

D00141

NOAA FORM 76-35A

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY

DESCRIPTIVE REPORT

Type of Survey **Hydrographic Reconnaissance**

Registry No. **D00141**

LOCALITY

State **Louisiana**

General Locality **Chandeleur and Breton Sounds**

Sub-locality **Southern Chandeleur and Western Breton Sounds**

2008-2009

CHIEF OF PARTY
Joseph Talbott
TerraSond Ltd.

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DATE **April 29, 2009**

NOAA FORM 77-28 U.S. DEPARTMENT OF COMMERCE (11-72) NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION <h2 style="text-align: center;">HYDROGRAPHIC TITLE SHEET</h2>	REGISTRY NUMBER: <h2 style="text-align: center;">D00141</h2>
INSTRUCTIONS: The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.	FIELD NUMBER: N/A
<div style="display: flex; flex-direction: column;"> <div> <div>State/Territory:</div> <div>Louisiana</div> </div> <div> <div>General Locality:</div> <div>Chandeleur and Breton Sounds</div> </div> <div> <div>Sub-Locality:</div> <div>Sothern Chandeleur and Western Breton Sounds</div> </div> <div> <div>Scale: 1:20,000</div> <div>Date of Survey: JUL 04, 2008 – JAN 24, 2009</div> </div> <div> <div>Instructions Dated:</div> <div>APR 21, 2008</div> <div>Project Number: OPR-J977-TE-08</div> </div> <div> <div>Vessel:</div> <div>M/V Thomas R. Dowell and M/V Bella Marie</div> </div> <div> <div>Chief of Party:</div> <div>Joseph Talbott</div> </div> <div> <div>Surveyed by:</div> <div>TerraSond Ltd.</div> </div> <div> <div>Soundings by:</div> <div>Singlebeam Echosounder</div> </div> <div> <div>Graphic record scaled by:</div> <div>N/A</div> </div> <div> <div>Graphic record checked by:</div> <div>N/A</div> </div> <div> <div>Protracted by:</div> <div>N/A</div> <div>Automated Plot: N/A</div> </div> <div> <div>Verification by:</div> <div>Atlantic Hydrographic Branch</div> </div> <div> <div>Soundings in:</div> <div>Meters <i>Feet</i> at MLLW</div> </div> <div> <div>Remarks:</div> <div> <p><i>1) All Times are UTC.</i></p> <p><i>2) This is a basic Hydrographic Survey under the Navigable Area Co2ncept.</i></p> <p><i>3) Projection is UTM Zone 16N.</i></p> <p><i>Bold italic red notes in the Descriptive Report were made during office processing.</i></p> </div> </div> </div>	

DESCRIPTIVE REPORT OPR-J977-TE-08



Registry Number: D00141

M/V Thomas R. Dowell M/V Bella Marie

Survey: H State: Louisiana General Locality: Chandeleur and Breton Sounds Sublocality:
Southern Chandeleur, Western Breton Sounds Survey Dates: July 4, 2008 – January 24, 2009
Lead Hydrographer: Joseph C. Talbott



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Descriptive Report to Accompany Hydrographic Survey D00141 Survey H

July 4, 2008 – January 24, 2009 TerraSond Ltd. Lead Hydrographer: Joseph C. Talbott

A. AREA SURVEYED

A singlebeam echo sounder survey was conducted in Chandeleur and Breton Sounds, Louisiana in accordance with the NOAA, National Ocean Service, Statement of Work (SOW)*, Side Scan Sonar Services, OPR-J977-TE-08, dated April 21, 2008. ***Filed with original field records.**

The purpose of this project was to provide NOAA with modern, accurate hydrographic survey data with which to update the nautical charts of the assigned area. The project area was approximately 190 square nautical miles and was located in Southern Chandeleur and Western Breton Sounds, east of the Mississippi River Delta, in the State of Louisiana.

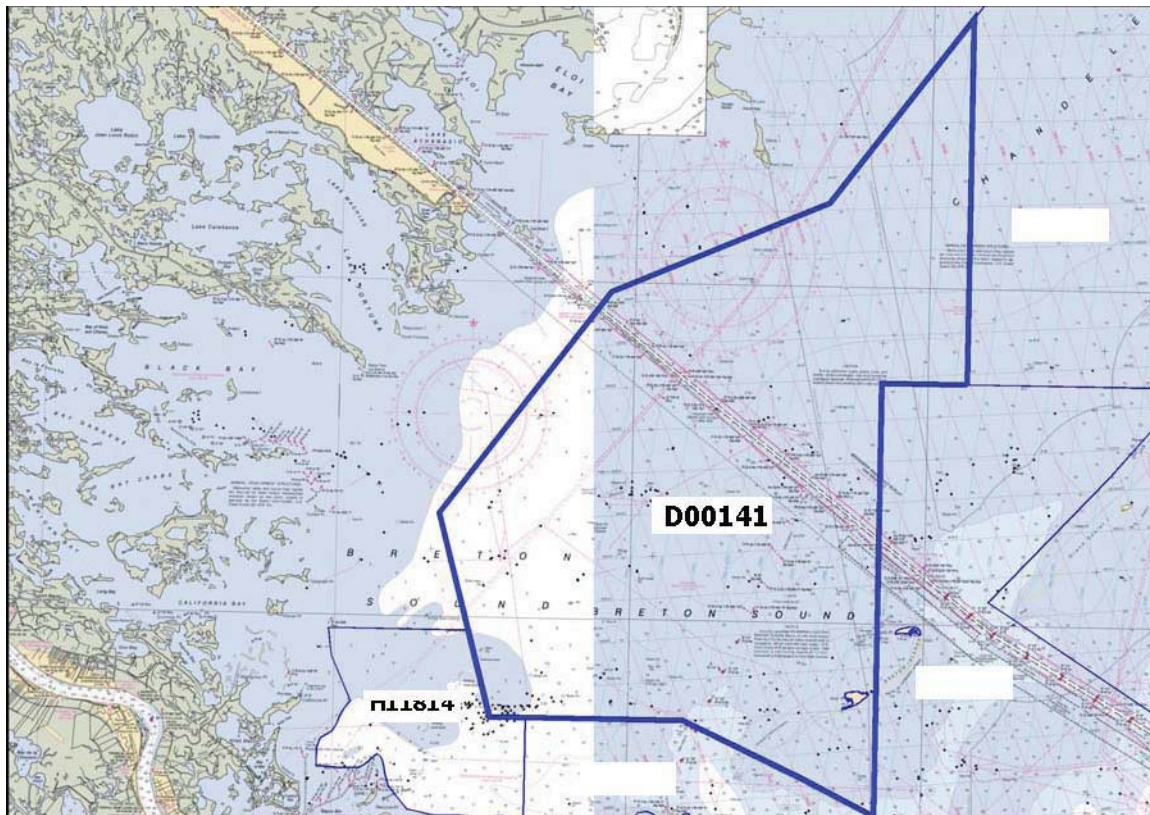


Figure 1 – Overview of D00141 with Chart 11363, 41st Edition, June 2007 and Chart 11364, 41st Edition, December 2005. Soundings in feet.

The project area is located in Chandeleur and Breton Sounds which have an active shrimp and oyster fishery and contain numerous oil and gas structures. The project area is

located adjacent to the Mississippi River Gulf Outlet (MRGO) which, prior to its closure in 2008, provided a primary access route to the New Orleans Industrial Canal for barge traffic from Eastern Gulf of Mexico ports to New Orleans and the Mississippi River. At the time of the survey, the MRGO was in the process of being closed by the US Army Corps of Engineers. This closure involves the placement of riprap across the mouth of the MRGO and the removal of aids to navigation marking the MRGO channel.

The SOW* for OPR-J977-TE-08 specified a survey of D00141 using a singlebeam echo sounder with survey lines spaced 1000 meters apart. The survey was intended to provide a baseline for a chart adequacy review of the area to determine future charting needs. Discussions with the NOAA Contracting Officers Technical Representative (COTR) during the survey resulted with the survey being downgraded to a reconnaissance. This eliminated the requirement to pursue additional development work in areas where the 2008 survey found significant discrepancies with the charted data. **Filed with original field records.*

This survey has a maximum depth of 6.4 meters and a minimum depth of 1.2 meters below the Mean Lower Low Water (MLLW) tidal datum.

- *Concur with clarification. The maximum depth for D00141 was 24.346m and the minimum depth was 0.433m below the Mean Lower Low Water (MLLW) tidal datum.*

For complete survey limits, refer to Figure 1 on the preceding page.

B. DATA ACQUISITION AND PROCESSING *See Also Evaluation Report*

B.1. Equipment

Bathymetry for this survey was acquired using the hydrographic survey vessels *M/V Bella Marie* and *M/V Thomas R. Dowell*.

M/V Thomas R. Dowell

The *M/V Thomas R. Dowell* is an aluminum hulled survey vessel, 10.2 meters length overall with a 2.9 meter beam and a 0.4 meter draft. The *Dowell* is powered by two four-stroke 150 HP Honda outboard motors. Auxiliary electrical service is provided by a 3 KW Honda generator. The primary survey systems used on the *M/V Thomas R. Dowell* are listed in Table 1.

Table 1 - Major systems used aboard the *M/V Thomas R. Dowell*.

VESSEL <i>M/V Thomas R. Dowell</i> LOA: 10.2 m, BEAM 2.9 m, DRAFT: 0.4 m	
Equipment	Manufacturer & Model
Singlebeam echo sounder	Odom Hydrotrac

Positioning	Trimble DSM-232
Sound speed	Odom Digibar Pro
Vessel course and pitch	Hemisphere Crescent V100

M/V Bella Marie

The *M/V Bella Marie* is an aluminum hulled vessel, 11.9 meters length overall with a 4.3 meter beam and a 0.8 meter draft. The *Bella Marie* is powered by two 350 HP Volvo D-6 diesel engines with outdrive propulsion. Auxiliary electrical service is provided by a 13 KW Isuzu Marathon generator. The primary survey systems used on *M/V Bella Marie* are listed in Table 2.

Table 2 - Major systems used aboard the *M/V Bella Marie*.

VESSEL <i>M/V Bella Marie</i> LOA: 11.9 m, BEAM 4.3 m, DRAFT: 0.8 m	
Equipment	Manufacturer & Model
Singlebeam echo sounder	Odom Hydrotrac
Positioning	Kongsberg Maritime Seatex Seapath 200
Sound speed	Odom Digibar Pro
Vessel attitude	Kongsberg Maritime Seatex MRU 5

Equipment performance details are provided in the Data Acquisition and Processing Report (DAPR)*, Sections A. Equipment and B. Quality Control. **Filed with original field records.*

B.2. Quality Control

B.2.1. Vertical Beam Echo Sounder (VBES)

No conditions with the potential for adversely affecting data integrity were encountered on the *M/V Bella Marie* or the *M/V Thomas R. Dowell* with the VBES suite during this survey.

VBES confidence checks were conducted on a weekly basis, when possible. The confidence checks consisted of a single depth deployment of a bar check apparatus at a fixed distance below the VBES transducer to check for drift in the VBES system index value. No significant drift in the index value was observed during the course of the survey.

A detailed discussion of VBES system calibrations, data acquisition, and processing is provided in the Data Acquisition and Processing Report (DAPR), Paragraphs A. Equipment and B. Quality Control.

B.2.2. Crosslines

22 mainscheme lines totaling 357 lineal nautical miles and 3 lines totaling 35 lineal nautical miles of crosslines were run during the 2008 survey of H11815. The ratio of the lineal nautical miles of crosslines to the lineal nautical miles of mainscheme lines, at

9.8 %, exceeds the 8 % required by “NOAA, NOS Hydrographic Surveys Specifications and Deliverables,” April 2007, Section 5.1.4.

Do not concur. The statements above are in reference to another survey conducted by the field unit and not survey D00141 however the submitted met NOS Specifications and Deliverables.



Crossline analysis was conducted by creating a BASE surface of the mainscheme lines and a separate BASE surface using the crosslines. The surfaces were then compared and the difference between the surfaces was computed.

8,107 surface difference values were compared in D00141. 100% of the compared values were within the allowable error for the depths surveyed. **Concur.**

A comprehensive explanation of the crossline analysis process is in the Data Acquisition and Processing Report (DAPR), Paragraphs A. Equipment and B. Quality Control. Contemporary Survey Junctions

B.2.3. Survey Junctions

This survey junctions with four other surveys completed in 2008 / 2009. The eastern limits of D00141 junctions with the western limits of D00140 (OPR-J977-TE-08). The southern limits of D00141 junctions with H11814 and H11815 (OPR-J977-TE-08). The survey also junctions with a small portion of D00142 (OPR-J977-TE-08) along the southeast boundary.

Five meter BASE surfaces were created for each survey in the area of overlap. CARIS Subset Editor was then used to analyze the difference between sounding values for each sheet at each survey junction. The soundings are in general agreement between the surveys. No adjustments are recommended based on the junction analysis.

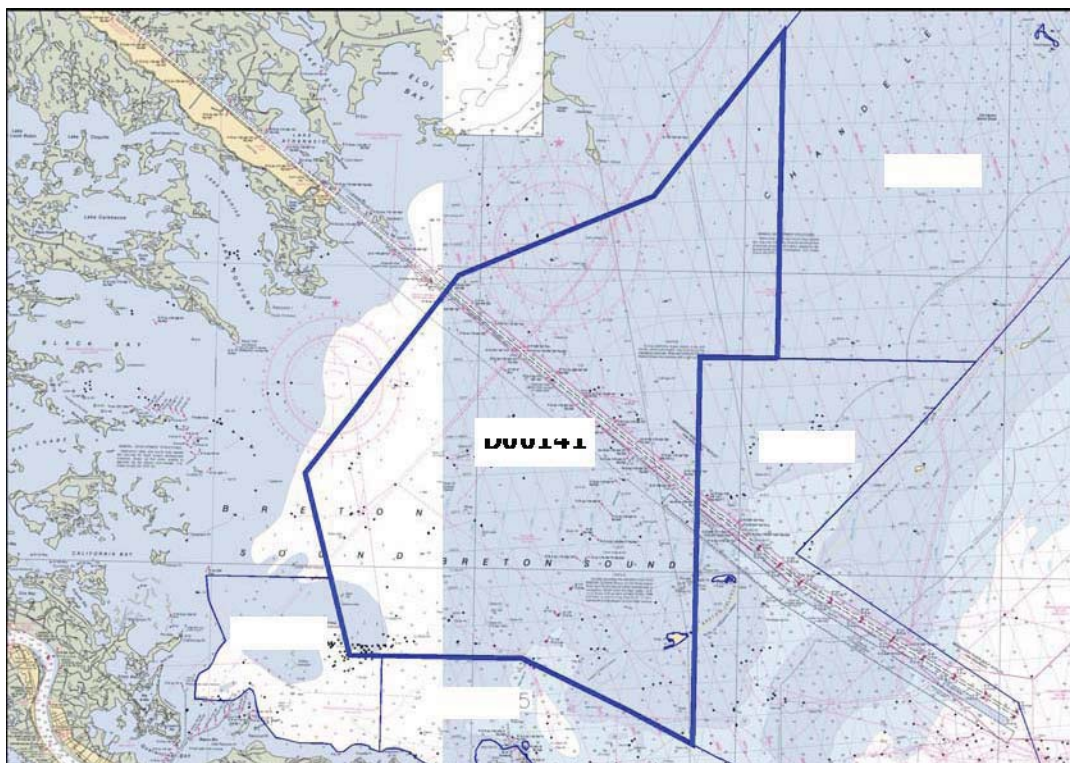


Figure 2 – Overview of survey area showing the junction locations of D00141 with D00140, D00142, H11814, and H11815 (OPR-J977-TE-08). Charts 11363, 41st Edition, June 2007 and 11364, 41st Edition, December 2005.

B.3. Corrections to Echo Soundings

Survey D00141 was performed in conjunction with five other surveys in Project OPRJ977-TE-08. Any change to the corrections to echo soundings affects all surveys in the area and is described in detail in the DAPR.

Sounding data were reduced using zoning provided by NOAA/CO-OPS under the SOW with final tides for the National Water Level Observation Network (NWLON) stations at Pilot Station East, LA (8760922) located at the Gulf of Mexico end of Southwest Pass, Bay Waveland Yacht Club, MS (8747437), Gulfport Harbor, MS (8745557) and one supplemental station established for this survey. The supplemental station, Olga Compressor Station, LA (8760889) was installed, maintained, and removed by TerraSond Ltd. in conjunction with survey operations conducted for OPR-J977-TE-08. Refer to the Horizontal and Vertical Control Report (HVCR) for tidal zoning methods and operations.

• *Concur.*

B.4. Data Processing

The final depth information for D00141 was submitted as a collection of CARIS BASE surfaces which best represented the seafloor at the time of the 2008 / 2009 survey. All possible measures were taken to ensure the data was correctly processed and the appropriate designated soundings,

representing the least depth of significant contacts, were selected and retained in the finalized surfaces.

Two digital products were submitted for the D00141. A CARIS BASE uncertainty surface, covering the entire survey area in which the finalized uncertainty was the greater of either the standard deviation of sounding values, or *a priori* uncertainty values, and a sun-illuminated Digital Terrain Model (DTM). The naming convention used for each grid was:

CARIS BASE Uncertainty Surface: D00141_5m.hns

- 5m represents the 5.0 m resolution

Sun-Illuminated Elevation DTM: D00141_5m.tif

- 5m represents the 5.0 m resolution

- *Concur with clarification. The field unit submitted *.hns files however, the submitted files will not be used for H-cell compilation because the *.hns does not include full data coverage.*

The Data Acquisition and Processing Report Paragraphs A: Equipment – Data Collection; and B: Quality Control contain detailed discussions of the steps followed when acquiring and processing the 2008 / 2009 survey data.

C. VERTICAL AND HORIZONTAL CONTROL

Sounding data were tide adjusted using final tide levels for National Water Level Observation Network (NWLON) stations at Pilot Station East, LA (8760922) located at the Gulf of Mexico end of Southwest Pass, Bay Waveland Yacht Club, MS (8747437), Gulfport Harbor, MS (8745557) and one supplemental station established at the historic USC&GS tide station site at Olga Compressor Station, Grand Bay, LA (876-0889) The final zoning methodology is described in detail in the project wide HVCR.

The horizontal control datum used for this survey is the North American Datum of 1983 (NAD 83). The projection used was UTM, Zone 16 North.

Sounding position control was determined using a Differential Global Positioning System (DGPS). The primary source of navigation correctors was the United States Coast Guard DGPS station at English Turn, LA, StaID 292. Correctors from the USCG differential DGPS station at Mobile Point, AL, StaID 300, were used when the English Turn station was unavailable. A summary of weekly DGPS confidence checks is provided in Separates I: Acquisition and Processing Logs included with this report. *Concur.*

D. RESULTS AND RECOMMENDATIONS *See Also Evaluation Report*

D.1. Chart Comparison

The chart comparison for D00141 was performed by examining all raster navigational charts (RNC) and electronic navigation charts (ENC) covering the survey area and comparing charted depths with surveyed depths at the same location. CARIS HIPS was used to create 5 meter resolution soundings from the survey data which were used as a foreground layer with the RNC or ENC in the background. Each charted depth was compared with the 2008 / 2009 survey soundings at, or closest to, the same location. The RNC / ENC depth and the shoalest corresponding 2008 / 2009 survey sounding was then analyzed to determine trends. All depths were recorded in feet and, where the survey depth was deeper or shallower than the charted depth by a factor greater than or equal to 10% of the water depth, the position, charted depth, survey depth and an image showing the depths being compared were included in Appendix V: SUPPLEMENTAL RECORDS AND CORRESPONDENCE.

Local Notice to Mariners (LNM) updates were applied to all RNC's and ENC's during the survey of D00141 to ensure the field observations represented the most current published information available. LNM number 08-08-2009 dated February 26, 2009 was the last LNM reviewed for this project.

There were Five (5) features submitted as Dangers to Navigation (DTON) for the 2008 / 2009 survey. A copy of each DTON is included in Appendix I: DANGER TO NAVIGATION REPORTS.

All survey data were compared to the data published in the RNC's listed in Table 3 and the ENC's listed in Table 4. Figure 3 and Figure 4 show the survey limits with respect to the RNC and ENC used for chart comparison.

Table 3 - Raster Navigational Chart used during chart comparisons.

Chart	Scale	Edition Number	Issue Date
11353	1:40,000	5	January 2008
11363	1:80,000	41	June 2007
11364	1:80,000	42	September 2007



Table 4 -Electronic Navigation Chart used during chart comparisons.

Cell Name	Chart	Scale	Edition Number	Issue Date
US4LA34M	11363	1:80,000	1	June 18, 2008
US4LA35M	11364	1:80,000	23	May 29, 2008
US5LA24M	11353	1:40,000	24	June 3, 2008

All charted features were investigated visually and with a vertical beam echosounder as appropriate. High levels of turbidity and biomass limited visibility in the water column to a few inches in the southern portion of D00141 to approximately one foot in the northern portion and the ability to visually examine features in the water was significantly reduced, even in very shallow water.

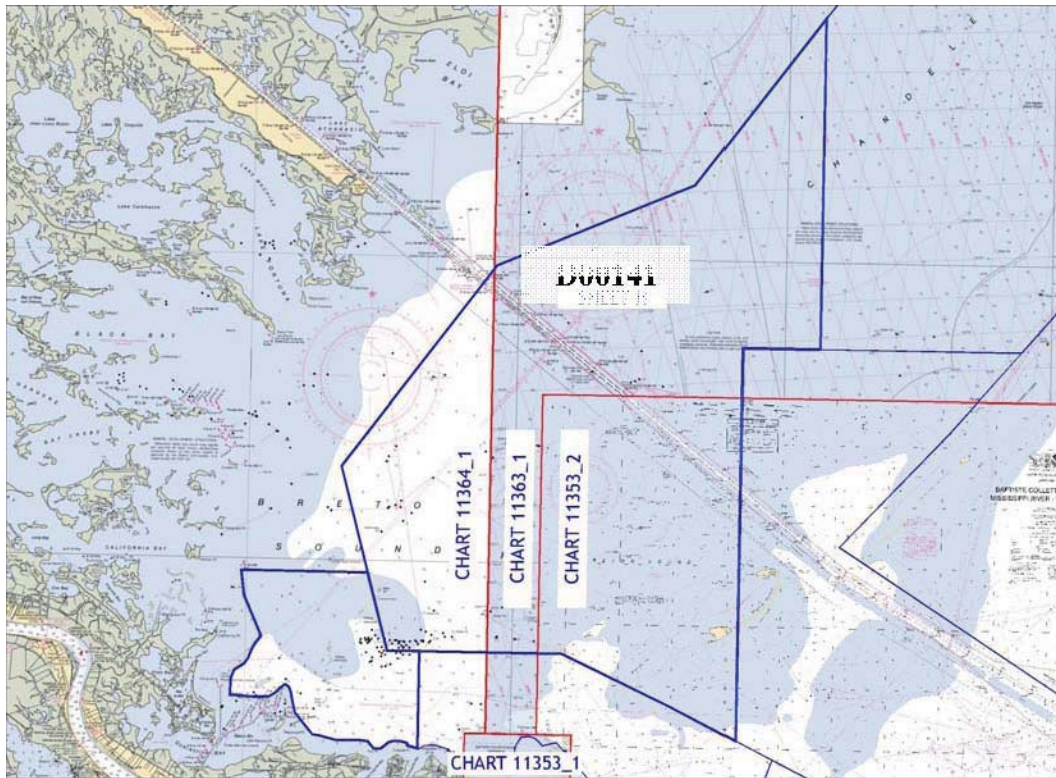


Figure 3- Survey limits of D00141 shown with raster navigational charts 11353, 5th Edition, 11363, 41st Edition and 11364, 42nd Edition.

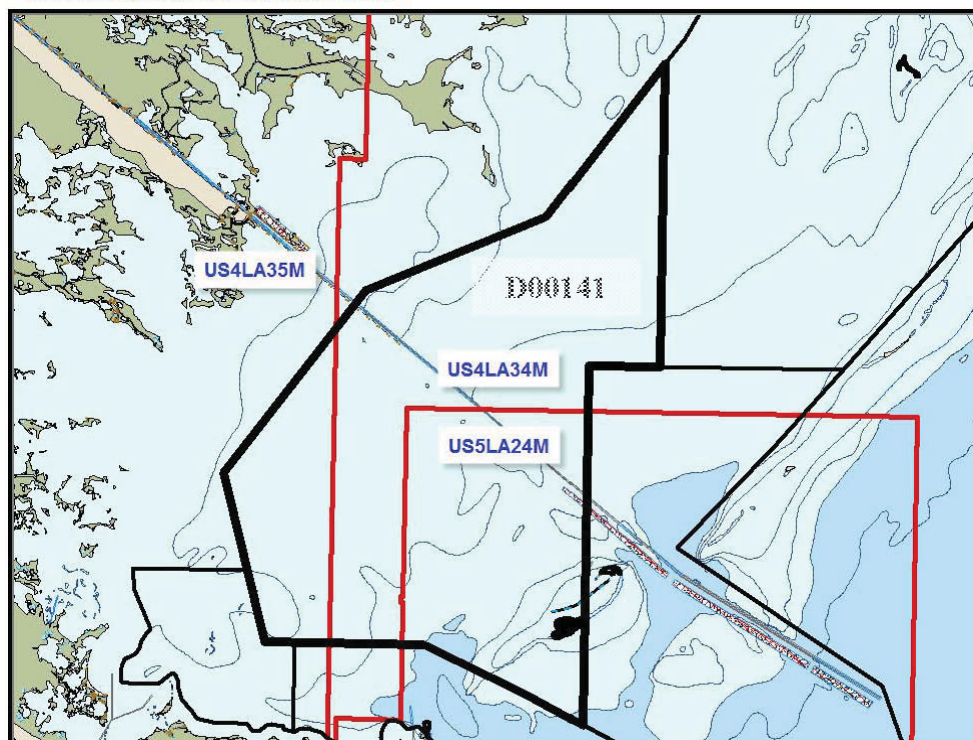


Figure 4- Survey limits of D00141 shown with electronic navigation chart US4LA34M, 1st Edition, US4LA35M, 23rd Edition and US5LA24M, 24th Edition.

The 2008 / 2009 survey data differ significantly from the depths depicted on RNC and ENC covering D00140. Discrepancies between the referenced charts and the 2008 / 2009 survey data are detailed in paragraphs D.1.1 through D.1.5.

D.1.1. New Features

The 2008 survey identified three (3) features which are not currently charted. A detailed description of these features is contained in Table 5 and shown in Figure 5 and Figure 6. The hydrographer recommends updating the charts with data from the 2008 survey.

Table 5 - Detailed description of the uncharted feature shown in Error! Reference source not found. and Figure 6 positioned during OPR J977-TE-08 survey in D00141.

Feature ¹	Latitude (N)	Longitude (W)	Least Depth	Description
H1	29° 27' 09.21"	89° 24' 12.11"	Always exposed	Piling
H2	29° 36' 31.53"	89° 19' 15.12"	Always exposed	Piling. DTON submitted.

