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

SURVEY REPORT

Prepared for:

United States Department of Agriculture
Natural Resources Conservation Service

August 6, 2014

TBS Project Number 2014.0457

Submitted by:

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

SURVEY REPORT

Prepared for: U.S.D.A.
Natural Resources Conservation Service
3737 Government Street
Alexandria, LA 71302

Submitted By: T Baker Smith, LLC
107 Global Circle
Lafayette, LA 70503

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

SURVEY REPORT

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DIGITAL APPENDIX

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

1.0 INTRODUCTION

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

2.0 PROJECT OVERVIEW

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

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

3.0 DATA COLLECTION SUMMARY

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

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

3.1 Geotechnical Surveys

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

3.2 Magnetometer Surveys

The magnetometer surveys were performed in the access route and the marsh creation cells. The purpose of this survey was to determine the location of any possible pipelines or other metallic objects. This survey was performed using a proton magnetometer secured in a kayak and towed with an airboat. Planned survey lines were provided by NRCS and set up in HyPack 2013 based on provided alignments in order to collect adequate data within each area. All magnetometer data with a gamma reading of fifty (50) gammas or greater was processed. A total of 112 magnetic anomalies were detected within the cell boundaries during this survey. There were 18 magnetic anomalies that were detected within the access route corridor. The survey showed the existence of 5 possible pipelines crossing the project area. In cell area #1, there are two pipelines that exist within the proposed cell boundaries. In cell area #2, there are two

pipelines that parallel the southeastern boundary and these same pipelines are present in cell #4. Please refer to Map Sheets 6, 7 and 8 of 14 for information on these magnetic anomalies.

3.3 Pipeline Investigation Survey

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

4.0 METHODOLOGY

4.1 Survey Control and Datum Information

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

4.2 Geophysical Surveys

Geophysical instruments used during this survey consisted of a Marine Magnetics SeaSPY magnetometer. See appendix 3 for specifications. Horizontal positioning of the survey vessel was accomplished using HyPack® navigation software (version HyPack 2013) with a Trimble R8 GNSS (RTK) global positioning receiver. Horizontal accuracy of this positioning as stated by the manufacturer is ±2-3 centimeters. See appendix 3 for specifications. The magnetometer sensor was deployed 45 feet behind the positioning antenna during the field survey. The magnetometer sensor was mounted inside a kayak and towed behind the Airboat (see Figure 1). This method allows the operator to survey continuously through both open water and low-elevation marsh. The magnetometer sensor was set at

.1sec/gamma. All Magnetometer data was digitally recorded by an onboard laptop computer using the SeaSPY interface linked with the *HYPACK MAX* survey navigation software mentioned above. The magnetic data was processed in HyPack to obtain the position, signature type and strength of each anomaly. The HyPack processing software allows the user to view the magnetic data as actual magnetic field values along a continuous line. The user is able to easily pinpoint anomalies as deflections from the normal magnetic field and note the position based on the center of the signature. Each magnetic anomaly is interpreted based on its size, signature type and actual field observations.

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

4.3 Pipeline Investigation Surveys

Pipeline investigation surveys were performed using a standard three-man survey crew, accessing the survey area by airboat. A Trimble© model R8 GNSS GPS RTK unit was used to collect the topographic field data. The manufacturer's stated

accuracy of this unit is 2-3 cm horizontal, and 3-4 cm vertical. All RTK GPS Survey information was stored digitally using a Trimble TSC-2 Data Collector. Topographic survey data was downloaded from the Trimble TSC-2 Data Collector into the Trimble Business Center software for processing. This software allows for QA/QC of GPS data and was used to check for instrument setup errors, antenna height errors and other errors. These points were then exported and entered into AutoCAD Civil 3D for further processing. The processed survey data was also exported to one complete digital text file containing point numbers X, Y, Z coordinates and point descriptions using the DOTD survey feature code list.

APPENDIX 1

Survey Benchmark Data Sheet

VICINITY MAP Not to Scale Reproduced from 2010 DOQQ Arial Photography

Station Name: "BS16-SM-02"

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

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

Installation Date: August 2013

Date of Survey: August 2013

Monument Established By: T. Baker Smith, LLC

For: *Natural Resources Conservation Service*

Adjusted NAD 83 (2011) Geodetic Position
Lat. 29° 46' 31.97" N
Long. 89° 51' 50.31" W

Adjusted NAD 83 Datum LSZ (1702) Feet
N= 466,857.617
E= 3,746,965.627

Adjusted NAVD88 (2010.0) Height
Elevation = 1.761 feet (0.537 mtrs.) (Geoid12A)

Ellipsoid Height = -24.924 mtrs.
Geoid12A Height = -25.461 mtrs.

FOR REFERENCE ONLY
Adjusted NAVD88 Height (2006.81) (Geoid03)
Elevation = 1.574 feet (0.480 mtrs)
Ellipsoid Height = -81.903 feet (-24.964 mtrs)
Geoid 03 Height = -83.477 feet (-25.444 mtrs) (2004.65)

APPENDIX 2

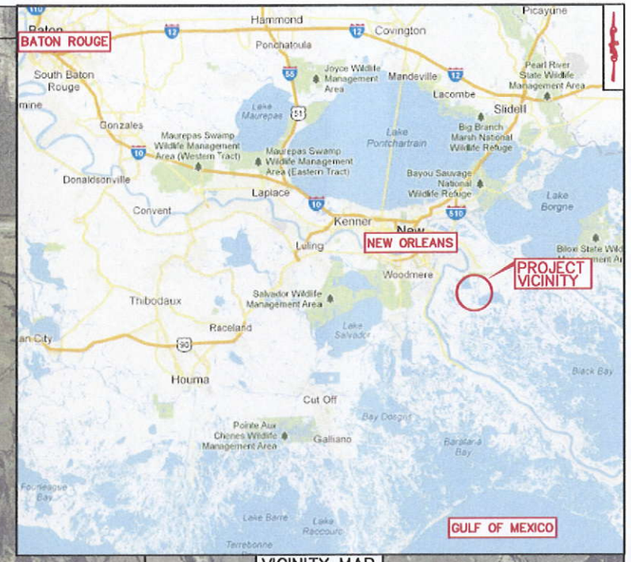
Magnetometer Survey Exhibits

LOUISIANA COORDINATE SYSTEM (SOUTH ZONE)
(NAD83) (NAVD88)

T 13 S - R 12 E
T 14 S - R 12 E
T 13 S - R 13 E
T 14 S - R 13 E
T 14 S - R 24 E
T 14 S - R 25 E
MISSISSIPPI RIVER
T 14 S - R 12 E
T 14 S - R 13 E
T 14 S - R 13 E
T 14 S - R 14 E
T 14 S - R 13 E
T 14 S - R 13 E

EXISTING ACCESS ROUTES
BIG MAR
PROPOSED CELL 1
PROPOSED CELL 2
PROPOSED CELL 3
PROPOSED CELL 4
LAKE LERY

BS16-SM-02 EL=1.761'
X = 3,746,965.627' NAD 83
Y = 466,857.617'
LAT = 29° 46' 31.97" NAD 83
LONG = 89° 51' 50.31"
GEOID 12A



VICINITY MAP
NOT TO SCALE

LEGEND

- Proposed Cells
- CMD Permitted Line
- Existing Pipeline as per T. Baker Smith Survey dated MAY 2014.
- Proposed Access Routes
- Control Point NRCS MONUMENT BS16-SM-02

INDEX TO SHEETS

SHEET NO.	DESCRIPTION
1	VICINITY MAP
2	BORING LOCATION-KEY MAP
3-5	BORING LOCATION - CELLS 1-4
6	MAG ANOMALY AREA MAP
7	MAG ANOMALY INVESTIGATION TABLES
8	MAG ANOMALY ACCESS ROUTE MAP
9-11	PIPELINE INVESTIGATION MAPS
12	PIPELINE INVESTIGATION TABLES
13-14	PIPELINE PROFILES

I CERTIFY THAT THIS PLAT REPRESENTS THE RESULTS OF A SURVEY PERFORMED UNDER MY SUPERVISION.

STATE OF LOUISIANA
JOHN C. MATTINGLY
REG. No. 4710
REGISTERED PROFESSIONAL
LAND SURVEYOR

JOHN C. MATTINGLY, PLS
PROFESSIONAL LAND SURVEYOR NO. 4710

NOTES:

NRCS

TBS T. BAKER SMITH
SOLUTIONS START HERE
107 Global Circle, Lafayette, LA 70503
(337)735-2800 - tbsmith.com

SCALE: 1" = 4000'
4000' 2000' 0' 4000'

REV. NO:	REV. DATE:	REV. BY:
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REVISION DESCRIPTION:
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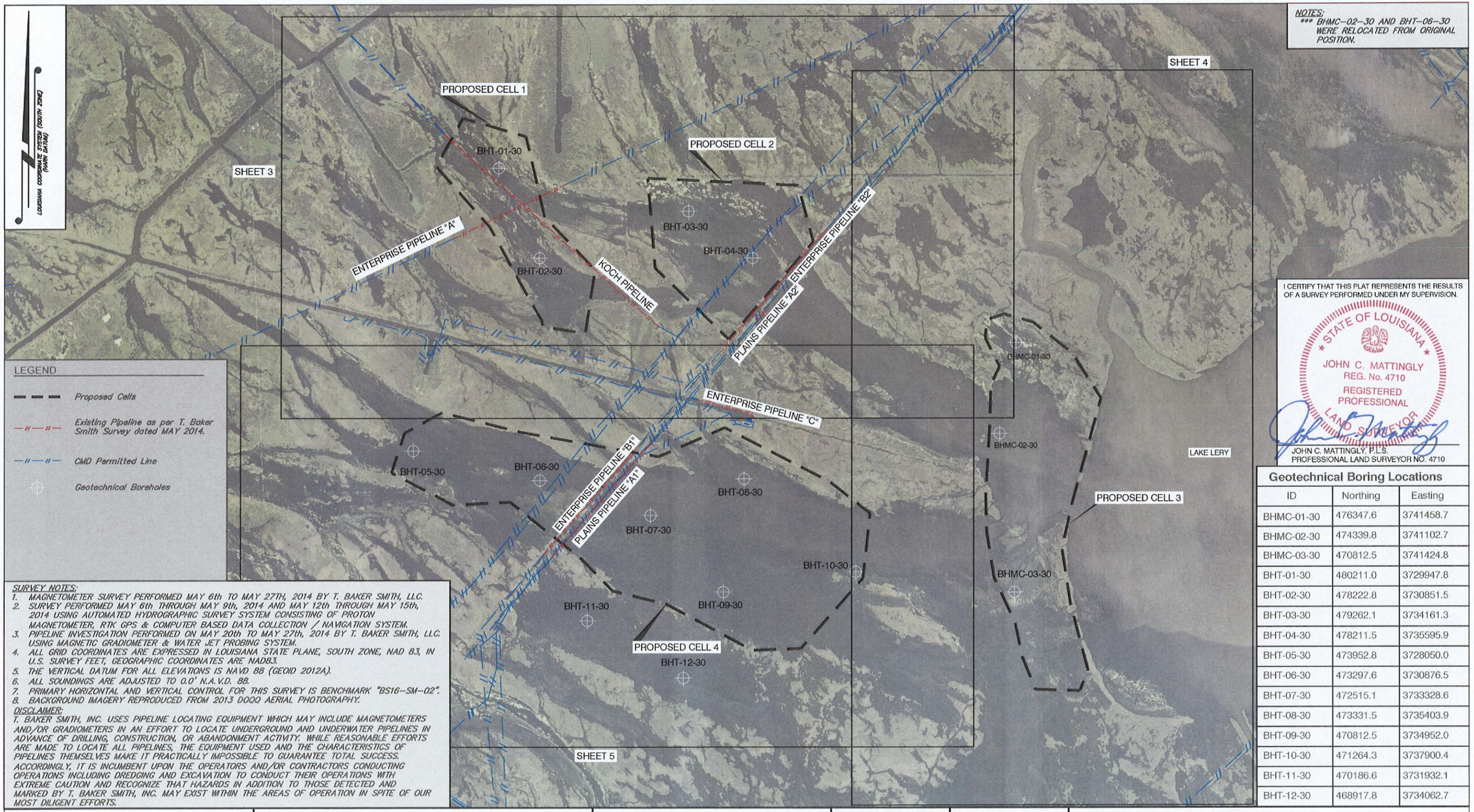
DRAWN BY:	AZB	APPROVED BY:	WMB
DATE:	6/2/14	JOB NO:	2014.0457

DRAWING NAME: 140457_VIC_SH1.DWG
PROJECTION: LA 83-SF-MOD
GEO. DATUM: NAD83 | VERT. DATUM: NAVD88, Gd 12A
GRID UNITS: US SURVEY FEET
SHEET NO: 1 OF 14

VICINITY MAP

Natural Resources Conservation Service
MAGNETOMETER SURVEYS
FOR
TERRACING AND MARSH CREATION
SOUTH OF BIG MAR (BS-24)
PLAQUEMINES PARISH, LOUISIANA



LEGEND

- Proposed Cells
- Existing Pipeline as per T. Baker Smith Survey dated MAY 2014.
- CMD Permitted Line
- Geotechnical Boreholes

NOTES:
*** BHMC-02-30 AND BHT-06-30 WERE RELOCATED FROM ORIGINAL POSITION.

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STATE OF LOUISIANA
JOHN C. MATTINGLY
REG. No. 4710
REGISTERED PROFESSIONAL LAND SURVEYOR

JOHN C. MATTINGLY, P.L.S.
PROFESSIONAL LAND SURVEYOR NO. 4710

Geotechnical Boring Locations

ID	Northing	Easting
BHMC-01-30	476347.6	3741458.7
BHMC-02-30	474339.8	3741102.7
BHMC-03-30	470812.5	3741424.8
BHT-01-30	480211.0	3729947.8
BHT-02-30	478222.8	3730851.5
BHT-03-30	479262.1	3734161.3
BHT-04-30	478211.5	3735595.9
BHT-05-30	473952.8	3728050.0
BHT-06-30	473297.6	3730876.5
BHT-07-30	472515.1	3733328.6
BHT-08-30	473331.5	3735403.9
BHT-09-30	470812.5	3734952.0
BHT-10-30	471264.3	3737900.4
BHT-11-30	470186.6	3731932.1
BHT-12-30	468917.8	3734062.7

SURVEY NOTES:
1. MAGNETOMETER SURVEY PERFORMED MAY 6th TO MAY 27TH, 2014 BY T. BAKER SMITH, LLC.
2. SURVEY PERFORMED MAY 6th THROUGH MAY 9th, 2014 AND MAY 12th THROUGH MAY 15th, 2014 USING AUTOMATED HYDROGRAPHIC SURVEY SYSTEM CONSISTING OF PROTON MAGNETOMETER, RTK GPS & COMPUTER BASED DATA COLLECTION / NAVIGATION SYSTEM.
3. PIPELINE INVESTIGATION PERFORMED ON MAY 20th TO MAY 27th, 2014 BY T. BAKER SMITH, LLC. USING MAGNETIC GRADIOMETER & WATER JET PROBING SYSTEM.
4. ALL GRID COORDINATES ARE EXPRESSED IN LOUISIANA STATE PLANE, SOUTH ZONE, NAD 83, IN U.S. SURVEY FEET, GEOGRAPHIC COORDINATES ARE NAD83.
5. THE VERTICAL DATUM FOR ALL ELEVATIONS IS NAVD 88 (GEOID 2012A).
6. ALL SOUNDINGS ARE ADJUSTED TO 0.0' N.A.V.D. 88.
7. PRIMARY HORIZONTAL AND VERTICAL CONTROL FOR THIS SURVEY IS BENCHMARK "BS16-SM-02".
8. BACKGROUND IMAGERY REPRODUCED FROM 2013 DOQQ AERIAL PHOTOGRAPHY.

