level
100103	3948816.74	227496.51	29 06 31.6142 N	089 14 29.7138 W	001_1026	m+	46424	103.9	2.1	57.1	27-Aug-19	Low

MAGNETOMETER NOTE: MPH identified all inflections (anomalies) above 100 gammas. Lower inflections (<250 gammas) signify small to moderate ferrous objects, medium inflections (250 to 500 gammas) signify moderate to large ferrous objects and high inflections (>500 gammas) indicate large ferrous objects.



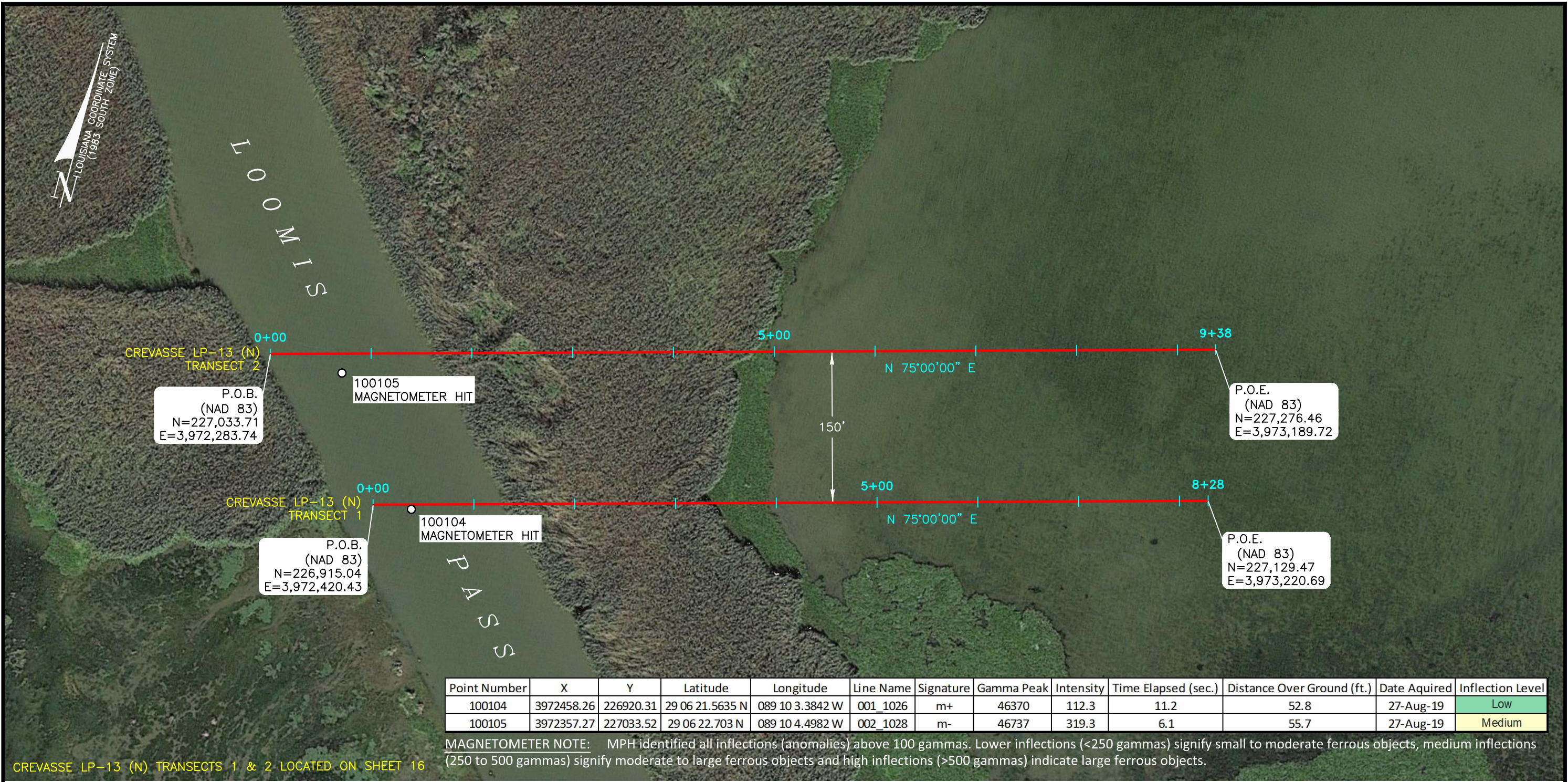
Morris P. Hebert, Inc.
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TEXAS SURVEY FIRM REGISTRATION NUMBER: 10193786 (HOUMA OFFICE)

OFFICE OF COASTAL PROTECTION RESTORATION AUTHORITY OF LOUISIANA

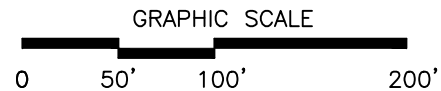
DELTA WIDE CREVASSES – CREVASSE SP-12 OVERVIEW
DELTA WIDE CREVASSES SURVEYING SERVICES
MR-0009
PLAQUEMINES PARISH, LOUISIANA

DRAWN BY:	TJW & TPC	SHEET:	10 OF 16
CHKD./APPD. BY:	JCM	SCALE:	1" = 200'
UPDATED BY:		DATE:	08/28/2019
DATA BASE:	13000-04	JOB NO.	13000-04
MPH CAD FILE: 13000-04-TRANS010A0.DWG			

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AN ON-THE-GROUND EFFORT WAS MADE TO LOCATE AND INDICATE ALL BELOW GROUND FERROUS METAL CABLES, PIPELINES AND UTILITIES IN THE AREAS DESCRIBED ABOVE; HOWEVER, DUE TO THE INHERENT LIMITATIONS OF ELECTRONIC MAGNETIC LOCATING EQUIPMENT, MORRIS P. HEBERT, INC. IS NOT RESPONSIBLE FOR ANY CABLES, PIPELINES, UTILITIES OR ANY OTHER BELOW GROUND STRUCTURES (INCLUDING PVC) NOT LOCATED DURING THE COURSE OF THE SURVEY. MPH'S EFFORTS DO NOT RELIEVE THE LA ONE CALL RESPONSIBILITY PRIOR TO MOBILIZATION OF EQUIPMENT AND OR EXCAVATION.



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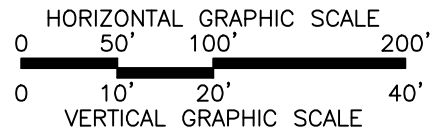
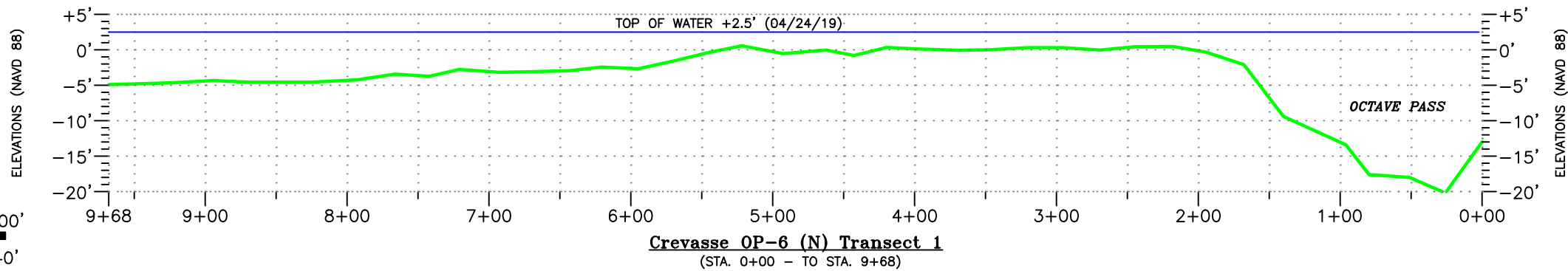
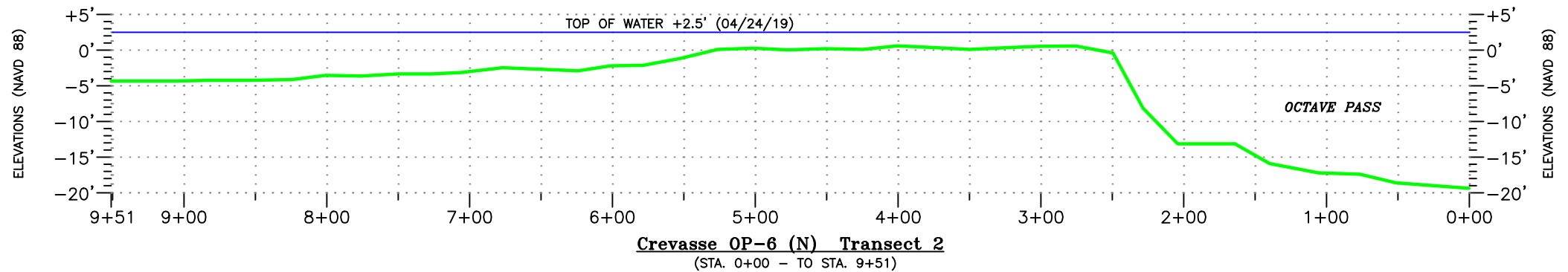
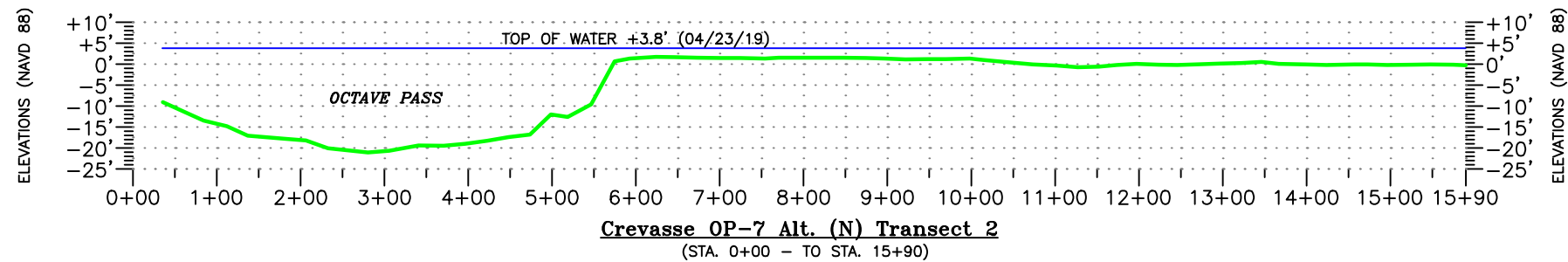
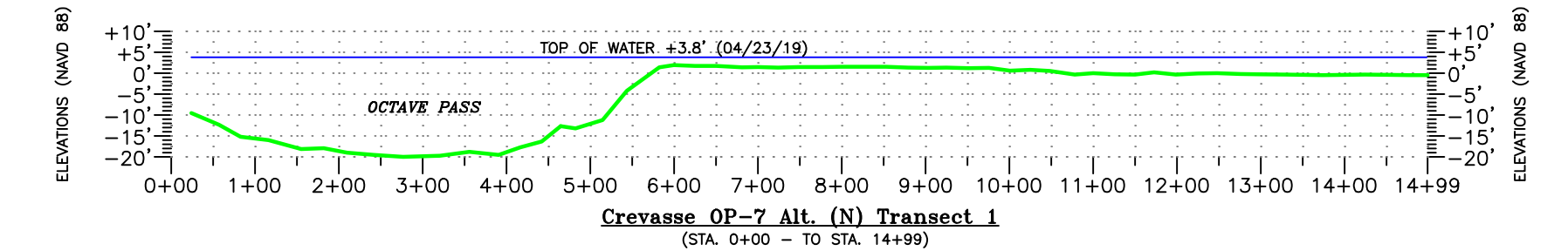
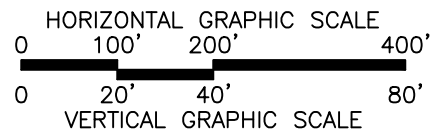
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TEXAS SURVEY FIRM REGISTRATION NUMBER: 10193786 (HOUMA OFFICE)

OFFICE OF COASTAL PROTECTION RESTORATION AUTHORITY OF LOUISIANA

DELTA WIDE CREVASSES – CREVASSE LP-13 (N) OVERVIEW
DELTA WIDE CREVASSES SURVEYING SERVICES
MR-0009
PLAQUEMINES PARISH, LOUISIANA

DRAWN BY:	TJW & TPC	SHEET:	11 OF 16
CHKD./APPD. BY:	JCM	SCALE:	1" = 100'
UPDATED BY:		DATE:	08/28/2019
DATA BASE:	13000-04	JOB NO.	13000-04
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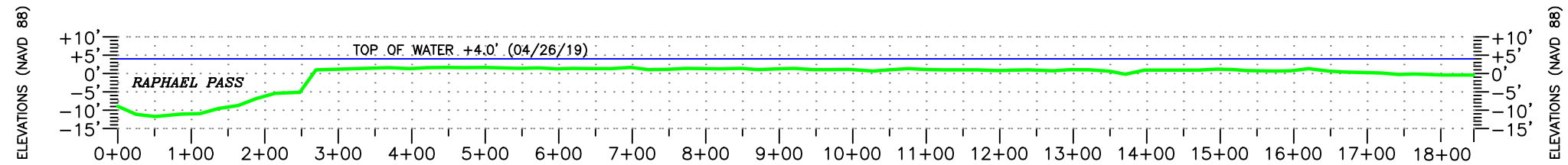


OFFICE OF COASTAL PROTECTION RESTORATION AUTHORITY OF LOUISIANA

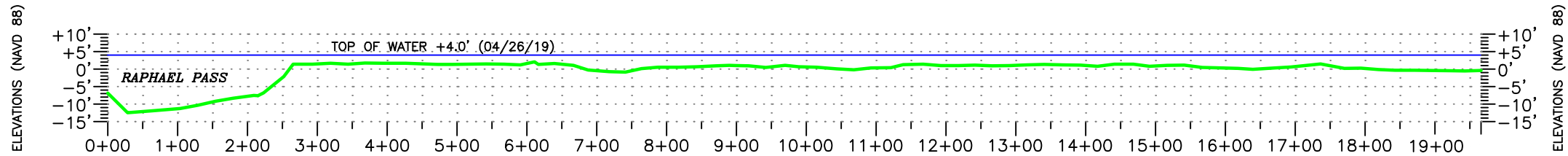
DELTA WIDE CREVASSES - OP-6 (N) TRANSECTS 1-2 & OP-7 ALT. (N) TRANSECTS 1-2
DELTA WIDE CREVASSES SURVEYING SERVICES
MR-0009
PLAQUEMINES PARISH, LOUISIANA

DRAWN BY:	TJW & TPC	SHEET:	12 OF 16
CHKD./APPD. BY:	JCM	SCALE:	AS SHOWN
UPDATED BY:		DATE:	08/28/2019
DATA BASE:	13000-04	JOB NO.	13000-04
MPH CAD FILE: 13000-04-TRANS012A0.DWG			

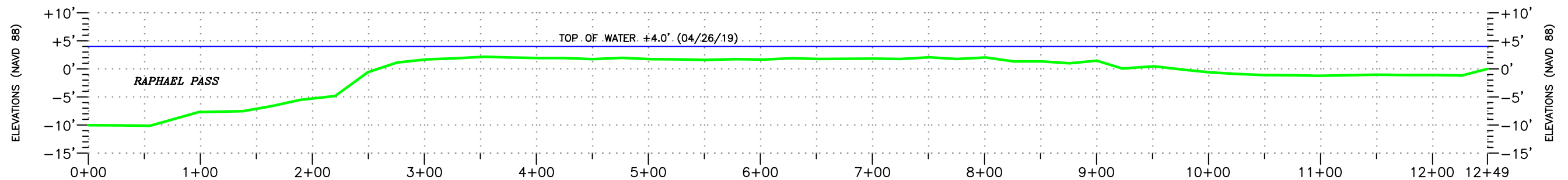
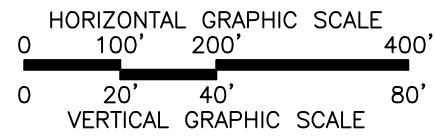
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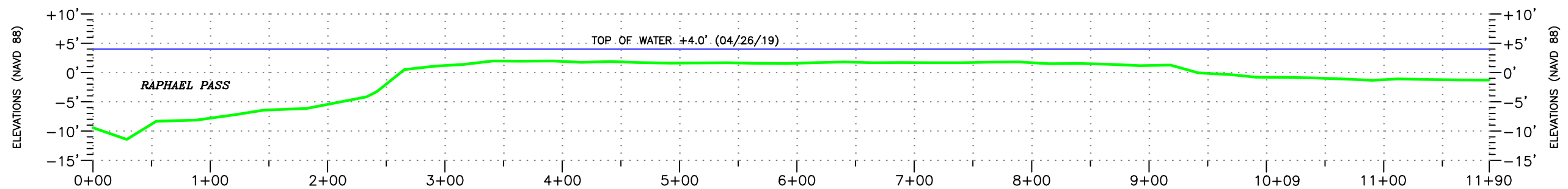
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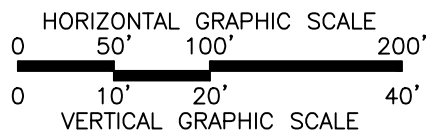
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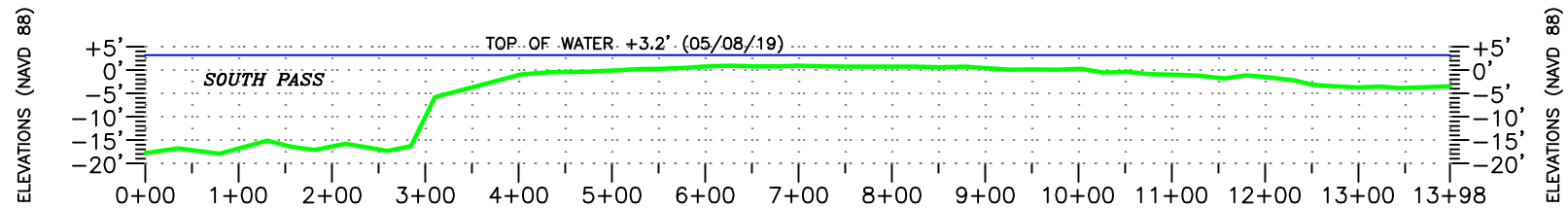