H3	29° 34' 34.47"	89° 15' 53.39"	Always exposed	Wreck / Obstruction. DTON submitted.
H4	29° 35' 34.00"	89° 17' 46.00"	3.1 m	Obstruction. DTON submitted.

¹Feature designator corresponds to the identification number used in the master contact file (APPENDIX V: SUPPLEMENTAL RECORDS AND CORRESPONDENCE: D.1. CHART COMPARISON).

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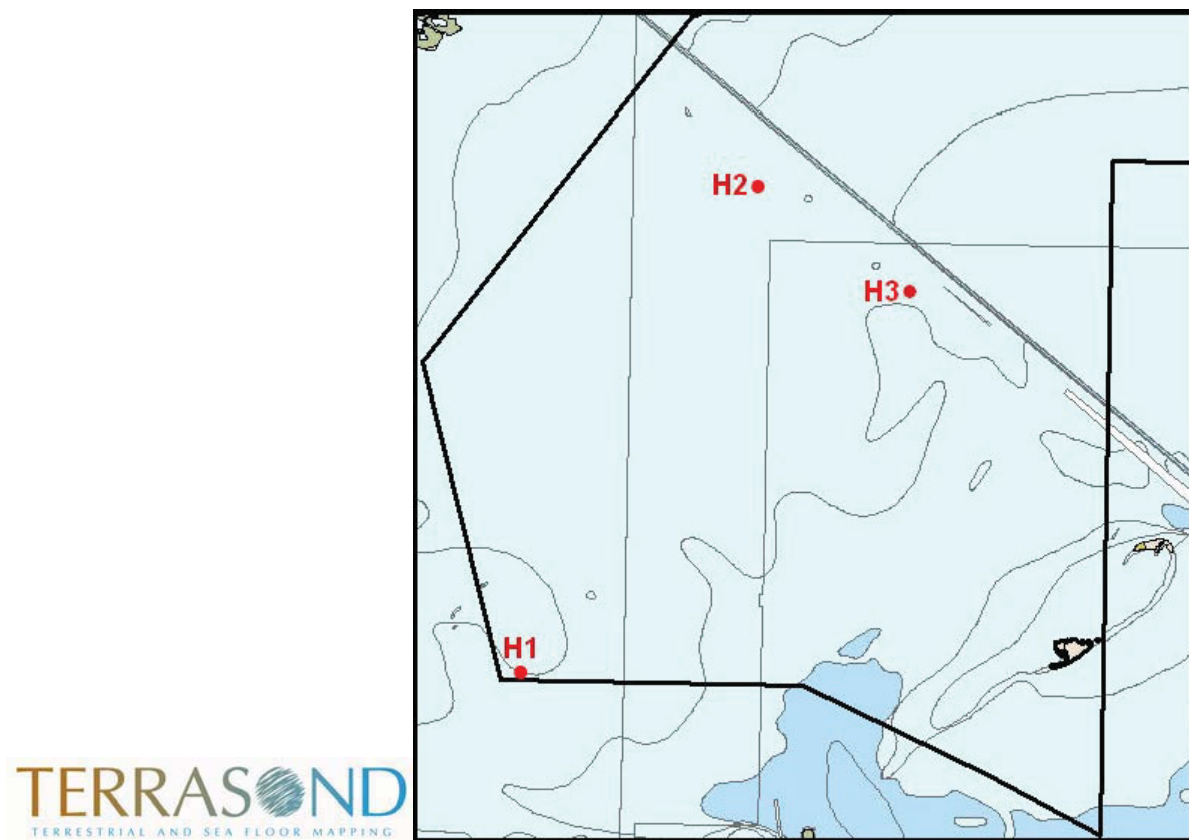


Figure 5 - Overview of D00141 showing the location of uncharted features. ENC US5LA24M, 24th Edition.

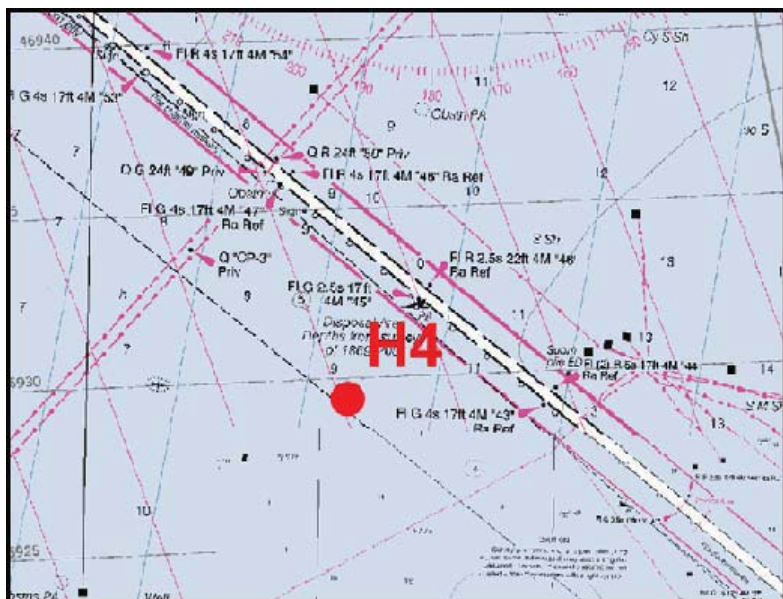


Figure 6 - Detail of vicinity of obstruction adjacent to the Mississippi River Gulf Outlet. Chart 11363, 41st Edition. Depths in feet.

The hydrographer recommends that the charts listed in Table 6 be updated to include the features, listed in Table 5, positioned during the 2008 / 2009 survey.



TerraSond Ltd. *Concur.*

Table 6 - Nautical charts, raster and electronic, which require updating to include the uncharted features.

Chart Number	Scale	Edition Number	Edition Date
11653	1:40,000	5	January 2008
11363	1:80,000	41	June 2007
11364	1:80,000	42	September 2007

ENC	Chart	Scale	Edition Number	Issue Date
US4LA34M	11363	1:80,000	1	June 18, 2008
US4LA35M	11364	1:80,000	23	May 29, 2008
US5LA24M	11353	1:40,000	24	June 3, 2008

D.1.2. Changed Features

There were no charted features in D00141 that are recommended to be changed. *Do not concur. The Breton Island shoreline has changed significantly since the last nautical chart update. It is recommended that the shoreline be updated to reflect the current shoreline.*

D.1.3. Disproved Features

33 features, which appear on the charts within the boundaries of D00141 were searched for but not found during the 2008 / 2009 survey. The locations of these features are shown in Figure 7 and a detailed description of the features is contained in Table 7.

Table 7 - Detailed description of charted features shown in Figure 7 searched for but not found during OPR J977-TE-08 survey in D00141.

Feature ¹	Latitude (N)	Longitude (W)	Description	Remarks
H1	29° 40' 16.49"	89° 17' 17.09"	Wreck awash PA	Searched for visually. Not found during 2008 / 2009 Survey.
H2	29° 38' 58.53"	89° 12' 56.58"	Wreck awash PA	Searched for visually. Not found during 2008 / 2009 Survey.
H3	29° 36' 01.00"	89° 23' 07.00"	Wreck awash PA	Searched for visually. Not found during 2008 / 2009 Survey.
H4	29° 36' 18.00"	89° 17' 12.00"	Wreck awash PA	Searched for visually. Not found during 2008 / 2009 Survey.



Feature ¹	Latitude (N)	Longitude (W)	Description	Remarks
H5	29° 34' 48.03"	89° 15' 24.18"	Wreck awash PA	Searched for visually. Not found during 2008 / 2009 Survey.
H6	29° 33' 01.00"	89° 14' 22.80"	Wreck awash PA	Searched for visually. Not found during 2008 / 2009 Survey.

H7	29° 29' 01.98"	89° 25' 00.16"	Wreck awash PA	Searched for visually. Not found during 2008 / 2009 Survey.
H8	29° 28' 36.04"	89° 19' 00.13"	Wreck awash PA	Searched for visually. Not found during 2008 / 2009 Survey.
H9	29° 27' 31.00"	89° 12' 30.66"	Wreck awash PA	Searched for visually. Not found during 2008 / 2009 Survey.
H10	29° 36' 19.02"	89° 13' 14.34"	Wreck REP	Not visible on surface. Not investigated.
H11	29° 34' 43.76"	89° 15' 54.11"	Wreck PA	Not visible on surface. Not investigated.
H12	29° 35' 39.67"	89° 19' 23.55"	Wreck PA	Not visible on surface. Not investigated.
H13	29° 33' 59.94"	89° 17' 30.13"	Wreck PD	Not visible on surface. Not investigated.
H14	29° 35' 18.07"	89° 14' 13.22"	Wreck PA	Not visible on surface. Not investigated.
H15	29° 33' 03.05"	89° 12' 32.99"	Wreck PA	Not visible on surface. Not investigated.
H16	29° 32' 00.25"	89° 13' 59.16"	Wreck PA	Not visible on surface. Not investigated.
H17	29° 31' 35.35"	89° 13' 43.37"	Wreck PD	Not visible on surface. Not investigated.
H18	29° 38' 31.91"	89° 16' 00.56"	Wreck PA	Not visible on surface. Not investigated.



Feature1	Latitude (N)	Longitude (W)	Description	Remarks
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H19	29° 33' 30.04"	89° 18' 30.06"	Wreck PA	Not visible on surface. Not investigated.
H20	29° 30' 26.64"	89° 21' 57.90"	Wreck ED	Not visible on surface. Not investigated.
H21	29° 28' 18.00"	89° 21' 06.00"	Wreck PA	Not visible on surface. Not investigated.
H22	29° 28' 22.00"	89° 20' 50.00"	Wreck PA	Not visible on surface. Not investigated.
H23	29° 28' 48.00"	89° 14' 13.00"	Wreck PA	Not visible on surface. Not investigated.
H24	29° 32' 30.50"	89° 22' 06.48"	Pipe	Not visible on surface. Not investigated.
H25	29° 30' 47.00"	89° 14' 46.00"	Piling PA	Searched for visually. Not found during 2008 / 2009 Survey.
H26	29° 31' 52.20"	89° 20' 28.20"	Piling PA	Searched for visually. Not found during 2008 / 2009 Survey.
H27	29° 26' 58.00"	89° 16' 14.00"	Piling PA	Searched for visually. Not found during 2008 / 2009 Survey.
H28	29° 29' 42.17"	89° 20' 54.19"	Piles, PA	Searched for visually. Not found during 2008 / 2009 Survey.
H29	29° 31' 00.57"	89° 24' 58.71"	Submerged piles PA	Not visible on surface. Not investigated.
H30	29° 35' 48.00"	89° 15' 54.00"	Submerged pile ED	Not visible on surface. Not investigated.
H31	29° 41' 02.10"	89° 15' 11.06"	Piling PA	Searched for visually. Not found during 2008 / 2009 Survey.

Feature ¹	Latitude (N)	Longitude (W)	Description	Remarks
H32	29° 31' 01.56"	89° 12' 59.36"	Piling rep PA	Searched for visually. Not found during 2008 / 2009 Survey.
H33	29° 31' 36.74"	89° 13' 41.40"	Pipe rep PA	Not visible on surface. Not investigated.

¹Feature designator corresponds to the identification number used in the master contact file (APPENDIX V: SUPPLEMENTAL RECORDS AND CORRESPONDENCE: D.1. CHART COMPARISON).

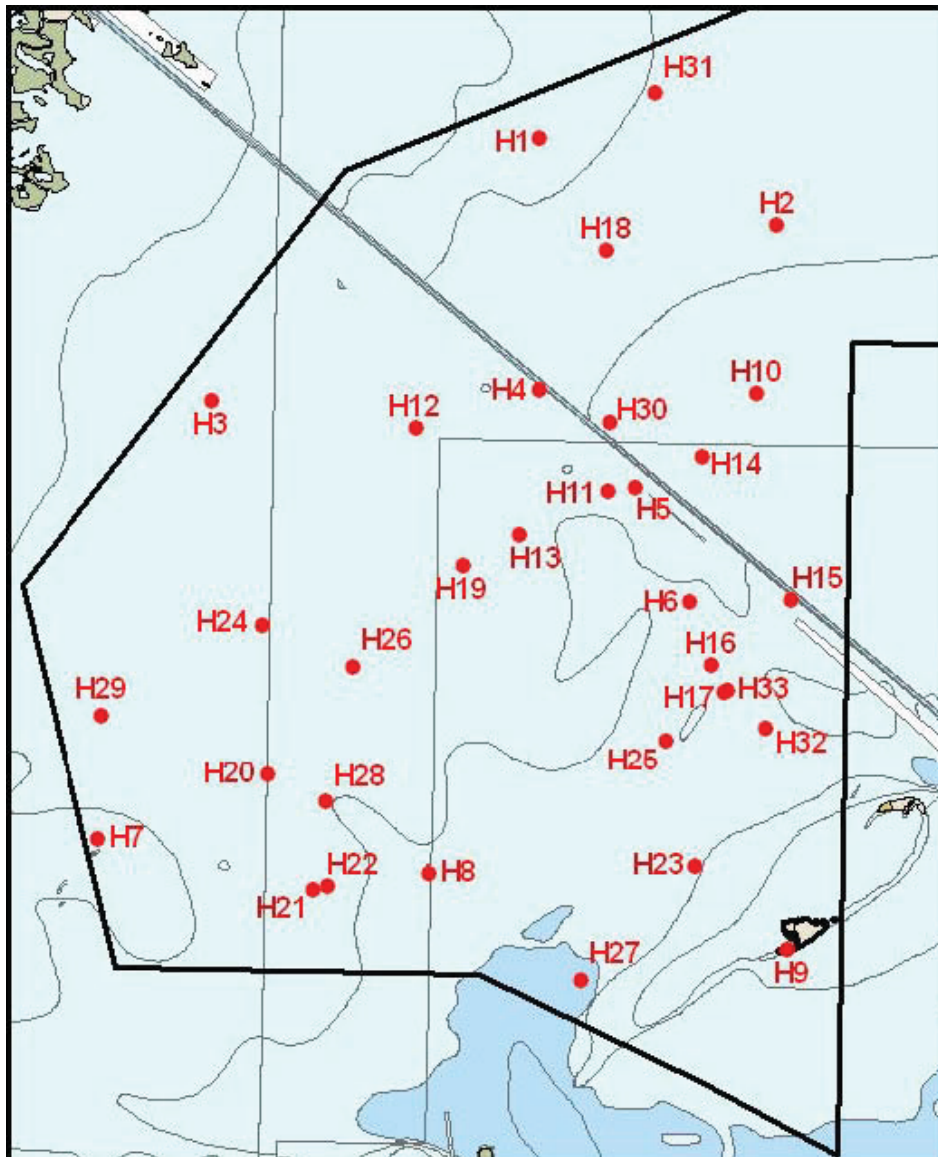


Figure 7 - Charted features located in D00141 which were searched for but not found during OPRJ977-TE-08. ENC US5LA24M, 24th Edition.



It is important to note that, due to the limited tasking specified in the SOW for this survey, the field procedure used to investigate charted features was limited to a visual surface search only. Many of the features investigated were depicted on the chart as subsurface in nature and would not have been visible during the investigation.

A complete listing of all features investigated in D00141 is provided in APPENDIX V: SUPPLEMENTAL RECORDS AND CORRESPONDENCE: D.1. CHART COMPARISON

Due to the limited nature of the investigation performed to search for charted features in D00141, the hydrographer does not recommend that the features listed as “searched for but not found” in Table 7 be removed from RNC’s 11353, 5th Edition, 11363, 41st Edition and 11364, 42nd Edition and ENC’s US4LA34M, 1st Edition, US4LA35M, 23rd Edition. Additional field investigation with appropriate survey tools (side scan sonar) will be necessary to conclusively determine the status of these features. *Concur, due to limited data it not recommend to prove or disprove any features.*

D.1.4. Soundings

The 2008 / 2009 survey depths differ significantly from the depths depicted on the RNC’s and ENC’s covering D00141. The charted depths selected for comparison with the survey data were those which were located in close proximity to the survey lines. The result of this comparison is summarized in Table 8. A complete listing of all charted and survey depths used in this comparison is located in Appendix V: SUPPLEMENTAL RECORDS AND CORRESPONDENCE: D.1.4. SOUNDINGS.

Table 8 - Summary of charted depths compared with surveyed depths.

Chart	Total Depths Compared ¹	Chart Shoaler than Survey	Chart Deeper than Survey
11353	21	14 (67%)	7 (33%)
11363	38	34 (89%)	4 (11%)
11364	15	14 (93%)	1 (7%)
US4LA34M	15	14 (93%)	1 (7%)
US4LA35M	12	11 (92%)	1 (8%)
US5LA24M	16	13 (81%)	3 (19%)

¹This includes only the charted depths which varied from the survey data by $\geq 10\%$ of the water depth.

Although the hydrographer would normally recommend that the charts be updated to reflect the 2008 / 2009 survey data, the 1000 meter minimum line spacing specified by the SOW for OPR-J977-TE-08 does not provide sufficient sounding density to disprove shoal soundings depicted on the charts where the survey depths are deeper than the charted depths. The hydrographer recommends updating the RNC and ENC to reflect the 2008 / 2009 survey data only for those areas where the survey depths are shoaler than the charted depths.



D.1.5. Trends and Changeable Areas

The 2008 / 2009 survey contours were compared with the charted contours in D00140. The charts used for this comparison included raster navigational charts 11353, 5th Edition, dated January 2008, 11363, 41st Edition, dated June 2007, 11364, 42nd Edition, dated September 2007, electronic navigation charts US4LA34M, 1st Edition, dated June 18, 2008, US4LA35M, 23rd Edition, dated May 29, 2008 and US5LA24M, 24th Edition, dated June 3, 2008. Figures 1 through 6 in Appendix V: SUPPLEMENTAL RECORDS AND CORRESPONDENCE: D.1.5 CONTOURS show the survey data with the respective charts used during the comparison.

Although few charted contours cross D00141, the contours present tend to differ significantly from the contours generated from the 2008 / 2009 survey data. D00141 is located in a very dynamic coastal environment which is subject to significant erosion, deposition and along-shore sediment transportation on a recurring, short-term, basis. Local watermen have reported changes in the bathymetric and surface feature character of Chandeleur Sound with each hurricane that has impacted the area in the past 25 years.

In very general terms, the depth contours produced by the 2009 / 2009 survey trend in a northeast to southwest direction, parallel to the shoreline, and the depths tend to be deeper than the depths shown on the chart. Although the hydrographer would normally recommend that the charts be updated to reflect the 2008 / 2009 survey data, the 1000 meter minimum line spacing specified by the SOW for OPR-J977-TE-08 does not provide sufficient sounding density in D00141 to conclusively define the bathymetric contours. *Concur.*

D.1.6. AWOIS Items Summary

Investigation of Automated Wreck and Obstruction Information System (AWOIS) items was not required under this task order.

The online AWOIS data base (<http://www.nauticalcharts.noaa.gov/hsd/awois.html>) was examined and one AWOIS record was found with a reported position within the survey boundaries.

Table 9 - AWOIS items located in D00141.

AWOIS Record	Latitude	Longitude	Comments
415	29° 37' 12.74" N	089° 18' 24.17" W	Charted obstruction
420	29° 38' 30.74" N	089° 16' 00.17" W	Charted Wreckage PA

Refer to Appendix II: SURVEY FEATURE REPORT for the AWOIS item investigation report and associated graphics files.

- *Concur. AWOIS item 420 and 415 were within the survey area. Due to limited data, both AWOIS items will be retained as charted.*

D.2. Additional Results

D.2.1. Aids to Navigation

There are 32 floating and non-floating aids to navigation (ATON) appearing on charts 11353, 5th edition, dated June 2007, 11364, 42nd Edition, dated September 2007 and Electronic Navigation Charts (ENC).

US4LA34M, updated May 2008, US4LA35M, updated May 2008 and US5LA24M updated June 2008 located in D00141. 24 of the ATON's were verified as charted and 8 were searched for but not found.

A complete listing of the ATON's in D00140 is included in "Appendix V: AIDS TO NAVIGATION" *Appended to this report.*

D.2.2. Drilling Structures

115 oil and gas related structures were shown on the charts within the boundaries of D00141. All structures were positioned using DGPS in conjunction with CARIS Notebook. 82 charted structure positions were verified as charted. 33 charted structures were searched for but not found. 79 uncharted structures were positioned as "new" features.

Refer to Appendix II: SURVEY FEATURE REPORT for a tabular listing of all oil and gas related structures in D00141 and their associated graphics files. *Appended to this report.*

D.2.3. Comparison with Prior Surveys

A comparison with prior surveys was not required under this task order. *Concur.*

D.2.4. Bottom Samples

40 bottom samples were collected in D00141. The samples were distributed geographically to obtain a full representation of the bottom characteristics as specified in “NOAA Hydrographic Surveys Specifications and Deliverables”, Section 7.1 as modified by the SOW. *Eqpewt0*

Refer to Appendix V: SUPPLEMENTAL RECORDS AND CORRESPONDENCE for a tabular listing and description of all bottom samples collected in D00141. *Crrgpfgf 'w'j kú'tgr qt w0*

D.2.5. Bridges and Overhead Cables

There are no bridges or overhead cables in the survey area. *Eqpewt0'*

D.2.6. Submarine Cables and Pipelines

Numerous submarine pipelines, active and abandoned, crisscross the survey area. These pipelines connect wellheads, production and distribution platforms, compressor stations and extend to the shore. Specific identification of individual pipelines was not pursued during OPR-



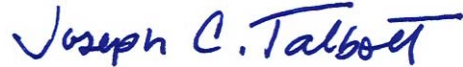
LETTER OF APPROVAL

REGISTRY NO. D00141

This report and the accompanying digital data are respectfully submitted.

Field operations contributing to the accomplishment of survey D00141 were conducted under my direct supervision with frequent personal checks of progress and adequacy. This report, digital data, and accompanying records have been closely reviewed and are considered complete and adequate as per the Statement of Work. Other reports submitted with this survey include the Data Acquisition and Processing Report and the Horizontal and Vertical Control Report.

I believe this survey is complete and adequate for its intended purpose.



Joseph C. Talbott, Lead Hydrographer
TerraSond Ltd.

Date April 28, 2009



APPENDIX I

Danger To Navigation Reports

REPORT OF DANGER TO NAVIGATION

Hydrographic Survey Registry Number: D00141

Survey Title: State: Louisiana
Locality: Chandeleur and Breton Sound
Sublocality: Southern Chandeleur and Western Breton Sound

Project Number: OPR-J977_TE-08
Survey dates: June 22, 2008 - Present
Survey Danger Acquisition Date and Time: July 5, 2008; 1349UTC

Feature is reduced to Mean Lower Low Water using predicted NOAA tides and positioned on NAD 83.

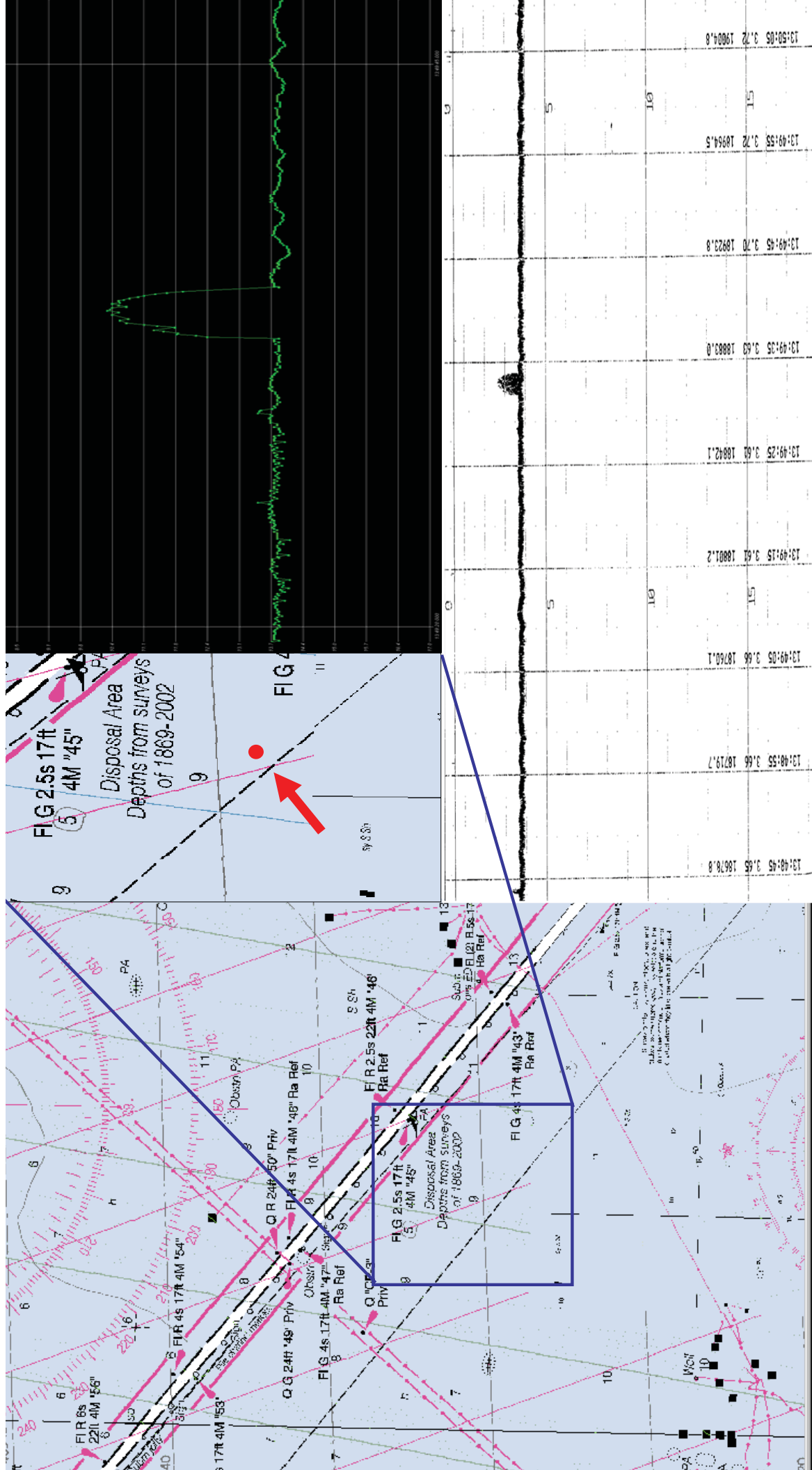
Chart affected: 11363 41st Edition/June 1, 2007, scale 1:80,000, NAD 83

DANGER TO NAVIGATION

FEATURE	DEPTH (FT)	LATITUDE (N)	LONGITUDE (W)
Obstruction	10.4	29/35/34	89/17/46

Questions concerning this report should be directed to Terrasond (907) 745-7215.


Concur with clarification. This DToN is the result of a report submitted by the field unit before the final tides were applied to the data. The office verified that final tides were applied and generated a grid. The shoal layer was then extracted from the grid. The resulting depth value for the DToN is 8.573 ft.