DISCLAIMER:
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NOTES:

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SOLUTIONS START HERE
107 Global Circle, Lafayette, LA 70503
(337)735-2800 - tbsmith.com

SCALE: 1" = 2000'
2000' 1000' 0' 2000'

REV. NO:	REV. DATE:	REV. BY:
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REVISION DESCRIPTION:
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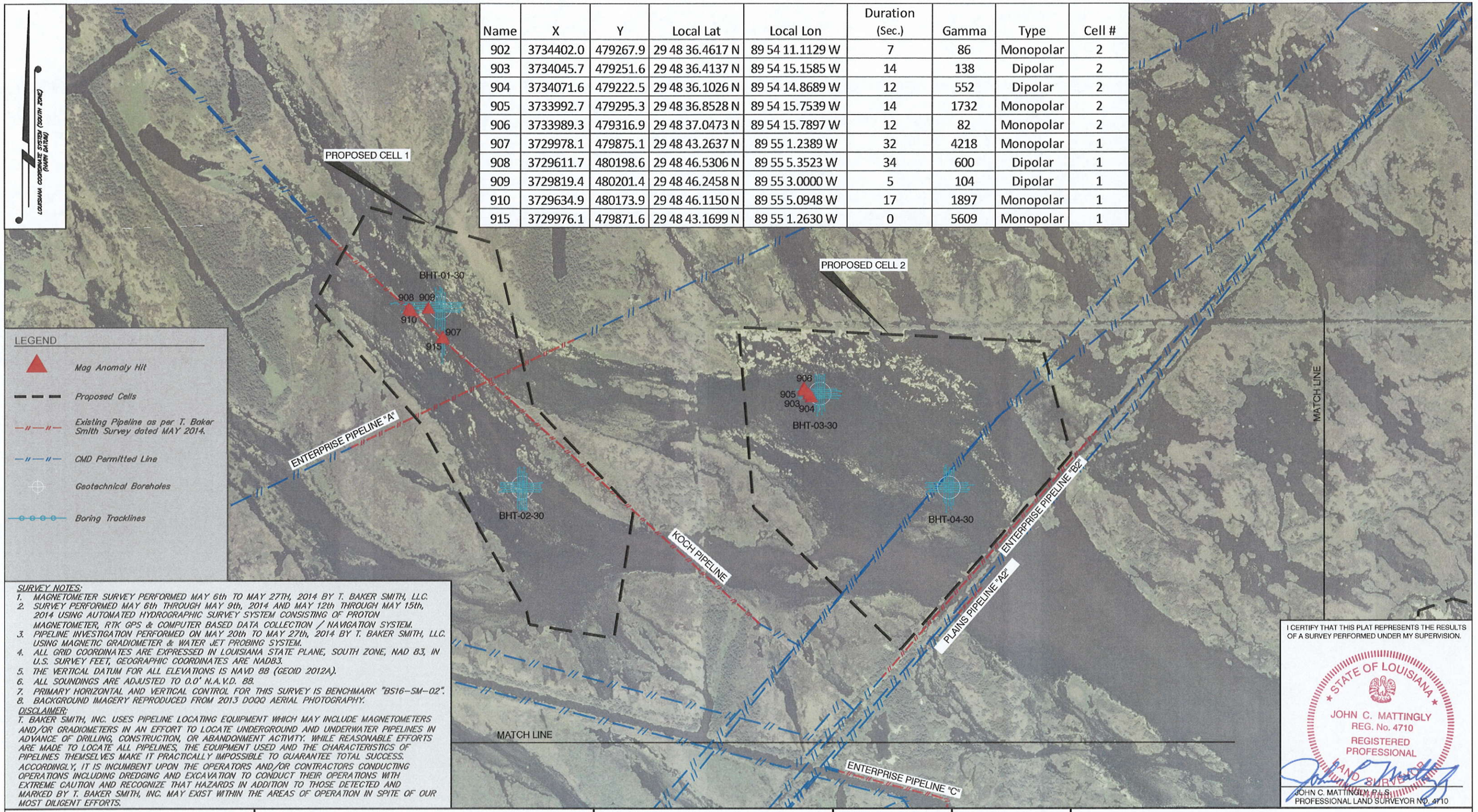
DRAWN BY:	AZB	APPROVED BY:	WMB
DATE:	6/2/14	JOB NO:	2014.0457

DRAWING NAME: 140457_BOREHOLES_SH2-5.DWG
PROJECTION: LA 83-SF-MOD
GEO. DATUM: NAD83 | VERT. DATUM: NAVD88, Gd 12A
GRID UNITS: US SURVEY FEET
SHEET NO: 2 OF 14

BORING LOCATION - KEY MAP

Natural Resources Conservation Service
MAGNETOMETER SURVEYS
FOR
TERRACING AND MARSH CREATION
SOUTH OF BIG MAR (BS-24)
PLAQUEMINES PARISH, LOUISIANA

Name	X	Y	Local Lat	Local Lon	Duration (Sec.)	Gamma	Type	Cell #
902	3734402.0	479267.9	29 48 36.4617 N	89 54 11.1129 W	7	86	Monopolar	2
903	3734045.7	479251.6	29 48 36.4137 N	89 54 15.1585 W	14	138	Dipolar	2
904	3734071.6	479222.5	29 48 36.1026 N	89 54 14.8689 W	12	552	Dipolar	2
905	3733992.7	479295.3	29 48 36.8528 N	89 54 15.7539 W	14	1732	Monopolar	2
906	3733989.3	479316.9	29 48 37.0473 N	89 54 15.7897 W	12	82	Monopolar	2
907	3729978.1	479875.1	29 48 43.2637 N	89 55 1.2389 W	32	4218	Monopolar	1
908	3729611.7	480198.6	29 48 46.5306 N	89 55 5.3523 W	34	600	Dipolar	1
909	3729819.4	480201.4	29 48 46.2458 N	89 55 3.0000 W	5	104	Dipolar	1
910	3729634.9	480173.9	29 48 46.1150 N	89 55 5.0948 W	17	1897	Monopolar	1
915	3729976.1	479871.6	29 48 43.1699 N	89 55 1.2630 W	0	5609	Monopolar	1



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5. THE VERTICAL DATUM FOR ALL ELEVATIONS IS NAVD 88 (GEOID 2012A).
6. ALL SOUNDINGS ARE ADJUSTED TO 0.0' N.A.V.D. 88.
7. PRIMARY HORIZONTAL AND VERTICAL CONTROL FOR THIS SURVEY IS BENCHMARK "BS16–SM–02".
8. BACKGROUND IMAGERY REPRODUCED FROM 2013 DOQQ AERIAL PHOTOGRAPHY.

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SCALE: 1" = 1000'
1000' 500' 0' 1000'

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REVISION DESCRIPTION:
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DRAWN BY:	FKH	APPROVED BY:	WMB
DATE:	6/17/14	JOB NO:	2014.0457

DRAWING NAME: 140457_BOREHOLES_SH2-5.DWG
PROJECTION: LA 83-SF-MOD
GEO. DATUM: NAD83 | VERT. DATUM: NAVD88, Gd 12A
GRID UNITS: US SURVEY FEET

SHEET NO: 3 OF 14

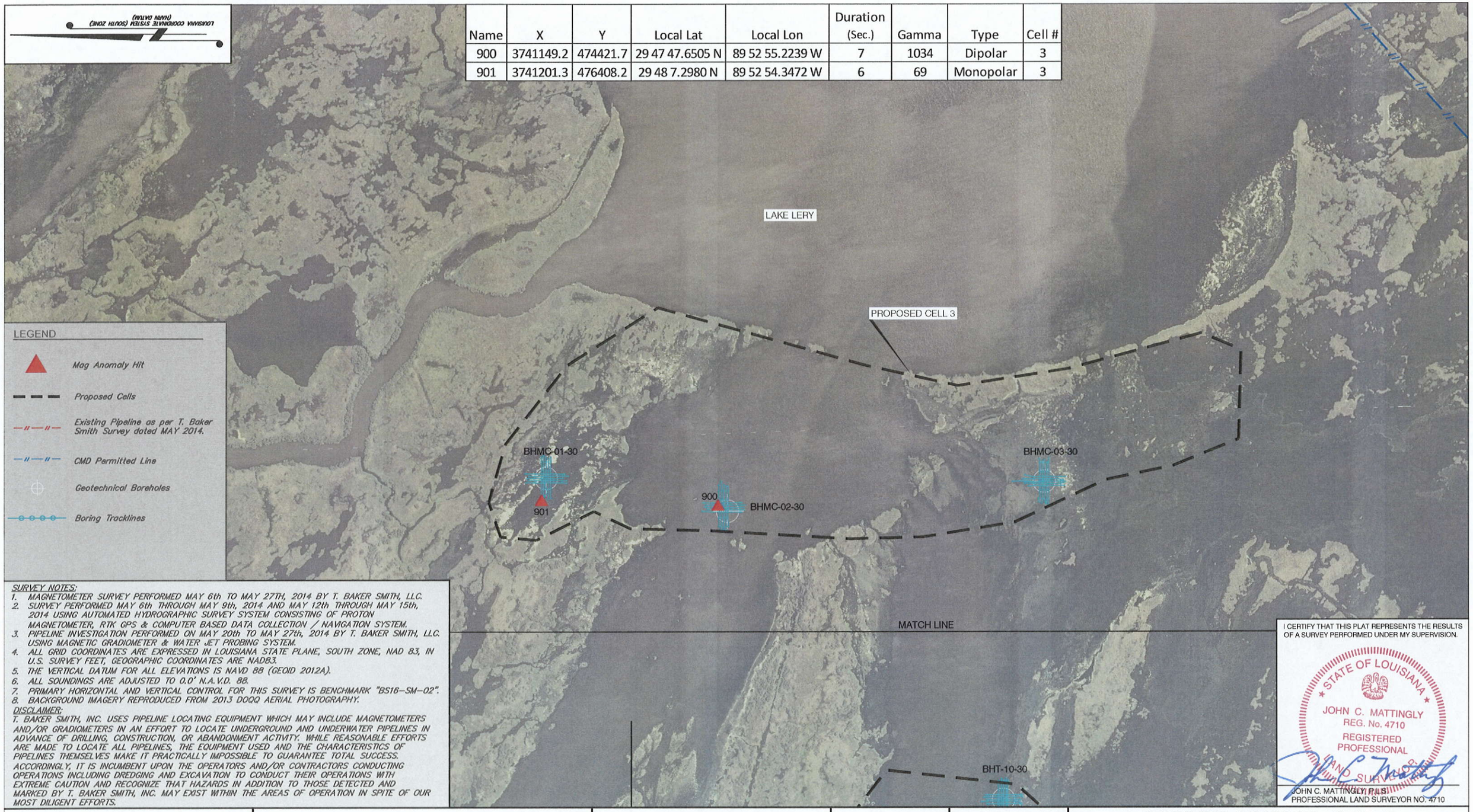
BORING LOCATION - CELL 1 & 2

Natural Resources Conservation Service

MAGNETOMETER SURVEYS
FOR
TERRACING AND MARSH CREATION
SOUTH OF BIG MAR (BS-24)
PLAQUEMINES PARISH, LOUISIANA

LOUISIANA COORDINATE SYSTEM (SOUTH ZONE)
(NAD83)

Name	X	Y	Local Lat	Local Lon	Duration (Sec.)	Gamma	Type	Cell #
900	3741149.2	474421.7	29 47 47.6505 N	89 52 55.2239 W	7	1034	Dipolar	3
901	3741201.3	476408.2	29 48 7.2980 N	89 52 54.3472 W	6	69	Monopolar	3



LEGEND

- Mag Anomaly Hit
- Proposed Cells
- Existing Pipeline as per T. Baker Smith Survey dated MAY 2014.
- CMD Permitted Line
- Geotechnical Boreholes
- Boring Tracklines

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NRCS

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SOLUTIONS START HERE
107 Global Circle, Lafayette, LA 70503
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1000' 500' 0' 1000'

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REVISION DESCRIPTION:
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DRAWN BY:	FKH	APPROVED BY:	WMB
DATE:	6/17/14	JOB NO:	2014.0457

DRAWING NAME: 140457_BOREHOLES_SH2-5.DWG
PROJECTION: LA 83-SF-MOD
GEO. DATUM: NAD83 | VERT. DATUM: NAVD88, Gd 12A
GRID UNITS: US SURVEY FEET

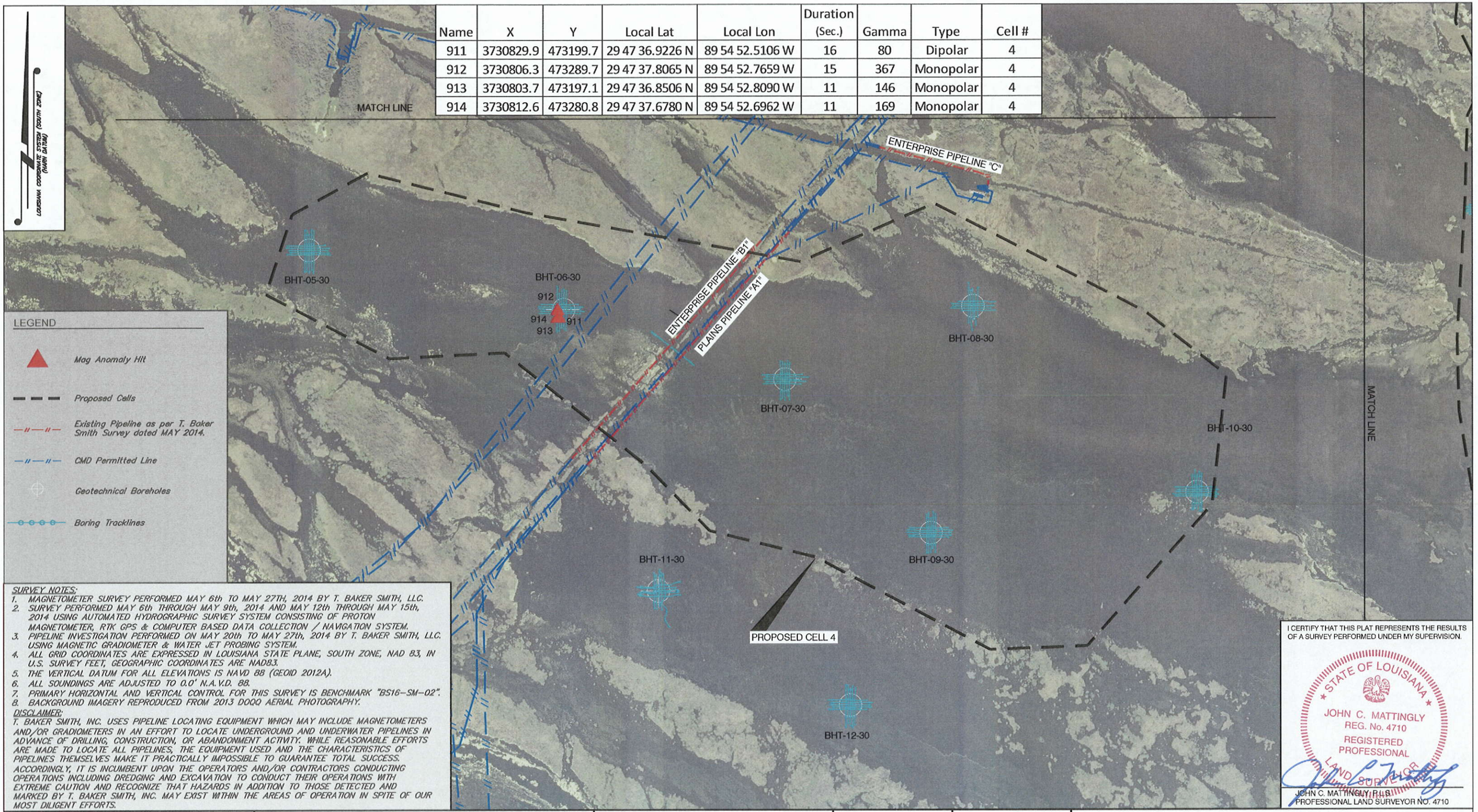
SHEET NO: 4 OF 14

BORING LOCATION - CELL 3

Natural Resources Conservation Service

MAGNETOMETER SURVEYS
FOR
TERRACING AND MARSH CREATION
SOUTH OF BIG MAR (BS-24)
PLAQUEMINES PARISH, LOUISIANA

Name	X	Y	Local Lat	Local Lon	Duration (Sec.)	Gamma	Type	Cell #
911	3730829.9	473199.7	29 47 36.9226 N	89 54 52.5106 W	16	80	Dipolar	4
912	3730806.3	473289.7	29 47 37.8065 N	89 54 52.7659 W	15	367	Monopolar	4
913	3730803.7	473197.1	29 47 36.8506 N	89 54 52.8090 W	11	146	Monopolar	4
914	3730812.6	473280.8	29 47 37.6780 N	89 54 52.6962 W	11	169	Monopolar	4



LEGEND

- Mag Anomaly Hit
- Proposed Cells
- Existing Pipeline as per T. Baker Smith Survey dated MAY 2014.
- CMD Permitted Line
- Geotechnical Boreholes
- Boring Tracklines

SURVEY NOTES:

1. MAGNETOMETER SURVEY PERFORMED MAY 6th TO MAY 27TH, 2014 BY T. BAKER SMITH, LLC.
2. SURVEY PERFORMED MAY 6th THROUGH MAY 9th, 2014 AND MAY 12th THROUGH MAY 15th, 2014 USING AUTOMATED HYDROGRAPHIC SURVEY SYSTEM CONSISTING OF PROTON MAGNETOMETER, RTK GPS & COMPUTER BASED DATA COLLECTION / NAVIGATION SYSTEM.
3. PIPELINE INVESTIGATION PERFORMED ON MAY 20th TO MAY 27th, 2014 BY T. BAKER SMITH, LLC. USING MAGNETIC GRADIOMETER & WATER JET PROBING SYSTEM.
4. ALL GRID COORDINATES ARE EXPRESSED IN LOUISIANA STATE PLANE, SOUTH ZONE, NAD 83, IN U.S. SURVEY FEET, GEOGRAPHIC COORDINATES ARE NAD83.
5. THE VERTICAL DATUM FOR ALL ELEVATIONS IS NAVD 88 (GEOID 2012A).
6. ALL SOUNDINGS ARE ADJUSTED TO 0.0' N.A.V.D. 88.
7. PRIMARY HORIZONTAL AND VERTICAL CONTROL FOR THIS SURVEY IS BENCHMARK "BS16–SM–02".
8. BACKGROUND IMAGERY REPRODUCED FROM 2013 DOQQ AERIAL PHOTOGRAPHY.

DISCLAIMER:

T. BAKER SMITH, INC. USES PIPELINE LOCATING EQUIPMENT WHICH MAY INCLUDE MAGNETOMETERS AND/OR GRADIOMETERS IN AN EFFORT TO LOCATE UNDERGROUND AND UNDERWATER PIPELINES IN ADVANCE OF DRILLING, CONSTRUCTION, OR ABANDONMENT ACTIVITY. WHILE REASONABLE EFFORTS ARE MADE TO LOCATE ALL PIPELINES, THE EQUIPMENT USED AND THE CHARACTERISTICS OF PIPELINES THEMSELVES MAKE IT PRACTICALLY IMPOSSIBLE TO GUARANTEE TOTAL SUCCESS. ACCORDINGLY, IT IS INCUMBENT UPON THE OPERATORS AND/OR CONTRACTORS CONDUCTING OPERATIONS INCLUDING DREDGING AND EXCAVATION TO CONDUCT THEIR OPERATIONS WITH EXTREME CAUTION AND RECOGNIZE THAT HAZARDS IN ADDITION TO THOSE DETECTED AND MARKED BY T. BAKER SMITH, INC. MAY EXIST WITHIN THE AREAS OF OPERATION IN SPITE OF OUR MOST DILIGENT EFFORTS.