OFFICE OF COASTAL PROTECTION RESTORATION AUTHORITY OF LOUISIANA

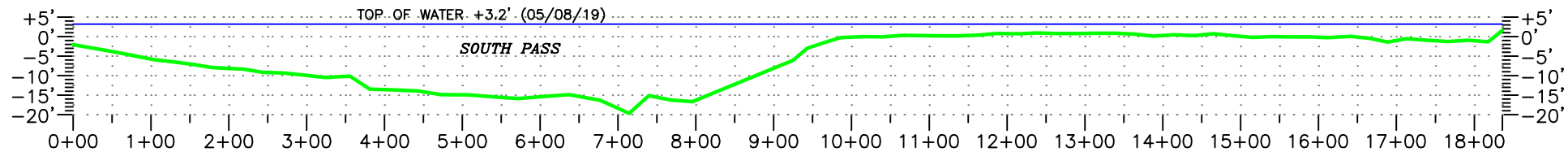
DELTA WIDE CREVASSES - RP-8 (N) TRANSECTS 1-2 & RP-9 ALT. (R) TRANSECTS 1-2
DELTA WIDE CREVASSES SURVEYING SERVICES
MR-0009
PLAQUEMINES PARISH, LOUISIANA

DRAWN BY: TJW & TPC	SHEET: 13 OF 16
CHKD./APPD. BY: JCM	SCALE: AS SHOWN
UPDATED BY:	DATE: 05/03/2019
DATA BASE: 13000-04	JOB NO. 13000-04
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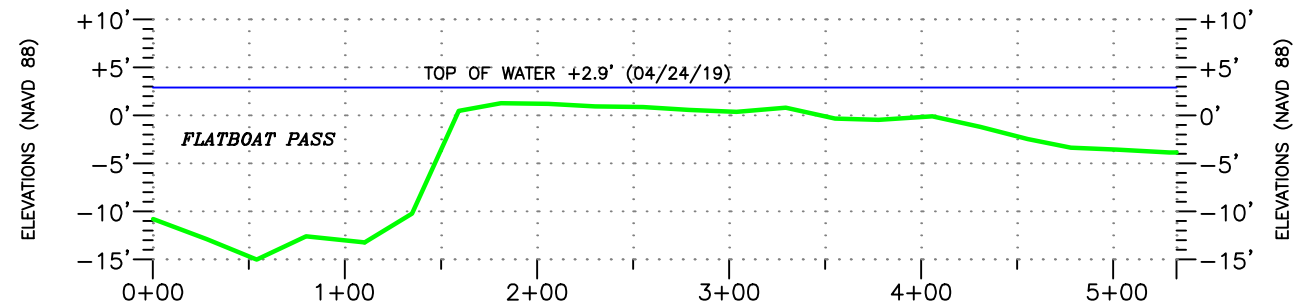
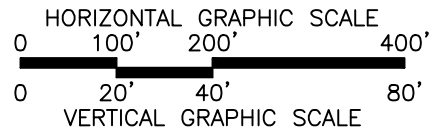
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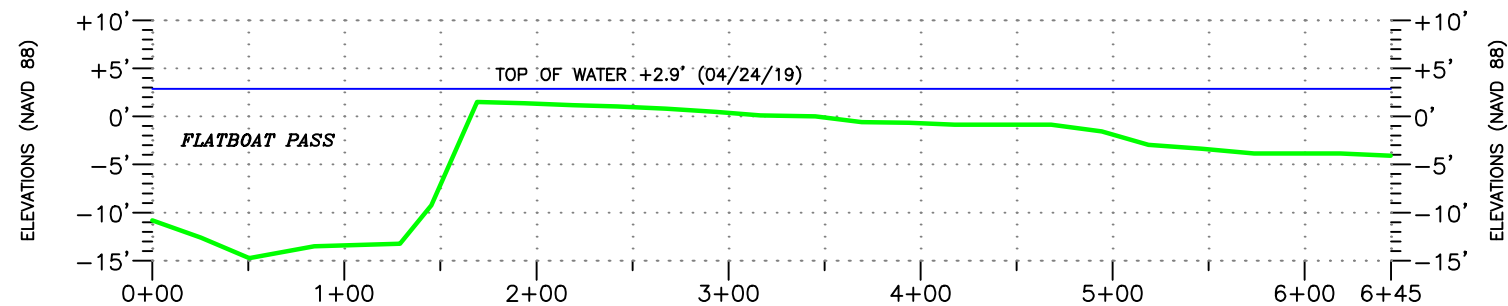
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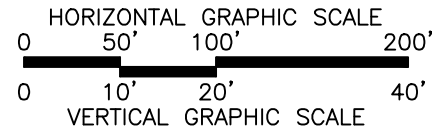
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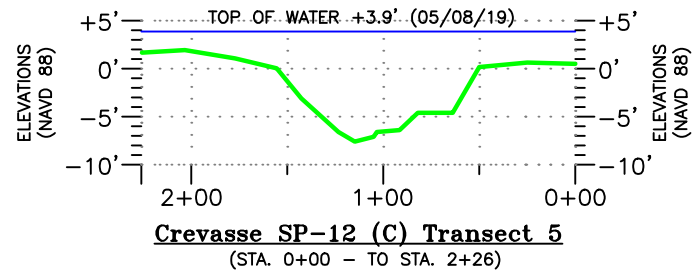


OFFICE OF COASTAL PROTECTION RESTORATION AUTHORITY OF LOUISIANA

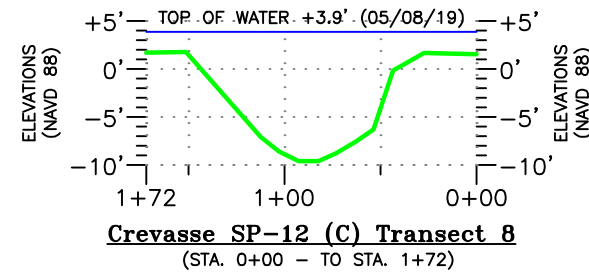
DELTA WIDE CREVASSES FP-10 (N) TRANSECTS 1-2, & SP-11 (N) TRANSECTS 1-2
DELTA WIDE CREVASSES SURVEYING SERVICES
MR-0009
PLAQUEMINES PARISH, LOUISIANA

DRAWN BY:	TJW & TPC	SHEET:	14 OF 16
CHKD./APPD. BY:	JCM	SCALE:	AS SHOWN
UPDATED BY:		DATE:	08/28/2019
DATA BASE:	13000-04	JOB NO.	13000-04
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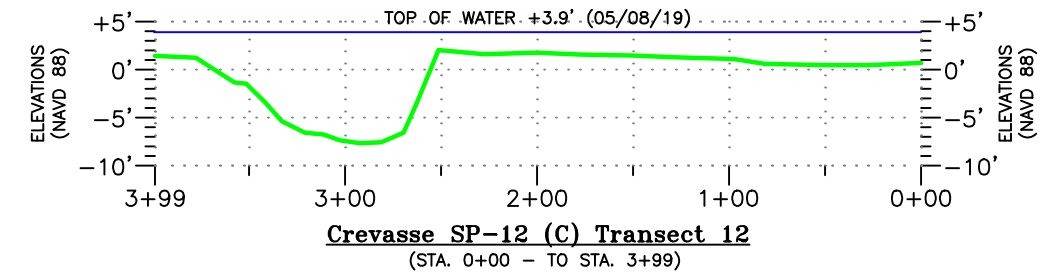
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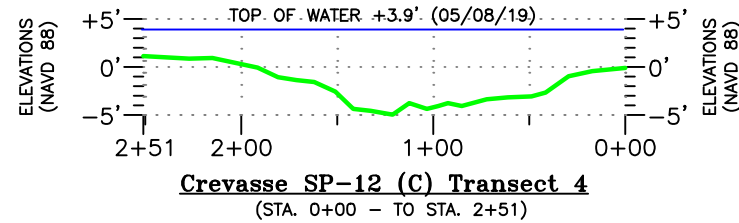
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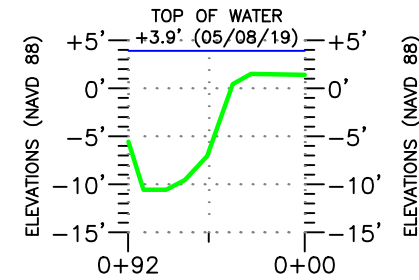
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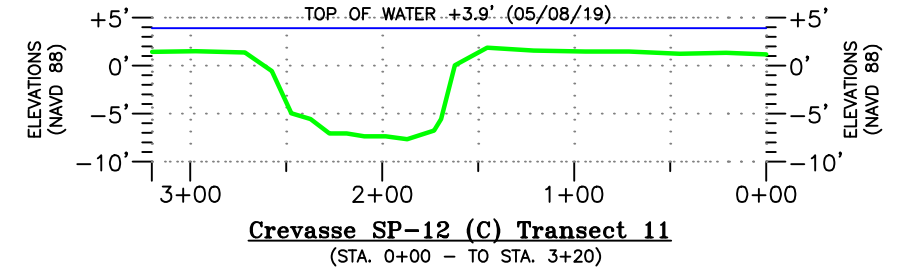
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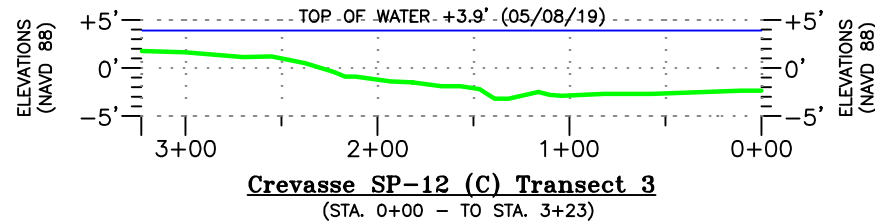
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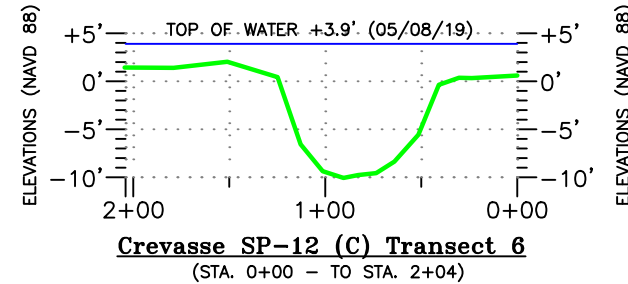
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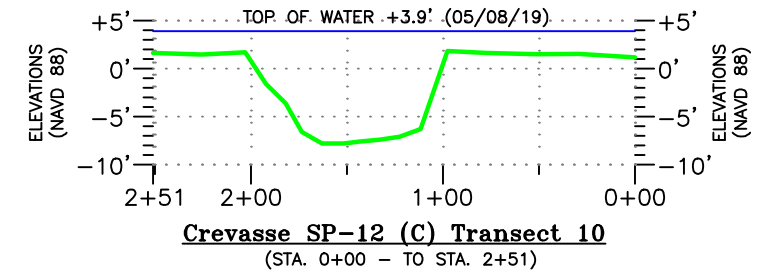
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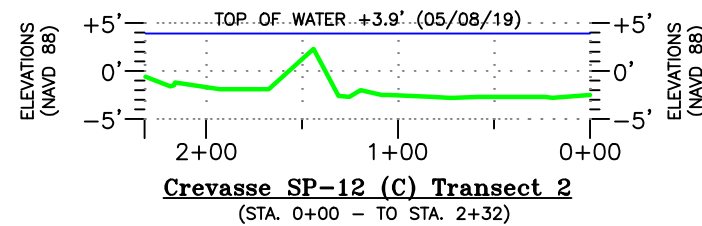
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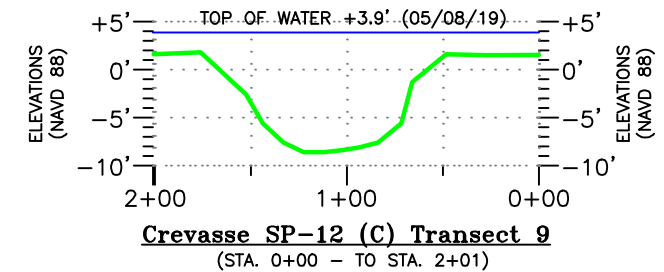
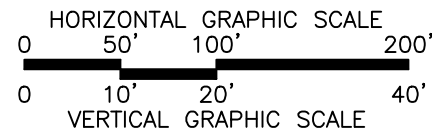
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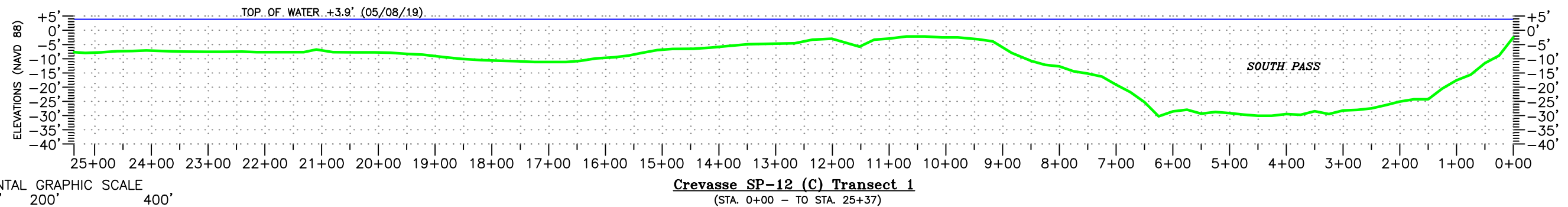
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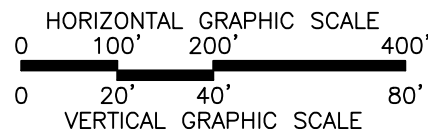
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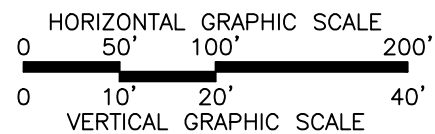
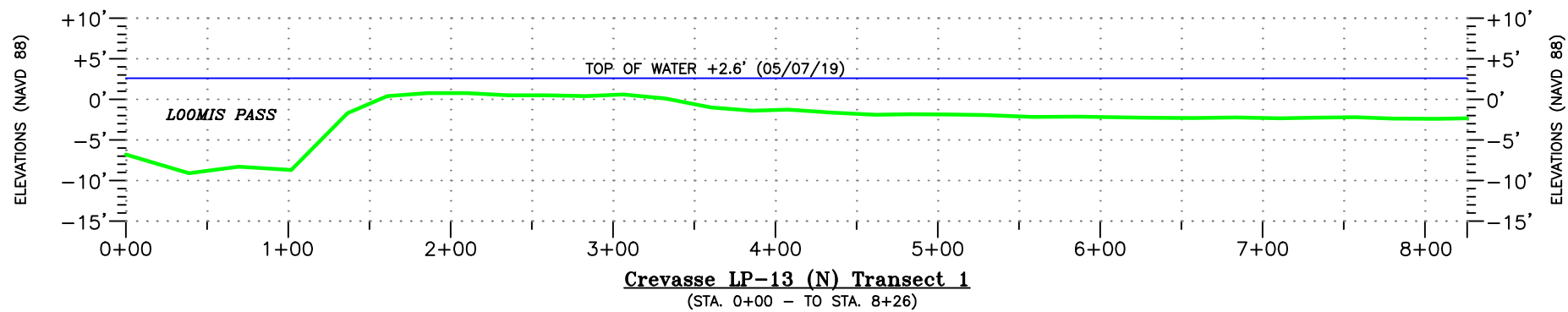
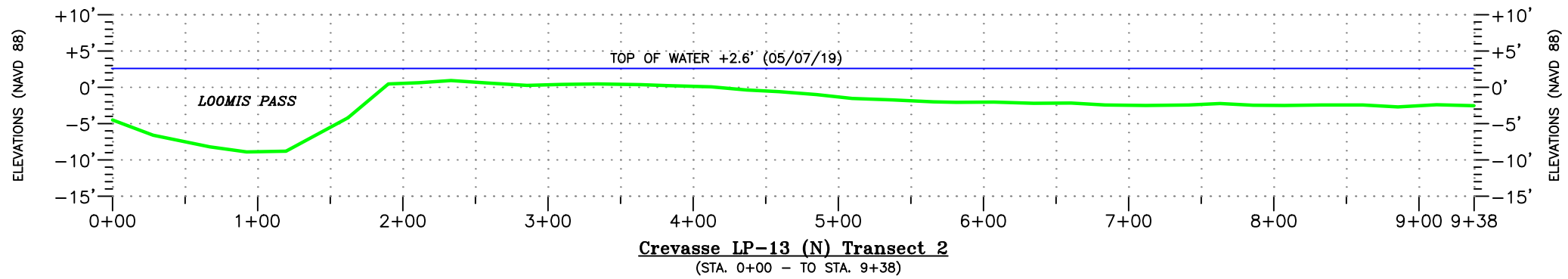


OFFICE OF COASTAL PROTECTION RESTORATION AUTHORITY OF LOUISIANA

DELTA WIDE CREVASSES - SP-12 (C) TRANSECTS 1 THRU 12
DELTA WIDE CREVASSES SURVEYING SERVICES
MR-0009
PLAQUEMINES PARISH, LOUISIANA