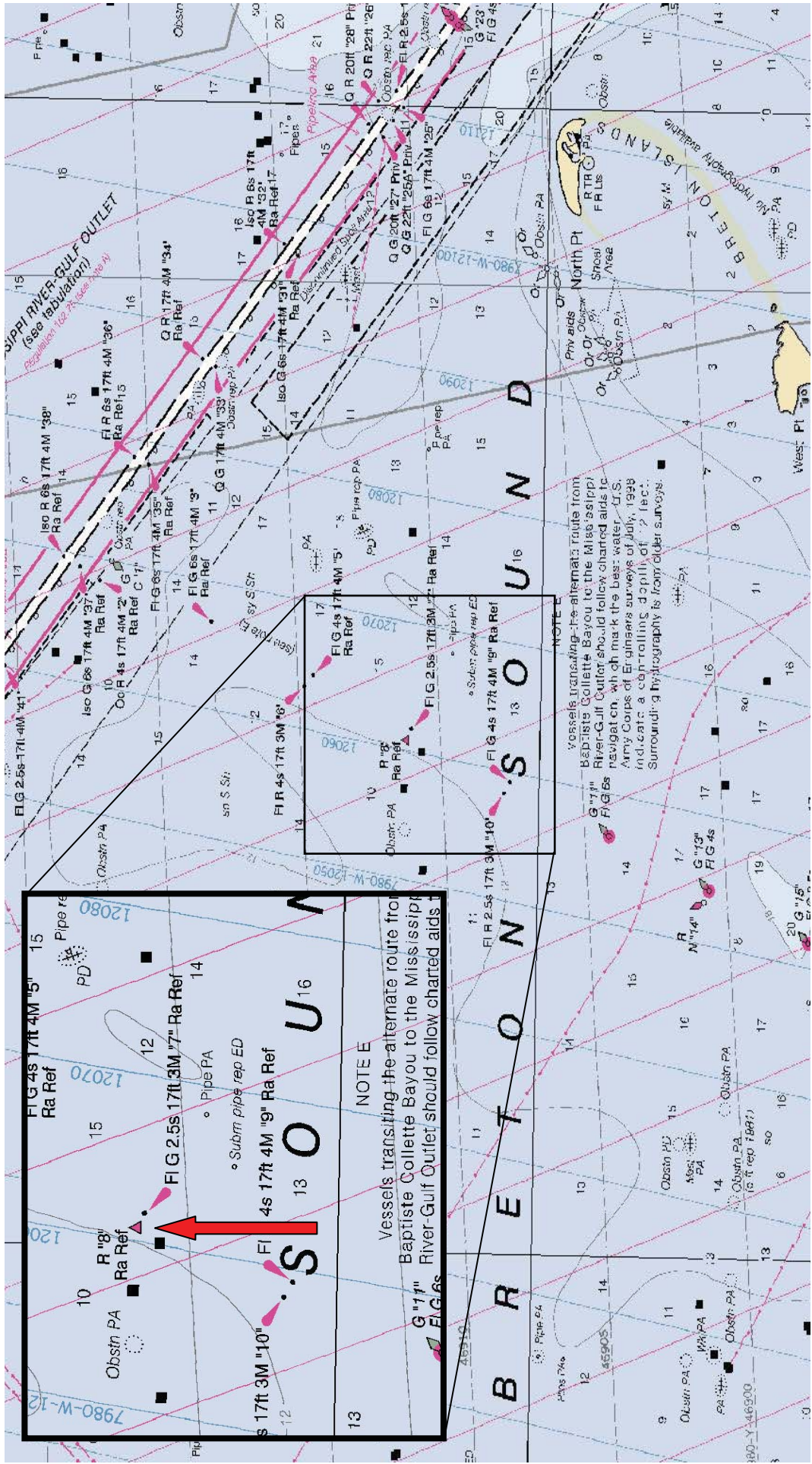


Uncharted Obstruction with 10.4 ft least depth.

NOT FOR NAVIGATION


Chartlet 1 of 1 Sheet H

	<p>Project: OPR-J977-TE-08 Survey: D00141 State: Louisiana Locality: Chandealeur & Breton Sound Sub-locality: Western Breton Sound Survey Scale: 1:80,000</p>	<p>Sounding Units: Feet Sounding Datum: MLLW Horizontal Datum: NAD 83 Projection: UTM 16N Central Meridian: 093° 00 00 Scale Factor: 0.9996</p>	<p>M/V Thomas Dowell Acquisition Date: July 5, 2008</p>
---	---	---	---



Breton Sound Channel Daybeacon #8 and USCG LNM 37/08 (TRUB) missing, not found in visual search.

Chartlet 1 of 1 Sheet E

 <p>Project: OPR-J977-TE-08 Survey: D00141 State: Louisiana Locality: Breton Sound Sub-locality: West Breton Sound Survey Scale: 1:40,000</p>	<p>Sounding Units: Feet Sounding Datum: MLLW Horizontal Datum: NAD 83 Projection: UTM 16N Central Meridian: 153° 00' 00.00W Scale Factor: 0.9996</p>	<p>R/V Thomas Dowell</p> <p>September 29, 2008</p>
--	--	--

REPORT OF DANGER TO NAVIGATION

Hydrographic Survey Registry Number: D00141

Survey Title: State: Louisiana
Locality: Chandeleur and Breton Sound
Sublocality: West Breton Sound Channel

Project Number: OPR-J977_TE-08
Survey dates: June 22, 2008 - Present
Survey Danger Acquisition Date and Time: September 29, 2008; 1453 UTC

Chart affected: 11363 41st Edition/June 1, 2007, scale 1:80,000, NAD 83

DANGER TO NAVIGATION

FEATURE	DEPTH (FT)	LATITUDE (N)	LONGITUDE (W)
Breton Sound Channel			
Daybeacon #8	N/A	29/31/11	89/12/32

The Breton Sound Channel Daybeacon #8 is missing. Note: ATON was reported in USCG LNM 37/08. Daybeacon reported as (TRUB) Temporarily Replaced in by Unlighted Buoy. The Buoy was not found in the visual search which was conducted on September 29, 2008 at 1453 UTC. No data was collected.

Questions concerning this report should be directed to Terrasond (907) 745-7215.

Concur.

D00141 DtoN #4

Registry Number: D00141
State: Louisiana
Locality: Chandeleur and Breton Sound
Sub-locality: Southern Chandeleur, Western Breton Sounds
Project Number: OPR-J977-TE-08
Survey Date: 01/31/2009

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
11363	41st	06/01/2007	1:80,000 (11363_1)	USCG LNM: 02/03/2009 (02/03/2009) NGA NTM: 11/12/2005 (02/07/2009)
11366	11th	01/01/2008	1:250,000 (11366_1)	[L]NTM: ?
11360	42nd	02/01/2007	1:456,394 (11360_1)	[L]NTM: ?
1115A	42nd	02/01/2007	1:456,394 (1115A_1)	[L]NTM: ?
11340	72nd	07/01/2007	1:458,596 (11340_1)	[L]NTM: ?
1116A	72nd	07/01/2007	1:458,596 (1116A_1)	[L]NTM: ?
11006	32nd	08/01/2005	1:875,000 (11006_1)	[L]NTM: ?
411	52nd	09/01/2007	1:2,160,000 (411_1)	[L]NTM: ?

* Correction(s) - source: last correction applied (last correction reviewed--"cleared date")

Features

No.	Name	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	Pile	GP	0.00 m	29° 36' 31.0" N	089° 19' 15.0" W	---

1 - Danger To Navigation

1.1) GP No. - 1 from D00141 DtoN#4.xls**DANGER TO NAVIGATION****Survey Summary**

Survey Position: 29° 36' 31.0" N, 089° 19' 15.0" W
Least Depth: 0.00 m (= 0.00 ft = 0.000 fm = 0 fm 0.00 ft)
TPU ($\pm 1.96\sigma$): **THU (TPEh)** [None] ; **TVU (TPEv)** [None]
Timestamp: 2009-031.18:56:00.000 (01/31/2009)
GP Dataset: D00141 DtoN#4.xls
GP No.: 1
Charts Affected: 11363_1, 11366_1, 1115A_1, 11360_1, 1116A_1, 11340_1, 11006_1, 411_1

Remarks:

Pile is located 5900 ft southwest of Mississippi River Gulf Outlet Light #49.

Feature Correlation

Address	Feature	Range	Azimuth	Status
D00141 DtoN#4.xls	1	0.00	000.0	Primary

Hydrographer Recommendations

Recommend submitting to MCD as a DtoN. Chart exposed pile, height unknown at surveyed location.

Cartographically-Rounded Depth (Affected Charts):

0ft (11363_1)

0fm (1115A_1, 11360_1, 1116A_1, 11340_1, 11006_1, 411_1)

0fm 0ft (11366_1)

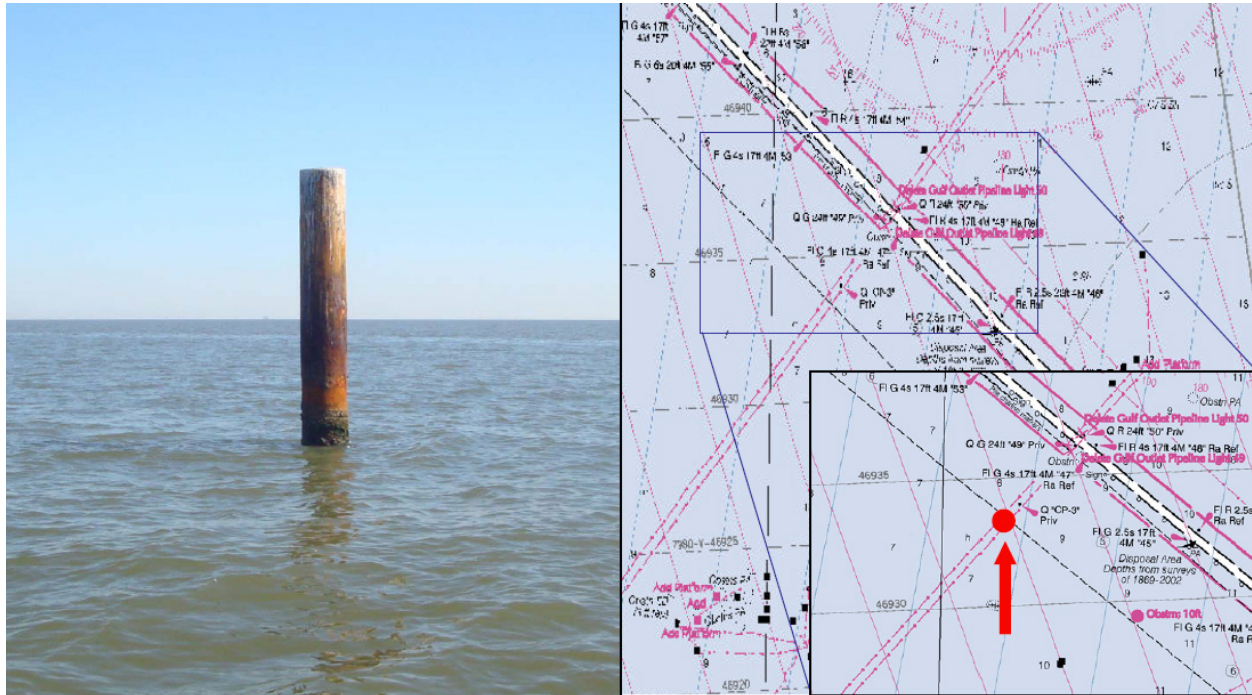
S-57 Data

Geo object 1: Pile (PILPNT)
Attributes: CATPLE - 3:post
 CONVIS - 1:visual conspicuous
 SORDAT - 20090131
 SORIND - US,US,SURVY,D00141

Office Notes

This submission is preliminary. No data has been provided to AHB for verification. Feature will be reviewed and verified once the survey data has been submitted.

Feature Images



Pile located 5900 ft southwest of Mississippi River Gulf Outlet Light #49.

Figure 1.1.1

D00141 DtoN #5

Registry Number: D00141
State: Louisiana
Locality: Chandeleur and Breton Sound
Sub-locality: Southern Chandeleur, Western Breton Sounds
Project Number: OPR-J977-TE-08
Survey Date: 01/31/2009

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
11353	5th	01/01/2008	1:40,000 (11353_2)	[L]NTM: ?
11363	41st	06/01/2007	1:80,000 (11363_1)	USCG LNM: 02/03/2009 (02/03/2009) NGA NTM: 11/12/2005 (02/07/2009)
11366	11th	01/01/2008	1:250,000 (11366_1)	[L]NTM: ?
11360	42nd	02/01/2007	1:456,394 (11360_1)	[L]NTM: ?
1115A	42nd	02/01/2007	1:456,394 (1115A_1)	[L]NTM: ?
11340	72nd	07/01/2007	1:458,596 (11340_1)	[L]NTM: ?
1116A	72nd	07/01/2007	1:458,596 (1116A_1)	[L]NTM: ?
11006	32nd	08/01/2005	1:875,000 (11006_1)	[L]NTM: ?
411	52nd	09/01/2007	1:2,160,000 (411_1)	[L]NTM: ?

* Correction(s) - *source: last correction applied (last correction reviewed--"cleared date")*

Features

No.	Name	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	Exposed Wreck (-5ft)	Wreck	-1.52 m	29° 34' 34.5" N	089° 15' 53.4" W	---

1 - Danger To Navigation

1.1) GP No. - 1 from D00141_DtoN#5.xls**DANGER TO NAVIGATION****Survey Summary**

Survey Position: 29° 34' 34.5" N, 089° 15' 53.4" W
Least Depth: -1.52 m (= -5.00 ft = -0.833 fm = 0 fm 1.00 ft)
TPU ($\pm 1.96\sigma$): **THU (TPEh)** [None] ; **TVU (TPEv)** [None]
Timestamp: 2009-031.16:28:00.000 (01/31/2009)
GP Dataset: D00141_DtoN#5.xls
GP No.: 1
Charts Affected: 11353_2, 11363_1, 11366_1, 1115A_1, 11360_1, 1116A_1, 11340_1, 11006_1, 411_1

Remarks:

Wreck is located 4900 ft west of Mississippi River Gulf Outlet Beacon # 41. The wreck height is 5 feet.

Feature Correlation

Address	Feature	Range	Azimuth	Status
D00141_DtoN#5.xls	1	0.00	000.0	Primary

Hydrographer Recommendations

Recommend charting an exposed wreck (-5ft) above mean high water.

Cartographically-Rounded Depth (Affected Charts):

-5ft (11353_2, 11363_1)

0 $\frac{3}{4}$ fm (1115A_1, 11360_1, 1116A_1, 11340_1, 11006_1, 411_1)

0fm 5ft (11366_1)

S-57 Data

Geo object 1: Wreck (WRECKS)
Attributes: CATWRK - 2:dangerous wreck
 CONVIS - 1:visual conspicuous
 HEIGHT - -1.5239 m
 INFORM - visually identified

OBJNAM - Exposed Wreck
QUASOU - 9:value reported (not confirmed)
SORDAT - 20090131
SORIND - US,US,survy,D00141
VALSOU - -1.5239 m
VERDAT - 16:Mean high water
WATLEV - 2:always dry

Office Notes

This submission is preliminary. No data has been provided to AHB for verification. Feature will be reviewed and verified once the survey data has been submitted.

Feature Images



Figure 1.1.1

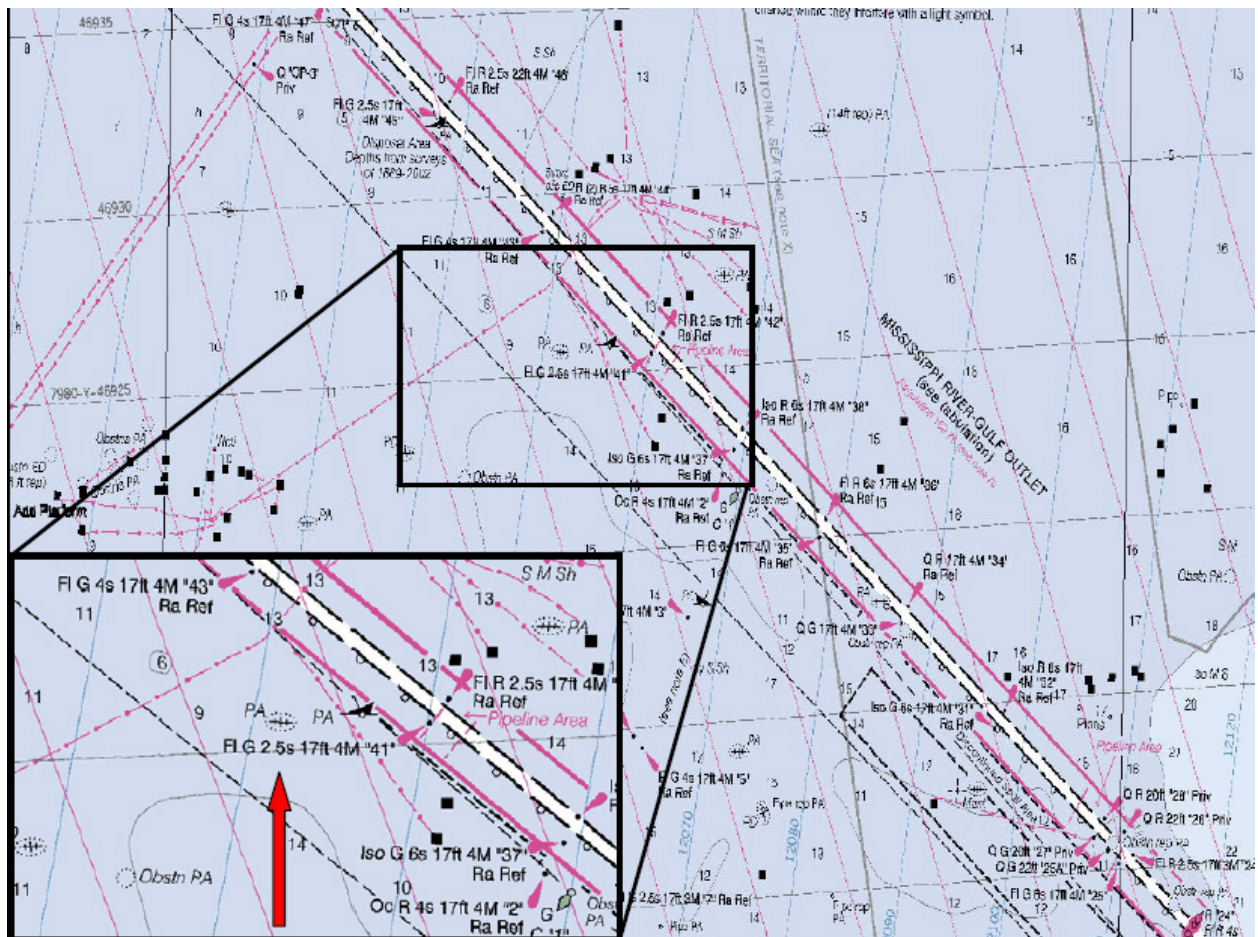


Figure 1.1.2

REPORT OF DANGER TO NAVIGATION

Hydrographic Survey Registry Number: D00141

Survey Title: State: Louisiana
Locality: Chandeleur and Breton Sound
Sublocality: Southern Chandeleur, Western Breton Sounds

Project Number: OPR-J977_TE-08
Survey dates: June 22, 2008 – February 1, 2009
Survey Danger Acquisition Date and Time: January 31, 2009; 2103 UTC

Chart affected: 11363 41st Edition/June 1, 2007, scale 1:80,000, NAD 83

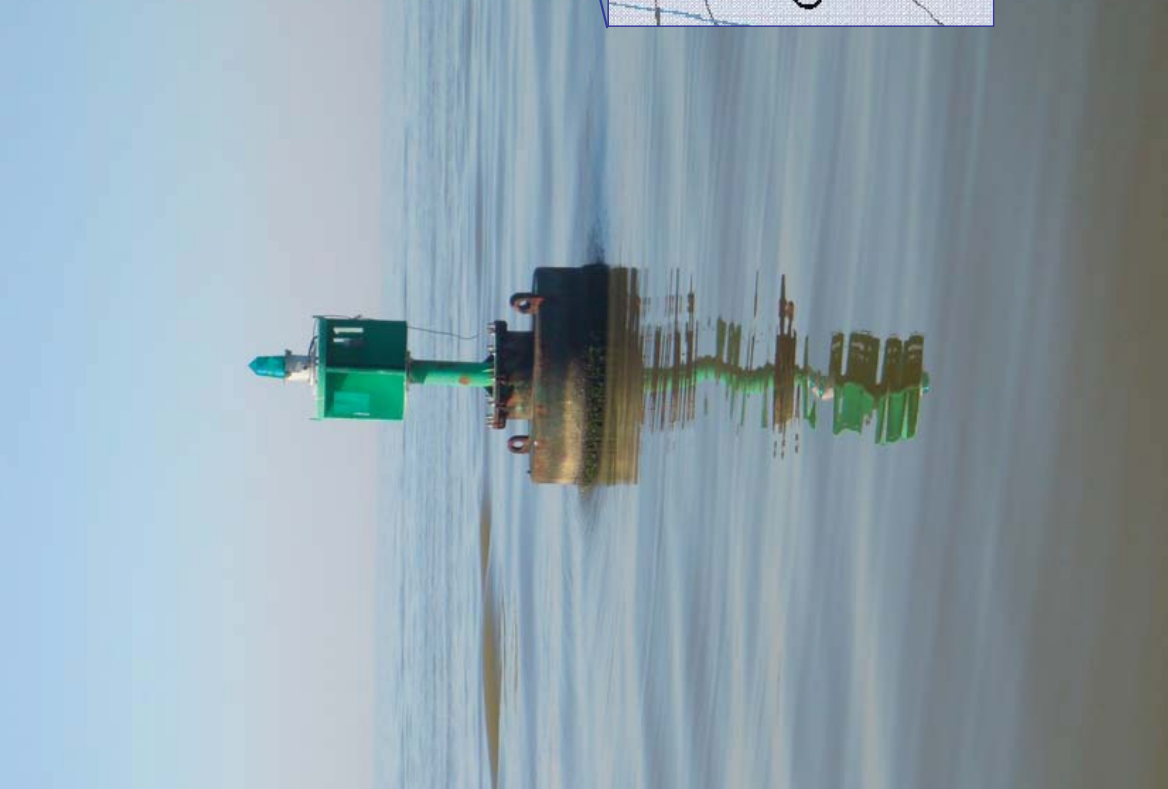
DANGER TO NAVIGATION

FEATURE	DEPTH (FT)	LATITUDE (N)	LONGITUDE (W)
Green Lighted Buoy	N/A	29/29/45	89/12/10

Green Lighted Buoy is located 6600 ft west of North Pt, Breton Island. The label of the buoy is partially destroyed and so the buoy may be named #1 or 11.

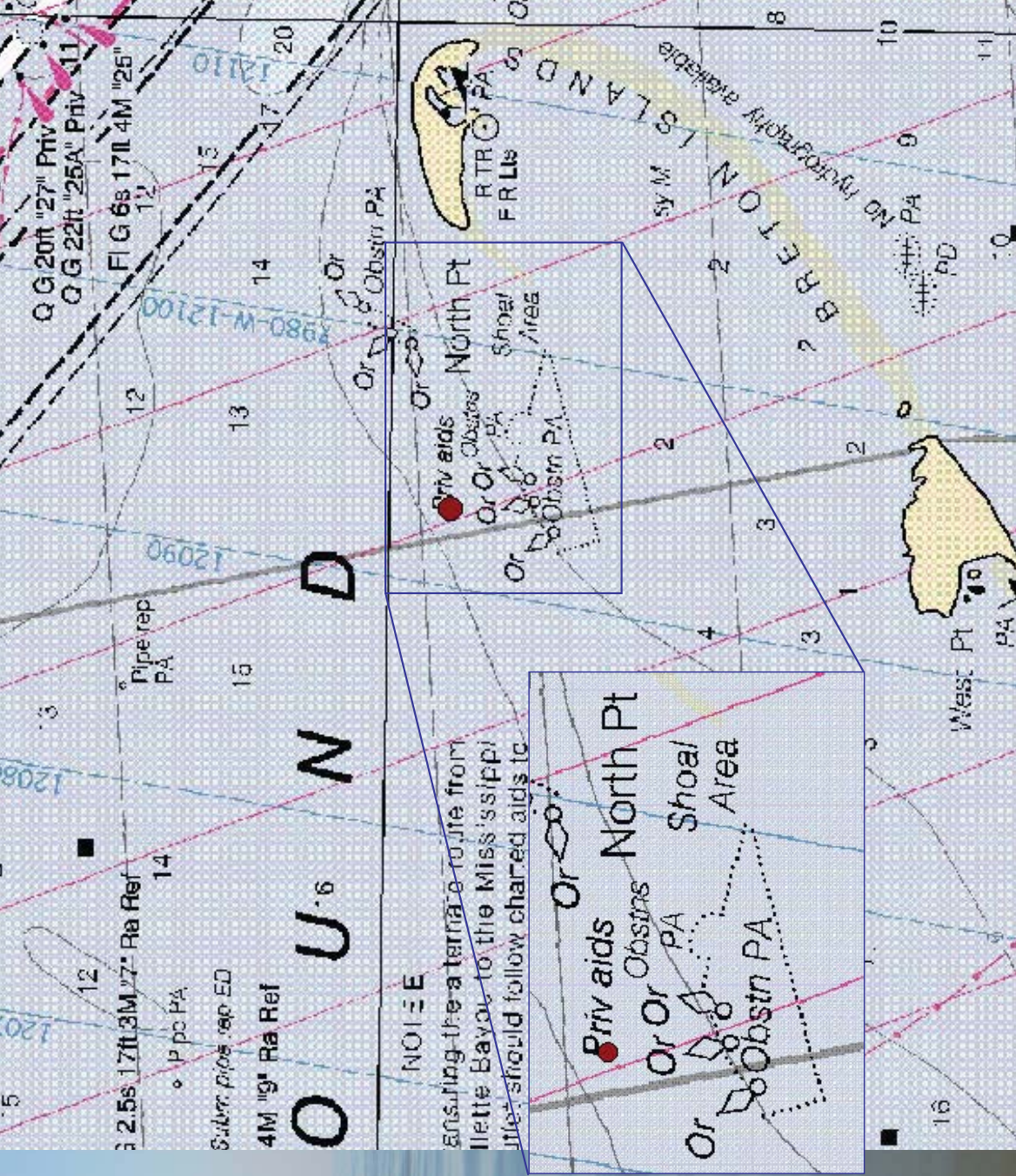
Questions concerning this report should be directed to Terrasond (907) 745-7215.

Concur with clarification. Chart 11353 5th Edition is effected by this DToN report.



Green Lighted Buoy located 6600 ft west of North Pt, Breton Islands.

Chartlet 1 of 1 Sheet H



TERRASOUND
TERRESTRIAL AND SEA FLOOR MAPPING

Project: OPR-J977-TE-08
Survey: D00141
State: Louisiana
Locality: Chandeleur and Breton
Sub-locality: Sound
Survey Scale: 1:40,000

Sounding Units: Feet
Sounding Datum: MLLW
Horizontal Datum: NAD 83
Projection: UTM 16N
Central Meridian: 87° 00' 00.00W
Scale Factor: 0.9996

MV Thomas Dowell
January 31, 2009



APPENDIX II

Survey Feature Report

AWOIS

There were no Automated Wrecks and Obstructions (AWOIS) features assigned for review in D00141.