I CERTIFY THAT THIS PLAT REPRESENTS THE RESULTS OF A SURVEY PERFORMED UNDER MY SUPERVISION.

STATE OF LOUISIANA
JOHN C. MATTINGLY
REG. No. 4710
REGISTERED PROFESSIONAL LAND SURVEYOR

JOHN C. MATTINGLY, P.L.S.
PROFESSIONAL LAND SURVEYOR NO. 4710

NRCS

TBS T. BAKER SMITH
SOLUTIONS START HERE
107 Global Circle, Lafayette, LA 70503
(337)735-2800 - tbsmith.com

SCALE: 1" = 1000'
1000' 500' 0' 1000'

REV. NO:	REV. DATE:	REV. BY:
00	--/--/--	---

REVISION DESCRIPTION:
--

DRAWN BY:	FKH	APPROVED BY:	WMB
DATE:	6/17/14	JOB NO:	2014.0457

DRAWING NAME: 140457_BOREHOLES_SH2-5.DWG

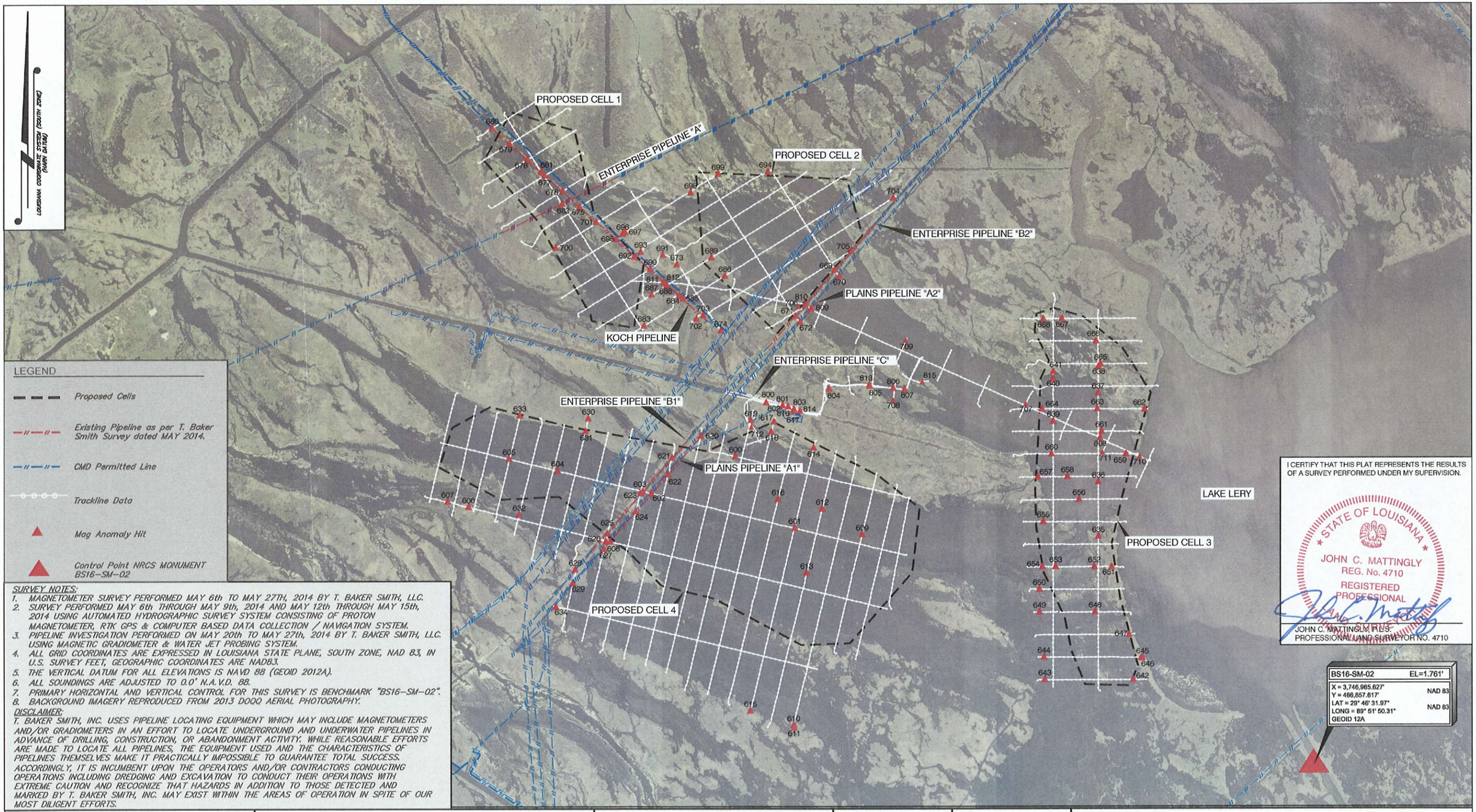
PROJECTION: LA 83-SF-MOD
GEO. DATUM: NAD83 | VERT. DATUM: NAVD88, Gd 12A
GRID UNITS: US SURVEY FEET

SHEET NO: 5 OF 14

BORING LOCATION - CELL 4

Natural Resources Conservation Service

MAGNETOMETER SURVEYS
FOR
TERRACING AND MARSH CREATION
SOUTH OF BIG MAR (BS-24)
PLAQUEMINES PARISH, LOUISIANA



NRCS

TBS **T. BAKER SMITH**
SOLUTIONS START HERE
107 Global Circle, Lafayette, LA 70503
(337)735-2800 - tbsmith.com

SCALE: 1" = 2000'
2000' 1000' 0' 2000'

REV. NO:	REV. DATE:	REV. BY:
00	--/--/--	---

REVISION DESCRIPTION:
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DRAWN BY:	FKH	APPROVED BY:	WMB
DATE:	6/17/14	JOB NO:	2014.0457

DRAWING NAME: 140457_MAG-CHARTS_SH6-7.DWG
PROJECTION: LA 83-SF-MOD
GEO. DATUM: NAD83 | VERT. DATUM: NAVD88, Gd 12A
GRID UNITS: US SURVEY FEET
SHEET NO: 6 OF 14

MAG ANOMALY AREA MAP

Natural Resources Conservation Service
MAGNETOMETER SURVEYS
FOR
TERRACING AND MARSH CREATION
SOUTH OF BIG MAR (BS-24)
PLAQUEMINES PARISH, LOUISIANA

Cell #	Name	X: Easting (NAD83)	Y: Northing (NAD83)	Lat: (NAD83)	Lon: (NAD83)	Duration (Sec.)	Gamma	Type	Description
4	600	3734139.00	473700.60	29 47 41.3847 N	089 54 14.8864 W	7.00	1679	monopolar	Nothing Found
4	601	3735460.00	472113.60	29 47 25.4813 N	089 54 0.1200 W	3.90	1048	monopolar	Nothing Found
4	602	3732273.00	472886.80	29 47 33.5887 N	089 54 36.1780 W	10.00	1995	monopolar	Pipeline
4	603	3732082.40	472934.60	29 47 34.1743 N	089 54 38.3330 W	18.99	1171	monopolar	Pipeline
4	604	3730190.80	473391.60	29 47 38.8212 N	089 54 59.7379 W	8.00	313	monopolar	Nothing Found
4	605	3729119.20	473652.70	29 47 41.5170 N	089 55 11.8632 W	6.00	795	monopolar	Nothing Found
4	606	3728222.10	472584.70	29 47 31.0377 N	089 55 22.1938 W	4.30	468	monopolar	Nothing Found
4	607	3727760.30	472703.90	29 47 32.2808 N	089 55 27.4180 W	5.00	1693	monopolar	Nothing Found
4	608	3731364.40	471816.40	29 47 23.2887 N	089 54 46.6374 W	28.60	1814	monopolar	Pipeline
4	609	3736955.90	471969.90	29 47 23.9138 N	089 53 43.1637 W	7.99	1981	monopolar	Nothing Found
4	610	3735433.00	467745.60	29 46 42.2675 N	089 54 1.0461 W	6.00	980	monopolar	Unknown Anomaly
4	611	3735442.20	467694.00	29 46 41.7280 N	089 54 0.9494 W	3.21	981	monopolar	Unknown Anomaly
4	612	3736067.70	472536.70	29 47 29.6645 N	089 53 53.1624 W	11.00	176	monopolar	Crab Trap
4	613	3735722.20	471121.00	29 47 15.7421 N	089 53 57.2837 W	15.90	97	monopolar	Nothing Found
4	614	3735881.00	473892.80	29 47 43.0510 N	089 53 55.0893 W	4.90	443	monopolar	Nothing Found
4	615	3734471.50	468066.90	29 46 45.5372 N	089 54 11.9113 W	3.00	384	monopolar	Unknown Anomaly
4	616	3735084.90	472750.10	29 47 31.8382 N	089 54 4.2864 W	4.90	708	monopolar	Nothing Found
4	617	3734995.20	474466.30	29 47 48.8980 N	089 54 5.0602 W	11.00	2164	monopolar	Nothing Found
4	618	3734934.30	474245.50	29 47 46.7298 N	089 54 5.7825 W	12.00	82	monopolar	Nothing Found
4	619	3734482.60	474502.80	29 47 49.4019 N	089 54 10.8715 W	19.00	306	monopolar	Crab Trap
4	620	3733378.90	474154.20	29 47 46.2556 N	089 54 23.4446 W	36.00	7079	monopolar	Pipeline
4	621	3732735.60	473672.10	29 47 41.4835 N	089 54 30.8146 W	28.00	1892	monopolar	Pipeline
4	622	3732646.40	473304.30	29 47 37.8636 N	089 54 31.8787 W	29.00	1996	monopolar	Pipeline
4	623	3732025.40	472883.20	29 47 33.5587 N	089 54 38.9888 W	7.50	450	monopolar	Pipeline
4	624	3731930.60	472484.90	29 47 29.8504 N	089 54 40.1176 W	30.00	4105	monopolar	Pipeline
4	625	3731303.40	471993.70	29 47 24.9364 N	089 54 47.3064 W	17.00	1045	monopolar	Pipeline
4	626	3731264.60	471819.30	29 47 23.1149 N	089 54 47.7727 W	6.90	964	monopolar	Nothing Found
4	627	3731223.10	471650.10	29 47 21.7035 N	089 54 48.2637 W	33.00	1412	Dipolar	Pipeline
4	628	3730582.60	471196.10	29 47 17.1493 N	089 54 55.5981 W	19.00	1012	monopolar	Pipeline
4	629	3730534.00	470889.10	29 47 14.2054 N	089 54 56.1915 W	28.00	10080	Dipolar	Pipeline
4	630	3730874.40	474546.10	29 47 50.1241 N	089 54 51.8181 W	3.80	40	monopolar	Nothing Found
4	631	3730815.90	474264.30	29 47 47.3299 N	089 54 52.5218 W	2.60	20	monopolar	Nothing Found
4	632	3729343.70	472413.40	29 47 29.3111 N	089 55 9.4876 W	15.00	32	monopolar	Nothing Found
4	633	3729356.70	474613.50	29 47 51.0000 N	089 55 9.0330 W	7.00	542	monopolar	Nothing Found
4	634	3730155.50	470371.80	29 47 8.9727 N	089 55 0.5616 W	12.00	1356	Dipolar	Pipeline
3	635	3742192.40	471920.60	29 47 22.7172 N	089 52 43.7454 W	2.50	76	Dipolar	Crab Trap
3	636	3742191.60	473126.70	29 47 34.6750 N	089 52 43.5805 W	4.40	197	monopolar	Crab Trap
3	637	3742188.80	475099.60	29 47 54.2056 N	089 52 43.3280 W	4.50	120	monopolar	Nothing Found
3	638	3742192.80	475688.10	29 48 0.0503 N	089 52 43.1975 W	6.50	701	monopolar	Nothing Found
3	639	3741192.60	474476.90	29 47 48.2063 N	089 52 54.7232 W	8.50	1532	monopolar	Nothing Found
3	640	3741186.10	475416.00	29 47 57.4734 N	089 52 54.6624 W	5.50	318	monopolar	Nothing Found
3	641	3741193.10	475578.70	29 47 59.0731 N	089 52 54.5597 W	4.50	203	monopolar	Crab Trap
3	642	3742966.10	468756.30	29 46 51.3358 N	089 52 35.4211 W	6.40	143	monopolar	Nothing Found
3	643	3741002.60	468751.40	29 46 51.5151 N	089 52 57.7028 W	4.50	60	monopolar	Nothing Found
3	644	3740987.10	469254.10	29 46 56.4941 N	089 52 57.8064 W	4.60	552	monopolar	Nothing Found
3	645	3743146.90	469236.10	29 46 56.0338 N	089 52 33.3007 W	3.50	410	monopolar	Nothing Found
3	646	3743172.90	469229.10	29 46 55.9612 N	089 52 33.0000 W	3.50	1628	monopolar	Nothing Found
3	647	3742874.60	469752.10	29 47 1.1837 N	089 52 36.3161 W	4.30	110	monopolar	Nothing Found
3	648	3742119.70	470250.90	29 47 6.2181 N	089 52 44.8106 W	4.50	130	monopolar	Nothing Found
3	649	3740886.70	470249.20	29 47 6.3659 N	089 52 58.8027 W	5.50	43	monopolar	Nothing Found
3	650	3740883.60	470753.40	29 47 11.3424 N	089 52 58.7657 W	4.00	64	monopolar	Nothing Found
3	651	3742491.40	471253.40	29 47 16.0752 N	089 52 40.4484 W	2.50	599	monopolar	Nothing Found
3	652	3742104.30	471255.20	29 47 16.1565 N	089 52 44.8408 W	4.00	121	monopolar	Nothing Found
3	653	3741247.30	471254.80	29 47 16.2551 N	089 52 54.5664 W	3.50	60	monopolar	Nothing Found
3	654	3740949.10	471255.30	29 47 16.3024 N	089 52 57.9503 W	4.00	67	monopolar	Nothing Found
3	655	3740968.90	472253.60	29 47 26.2116 N	089 52 57.5817 W	7.00	1092	Dipolar	Crab Trap
3	656	3741764.10	472744.70	29 47 30.9583 N	089 52 48.4869 W	5.50	44	monopolar	Nothing Found
3	657	3740850.10	473245.90	29 47 36.0441 N	089 52 58.7874 W	6.50	185	monopolar	Unknown Metal Object
3	658	3741507.00	473249.70	29 47 36.0000 N	089 52 51.3319 W	5.80	24	monopolar	Nothing Found
3	659	3742807.20	473749.70	29 47 40.7853 N	089 52 36.504 W	6.50	94	monopolar	Crab Trap
3	660	3741153.30	473751.00	29 47 41.0653 N	089 52 55.2730 W	12.50	41	monopolar	Nothing Found
3	661	3742265.80	474251.10	29 47 45.8414 N	089 52 42.5757 W	9.00	90	monopolar	Crab Trap
3	662	3743221.90	474743.90	29 47 50.5646 N	089 52 31.6541 W	5.50	237	monopolar	Nothing Found
3	663	3742168.60	474751.00	29 47 50.7674 N	089 52 43.6073 W	5.50	130	monopolar	Nothing Found
3	664	3740942.90	474749.00	29 47 50.9251 N	089 52 57.5181 W	7.90	131	Dipolar	Nothing Found
3	665	3742239.00	475745.30	29 48 0.6157 N	089 52 42.6648 W	7.00	188	monopolar	Nothing Found
3	666	3742137.70	476254.80	29 48 5.6857 N	089 52 43.7409 W	8.40	185	monopolar	Nothing Found