DRAWN BY: TJW & TPC	SHEET: 15 OF 16
CHKD./APPD. BY: JCM	SCALE: AS SHOWN
UPDATED BY:	DATE: 08/28/2019
DATA BASE: 13000-04	JOB NO. 13000-04
MPH CAD FILE: 13000-04-TRANS015A0.DWG	

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OFFICE OF COASTAL PROTECTION RESTORATION AUTHORITY OF LOUISIANA

DELTA WIDE CREVASSES - LP-13 (N) TRANSECTS 1-2
DELTA WIDE CREVASSES SURVEYING SERVICES
MR-0009
PLAQUEMINES PARISH, LOUISIANA

DRAWN BY: TJW & TPC	SHEET: 16 OF 16
CHKD./APPD. BY: JCM	SCALE: AS SHOWN
UPDATED BY:	DATE: 08/28/2019
DATA BASE: 13000-04	JOB NO. 13000-04
MPH CAD FILE: 13000-04-TRANS016A0.DWG	

APPENDIX 4

Field Survey Data

Point_No	Northing	Easting	Elevation	Description
1000	267445.484	3945645.4	5.494	MR09-SM-31 CHK
1001	276368.213	3947242.724	1.973	MR09-SM-38 CHK MON
1002	238749.078	3953567.719	2.716	MR09-SM0-06 CHK
1004	234136.261	3959208.644	5.237	MON
1014	264804.106	3956270.399	2.054	TOW
2000	276368.203	3947243.321	4.053	MON
2002	264846.279	3956188.122	-13.161	SND
2003	264821.66	3956209.627	-11.161	SND
2004	264801.31	3956230.035	-4.161	SND
2005	264783.046	3956265.475	1.408	WBY
2006	264772.199	3956278.717	1.977	WBY
2007	264755.684	3956297.982	1.779	WBY
2008	264738.932	3956317.317	1.778	NG
2009	264719.008	3956340.446	1.427	WBY
2010	264707.156	3956355.85	1.454	WBY
2011	264691.754	3956373.885	1.331	WBY
2012	264676.386	3956392.78	1.489	WBY
2013	264657.441	3956413.942	1.5	WBY
2014	264643.382	3956431.803	1.562	WBY
2015	264627.061	3956450.91	1.578	WBY
2016	264609.232	3956472.248	1.56	WBY
2017	264591.577	3956492.466	1.382	WBY
2018	264576.51	3956511.234	1.296	WBY
2019	264562.873	3956527.856	1.328	WBY
2020	264546.06	3956547.495	1.245	WBY
2021	264530.144	3956566.481	1.312	WBY
2022	264514.206	3956585.768	0.603	WBY
2023	264498.881	3956604.819	0.849	WBY
2024	264483.339	3956621.914	0.562	WBY
2025	264463.762	3956644.433	-0.299	WBY
2026	264450.244	3956661.92	0.018	WBY
2027	264433.899	3956681.474	-0.267	WBY
2028	264418.203	3956700.168	-0.31	WBY
2029	264403.79	3956717.47	0.198	WBY
2030	264386.378	3956736.893	-0.337	WBY
2031	264369.919	3956758.01	-0.058	WBY
2032	264355.141	3956774.95	0.024	WBY
2033	264338.152	3956797.267	-0.192	WBY
2034	264324.646	3956814.296	-0.258	WBY
2035	264302.693	3956838.042	-0.282	WBY
2036	264288.385	3956855.034	-0.409	WBY
2037	264274.622	3956870.964	-0.423	WBY
2038	264257.161	3956892.632	-0.364	WBY
2039	264241.04	3956909.7	-0.29	WBY
2040	264223.275	3956931.957	-0.355	WBY
2041	264207.619	3956950.852	-0.457	WBY

Point_No	Northing	Easting	Elevation	Description
2042	264191.965	3956968.435	-0.461	WBY
2043	264191.877	3956964.567	1.624	TOW
2044	264083.152	3956862.341	1.571	TOW
2045	264084.836	3956863.763	-0.27	WBY
2046	264094.65	3956852.483	-0.143	WBY
2047	264111.529	3956831.05	-0.112	WBY
2048	264125.529	3956814.436	-0.146	WBY
2049	264144.797	3956791.818	-0.26	WBY
2050	264160.192	3956774.007	-0.112	WBY
2051	264170.563	3956761.867	-0.079	WBY
2052	264191.946	3956737.323	-0.215	WBY
2053	264207.883	3956717.969	-0.112	WBY
2054	264228.355	3956692.853	0.015	WBY
2055	264241.658	3956677.026	0.478	WBY
2056	264256.223	3956658.481	0.24	WBY
2057	264273.913	3956639.363	0.093	WBY
2058	264292.716	3956616.351	-0.074	WBY
2059	264306.175	3956600.196	-0.221	WBY
2060	264320.071	3956582.939	-0.181	WBY
2061	264337.214	3956563	0.02	WBY
2062	264352.453	3956545.259	-0.25	WBY
2063	264366.116	3956528.172	-0.661	WBY
2064	264382.344	3956509.096	-0.774	WBY
2065	264398.064	3956489.914	-0.389	WBY
2066	264416.787	3956468.256	-0.102	WBY
2067	264434.146	3956448.432	0.39	WBY
2068	264454.799	3956422.672	0.996	WBY
2069	264464.863	3956409.969	1.304	WBY
2070	264483.334	3956388.525	1.193	WBY
2071	264497.367	3956371.97	1.198	WBY
2072	264514.983	3956352.361	1.136	WBY
2073	264529.736	3956332.96	1.316	WBY
2074	264545.101	3956315.968	1.407	WBY
2075	264562.373	3956294.601	1.494	WBY
2076	264578.685	3956275.201	1.532	WBY
2077	264593.515	3956258.318	1.486	WBY
2078	264611.963	3956236.095	1.51	WBY
2079	264622.81	3956224.011	1.314	WBY
2080	264641.264	3956200.745	1.416	WBY
2081	264656.13	3956182.801	1.434	WBY
2082	264674.672	3956162.155	1.537	WBY
2083	264691.437	3956141.425	1.609	WBY
2084	264706.422	3956124.086	1.734	WBY
2085	264726.168	3956100.097	1.3	WBY
2086	264727.69	3956110.664	2.016	TOW
2087	276368.185	3947243.298	3.949	CHK

Point_No	Northing	Easting	Elevation	Description
2088	267445.237	3945645.637	7.208	CHK
2089	280862.493	3969412.1	0.721	TOW
2090	280853.697	3969421.709	-2.103	WBY
2091	280876.791	3969408.612	-0.331	WBY
2092	280896.991	3969397.101	0.482	WBY
2093	280919.42	3969382.143	0.44	WBY
2094	280940.885	3969370.095	-0.019	WBY
2095	280963.919	3969357.826	0.318	WBY
2096	280985.319	3969344.483	0.297	WBY
2097	281009.496	3969331.661	0.023	WBY
2098	281028.396	3969321.057	-0.067	WBY
2099	281054.249	3969306.252	0.146	WBY
2100	281071.999	3969296.079	0.357	WBY
2101	281091.879	3969284.757	-0.776	WBY
2102	281109.072	3969274.774	-0.032	WBY
2103	281134.781	3969259.228	-0.531	WBY
2104	281160.777	3969245.883	0.569	WBY
2105	281182.137	3969236.916	-0.356	WBY
2106	281204.952	3969224.06	-1.616	WBY
2107	281222.07	3969205.787	-2.651	WBY
2108	281245.887	3969195.059	-2.427	WBY
2109	281264.255	3969183.768	-2.914	WBY
2110	281289.425	3969170.065	-3.085	WBY
2111	281307.875	3969157.962	-3.159	WBY
2112	281332.539	3969144.876	-2.752	WBY
2113	281350.793	3969134.712	-3.7405	SND
2114	281370.944	3969120.697	-3.4405	SND
2115	281394.938	3969109.497	-4.2405	SND
2116	281427.061	3969098.981	-4.5405	SND
2117	281462.186	3969072.529	-4.5405	SND
2118	281482.678	3969058.321	-4.3405	SND
2119	281508.684	3969041.333	-4.6405	SND
2120	281524.18	3969034.8	-4.7405	SND
2121	281550.022	3969015.031	-4.9405	SND
2122	281555.931	3969009.972	0.798	TOW
2123	281651.645	3969126.907	0.725	TOW
2124	281648.594	3969133.671	-4.443	SND
2125	281643.096	3969139.478	-4.343	SND
2126	281626.546	3969149.606	-4.543	SND
2127	281600.731	3969163.844	-4.343	SND
2128	281582.327	3969174.395	-4.343	SND
2129	281562.285	3969185.982	-4.243	SND
2130	281539.001	3969201.471	-4.243	SND
2131	281511.368	3969214.062	-4.143	SND
2132	281490.849	3969226.492	-3.543	SND
2133	281469.79	3969239.597	-3.643	SND

Point_No	Northing	Easting	Elevation	Description
2134	281447.378	3969252.864	-3.343	SND
2135	281426.733	3969263.85	-3.343	SND
2136	281408.646	3969274.166	-3.143	SND
2137	281384.256	3969289.194	-2.488	WBY
2138	281362.879	3969302.064	-2.687	WBY
2139	281338.365	3969315.558	-2.892	WBY
2140	281318.069	3969326.413	-2.212	WBY
2141	281298.554	3969337.843	-2.151	WBY
2142	281275.852	3969350.648	-1.186	WBY
2143	281253.372	3969363.858	0.101	WBY
2144	281231.582	3969376.926	0.266	WBY
2145	281210.713	3969388.006	0.038	WBY
2146	281188.35	3969401.846	0.203	WBY
2147	281165.443	3969415.057	0.104	WBY
2148	281144.304	3969427.098	0.588	WBY
2149	281123.406	3969439.356	0.368	WBY
2150	281100.889	3969452.745	0.08	WBY
2151	281079.3	3969465.201	0.325	WBY
2152	281057.938	3969476.467	0.522	WBY
2153	281035.768	3969489.45	0.545	WBY
2154	281013.764	3969502.379	-0.393	WBY
2155	281000.884	3969522.109	-8.143	SND
2156	280984.164	3969541.939	-13.143	SND
2157	280938.897	3969543.561	-13.143	SND
2158	281009.645	3969496.163	0.989	TOW
2159	266003.668	3967775.113	1.344	TOW
2160	266000.694	3967788.961	0.459	WBY
2161	265978.006	3967787.112	1.274	WBY
2162	265954.31	3967794.421	1.182	WBY
2163	265930.651	3967800.355	0.935	WBY
2164	265906.187	3967805.66	0.864	WBY
2165	265882.486	3967809.372	0.573	WBY
2166	265858.079	3967813.36	0.366	WBY
2167	265833.087	3967818.995	0.797	WBY
2168	265807.912	3967823.801	-0.328	WBY
2169	265785.46	3967827.124	-0.469	WBY
2170	265757.721	3967831.589	-0.101	WBY
2171	265733.131	3967835.982	-1.204	WBY
2172	265708.884	3967839.835	-2.469	WBY
2173	265686.875	3967844.637	-3.3845	SND
2174	265663.232	3967847.691	-3.5845	SND
2175	265636.109	3967852.949	-3.8845	SND
2176	265611.945	3967856.643	-3.8845	SND
2177	265619.806	3967858.664	1.087	TOW
2178	265585.68	3967708.806	1.047	TOW
2179	265586.04	3967708.734	-4.0675	SND

Point_No	Northing	Easting	Elevation	Description
2180	265612.132	3967704.943	-3.8675	SND
2181	265637.785	3967702.23	-3.8675	SND
2182	265657.148	3967700.628	-3.8675	SND
2183	265683.808	3967693.825	-3.3675	SND
2184	265710.731	3967687.816	-2.9675	SND
2185	265734.621	3967683.625	-1.566	WBY
2186	265760.672	3967679.33	-0.851	WBY
2187	265782.208	3967675.514	-0.846	WBY
2188	265809.947	3967669.279	-0.859	WBY
2189	265833.392	3967666.286	-0.667	WBY
2190	265857.562	3967661.278	-0.603	WBY
2191	265881.343	3967657.28	0.004	WBY
2192	265909.725	3967652.8	0.097	WBY
2193	265932.379	3967649.274	0.463	WBY
2194	265957.79	3967643.682	0.816	WBY
2195	265983.014	3967639.6	1.061	WBY
2196	265978.928	3967641.737	1.218	TOW
2197	267445.333	3945645.708	7.115	CHK
2198	267445.321	3945645.652	7.23	CHK
2199	255140.083	3947640.914	2.364	TOW
2200	255116.895	3947634.3	-0.613	WBY
2201	255137.395	3947651.025	1.117	WBY
2202	255157.625	3947668.332	1.679	WBY
2203	255175.731	3947683.273	1.853	WBY
2204	255197.321	3947701.468	2.166	WBY
2205	255214.066	3947715.718	2.023	WBY
2206	255233.935	3947732.887	1.913	WBY
2207	255251.964	3947747.299	1.912	WBY
2208	255270.521	3947763.387	1.726	WBY
2209	255290.874	3947780.571	1.943	WBY
2210	255310.96	3947797.033	1.721	WBY
2211	255328.898	3947812.134	1.689	WBY
2212	255347.536	3947828.177	1.588	WBY
2213	255367.927	3947845.292	1.74	WBY
2214	255388.183	3947861.69	1.66	WBY
2215	255406.881	3947878.27	1.882	WBY
2216	255425.957	3947893.346	1.747	WBY
2217	255443.691	3947907.992	1.799	WBY
2218	255463.226	3947924.251	1.834	WBY
2219	255481.114	3947940.629	1.751	WBY
2220	255500.813	3947957.018	2.07	WBY
2221	255519.623	3947972.82	1.766	WBY
2222	255540	3947988.783	2.008	WBY
2223	255558.929	3948004.877	1.337	WBY
2224	255578.066	3948021.513	1.324	WBY
2225	255596.954	3948037.074	1.007	WBY

Point_No	Northing	Easting	Elevation	Description
2226	255615.305	3948053.089	1.454	WBY
2227	255632.876	3948067.607	0.05	WBY
2228	255654.542	3948086.221	0.466	WBY
2229	255675.953	3948102.992	-0.18	WBY
2230	255692.496	3948117.05	-0.62	WBY
2231	255710.699	3948133.434	-0.897	WBY
2232	255728.732	3948149.971	-1.124	WBY
2233	255750.995	3948166.006	-1.144	WBY
2234	255766.267	3948180.133	-1.227	WBY
2235	255786.232	3948195.759	-1.146	WBY
2236	255806.401	3948212.797	-1.051	WBY
2237	255828.478	3948231.27	-1.111	WBY
2238	255848.285	3948247.455	-1.112	WBY
2239	255865.652	3948262.367	-1.162	WBY
2240	255885.416	3948277.671	-1.277	WBY
2241	255882.534	3948278.867	2.241	TOW
2242	255784.909	3948397.472	2.22	TOW
2243	255785.138	3948390.028	-1.28	WBY
2244	255763.97	3948372.768	-1.252	WBY
2245	255745.996	3948358.141	-1.185	WBY
2246	255725.419	3948340.269	-1.092	WBY
2247	255708.169	3948327.256	-1.329	WBY
2248	255692.244	3948312.435	-1.127	WBY
2249	255671.62	3948293.218	-0.919	WBY
2250	255652.394	3948279.505	-0.817	WBY
2251	255632.772	3948262.198	-0.79	WBY
2252	255616.218	3948249.345	-0.363	WBY
2253	255595.071	3948231.273	-0.047	WBY
2254	255577.202	3948215.415	1.273	WBY
2255	255556.526	3948199.689	1.167	WBY
2256	255536.771	3948182.202	1.414	WBY
2257	255518.403	3948166.462	1.554	WBY
2258	255497.434	3948149.655	1.513	WBY
2259	255477.689	3948132.556	1.816	WBY
2260	255458.814	3948116.714	1.77	WBY
2261	255440.771	3948101.132	1.678	WBY
2262	255420.805	3948085.038	1.679	WBY
2263	255400.851	3948067.606	1.71	WBY
2264	255382.5	3948052.727	1.668	WBY
2265	255363.765	3948037.606	1.797	WBY
2266	255343.275	3948019.833	1.675	WBY
2267	255326.395	3948006.368	1.539	WBY
2268	255306.299	3947988.681	1.576	WBY
2269	255288.247	3947973.07	1.686	WBY
2270	255268.671	3947957.742	1.645	WBY
2271	255250.112	3947941.688	1.605	WBY

Point_No	Northing	Easting	Elevation	Description
2272	255229.464	3947924.64	1.716	WBY
2273	255211.234	3947908.978	1.874	WBY
2274	255192.321	3947893.175	1.73	WBY
2275	255173.892	3947877.676	1.977	WBY
2276	255152.995	3947859.969	1.935	WBY
2277	255134.71	3947844.869	1.991	WBY
2278	255115.45	3947827.832	1.374	WBY
2279	255098.077	3947813.002	1.093	WBY
2280	255076.619	3947796.424	0.52	WBY
2281	255058.995	3947780.935	-3.249	SND
2282	255046.307	3947782.334	-4.149	SND
2283	254982.929	3947778.467	-6.149	SND
2284	255068.584	3947792.756	2.338	TOW
2285	254162.927	3953729.01	1.526	WBY
2286	254132.444	3953741.861	1.709	WBY
2287	254102.396	3953754.162	1.676	WBY
2288	254086.232	3953762.602	1.547	WBY
2289	254059.87	3953771.886	1.373	WBY
2290	254039.986	3953778.442	1.327	WBY
2291	254019.283	3953788.213	1.411	WBY
2292	253995.442	3953796.648	1.489	WBY
2293	253971.949	3953807.114	1.414	WBY
2294	253949.952	3953815.531	1.222	WBY
2295	253926.216	3953825.241	1.337	WBY
2296	253932.483	3953826.458	2.071	TOW
2297	253905.184	3953834.405	1.58	WBY
2298	253879.736	3953844.057	1.074	WBY
2299	253860.339	3953852.023	-0.236	WBY
2300	253832.267	3953862.841	-0.709	WBY
2301	253810.903	3953872.059	-0.879	WBY
2302	253789.615	3953880.822	0.114	WBY
2303	253767.614	3953889.742	0.55	WBY
2304	253739.376	3953899.658	0.549	WBY
2305	253716.116	3953911.385	0.687	WBY
2306	253690.191	3953920.281	0.953	WBY
2307	253673.108	3953927.773	1.09	WBY
2308	253662.873	3953931.585	1.001	WBY
2309	253647.161	3953938.696	0.915	WBY
2310	253624.444	3953947.113	0.484	WBY
2311	253598.934	3953957.982	1.092	WBY
2312	253580.317	3953964.741	0.708	WBY
2313	253557.176	3953974.63	0.574	WBY
2314	253530.391	3953985.845	0.084	WBY
2315	253507.536	3953994.246	-0.208	WBY
2316	253484.425	3954003.485	0.335	WBY
2317	253458.505	3954014.773	0.405	WBY