A comprehensive search of the NOAA / NOS online AWOIS database, <http://www.nauticalcharts.noaa.gov/hsd/awois.html>, produced two features that were located within the survey limits of D00141 (Table 1).

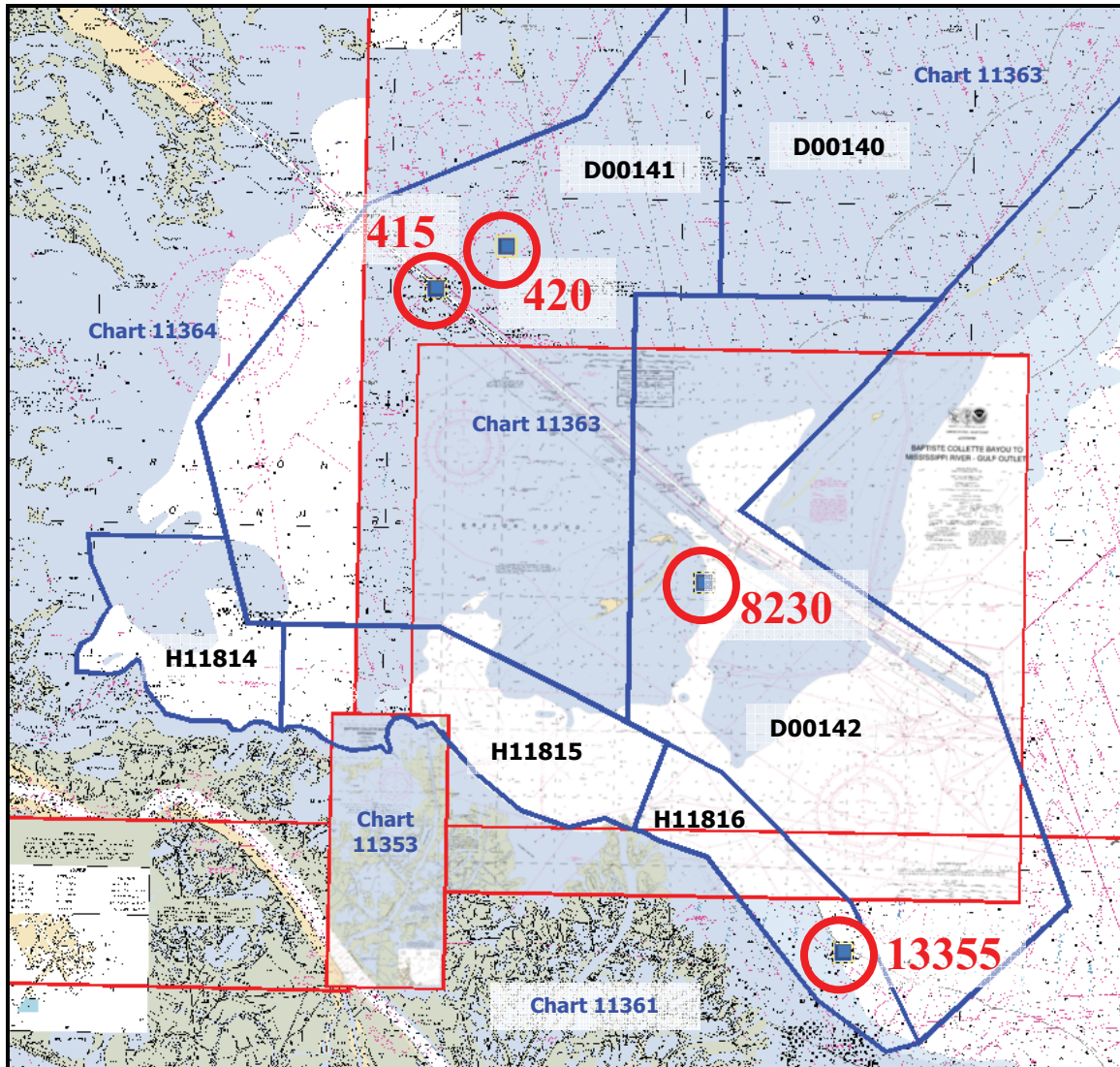


Figure 1 - Overview of OPR-J977-TE-08 showing the four AWOIS features (circled in red). Respective charts are indicated in blue.

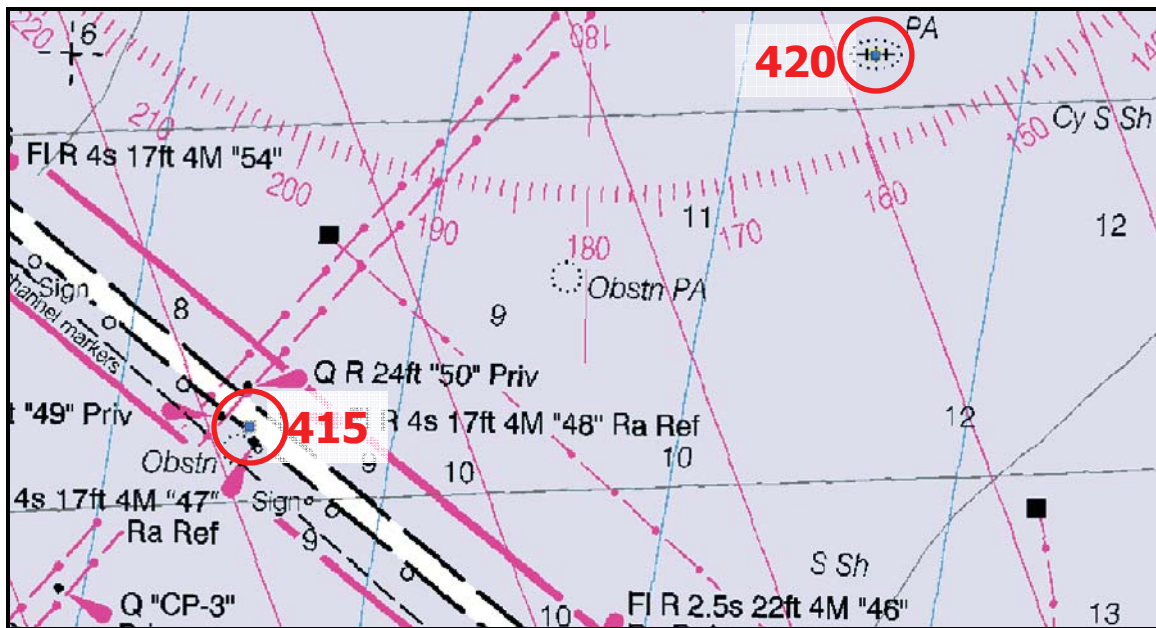


Figure 2 - Charted positions of AWOIS database features 415 and 420. Chart 11363, 41st Edition.
Depths in feet.

Table 1 - Listing of AWOIS features located in D00141.

AWOIS Record Number	Latitude	Longitude	Description
415	29° 37' 12.74" N	089° 18' 24.17" W	Reported obstruction in the channel. Searched for visually. Nothing found.
420	29° 38' 30.74" N	089° 16' 00.17" W	Reported wreck "PA." Searched for visually. Nothing found.

The water depth in the vicinity of the reported features is less than 4 meters deep. Although the high level of turbidity in the water column prevented a visual examination below the water surface, an extensive surface search for the features was conducted. No trace of the reported features was found during this search.



APPENDIX III

Progress Sketch

Sheet	Registry #	Start Date	Area (SQNM)	Linear NM Complete	Area Complete (S
D (Recon)	H11814	2008-174	39.52	90.06	
D	H11814	2008-174	25.23	1021.17	
E	H11815	2008-177	39.02	1831.26	
F	H11816	2008-174	24.64	1069.75	
G	D00140	2008-184	280.99	380.40	
H	D00141	2008-186	189.60	357.00	
J	D00142	2008-196	149.69	287.47	

*** Sheet D (Recon) is a VBES Reconnaissance Survey with 1000 meter line spacing.





APPENDIX IV

Tides and Water Levels

Abstract of Times Hydrography

Project: OPR-J977-TE-08

Registry No.: D00141

Table 1 – Sheet H Times of Hydrography: Inclusive Dates: July 4, 2008 – January 24, 2009.

START		END	
Day (Julian)	Time (UTC)	Day (Julian)	Time (UTC)
2008-186	1313	2008-186	1916
2008-187	1231	2008-187	2054
2008-190	1311	2008-190	2125
2008-191	1459	2008-191	1806
2008-192	1228	2008-192	1742
2008-197	1243	2008-197	2115
2008-199	1246	2008-199	2200
2008-200	1141	2008-200	1815
2008-201	1503	2008-201	2045
2008-210	1308	2008-210	1350
2008-213	1239	2008-213	1533
2008-214	1220	2008-214	1519
2008-218	1240	2008-218	1351
2009-024	1442	2009-024	1445
2009-025	1413	2009-025	1942

FINAL TIDE NOTE and FINAL TIDE ZONING CHART**DATE:** February 1, 2009**HYDROGRAPHIC BRANCH:** Atlantic**HYDROGRAPHIC PROJECT:** OPR-J977-TE_08**HYDROGRAPHIC SHEET:** D00141**LOCALITY:** Southern Chandeleur, Western Breton Sounds, LA**TIME PERIOD:** July 4, 2008 – January 24, 2009**TIDE STATION USED:**

Station No.	Station Name	Latitude	Longitude
8745557	Gulfport Harbor, MS	30° 21.6' N	089° 04.9' W
8760889	Olga Compressor Station, Grand Bay, LA	29° 23.1' N	089° 22.8' W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters**HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE:**

Station No.	Station Name	MHW
8745557	Gulfport Harbor, MS	0.500 m
8760889	Olga Compressor Station, Grand Bay, LA	0.392 m

REMARKS: RECOMMENDED ZONING

Use zone(s) identified as: CGM134, CGM135, CGM136, CGM137, CGM138, CGM139, CGM140, CGM141, CGM142, CGM163, CGM164, CGM165, CGM166, CGM167, CGM168, CGM169, CGM170, CGM200, CGM201, CGM202, CGM203, CGM204, CGM206, CGM207, CGM208, and CGM209

Refer to Figure for zoning information.

Note 1: Provided time series data are tabulated in metric units (Meters), relative to MLLW and on Universal Time, Coordinated (UTC).

Note 2: Pilot Station East, LA (8760922) served as datum control for subordinate tide stations but was not used to supply MLLW correctors for this hydrographic survey. The datum for this station was updated in February 2009.

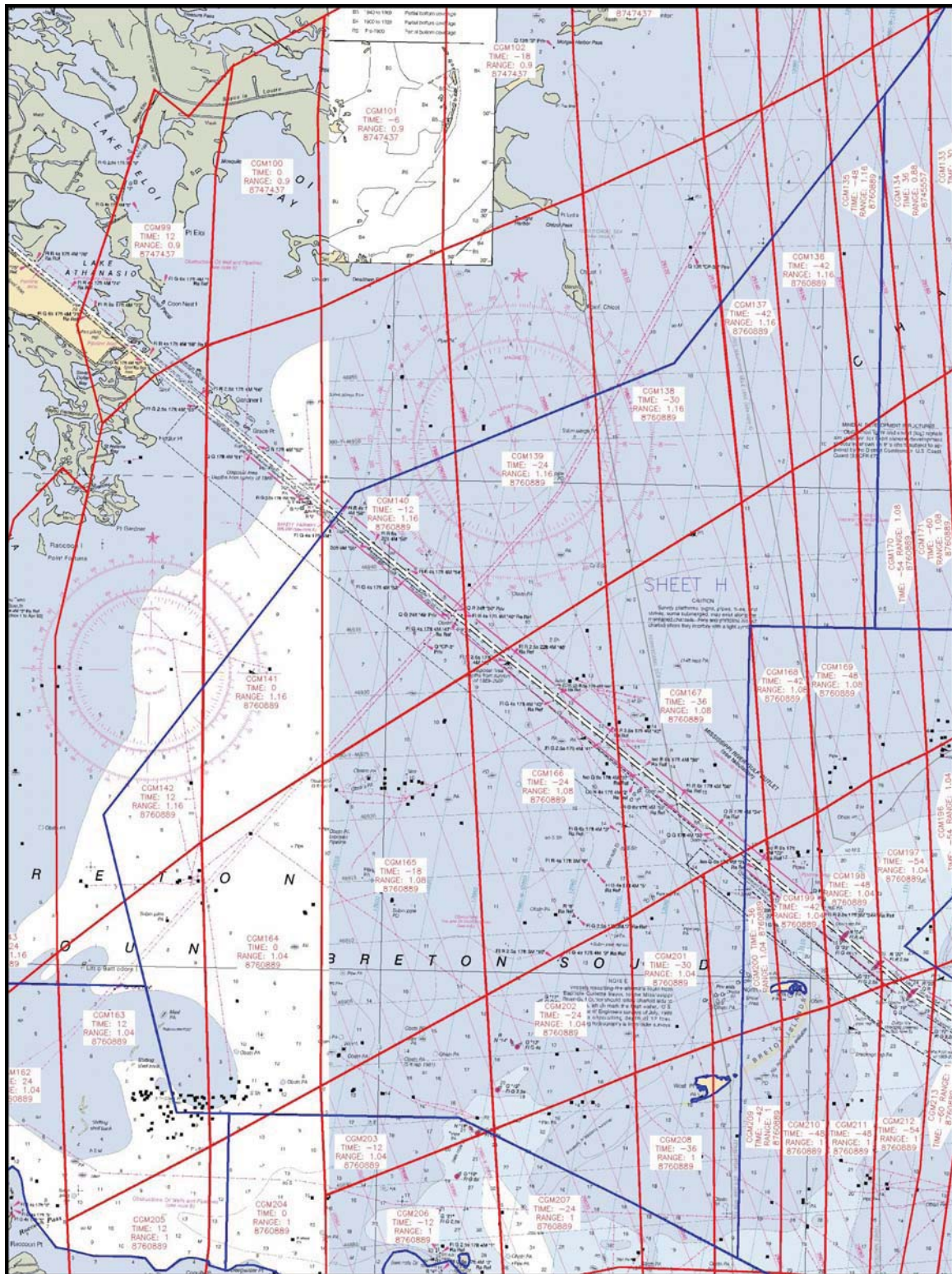
Final Tidal Zoning for OPR-J977-TE-08

Figure 1 - Final Tidal Zoning Chart for OPR-J977-TE-08, Sheet D00141 with Chart 11363, 41st Edition, June 2007 and Chart 11364, 41st Edition, December 2005. Soundings in feet.



Descriptive Report for Tidal Zoning

OCS Project: S-J977-KR-TERRA-2008
Client: Terrasond, Ltd.
JOA Work Order: 115
Primary Tide Stations for Project: 8760922 Pilot Station East, LA (*datum control only*)
8747437 Bay Waveland Yacht Club, MS (*not used in final zoning*)
8745557 Gulfport Harbor, MS

Tertiary Tide Stations for Project: 8760417 Devon Energy Facility, LA
8760889 Olga Compressor Station, LA

Submitted by: Mike Zieserl
Email: mike@joasurveys.com

Preliminary Zoning

The preliminary zoning from CO-OPS generally shows the tide range increasing from about 0.3m to 0.5m from south to north, while the tide generally progresses from east to west taking nearly 3 hours to move through the survey area.

Preliminary tidal zoning from CO-OPS was based on the following NWLON stations:

- 8745557 Gulfport Harbor, MS
- 8747437 Bay Waveland, MS
- 9760922 Pilot Station East, LA

Final Zoning

The preliminary zoning was edited to make the zoning factors relative to the following tide stations:

- 8745557 Gulfport Harbor, MS (NWLON)
- 8760889 Olga Compressor Station (tertiary)
- 8760417 Devon Energy Facility (tertiary)

A comparison of the GT at the three tide stations showed that the preliminary zoning essentially had the range ratios modeled correctly. Looking at the difference in time of the tides between these three stations also showed that the time offsets were nearly correct as well.

GT for the 3 zones where the tide stations are located

	Gulfport Harbor	Olga Compressor	Devon Energy
Preliminary Zoning	0.53	0.39	0.36
Actual	0.53	0.40	0.37
Final Zoning	0.53	0.40	0.37

Time change in minutes between the tide stations

	Gulfport Harbor to Olga	Devon Energy to Olga Compressor
Preliminary Zoning	84	114
Actual	50 (1 sigma = 88min)	112 (1 sigma = 88min)
Final Zoning	84	114

The final zoning was not edited to reflect the measured time change between Olga and Gulfport Harbor (determined by comparing times of high and low tides) because the standard deviation of the measured time difference was so large. During the development of the final zoning, the measured time change between Gulfport and Olga was used to modify the time offsets as a test, and it did not improve the discrete shift at the zoning boundary between these two tide stations. Therefore, the preliminary zoning scheme was generally maintained, and the zoning factors were simply edited to reference these stations. The geometry of the zoning was not changed, with the exception of 15 zones that were deleted because they were not required for the survey area.

The deleted zones are listed below:

CGM151	CGM152	CGM99	CGM100	CGM101	CGM102
CGM103	CGM104	CGM105	CGM106	CGM107	CGM108
CGM74	CGM73A	CGM73			

The Bay Waveland NWLON was removed from the zoning because the tide station did not have verified data on several occasions during survey operations. Gulfport Harbor and Olga Compressor station were used to cover the zones that had been assigned to Bay Waveland.

Changed these zones to reference Gulfport instead of Bay Waveland:

CGM124	CGM125	CGM126	CGM127	CGM128	CGM129
CGM130	CGM131	CGM132	CGM133	CGM134	

Changed these zones to reference Olga instead of Bay Waveland:

CGM135	CGM136	CGM137	CGM138	CGM139	CGM140
CGM141	CGM142	CGM143	CGM159	CGM160	

Zoned tides covering the entire time period of the survey were compared at the boundary between Olga Compressor and Devon Energy at CGM260, and at the boundary of Olga Compressor and Gulfport Harbor at CGM134. The zoned tides from Devon and Olga compare passably. The average of the differenced zoned tides (excluding the 2 hurricanes) is about 1cm, with a standard deviation of 8cm.

The comparison of zoned tides between Olga and Gulfport at CGM134 do not match nearly as well. The water seems to behave much differently at Gulfport and Bay Waveland then it does at Olga or Devon. The average of the difference between the two zoned tides (excluding the 2 hurricanes) is 6cm. Starting in September, the Olga MLLW tide data seems to be consistently higher than the Gulfport MLLW data, possibly indicating a seasonal difference between these two areas, or a difference in the datum epoch. The standard deviation of the difference is 13cm.

Recommendations

For future hydrographic survey projects, COOPS should include the time and range contours, as well as any boundary conditions that are used to develop the preliminary zoning, with the SOW. This would make zoning revision much more straight forward. Currently, the time and range contours have to be recomputed from the preliminary zoning factors, and some guesswork is involved.

In addition, COOPS should include the historic station summary files they use to create the preliminary zoning. It can be difficult to understand, much less perform meaningful revision to the preliminary tidal zoning without the justifying data that went into creating it.

For future surveys in this area, it may be beneficial to install a tide station at the NE boundary of the project, near the Chandeleur Islands, to help bridge the difference between the water levels in the south (Olga and Devon) and north (Bay Waveland and Gulfport).

While the tide range is rather small, and fairly slow to change across the project area, the time of the tide changes much more, and is much more erratic depending on local weather conditions. Instead of discrete tide zones, averages of water levels from two or more tide stations, weighted for importance, may produce better results, and smoother transitions between zone boundaries.



APPENDIX V

Supplemental Survey Records and Correspondence

Aids to Navigation

Twenty-four (24) charted floating and non-floating aids to navigation (ATON) were located in D00141. The position of each ATON was compared with raster charts 11353, 5th edition, dated January 2008, 11363, 41st edition, dated June 2007, 11364, 42nd Edition, dated September 2007 and Electronic Navigation Charts (ENC) US4LA34M, updated May 2008, US4LA35M, updated May 2008 and US5LA24M updated June 2008.

The Mississippi River Gulf Outlet (MRGO) is in the process of being closed as a primary navigable channel from the Gulf of Mexico to the Port of New Orleans. As the MRGO is closed, the non-floating ATON's marking the channel are being replaced with temporary floating ATON's. The status of the ATON's reported in the Comments field of Table 1 reflects the status of the chart and the time of the survey, as updated with the latest Notice to Mariners (NTM) to better reflect the closure process. Except as noted, all of the ATON's listed in Table 1 were found as charted and served their intended purpose.

Table 1 – Charted floating and non-floating Aids to Navigation located in D00141.

USCG Light List Number	Date	Time (UTC)	Latitude (N)	Longitude (W)	Comments
10715	1/31/2009	1945	29° 32' 54.75"	89° 12' 18.17"	MRGO light 33 agrees with chart as updated by LNM 04/09 (Temporarily replaced by Lighted Buoy)
10735	1/31/2009	1946	29° 34' 06.58"	89° 14' 03.94"	MRGO light 37 agrees with chart as updated by LNM 35/08 (Temporarily replaced by Lighted Buoy)
10740	1/31/2009	1946	29° 34' 15.72"	89° 13' 58.82"	MRGO light 38 agrees with chart as updated by LNM 38/08 (Temporarily replaced by Lighted Buoy)
10745	1/31/2009	1942	29° 34' 44.74"	89° 14' 57.35"	MRGO light 41 agrees with chart as updated by LNM 38/08 (Temporarily replaced by Lighted Buoy)
10750	1/31/2009	1942	29° 34' 53.12"	89° 14' 51.23"	MRGO light 42 agrees with chart as updated by LNM 38/08 (Temporarily replaced by Lighted Buoy)
10755	1/31/2009	1932	29° 35' 32.96"	89° 16' 07.32"	MRGO light 43 agrees with chart.
10760	1/31/2009	1938	29° 35' 41.47"	89° 15' 59.78"	MRGO light 44 agrees with chart as updated by LNM 38/08 (Temporarily replaced by Lighted Buoy)
10765	1/31/2009	1933	29° 36' 19.87"	89° 17' 11.11"	MRGO light 45 agrees with chart.
10770	1/31/2009	1933	29° 36' 26.77"	89° 17' 05.42"	MRGO light 46 agrees with chart as updated by LNM 38/08 (Temporarily replaced by Lighted Buoy)
10780	1/31/2009	1930	29° 37' 16.15"	89° 18' 16.75"	MRGO light 48 agrees with chart as updated by LNM 38/08 (Temporarily replaced by Lighted Buoy)

USCG Light List Number	Date	Time (UTC)	Latitude (N)	Longitude (W)	Comments
10800	1/31/2009	1923	29° 38' 09.86"	89° 19' 33.04"	MRGO light 54 agrees with chart.
10810	1/31/2009	1921	29° 38' 42.21"	89° 20' 20.92"	MRGO light 56 agrees with chart.
10820	1/31/2009	1917	29° 39' 16.75"	89° 21' 08.18"	MRGO light 58 agrees with chart as updated by LNM 04/09 (Missing)
12353	1/31/2009	1950	29° 33' 48.47"	89° 14' 01.81"	Breton sound light buoy '1' agrees with chart.
12353.1	1/31/2009	1950	29° 33' 54.48"	89° 14' 11.47"	Breton sound light buoy 2 agrees with chart as updated by LNM 34/08. (Temporarily replaced by Lighted Buoy)
12353.2	1/25/2009	1920	29° 32' 55.13"	89° 14' 31.65"	Breton sound light buoy 3 agrees with chart as updated by LNM 37/08. (Temporarily replaced by Lighted Buoy)
12353.3	9/29/2008	1450	29° 31' 08.25"	89 15' 26.03"	Breton sound light buoy 7 agrees with chart as updated by LNM 37/08. (Temporarily replaced by Lighted Buoy)
12353.3	1/25/2009	1859	29° 32' 00.76"	89° 14' 59.09"	Breton sound light buoy 5 agrees with chart as updated by LNM 29/08. (Temporarily replaced by Lighted Buoy)
12353.4	1/25/2009	1901	29° 32' 05.05"	89° 15' 05.05"	Breton sound light buoy 6 agrees with chart as updated by LNM 37/08. (Temporarily replaced by Lighted Buoy)
12353.7	2/1/2009	1522	29° 30' 15.15"	89° 15' 52.79"	Breton sound light buoy 9 agrees with chart as updated by LNM 37/08. (Temporarily replaced by Lighted Buoy)
12353.8	2/1/2009	1522	29° 30' 18.61"	89° 15' 58.47"	Breton sound light buoy 10 agrees with chart as updated by LNM 37/08. (Temporarily replaced by Lighted Buoy)
12353.9	9/29/2008	1539	29° 29' 21.85"	89° 16' 20.36"	Breton sound light buoy 11 agrees with chart.
12354	9/28/2008	1609	29° 28' 28.33"	89° 16' 47.56"	Breton sound light buoy 13 agrees with chart.

Eight (8) additional ATON's were shown on raster charts 11353, 5th edition, dated January 2008, 11363, 41st edition, dated June 2007, 11364, 42nd Edition, dated September 2007 or Electronic Navigation Charts (ENC) US4LA34M, updated May 2008, US4LA35M, updated May 2008 and US5LA24M updated June 2008.. These ATON's, listed in Table 2, were searched for but not found during OPR-J977-TE-08.

Table 2 – Charted floating and non-floating Aids to Navigation searched for but not found in D00141.

USCG Light List Number	Date	Time (UTC)	Latitude (N)	Longitude (W)	Comments
10720	1/31/2009	2000	29° 33' 02.53"	89° 12' 14.66"	MRGO light 34 Not Found
10725	1/31/2009	1955	29° 33' 30.75"	89° 13' 10.01"	MRGO light 35 Not Found
10730	1/31/2009	1955	29° 33' 38.41"	89° 13' 05.88"	MRGO light 36 Not Found
10775	1/31/2009	1930	29° 37' 10.30"	89° 18' 23.80"	MRGO light 47 Not Found - replaced by no number green can Buoy. No mention in LNM.
10795	1/31/2009	1924	29° 37' 59.25"	89° 19' 34.17"	MRGO light #53 on Pile Beacon not found.
10805	1/31/2009	1919	29° 38' 36.75"	89° 20' 26.18"	MRGO Day beacon/ light 55 not found, Reported in LNM 38/08 as DBN IMCH.
10815	1/31/2009	1917	29° 39' 07.90"	89° 21' 12.92"	MRGO light 57 Not Found
12353.6	9/29/2008	1453	29° 31' 10.59"	89° 15' 32.39"	Breton Sound Day beacon 8 not found. Reported in LNM 37/08 as (Temporarily Replaced by Unlighted Buoy). Unlighted Buoy not found.

Bottom Samples

Forty (40) bottom samples were collected in D00141 pursuant to OPR-J977-TE-08. The samples were distributed geographically to obtain a full representation of the bottom characteristics as specified in NOAA Hydrographic Surveys specifications and Deliverables, Section 7.1 dated April 2007 as amended by the Statement of Work for OPR-J977-TE-08 dated April 21, 2008.