Cell #	Name	X: Easting (NAD83)	Y: Northing (NAD83)	Lat: (NAD83)	Lon: (NAD83)	Duration (Sec.)	Gamma	Type	Desc.
3	667	3741379.50	476751.30	29 48 10.6550 N	089 52 52.2755 W	4.30	40	monopolar	Nothing Found
3	668	3740969.50	476742.60	29 48 10.6322 N	089 52 56.9301 W	5.50	131	monopolar	Nothing Found
2	669	3736344.80	477837.30	29 48 22.1095 N	089 53 49.2635 W	12.00	855	monopolar	Pipeline
2	670	3736446.20	477687.90	29 48 20.7467 N	089 53 48.1320 W	25.00	5497	monopolar	Pipeline
2	671	3735470.80	476805.90	29 48 12.0171 N	089 53 59.3300 W	12.90	1908	monopolar	Pipeline
2	672	3735574.10	476678.90	29 48 10.6987 N	089 53 58.1763 W	8.00	6460	monopolar	Pipeline
1	673	3732834.50	477959.30	29 48 23.6669 N	089 54 29.0905 W	3.50	30	monopolar	Nothing Found
1	674	3733811.90	476487.70	29 48 9.1130 N	089 54 18.2029 W	17.00	131	monopolar	Nothing Found
1	675	3730677.60	479238.40	29 48 36.7666 N	089 54 53.3899 W	21.00	1286	monopolar	Pipeline
1	676	3730301.70	479591.70	29 48 40.2010 N	089 54 57.6086 W	10.00	2130	monopolar	Pipeline
1	677	3729900.80	479931.00	29 48 43.6562 N	089 55 2.1109 W	14.80	1184	monopolar	Pipeline
1	678	3729524.10	480289.00	29 48 47.2679 N	089 55 6.3364 W	17.00	784	monopolar	Pipeline
1	679	3729123.90	480630.70	29 48 50.6596 N	089 55 10.8318 W	13.00	1551	monopolar	Pipeline
1	680	3728737.30	480982.80	29 48 54.2119 N	089 55 15.1706 W	15.00	101	monopolar	Pipeline
1	681	3729824.50	480008.00	29 48 44.6079 N	089 55 2.9637 W	33.00	6922	monopolar	Pipeline
1	682	3730286.80	479300.20	29 48 37.3272 N	089 54 57.8185 W	11.00	272	monopolar	Pipeline
1	683	3732108.80	476602.00	29 48 10.3354 N	089 54 37.5185 W	5.00	218	monopolar	Nothing Found
1	684	3732888.00	477266.10	29 48 16.8925 N	089 54 28.5798 W	13.00	1104	monopolar	Pipeline
1	685	3732976.00	477197.70	29 48 16.2236 N	089 54 27.5903 W	14.92	3091	Dipolar	Pipeline
2	686	3733902.40	477698.80	29 48 20.9616 N	089 54 17.0000 W	4.00	266	monopolar	Nothing Found
1	687	3732274.30	477288.90	29 48 17.1343 N	089 54 35.5430 W	7.00	554	monopolar	Nothing Found
1	688	3732615.50	477499.90	29 48 19.3196 N	089 54 31.6386 W	21.00	1420	monopolar	Pipeline
2	689	3733604.30	478107.30	29 48 25.0618 N	089 54 20.3317 W	6.00	350	monopolar	Nothing Found
1	690	3732244.10	477858.10	29 48 22.8417 N	089 54 35.8045 W	14.00	1239	monopolar	Pipeline
1	691	3732523.70	478168.10	29 48 25.7859 N	089 54 32.5885 W	4.90	144	monopolar	Nothing Found
1	692	3731892.60	478135.30	29 48 25.6091 N	089 54 39.7554 W	12.00	703	monopolar	Pipeline
1	693	3732032.10	478239.00	29 48 26.5491 N	089 54 38.1584 W	5.00	351	monopolar	Nothing Found
2	694	3734856.30	480010.90	29 48 43.7406 N	089 54 5.8511 W	5.00	217	monopolar	Nothing Found
1	695	3731492.80	478523.30	29 48 29.4890 N	089 54 44.2388 W	11.00	498	monopolar	Pipeline
1	696	3731631.50	478635.90	29 48 30.5173 N	089 54 42.6496 W	4.00	175	monopolar	Nothing Found
1	697	3731684.40	478671.10	29 48 30.8770 N	089 54 42.0440 W	5.80	250	monopolar	Nothing Found
2	698	3733141.00	479551.50	29 48 39.4345 N	089 54 25.3860 W	8.00	285	monopolar	Nothing Found
2	699	3733749.20	479959.90	29 48 43.4022 N	089 54 18.4246 W	8.00	181	monopolar	Nothing Found
1	700	3730145.70	478328.80	29 48 27.6912 N	089 54 59.5570 W	7.20	723	monopolar	Nothing Found
1	701	3731046.40	478899.10	29 48 33.2736 N	089 54 49.2527 W	12.00	2247	monopolar	Pipeline
1	702	3733271.50	476750.60	29 48 11.7603 N	089 54 24.2996 W	14.80	2533	monopolar	Possible Well Casing
1	703	3733427.40	476833.50	29 48 12.5933 N	089 54 22.5179 W	18.00	852	monopolar	Pipeline
2	704	3737639.50	479427.80	29 48 37.6421 N	089 53 34.3420 W	6.90	502	monopolar	Pipeline
2	705	3736704.70	478250.10	29 48 26.1312 N	089 53 45.1200 W	10.00	988	monopolar	Pipeline
2	706	3735500.10	476925.20	29 48 13.1014 N	089 53 58.9818 W	3.50	52	monopolar	Pipeline
3	707	3740580.82	474855.69	29 47 51.9484 N	089 53 1.6133 W	4.90	413	monopolar	Nothing Found
4	708	3737640.87	474944.11	29 47 53.1906 N	089 53 34.9672 W	7.30	169	monopolar	Nothing Found
4	709	3737927.10	476267.60	29 48 6.2559 N	089 53 31.5297 W	5.60	282	monopolar	Crab Trap
3	710	3743110.37	473689.60	29 47 40.0879 N	089 52 33.0729 W	5.90	489	monopolar	Crab Trap
3	711	3742283.98	473781.00	29 47 41.0966 N	089 52 42.4384 W	5.90	96	monopolar	Crab Trap
4	712	3734491.03	474350.24	29 47 47.7026 N	089 54 10.8001 W	5.99	100	monopolar	Crab Trap

SURVEY NOTES:
1. *NOTHING FOUND – DID NOT PICK UP WITH GRADIOMETER.*
2. *UNKNOWN ANOMALY – PICKED UP WITH GRADIOMETER, BUT UNABLE TO HIT WITH PROBE.*
3. *POINT 702 RETURNED A BIG MAG HIT, BUT WAS UNABLE TO HIT WITH PROBE.*

I CERTIFY THAT THIS PLAT REPRESENTS THE RESULTS OF A SURVEY PERFORMED UNDER MY SUPERVISION.

STATE OF LOUISIANA
JOHN C. MATTINGLY
REG. No. 4710
REGISTERED PROFESSIONAL LAND SURVEYOR

JOHN C. MATTINGLY, PLS
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NRCS

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SOLUTIONS START HERE
107 Global Circle, Lafayette, LA 70503
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REV. NO.	REV. DATE:	REV. BY:
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REVISION DESCRIPTION:
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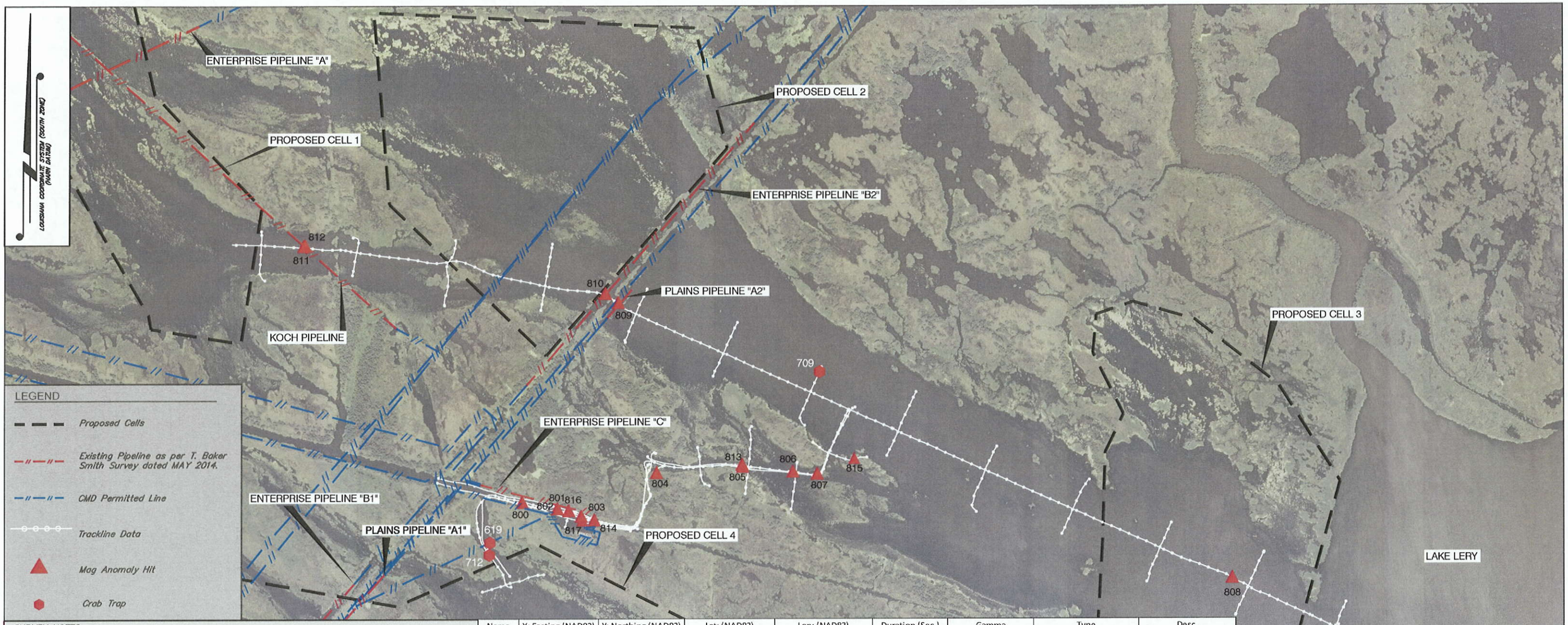
DRAWN BY:	FKH	APPROVED BY:	WMB
DATE:	6/17/14	JOB NO:	2014.0457

DRAWING NAME: 140457_MAG-CHARTS_SH6-7.DWG
PROJECTION: LA 83-SF-MOD
GEO. DATUM: NAD83 | VERT. DATUM: NAVD88, Gd 12A
GRID UNITS: US SURVEY FEET
SHEET NO: 7 OF 14

MAG ANOMOLY INVESTIGATION TABLES

Natural Resources Conservation Service
MAGNETOMETER SURVEYS
FOR
TERRACING AND MARSH CREATION
SOUTH OF BIG MAR (BS-24)
PLAQUEMINES PARISH, LOUISIANA



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8. *BACKGROUND IMAGERY REPRODUCED FROM 2013 DOQQ AERIAL PHOTOGRAPHY.*

DISCLAIMER:

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Name	X: Easting (NAD83)	Y: Northing (NAD83)	Lat: (NAD83)	Lon: (NAD83)	Duration (Sec.)	Gamma	Type	Desc.
800	3734819.38	474891.62	29 47 53.1992 N	089 54 7.0000 W	18	94	Monopolar	Nothing Found
801	3735186.78	474827.28	29 47 52.4971 N	089 54 2.8339 W	16	61	Monopolar	Nothing Found
802	3735305.89	474803.99	29 47 52.2518 N	089 54 1.4854 W	16	154	Monopolar	Pipeline
803	3735508.34	474745.05	29 47 52.1184 N	089 53 59.1893 W	64	833	Dipolar	Nothing Found
804	3736221.25	475199.27	29 47 55.9620 N	089 53 51.0417 W	7	294	Dipolar	Nothing Found
805	3737120.42	475263.12	29 47 56.5517 N	089 53 40.8265 W	14	18	Monopolar	Unknown Metal Object
806	3737644.31	475211.73	29 47 55.9680 N	089 53 34.8881 W	13	10	Monopolar	Nothing Found
807	3737899.71	475188.37	29 47 55.8534 N	089 53 32.0000 W	28	20	Dipolar	Nothing Found
808	3742230.06	474101.07	29 47 44.4301 N	089 52 43.0000 W	16	360	Monopolar	Nothing Found
809	3735821.04	476973.02	29 48 13.7478 N	089 53 55.3293 W	25	6106	Monopolar	Pipeline
810	3735687.36	477065.88	29 48 14.6737 N	089 53 56.8335 W	24	863	Dipolar	Pipeline
811	3732538.70	477561.64	29 48 20.0986 N	089 54 32.4993 W	37	209	Monopolar	Pipeline
812	3732553.45	477566.44	29 48 20.2927 N	089 54 32.3291 W	52	349	Dipolar	Pipeline
813	3737113.25	475284.82	29 47 56.7872 N	089 53 40.9045 W	16	507	Monopolar	Unknown Metal Object
814	3735571.18	474707.83	29 47 51.2968 N	089 53 58.4878 W	19	502	Monopolar	Pipeline
815	3735435.95	474746.92	29 47 51.7499 N	089 54 0.0163 W	24	545	Monopolar	Nothing Found
816	3738286.57	475348.30	29 47 57.1706 N	089 53 27.5803 W	6	60	Monopolar	Unknown Metal Object
817	3735444.60	474706.34	29 47 51.3571 N	089 53 59.9237 W	25	6939	Monopolar	Well 214

I CERTIFY THAT THIS PLAT REPRESENTS THE RESULTS OF A SURVEY PERFORMED UNDER MY SUPERVISION.

STATE OF LOUISIANA
JOHN C. MATTINGLY
REG. No. 4710
REGISTERED PROFESSIONAL LAND SURVEYOR

JOHN C. MATTINGLY, P.L.S.
PROFESSIONAL LAND SURVEYOR NO. 4710

NOTES:

NRCS

TBS **T. BAKER SMITH**
SOLUTIONS START HERE
107 Global Circle, Lafayette, LA 70503
(337)735-2800 - tbsmith.com

SCALE: 1" = 1000'
1000' 500' 0' 1000'

REV. NO:	REV. DATE:	REV. BY:
00	--/--/--	---

REVISION DESCRIPTION:
--

DRAWN BY:	FKH	APPROVED BY:	WMB
DATE:	6/2/14	JOB NO:	2014.0457

DRAWING NAME: MAG-HIT_TRACKLINE_SH8.DWG
PROJECTION: LA 83-SF-MOD
GEO. DATUM: NAD83 | VERT. DATUM: NAVD88, Gd 12A
GRID UNITS: US SURVEY FEET
SHEET NO: 8 OF 14

MAG ANOMALY ACCESS ROUTE MAP

Natural Resources Conservation Service
MAGNETOMETER SURVEYS
FOR
TERRACING AND MARSH CREATION
SOUTH OF BIG MAR (BS-24)
PLAQUEMINES PARISH, LOUISIANA

LOUISIANA COORDINATE SYSTEM
SOUTH ZONE
NAD83 (2011)
(EPOCH 2010.00)

PROPOSED CELL 1

PROPOSED CELL 2

DELACROIX CORPORATION 002-D

DELACROIX CORP 001

DELACROIX 001

DELACROIX CORP L 001

DELACROIX CORPORATION 001

DELACROIX CORP 004

DELACROIX CORPORATION 001

ENTERPRISE PIPELINE "A"
SEE PROFILE B
PAGE 13

KOCH PIPELINE
SEE PROFILE A
PAGE 13

ENTERPRISE PIPELINE "B2"
SEE PROFILE D
PAGE 14

PLAINS PIPELINE "A2"
SEE PROFILE G
PAGE 14

ENTERPRISE PIPELINE "C"
SEE PROFILE E
PAGE 14

MATCHLINE

MATCHLINE

UNKNOWN

UNKNOWN

WELL

709

LEGEND

- Proposed Cells
- Existing Pipeline as per T. Baker Smith Survey dated MAY 2014.
- CMD Permitted Line
- Crab Trap
- 200 Probe Location
- Unknown Metal Object
- 001 Well Location Per CMD
- Proposed Access Route

SURVEY NOTES:

1. MAGNETOMETER SURVEY PERFORMED MAY 6th TO MAY 27TH, 2014 BY T. BAKER SMITH, LLC.
2. SURVEY PERFORMED MAY 6th THROUGH MAY 9th, 2014 AND MAY 12th THROUGH MAY 15th, 2014 USING AUTOMATED HYDROGRAPHIC SURVEY SYSTEM CONSISTING OF PROTON MAGNETOMETER, RTK GPS & COMPUTER BASED DATA COLLECTION / NAVIGATION SYSTEM.
3. PIPELINE INVESTIGATION PERFORMED ON MAY 20th TO MAY 27th, 2014 BY T. BAKER SMITH, LLC. USING MAGNETIC GRADIOMETER & WATER JET PROBING SYSTEM.
4. ALL GRID COORDINATES ARE EXPRESSED IN LOUISIANA STATE PLANE, SOUTH ZONE, NAD 83, IN U.S. SURVEY FEET, GEOGRAPHIC COORDINATES ARE NAD83.
5. THE VERTICAL DATUM FOR ALL ELEVATIONS IS NAVD 88 (GEOID 2012A).
6. ALL SOUNDINGS ARE ADJUSTED TO 0.0' N.A.V.D. 88.
7. PRIMARY HORIZONTAL AND VERTICAL CONTROL FOR THIS SURVEY IS BENCHMARK "BS16–SM–02".
8. BACKGROUND IMAGERY REPRODUCED FROM 2013 DOQQ AERIAL PHOTOGRAPHY.

DISCLAIMER:

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REG. No. 4710
REGISTERED PROFESSIONAL LAND SURVEYOR

JOHN C. MATTINGLY, PLS
PROFESSIONAL LAND SURVEYOR NO. 4710

NRCS

T. BAKER SMITH
SOLUTIONS START HERE
107 Global Circle, Lafayette, LA 70503
(337)735-2800 - tbsmith.com

SCALE: 1" = 1000'
1000' 500' 0' 1000'

REV. NO:	REV. DATE:	REV. BY:
00	--/--/--	---

REVISION DESCRIPTION:
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DRAWN BY:	FKH	APPROVED BY:	WMB
DATE:	6/2/14	JOB NO:	2014.0457

DRAWING NAME: 140457_PIPE-CHARTS_SH9-12.DWG
PROJECTION: LA 83-SF-MOD
GEO. DATUM: NAD83 | VERT. DATUM: NAVD88, Gd 12A
GRID UNITS: US SURVEY FEET
SHEET NO: 9 OF 14

PIPELINE INVESTIGATION MAP

Natural Resources Conservation Service

MAGNETOMETER SURVEYS
FOR
TERRACING AND MARSH CREATION
SOUTH OF BIG MAR (BS-24)
PLAQUEMINES PARISH, LOUISIANA

LOUISIANA COORDINATE SYSTEM (SOUTH ZONE)
(NAD83 DATUM)

SURVEY NOTES:

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4. ALL GRID COORDINATES ARE EXPRESSED IN LOUISIANA STATE PLANE, SOUTH ZONE, NAD 83, IN U.S. SURVEY FEET, GEOGRAPHIC COORDINATES ARE NAD83.
5. THE VERTICAL DATUM FOR ALL ELEVATIONS IS NAVD 88 (GEOID 2012A).
6. ALL SOUNDINGS ARE ADJUSTED TO 0.0' N.A.V.D. 88.
7. PRIMARY HORIZONTAL AND VERTICAL CONTROL FOR THIS SURVEY IS BENCHMARK "BS16-SM-02".
8. BACKGROUND IMAGERY REPRODUCED FROM 2013 DOQQ AERIAL PHOTOGRAPHY.