Point_No	Northing	Easting	Elevation	Description
2318	253441.894	3954020.389	1.249	WBY
2319	253415.698	3954031.935	1.4	WBY
2320	253392.088	3954041.38	0.987	WBY
2321	253368.758	3954050.543	1.013	WBY
2322	253346.643	3954059.021	1.119	WBY
2323	253323.923	3954068.516	0.975	WBY
2324	253300.821	3954078.156	1.024	WBY
2325	253278.341	3954087.47	1.227	WBY
2326	253254.494	3954096.309	1.347	WBY
2327	253230.156	3954106.693	1.187	WBY
2328	253206.905	3954116.247	1.13	WBY
2329	253184.334	3954125.795	0.826	WBY
2330	253161.531	3954133.965	1.409	WBY
2331	253136.349	3954144.432	1.395	WBY
2332	253115.017	3954153.089	0.794	WBY
2333	253091.555	3954162.336	1.103	WBY
2334	253068.872	3954171.58	1.149	WBY
2335	253044.982	3954181.557	0.507	WBY
2336	253019.758	3954191.503	0.327	WBY
2337	252997.767	3954201.52	0.239	WBY
2338	252977.545	3954207.831	-0.068	WBY
2339	252952.33	3954216.565	0.292	WBY
2340	252926.291	3954227.053	0.63	WBY
2341	267445.272	3945645.647	7.247	CHK
2342	276368.257	3947243.324	3.959	CHK
2343	254257.565	3953699.628	2.452	TOW
2344	254306.77	3953696.2	-7.5885	SND
2345	254291.213	3953678.672	-6.7885	SND
2346	254266.672	3953694.934	-2.0885	SND
2347	254251.153	3953692.296	1.402	WBY
2348	254226.083	3953704.053	1.39	WBY
2349	254201.946	3953713.455	1.711	WBY
2350	254178.739	3953722.854	1.44	WBY
2351	254156.459	3953731.937	1.737	WBY
2352	252887.745	3954244.856	1.494	WBY
2353	252856.705	3954258.036	0.231	WBY
2354	252834.356	3954266.134	0.264	WBY
2355	252810.971	3954276.409	-0.109	WBY
2356	252790.742	3954288.449	-0.288	WBY
2357	252763.56	3954295.45	-0.324	WBY
2358	252742.039	3954303.466	-0.382	WBY
2359	252715.842	3954314.63	-0.429	WBY
2360	252696.669	3954322.538	-0.519	WBY
2361	252669.511	3954332.548	-0.328	WBY
2362	252669.803	3954333.198	2.371	TOW
2363	252735.11	3954480.348	2.388	TOW

Point_No	Northing	Easting	Elevation	Description
2364	252734.165	3954468.32	-0.38	WBY
2365	252772.602	3954453.355	-0.404	WBY
2366	252811.898	3954445.062	-0.123	WBY
2367	252828.478	3954430.902	-0.292	WBY
2368	252849.428	3954421.192	0.134	WBY
2369	252870.968	3954413.712	0.303	WBY
2370	252896.7	3954404.002	0.418	WBY
2371	252917.674	3954395.203	0.704	WBY
2372	252942.296	3954384.279	1.364	WBY
2373	252964.561	3954375.144	0.754	WBY
2374	252986.207	3954367.124	0.679	WBY
2375	253021.499	3954353.105	0.793	WBY
2376	253036.047	3954346.655	1.102	WBY
2377	253057.298	3954338.027	1.188	WBY
2378	253080.443	3954328.241	0.916	WBY
2379	253106.05	3954318.724	0.957	WBY
2380	253122.277	3954312.025	0.924	WBY
2381	253149.054	3954301.234	0.969	WBY
2382	253173.201	3954290.324	-0.175	WBY
2383	253191.952	3954282.82	0.61	WBY
2384	253217.149	3954273.499	0.972	WBY
2385	253242.03	3954263.425	1.061	WBY
2386	253264.435	3954252.408	0.723	WBY
2387	253294.423	3954239.686	1.015	WBY
2388	253312.775	3954234.43	0.912	WBY
2389	253334.239	3954224.952	0.785	WBY
2390	253360.171	3954215.041	1.011	WBY
2391	253381.843	3954206.281	1.018	WBY
2392	253404.269	3954197.978	1.01	WBY
2393	253428.045	3954188.072	1.119	WBY
2394	253447.152	3954179.735	1.335	WBY
2395	253472.342	3954170.524	0.99	WBY
2396	253491.28	3954163.002	0.64	WBY
2397	253522.025	3954149.856	1.144	WBY
2398	253543.569	3954140.861	1.102	WBY
2399	253568	3954132.194	1.104	WBY
2400	253590.492	3954121.897	1.421	WBY
2401	253612.988	3954112.225	1.246	WBY
2402	253637.187	3954103.867	1.105	WBY
2403	253658.245	3954095.9	1.379	WBY
2404	253683.86	3954084.697	1.302	WBY
2405	253705.061	3954076.393	1.307	WBY
2406	253727.332	3954067.206	1.399	WBY
2407	253751.416	3954056.945	1.139	WBY
2408	253775.557	3954048.521	1.079	WBY
2409	253796.816	3954038.344	1.673	WBY

Point_No	Northing	Easting	Elevation	Description
2410	253822.008	3954028.26	1.313	WBY
2411	253844.999	3954019.608	1.332	WBY
2412	253870.879	3954009.305	1.388	WBY
2413	253890.372	3954001.526	1.283	WBY
2414	253914.216	3953992.183	1.522	WBY
2415	253937.604	3953981.313	1.424	WBY
2416	253960.331	3953972.683	1.57	WBY
2417	253981.982	3953964.203	1.662	WBY
2418	254006.854	3953953.622	1.624	WBY
2419	254029.45	3953944.612	1.643	WBY
2420	254052.638	3953935.499	1.623	WBY
2421	254076.217	3953925.461	1.366	WBY
2422	254101.917	3953916.109	1.632	WBY
2423	254194.391	3953878.896	1.019	WBY
2424	254216.505	3953870.255	-5.605	SND
2425	254205.219	3953876.123	2.402	TOW
2426	276368.26	3947243.286	3.97	CHK
2429	227081.94	3972438.759	-4.196	SND
2430	227081.215	3972467.796	0.468	WBY
2431	227087.192	3972488.133	0.613	WBY
2432	227093.331	3972509.148	0.94	WBY
2433	227100.925	3972535.464	0.546	WBY
2434	227106.179	3972559.955	0.265	WBY
2435	227109.093	3972583.981	0.376	WBY
2436	227117.557	3972607.305	0.445	WBY
2437	227126.991	3972635.575	0.347	WBY
2438	227131.686	3972653.472	0.218	WBY
2439	227140.077	3972682.263	0.044	WBY
2440	227146.324	3972705.848	-0.389	WBY
2441	227151.893	3972727.59	-0.623	WBY
2442	227158.098	3972752.57	-1.015	WBY
2443	227164.513	3972776.254	-1.531	WBY
2444	227171.917	3972803.041	-1.738	WBY
2445	227180.416	3972829.959	-2.003	WBY
2446	227185.534	3972844.901	-2.061	WBY
2447	227189.994	3972870.421	-2.049	WBY
2448	227196.295	3972897.028	-2.224	WBY
2449	227203.432	3972921.939	-2.175	WBY
2450	227210.558	3972944.278	-2.452	WBY
2451	227216.847	3972971.59	-2.504	WBY
2452	227224.205	3973000.163	-2.441	WBY
2453	227233.541	3973020.15	-2.241	WBY
2454	227236.57	3973042.761	-2.488	WBY
2455	227241.223	3973063.867	-2.51	WBY
2456	227247.767	3973088.565	-2.457	WBY
2457	227255.796	3973115.892	-2.426	WBY

Point_No	Northing	Easting	Elevation	Description
2458	227259.203	3973140.06	-2.723	WBY
2459	227269.442	3973164.934	-2.414	WBY
2460	227274.506	3973190.086	-2.551	WBY
2461	227273.361	3973188.521	1.352	TOW
2462	227130.904	3973228.608	1.312	TOW
2464	226940.155	3972519.104	-8.6825	SND
2465	226927.593	3972522.62	-8.4825	SND
2466	226951.915	3972551.936	-1.6825	SND
2467	226955.157	3972576.409	0.418	WBY
2468	226963.022	3972599.831	0.787	WBY
2469	226969.083	3972623.482	0.78	WBY
2470	226975.985	3972647.595	0.5	WBY
2471	226981.358	3972670.767	0.52	WBY
2472	226987.716	3972694.146	0.41	WBY
2473	226993.693	3972716.502	0.608	WBY
2474	227000.281	3972741.601	0.096	WBY
2475	227007.388	3972768.758	-1.001	WBY
2476	227013.58	3972793.271	-1.381	WBY
2477	227019.578	3972814.597	-1.251	WBY
2478	227025.819	3972840.837	-1.616	WBY
2479	227033.484	3972866.548	-1.881	WBY
2480	227039.064	3972886.715	-1.835	WBY
2481	227045.109	3972910.42	-1.847	WBY
2482	227050.847	3972931.157	-1.923	WBY
2483	227061.113	3972959.708	-2.176	WBY
2484	227065.421	3972986.615	-2.126	WBY
2485	227076.696	3973028.352	-2.268	WBY
2486	227084.95	3973055.017	-2.296	WBY
2487	227092.071	3973081.13	-2.238	WBY
2488	227097.079	3973107.546	-2.333	WBY
2489	227102.223	3973125.058	-2.271	WBY
2490	227108.94	3973151.917	-2.202	WBY
2491	227113.303	3973174.824	-2.35	WBY
2492	227122.916	3973199.6	-2.391	WBY
2493	227127.727	3973221.04	-2.33	WBY
2494	227126.509	3973218.695	1.323	TOW
2495	215471.273	3958529.205	2.274	TOW
2496	215456.294	3958481.446	-0.9625	SND
2497	215453.176	3958512.069	-0.4625	SND
2499	215443.978	3958555.916	-0.35	WBY
2500	215440.051	3958581.025	-0.096	WBY
2501	215434.996	3958605.645	0.221	WBY
2502	215431.993	3958627.128	0.291	WBY
2503	215426.252	3958654.056	0.477	WBY
2504	215422.965	3958678.789	0.766	WBY
2505	215418.144	3958701.435	0.916	WBY

Point_No	Northing	Easting	Elevation	Description
2506	215414.077	3958725.904	0.815	WBY
2507	215408.85	3958752.808	0.787	WBY
2508	215405.024	3958773.679	0.964	WBY
2509	215400.283	3958802.501	0.829	WBY
2510	215396.309	3958827.075	0.734	WBY
2511	215392.348	3958849.411	0.713	WBY
2512	215387.702	3958875.974	0.71	WBY
2513	215384.279	3958897.893	0.736	WBY
2514	215379.279	3958922.94	0.618	WBY
2515	215374.473	3958950.344	0.737	WBY
2516	215369.905	3958972.067	0.385	WBY
2517	215365.815	3958998.579	0.089	WBY
2518	215361.521	3959021.63	0.118	WBY
2519	215357.288	3959047.015	0.042	WBY
2520	215352.773	3959072.404	0.296	WBY
2521	215348.672	3959095.477	-0.502	WBY
2522	215343.887	3959122.234	-0.384	WBY
2523	215339.591	3959143.993	-0.875	WBY
2524	215335.435	3959172.072	-0.982	WBY
2525	215331.601	3959197.001	-1.177	WBY
2526	215328.509	3959224.122	-1.79	WBY
2527	215323.482	3959246.82	-1.104	WBY
2528	215318.06	3959266.056	-1.453	WBY
2529	215313.579	3959297.226	-2.215	WBY
2530	215312.331	3959317.148	-3.1625	SND
2531	215308.691	3959339.066	-3.4625	SND
2532	215303.374	3959364.671	-3.7625	SND
2533	215296.995	3959387.824	-3.5625	SND
2534	215293.852	3959408.333	-3.8625	SND
2535	215290.113	3959437.626	-3.6625	SND
2536	215286.446	3959466.985	-3.4625	SND
2537	215294.211	3959467.608	1.801	TOW
2538	215279.774	3958600.572	2.201	TOW
2539	215301.414	3958539.65	-6.026	SND
2540	215293.578	3958556.542	-3.026	SND
2541	215286.307	3958577.616	-1.526	SND
2542	215284.419	3958598.441	-0.227	WBY
2543	215279.489	3958627.127	0.022	WBY
2544	215274.358	3958650.507	-0.044	WBY
2545	215270.184	3958679.002	0.336	WBY
2546	215266.514	3958698.559	0.263	WBY
2547	215262.204	3958724.527	0.219	WBY
2548	215257.498	3958749.077	0.202	WBY
2549	215253.033	3958774.18	0.44	WBY
2550	215250.068	3958796.506	0.823	WBY
2551	215244.062	3958825.862	0.736	WBY

Point_No	Northing	Easting	Elevation	Description
2552	215240.133	3958846.491	0.967	WBY
2553	215236.004	3958870.478	0.826	WBY
2554	215230.881	3958898.677	0.836	WBY
2555	215226.949	3958924.867	0.89	WBY
2556	215222.323	3958945.705	0.863	WBY
2557	215219.093	3958968.962	0.661	WBY
2558	215214.715	3958993.983	0.155	WBY
2559	215210.488	3959020.298	0.5	WBY
2560	215205.149	3959045.945	0.291	WBY
2561	215200.417	3959070.237	0.762	WBY
2562	215197.038	3959093.749	0.306	WBY
2563	215192.962	3959120.158	-0.192	WBY
2564	215188.079	3959144.643	0.018	WBY
2565	215184.736	3959166.758	-0.052	WBY
2566	215179.371	3959192.217	-0.03	WBY
2567	215174.778	3959214.312	-0.241	WBY
2568	215170.174	3959243.784	0.043	WBY
2569	215165.96	3959268.879	-0.491	WBY
2570	215162.67	3959290.664	-1.369	WBY
2571	215160.718	3959315.01	-0.497	WBY
2572	215154.432	3959340.971	-0.944	WBY
2573	215148.389	3959367.152	-1.229	WBY
2574	215144.827	3959393.08	-0.919	WBY
2575	215139.468	3959417.945	-1.307	WBY
2576	215135.839	3959443.555	-1.795	WBY
2577	215133.657	3959445.079	1.747	TOW
2578	227724.727	3948823.097	2.669	TOW
2579	226829.651	3947718.429	0.426	WBY
2580	226843.789	3947742.475	0.335	WBY
2581	226855.494	3947760.839	1.031	WBY
2582	226870.468	3947780.314	1.024	WBY
2583	226885.115	3947801.197	1.07	WBY
2584	226901.066	3947825.576	1.232	WBY
2585	226914.847	3947843.577	1.242	WBY
2586	226928.603	3947863.959	1.515	WBY
2587	226943.098	3947884.237	1.634	WBY
2588	226957.946	3947905.946	1.744	WBY
2589	226973.599	3947927.411	1.463	WBY
2590	226987.521	3947948.561	1.449	WBY
2591	226999.696	3947965.218	1.429	WBY
2592	227014.788	3947987	1.523	WBY
2593	227028.29	3948005.552	1.754	WBY
2594	227043.278	3948026.579	1.534	WBY
2595	227071.218	3948069.221	1.668	WBY
2596	227085.543	3948088.255	1.756	WBY
2597	227100.34	3948109.786	1.955	WBY

Point_No	Northing	Easting	Elevation	Description
2598	227116.077	3948130.612	1.567	WBY
2599	227131.19	3948154.039	-0.371	WBY
2601	227155.101	3948190.647	-4.0425	SND
2602	227171.24	3948213.547	-3.9425	SND
2603	227189.601	3948233.56	-3.5425	SND
2604	227202.698	3948255.13	-4.5425	SND
2605	227218.548	3948275.391	-4.6425	SND
2606	227231.644	3948294.554	-4.5425	SND
2607	227247.114	3948316.521	-4.6425	SND
2608	227258.077	3948334.694	-4.7425	SND
2609	227272.013	3948353.082	-4.6425	SND
2610	227286.299	3948376.301	-4.8425	SND
2611	227300.052	3948394.522	-4.0425	SND
2612	227315.161	3948415.241	-2.5425	SND
2613	227331.352	3948439.631	-1.8425	SND
2614	227343.904	3948456.739	0.4575	SND
2615	227361.427	3948481.562	0.09	WBY
2616	227371.602	3948498.535	-0.185	WBY
2617	227385.758	3948517.34	0.652	WBY
2618	227401.002	3948539.323	0.241	WBY
2619	227417.026	3948561.3	0.525	WBY
2620	227428.843	3948579.007	0.185	WBY
2621	227445.086	3948600.598	-0.77	WBY
2622	227461.511	3948624.046	-2.2425	SND
2623	227477.466	3948646.536	-3.2425	SND
2624	227486.102	3948662.701	-2.9425	SND
2625	238749.516	3953565.96	3.928	CHK
2626	227475.883	3948623.485	2.246	TOW
2627	227498.221	3948677.974	-2.6425	SND
2628	227514.822	3948700.79	-2.5425	SND
2629	227529.995	3948719.628	-2.5425	SND
2630	227544.459	3948740.95	-2.3425	SND
2631	227558.713	3948759.899	-2.2425	SND
2632	227571.733	3948785.597	-2.5425	SND
2633	227587.36	3948803.925	-2.4425	SND
2634	227599.136	3948822.428	-2.4425	SND
2635	227615.091	3948846.893	-2.2425	SND
2636	227625.879	3948862.089	-3.5425	SND
2637	227643.833	3948886.645	-2.3425	SND
2638	227659.718	3948906.513	-2.6425	SND
2639	227671.155	3948924.834	-2.4425	SND
2640	227690.901	3948946.695	-2.5425	SND
2641	227694.482	3948937.335	2.375	TOW
2642	226869.608	3947691.471	0.678	WBY
2643	226846.885	3947706.1	0.462	WBY
2644	226828.632	3947720.754	0.458	WBY