Point Number	Date	Time (UTC)	Depth (m)	Latitude (N)	Longitude (W)	Color	Surface Description	Nature of Surface	Secondary Nature of Surface
H1	9/28/2008	1341	5.2	29° 25' 57.04"	89° 13' 36.04"	Grey	Fine	Sand	
H2	9/28/2008	1509	4.3	29° 28' 06.12"	89° 3' 38.20"	Grey	Fine	Sand	
H3	9/28/2008	1540	5.5	29° 28' 05.50"	89° 16' 07.20"	Black	Soft	Mud	
H4	9/28/2008	1640	5.5	29° 28' 03.37"	89° 18' 35.99"	Black	Soft	Mud	
H5	9/28/2008	1737	4.5	29° 27' 59.89"	89° 21' 05.74"		Fine	Sand	
H6	9/28/2008	1809	3.6	29° 27' 57.36"	89° 23' 34.34"		Fine	Sand	
H7	9/29/2008	1402	1.9	29° 28' 56.28"	89° 12' 07.09"	Brown	Fine	Sand	
H8	9/29/2008	1422	5	29° 30' 15.47"	89° 13' 42.52"	Grey	Fine	Mud	
H9	9/29/2008	1515	4.9	29° 30' 14.27"	89° 16' 11.82"	Grey	Fine	Mud	
H10	9/29/2008	1537	4.8	29° 30' 11.49"	89° 18' 39.25"	Grey	Fine	Mud	
H11	9/29/2008	1613	4.7	29° 30' 09.96"	89° 21' 09.33"		Fine	Sand	
H12	9/29/2008	1648	4.1	29° 30' 07.58"	89° 23' 36.96"		Fine	Sand	
H13	9/29/2008	1742	3.8	29° 32' 13.97"	89° 26' 09.17"	Brown	Fine	Sand	
H14	9/29/2008	1805	4.4	29° 32' 15.31"	89° 23' 38.60"		Fine	Sand	
H15	9/29/2008	1931	4.1	29° 32' 19.78"	89° 21' 10.51"		Fine	Mud	
H16	9/29/2008	2006	4.4	29° 32' 21.55"	89° 18' 42.61"		Fine	Mud	
H17	9/29/2008	2021	5.1	29° 32' 26.45"	89° 16' 13.77"		Sticky	Mud	

Point Number	Date	Time (UTC)	Depth (m)	Latitude (N)	Longitude (W)	Color	Surface Description	Nature of Surface	Secondary Nature of Surface
H18	1/24/2009	1448	3.2	29° 45' 30.75"	89° 09' 06.05"		Fine	Sand	Broken Shells
H19	1/24/2009	1456	2.9	29° 43' 20.47"	89° 11' 31.29"		Fine	Sand	Broken Shells
H20	1/24/2009	1508	3.2	29° 43' 20.70"	89° 09' 02.34"		Fine	Sand	
H21	1/24/2009	1656	3.4	29° 41' 12.68"	89° 08' 56.83"		Fine	Sand	
H22	1/24/2009	1712	3.3	29° 41' 11.34"	89° 11' 26.31"		Fine	Sand	Broken Shells
H23	1/24/2009	1718	3.3	29° 41' 08.21"	89° 13' 54.69"		Sticky	Mud	
H24	1/24/2009	1730	2.8	29° 41' 05.75"	89° 16' 26.51"		Sticky	Mud	
H25	1/24/2009	1743	2.6	29° 38' 52.70"	89° 18' 51.06"		Fine	Sand	
H26	1/24/2009	1753	3.2	29° 38' 57.07"	89° 16' 21.85"		Fine	Sand	
H27	1/24/2009	1803	3.6	29° 38' 56.38"	89° 13' 54.52"		Fine	Sand	
H28	1/24/2009	1810	3.2	29° 39' 02.23"	89° 11' 26.67"		Fine	Sand	Broken Shells
H29	1/24/2009	1820	3.6	29° 39' 03.12"	89° 08' 55.95"		Fine	Sand	
H30	1/24/2009	1937	4.2	29° 36' 49.46"	89° 13' 52.14"		Fine	Sand	
H31	1/25/2009	1845	4.6	29° 32' 28.34"	89° 13' 45.34"		Sticky	Mud	Broken Shells
H32	1/31/2009	1540	4.5	29° 34' 36.98"	89° 13' 46.93"		Fine	Sand	
H33	1/31/2009	1610	3.8	29° 36' 46.13"	89° 16' 17.85"		Fine	Sand	
H34	1/31/2009	1631	3.6	29° 34' 37.74"	89° 16' 13.97"		Sticky	Mud	Broken Shells
H35	1/31/2009	1719	3.1	29° 34' 32.64"	89° 18' 44.64"		Sticky	Mud	
H36	1/31/2009	1810	2.7	29° 34' 30.89"	89° 21' 13.79"		Sticky	Mud	
H37	1/31/2009	1823	3.1	29° 34' 27.76"	89° 23' 38.49"		Sticky	Mud	
H38	1/31/2009	1836	2.6	29° 36' 38.94"	89° 21' 18.44"		Sticky	Mud	

Point Number	Date	Time (UTC)	Depth (m)	Latitude (N)	Longitude (W)	Color	Surface Description	Nature of Surface	Secondary Nature of Surface
H39	1/31/2009	1844	1.7	29° 38' 39.96''	89° 21' 18.15''		Sticky	Mud	Broken Shells
H40	1/31/2009	1859	3.4	29° 36' 41.61''	89° 18' 48.70''		Sticky	Mud	Broken Shells

Oil Related Structures

118 charted petroleum industry related structures (e.g. drilling structures, production platforms, well heads, etc.) appear within the survey boundaries of D00141 on raster charts 11353, 5th edition, dated January 2008, 11363, 41st edition, dated June 2007, 11364, 42nd Edition, dated September 2007 and Electronic Navigation Charts (ENC) US4LA34M, updated May 2008, US4LA35M, updated May 2008 and US5LA24M updated June 2008. The position of each charted structure was examined in the field and, except as noted in Table 1 and Table 2, all of the charted information was determined to be correct as represented on the charts.

Thirty-three (33) charted structures were searched for but not found. These structures should be removed from the chart(s).

Table 1 –Petroleum industry structures that appear on the raster chart or ENC in D00141 that were not found during OPR-J977-TE-08.

Survey Date	Time (UTC)	Latitude (N)	Longitude (W)	Comments
9/28/2008	1339	29° 26' 17.09"	89° 12' 51.10"	Structure searched for but not found.
9/28/2008	1338	29° 26' 19.12"	89° 12' 28.15"	Structure searched for but not found.
9/28/2008	1340	29° 26' 4.840"	89° 13' 29.93"	Structure searched for but not found.
9/28/2008	1704	29° 27' 28.59"	89° 19' 53.29"	Structure searched for but not found.
9/28/2008	1551	29° 27' 22.17"	89° 15' 1.058"	Structure searched for but not found.
9/28/2008	1552	29° 27' 22.08"	89° 15' 15.99"	Structure searched for but not found.
9/28/2008	1553	29° 27' 21.13"	89° 15' 31.08"	Structure searched for but not found.
9/28/2008	1554	29° 27' 4.100"	89° 15' 13.02"	Structure searched for but not found.
9/28/2008	1555	29° 27' 7.131"	89° 16' 02.03"	Structure searched for but not found.
9/28/2008	1730	29° 28' 13.97"	89° 20' 56.29"	Structure searched for but not found.
9/28/2008	1748	29° 27' 32.19"	89° 22' 14.70"	Structure searched for but not found.
9/28/2008	1819	29° 27' 35.72"	89° 23' 01.01"	Structure searched for but not found.
9/28/2008	1948	29° 27' 20.49"	89° 24' 14.33"	Structure searched for but not found.
9/28/2008	1951	29° 27' 16.49"	89° 24' 29.21"	Structure searched for but not found.
9/28/2008	2016	29° 27' 13.61"	89° 24' 07.81"	Structure searched for but not found.

Survey Date	Time (UTC)	Latitude (N)	Longitude (W)	Comments
9/28/2008	1828	29° 27' 39.21"	89° 22' 34.60"	Structure searched for but not found.
9/28/2008	1832	29° 27' 32.15"	89° 22' 30.84"	Structure searched for but not found.
9/28/2008	1843	29° 27' 23.64"	89° 23' 03.31"	Structure searched for but not found.
9/29/2008	1601	29° 31' 9.310"	89° 21' 45.98"	Structure searched for but not found.
9/29/2008	1602	29° 31' 11.03"	89° 21' 47.26"	Structure searched for but not found.
9/29/2008	1605	29° 31' 19.97"	89° 21' 35.18"	Structure searched for but not found.
9/29/2008	1752	29° 33' 15.99"	89° 24' 50.00"	Structure searched for but not found.
9/29/2008	1753	29° 33' 25.99"	89° 24' 44.99"	Structure searched for but not found.
9/29/2008	1754	29° 33' 46.00"	89° 24' 29.00"	Structure searched for but not found.
9/29/2008	1800	29° 32' 44.99"	89° 23' 03.10"	Structure searched for but not found.
1/24/2009	1452	29° 44' 46.55"	89° 09' 31.98"	Structure searched for but not found.
1/25/2009	1425	29° 33' 59.00"	89° 12' 33.00"	Structure searched for but not found.
1/25/2009	1425	29° 34' 18.99"	89° 12' 19.00"	Structure searched for but not found.
1/25/2009	1824	29° 31' 41.05"	89° 11' 57.05"	Structure searched for but not found.
1/31/2009	1526	29° 35' 6.000"	89° 14' 48.00"	Structure searched for but not found.
1/31/2009	1538	29° 35' 3.998"	89° 13' 53.00"	Structure searched for but not found.
1/31/2009	1721	29° 35' 7.108"	89° 18' 37.94"	Structure searched for but not found.
1/31/2009	1722	29° 35' 5.420"	89° 18' 38.35"	Structure searched for but not found.

Seventy-nine (79) uncharted petroleum industry structures were positioned in D00141. These structures should be added to the chart(s).

Table 2 – Petroleum industry structures positioned in D00141 during OPR-J977-TE-08 that do not appear on the raster chart or ENC.

Survey Date	Time (UTC)	Latitude (N)	Longitude (W)	Comments
9/28/2008	1821	29°27'42.41"	89°23'3.001"	Structure does not appear on the chart of the area.
9/28/2008	1832	29°27'41.54"	89°22'37.82"	Structure does not appear on the chart of the area.
9/28/2008	1835	29°27'35.06"	89°22'46.34"	Structure does not appear on the chart of the area.
9/28/2008	1839	29°27'33.66"	89°23'6.511"	Structure does not appear on the chart of the area.
9/28/2008	1841	29°27'31.01"	89°23'9.751"	Structure does not appear on the chart of the area.
9/28/2008	1847	29°27'15.32"	89°23'15.43"	Structure does not appear on the chart of the area.
9/28/2008	1855	29°27'31.91"	89°23'21.02"	Structure does not appear on the chart of the area.
9/28/2008	1857	29°27'34.36"	89°23'20.33"	Structure does not appear on the chart of the area.
9/28/2008	1900	29°27'34.48"	89°23'34.81"	Structure does not appear on the chart of the area.
9/28/2008	1906	29°27'15.54"	89°23'32.74"	Structure does not appear on the chart of the area.
9/28/2008	1913	29°27'24.68"	89°23'52.85"	Structure does not appear on the chart of the area.
9/28/2008	1925	29°27'23.09"	89°24'5.889"	Structure does not appear on the chart of the area.
9/28/2008	1928	29°27'34.76"	89°24'4.438"	Structure does not appear on the chart of the area.
9/28/2008	1931	29°27'35.13"	89°24'13.17"	Structure does not appear on the chart of the area.
9/28/2008	1932	29°27'34.09"	89°24'19.88"	Structure does not appear on the chart of the area.
9/28/2008	1939	29°27'22.15"	89°24'35.62"	Structure does not appear on the chart of the area.
9/28/2008	1954	29°27'9.298"	89°24'40.35"	Structure does not appear on the chart of the area.
9/28/2008	2023	29°27'4.21"	89°24'11.74"	Structure does not appear on the chart of the area.
9/28/2008	1952	29°27'17.92"	89°24'41.51"	Structure does not appear on the chart of the area.

Survey Date	Time (UTC)	Latitude (N)	Longitude (W)	Comments
9/28/2008	1400	29°26'13.66"	89°13'5.854"	Structure does not appear on the chart of the area.
9/29/2008	1509	29°30'28.73"	89°16'45.46"	Structure does not appear on the chart of the area.
9/29/2008	1658	29°31'1.009"	89°24'20.48"	Structure does not appear on the chart of the area.
9/29/2008	1441	29°30'54.69"	89°14'11.55"	Structure does not appear on the chart of the area.
9/29/2008	1831	29°31'39.15"	89°24'28.14"	Structure does not appear on the chart of the area.
9/29/2008 1833		29°31'40.43"	89°24'23.01"	Harvest Group SL 16432 Well #11. Structure does not appear on the chart of the area.
9/29/2008	1846	29°31'50.53"	89°24'28.23"	Structure does not appear on the chart of the area.
9/29/2008 1854		29°31'49.49"	89°24'22.90"	Amerada Hess Corp SI 16432 SWD #1 SN 972989. Structure does not appear on the chart of the area.
9/29/2008 1902		29°31'53.06"	89°24'9.579"	Harvest Group SL 16432 Well No 12. Structure does not appear on the chart of the area.
9/29/2008	1942	29°32'2.540"	89°20'43.86"	Structure does not appear on the chart of the area.
9/29/2008	1955	29°33'1.731"	89°18'22.79"	Structure does not appear on the chart of the area.
9/29/2008	2003	29°32'55.20"	89°18'39.00"	Structure does not appear on the chart of the area.
9/30/2008	1704	29°30'55.37"	89°24'23.04"	Structure does not appear on the chart of the area.
1/8/2009	1441	29°27'35.47"	89°24'49.47"	Structure does not appear on the chart of the area.
1/18/2009	1819	29°32'23.44"	89°16'56.33"	Structure does not appear on the chart of the area.
1/18/2009	1821	29°32'31.52"	89°16'34.35"	Structure does not appear on the chart of the area.
1/18/2009	1813	29°32'32.36"	89°16'35.76"	Structure does not appear on the chart of the area.
1/18/2009	1805	29°31'35.00"	89°16'44.76"	Structure does not appear on the chart of the area.
1/24/2009	1724	29°39'59.15"	89°15'15.50"	Structure does not appear on the chart of the area.
1/24/2009	1726	29°40'4.501"	89°15'50.42"	Structure does not appear on the chart of the area.
1/24/2009	1727	29°40'7.330"	89°15'48.20"	Structure does not appear on the chart of the area.

Survey Date	Time (UTC)	Latitude (N)	Longitude (W)	Comments
1/24/2009	1734	29°41'4.408"	89°16'59.90"	Structure does not appear on the chart of the area.
1/24/2009	1933	29°36'20.18"	89°12'26.92"	Structure does not appear on the chart of the area.
1/24/2009	1946	29°35'53.62"	89°15'11.95"	Structure does not appear on the chart of the area.
1/25/2009	1832	29°31'56.12"	89°14'13.17"	Structure does not appear on the chart of the area.
1/25/2009	1851	29°31'58.91"	89°14'46.11"	Structure does not appear on the chart of the area.
1/25/2009	1947	29°32'26.30"	89°15'32.88"	Structure does not appear on the chart of the area.
1/25/2009	1948	29°32'15.98"	89°15'40.22"	Structure does not appear on the chart of the area.
1/25/2009	1949	29°32'7.000"	89°15'50.00"	Structure does not appear on the chart of the area.
1/25/2009	1951	29°32'10.01"	89°16'0.008"	Structure does not appear on the chart of the area.
1/25/2009	1953	29°32'18.21"	89°15'49.78"	Structure does not appear on the chart of the area.
1/25/2009	1955	29°32'21.69"	89°15'46.11"	Structure does not appear on the chart of the area.
1/25/2009	1956	29°32'27.30"	89°15'52.07"	Structure does not appear on the chart of the area.
1/25/2009	1958	29°32'26.08"	89°15'40.75"	Structure does not appear on the chart of the area.
1/25/2009	2007	29°32'19.34"	89°16'34.46"	Structure does not appear on the chart of the area.
1/25/2009	2009	29°32'23.16"	89°16'19.17"	Structure does not appear on the chart of the area.
1/25/2009	2012	29°32'4.718"	89°16'28.08"	Structure does not appear on the chart of the area.
1/31/2009	1521	29°34'32.86"	89°14'55.55"	Structure does not appear on the chart of the area.
1/31/2009	1531	29°35'37.26"	89°13'52.73"	Structure does not appear on the chart of the area.
1/31/2009	1532	29°35'20.10"	89°14'0.358"	Structure does not appear on the chart of the area.
1/31/2009	1537	29°34'59.85"	89°13'59.00"	Structure does not appear on the chart of the area.
1/31/2009	1649	29°33'48.57"	89°18'57.22"	Structure does not appear on the chart of the area.
1/31/2009	1655	29°33'57.95"	89°19'25.44"	Structure does not appear on the chart of the area.

Survey Date	Time (UTC)	Latitude (N)	Longitude (W)	Comments
1/31/2009	1657	29°34'0.289"	89°19'28.00"	Structure does not appear on the chart of the area.
1/31/2009	1659	29°33'56.25"	89°19'38.43"	Structure does not appear on the chart of the area.
1/31/2009	1707	29°33'36.87"	89°19'23.82"	Structure does not appear on the chart of the area.
1/31/2009	1711	29°33'28.59"	89°19'29.19"	Structure does not appear on the chart of the area.
1/31/2009	1713	29°33'32.78"	89°19'29.29"	Structure does not appear on the chart of the area.
1/31/2009	1731	29°33'49.85"	89°19'50.40"	Structure does not appear on the chart of the area.
1/31/2009	1740	29°34'10.68"	89°20'10.08"	Structure does not appear on the chart of the area.
1/31/2009	1742	29°33'56.68"	89°20'13.38"	Structure does not appear on the chart of the area.
1/31/2009	1743	29°33'51.95"	89°20'11.29"	Structure does not appear on the chart of the area.
1/31/2009	1744	29°33'51.90"	89°20'12.69"	Structure does not appear on the chart of the area.
1/31/2009	1746	29°33'51.13"	89°20'14.65"	Structure does not appear on the chart of the area.
1/31/2009	1749	29°33'48.94"	89°20'20.55"	Structure does not appear on the chart of the area.
1/31/2009	1753	29°33'58.91"	89°20'18.44"	Structure does not appear on the chart of the area.
1/31/2009	1755	29°34'4.000"	89°20'27.30"	Structure does not appear on the chart of the area.
1/31/2009	1800	29°33'56.04"	89°20'33.82"	Structure does not appear on the chart of the area.
1/31/2009	1802	29°33'53.60"	89°20'37.71"	Structure does not appear on the chart of the area.
1/31/2009	1804	29°33'40.87"	89°20'50.97"	Structure does not appear on the chart of the area.

D.1. Chart Comparison

Features

Charted features investigated and new features positioned during OPR-J977-TE-08 are listed in Table 1 and Table 2.

Table 1 – Charted features located in D00141 which were compared with the survey data during OPR-J977-TE-08.

Feature	Latitude (N)	Longitude (W)	Charts Affected	Description
H01	29° 40' 16.49"	89° 17' 17.09"	11363_1 US4LA34M	Charted wreck PA. Searched for visually but not found during 2008 / 2009 survey.
H02	29° 38' 58.53"	89° 12' 56.58"	11363_1 US4LA34M	Charted wreck PA. Searched for visually but not found during 2008 / 2009 survey.
H03	29° 36' 01.00"	89° 23' 07.00"	11363_1 11364_1 US4LA35M	Charted wreck PA. Searched for visually but not found during 2008 / 2009 survey.
H04	29° 36' 18.00"	89° 17' 12.00"	11363_1 US4LA34M	Charted wreck PA. Searched for visually but not found during 2008 / 2009 survey.
H05	29° 34' 48.03"	89° 15' 24.18"	11363_1 11353_2 US5LA24M	Charted wreck PA. Searched for visually but not found during 2008 / 2009 survey.
H06	29° 33' 01.00"	89° 14' 22.80"	11363_1 11353_2 US5LA24M	Charted wreck PA. Searched for visually but not found during 2008 / 2009 survey.
H07	29° 29' 01.98"	89° 25' 00.16"	11363_1 11364_1 US4LA35M	Charted wreck PA. Searched for visually but not found during 2008 / 2009 survey.
H08	29° 28' 36.04"	89° 19' 00.13"	11363_1 US4LA34M	Charted wreck mast PA. Searched for visually but not found during 2008 / 2009 survey.
H09	29° 27' 31.00"	89° 12' 30.66"	11363_1 11353_2 US5LA24M	Charted wreck PA. Searched for visually but not found during 2008 / 2009 survey.
H10	29° 36' 19.02"	89° 13' 14.34"	11363_1 US4LA34M	Charted submerged wreck 14ft rep.. Searched for visually but not found during 2008 / 2009 survey.

Feature	Latitude (N)	Longitude (W)	Charts Affected	Description
H11	29° 34' 43.76"	89° 15' 54.11"	11363_1 11353_2 US5LA24M	Charted submerged wreck PA. Searched for visually but not found during 2008 / 2009 survey.
H12	29° 35' 39.67"	89° 19' 23.55"	11363_1 US4LA34M	Charted submerged wreck PA. Searched for visually but not found during 2008 / 2009 survey.
H13	29° 33' 59.94"	89° 17' 30.13"	11363_1 11353_2 US5LA24M	Charted submerged wreck PD. Searched for visually but not found during 2008 / 2009 survey.
H14	29° 35' 18.07"	89° 14' 13.22"	11363_1 11353_2 US5LA24M	Charted submerged wreck PA. Searched for visually but not found during 2008 / 2009 survey.
H15	29° 33' 03.05"	89° 12' 32.99"	11363_1 11353_2 US5LA24M	Charted submerged wreck PA. Searched for visually but not found during 2008 / 2009 survey.
H16	29° 32' 00.25"	89° 13' 59.16"	11363_1 11353_2 US5LA24M	Charted submerged wreck PA. Searched for visually but not found during 2008 / 2009 survey.
H17	29° 31' 35.35"	89° 13' 43.37"	11363_1 11353_2 US5LA24M	Charted submerged Wreck PD. Searched for visually but not found during 2008 / 2009 survey.
H18	29° 38' 31.91"	89° 16' 00.56"	11363_1 US4LA34M	Charted submerged wreck PA. Searched for visually but not found during 2008 / 2009 survey.
H19	29° 33' 30.04"	89° 18' 30.06"	11363_1 11353_2 US5LA24M	Charted submerged wreck PA. Searched for visually but not found during 2008 / 2009 survey.
H20	29° 30' 26.64"	89° 21' 57.90"	11363_1 11364_1 US4LA35M	Charted submerged wreck ED. Searched for visually but not found during 2008 / 2009 survey.
H21	29° 28' 18.00"	89° 21' 06.00"	11363_1 US4LA34M	Charted submerged wreck PA. Searched for visually but not found during 2008 / 2009 survey.
H22	29° 28' 22.00"	89° 20' 50.00"	11363_1 US4LA34M	Charted submerged wreck PA. Searched for visually but not found during 2008 / 2009 survey.

Feature	Latitude (N)	Longitude (W)	Charts Affected	Description
H23	29° 28' 48.00"	89° 14' 13.00"	11363_1 11353_2 US4LA34M	Charted submerged wreck PA. Searched for visually but not found during 2008 / 2009 survey.
H24	29° 31' 20.05"	89° 19' 42.50"	11363_1 US4LA34M	Charted submerged pipe PD
H25	29° 31' 52.20"	89° 20' 28.20"	11363_1 US4LA34M	Charted pilings PA. Searched for visually but not found during 2008 / 2009 survey.
H26	29° 32' 51.00"	89° 21' 20.00"	11363_1 11364_1 US4LA35M	Charted obstruction PA. Not investigated.
H27	29° 33' 39.06"	89° 20' 19.38"	11363_1 US4LA34M	Charted obstruction PA. Not investigated.
H28	29° 33' 43.98"	89° 20' 51.00"	11363_1 11364_1 US4LA35M	Charted obstruction PA. Not investigated.
H29	29° 33' 49.02"	89° 20' 30.12"	11363_1 US4LA34M	Charted obstruction PA. Not investigated.
H30	29° 33' 50.44"	89° 16' 52.35"	11363_1 US4LA34M	Charted obstruction PA. Not investigated.
H31	29° 33' 51.81"	89° 13' 40.52"	11363_1 US4LA34M	Charted obstruction rep PA. Not investigated.
H32	29° 33' 53.04"	89° 20' 14.10"	11363_1 US4LA34M	Charted obstruction PA. Not investigated.
H33	29° 33' 54.60"	89° 20' 22.86"	11363_1 US4LA34M	Charted obstruction PA. Not investigated.
H34	29° 33' 56.04"	89° 20' 34.26"	11363_1 US4LA34M	Charted obstruction PA. Not investigated.
H35	29° 33' 56.12"	89° 21' 11.49"	11363_1 11364_1 US4LA35M	Charted obstruction ED. Not investigated.
H36	29° 33' 56.40"	89° 20' 13.38"	11363_1 US4LA34M	Charted obstruction PA. Not investigated.

Feature	Latitude (N)	Longitude (W)	Charts Affected	Description
H37	29° 34' 09.66"	89° 20' 10.92"	11363_1 US4LA34M	Charted obstruction PA. Not investigated.
H38	29° 37' 45.43"	89° 17' 11.22"	11363_1 US4LA34M	Charted obstruction PA. Not investigated.
H39	29° 25' 19.22"	89° 11' 52.83"	11363_1 US4LA34M	Charted obstruction PA. Not investigated.
H40	29° 26' 58.00"	89° 16' 14.00"	11363_1 US4LA34M	Charted pile PA. Searched for visually but not found during 2008 / 2009 survey.
H41	29° 27' 42.00"	89° 22' 12.00"	11363_1 US4LA34M	Charted obstruction PA. Not investigated.
H42	29° 28' 13.02"	89° 19' 30.03"	11363_1 US4LA34M	Charted obstruction PA 5 ft rep. Not investigated.
H43	29° 28' 13.81"	89° 20' 11.06"	11363_1 US4LA34M	Charted obstruction PA. Not investigated.
H44	29° 28' 17.88"	89° 18' 42.15"	11363_1 11353_2 US5LA24M	Charted obstruction PA. Not investigated.
H45	29° 28' 18.00"	89° 23' 18.00"	11363_1 US4LA34M	Charted obstruction PA
H46	29° 28' 36.72"	89° 20' 53.67"	11363_1 11364_1 US4LA34M	Charted obstruction PA. Not investigated.
H47	29° 28' 42.02"	89° 19' 00.03"	11363_1 11353_2 US5LA24M	Charted obstruction PD. Not investigated.
H48	29° 29' 23.25"	89° 12' 17.72"	11363_1 11353_2 US5LA24M	Charted buoy, private OR. Not investigated.
H49	29° 29' 25.41"	89° 12' 07.53"	11363_1 11353_2 US5LA24M	Charted buoy, private OR. Not investigated.