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LEGEND

- Proposed Cells
- CMD Permitted Line
- Crab Trap
- 200 Probe Location
- Control Point NRCS MONUMENT BS16-SM-02
- Unknown Metal Object
- Proposed Access Route

I CERTIFY THAT THIS PLAT REPRESENTS THE RESULTS OF A SURVEY PERFORMED UNDER MY SUPERVISION.

STATE OF LOUISIANA
JOHN C. MATTINGLY
REG. No. 4710
REGISTERED PROFESSIONAL LAND SURVEYOR

JOHN C. MATTINGLY, P.L.S.
PROFESSIONAL LAND SURVEYOR NO. 4710

001
SL 4502

BS16-SM-02	EL=1.761'
X = 3,746,965.627'	NAD 83
Y = 466,857.617'	
LAT = 29° 46' 31.97"	NAD 83
LONG = 89° 51' 50.31"	
GEOID 12A	

LAKE LERY

PROPOSED CELL 3

710
659
661
711
636
635
641
655

UNKNOWN

MATCHLINE

NRCS

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(337)735-2800 - tbsmith.com

SCALE: 1" = 1000'
1000' 500' 0' 1000'

REV. NO:	00	REV. DATE:	--/--/--	REV. BY:	---

REVISION DESCRIPTION:
--

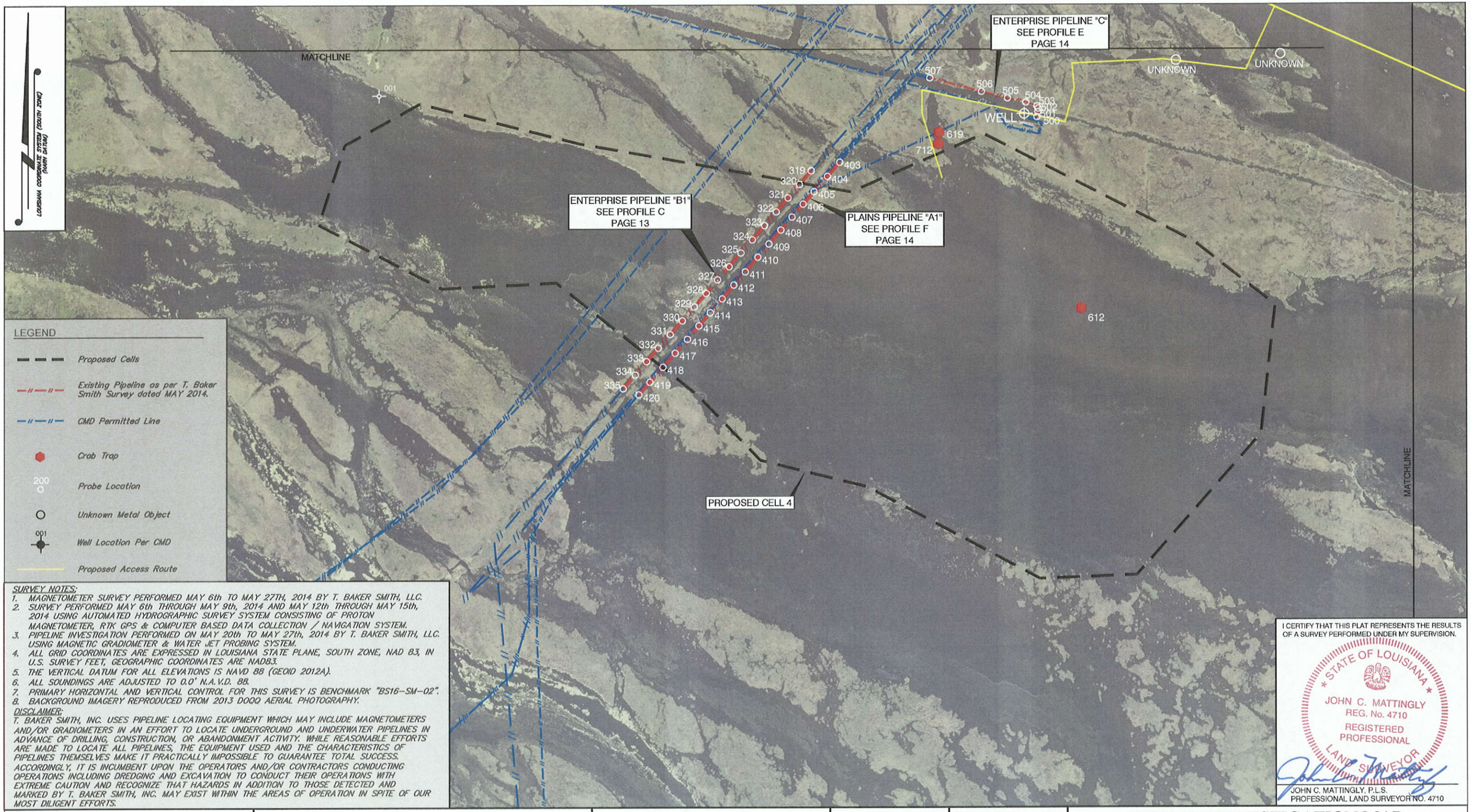
DRAWN BY:	FKH	APPROVED BY:	WMB
DATE:	6/2/14	JOB NO:	2014.0457

DRAWING NAME: 140457_PIPE-CHARTS_SH9-12.DWG
PROJECTION: LA 83-SF-MOD
GEO. DATUM: NAD83 | VERT. DATUM: NAVD88, Gd 12A
GRID UNITS: US SURVEY FEET
SHEET NO: 10 OF 14

PIPELINE INVESTIGATION MAP

Natural Resources Conservation Service

MAGNETOMETER SURVEYS
FOR
TERRACING AND MARSH CREATION
SOUTH OF BIG MAR (BS-24)
PLAQUEMINES PARISH, LOUISIANA



SURVEY NOTES:

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SCALE: 1" = 1000'
1000' 500' 0' 1000'

REV. NO:	REV. DATE:	REV. BY:
00	--/--/--	---

REVISION DESCRIPTION:
--

DRAWN BY:	FKH	APPROVED BY:	WMB
DATE:	6/2/14	JOB NO:	2014.0457

DRAWING NAME: 140457_PIPE-CHARTS_SH9-12.DWG
PROJECTION: LA 83-SF-MOD
GEO. DATUM: NAD83 | VERT. DATUM: NAVD88, Gd 12A
GRID UNITS: US SURVEY FEET
SHEET NO: 11 OF 14

PIPELINE INVESTIGATION MAP

Natural Resources Conservation Service

MAGNETOMETER SURVEYS
FOR
TERRACING AND MARSH CREATION
SOUTH OF BIG MAR (BS-24)
PLAQUEMINES PARISH, LOUISIANA

TIE	AS BUILT KOCH PIPELINE (SEE PROFILE "A")						
	X	Y	LATITUDE	LONGITUDE	T.O.P. ELEV	MUD COVER	CELL #
100	3,728,737.87'	480,985.57'	29° 52' 34.097"N	85° 52' 35.970"W	-3.646'	2.9'	1
101	3,728,885.78'	480,851.63'	29° 52' 32.703"N	85° 52' 34.365"W	-2.507'	1.6'	1
102	3,729,048.59'	480,706.94'	29° 52' 31.195"N	85° 52' 32.596"W	-4.035'	3.4'	1
103	3,729,188.05'	480,580.12'	29° 52' 29.875"N	85° 52' 31.082"W	-3.355'	2.8'	1
104	3,729,340.85'	480,442.51'	29° 52' 28.442"N	85° 52' 29.423"W	-5.069'	4.5'	1
105	3,729,483.37'	480,317.50'	29° 52' 27.139"N	85° 52' 27.873"W	-3.608'	3.1'	1
106	3,729,637.66'	480,180.04'	29° 52' 25.707"N	85° 52' 26.197"W	-4.486'	3.8'	1
107	3,729,785.04'	480,047.64'	29° 52' 24.328"N	85° 52' 24.597"W	-3.835'	3.0'	1
108	3,729,934.88'	479,913.20'	29° 52' 22.928"N	85° 52' 22.969"W	-3.738'	2.9'	1
109	3,730,080.44'	479,781.49'	29° 52' 21.557"N	85° 52' 21.389"W	-3.567'	2.8'	1
110	3,730,232.94'	479,646.74'	29° 52' 20.153"N	85° 52' 19.732"W	-4.100'	3.4'	1
111	3,730,387.13'	479,510.19'	29° 52' 18.730"N	85° 52' 18.056"W	-3.713'	2.9'	1
112	3,730,533.93'	479,375.90'	29° 52' 17.333"N	85° 52' 16.464"W	-4.274'	3.8'	1
113	3,730,676.03'	479,248.50'	29° 52' 16.006"N	85° 52' 14.920"W	-3.712'	3.2'	1
114	3,730,823.67'	479,120.13'	29° 52' 14.667"N	85° 52' 13.315"W	-3.573'	3.1'	1
115	3,730,978.01'	478,978.51'	29° 52' 13.193"N	85° 52' 11.640"W	-4.100'	3.4'	1
116	3,731,123.05'	478,851.17'	29° 52' 11.866"N	85° 52' 10.064"W	-4.225'	4.7'	1
117	3,731,296.04'	478,694.61'	29° 52' 10.236"N	85° 52' 08.186"W	-4.291'	5.0'	1
118	3,731,551.17'	478,466.09'	29° 52' 07.856"N	85° 52' 05.415"W	-4.208'	5.0'	1
119	3,731,761.97'	478,280.67'	29° 52' 05.923"N	85° 52' 03.124"W	-4.811'	5.7'	1
120	3,731,882.58'	478,172.12'	29° 52' 04.792"N	85° 52' 01.814"W	-3.094'	4.2'	1
121	3,732,235.50'	477,854.92'	29° 52' 01.489"N	85° 51' 57.982"W	-4.524'	5.0'	1
122	3,732,376.44'	477,727.66'	29° 52' 00.164"N	85° 51' 56.452"W	-4.644'	3.5'	1
123	3,732,540.63'	477,580.19'	29° 51' 58.628"N	85° 51' 54.670"W	-4.756'	3.4'	1
124	3,732,669.71'	477,464.10'	29° 51' 57.419"N	85° 51' 53.268"W	-4.670'	3.3'	1
125	3,732,785.81'	477,360.45'	29° 51' 56.340"N	85° 51' 52.007"W	-5.800'	4.2'	1
126	3,732,972.96'	477,191.83'	29° 51' 54.584"N	85° 51' 49.975"W	-2.838'	2.8'	1
127	3,733,231.51'	476,960.03'	29° 51' 52.170"N	85° 51' 47.168"W	-3.861'	3.9'	1
128	3,733,315.18'	476,885.68'	29° 51' 51.395"N	85° 51' 46.259"W	-3.281'	3.8'	1
129	3,733,407.68'	476,805.01'	29° 51' 50.553"N	85° 51' 45.253"W	-4.475'	3.9'	1
130	3,733,500.08'	476,721.42'	29° 51' 49.683"N	85° 51' 44.250"W	-4.233'	3.9'	1
TOTAL LENGTH: 6,392.43 FT., 1.21 MI.							

TIE	AS BUILT ENTERPRISE PIPELINE "A" (SEE PROFILE B")						
	X	Y	LATITUDE	LONGITUDE	T.O.P. ELEV	MUD COVER	CELL #
200	3,728,969.12'	478,676.32'	29° 52' 11.152"N	85° 52' 34.595"W	-5.401'	6.0'	1
201	3,729,242.14'	478,807.60'	29° 52' 12.322"N	85° 52' 31.427"W	-5.528'	6.0'	1
202	3,729,457.45'	478,912.26'	29° 52' 13.255"N	85° 52' 28.927"W	-5.684'	6.0'	1
203	3,729,647.50'	479,004.40'	29° 52' 14.077"N	85° 52' 26.721"W	-6.095'	6.5'	1
204	3,729,815.89'	479,085.75'	29° 52' 14.802"N	85° 52' 24.767"W	-4.335'	3.7'	1
205	3,729,994.11'	479,170.56'	29° 52' 15.557"N	85° 52' 22.699"W	-4.655'	3.6'	1
206	3,730,177.18'	479,259.15'	29° 52' 16.346"N	85° 52' 20.574"W	-5.780'	4.9'	1
207	3,730,353.79'	479,344.31'	29° 52' 17.105"N	85° 52' 18.524"W	-5.295'	4.4'	1
208	3,730,543.50'	479,438.05'	29° 52' 17.943"N	85° 52' 16.321"W	-8.326'	7.4'	1
209	3,730,710.54'	479,517.09'	29° 52' 18.645"N	85° 52' 14.383"W	-5.354'	4.3'	1
210	3,730,897.10'	479,609.53'	29° 52' 19.471"N	85° 52' 12.217"W	-5.740'	4.1'	1
211	3,731,073.66'	479,695.09'	29° 52' 20.234"N	85° 52' 10.167"W	-5.588'	4.1'	1
212	3,731,254.98'	479,780.79'	29° 52' 20.996"N	85° 52' 08.064"W	-5.440'	4.1'	1
213	3,731,442.27'	479,870.84'	29° 52' 21.798"N	85° 52' 05.890"W	-5.843'	6.7'	1
TOTAL LENGTH: 2,746.55 FT., 0.52 MI.							

TIE	AS BUILT ENTERPRISE PIPELINE "B1" (SEE PROFILE "C")						
	X	Y	LATITUDE	LONGITUDE	T.O.P. ELEV	MUD COVER	CELL #
319	3,733,066.12'	474,060.52'	29° 51' 23.576"N	85° 51' 50.615"W	-7.586'	8.2'	4
320	3,732,934.61'	473,909.18'	29° 51' 22.141"N	85° 51' 52.189"W	-8.701'	6.9'	4
321	3,732,806.14'	473,759.97'	29° 51' 20.726"N	85° 51' 53.727"W	-7.633'	4.4'	4
322	3,732,673.73'	473,605.60'	29° 51' 19.262"N	85° 51' 55.313"W	-7.312'	5.4'	4
323	3,732,542.95'	473,453.65'	29° 51' 17.822"N	85° 51' 56.879"W	-7.529'	5.2'	4
324	3,732,404.90'	473,295.78'	29° 51' 16.326"N	85° 51' 58.530"W	-7.623'	5.5'	4
325	3,732,276.54'	473,149.81'	29° 51' 14.943"N	85° 52' 00.065"W	-8.305'	6.1'	4
326	3,732,145.31'	472,998.71'	29° 51' 13.511"N	85° 52' 01.636"W	-7.887'	5.5'	4
327	3,732,014.34'	472,853.14'	29° 51' 12.133"N	85° 52' 03.200"W	-7.913'	5.4'	4
328	3,731,886.59'	472,703.21'	29° 51' 10.711"N	85° 52' 04.730"W	-8.308'	5.7'	4
329	3,731,754.93'	472,552.34'	29° 51' 09.281"N	85° 52' 06.306"W	-9.011'	6.4'	4
330	3,731,622.61'	472,398.70'	29° 51' 07.824"N	85° 52' 07.890"W	-7.804'	5.7'	4
331	3,731,487.58'	472,247.57'	29° 51' 06.393"N	85° 52' 09.503"W	-8.084'	6.0'	4
332	3,731,356.25'	472,096.90'	29° 51' 04.965"N	85° 52' 11.075"W	-7.608'	5.4'	4
333	3,731,227.03'	471,947.82'	29° 51' 03.552"N	85° 52' 12.621"W	-8.629'	6.1'	4
334	3,731,101.31'	471,798.26'	29° 51' 02.133"N	85° 52' 14.128"W	-8.550'	6.0'	4
335	3,730,967.38'	471,646.31'	29° 51' 00.693"N	85° 52' 15.729"W	-8.531'	6.2'	4
TOTAL LENGTH: 3,199.03 FT., 0.61 MI.							