Point_No	Northing	Easting	Elevation	Description
2645	226803.789	3947739.478	0.579	WBY
2646	226791.943	3947750.079	1.097	WBY
2647	226766.563	3947762.698	1.252	WBY
2648	226745.748	3947777.18	1.44	WBY
2649	226723.511	3947791.669	1.563	WBY
2650	226704.806	3947806.051	1.739	WBY
2651	226682.906	3947821.203	1.581	WBY
2652	226663.081	3947834.579	2.031	WBY
2653	226653.329	3947840.903	-3.582	SND
2654	226651.221	3947849.332	-6.582	SND
2655	226642.821	3947857.655	-7.582	SND
2656	226632.997	3947863.017	-7.682	SND
2657	226622.644	3947866.463	-7.382	SND
2658	226616.635	3947872.468	-6.782	SND
2659	226610.181	3947880.502	-6.582	SND
2660	226599.16	3947885.755	-5.382	SND
2661	226590.719	3947889.099	-3.382	SND
2662	226583.299	3947895.318	-1.482	SND
2663	226581.422	3947903.38	-1.361	WBY
2664	226562.91	3947911.987	1.208	WBY
2665	226543.895	3947922.727	1.442	WBY
2666	226951.662	3947816.037	1.17	WBY
2667	226934.714	3947828.203	1.315	WBY
2668	226915.013	3947842.078	1.214	WBY
2669	226893.136	3947857.133	1.45	WBY
2670	226874.314	3947870.002	1.464	WBY
2671	226852.237	3947885.356	1.573	WBY
2672	226832.999	3947899.835	1.86	WBY
2673	226815.573	3947904.285	0.032	WBY
2674	226813.19	3947913.481	-5.582	SND
2675	226810.698	3947916.435	-6.782	SND
2676	226802.438	3947929.058	-7.682	SND
2677	226791.296	3947932.585	-7.382	SND
2678	226781.506	3947937.852	-7.382	SND
2679	226773.491	3947942.627	-7.082	SND
2680	226766.976	3947949.03	-7.082	SND
2681	226760.124	3947956.145	-5.582	SND
2682	226751.267	3947960.979	-4.982	SND
2683	226743.859	3947968.165	-0.582	SND
2684	226730.858	3947974.054	1.366	WBY
2685	226708.678	3947987.023	1.481	WBY
2686	226689.741	3947999.6	1.421	WBY
2687	227041.39	3947935.705	1.181	WBY
2688	227018.391	3947953.68	1.519	WBY
2689	227000.091	3947965.903	1.487	WBY
2690	226977.404	3947979.594	1.643	WBY

Point_No	Northing	Easting	Elevation	Description
2691	226961.534	3947991.881	1.847	WBY
2692	226950.515	3948000.614	-6.282	SND
2693	226943.405	3948009.675	-7.082	SND
2694	226934.549	3948014.683	-7.382	SND
2695	226925.328	3948020.102	-7.582	SND
2696	226916.886	3948022.671	-7.782	SND
2697	226905.955	3948026.353	-7.782	SND
2698	226900.447	3948036.844	-6.582	SND
2699	226894.885	3948043.983	-3.582	SND
2700	226886.154	3948049.223	-1.582	SND
2701	226878.014	3948056.425	1.689	WBY
2702	226856.417	3948065.066	1.465	WBY
2703	226834.121	3948077.461	1.642	WBY
2704	227128.846	3948060.59	1.555	WBY
2705	227105.953	3948074.607	1.513	WBY
2706	227088.969	3948087.845	1.602	WBY
2707	227073.303	3948096.3	-1.303	WBY
2708	227070.428	3948102.22	-5.582	SND
2709	227062.21	3948111.788	-7.582	SND
2710	227054.052	3948117.025	-8.082	SND
2711	227045.348	3948120.628	-8.382	SND
2712	227037.473	3948125.324	-8.582	SND
2713	227030.639	3948133.962	-8.582	SND
2714	227017.769	3948133.699	-7.582	SND
2715	227007.872	3948138.496	-5.582	SND
2716	227002.901	3948146.704	-2.582	SND
2717	226984.244	3948161.094	1.819	WBY
2718	226962.681	3948173.16	1.601	WBY
2719	227214.034	3948182.766	1.551	WBY
2720	227191.353	3948197.883	1.668	WBY
2721	227177.094	3948205.855	-0.142	WBY
2722	227171.182	3948215.213	-6.282	SND
2723	227164.657	3948222.43	-7.582	SND
2724	227156.883	3948229.22	-8.782	SND
2725	227148.328	3948232.688	-9.582	SND
2726	227137.434	3948235.012	-9.582	SND
2727	227127.119	3948237.926	-8.582	SND
2728	227116.83	3948239.612	-7.082	SND
2729	227089.453	3948268.673	1.774	WBY
2730	227071.363	3948278.805	1.697	WBY
2731	227300.249	3948307.405	1.379	WBY
2732	227276.223	3948321.962	1.48	WBY
2733	227267.906	3948326.294	0.418	SND
2734	227254.006	3948329.078	-7.082	SND
2735	227248.102	3948342.11	-9.582	SND
2736	227240.043	3948347.228	-10.582	SND

Point_No	Northing	Easting	Elevation	Description
2737	227230.534	3948352.063	-10.582	SND
2738	227229.276	3948352.552	-10.582	SND
2739	227221.458	3948354.462	-5.582	SND
2740	227387.031	3948431.204	0.59	WBY
2741	227364.997	3948440.845	0.315	WBY
2742	227359.255	3948444.128	0.365	WBY
2743	227348.864	3948447.634	-0.382	SND
2744	227340.511	3948454.146	-5.582	SND
2745	227332.873	3948465.309	-8.382	SND
2746	227326.947	3948473.734	-9.582	SND
2747	227320.422	3948480.774	-9.782	SND
2748	227312.756	3948483.074	-10.082	SND
2749	227299.936	3948483.272	-9.382	SND
2750	227290.854	3948490.294	-6.582	SND
2751	227286.035	3948504.647	0.418	SND
2752	227260.831	3948514.268	2.024	WBY
2753	227239.293	3948532.24	1.379	WBY
2754	227216.646	3948544.29	1.419	WBY
2755	227471.587	3948551.631	0.505	WBY
2756	227451.914	3948567.32	0.637	WBY
2757	227429.554	3948578.993	0.192	WBY
2758	227419.646	3948588.691	-4.582	SND
2759	227412.982	3948596.711	-4.582	SND
2760	227406.208	3948601.323	-4.582	SND
2761	227395.336	3948602.295	-6.382	SND
2762	227383.228	3948605.597	-6.582	SND
2763	227381.71	3948606.541	-7.082	SND
2764	227374.22	3948612.891	-7.582	SND
2765	227370.178	3948621.799	-6.582	SND
2766	227353.237	3948631.391	-3.082	SND
2767	227345.16	3948642.222	0.033	WBY
2768	227325.283	3948651.599	1.09	WBY
2769	227304.848	3948668.066	1.937	WBY
2770	227286.887	3948681.275	1.682	WBY
2771	227555.587	3948675.604	-0.09	WBY
2772	227534.35	3948689.499	-0.833	WBY
2773	227531.719	3948693.957	2.418	SND
2774	227522.417	3948695.955	2.418	SND
2775	227520.098	3948705.063	2.418	SND
2776	227512.135	3948722.134	2.418	SND
2777	227501.506	3948723.459	2.418	SND
2778	227488.982	3948722.136	2.418	SND
2779	227474.412	3948719.591	2.418	SND
2780	227475.969	3948733.306	2.418	SND
2781	227468.941	3948742.954	2.418	SND
2782	227458.175	3948744.566	2.418	SND

Point_No	Northing	Easting	Elevation	Description
2783	227443.77	3948741.951	2.418	SND
2784	227446.307	3948754.081	2.418	SND
2785	227436.799	3948767.058	2.418	SND
2786	227424.69	3948766.721	2.418	SND
2787	227418.459	3948775.504	2.418	SND
2788	227409.979	3948780.421	2.418	SND
2789	227403.345	3948788.356	2.418	SND
2790	227557.906	3948675.211	-0.117	WBY
2791	227544.409	3948685.872	-0.461	WBY
2792	227533.909	3948692.581	-0.986	WBY
2793	227523.774	3948699.023	-2.682	SND
2794	227514.231	3948698.137	-3.082	SND
2795	227511.866	3948716.292	-3.182	SND
2796	227500.39	3948718.824	-3.382	SND
2797	227484.035	3948718.308	-4.082	SND
2798	227468.469	3948717.262	-4.082	SND
2799	227483.18	3948729.609	-3.782	SND
2800	227474.383	3948736.173	-4.382	SND
2801	227466.863	3948741.498	-3.782	SND
2802	227458.482	3948744.568	-4.982	SND
2803	227450.593	3948753.419	-4.582	SND
2804	227439.514	3948753.361	-4.382	SND
2805	227428.852	3948754.3	-2.582	SND
2806	227426.883	3948770.728	-1.582	SND
2807	227418.492	3948774.975	-1.382	SND
2808	227412.879	3948783.504	-1.082	SND
2809	227405.787	3948791.754	-0.082	SND
2810	227381.919	3948798.725	0.905	WBY
2811	227371.108	3948804.678	0.842	WBY
2812	227352.613	3948819.85	1.121	WBY
2813	227640.119	3948800.656	-2.382	SND
2814	227634.949	3948809.943	-2.382	SND
2815	227630.583	3948806.031	-2.382	SND
2816	227670.033	3948740.5	2.461	TOW
2817	238749.579	3953566.055	3.931	CHK
2819	227681.899	3948769.967	2.262	TOW
2820	227611.455	3948810.557	-2.492	SND
2821	227593.49	3948833.609	-2.692	SND
2822	227589.373	3948838.573	-2.692	SND
2823	227580.915	3948844.714	-2.692	SND
2824	227569.334	3948842.604	-2.692	SND
2825	227553.225	3948858.095	-2.892	SND
2826	227552.728	3948868.251	-2.792	SND
2827	227546.114	3948868.943	-2.492	SND
2828	227525.007	3948865.797	-3.192	SND
2829	227525.746	3948879.87	-3.192	SND

Point_No	Northing	Easting	Elevation	Description
2830	227522.604	3948888.992	-2.192	SND
2831	227512.902	3948892.607	-1.892	SND
2832	227504.215	3948897.178	-1.892	SND
2833	227490.289	3948903.825	-1.492	SND
2834	227488.393	3948900.763	-1.492	SND
2835	227485.259	3948916.251	-1.392	SND
2836	227465.401	3948919.969	-0.892	SND
2837	227463.565	3948926.532	-0.892	SND
2838	227456.34	3948927.196	-0.392	SND
2839	227442.777	3948933.352	0.508	SND
2840	227431.633	3948947.882	1.208	SND
2841	227416.613	3948952.328	1.127	WBY
2842	227392.952	3948971.14	1.618	WBY
2843	227375.195	3948985.034	1.766	WBY
2844	227735.009	3948914.376	-2.492	SND
2845	227712.911	3948916.893	-2.792	SND
2846	227716.433	3948928.606	-2.692	SND
2847	227701.257	3948937.735	-2.692	SND
2848	227687.456	3948947.282	-2.692	SND
2849	227680.909	3948961.166	-2.792	SND
2850	227673.849	3948955.235	-2.792	SND
2851	227673.048	3948969.055	-2.692	SND
2852	227644.011	3948967.031	-2.492	SND
2853	227650.585	3948983.19	-2.492	SND
2854	227641.212	3948989.131	-1.992	SND
2855	227638.722	3948995.77	-2.692	SND
2856	227631.984	3948995.95	-2.592	SND
2857	227623.512	3949006.525	2.308	SND
2858	227595.615	3949007.2	-1.892	SND
2859	227591.538	3949010.09	-1.892	SND
2860	227592.094	3949013.294	-1.892	SND
2861	227581.388	3949019.798	-1.892	SND
2862	227584.87	3949036.423	-1.892	SND
2863	227555.502	3949034.778	-1.192	SND
2864	227560.673	3949043.443	-1.492	SND
2865	227558.462	3949043.625	-1.592	SND
2866	227543.969	3949045.234	-0.592	SND
2867	227404.581	3949042.887	2.354	TOW
2870	264724.333	3956106.884	2.347	TOW
2871	264737.968	3956086.503	0.641	WBY
2872	264757.201	3956065.959	-9.649	SND
2873	264778.915	3956047.948	-12.649	SND
2874	264871.976	3956186.921	-12.649	SND
2875	264780.001	3956259.266	2.355	TOW
2876	266047.67	3967619.332	1.775	TOW
2877	266005.931	3967635.514	1.178	WBY

Point_No	Northing	Easting	Elevation	Description
2878	266030.573	3967631.236	1.372	WBY
2879	266054.767	3967626.305	1.499	WBY
2880	266079.094	3967627.127	-9.235	SND
2881	266093.887	3967617.172	-13.235	SND
2882	266024.621	3967784.978	-10.235	SND
2883	266049.437	3967783.19	-13.235	SND
2884	265996.161	3967784.871	1.755	TOW
2885	280835.096	3969367.566	1.592	TOW
2886	280831.12	3969438.463	-9.402	SND
2887	280788.631	3969453.201	-13.402	SND
2888	280835.054	3969402.214	1.604	TOW
9000	281621.4133	3969151.684	-4.34	SND
9001	280791.4363	3969457.666	-13.38	SND
9002	281546.4133	3969021.78	-4.9	SND
9003	264858.8083	3956175.505	-12.65	SND
9004	264193.9987	3956967.795	-0.46	WBY
9005	264773.7971	3956043.459	-12.65	SND
9006	255116.88	3947634.586	-0.6	WBY
9007	255882.9244	3948277.374	0	WBY
9008	255012.259	3947742.61	-6.15	SND
9009	254214.763	3953870.633	-5.11	SND
9010	254298.5037	3953675.019	-7.59	SND
9011	252675.0778	3954330.926	-0.37	WBY
9012	265612.5409	3967857.446	-3.88	SND
9013	265586.4937	3967709.725	-4.07	SND
9014	215136.669	3959436.134	1.65	WBY
9015	215284.3902	3959462.181	-3.49	SND
9016	226828.9224	3947719.195	0.426	WBY

APPENDIX 5

Bathymetry Survey Data

20190001	227,722.32	3,949,104.88	-10.75	Bathymetric
20190002	227,736.45	3,949,125.58	-12.17	Bathymetric
20190003	227,750.54	3,949,146.16	-12.67	Bathymetric
20190004	227,764.65	3,949,166.80	-14.44	Bathymetric
20190005	227,778.80	3,949,187.37	-15.2	Bathymetric
20190006	227,793.01	3,949,207.99	-16.26	Bathymetric
20190007	227,807.05	3,949,228.58	-19.18	Bathymetric
20190008	227,821.17	3,949,249.27	-21.78	Bathymetric
20190009	227,835.35	3,949,269.75	-25.27	Bathymetric
20190010	227,863.65	3,949,311.09	-28.57	Bathymetric
20190011	227,849.48	3,949,290.43	-30.29	Bathymetric
20190012	227,877.69	3,949,331.79	-27.97	Bathymetric
20190013	227,891.87	3,949,352.33	-29.34	Bathymetric
20190014	227,905.98	3,949,373.03	-28.75	Bathymetric
20190015	227,919.85	3,949,393.46	-29.11	Bathymetric
20190016	227,934.21	3,949,414.38	-29.67	Bathymetric
20190017	227,948.49	3,949,434.90	-30.04	Bathymetric
20190018	227,976.76	3,949,476.15	-29.45	Bathymetric
20190019	227,990.81	3,949,496.74	-29.75	Bathymetric
20190020	227,961.94	3,949,454.52	-30.06	Bathymetric
20190021	228,033.01	3,949,558.55	-28.19	Bathymetric
20190022	228,004.80	3,949,517.41	-28.45	Bathymetric
20190023	228,018.96	3,949,538.00	-29.46	Bathymetric
20190024	228,061.30	3,949,599.81	-27.46	Bathymetric
20190025	228,047.21	3,949,579.24	-27.99	Bathymetric
20190026	228,103.66	3,949,661.60	-24.28	Bathymetric
20190027	228,089.51	3,949,641.04	-25.08	Bathymetric
20190028	228,075.47	3,949,620.48	-26.32	Bathymetric
20190029	228,131.94	3,949,702.94	-20.48	Bathymetric
20190030	228,117.81	3,949,682.30	-24.3	Bathymetric
20190031	228,174.38	3,949,764.91	-11.59	Bathymetric
20190032	228,160.20	3,949,744.22	-15.62	Bathymetric
20190033	228,146.02	3,949,723.49	-17.65	Bathymetric
20190034	228,188.48	3,949,785.53	-8.87	Bathymetric
20190035	228,202.63	3,949,806.19	-2.53	Bathymetric
20190036	280,800.09	3,969,630.60	-19.36	Bathymetric
20190037	254,947.00	3,947,492.36	-10.07	Bathymetric
20190038	254,968.01	3,947,509.79	-10.13	Bathymetric
20190039	254,925.58	3,947,474.58	-10.03	Bathymetric
20190040	255,001.37	3,947,537.49	-7.7	Bathymetric
20190041	255,031.91	3,947,562.83	-7.53	Bathymetric
20190042	254,895.27	3,947,644.49	-11.43	Bathymetric
20190043	254,873.25	3,947,626.01	-9.43	Bathymetric
20190044	254,914.55	3,947,660.67	-8.33	Bathymetric
20190045	254,940.71	3,947,682.63	-8.13	Bathymetric
20190046	255,051.48	3,947,579.07	-6.63	Bathymetric
20190047	255,070.88	3,947,595.18	-5.53	Bathymetric