Feature	Latitude (N)	Longitude (W)	Charts Affected	Description
H50	29° 29' 26.29"	89° 12' 03.08"	11363_1 11353_2 US5LA24M	Charted buoy, private OR. Not investigated.
H51	29° 29' 28.00"	89° 11' 47.70"	11363_1 11353_2 US5LA24M	Charted obstruction PA exposed pipeline. Not investigated.
H52	29° 29' 28.79"	89° 11' 49.36"	11363_1 US4LA34M	Charted obstruction PA exposed pipeline. Not investigated.
H53	29° 29' 29.07"	89° 11' 47.85"	11363_1 US4LA34M	Charted obstruction PA exposed pipeline. Not investigated.
H54	29° 29' 29.94"	89° 11' 49.43"	11363_1 US4LA34M	Charted obstruction PA exposed pipeline. Not investigated.
H55	29° 29' 42.17"	89° 20' 54.19"	11363_1 11364_1 US4LA35M	Charted obstruction piles PA. Searched for visually but not found during 2008 / 2009 survey.
H56	29° 29' 55.20"	89° 20' 52.80"	11363_1 11364_1 US4LA34M	Charted obstruction pipe PA. Not investigated.
H57	29° 30' 36.03"	89° 15' 06.10"	11363_1 11353_2 US5LA24M	Charted submerged pipe ED. Not investigated.
H58	29° 30' 47.00"	89° 14' 46.00"	11363_1 11353_2 US5LA24M	Charted pipe rep. PA. Searched for visually but not found during 2008 / 2009 survey.
H59	29° 31' 00.57"	89° 24' 58.71"	11363_1 11364_1 US4LA35M	Charted obstruction submerged piles PA. Searched for visually but not found during 2008 / 2009 survey.
H60	29° 31' 01.56"	89° 12' 59.36"	11363_1 11353_2 US5LA24M	Charted pipe rep PA. Searched for visually but not found during 2008 / 2009 survey.

Feature	Latitude (N)	Longitude (W)	Charts Affected	Description
H61	29° 31' 11.00"	89° 16' 19.00"	11363_1 11353_2 US5LA24M	Charted obstruction PA. Not investigated.
H62	29° 31' 36.74"	89° 13' 41.40"	11363_1 11353_2 US5LA24M	Charted pipeline pipe rep. PA. Searched for visually but not found during 2008 / 2009 survey.
H63	29° 32' 52.08"	89° 12' 15.68"	11363_1 11353_2 US5LA24M	Charted obstruction rep. PA. Not investigated.
H64	29° 32' 53.00"	89° 21' 28.00"	11363_1 11364_1 US4LA35M	Charted obstruction pipe PA. Not investigated.
H65	29° 35' 48.00"	89° 15' 54.00"	11363_1 US4LA34M	Charted obstruction submerged pile ED. Searched for visually but not found during 2008 / 2009 survey.
H66	29° 40' 01.03"	89° 15' 59.90"	11363_1 US4LA34M	Charted obstruction submerged pipe
H67	29° 41' 02.10"	89° 15' 11.06"	11363_1 US4LA34M	Charted submerged pilings PA. Searched for visually but not found during 2008 / 2009 survey.

Table 2 - Uncharted features located in D00141 which were positioned during OPR-J977-TE-08.

Feature	Latitude (N)	Longitude (W)	Charts Affected	Description
H1	29° 27' 09.21"	89° 24' 12.11"	11364_1 US4LA35M	Uncharted piling positioned during 2008 / 2009 survey.
H2	29° 36' 31.53"	89° 19' 15.12"	11363_1 US4LA34M	Uncharted piling positioned during 2008 / 2009 survey. DTON submitted.
H3	29° 34' 34.47"	89° 15' 53.39"	11353_1 11363_1 US5LA24M	Uncharted wreck awash positioned during 2008 / 2009 survey. DTON submitted.

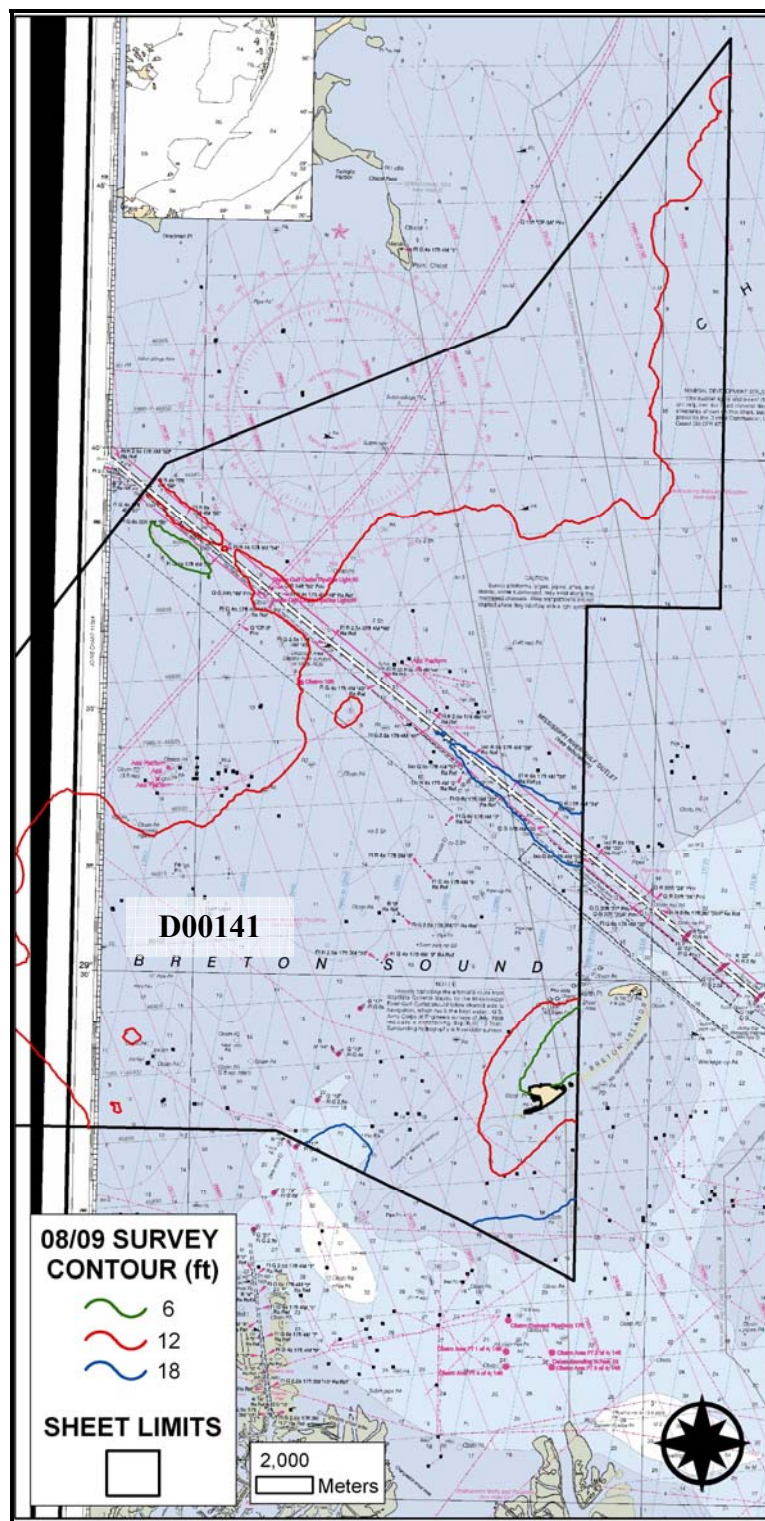
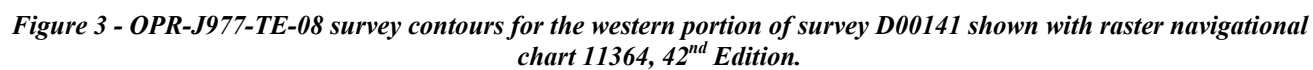


Figure 2 - OPR-J977-TE-08 survey contours for the eastern and northern portions of survey D00141 shown with raster navigational chart 11363, 41st Edition.



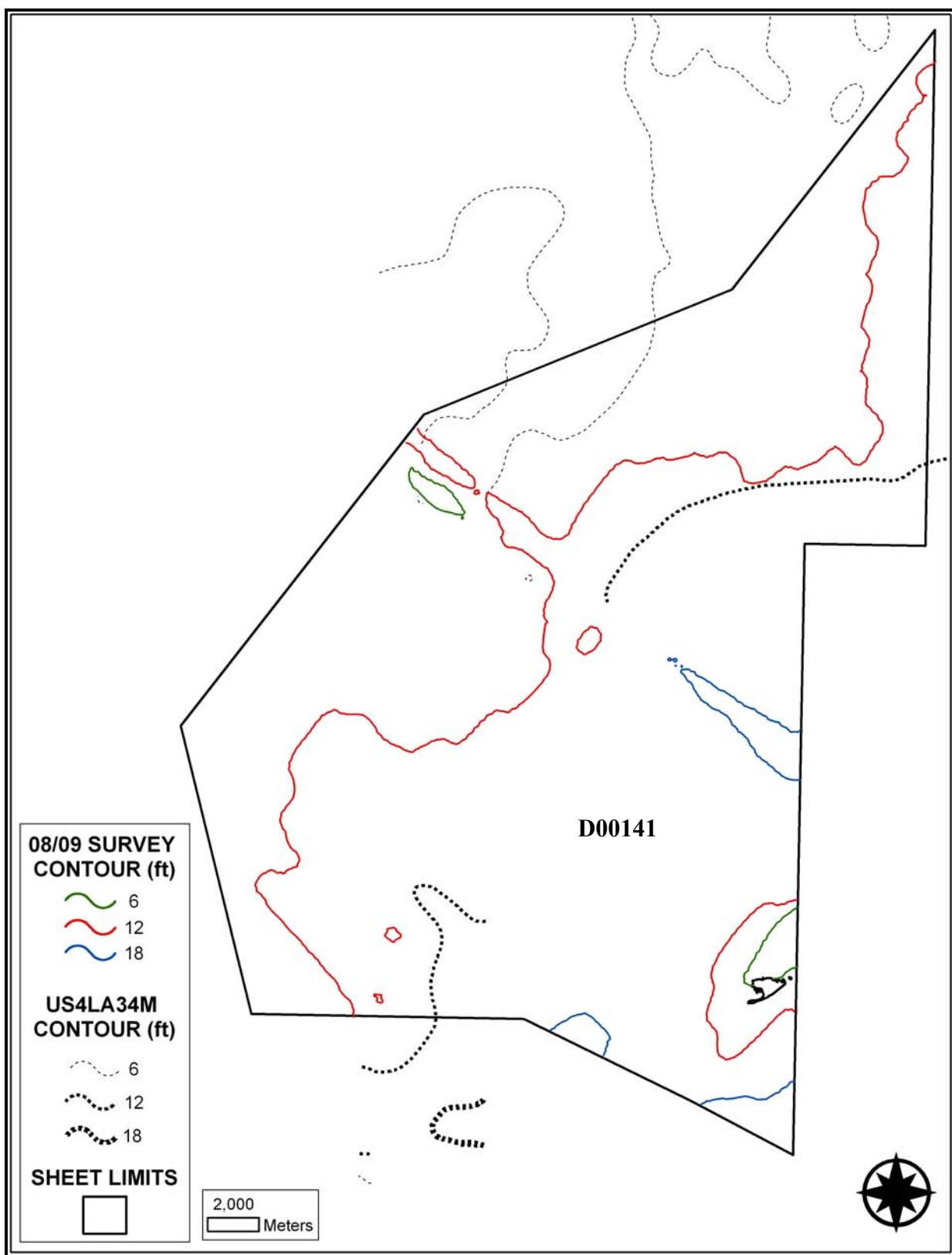


Figure 4 - OPR-J977-TE-08 survey contours for survey D00141 shown with electronic navigation chart US4LA34M, 1st Edition.

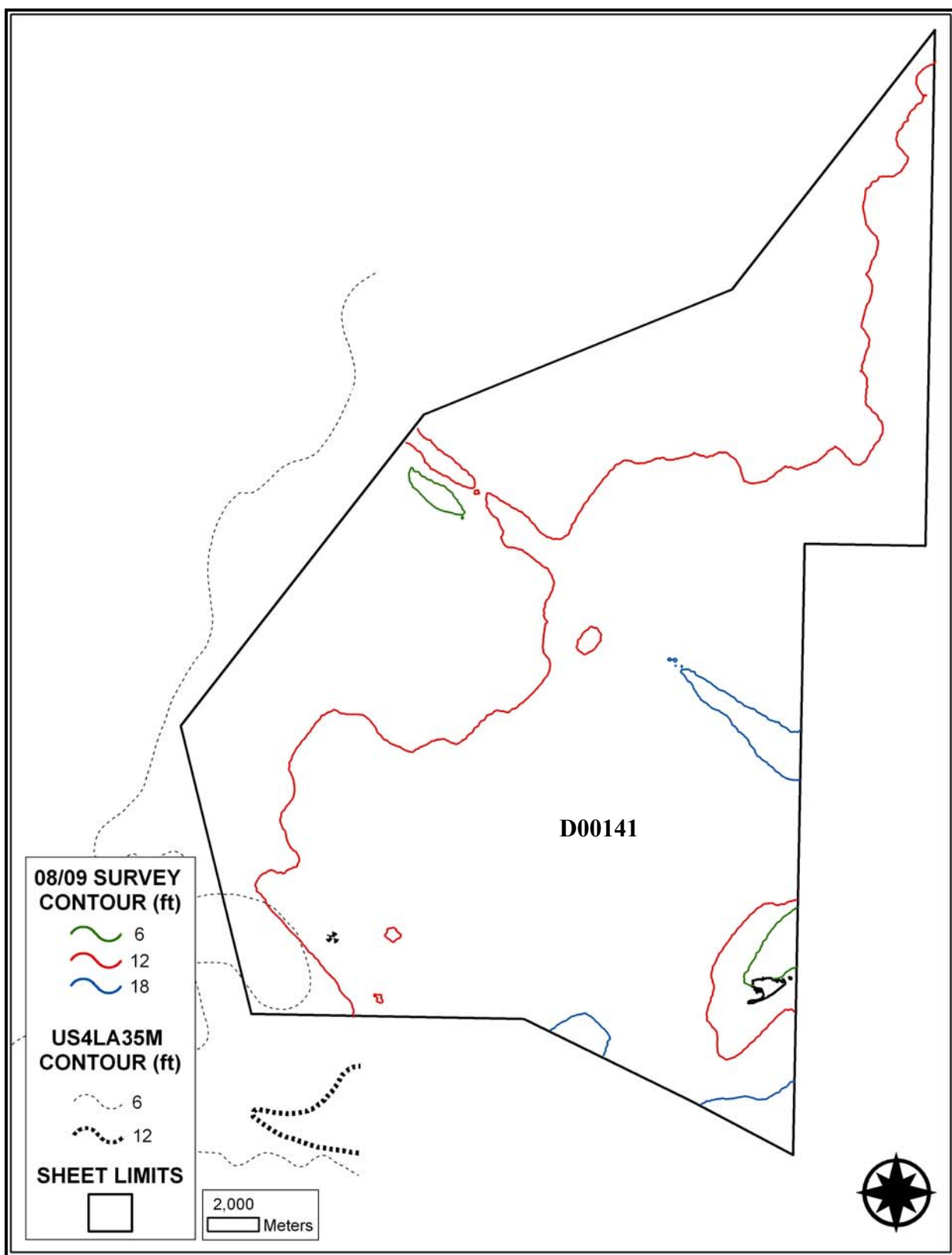


Figure 5 - OPR-J977-TE-08 survey contours for survey D00141 shown with electronic navigation chart US4LA35M, 23rd Edition.

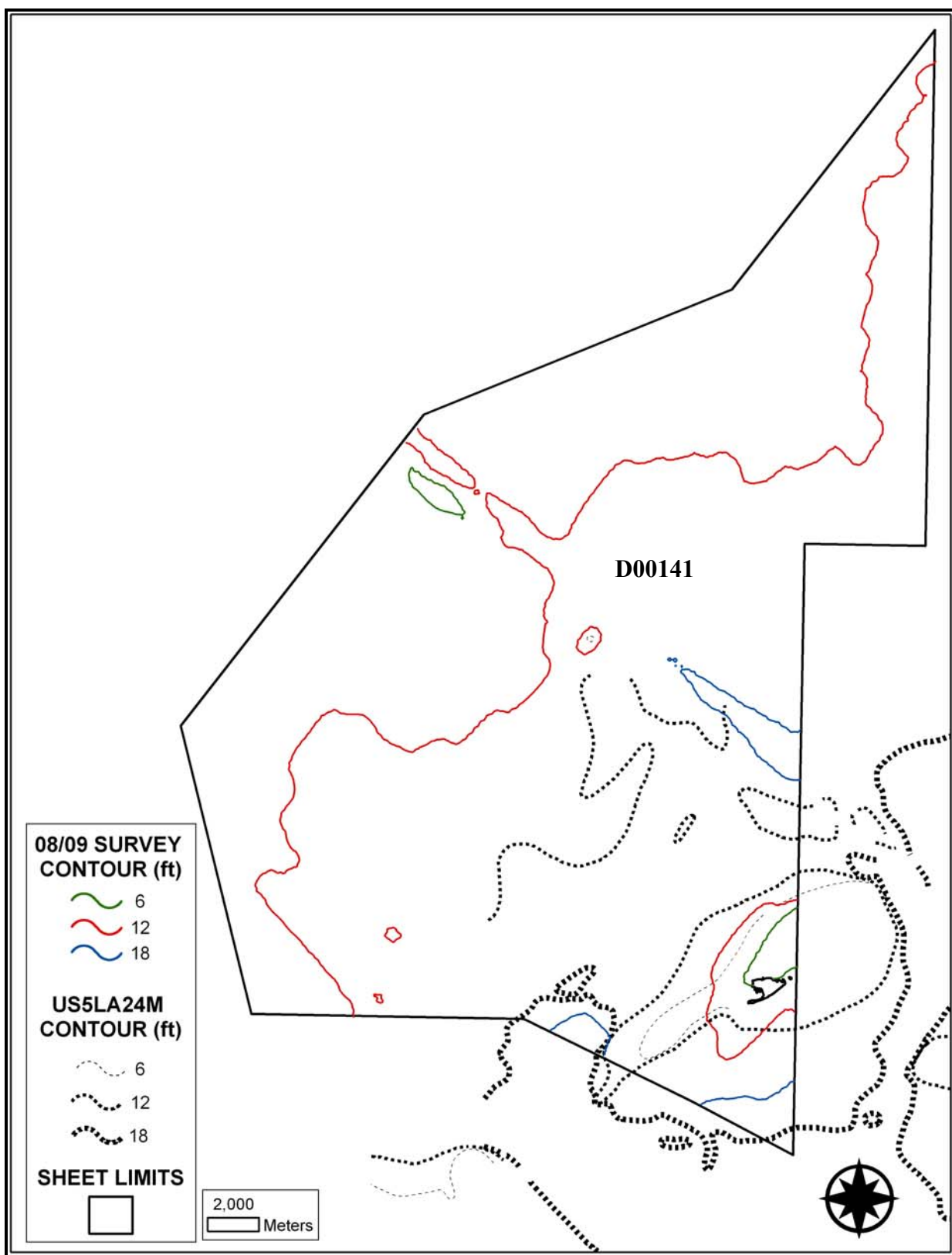


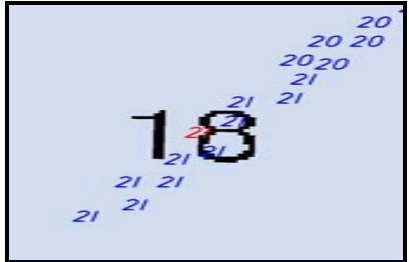

Figure 6 - OPR-J977-TE-08 survey contours for survey D00141 shown with electronic navigation chart US5LA24M, 24th Edition.

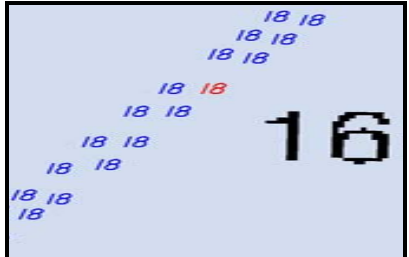


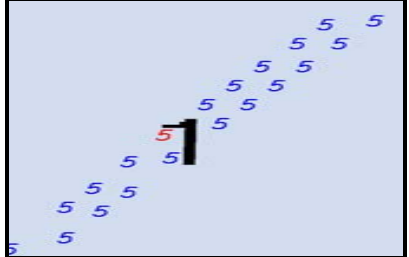
D.1. Compare to Chart


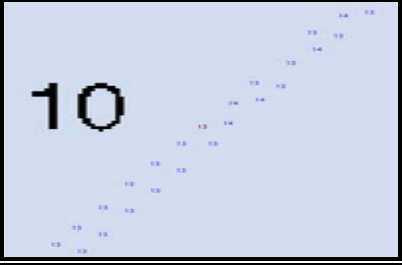

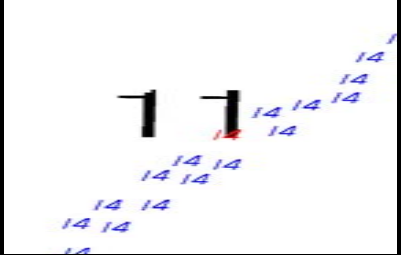
D.1.4. Soundings

The 2008 / 2009 survey depths were compared with the charted depths in D00141. The charts used for this comparison included raster navigational charts 11353, 5th Edition, dated January 2008, 11363, 41st Edition, dated June 2007, 11364, 42nd Edition, dated September 2007 and electronic navigation charts USA4LA34M, 1st Edition, dated June 18, 2008, US4LA35M, 23rd Edition, dated May 29, 2008 and US5LA24M, 24th Edition, dated June 3, 2008. Tables 1 through 12 contain detailed information for each survey depth that differed from the charted depth by greater than 10% of the water depth at the charted position. The tables are separated by the respective chart and are further classified by whether the charted depth is shoaler or deeper than the survey depth.

Table 1 - Charted depths are shoaler than OPR-J977-TE-08 survey depths. Chart 11353, 5th Edition, January 2008.

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 24' 39.93" N	089° 12' 25.93" W	11353, 5 th Edition, January 2008	18 ft	21 ft	
29° 25' 05.86" N	089° 13' 36.66" W	11353, 5 th Edition, January 2008	18 ft	20 ft	

Latitude Longitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 25' 39.97" N	089° 11' 33.17" W	11353, 5 th Edition, January 2008	16 ft	18 ft	
29° 26' 29.34" N	089° 14' 43.02" W	11353, 5 th Edition, January 2008	5 ft	14 ft	
29° 28' 05.87" N	089° 14' 06.86" W	11353, 5 th Edition, January 2008	11 ft	13 ft	
29° 28' 12.41" N	089° 12' 29.41" W	11353, 5 th Edition, January 2008	1 ft	5 ft	

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 28' 30.42" N	089° 12' 12.56" W	11353, 5 th Edition, January 2008	3 ft	4 ft	
29° 28' 47.39" N	089° 13' 32.04" W	11353, 5 th Edition, January 2008	10 ft	13 ft	
29° 30' 33.05" N	089° 18' 58.48" W	11353, 5 th Edition, January 2008	11 ft	13 ft	
29° 30' 57.65" N	089° 17' 05.24" W	11353, 5 th Edition, January 2008	11 ft	14 ft	

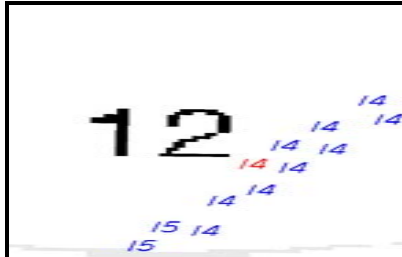
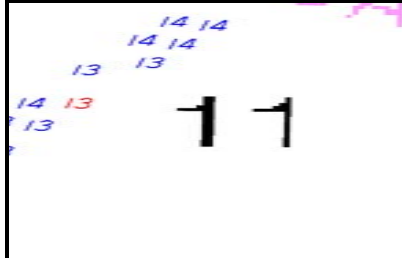

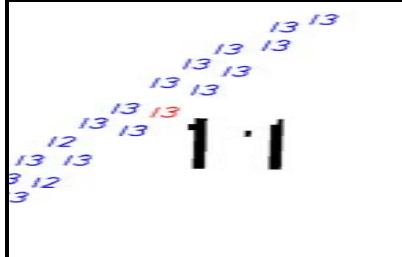
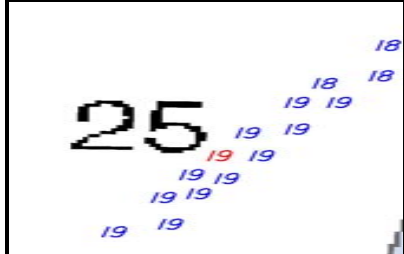
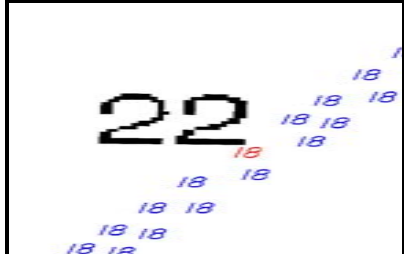


Latitude Longitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 30' 58.90" N	089° 11' 39.77" W	11353, 5 th Edition, January 2008	12 ft	14 ft	
29° 32' 08.66" N	089° 17' 35.87" W	11353, 5 th Edition, January 2008	11 ft	13 ft	
29° 35' 03.19" N	089° 16' 40.21" W	11353, 5 th Edition, January 2008	6 ft	11 ft	
29° 35' 20.45" N	089° 17' 10.79" W	11353, 5 th Edition, January 2008	11 ft	13 ft	

Table 2 - Charted depths are deeper than OPR-J977-TE-08 survey depths. Chart 11353, 5th Edition, January 2008.