TIE	AS BUILT ENTERPRISE PIPELINE "B2" (SEE PROFILE "D")						
	X	Y	LATITUDE	LONGITUDE	T.O.P. ELEV	MUD COVER	CELL #
300	3,737,241.64'	478,859.82'	29° 52' 09.059"N	85° 51' 00.642"W	-7.431'	7.2'	2
301	3,737,108.93'	478,706.83'	29° 52' 07.609"N	85° 51' 02.231"W	-7.598'	6.3'	2
302	3,736,974.40'	478,553.87'	29° 52' 06.160"N	85° 51' 03.840"W	-6.681'	6.6'	2
303	3,736,845.01'	478,403.30'	29° 52' 04.733"N	85° 51' 05.390"W	-8.186'	7.4'	2
304	3,736,714.73'	478,255.87'	29° 52' 03.336"N	85° 51' 06.948"W	-8.339'	5.7'	2
305	3,736,568.75'	478,086.89'	29° 52' 01.734"N	85° 51' 08.696"W	-8.129'	6.3'	2
306	3,736,457.87'	477,956.27'	29° 52' 00.495"N	85° 51' 10.025"W	-8.483'	6.0'	2
307	3,736,325.60'	477,804.47'	29° 51' 59.057"N	85° 51' 11.608"W	-8.359'	5.0'	2
308	3,736,191.11'	477,649.33'	29° 51' 57.586"N	85° 51' 13.218"W	-7.768'	6.0'	2
309	3,736,053.22'	477,491.80'	29° 51' 56.094"N	85° 51' 14.868"W	-8.128'	6.1'	2
310	3,735,929.11'	477,345.72'	29° 51' 54.708"N	85° 51' 16.355"W	-8.182'	6.5'	2
311	3,735,788.03'	477,187.22'	29° 51' 53.208"N	85° 51' 18.042"W	-7.642'	5.9'	2
312	3,735,671.13'	477,054.41'	29° 51' 51.950"N	85° 51' 19.440"W	-8.756'	6.7'	2
313	3,735,524.98'	476,885.07'	29° 51' 50.344"N	85° 51' 21.190"W	-8.882'	6.7'	2
314	3,735,393.88'	476,736.74'	29° 51' 48.939"N	85° 51' 22.758"W	-9.211'	7.3'	2
315	3,735,269.43'	476,592.71'	29° 51' 47.574"N	85° 51' 24.248"W	-9.083'	7.7'	2
316	3,735,131.07'	476,432.07'	29° 51' 46.051"N	85° 51' 25.904"W	-8.886'	8.3'	2
317	3,734,995.71'	476,276.53'	29° 51' 44.577"N	85° 51' 27.524"W	-10.230'	10.3'	2
318	3,734,864.23'	476,126.51'	29° 51' 43.156"N	85° 51' 29.097"W	-7.904'	8.0'	2
TOTAL LENGTH: 3,622.64 FT., 0.69 MI.							

TIE	AS BUILT ENTERPRISE PIPELINE "C" (SEE PROFILE "E")						
	X	Y	LATITUDE	LONGITUDE	T.O.P. ELEV	MUD COVER	CELL #
500	3,735,576.65'	474,656.10'	29° 51' 28.278"N	85° 51' 21.813"W	-8.194'	7.9'	4
501	3,735,586.76'	474,709.74'	29° 51' 28.804"N	85° 51' 21.669"W	-7.849'	6.4'	4
502	3,735,589.61'	474,750.82'	29° 51' 29.209"N	85° 51' 21.615"W	-6.447'	5.1'	4
503	3,735,576.87'	474,775.15'	29° 51' 29.456"N	85° 51' 21.746"W	+1.500'	0.0'	4
504	3,735,452.58'	474,818.28'	29° 51' 29.941"N	85° 51' 23.133"W	+0.793'	0.5'	4
505	3,735,248.19'	474,865.86'	29° 51' 30.508"N	85° 51' 25.425"W	+0.485'	0.0'	4
506	3,734,959.10'	474,940.66'	29° 51' 31.384"N	85° 51' 28.664"W	-1.477'	1.0'	4
507	3,734,382.51'	475,090.21'	29° 51' 33.136"N	85° 51' 35.124"W	+0.391'	0.0'	4
TOTAL LENGTH: 1,358.93 FT., 0.26 MI.							

TIE	AS BUILT PLAINS PIPELINE "A1" (SEE PROFILE "F")						
	X	Y	LATITUDE	LONGITUDE	T.O.P. ELEV	MUD COVER	CELL #
403	3,733,380.55'	474,155.01'	29° 51' 24.361"N	85° 51' 46.997"W	-6.018'	5.0'	4
404	3,733,244.28'	473,999.05'	29° 51' 22.884"N	85° 51' 48.628"W	-5.875'	7.0'	4
405	3,733,096.11'	473,829.19'	29° 51' 21.274"N	85° 51' 50.400"W	-5.881'	6.9'	4
406	3,732,975.49'	473,690.97'	29° 51' 19.964"N	85° 51' 51.844"W	-5.221'	5.9'	4
407	3,732,851.01'	473,546.89'	29° 51' 18.598"N	85° 51' 53.334"W	-6.332'	4.8'	4
408	3,732,727.09'	473,403.77'	29° 51' 17.241"N	85° 51' 54.817"W	-6.735'	5.5'	4
409	3,732,593.53'	473,249.21'	29° 51' 15.776"N	85° 51' 56.416"W	-6.520'	4.8'	4
410	3,732,467.08'	473,103.20'	29° 51' 14.392"N	85° 51' 57.929"W	-4.028'	4.5'	4
411	3,732,325.69'	472,940.49'	29° 51' 12.850"N	85° 51' 59.621"W	-6.447'	4.6'	4
412	3,732,198.27'	472,794.34'	29° 51' 11.465"N	85° 52' 01.146"W	-6.476'	4.9'	4
413	3,732,066.09'	472,641.66'	29° 51' 10.017"N	85° 52' 02.728"W	-7.639'	6.0'	4
414	3,731,932.37'	472,488.58'	29° 51' 08.567"N	85° 52' 04.327"W	-6.698'	5.2'	4
415	3,731,806.98'	472,343.01'	29° 51' 07.186"N	85° 52' 05.828"W	-6.617'	4.5'	4
416	3,731,678.07'	472,194.13'	29° 51' 05.775"N	85° 52' 07.371"W	-6.335'	4.4'	4
417	3,731,543.48'	472,040.04'	29° 51' 04.315"N	85° 52' 08.982"W	-8.120'	5.9'	4
418	3,731,408.03'	471,883.61'	29° 51' 02.832"N	85° 52' 10.603"W	-7.706'	5.6'	4
419	3,731,263.75'	471,718.66'	29° 51' 01.269"N	85° 52' 12.328"W	-8.042'	8.5'	4
420	3,731,141.41'	471,578.92'	29° 50' 59.945"N	85° 52' 13.792"W	-7.923'	8.5'	4
TOTAL LENGTH: 3,413.21 FT., 0.65 MI.							

TIE	AS BUILT PLAINS PIPELINE "A2" (SEE PROFILE "G")						
	X	Y	LATITUDE	LONGITUDE	T.O.P. ELEV	MUD COVER	CELL #
400	3,735,964.71'	477,124.00'	29° 51' 52.499"N	85° 51' 16.072"W	-8.355'	6.7'	2
401	3,735,831.66'	476,968.37'	29° 51' 51.023"N	85° 51' 17.665"W	-9.647'	6.2'	2
402	3,735,707.55'	476,828.12'	29° 51' 49.695"N	85° 51' 19.150"W			
TOTAL LENGTH: 392.03 FT., 0.07 MI.							

I CERTIFY THAT THIS PLAT REPRESENTS THE RESULTS OF A SURVEY PERFORMED UNDER MY SUPERVISION.

STATE OF LOUISIANA
JOHN C. MATTINGLY
REG. No. 4710
REGISTERED PROFESSIONAL LAND SURVEYOR

JOHN C. MATTINGLY, P.L.S.
PROFESSIONAL LAND SURVEYOR NO. 4710

NRCS

T. BAKER SMITH
SOLUTIONS START HERE
107 Global Circle, Lafayette, LA 70503
(337)735-2800 - tbsmith.com

REV. NO:	REV. DATE:	REV. BY:
00	--/--/--	---

REVISION DESCRIPTION:
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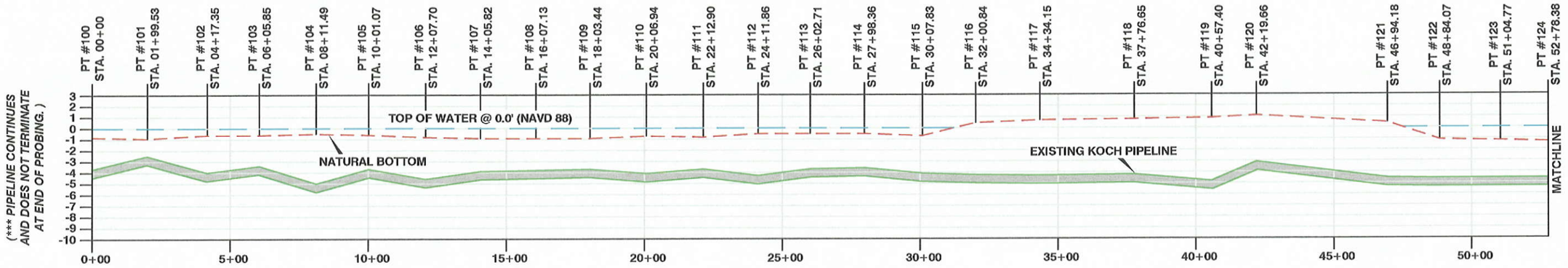
DRAWN BY:	FKH	APPROVED BY:	WMB
DATE:	6/2/14	JOB NO:	2014.0457

DRAWING NAME: 140457_PIPE-CHARTS_SH9-12.DWG
PROJECTION: LA 83-SF-MOD
GEO. DATUM: NAD83 | VERT. DATUM: NAVD88, Gd 12A
GRID UNITS: US SURVEY FEET
SHEET NO: 12 OF 14

PIPELINE INVESTIGATION TABLES

Natural Resources Conservation Service
MAGNETOMETER SURVEYS
FOR
TERRACING AND MARSH CREATION
SOUTH OF BIG MAR (BS-24)
PLAQUEMINES PARISH, LOUISIANA



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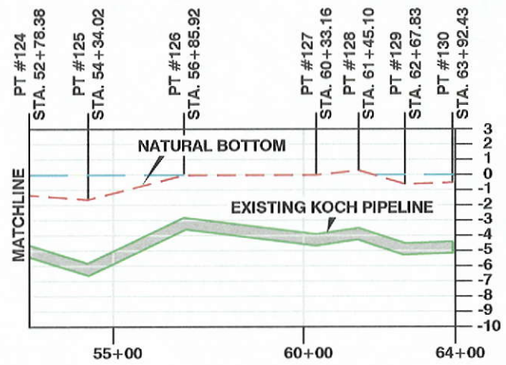

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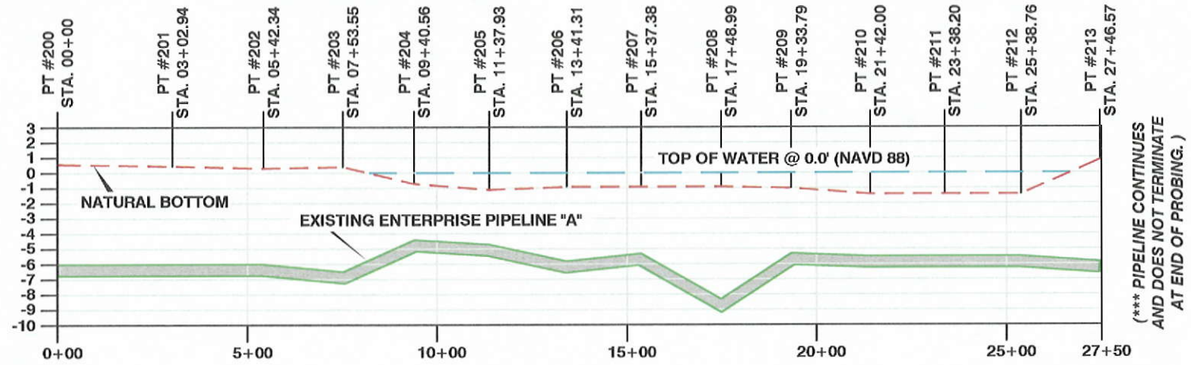

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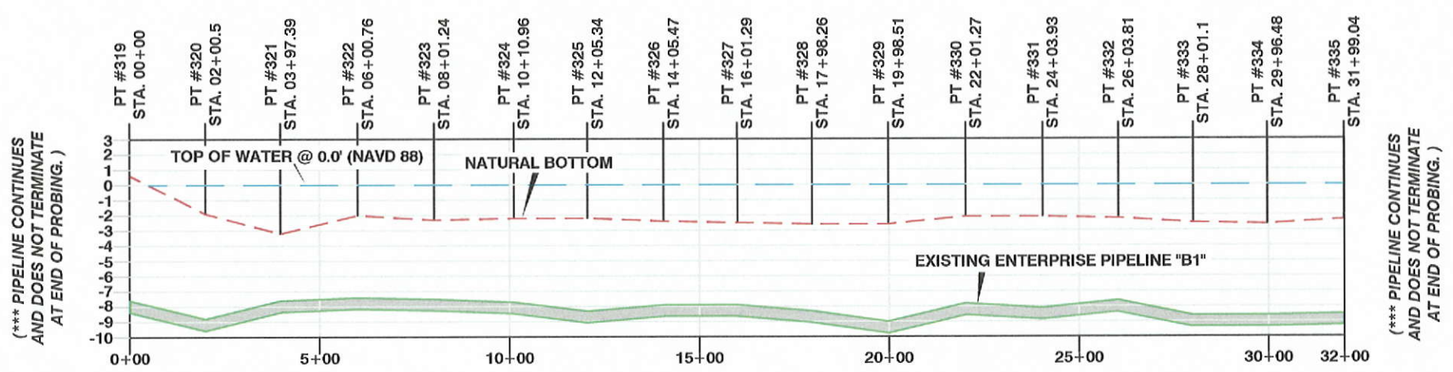

PROFILE "C"

I CERTIFY THAT THIS PLAT REPRESENTS THE RESULTS OF A SURVEY PERFORMED UNDER MY SUPERVISION.

STATE OF LOUISIANA
JOHN C. MATTINGLY
REG. No. 4710
REGISTERED
PROFESSIONAL
LAND SURVEYOR

JOHN C. MATTINGLY, P.L.S.
PROFESSIONAL LAND SURVEYOR NO. 4710

NOTES:

NRCS

TBS T. BAKER SMITH
SOLUTIONS START HERE
107 Global Circle, Lafayette, LA 70503
(337)735-2800 - tbsmith.com

HORIZONTAL SCALE: 1" = 400'
400' 200' 0' 400'
VERTICAL SCALE: 1" = 10'
10' 5' 0' 10'

REV. NO:	REV. DATE:	REV. BY:
00	--/--/--	---

REVISION DESCRIPTION:
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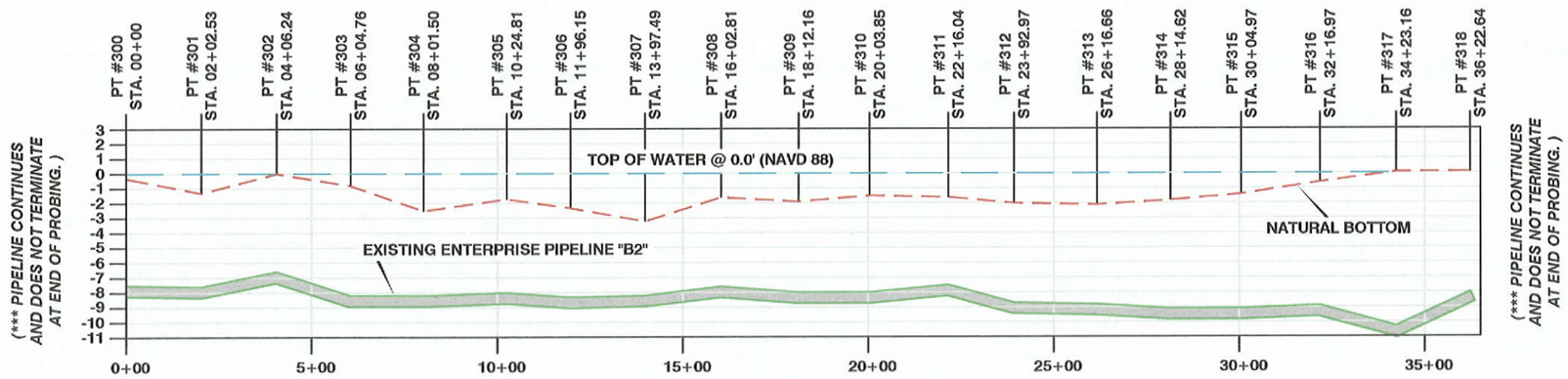
DRAWN BY:	FKH	APPROVED BY:	WMB
DATE:	6/2/14	JOB NO:	2014.0457
DRAWING NAME:	ALL_PROFILES_REV1.5.DWG		
PROJECTION: LA 83-SF-MOD GEO. DATUM: NAD83 | VERT. DATUM: NAVD88, Gd 12A GRID UNITS: US SURVEY FEET			
SHEET NO:	13 OF 14		

PIPELINE PROFILES

Natural Resources Conservation Service
MAGNETOMETER SURVEYS
FOR
TERRACING AND MARSH CREATION
SOUTH OF BIG MAR (BS-24)
PLAQUEMINES PARISH, LOUISIANA



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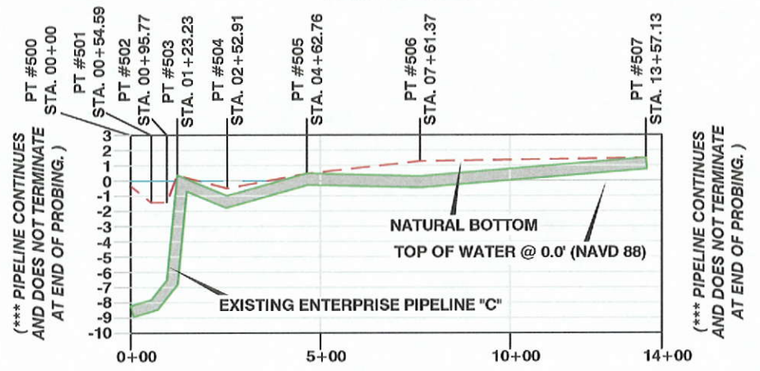
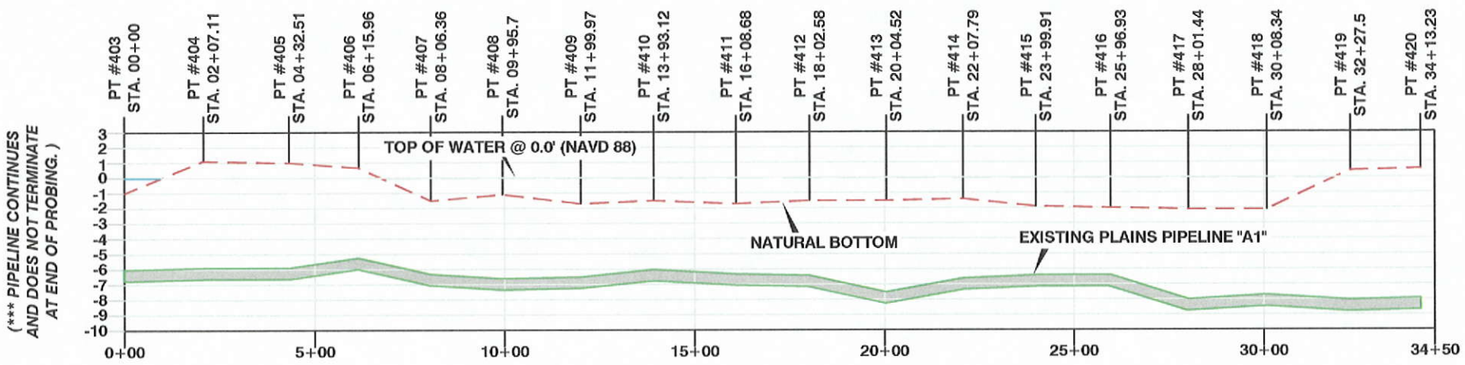


I CERTIFY THAT THIS PLAT REPRESENTS THE RESULTS OF A SURVEY PERFORMED UNDER MY SUPERVISION.