20190048	255,095.12	3,947,615.30	-4.83	Bathymetric
20190049	254,965.53	3,947,703.46	-7.23	Bathymetric
20190050	254,984.75	3,947,719.60	-6.43	Bathymetric
20190051	255,004.05	3,947,735.79	-6.21	Bathymetric
20190052	226,656.90	3,947,860.52	-7.98	Bathymetric
20190053	226,676.45	3,947,883.24	-7.78	Bathymetric
20190054	226,811.05	3,947,939.51	-7.48	Bathymetric
20190055	226,708.41	3,947,881.93	-7.38	Bathymetric
20190056	226,786.36	3,947,928.29	-7.38	Bathymetric
20190057	226,728.13	3,947,901.33	-7.28	Bathymetric
20190058	226,754.76	3,947,904.60	-7.08	Bathymetric
20190059	226,920.76	3,948,007.48	-7.68	Bathymetric
20190060	226,987.19	3,948,059.83	-7.68	Bathymetric
20190061	226,965.76	3,948,041.87	-7.68	Bathymetric
20190062	226,944.78	3,948,024.62	-7.68	Bathymetric
20190063	226,872.92	3,947,974.42	-7.58	Bathymetric
20190064	226,849.03	3,947,958.93	-7.58	Bathymetric
20190065	226,899.31	3,947,993.06	-7.48	Bathymetric
20190066	227,011.67	3,948,064.91	-6.78	Bathymetric
20190067	227,116.08	3,948,188.62	-8.28	Bathymetric
20190068	227,098.05	3,948,166.16	-7.88	Bathymetric
20190069	227,081.50	3,948,143.53	-7.78	Bathymetric
20190070	227,058.34	3,948,118.78	-7.78	Bathymetric
20190071	227,026.94	3,948,092.59	-7.68	Bathymetric
20190072	227,192.78	3,948,296.29	-10.48	Bathymetric
20190073	227,175.24	3,948,268.26	-10.08	Bathymetric
20190074	227,160.58	3,948,240.81	-9.48	Bathymetric
20190075	227,135.31	3,948,208.93	-8.58	Bathymetric
20190076	227,266.54	3,948,393.18	-11.18	Bathymetric
20190077	227,250.70	3,948,368.88	-11.18	Bathymetric
20190078	227,280.39	3,948,416.30	-11.18	Bathymetric
20190079	227,233.23	3,948,345.89	-10.88	Bathymetric
20190080	227,294.54	3,948,436.98	-10.78	Bathymetric
20190081	227,210.80	3,948,318.91	-10.68	Bathymetric
20190082	227,310.95	3,948,459.03	-9.88	Bathymetric
20190083	227,327.65	3,948,486.54	-9.48	Bathymetric
20190084	227,338.33	3,948,509.66	-8.88	Bathymetric
20190085	227,348.37	3,948,532.88	-7.88	Bathymetric
20190086	227,359.25	3,948,556.22	-6.98	Bathymetric
20190087	227,371.85	3,948,579.04	-6.58	Bathymetric
20190088	227,391.94	3,948,610.41	-6.48	Bathymetric
20190089	227,407.27	3,948,636.43	-6.08	Bathymetric
20190090	227,422.38	3,948,665.27	-5.48	Bathymetric
20190091	227,440.40	3,948,694.23	-4.88	Bathymetric
20190092	227,470.52	3,948,731.74	-4.67	Bathymetric
20190093	227,489.86	3,948,759.66	-4.57	Bathymetric
20190094	227,509.49	3,948,783.86	-3.27	Bathymetric

20190095	227,529.32	3,948,812.09	-2.97	Bathymetric
20190096	227,552.93	3,948,854.69	-5.77	Bathymetric
20190097	227,565.55	3,948,877.64	-3.27	Bathymetric
20190098	227,579.83	3,948,900.62	-2.87	Bathymetric
20190099	227,596.61	3,948,925.02	-2.17	Bathymetric
20190100	227,691.46	3,949,044.50	-3.87	Bathymetric
20190101	227,678.51	3,949,022.55	-3.17	Bathymetric
20190102	227,637.48	3,948,973.35	-2.47	Bathymetric
20190103	227,656.89	3,948,993.49	-2.47	Bathymetric
20190104	227,616.58	3,948,950.87	-2.17	Bathymetric
20190105	227,706.36	3,949,074.72	-7.97	Bathymetric
20190106	254,472.59	3,953,607.31	-12.41	Bathymetric
20190107	254,498.85	3,953,596.73	-6.88	Bathymetric
20190108	254,440.37	3,953,620.28	-11.91	Bathymetric
20190109	254,402.43	3,953,635.56	-11.27	Bathymetric
20190110	254,379.07	3,953,644.97	-10.33	Bathymetric
20190111	254,355.78	3,953,654.36	-9.18	Bathymetric
20190112	254,332.51	3,953,663.73	-8.31	Bathymetric
20190113	254,304.94	3,953,674.83	-7.53	Bathymetric
20190114	254,396.57	3,953,794.90	-11.75	Bathymetric
20190115	254,364.07	3,953,808.08	-11.03	Bathymetric
20190116	254,420.38	3,953,785.25	-11.12	Bathymetric
20190117	254,443.75	3,953,775.78	-8.92	Bathymetric
20190118	254,339.96	3,953,817.85	-10.92	Bathymetric
20190119	254,316.35	3,953,827.42	-9.52	Bathymetric
20190120	254,291.88	3,953,837.34	-8.72	Bathymetric
20190121	254,268.52	3,953,846.81	-6.82	Bathymetric
20190122	254,245.28	3,953,856.23	-5.42	Bathymetric
20190123	265,082.74	3,955,672.30	-9.07	Bathymetric
20190124	265,106.53	3,955,643.86	-6.47	Bathymetric
20190125	264,973.24	3,955,803.19	-18.2	Bathymetric
20190126	264,989.48	3,955,783.78	-17.8	Bathymetric
20190127	265,017.74	3,955,750.00	-17.1	Bathymetric
20190128	265,033.92	3,955,730.65	-14.85	Bathymetric
20190129	265,051.58	3,955,709.55	-13.48	Bathymetric
20190130	264,925.93	3,955,859.74	-21.1	Bathymetric
20190131	264,909.70	3,955,879.14	-20.7	Bathymetric
20190132	264,956.35	3,955,823.38	-20.1	Bathymetric
20190133	264,887.23	3,955,906.00	-19.45	Bathymetric
20190134	264,867.92	3,955,929.08	-19.5	Bathymetric
20190135	265,057.30	3,955,937.66	-18.1	Bathymetric
20190136	265,082.24	3,955,907.73	-16	Bathymetric
20190137	265,103.60	3,955,882.09	-15.2	Bathymetric
20190138	265,119.94	3,955,862.49	-12.3	Bathymetric
20190139	265,141.14	3,955,837.05	-9.52	Bathymetric
20190140	265,157.15	3,955,817.84	-8.91	Bathymetric
20190141	264,979.41	3,956,031.13	-20	Bathymetric

20190142	264,951.32	3,956,064.85	-19.7	Bathymetric
20190143	265,001.89	3,956,004.16	-19.5	Bathymetric
20190144	264,851.53	3,955,948.67	-19	Bathymetric
20190145	265,022.17	3,955,979.82	-19	Bathymetric
20190146	264,834.23	3,955,969.35	-18.3	Bathymetric
20190147	265,039.94	3,955,958.50	-17.9	Bathymetric
20190148	264,818.12	3,955,988.61	-17.4	Bathymetric
20190149	264,801.78	3,956,008.14	-16.8	Bathymetric
20190150	264,785.67	3,956,027.40	-12	Bathymetric
20190151	264,906.39	3,956,118.76	-19.51	Bathymetric
20190152	264,928.79	3,956,091.88	-18.79	Bathymetric
20190153	264,889.92	3,956,138.53	-17.69	Bathymetric
20190154	264,873.62	3,956,158.09	-16.3	Bathymetric
20190155	215,447.73	3,957,689.59	-4.23	Bathymetric
20190156	215,452.20	3,957,664.20	-3.33	Bathymetric
20190157	215,458.53	3,957,628.27	-2.03	Bathymetric
20190158	215,427.48	3,957,804.52	-7.93	Bathymetric
20190159	215,431.83	3,957,779.81	-7.13	Bathymetric
20190160	215,436.21	3,957,755.00	-6.43	Bathymetric
20190161	215,440.70	3,957,729.50	-5.83	Bathymetric
20190162	215,407.04	3,957,920.55	-9.83	Bathymetric
20190163	215,411.72	3,957,894.00	-9.33	Bathymetric
20190164	215,416.30	3,957,868.02	-9.13	Bathymetric
20190165	215,420.66	3,957,843.27	-8.33	Bathymetric
20190166	215,381.64	3,958,064.75	-13.93	Bathymetric
20190167	215,386.85	3,958,035.16	-13.63	Bathymetric
20190168	215,392.46	3,958,003.35	-13.43	Bathymetric
20190169	215,402.39	3,957,946.94	-10.43	Bathymetric
20190170	215,396.85	3,957,978.43	-10.13	Bathymetric
20190171	215,517.12	3,958,164.06	-17.92	Bathymetric
20190172	215,531.08	3,958,085.75	-17.82	Bathymetric
20190173	215,524.88	3,958,120.58	-16.82	Bathymetric
20190174	215,512.69	3,958,188.93	-16.52	Bathymetric
20190175	215,363.80	3,958,166.04	-15.53	Bathymetric
20190176	215,370.29	3,958,129.19	-14.93	Bathymetric
20190177	215,376.52	3,958,093.80	-14.83	Bathymetric
20190178	215,499.34	3,958,263.79	-17.12	Bathymetric
20190179	215,359.38	3,958,191.12	-15.85	Bathymetric
20190180	215,503.75	3,958,239.09	-16.42	Bathymetric
20190181	215,341.04	3,958,295.24	-16.33	Bathymetric
20190182	215,493.42	3,958,297.02	-15.82	Bathymetric
20190183	215,354.94	3,958,216.30	-15.43	Bathymetric
20190184	215,508.15	3,958,214.39	-15.12	Bathymetric
20190185	215,348.02	3,958,255.60	-14.83	Bathymetric
20190186	215,334.60	3,958,331.79	-19.63	Bathymetric
20190187	215,485.55	3,958,341.13	-17.33	Bathymetric
20190188	215,320.48	3,958,411.94	-16.63	Bathymetric

20190189	215,325.24	3,958,384.90	-16.23	Bathymetric
20190190	215,330.25	3,958,356.50	-15.13	Bathymetric
20190191	215,481.12	3,958,366.02	-16.3	Bathymetric
20190192	215,476.63	3,958,391.18	-5.83	Bathymetric
20190193	266,221.43	3,967,597.75	-10.83	Bathymetric
20190194	266,196.55	3,967,602.10	-12.6	Bathymetric
20190195	266,138.45	3,967,612.28	-13.5	Bathymetric
20190196	266,171.69	3,967,606.46	-14.76	Bathymetric
20190197	266,130.14	3,967,768.36	-12.9	Bathymetric
20190198	266,104.60	3,967,772.89	-15.02	Bathymetric
20190199	266,157.69	3,967,763.47	-10.8	Bathymetric
20190200	266,079.34	3,967,777.37	-12.6	Bathymetric
20190201	280,730.92	3,969,492.93	-20.2	Bathymetric
20190202	280,752.87	3,969,480.37	-18	Bathymetric
20190203	280,777.49	3,969,466.28	-17.6	Bathymetric
20190204	280,919.28	3,969,558.33	-15.9	Bathymetric
20190205	280,708.36	3,969,505.83	-13	Bathymetric
20190206	280,842.81	3,969,602.64	-18.6	Bathymetric
20190207	280,864.54	3,969,590.05	-17.4	Bathymetric
20190208	280,889.83	3,969,575.39	-17.2	Bathymetric
20190209	227,041.29	3,972,310.73	-6.62	Bathymetric
20190210	227,033.95	3,972,283.69	-4.51	Bathymetric
20190211	226,919.03	3,972,419.45	-6.8	Bathymetric
20190212	227,058.18	3,972,372.91	-8.89	Bathymetric
20190213	227,065.28	3,972,399.01	-8.79	Bathymetric
20190214	227,051.52	3,972,348.37	-8.19	Bathymetric
20190215	226,929.03	3,972,456.96	-9.09	Bathymetric
20190216	226,936.92	3,972,486.54	-8.29	Bathymetric

APPENDIX 6

Magnetometer Survey Data

Name	X	Y	Latitude	Longitude	Line Name
100100	3959289.48	215291.25	29 04 28.9025 N	089 12 34.2296 W	002_0936
100101	3958707.65	215416.8	29 04 30.2518 N	089 12 40.7587 W	002_0936
100102	3957459.67	215646.42	29 04 32.7531 N	089 12 54.7717 W	001A1001
100103	3948816.74	227496.51	29 06 31.6142 N	089 14 29.7138 W	001_1026
100104	3972458.26	226920.31	29 06 21.5635 N	089 10 3.3842 W	001_1026
100105	3972357.27	227033.52	29 06 22.703 N	089 10 4.4982 W	002_1028
100106	3967512.48	266276.4	29 12 52.023 N	089 10 50.7911 W	001_1303
Name	Signature	Gamma Peak	Intensity	Time Elapsed (sec.)	Distance Over Ground (ft.)
100100	m-	46730	316.1	8.7	65.8
100101	m+	46426	100	2.8	26.5
100102	m+	46396	254.1	17.9	147.6
100103	m+	46424	103.9	2.1	57.1
100104	m+	46370	112.3	11.2	52.8
100105	m-	46737	319.3	6.1	55.7
100106	d	46539	166.8	4.6	32.7

APPENDIX 7

Field Note Records

Jolt#

13000-04

4-23-19

COASTAL PROTECTION/RESTORATION AUTHORITY

VENICE, LA

BASE AND MRO9-SH-31 (PT 1000)

CHK MRO9-SH-38 (PT 1001)

H-0.400 V-0.363 PT 2000

OPUS ON CP 1000 STARTED @ 1:05 PM

END @ 3:45 PM

CREVASSE OP-7

PT DESCRIPTION WAT

2001 L:20 PM TOW

2002 SUD 15'

2003 SUD 13.0

2004 SUD 6.0

2005-2042 BOTTOM

2043 TOW @ 2:17 PM

END 104-105

2044 TOW @ 2:28 PM

2045-2085 BOTTOM

2086 TOW @ 3:14

2087 H-0.372 V-0.295

2372

5, ROSE
C. G. LORRY
D. LEGENDRE

17

105

107

104

106

Job#

13000-04

4-24-19

C P R A

VENICE, LA

BASE ON NR 09-SH-38

OPUS STARTED @ 8:32 AM

END @ 1:46 pm

CHECK PT 1000 H-0.401 V-0.302 PT 2088

(102-103)

PT DESCRIPTION

2089 TOP @ 9:18 AM

2090 BOTTOM (BEGIN ROSOS)

2091-2103 BOTTOM

2104 BOTTOM (END ROSOS)

2105-2112 BOTTOM

2113 SAND 4.5' WAT

2114 SAND 4.2' WAT

2115 SAND 5.0' WAT

2116 SAND 5.3' WAT

2117 SAND 5.3' WAT

2118 SAND 5.1' WAT

2119 SAND 5.4' WAT

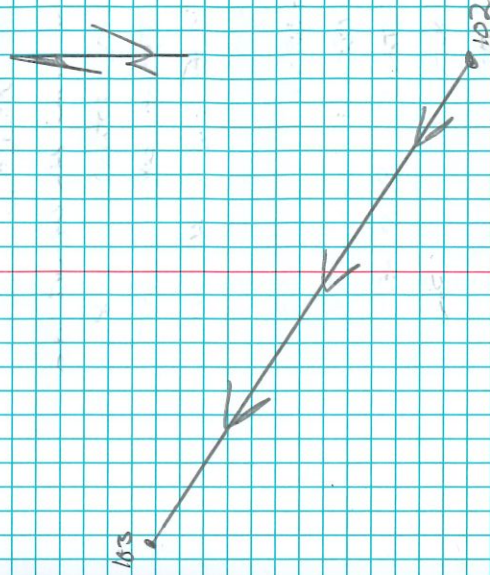
2120 SAND 5.5' WAT

2121 SAND 5.7' WAT

2122 TOP @ 10:22 AM

2372 18

J. ROSE
C. GARDY
D. LEGENDRE



Job#

1300004

CPRA

VENICE, LA

4-24-19

LINE 101-100

PT DESCRIPTION WAT

2123 TOL @ 10:25 AM

2124 SDD 5.3

2125 SDD 5.2

2126 SDD 5.4

2127 SDD 5.2

2128 SDD 5.2

2129 SDD 5.1

2130 SDD 5.1

2131 SDD 5.0

2132 SDD 4.4

2133 SDD 4.5

2134 SDD 4.2

2135 SDD 4.2

2136 SDD 4.0

2137-2147 Bottom

2143 Bottom (BEGINS ROSAS)

2144-2153 Bottom

2154 Bottom (END ROSAS)

2155 SDD 9.0

2156 SDD 14'

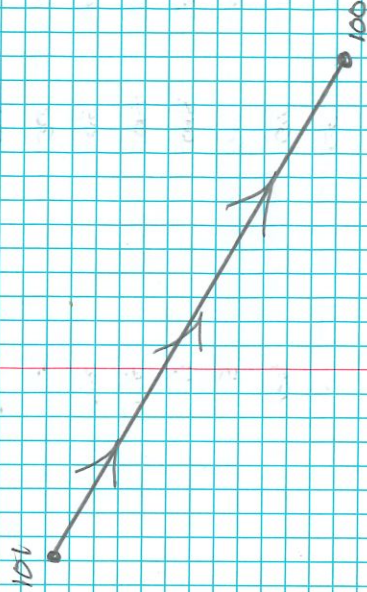
2157 SDD 14'