Latitude Longitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 26' 21.14" N	089° 16' 23.99" W	11353, 5 th Edition, January 2008	25 ft	19 ft	
29° 26' 58.05" N	089° 16' 38.55" W	11353, 5 th Edition, January 2008	22 ft	18 ft	
29° 27' 01.08" N	089° 17' 22.25" W	11353, 5 th Edition, January 2008	22 ft	17 ft	
29° 27' 49.00" N	089° 16' 41.35" W	11353, 5 th Edition, January 2008	19 ft	17 ft	

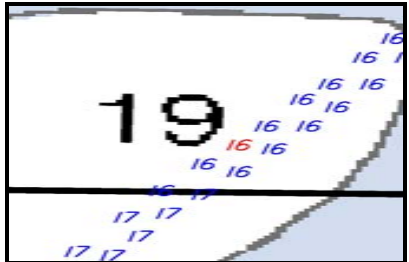

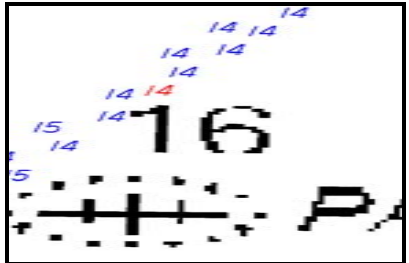
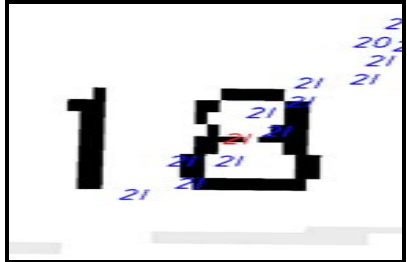
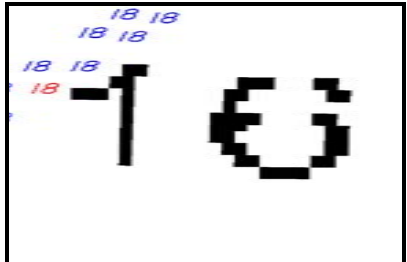

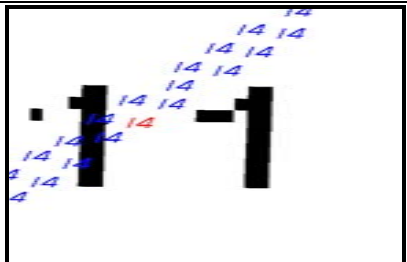
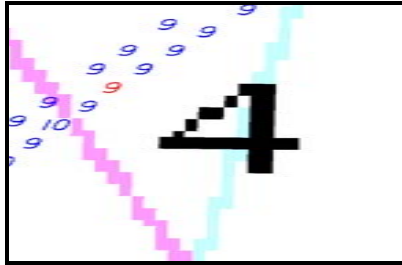
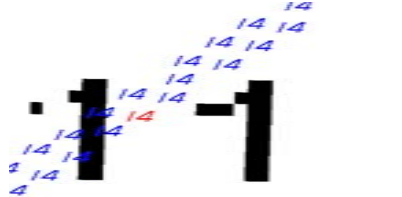
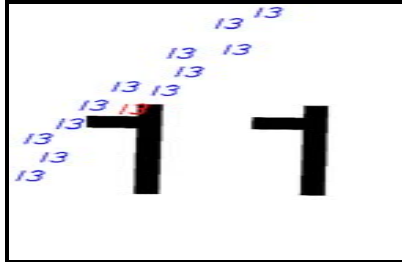
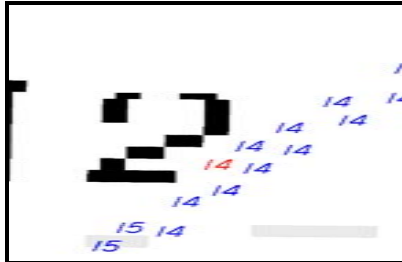
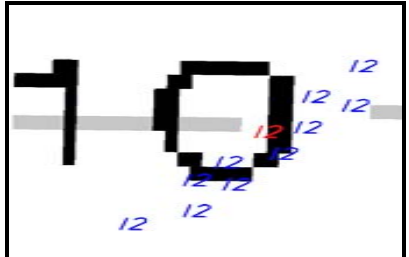
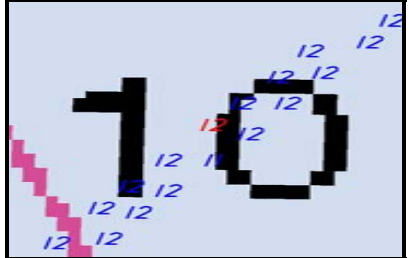
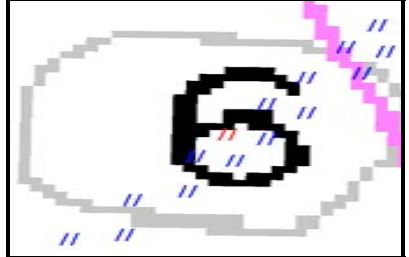
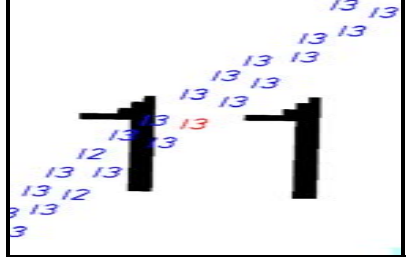
Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 28' 02.09" N	089° 16' 30.00" W	11353, 5 th Edition, January 2008	19 ft	16 ft	
29° 28' 12.86" N	089° 16' 21.24" W	11353, 5 th Edition, January 2008	18 ft	16 ft	
29° 28' 53.44" N	089° 14' 12.13" W	11353, 5 th Edition, January 2008	16 ft	14 ft	

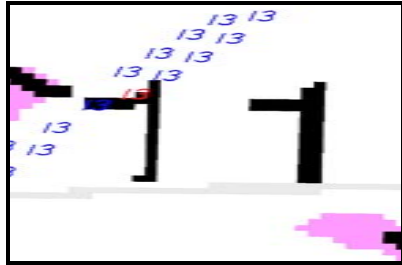
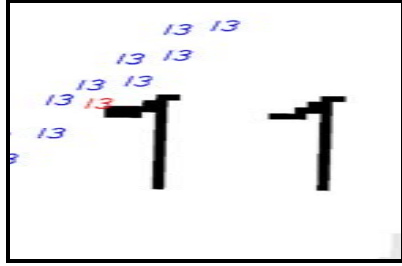
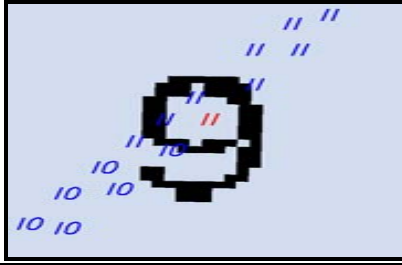
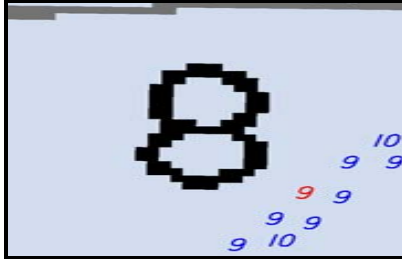
Table 3 - Charted depths are shoaler than OPR-J977-TE-08 survey depths. Chart 11363, 41st Edition, June 2007.

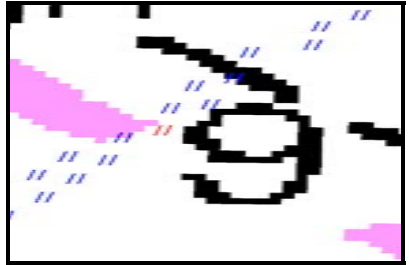

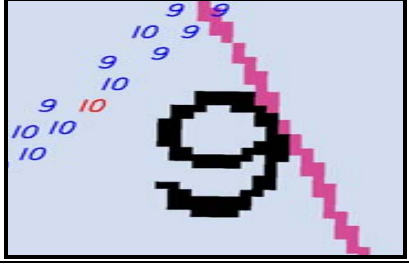
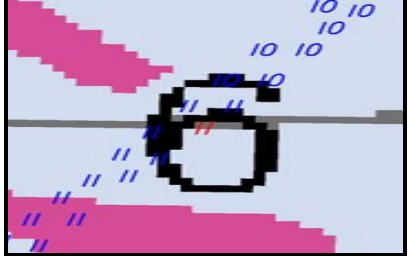
Latitude Longitude		Chart	Charted Depth	Survey Depth	Image
29° 24' 38.78" N	089° 12' 26.48" W	11363, 41st Edition, June 2007	18 ft	21 ft	
29° 25' 38.98" N	089° 11' 34.15" W	11363, 41st Edition, June 2007	16 ft	18 ft	
29° 26' 28.93" N	089° 14' 44.50" W	11363, 41st Edition, June 2007	5 ft	14 ft	
29° 27' 03.95" N	089° 21' 11.60" W	11363, 41st Edition, June 2007	11 ft	14 ft	

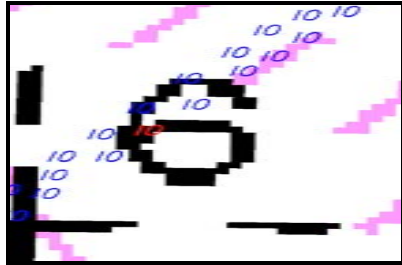
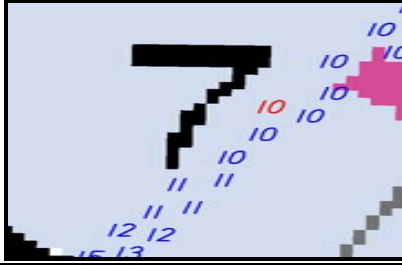
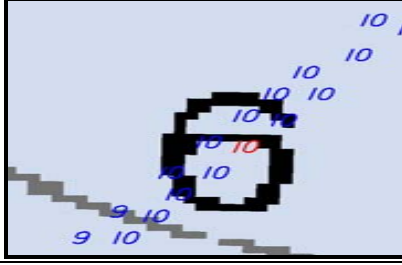
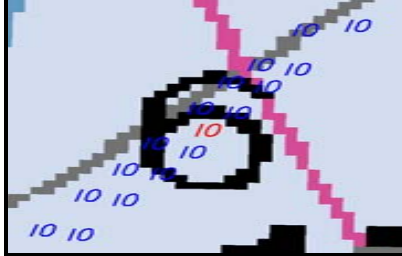
Latitude Longitude	Chart	Charted Depth	Survey Depth	Image
29° 27' 29.07" N 089° 11' 32.52" W	11363, 41st Edition, June 2007	10 ft	11 ft	
29° 28' 05.35" N 089° 14' 08.18" W	11363, 41st Edition, June 2007	11 ft	13 ft	
29° 28' 12.55" N 089° 12' 29.50" W	11363, 41st Edition, June 2007	1 ft	5 ft	
29° 28' 31.95" N 089° 12' 12.55" W	11363, 41st Edition, June 2007	3 ft	4 ft	

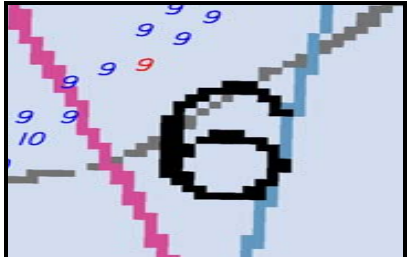
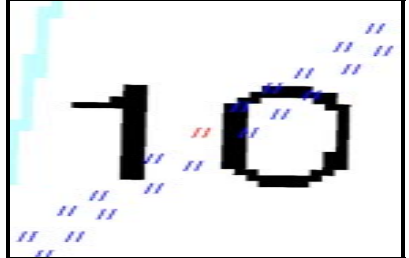
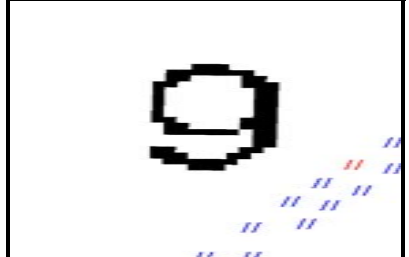
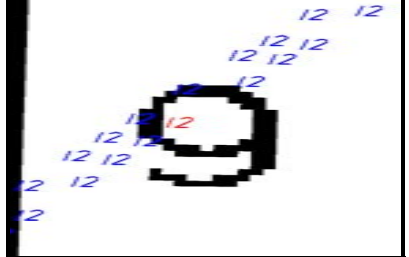
Latitude Longitude	Chart	Charted Depth	Survey Depth	Image
29° 28' 47.08" N 089° 12' 44.95" W	11363, 41st Edition, June 2007	4 ft	9 ft	
29° 28' 47.21" N 089° 20' 28.53" W	11363, 41st Edition, June 2007	11 ft	14 ft	
29° 30' 32.01" N 089° 18' 58.82" W	11363, 41st Edition, June 2007	11 ft	13 ft	
29° 30' 58.88" N 089° 11' 39.70" W	11363, 41st Edition, June 2007	2 ft	14 ft	

Latitude Longitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 31' 48.91" N	089° 20' 13.49" W	11363, 41st Edition, June 2007	10 ft	12 ft	
29° 32' 22.87" N	089° 21' 16.74" W	11363, 41st Edition, June 2007	10 ft	12 ft	
29° 32' 52.89" N	089° 17' 44.61" W	11363, 41st Edition, June 2007	6 ft	11 ft	
29° 35' 20.45" N	089° 17' 10.64" W	11363, 41st Edition, June 2007	11 ft	13 ft	

Latitude Longitude		Chart	Charted Depth	Survey Depth	Image
29° 35' 51.90" N	089° 16' 44.01" W	11363, 41st Edition, June 2007	11 ft	13 ft	
29° 36' 16.26" N	089° 16' 23.03" W	11363, 41st Edition, June 2007	11 ft	13 ft	
29° 36' 20.97" N	089° 18' 38.23" W	11363, 41st Edition, June 2007	9 ft	11 ft	
29° 36' 41.92" N	089° 21' 27.05" W	11363, 41st Edition, June 2007	8 ft	9 ft	

Latitude Longitude	Chart	Charted Depth	Survey Depth	Image
29° 36' 51.79" N 089° 18' 11.78" W	11363, 41st Edition, June 2007	9 ft	11 ft	
29° 37' 08.53" N 089° 17' 57.48" W	11363, 41st Edition, June 2007	9 ft	11 ft	
29° 37' 20.27" N 089° 21' 39.53" W	11363, 41st Edition, June 2007	9 ft	10 ft	
29° 38' 11.88" N 089° 19' 22.43" W	11363, 41st Edition, June 2007	6 ft	11 ft	

Latitude Longitude	Chart	Charted Depth	Survey Depth	Image
29° 38' 33.11" N 089° 19' 04.43" W	11363, 41st Edition, June 2007	6 ft	10 ft	
29° 39' 11.90" N 089° 20' 51.58" W	11363, 41st Edition, June 2007	7 ft	10 ft	
29° 39' 19.29" N 089° 17' 38.41" W	11363, 41st Edition, June 2007	6 ft	10 ft	
29° 39' 30.10" N 089° 20' 34.93" W	11363, 41st Edition, June 2007	6 ft	10 ft	

Latitude Longitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 39' 43.26" N	089° 19' 37.03" W	11363, 41st Edition, June 2007	6 ft	9 ft	
29° 40' 48.52" N	089° 11' 43.72" W	11363, 41st Edition, June 2007	10 ft	11 ft	
29° 41' 35.59" N	089° 11' 03.17" W	11363, 41st Edition, June 2007	9 ft	11 ft	
29° 42' 52.60" N	089° 09' 56.09" W	11363, 41st Edition, June 2007	9 ft	12 ft	

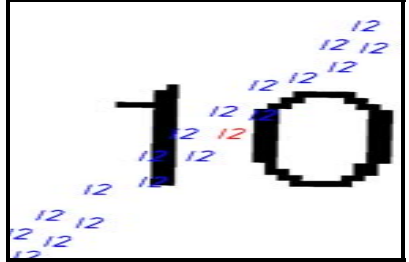
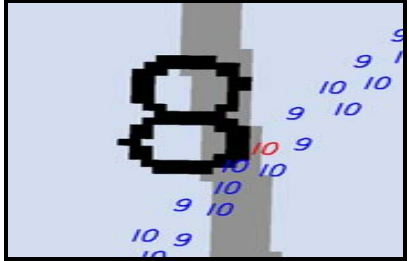
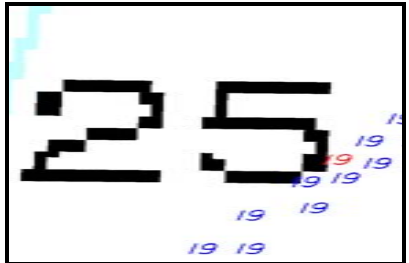
Latitude Longitude	Chart	Charted Depth	Survey Depth	Image
29° 43' 12.64" N 089° 08' 51.95" W	11363, 41st Edition, June 2007	10 ft	12 ft	
29° 44' 00.48" N 089° 12' 04.33" W	11363, 41st Edition, June 2007	8 ft	10 ft	

Table 4 - Charted depths are deeper than OPR-J977-TE-08 survey depths. Chart 11363, 41st Edition, June 2007.

Latitude Longitude	Chart	Charted Depth	Survey Depth	Image
29° 26' 20.31" N 089° 16' 24.64" W	11363, 41st Edition, June 2007	25 ft	19 ft	

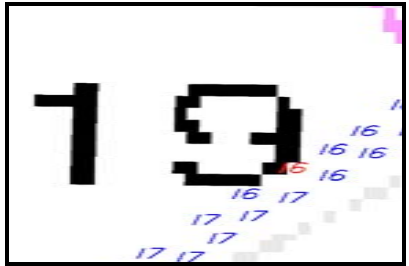

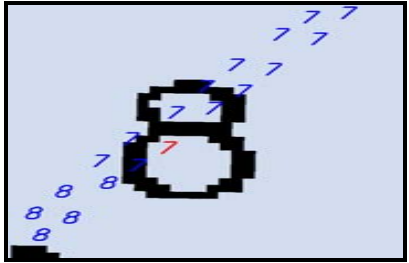
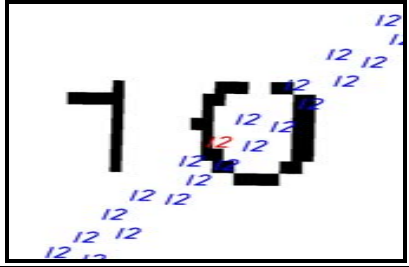
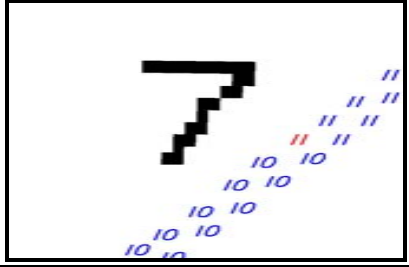
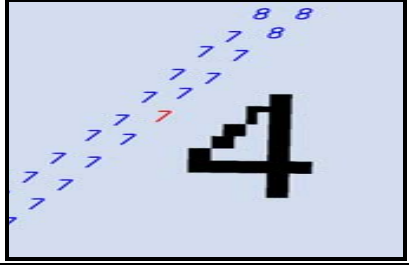
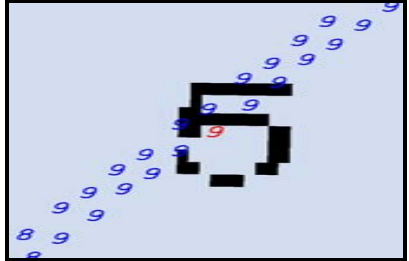
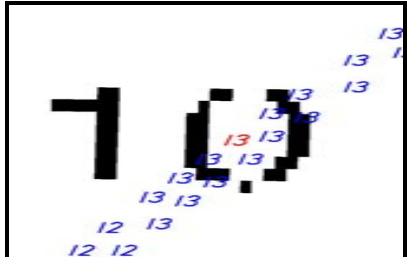
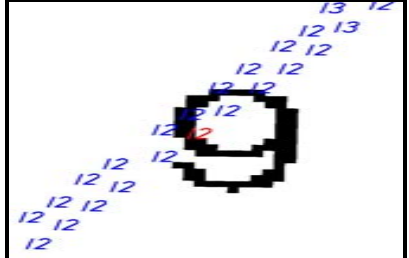
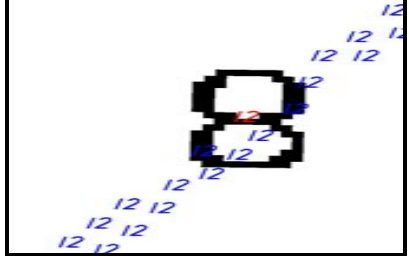
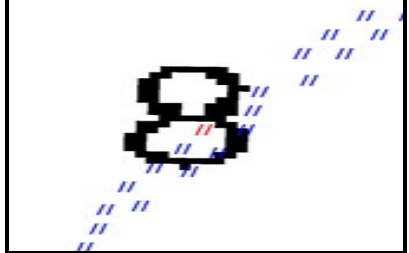
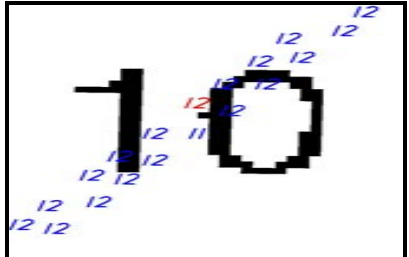
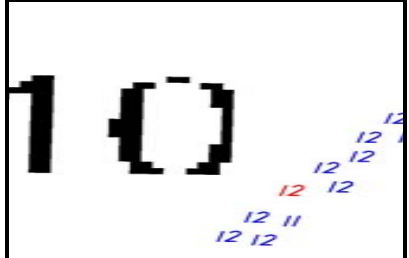
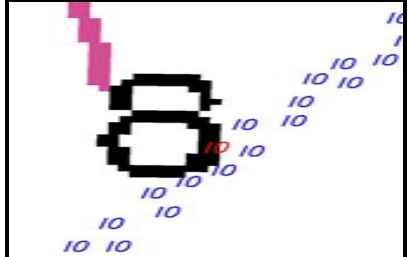
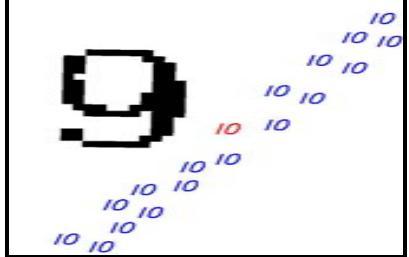
Latitude Longitude	Chart	Charted Depth	Survey Depth	Image
29° 28' 01.08" N 089° 16' 31.05" W	11363, 41st Edition, June 2007	19 ft	16 ft	
29° 35' 17.85" N 089° 11' 49.28" W	11363, 41st Edition, June 2007	16 ft	14 ft	
29° 37' 56.10" N 089° 21' 08.68" W	11363, 41st Edition, June 2007	8 ft	7 ft	

Table 5 - Charted depths are shoaler than OPR-J977-TE-08 survey depths. Chart 11364, 41st Edition, December 2005.

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 27' 04.68" N	089° 21' 10.95" W	11364, 41st Edition, December 2005	10 ft	12 ft	
29° 27' 09.47" N	089° 22' 39.88" W	11364, 41st Edition, December 2005	7 ft	11 ft	
29° 27' 47.69" N	089° 24' 24.99" W	11364, 41st Edition, December 2005	4 ft	7 ft	
29° 28' 06.69" N	089° 24' 08.74" W	11364, 41st Edition, December 2005	5 ft	9 ft	

Latitude Longitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 28' 26.67" N	089° 23' 06.53" W	11364, 41st Edition, December 2005	10 ft	13 ft	
29° 30' 15.47" N	089° 23' 04.74" W	11364, 41st Edition, December 2005	9 ft	12 ft	
29° 30' 42.84" N	089° 23' 28.87" W	11364, 41st Edition, December 2005	8 ft	12 ft	
29° 31' 56.90" N	089° 24' 44.75" W	11364, 41st Edition, December 2005	8 ft	11 ft	

Latitude Longitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 32' 22.87" N	089° 21' 16.88" W	11364, 41st Edition, December 2005	10 ft	12 ft	
29° 32' 54.03" N	089° 22' 23.37" W	11364, 41st Edition, December 2005	10 ft	12 ft	
29° 34' 14.89" N	089° 25' 05.77" W	11364, 41st Edition, December 2005	8 ft	10 ft	
29° 34' 56.01" N	089° 22' 11.30" W	11364, 41st Edition, December 2005	9 ft	10 ft	

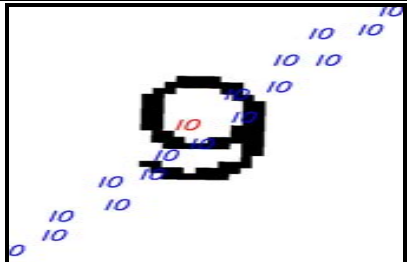
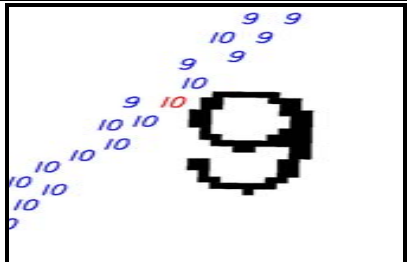
Latitude Longitude	Chart	Charted Depth	Survey Depth	Image
29° 37' 13.46" N 089° 22' 33.09" W	11364, 41st Edition, December 2005	9 ft	10 ft	
29° 37' 20.29" N 089° 21' 39.59" W	11364, 41st Edition, December 2005	9 ft	10 ft	

Table 6 - Charted depths are deeper than OPR-J977-TE-08 survey depths. Chart 11364, 41st Edition, December 2005.