STATE OF LOUISIANA
JOHN C. MATTINGLY
REG. No. 4710
REGISTERED PROFESSIONAL LAND SURVEYOR

JOHN C. MATTINGLY, P.L.S.
PROFESSIONAL LAND SURVEYOR NO. 4710

PROFILE "E"



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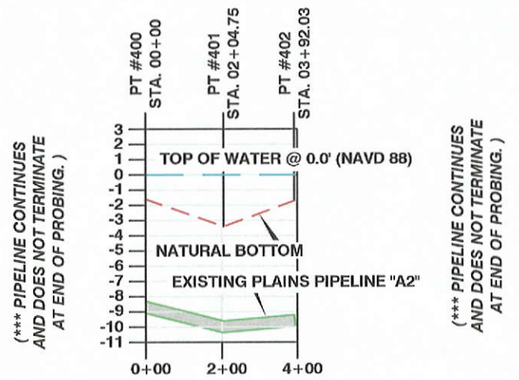

PROFILE "G"

NOTES:

NRCS

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107 Global Circle, Lafayette, LA 70503
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HORIZONTAL SCALE: 1" = 400'
400' 200' 0' 400'
VERTICAL SCALE: 1" = 10'
10' 5' 0' 10'

REV. NO:	REV. DATE:	REV. BY:
00	--/--/--	---

REVISION DESCRIPTION:
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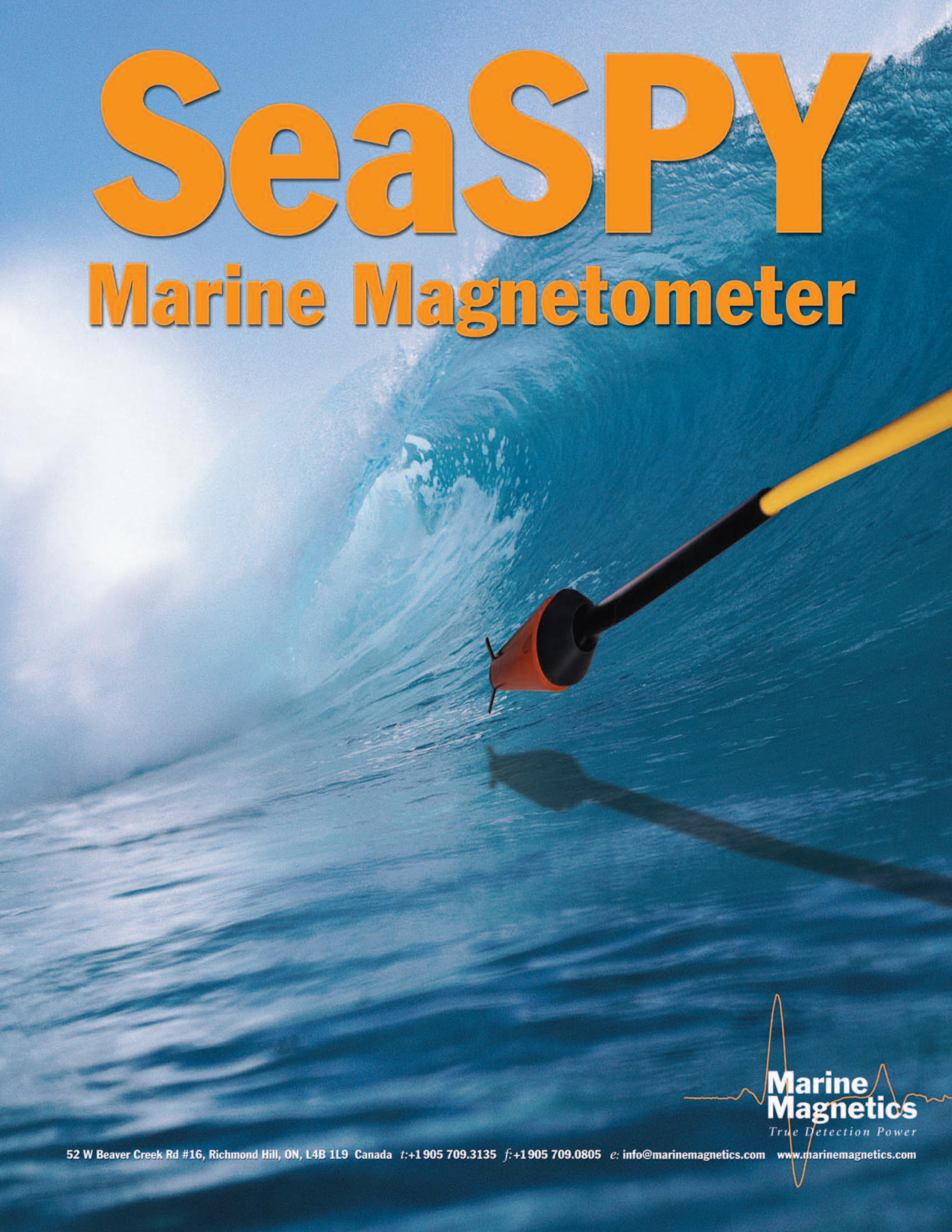
DRAWN BY:	FKH	APPROVED BY:	WMB
DATE:	6/2/14	JOB NO:	2014.0457
DRAWING NAME:	ALL_PROFILES_REV1.5.DWG		
PROJECTION: LA 83-SF-MOD GEO. DATUM: NAD83 | VERT. DATUM: NAVD88, Gd 12A GRID UNITS: US SURVEY FEET			
SHEET NO:	14	OF	14

PIPELINE PROFILES

Natural Resources Conservation Service
MAGNETOMETER SURVEYS
FOR
TERRACING AND MARSH CREATION
SOUTH OF BIG MAR (BS-24)
PLAQUEMINES PARISH, LOUISIANA

APPENDIX 3

Equipment Specifications


SeaSPY
Marine Magnetometer
Marine
Magnetics
True Detection Power
52 W Beaver Creek Rd #16, Richmond Hill, ON, L4B 1L9 Canada t:+1 905 709.3135 f:+1 905 709.0805 e: info@marinemagnetics.com www.marinemagnetics.com

SeaSPY Overhauser Sensor

Marine Magnetics takes pride in designing and manufacturing magnetic exploration equipment that meets scientific observatory specifications. The SeaSPY magnetometer product eliminates many of the inherent problems associated with other marine magnetometers such as orientation restrictions, sensor realignment, time and temperature drift and poor absolute accuracy.

The Overhauser Effect

Marine Magnetics is the only marine magnetometer company in the world that can produce stable Overhauser sensors that do not degrade with time.

Marine Magnetics' SeaSPY magnetometer measures the ambient magnetic field using a specialized branch of nuclear Magnetic Resonance technology, applied specifically to hydrogen nuclei.

Worldwide Operation With No Restrictions

The SeaSPY sensor is unique in that it is entirely omnidirectional. The amount of signal produced by the sensor is completely independent of magnetic field direction. You never have to orient your sensor, because it is already optimized to work around the World.

As a result, regardless of where you are in the World and no matter what the magnetic field strength is, your SeaSPY sensor will continue to provide a strong signal and accurate data.

Highest Absolute Accuracy

SeaSPY Overhauser sensors have the highest absolute accuracy of any magnetometer: 0.2nT

The repeatability between SeaSPY sensors is also unmatched at better than 0.01nT. This makes them ideal for gradiometer configurations, where the output of two independent sensors is compared to measure the value of magnetic gradient between them.

High Sensitivity

SeaSPY Overhauser sensors deliver high-resolution output with a noise level of 0.01nT/√Hz; counter sensitivity is 0.001nT

Maintenance Free Sensors, No Realignment and No Consumable Parts

SeaSPY Overhauser sensors are entirely maintenance free and most importantly, SeaSPY's specifications do not degrade over time. As a result, the SeaSPY sensor never has to be realigned, or recalibrated in order to meet the manufacturer's specifications at the time of shipping.

In addition, the SeaSPY sensor does not contain any parts that wear out and need to be replaced.

Ultra Low Power Consumption

A SeaSPY system only requires 1W standby and 3W maximum. SeaSPY can run for days directly from a 24V vehicle battery.

Digital System

SeaSPY is entirely digital. The magnetometer signal is measured inside the towfish where the signal is strongest and most immune to outside noise.

No Sensor Warm-Up Time

SeaSPY Overhauser sensors do not require temperature stabilization. Therefore, unlike competing technologies, SeaSPY will work equally as well in cold, deep water as in warm, tropical water, instantly on power-up.

Scientific Quality Instruments

Stable time: The clock used in the SeaSPY electronics module is accurate to 1ppm throughout the entire temperature range, as opposed to 100ppm found in competing magnetometer systems. As a result, no matter how much the temperature changes during a survey, the data will always be accurately time stamped, ensuring that it will always match up perfectly with diurnal correction (base station) information.

No temperature effect on accuracy: Data collected at –40°C will be identical to data recorded at +60°C

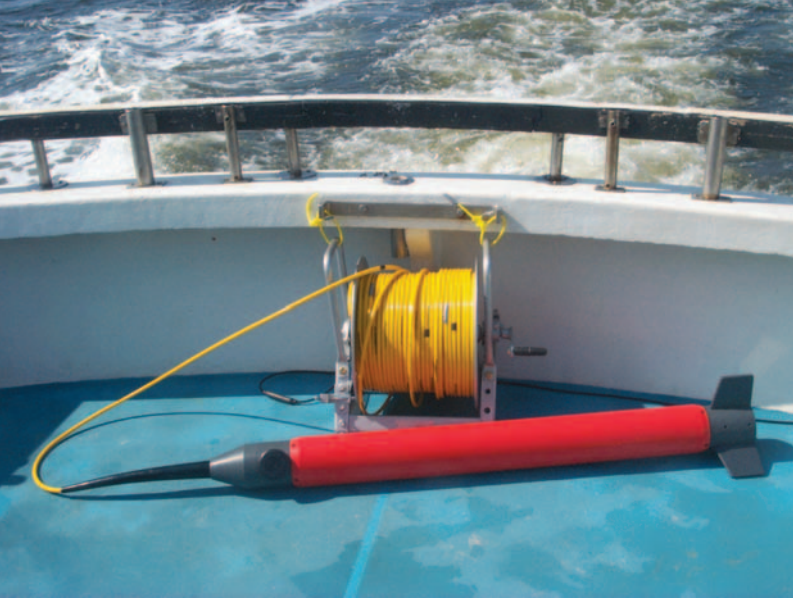
No heading error: Heading error is a detectable offset in the magnetometer output caused by changing the heading of the magnetometer within the Earth's magnetic field.

Marine Magnetics' SeaSPY magnetometer is constructed of the most nonmagnetic materials possible. As a result, the SeaSPY Overhauser sensor does not display heading error.

Therefore, no matter how the SeaSPY sensor is oriented in the Earth's magnetic field, successive survey lines taken in opposite directions will match up perfectly.

The benefits to the user are four-fold:

1. Targets will not be missed because they fall between mismatched survey lines.
2. Eliminates post processing. Competing technologies require the user to collect tie lines in order to level the data set (match-up inaccurate survey lines). This is not necessary with an accurate magnetometer like SeaSPY.
3. There will be no variation introduced in the data by slight course changes during a survey line.
4. A magnetic map of an area will look the same, regardless of in which direction the survey lines were conducted.



SeaSPY towfish with altimeter and 200m of cable on a metal reel

Standard SeaSPY Hardware

SeaSPY Towfish Includes:

- High sensitivity omnidirectional Overhauser sensor
- Electronics module containing all of the driving electronics, including the Larmour counter
- Leak detector
- 4 lead weights
- SeaLINK data acquisition and GPS logging software for Windows. See our SeaLINK brochure for more information.

Tow Cable

The SeaSPY tow cable is incredibly tough yet light in weight. The cable consists of one twisted pair of conductors, a Vectran strength member that is specifically woven to prevent rotational preference, water blocking and a yellow polyurethane jacket. Length to be determined by customer.

Communication Transceiver

The Communication Transceiver provides the complete interface between the customers PC and the SeaSPY towfish. One side connects to a PC serial port using an RS-232 cable, and the other plugs into the tow cable and towfish. In addition to conditioning the towfish power supply, the transceiver functions like a modem, providing two-way communication along the same conductors that provide power to the SeaSPY towfish.

Dimensions: 11 x 6 x 3 cm (4 x 2 x 1 inches)

Weight: 130g (0.28 lbs)

RS-232 Cable

The 3 connector RS-232 cable connects the communication transceiver, P.C. and power supply or battery clip cables.

Weight: 165g (0.36 lbs)

Power Supply

This unit will accept any AC line power, from 100-240VAC at 50/60 Hz, to provide conditioned and clean 24V DC power to the SeaSPY magnetometer system.

Dimensions: 11 x 6 x 3.5 cm (4 x 2 x 1 inches)

Weight: 370g (0.8 lbs)

SeaSPY Options

Pressure Sensor

Provides distance from the surface in metres with every mag reading.

Available in 100psi, 500psi, 2,500psi, 5,000psi and 10,000psi.

Altimeter

An integrated, nonmagnetic 200kHz altimeter is available for all depth options. The altimeter provides an accurate and precise (to 0.1m) towfish altitude measurement with every magnetometer reading.

Deep Tow Options

Marine Magnetics offers three deep tow options:

1000m SeaSPY towfish tested to 1,500psi

3000m SeaSPY towfish tested to 4,500psi

6000m SeaSPY towfish tested to 9,000psi

Side Scan Sonar Integrations

Marine Magnetics has designed an integration cable that contains all of the power conditioning and interface electronics in a stainless steel housing that is terminated onto a 10m long tow cable. The cable has detachable tow connectors to the magnetometer and side scan. The SeaSPY towfish does not have to be altered in any way; the integration cable does it all.

The integration also maintains the basic system integrity of the SeaSPY and Side Scan Sonar towfish. Each system can be run independently as well as together. For more information please see our *SeaSPY Side Scan Sonar Integration brochure.*

Drive up to 10,000m of cable with the SeaSPY Smart Transceiver

An enhanced version of the communication transceiver, the Smart Transceiver's adaptive design adjusts to suit a broad range of cable parameters, enabling it to drive up to 10,000m of cable.

Additional advantages include:

- Boosts and regulates the towfish supply voltage, to minimize voltage drop over long cables.
- Digital auto-tuning of transmission/reception frequencies.
- Diagnostic features include digital voltage and current monitoring.
- Keeps time after power off, and automatically sets the towfish time when needed.

No additional hardware has to be purchased. The Smart Transceiver is compatible with the 24V AC power supply provided with all SeaSPY Marine Magnetometer Systems.

Dimensions: 12 x 6.5 x 8 cm (4.7 x 2.5 x 3 inches)

Weight: 300g (0.66 lbs)

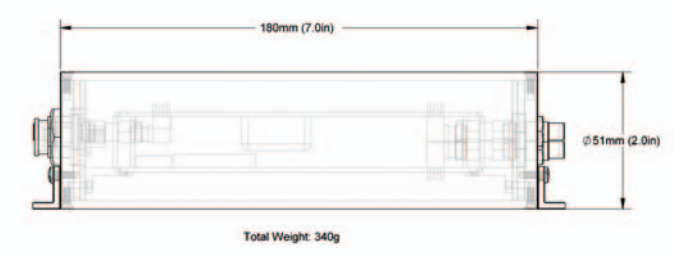
Deck Leader / On Board Cable

The deck leader cable connects the tow cable to the communication transceiver. The deck leader cable is required if the tow cable is on a winch. If not, it may be requested, but is not required. Standard lengths available 10m/30m, custom lengths are available.

OEM SeaSPY Electronics Module

SeaSPY electronics modules contain all of the driving electronics, including the Larmour counter. The module is a completely sealed, self-contained unit that is safe to handle even in dirty, or wet conditions.

All SeaSPY electronics modules are completely interchangeable, enabling a customer to swap between modules on demand. This makes them ideal for applications where multiple electronics modules are required as gradiometers or simply as spares.



SeaSPY electronics module

OEM SeaSPY Overhauser Sensor

All SeaSPY sensors are omnidirectional, maintenance free, and do not require realignment, or recalibration, and they do not contain any consumable parts, or toxic chemicals.