2372

S. ROSE
C. LINDY
D. LEGENDE

19

PT 2158 TOL @ 11:16 AM



Job#

13000-04

CPRA

VENICE, LA

LINE 116-117

4-24-09

PT DESCRIPTION WAT

2159 TOL @ 10:06 PM

2160 BOTTOM (BEGIN ROSAS)

2161-2169 BOTTOM

2170 BOTTOM (END ROSAS)

2171-2172 BOTTOM

2173 SAND

2174 SAND

2175 SAND

2176 SAND

2177 TOL @ 12:49 END

LINE 119-118

2178 TOL @ 12:53

2179 SAND

2180 SAND

2181 SAND

2182 SAND

2183 SAND

2184 SAND

2185 BOTTOM (BEGIN ROSAS)

2186-2195 BOTTOM

2196 TOL 1:12

2197 CHK PT 1000

2372

SURFACE
CIGWIDRY
DILEGEND

20



113

116

119

117

Job#

13000-04

C P R A

VENICE, LA

BASE ON CP 1001

CHK 1000 (PT 2198)

4-26-19

LINE 108-109

PT DESCRIPTION

2199 Tow @ 8:34 AM

2200 BOTTOM

2201 BOTTOM (BEGIN ROSS)

2202-25 BOTTOM

2206 BOTTOM (END ROSS)

2207-240 BOTTOM (OPEN WATER)

2241 Tow @ 9:18 AM

LINE 111-110

2242 Tow @ 9:22 AM

2243-2251 BOTTOM (OPEN WATER)

2252 BOTTOM (BEGIN ROSS)

2253-2277 BOTTOM

2278 BOTTOM (END ROSS)

2279-30 BOTTOM

2281 SAND

2282 SAND

2283 SAND

5.6

6.5

8.5

J. ROWE

C. GILROY

D. LEGERRE

2372

21

2284 Tow @ 10:21 AM

Job#

13000-04

CHRA

VENICE, LA

BASE ON CP 1000

CHK 1000 (2198)

4-20-19

LINE 114-115

PT

DESCRIPTION

DATE

2285-95 BOTTOM

2296 Tow @ 10:54 AM

2297 - 2339 BOTTOM

2340 STOOD BOTTOM

2341

CHK PT 1000

5120016

2372

22

Job#

13000-04

CPRA

VENICE, LA

BASE ON MR09-SH-31 (PT 1000)

3min. CHK ON PT 1001

H-0.429 V-0.269 PT 2342

BASE HT = 6.720'

S-C-2019

PT DESCRIPTION

2343 TOW @ 1:21 PM

2344 SNO 10.0

2345 SNO 9.2

2346 SNO 4.5

2347-2351 BOTTOM UP TO PT 2383

2352-CL BOTTOM

2362 TOW @ 1:56 PM

END LINE 114-115

START 113-112

2363 TOW @ 2:01 PM

2364-2421 BOTTOM

2422 BOTTOM START OF TREES

2423 BOTTOM END OF TREES

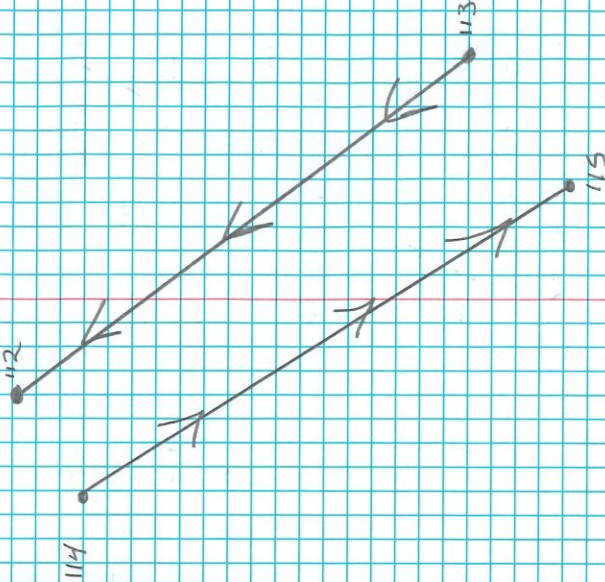
2424 SNO 8.0

2425 TOW @ 3:08 PM

2426 CHK 1001

2372 13

J. ROSE
C. GUNDY
DLE



Job #

13000-04

APRA

VENICE, LA

BASE ON CR 1000

CHK 1001 H V

BASE @ C. 720'

PT

5-7-2019

VOID

2372 24

J. ROWE

C. GARDY

D. LEGGENDRE

Job#

13000-04

CORA

VENTURA

BASE 100 MRO9-SH-06 (PT 1002)

BASE SET @ 4:22C

OPUS START @ 9:50AM END 12:50

5-7-2019

PT DESCRIPTION LAT

2427 Tow @ 10:12 AM 11.1

2428 SUD 11.2

2429 SUD 5.6

2430 BOTTOM START ROSOS

2431-38 BOTTOM

2439 BOTTOM END ROSOS

2440-2460 BOTTOM

2461 Tow @ 11:03 AM

LINE 127-126

2462 Tow @ 11:05 AM

2463 SUD 9.5

2464 SUD 10.0

2465 9.8

2466 3.0

2467 BOTTOM START ROSOS

2468-54 BOTTOM

2469 BOTTOM END ROSOS

2470-93 BOTTOM

2372

J. ROSE
C. GARDY
D. LE GENTRE

125



2491 Tow @ 11:48

129

128

127

126

Job#

13000-04

CPRA

5-8-2017

VENICE, LA

BASE ON CP 1002

1004

SET CP 1003 12/3/4" REBAR 12/CAP

LAT=29° 07' 35.445 LONG=89° 12' 31.222

EL= 7.76 - 6.45

Pt	DESCRIPTION	LAT
2495	Top @ 9:27 AM	
2496	SOD	3.0
2497	SOD	2.5
2498-2499	Bottom	
2530	SOD	5.2
2531	SOD	5.5
2532	SOD	5.8
2533	SOD	5.6
2534	SOD	5.9
2535	SOD	5.7
2536	SOD	5.5
2537	Top @ 10:23	

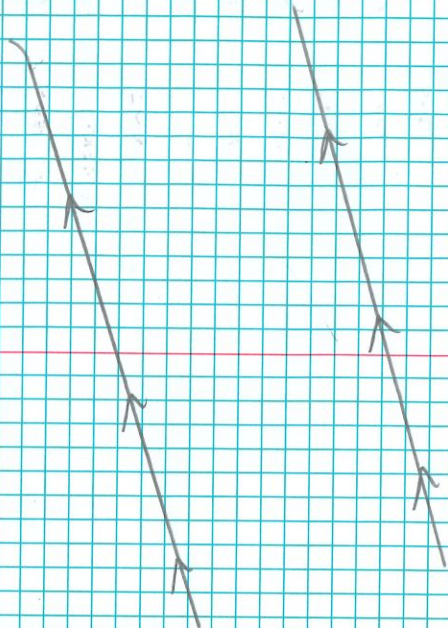
2372

S. ROSE

C. GLORY

D. LOGAN

26



Job#

13500-04

CPTA

5-8-19

LINE 100-101

PT	DESCRIPTION	WAT
2538	Top @ 10:28	
2539	SOD	8.0
2540	SOD	5.0
2541	SOD	3.5
2542-76	BOTTOM	
2577	Top @ 11:07	

2372

J. ROWE
C. GLADY
D. GENDERS

27

Job#

13000-04

CRTA

CREVASSE SP-12

5-8-19

PT DESCRIPTION LAT

2578 TOW @ 11:48

2579-93 BOTTOM

2594 BEGINNING TREES

2595 END TREES

2596-2599 BOTTOM

2600 SND 4.8

2601 SND 6.5

2602 SND 6.4

2603 SND 6.0

2604 SND 7.0

2605 SND 7.1

2606 SND 7.0

2607 SND 7.1

2608 SND 7.2

2609 SND 7.1

2610 SND 7.3

2611 SND 6.5

2612 SND 5.0

2613 SND 4.3

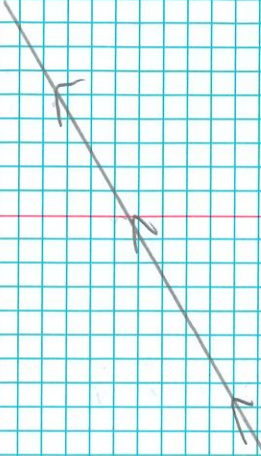
2614 SND 2.6

1372

SAME

28

N



Job#

13000-09

CPTA

CREVASSE SP-12

5-8-19

PT	DESCRIPTION	DATA
2015-21	BOTTOM	
2022	SND	4.7
2023		5.7
2024		5.5

SAHG

2372

29

Johff

13000-04

CPRA

VEHICLE, LA

BASE SET ON CP 1004

OPLS STARTED @ 12:10 PM END 4:30

CHK ON CP 1002' PT 2625

H-0.106 U-0.012

5-13-19

PT

DESCRIPTION

WAT

2626

Tow @ 12:44

2627

SND

5.1

2628

SND

5.0

2629

SND

5.0

2630

SND

4.8

2631

SND

4.7

2632

SND

5.0

2633

SND

4.9

2634

SND

4.9

2635

SND

4.7

2636

SND

6.0

2637

SND

4.8

2638

SND

5.1

2639

SND

4.9

2640

SND

5.0

2641

Tow @ 1:09

Job#

1300004

CPRA

CREVASSE SP-12

5-13-19

PT DESCRIPTION WAT LAT

2662-262 BOTTOM X-SECTION 2000

2653 SUD 6.0

2654 SUD 9.0

2655 SUD 10.0

2656 SUD 10.1

2657 SUD 9.8

2658 SUD 9.2

2659 SUD 9.0

2660 SUD 7.8

2661 SUD 5.8

2662 SUD 3.9

2663-65 BOTTOM

SITA 1+50

2666-73 BOTTOM

2674 SUD 8.0

2675 SUD 9.2

2676 SUD 10.1

2677 SUD 9.8

2678 SUD 9.8

2679 SUD 9.5

SIRADE
C.G. LORY

2372

DI. ELENDO

31

Job#

15000-04

C.P.R.A.

5-13-19

CREVASSE SP-12

PT	DESCRIPTION	WJAT
2680	SND	9.5
2681	SND	8.0
2682	SND	7.4
2683	SND	3.0
2684-86	BOTTOM	

STA 3+00

2687-91	BOTTOM	
2692	SND	8.7
2693	SND	9.5
2694	SND	9.8
2695	SND	10.0
2696	SND	10.2
2697	SND	10.2
2698	SND	9.0
2699	SND	6.0
2700	SND	4.0
2701-103	BOTTOM	

STA 4+50

2704-67	BOTTOM	
2708	SND	8.0
2709		10.0
2710		10.5

2372

J. ROWE
C. GARDNER
D. LEGGENDS

32

Job #

13000-04

5-13-19

PT	DESCRIPTION	WAT
2711	SND	10.8
2712	SND	11.0
2713	SND	11.0
2714	SND	10.0
2715	SND	8.0
2716	SND	5.0
2717-18	BOTTOM	
STA 6400		
2719-21	BOTTOM	
2722	SND	8.7
2723	SND	10.0
2724	SND	11.2
2725	SND	12.0
2726	SND	12.0
2727	SND	11.0
2728	SND	9.5
2729-30	BOTTOM	1.8
STA 7450		
2731-32	BOTTOM	
2733	SND	2.0
2734	SND	9.5
2735	SND	12.4
2736	SND	13

2372

J. Rouse
C. Chidsey
D. L. E. G. S. D. R.

33

CREWASSE SP-12

Job#

13000-04

APRA

S-13-19

PT DESCRIPTION

WAT

2737 SOD

18.0

2738 SOD

13

2739 SOD END TRKS

8.0

STA 9100

2740.42 BOTTOM

2743 SOD

2.8

2744 SOD

8.0

2745 SOD

10.8

2746 SOD

12.0

2747 SOD

12.2

2748 SOD

12.5

2749 SOD

11.8

2750 SOD

9.0

2751 SOD

2.0

2752-54 BOTTOM

STA 10+50

2754-57 BOTTOM

2758 SOD

7.0

2759 SOD

7.0

2760 SOD

7.0

2761 SOD

8.8

2762 SOD

9.0

2763 SOD

9.0

34

SAME

2372

CIREVASSE SP-12

Job#

13000-04

5-13-19

STA 10+50

PT DESCRIPTION

WAT

2764 SAND

10.0

2765 SAND

9.0

2766 SAND

5.5

2767-70 BOTTOM

STA 12+00

2771-72 BOTTOM

2773 SAND

4.2

2774 SAND

5.5

2775 SAND

5.0

2776 SAND

5.5

2777 SAND

5.5

2778 SAND

5.5

2779 SAND

5.8

2780 SAND

6.8

2781 SAND

7.0

2782 SAND

8.0

2783 SAND

7.5

2784 SAND

7.3

2785 SAND

4.5

2786 SAND

4.0

2787 SAND

3.0

2788

VOID

PTS 2771-2788

35

DATE

2372

Job#

13000-04

STA 1200

5-13-19

PT DESCRIPTION

WAT

2798-92 BOTTOM

S.O

2793 SOD

S.1

2794 SOD

S.3

2795 SOD

S.6

2796 SOD

S.8

2797 SOD

6.5

2798 SOD

C.5

2799 SOD

C.3

2800 SOD

C.8

2801 SOD

C.2

2802 SOD

7.4

2803

7.0

2804

C.8

2805

S.0

2806

4.0

2807

3.8

2808

3.5

2809

2.5

2810-12 BOTTOM

2372

Si ROAE

C. CUM DRY

D. DEFENSE

36

AIRVILLE SP-12

Job#

13000-04

Sta 1350

5-13-19

PT

DESCRIPTION

WAT

2813

4.8

2814

4.8

2815

4.2

2816

Tow 3.42

2817

CHK SHOT H 0.119 U 0.009

2818

2819

2820

2821

2822

2823

2824

2825

2826

DATE 37

1372

CREVASSE GR-12

Job#

13000-04

CPR

BASE ON CP 1004

CHK 1002 H 0.127 V - 0.030 FT 2818

S-14.19

STA 13+50

PT DESCRIPTION LAT

2819 TOW @ 8:31

2820 SMD

2821 4.8

2822 5.0

2823 5.0

2824 5.0

2825 5.2

2826 5.1

2827 4.8

2828 5.5

2829 5.5

2830 4.5

2831 4.8

2832 4.2

2833 3.8

2834 3.8

2835 3.7

2836 3.2

2837 3.2

J. Rowe

6-6-1974

D. L. GENDRE

38

2372

CREUASSE SP-12

Job#

13000-04

STA 13+50

S-14-12

PT DESCRIPTION WATER

2838

2.7

2839

1.8

2840

1.1

2841-43

BOTTOM

STA 13+00

2844

4.8

2845

5.1

2846

5.0

2847

5.0

2848

5.0

2849

5.1

2850

5.1

2851

5.0

2852

4.8

2853

4.8

2854

4.3

2855

5.0

2856

4.9

2857

4.9

2858

4.2

2859

4.2

2860

4.2

2861

4.2

2372

J. ROWE
C. B. WOOD
D. L. ELLIOTT

39

ATLANTIC SEASIDE

Job#

13000-04

1346 15400

5-14-19

PT	DESCRIPTION	DATA
2862	SWD	4.2
2863	SWD	3.5
2864	SWD	3.8
2865	SWD	3.9
2866	SWD	2.9
2867	TWC	9.28
2868	CHK H	0.090
		U-0.037

S. ROWE

C. C. LIPRY

D. LEGER

2372

40

C. RENAISSANCE SP-12

Job #

13000-04

CPRA

VENICE, LA

BASE SET ON CP 1000

BASE HT = 2.05 m

CHK ON CP 1000

H-0.299 V-0.225 PT 28809

CREVASSE SP-7

PT DESCRIPTION WAT

2870 TOW @ 11:07 AM (LINE 106-107)

2871 BOTTOM 12+

2872 SND 12+

2873 SND 15+

LINE 104-105

2874 SND 15+

2875 TOW @ 11:18 AM

CREVASSE FP-10

2876 TOW @ 11:30 AM (LINE 118-119)

2877-79 BOTTOM

2880 SND 15+ 11.0

2881 SND 15+

LINE (116-117)

2882 SND 12.0

2883 SND 15+

2884 TOW @ 11:43 AM

SAFE

2372

41

Job#

13000-04

CPRA

CREVASSE - OP - G

PT

DESCRIPTION

SND

2886

TOW @ 12:07 H

2886

SND

11.0

2887

SND

15+

5-14-19

J. ROOSE
C. GARDY
D. LIEGEARD

2372

42

Job#

CPRA

13000-04 Delta Wide Crevassees

(RTK)