In addition, all SeaSPY sensors are interchangeable, and with a repeatability of 0.01nT between the sensors, they are ideal for multi-sensor applications.

Floatation Cable

SeaSPY floatation cable consists of one twisted pair of conductors, a Vectran strength member, water blocking and the addition of an extra layer of syntactic foam, coated with an orange polyurethane jacket.

Extension Cables

Marine Magnetics provides extension cables for both our standard Vectran and floatation cables. Each extension consists of a male and female brass connector. Both connectors have the capability of bearing the full working load of the cable.

This configuration allows multiple extension cables to be connected together in series up to 1000m

Connector –Tow Cable Termination Kit

Marine Magnetics' proprietary screw-on underwater connector, for interface to the SeaSPY towfish, is made of a brass alloy that is entirely non-magnetic. The connector is extremely tough and can support more than one tonne of towing force.

This connector is used with all of the SeaSPY options, allowing the customer to swap between cables at will.

Best of all, the connector is field-serviceable with a Marine Magnetics termination kit.

Winches

Hand cranked reels and winches are available. Please contact Marine Magnetics.

Battery Clip Cable

The battery clip cable can be connected in place of the AC power supply if the system is to be powered from batteries. With a power consumption of only 3W, a complete SeaSPY system can operate for days from two standard 12V car batteries connected in series.

Lead Weights

The towfish can be made buoyant in the field by removing two of the internal stabilizing lead weights. For added versatility, the towfish can also be made heavier in the field by adding up to 4 more stabilizing lead weights inside the towfish.

Tow Cable Weights

Marine Magnetics brass cable weights are an effective, yet inexpensive way of getting our SeaSPY towfish to deep depths. Placing the cable weights periodically along the length of the cable effectively counters the lift produced by tow cable drag, it also produces a very sharp drop rate that can be sustained for long cable lengths. In recent trials it has proved to be more effective than depressor wings that are costly, awkward, and large.

Each weight weighs about 6lbs in water and can be installed or removed with a screwdriver, enabling the user to remove or add weights at will.

Brass tow cable weight attached to MMC's cable

Gradiometer Configurations

Overview

The simplest gradiometer measures magnetic gradient in one dimension by subtracting the difference between two independent magnetic sensors. Since the Earth's magnetic field is three dimensional, up to three independent gradient directions can be measured – vertical, horizontal (across-track) and longitudinal (along-track). Marine Magnetics offers each of these gradiometer configurations with its SeaSPY magnetometer product. In addition, all SeaSPY magnetometers are compatible, enabling existing SeaSPY customers to upgrade their magnetometer to the gradiometer configuration of their choice, as they need to.

Marine Magnetics' SeaSPY sensors are highly accurate and repeatable making them ideal for gradiometers. To learn more about how gradiometers work and why accuracy and repeatability are key elements in the way they perform, please see our ***Gradiometer Application Guide.***

For collection of gradient data in all three dimensions simultaneously please see our ***SeaQuest Multi-Sensor Gradiometer Platform brochure and Using SeaQuest To Track Cables and Pipelines.***

Horizontal or Vertical Transverse Gradiometer

Marine Magnetics' transverse gradiometers provide a rigid 2m structure linking the sensors, and are well suited for close-in precision surveys for small ferrous targets where short sensor separation is needed.

Applications:

Cable and Pipeline Survey – A horizontal transverse gradiometer can be used to track cables, or pipelines in real time from relatively high towing altitudes. Adding a vertical gradiometer enables the user to track the cable, and it also provides accurate measurement of cable/pipeline burial depth.

Detection of Small Ferrous Targets – Short baseline gradient measurement in any direction (longitudinal, horizontal, or vertical) is useful for eliminating geological interference and diurnal variation.

Longitudinal Gradiometer

Longitudinal gradiometers provide the largest variation in available baselines, from 1.5m to 500m+. Again, Marine Magnetics' communication transceiver technology is unmatched in its ability to support extremely long distances between the two towfish. Long baselines provide superior gradient measurement sensitivity and increased detection range. Longitudinal gradiometers are also extremely hydrodynamically stable when deployed.

Applications:

Shipwreck, Search and Salvage – Medium baseline longitudinal gradient measurement can eliminate interference by geological bodies, while highlighting massive magnetic sources like steel hulls, boilers or engines. Smaller sources such as anchors or cannons will require a shorter baseline, and lower towing altitude.

Environmental Survey – Medium baseline measurement with a longitudinal gradiometer can highlight shallow magnetic sediments, while eliminating deeper geological influences. The baseline should be on the order of magnitude of the expected towing altitude.

Exploration Geophysics – Long-baseline measurement with a longitudinal gradiometer is ideal since the bodies of interest are often far from the sensor, and produce very small gradients. The baseline should be on the order of magnitude of expected depth-to-source.

Specifications

Performance

Operating Zones	NO RESTRICTIONS. SeaSPY will perform exactly according to spec throughout the entire range.
Absolute Accuracy	0.2nT
Sensor Sensitivity	0.01nT
Counter Sensitivity	0.001nT
Resolution	0.001nT
Dead Zone	NONE
Heading Error	NONE
Temperature Drift	NONE
Power Consumption	1W standby, 3W maximum
Timebase stability	1ppm, -45°C to +60°C
Range	18,000nT to 120,000nT
Gradient Tolerance	Over 10,000nT/m
Sampling Range	4Hz – 0.1Hz
External Trigger	By RS-232
Communications	RS-232, 9600bps
Power Supply	15VDC-35VDC or 100-240VAC
Operating Temperature	-45°C to +60°C
Temperature Sensor	-45°C to +60°C, 0.1 step

Towfish Dimensions

Towfish Length	124 cm (49 inches)
Towfish Diameter	12.7 cm (5 inches)
Towfish Weight in Air	16 kg (35 lbs)
Towfish Weight in Water	2 kg (4.4 lbs)

Tow Cable Dimensions

Conductors	Twisted pair
Strength Member	Vectran
Breaking Strength	2,500 kg (5,500 lbs)
Outer Diameter	1 cm (0.4 inches)
Bending Diameter	16.5 cm (6.5 inches)
Weight in Air	125 g/m (84 lb/1000 ft)
Weight in Water	44 g/m (29.5 lb/1000 ft)
Outer Jacket	Yellow Polyurethane
Cable Termination	Field Replaceable

Floatation Cable

Conductors	Twisted pair
Strength Member	Vectran
Max Working Load	2,500 kg (5,500 lbs)
Outer Diameter	1.9 cm (0.74 inches)
Bending Diameter	25 cm (10 inches)
Weight in Air	272 g/m 183 lbs/1000 ft)
Weight in Water	-20 g/m (-13.5 lbs/1000 ft)
Outer Jacket	Orange Polyurethane
Cable Termination	Field Replaceable

Other Sensors

Pressure/depth sensor:
Available in 100psi, 500psi, 2,500psi, and 10,000psi.

Altimeter:
200kHz altimeter 0-100m range, 0.1 resolution integrated into the nose of the SeaSPY towfish. Altitude is available with every mag reading.

Transponder:
The transponder acoustically provides the accurate position of the SeaSPY towfish.

Marine Magnetics
True Detection Power

52 W Beaver Creek Rd #16, Richmond Hill, ON, L4B 1L9 Canada t: +1 905 709.3135 f: 709.0805 e: info@marinemagnetics.com www.marinemagnetics.com

TRIMBLE R8 GNSS SYSTEM

KEY FEATURES

Advanced satellite tracking with **Trimble 360 receiver technology**

Includes Trimble Maxwell 6 chips with **440 channels**

Unmatched GNSS tracking performance

Web user interface and remote configuration

Base and rover communications **options to suit any application**

THE INDUSTRY LEADING TOTAL GNSS SOLUTION

The Trimble® R8 GNSS system has long set the bar for advanced GNSS surveying systems. Through advanced Trimble 360 tracking technology and a comprehensive set of communication options integrated into a flexible system design, this integrated GNSS system delivers industry-leading performance. For surveyors facing demanding RTK applications, the Trimble R8 is an invaluable GNSS partner.

TRIMBLE 360 RECEIVER TECHNOLOGY

Future-proof your investment

Powerful Trimble 360 receiver technology integrated in the Trimble R8 supports signals from all existing and planned GNSS constellations and augmentation systems providing unmatched GNSS tracking performance. With this leading-edge technology, it is now possible for surveyors to expand the reach of their GNSS rovers into areas that were previously too obscured, such as under trees and in dense urban areas.

With two integrated Trimble Maxwell™ 6 chips, the Trimble R8 offers an unparalleled 440 GNSS channels. Also capable of tracking carrier signals from a wide range of satellite systems, including GPS, GLONASS, Galileo, BeiDou (COMPASS), and QZSS, the Trimble R8 provides a robust solution for surveyors.

The CMRx communications protocol in the Trimble R8 provides unprecedented correction compression for optimized bandwidth and full utilization all of the satellites in view, giving you the most reliable positioning performance.

Designed with the future in mind, Trimble 360 technology is optimized to receive future planned signals as the number of available satellites continues to grow. With Trimble 360 technology, the Trimble R8 delivers business confidence with a sound GNSS investment for today and long into the future.

FLEXIBLE SYSTEM DESIGN

The Trimble R8 combines the most comprehensive feature set into an integrated and flexible system design for demanding surveying applications. Connect directly to the controller, receive RTK network corrections, and connect to the Internet via comprehensive communication options. With a built-in transmit/receive UHF radio, the Trimble R8 enables ultimate flexibility for rover or base operation. As a base station, the internal NTRIP caster provides you customized access[1] to base station corrections via the Internet.

Trimble's exclusive Web UI™ eliminates travel requirements for routine monitoring of base station receivers. Now you can assess the health and status of base receivers and perform remote configurations from the office. Likewise, you can download post-processing data through Web UI and save additional trips out to the field.

AN INDUSTRY LEADING FIELD SOLUTION

If you're seeking the industry leading field solution, pair the Trimble R8 GNSS receiver with one of our powerful Trimble controllers, such as the Trimble TSC3, Trimble CU or Trimble Tablet Rugged PC featuring Trimble Access™ field software. These rugged controllers bring the power of the office to the field through an intiutive Windows-based interface.

Trimble Access field software offers numerous features and capabilities to streamline the flow of everyday surveying work. Streamlined workflows such as Roads, Monitoring, Mines, and Tunnels—guide crews through common project types and allows crews to get the job done faster with less distractions. Survey companies can also implement their unique workflows by taking advantage of the customization capabilities available in the Trimble Access Software Development Kit (SDK).

Need to get data back to the office immediately? Benefit from real-time data sharing via Trimble Access Services, now available with any valid Trimble Access maintenance agreement.

Back in the office, seamlessly transfer your field data using Trimble Business Center. Edit, process, and adjust collected data with confidence.

The Trimble R8 GNSS system—the industry leader for GNSS surveying applications.

1 Cellular modem required.

Trimble

TRIMBLE R8 GNSS SYSTEM

DATASHEET

PERFORMANCE SPECIFICATIONS

Measurements

- Advanced Trimble Maxwell 6 Custom Survey GNSS chips with 440 channels
- Future-proof your investment with Trimble 360 tracking
- High precision multiple correlator for GNSS pseudorange measurements
- Unfiltered, unsmoothed pseudorange measurements data for low noise, low multipath error, low time domain correlation and high dynamic response
- Very low noise GNSS carrier phase measurements with <1 mm precision in a 1 Hz bandwidth
- Signal-to-Noise ratios reported in dB-Hz
- Proven Trimble low elevation tracking technology
- Satellite signals tracked simultaneously:
  - GPS: L1C/A, L1C, L2C, L2E, L5
  - GLONASS: L1C/A, L1P, L2C/A, L2P, L3
  - SBAS: L1C/A, L5 (for SBAS satellites that support L5)
  - Galileo: E1, E5A, E5B
  - BeiDou (COMPASS): B1, B2
- SBAS: QZSS, WAAS, EGNOS, GAGAN
- Positioning rates: 1 Hz, 2 Hz, 5 Hz, 10 Hz, and 20 Hz

POSITIONING PERFORMANCE[1]

Code differential GNSS positioning

Horizontal	0.25 m + 1 ppm RMS
Vertical	0.50 m + 1 ppm RMS
SBAS differential positioning accuracy[2]	typically <5 m 3DRMS

STATIC GNSS SURVEYING

High-precision static

Horizontal	3 mm + 0.1 ppm RMS
Vertical	3.5 mm + 0.4 ppm RMS

Static and FastStatic

Horizontal	3 mm + 0.5 ppm RMS
Vertical	5 mm + 0.5 ppm RMS

POSTPROCESSED KINEMATIC (PPK) GNSS SURVEYING

Horizontal	8 mm + 1 ppm RMS
Vertical	15 mm + 1 ppm RMS

REAL-TIME KINEMATIC SURVEYING

Single Baseline <30 km

Horizontal	8 mm + 1 ppm RMS
Vertical	15 mm + 1 ppm RMS

NETWORK RTK[3]

Horizontal	8 mm + 0.5 ppm RMS
Vertical	15 mm + 0.5 ppm RMS
Initialization time[4]	typically <8 seconds
Initialization reliability[4]	typically >99.9%

1 Precision and reliability may be subject to anomalies due to multipath, obstructions, satellite geometry, and atmospheric conditions. The specifications stated recommend the use of stable mounts in an open sky view, EMI and multipath clean environment, optimal GNSS constellation configurations, along with the use of survey practices that are generally accepted for performing the highest-order surveys for the applicable application including occupation time appropriate for baseline length. Baselines longer than 30 km require precise ephemeris and occupations up to 24 hours may be required to achieve the high precision static specification.
2 Depends on SBAS system performance.
3 Network RTK PPM values are referenced to the closest physical reference station.
4 May be affected by atmospheric conditions, signal multipath, obstructions and satellite geometry. Initialization reliability is continuously monitored to ensure highest quality.
5 Receiver will operate normally to –40 °C, internal batteries are rated to –20 °C, optional internal GSM modem operates to -30 °C.
6 Tracking GPS, GLONASS and SBAS satellites.
7 Varies with temperature and wireless data rate. When using a receiver and internal radio in the transmit mode, it is recommended that an external 6 Ah or higher battery is used.
8 Varies with terrain and operating conditions.
9 Bluetooth type approvals are country specific.

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PN 022543-079M (04/13)

HARDWARE

Physical

Dimensions (W×H)	19 cm × 10.4 cm (7.5 in x 4.1 in), including connectors
Weight	1.52 kg (3.35 lb) with internal battery, internal radio with UHF antenna 3.81 kg (8.40 lb) items above plus range pole, controller, and bracket
Temperature[5]	
Operating	–40 °C to +65 °C (–40 °F to +149 °F)
Storage	–40 °C to +75 °C (–40 °F to +167 °F)
Humidity	100%, condensing
Water/dustproof	IP67 dustproof, protected from temporary immersion to depth of 1 m (3.28 ft)
Shock and vibration	Tested and meets the following environmental standards:
Shock	Non-operating: Designed to survive a 2 m (6.6 ft) pole drop onto concrete. Operating: to 40 G, 10 msec, sawtooth
Vibration	MIL-STD-810F, FIG.514.5C-1

Electrical

- Power 11 V DC to 28 V DC external power input with over-voltage protection on Port 1 (7-pin Lemo)
- Rechargeable, removable 7.4 V, 2.6 Ah Lithium-Ion battery. Power consumption[6] is 3.2 W in RTK rover mode with internal radio and Bluetooth in use.
- Operating times on internal battery:[7]
  - 450 MHz receive only option . . . . . 5.0 hours
  - 450 MHz receive/transmit option (0.5 W) . . . . . 2.5 hours
  - Cellular receive option . . . . . 4.7 hours

Communications and Data Storage

- Serial: 3-wire serial (7-pin Lemo) on Port 1; full RS-232 serial on Port 2 (Dsub 9 pin)
- Radio modem: fully Integrated, fully sealed internal 450 MHz receiver/transmitter option:
  - Transmit power: 0.5 W
  - Range[8]: 3–5 km typical/10 km optimal
- Cellular: fully integrated, sealed internal GSM/GPRS option
- Bluetooth: fully integrated, fully sealed 2.4 GHz communications port (Bluetooth®)[9]
- External communication devices for corrections supported on Serial and Bluetooth ports
- Data storage: 56 MB internal memory, 960 hours of raw observables (approx. 1.4 MB/day), based on recording every 15 sec from an average of 14 satellites

Data formats

- CMR: CMR+, CMRx input and outputs
- RTCM: RTCM 2.1, RTCM 2.3, RTCM 3.0, RTCM 3.1 input and outputs
- Other outputs: 23 NMEA outputs, GSOF, RT17 and RT27 outputs, supports BINEX and smoothed carrier

Web UI

- Offers simple configuration, operation, status and data transfer
- Accessible via Serial and Bluetooth

Supported Trimble Controllers

- Trimble TSC3 controller, Trimble CU controller, Trimble Tablet Rugged PC

Certifications

FCC Part 15 (Class B device), 22, 24, 90; CE Mark; C-Tick; 850/1900 MHz; Class 10 GSM/GPRS module; Bluetooth EPL

Specifications subject to change without notice.

TRIMBLE AUTHORIZED DISTRIBUTION PARTNER

NORTH AMERICA
Trimble Navigation Limited
10368 Westmoor Dr
Westminster CO 80021
USA

EUROPE
Trimble Germany GmbH
Am Prime Parc 11
65479 Raunheim
GERMANY

ASIA-PACIFIC
Trimble Navigation
Singapore Pty Limited
80 Marine Parade Road
#22-06, Parkway Parade
Singapore 449269
SINGAPORE