Set up GPSTs on CP# 1002

Point

Remarks

13,000

Check into CP# 1004

100103

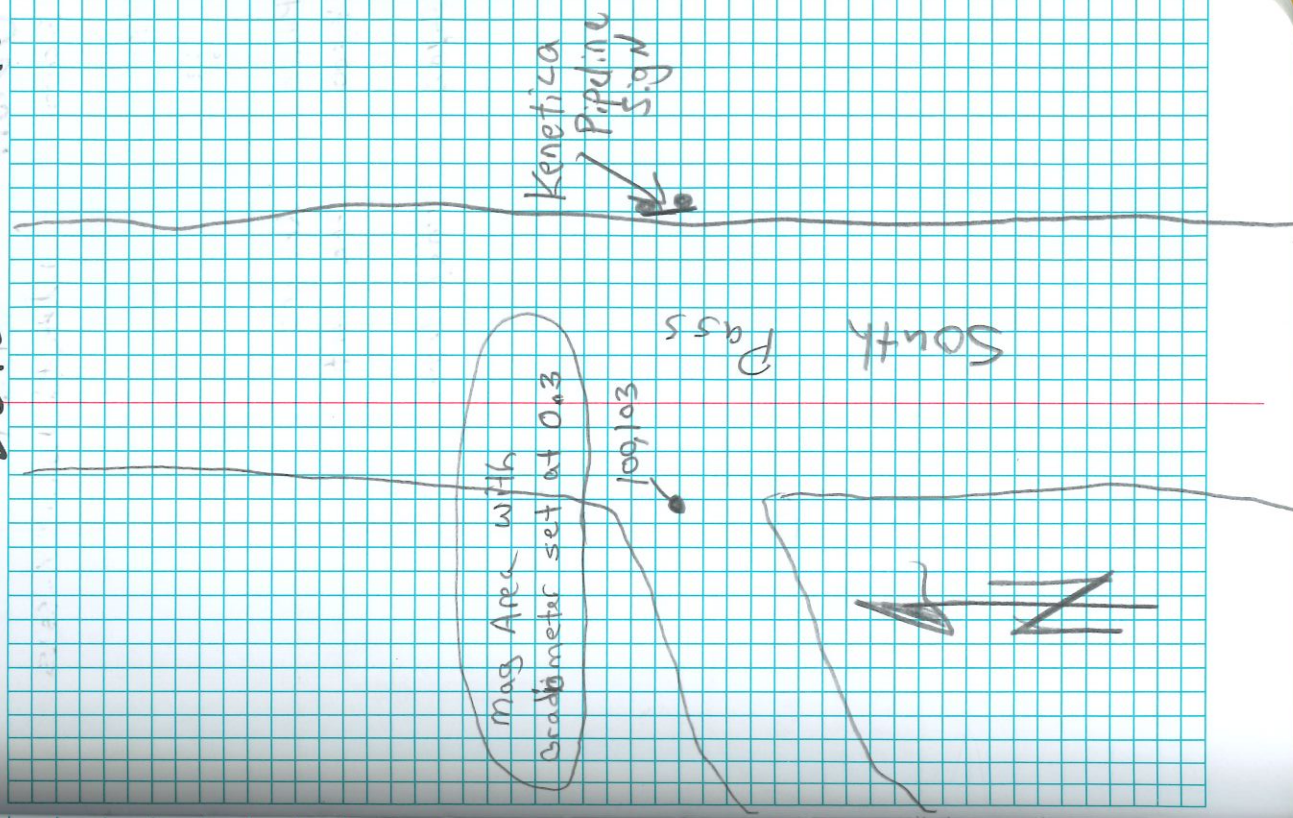
mag Hit

R. Billiot
J. Magnard

2372

8/30/19

43



Job#

13000-04

C.P.R.A

Delta Wide Crevasses

(RTK)

Points Remarks

Mag Hit

Mag Hit

Mag Hit

100,100

100,101

100,102

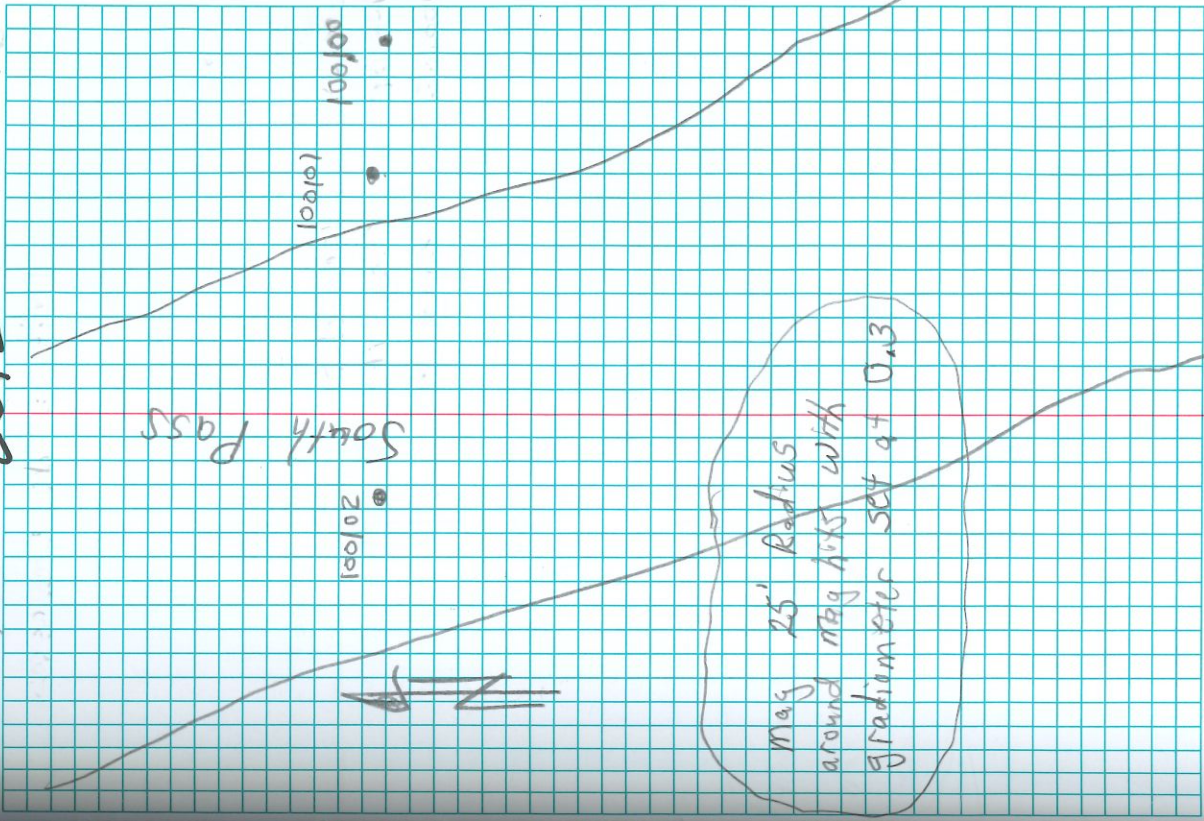
R. Billitt

J. Maynard

2372

8/30/19

44



Job#

13000-04

CPRA

Delta Wide Crevasse

(RTK)

Points

Remarks

100104

Mag Hit

100105

Mag Hit

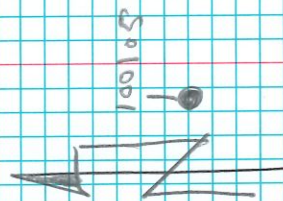
13001

Check into CP# 1004

R. Billiot
S. Meynard

2372

8/30/19 45



Mag 25' Radius around
mag hits with gradiometer
set at 0.3

100104

LO @ 1715
fcs

APPENDIX 8

Key Personnel

Key Personnel

OFFICE PERSONNEL

Ryan Boudreaux – Senior Technician/Designer
Tim Crosby – CAD III
Lee Drennan – Senior Technician/Designer
John Mattingly – Senior Professional Land Surveyor
Jessie Newton III – CAD III/GIS Technician

CONVENTIONAL FIELD PERSONNEL

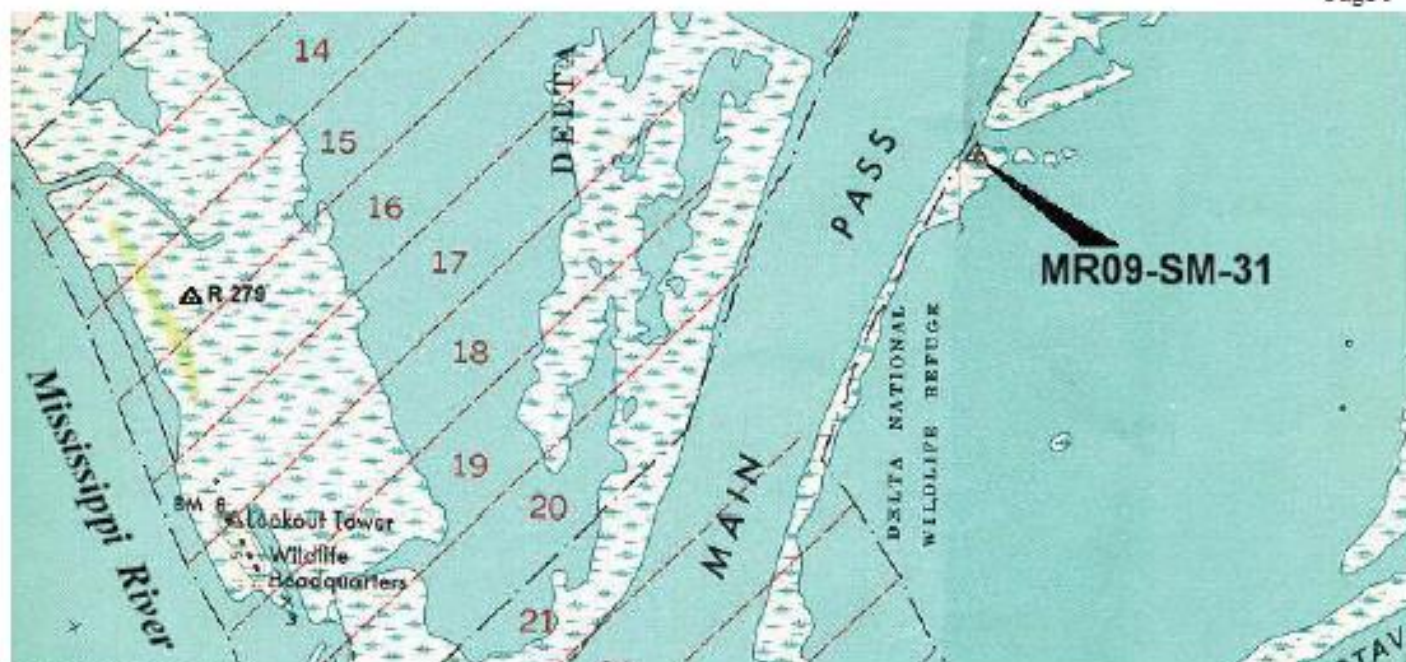
James Rowe – Survey Crew Chief
Ricky Billiot – Survey Crew Chief

HYDRO PERSONNEL

Stuart Babin – Hydro Survey Manager/Hydro Survey Technician
Kiley Cressionie – Hydro Survey Technician
Jonathan Morris – Hydro Survey Manager
Cody Pisani – Hydro Survey Technician

APPENDIX 9

Existing Benchmark Data Sheets



VICINITY MAP Scale: 1"=2000' Reproduced from USC&GS "PILOTTOWN & PASS A LOUTRE WEST, LA" Quads

Station Name: "MR09-SM-31"

Monument Location: By boat from Venice, Louisiana, proceed southeasterly in the Mississippi River for approximately 7.4 miles to Cubits Gap at the left. Turn left and proceed easterly though the north of Cubits Gap into Main Pass and continue for 1.5 miles to the monument on the right.

Monument Description: Deep Rod Monument; standard 3" survey disk set on steel rods and driven 52.2 feet to refusal, set in a PVC pipe and is recessed 0.4 feet below top of PVC pipe.

Date: August, 2002

Monument Established By: Pyburn & Odom, Inc.

For: LA Department of Natural Resources, CRD

P&O Published NAD 83 Geodetic Position

Lat. 29° 13.130"N

Long. 89° 14.951"W

P&O Published NAVD88 (Feet)

Elevation = 7.51

Adjusted NAD 83 Geodetic Position

Lat. 29° 13' 07.59826"N

Long. 89° 14' 57.28098"W

Adjusted NAD 83 Datum LSZ (1702) Feet

N= 267,445.51

E= 3,945,645.93

Adjusted NAVD88 Height

Elevation = 7.60 ft



Position determined by using Real-time Kinematic (RTK) survey from Temporary Flypoint "BILL"



VICINITY MAP Scale: 1"=2000' Reproduced from USC&GS "PILOTTOWN & PASS A LOUITRE WEST, LA" Quads

Station Name: "MR09-SM-38"

Monument Location: By boat from Venice, Louisiana, proceed southeasterly in the Mississippi River for approximately 7.4 miles to Cubits Gap at the left. Turn left and proceed easterly though the north of Cubits Gap into Main Pass and continue for 3.3 miles to the monument on the left.

Monument Description: Deep Rod Monument; standard 3" survey disk set on steel rods and driven 54.3 feet to refusal, set in a PVC pipe and is recessed 0.4 feet below top of PVC pipe.

Date: August 2002

Monument Established By: Pyburn & Odom, Inc.

For: LA Department of Natural Resources, CRD

P&O Published NAD 83 Geodetic Position

Lat. 29°14.592"N

Long. 89°14.267"W

P&O Published NAVD88 (Feet)

Elevation = 3.69

Adjusted NAD 83 Geodetic Position

Lat. 29° 14' 35.62284"N

Long. 89° 14' 37.40572"W

Adjusted NAD 83 Datum LSZ (1702) Feet

N= 276,368.03

E= 3,947,242.96

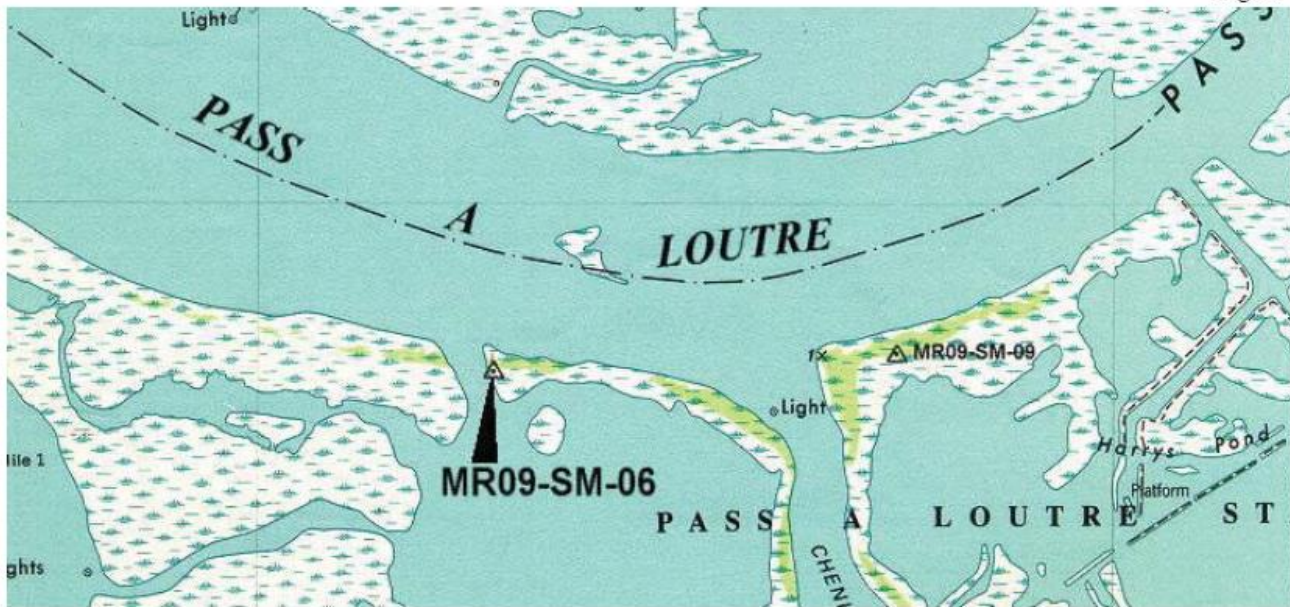
Adjusted NAVD88 Height

Elevation = 4.00 ft



Position determined by using Real-time Kinematic (RTK) survey from Temporary Flypoint "BILL"

Adjusted Position Established by John Chance Land Surveys, Inc. for Louisiana Department of Natural Resources, CRD



VICINITY MAP

Scale: 1" = 2000'

Reproduced from USC&GS "PASS A LOUTRE WEST, LA" Quadrangle

Station Name: "MR09-SM-06"

Monument Location: By boat from Venice, Louisiana, proceed southeasterly in the Mississippi River for approximately 10 miles to the Head of Passes. Turn left and proceed easterly into Pass a Loutre for approximately 2 miles to the monument on the right.

Monument Description: Deep Rod Monument; standard 3" survey disk set on steel rods and driven 54.5 feet to refusal, set in a PVC pipe and is recessed 0.4 feet below top of PVC pipe.

Date: August, 2002

Monument Established By: Pyburn & Odom, Inc.

For: Louisiana Department of Natural Resources, CRD

P&O Published NAD 83 Geodetic Position

Lat. 29°08.371"N
Long. 89°13.560"W

P&O Published NAVD88 (Feet)

Elevation = 3.94

Adjusted NAD 83 Geodetic Position

Lat. 29° 08' 22.13239"N
Long. 89° 13' 33.85342"W

Adjusted NAD 83 Datum LSZ (1702) Feet

N= 238,749.46
E= 3,953,566.05

Adjusted NAVD88 Height

Elevation = 3.89 ft

Position determined by using Real-time Kinematic (RTK) survey from Secondary GPS Monument "MR09-SM-11"



Adjusted Position Established by John Chance Land Surveys, Inc. for Louisiana Department of Natural Resources, CRD