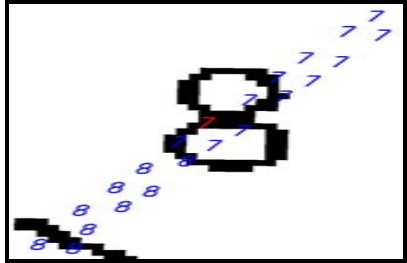
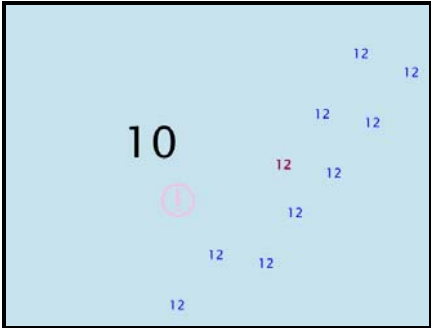
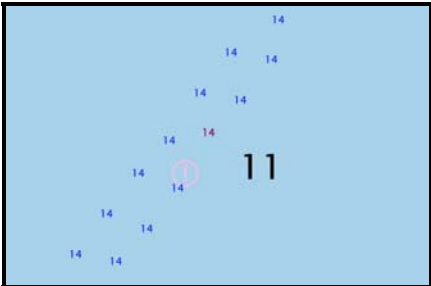
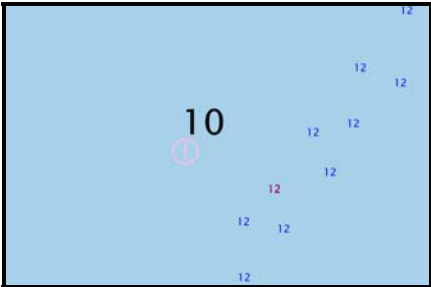
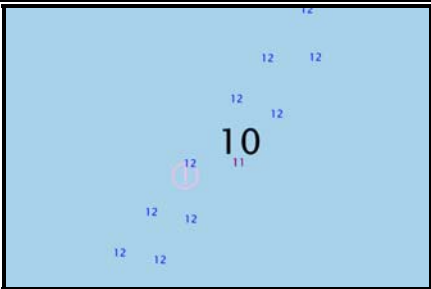
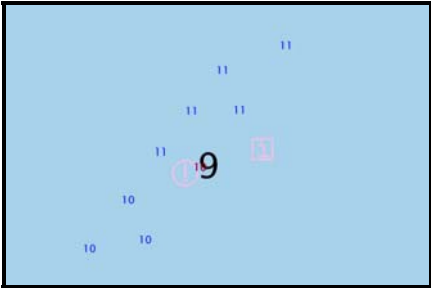
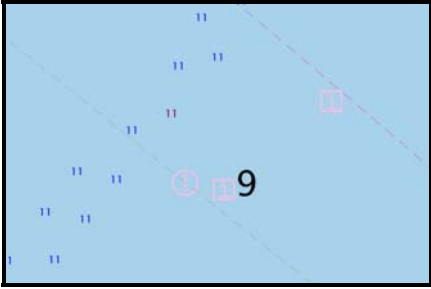
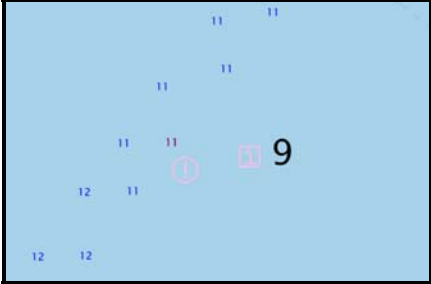
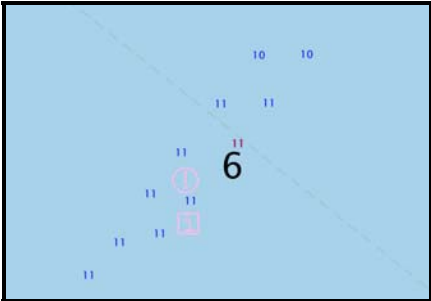
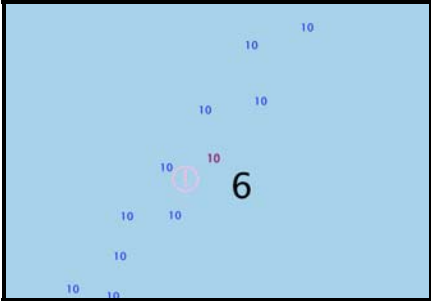
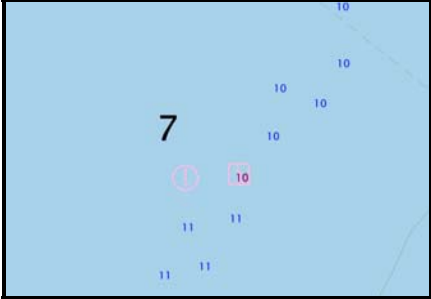
Latitude Longitude	Chart	Charted Depth	Survey Depth	Image
29° 37' 56.38" N 089° 21' 09.74" W	11364, 41st Edition, December 2005	8 ft	7 ft	

Table 7 - Charted depths are shoaler than OPR-J977-TE-08 survey depths. Electronic Navigation Chart US4LA34M, 1st Edition, June 18, 2008.

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 27' 03.94" N	089° 21' 11.77" W	US4LA34M 1 st Edition, June 18, 2008	10 ft	12 ft	
29° 28' 46.67" N	089° 20' 29.42" W	US4LA34M 1 st Edition, June 18, 2008	11 ft	14 ft	
29° 31' 47.84" N	089° 20' 14.28" W	US4LA34M 1 st Edition, June 18, 2008	10 ft	12 ft	

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 32' 21.64" N	089° 21' 16.88" W	US4LA34M 1 st Edition, June 18, 2008	10 ft	11 ft	
29° 36' 19.87" N	089° 18' 39.08" W	US4LA34M 1 st Edition, June 18, 2008	9 ft	10 ft	
29° 36' 51.86" N	089° 18' 11.75" W	US4LA34M 1 st Edition, June 18, 2008	9 ft	11 ft	
29° 37' 07.01" N	089° 17' 58.72" W	US4LA34M 1 st Edition, June 18, 2008	9 ft	11 ft	

Latitude Longitude		Chart	Charted Depth	Survey Depth	Image
29° 38' 11.98" N	089° 19' 22.53" W	US4LA34M 1 st Edition, June 18, 2008	6 ft	11 ft	
29° 38' 33.07" N	089° 19' 04.44" W	US4LA34M 1 st Edition, June 18, 2008	6 ft	10 ft	
29° 39' 10.15" N	089° 20' 52.37" W	US4LA34M 1 st Edition, June 18, 2008	7 ft	10 ft	


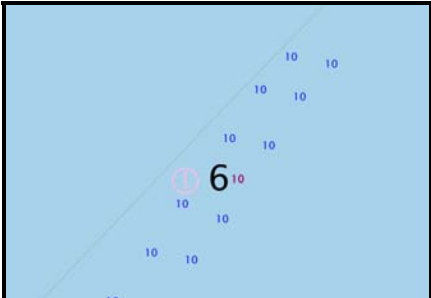


Latitude Longitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 39' 18.40" N	089° 17' 39.21" W	US4LA34M 1 st Edition, June 18, 2008	6 ft	10 ft	
29° 39' 30.10" N	089° 20' 34.98" W	US4LA34M 1 st Edition, June 18, 2008	6 ft	10 ft	
29° 40' 54.61" N	089° 14' 44.54" W	US4LA34M 1 st Edition, June 18, 2008	10 ft	11 ft	
29° 43' 59.97" N	089° 12' 04.93" W	US4LA34M 1 st Edition, June 18, 2008	8 ft	10 ft	

Table 8 - Charted depths are deeper than OPR-J977-TE-08 survey depths. Electronic Navigation Chart US4LA34M, 1st Edition, June 18, 2008.



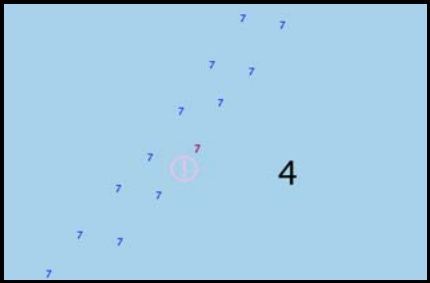
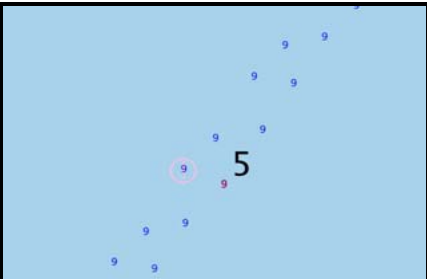


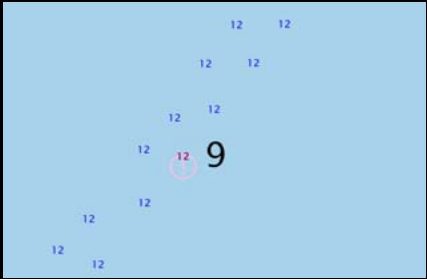

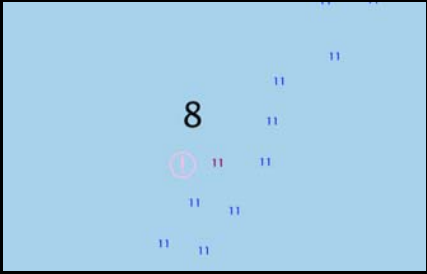


Latitude Longitude	Chart	Charted Depth	Survey Depth	Image
29° 37' 56.14" N 089° 21' 08.86" W	US4LA34M 1 st Edition, June 18, 2008	8 ft	7 ft	

Table 9 - Charted depths are shoaler than OPR-J977-TE-08 survey depths. Electronic Navigation Chart US4LA35M, 23rd Edition, May 29, 2008.

Latitude Longitude	Chart	Charted Depth	Survey Depth	Image
29° 27' 08.53" N 089° 22' 40.75" W	US4LA35M 23 rd Edition, May 29, 2008	7 10		
29° 27' 47.75" N 089° 24' 25.02" W	US4LA35M 23 rd Edition, May 29, 2008	4 7		

Latitude Longitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 28' 06.71" N	089° 24' 08.77" W	US4LA35M 23 rd Edition, May 29, 2008	5 9		
29° 28' 26.67" N	089° 23' 06.50" W	US4LA35M 23 rd Edition, May 29, 2008	10 13		
29° 29' 04.94" N	089° 22' 33.82" W	US4LA35M 23 rd Edition, May 29, 2008	11 12		
29° 30' 15.50" N	089° 23' 04.79" W	US4LA35M 23 rd Edition, May 29, 2008	9 12		

Latitude Longitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 30' 43.00" N	089° 23' 29.00" W	US4LA35M 23 rd Edition, May 29, 2008	8 12		
29° 31' 56.96" N	089° 24' 44.84" W	US4LA35M 23 rd Edition, May 29, 2008	8 11		
29° 34' 15.92" N	089° 25' 05.05" W	US4LA35M 23 rd Edition, May 29, 2008	8 10		
29° 34' 56.08" N	089° 22' 11.37" W	US4LA35M 23 rd Edition, May 29, 2008	9 10		

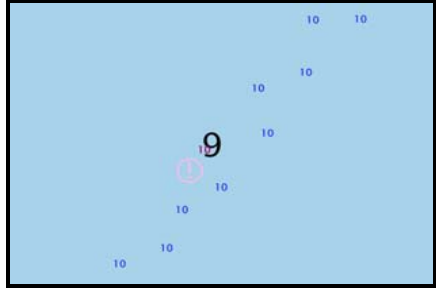
Latitude Longitude	Chart	Charted Depth	Survey Depth	Image
29° 37' 13.55" N 089° 22' 32.99" W	US4LA35M 23 rd Edition, May 29, 2008	9 10		

Table 10 - Charted depths are deeper than OPR-J977-TE-08 survey depths. Electronic Navigation Chart US4LA35M, 23rd Edition, May 29, 2008.

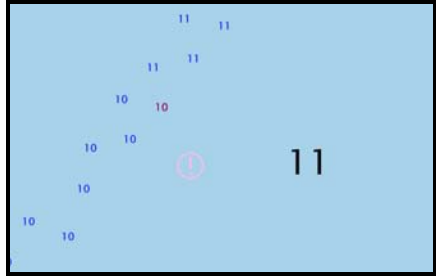
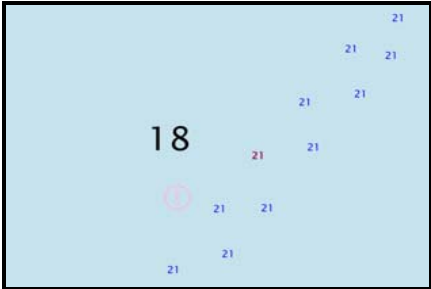
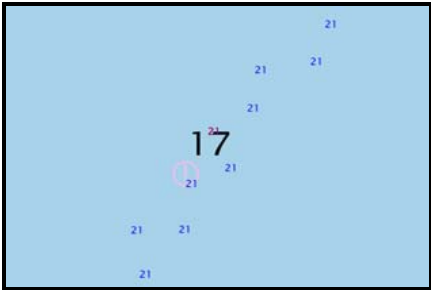
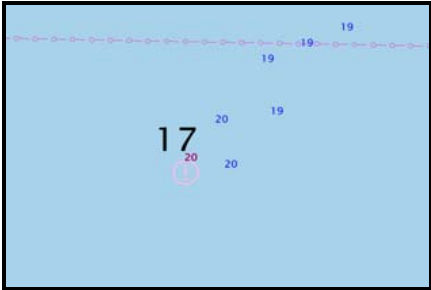
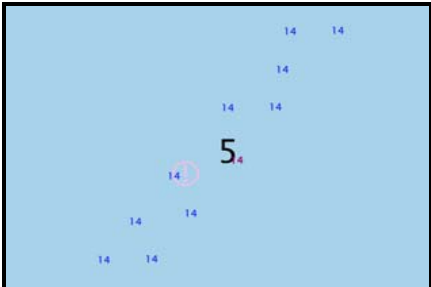

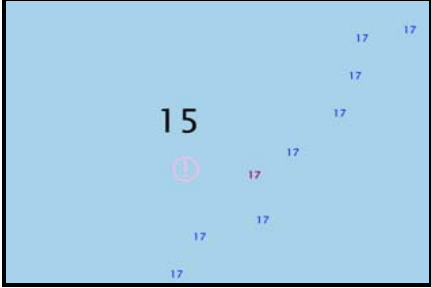





Latitude Longitude	Chart	Charted Depth	Survey Depth	Image
29° 27' 44.15" N 089° 22' 55.49" W	US4LA35M 23 rd Edition, May 29, 2008	11 10		

Table 11 - Charted depths are shoaler than OPR-J977-TE-08 survey depths. Electronic Navigation Chart US5LA24M, 24th Edition, June 3, 2008.

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 24' 39.94" N	089° 11' 39.80" W	US5LA24M 24 th Edition, June 3, 2008	18 ft	21 ft	
29° 24' 39.98" N	089° 12' 25.99" W	US5LA24M 24 th Edition, June 3, 2008	17 ft	21 ft	
29° 25' 05.11" N	089° 13' 37.38" W	US5LA24M 24 th Edition, June 3, 2008	17 ft	20 ft	

Latitude Longitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 26' 29.42" N	089° 14' 43.04" W	US5LA24M 24 th Edition, June 3, 2008	5 ft	14 ft	
29° 27' 03.24" N	089° 15' 47.81" W	US5LA24M 24 th Edition, June 3, 2008	15 ft	17 ft	
29° 27' 32.63" N	089° 17' 41.82" W	US5LA24M 24 th Edition, June 3, 2008	15 ft	17 ft	
29° 28' 06.01" N	089° 14' 06.76" W	US5LA24M 24 th Edition, June 3, 2008	11 ft	13 ft	

Latitude Longitude		Chart	Charted Depth	Survey Depth	Image
29° 28' 11.53" N	089° 12' 29.27" W	US5LA24M 24 th Edition, June 3, 2008	1 ft	5 ft	
29° 28' 30.49" N	089° 12' 12.60" W	US5LA24M 24 th Edition, June 3, 2008	3 ft	4 ft	
29° 30' 57.71" N	089° 17' 05.42" W	US5LA24M 24 th Edition, June 3, 2008	11 ft	14 ft	
29° 30' 58.97" N	089° 11' 39.80" W	US5LA24M 24 th Edition, June 3, 2008	12 ft	14 ft	




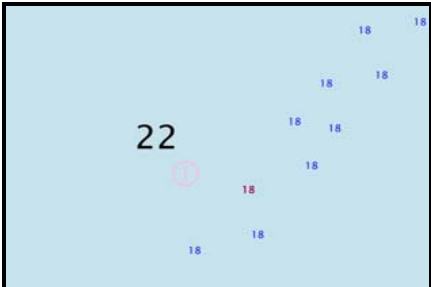

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 32' 08.79" N	089° 17' 35.99" W	US5LA24M 24 th Edition, June 3, 2008	11 ft	13 ft	
29° 35' 03.34" N	089° 16' 40.30" W	US5LA24M 24 th Edition, June 3, 2008	6 ft	11 ft	

Table 12 - Charted depths are deeper than OPR-J977-TE-08 survey depths. Electronic Navigation Chart US5LA24M, 24th Edition, June 3, 2008.

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 26' 21.21" N	089° 16' 23.97" W	US5LA24M 24 th Edition, June 3, 2008	25 ft	19 ft	

Latitude Longitude		Chart	Charted Depth	Survey Depth	Image
29° 26' 58.15" N	089° 16' 38.53" W	US5LA24M 24 th Edition, June 3, 2008	22 ft	18 ft	
29° 28' 02.12" N	089° 16' 30.13" W	US5LA24M 24 th Edition, June 3, 2008	18 ft	16 ft	

**ATLANTIC HYDROGRAPHIC BRANCH
EVALUATION REPORT to ACCOMPANY
SURVEY D00141 (2009)**

This Evaluation Report has been written to supplement and/or clarify the original Descriptive Report. Sections in this report refer to the corresponding sections of the Descriptive Report.

A. DATA ACQUISITION AND PROCESSING

A.1 DATA PROCESSING

The following software was used to process data at the Atlantic Hydrographic Branch:

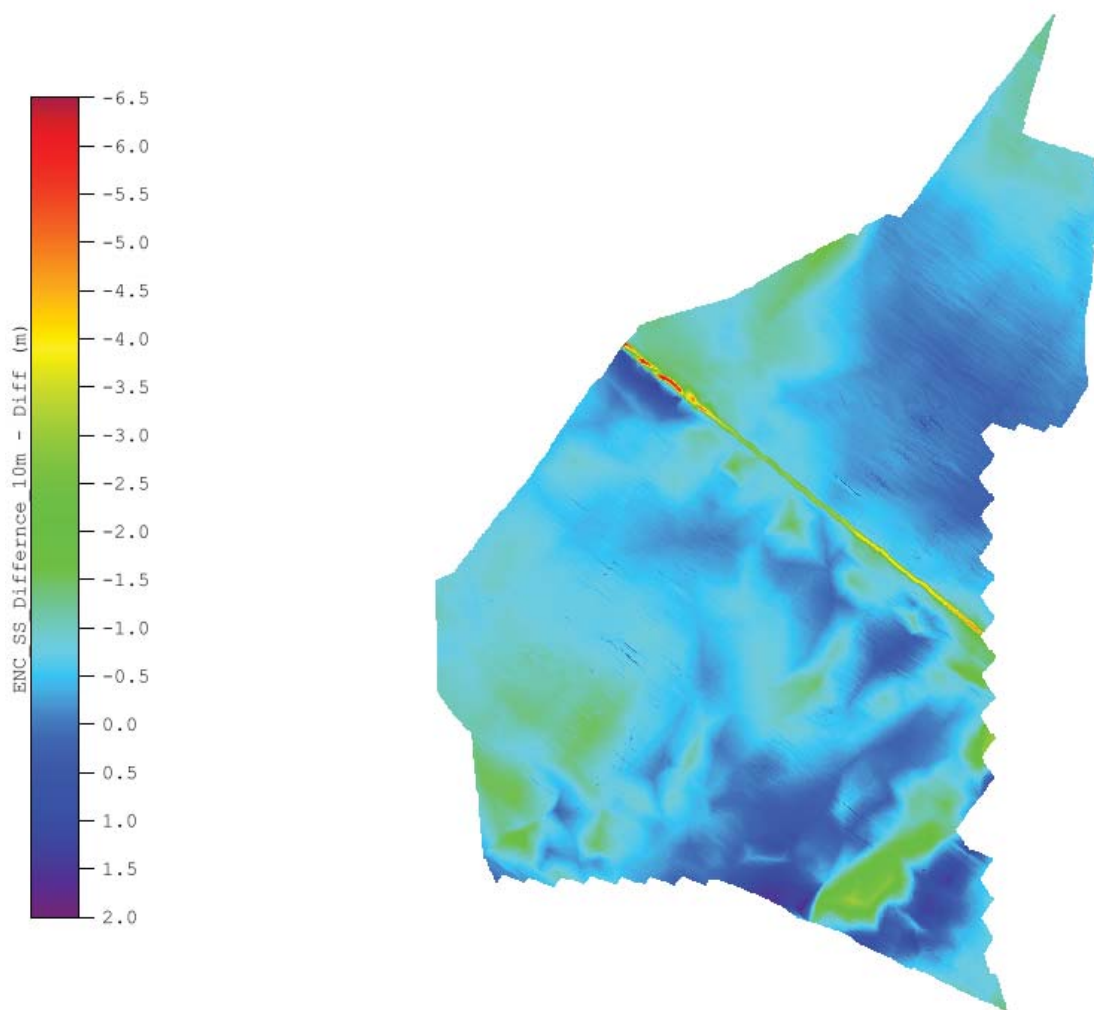
CARIS HIPS/SIPS version 6.1 SP1 HF 1-6
CARIS Bathy Manager version 2.1 HF 1-3
DKART INSPECTOR, version 5.0 Build 732 SP1
CARIS HOM version 3.3
CARIS S57 Composer version 1.0

A.2. QUALITY CONTROL

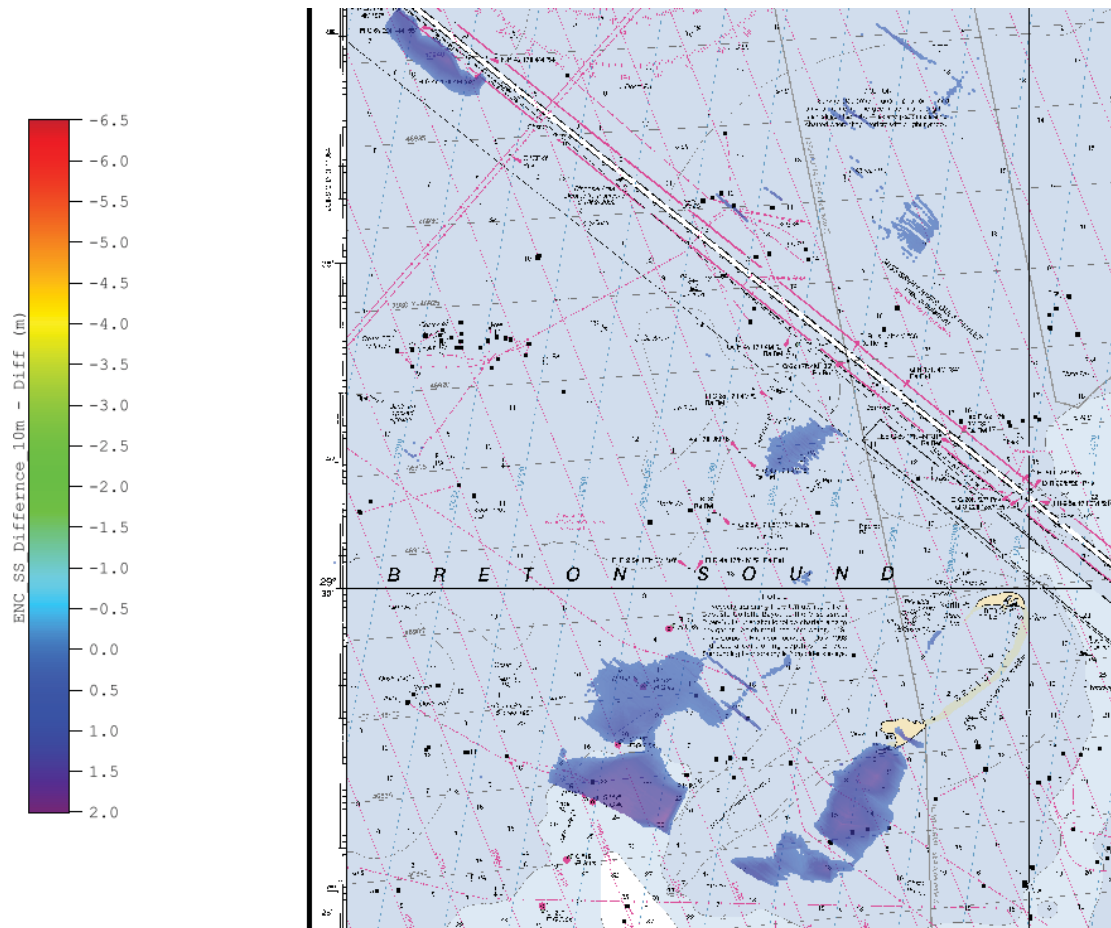
A.2.1. H-Cell

The source grid used for H-Cell D00141 was the product of a depth grid that was generated at the Atlantic Hydrographic Branch from the field unit's original VBES data that was collected at 1000 meter line spacing. The grid was generated at a 4 meter resolution and the shoal layer was extracted from the depth grid. The extracted shoal layer was used to compose survey scale selected soundings.

The selected sounding set is approximately 15 to 20 times the number of charted depths. The shoal layer grid was interpolated at a 10 meter resolution. Soundings were then extracted from the ENC and used to make a 10 meter resolution interpolated grid. A difference surface was then compiled to compare the ENC soundings to the survey scale soundings as seen below.



After the comparison the branch determined to supersede soundings only in areas that survey soundings were 0.25 to 2.0 feet shoaler than charted soundings.



The meta-object coverage is compiled only over areas where soundings were extracted from the survey scale sound set. Additional soundings were extracted from survey scale soundings and included in the chart scale sounding set in areas where the chart showed insufficient sounding data. All other soundings included in the chart scale sounding set were extracted from the following ENCs.

ENC	Chart	Scale
US4LA34M	11363	1:80,000
US4LA35M	11364	1:80,000
US5LA24M	11353	1:40,000

Hand drawn depth curves were compared to ENC depth curves. In areas where ENC soundings were used for chart scale sounding selection, ENC depth curves were extracted and modified to adhere to the chart scale sounding selection. The depth curves are forwarded to MCD for reference only. The curves were utilized during chart scale sounding selection and quality assurance efforts at AHB. The depth curves are incorporated into the Survey Scale Sounding deliverable.

The pre-compilation products or components (Stand Alone HOB files (SAHOB)) are detailed in the Pre-Compile Process Log attached at the end of this document. The SAHOB files included depth curves (DEPCNT), sounding selections (SOUNDG), features (SBDARE), Meta objects (M_COVR, M_QUAL, M_CSCL), and cartographic Blue Notes. The individual SAHOB files were inserted into one BASE Manager feature layer and exported to S57 format in order to create the H-Cell deliverable.

The completed H-Cell was exported as a Base Cell File (ENC.000) in S-57 format with all values in metric units. The metric equivalent ENC.000 file was then converted to NOAA chart units (ENC_CU.000) with all values measured in feet following NOAA sounding rounding rules.

Chart compilation was performed by Atlantic Hydrographic Branch personnel in Norfolk, Virginia. Compilation data will be forwarded to Marine Chart Division, Silver Spring, Maryland.

The D00141 CARIS H-Cell final deliverables include the following products:

D00141_CS.000	1:40,000 Scale	D0014 1 H-Cell with Chart Scale Selected Soundings, survey features, meta objects
D00141_SS.000	1:20,000 Scale	D00141 Selected Soundings (Survey Scale), and depth curves

A.22. Junctions

This survey junctions with four other surveys completed in 2008 / 2009. The eastern limits of D00141 junctions with the western limits of D00140 (OPR-J977-TE-08). The southern limits of D00141 junctions with H11814 and H11815 (OPR-J977-TE-08). The survey also junctions with a small portion of D00142 (OPR-J977-TE-08) along the southeast boundary.

Five meter BASE surfaces were created for each survey in the area of overlap. CARIS Subset Editor was then used to analyze the difference between sounding values for each sheet at each survey junction. The soundings are in general agreement between the surveys. No adjustments are recommended based on the junction analysis.

B. VERTICAL AND HORIZONTAL CONTROL

Final vertical correction processing was completed by the field unit with no additional correction required by Atlantic Hydrographic Branch. The field unit applied verified water levels in conjunction with the preliminary tidal zoning which was accepted and approved by N/OPSI CO-OPS as the final zoning for D00141. Sounding datum is Mean Lower Low Water (MLLW). Vertical datum is Mean High Water (MHW)

Horizontal control used for this survey during data acquisition is based upon the North American Datum of 1983 (NAD83), UTM projection zone 16. Office ENC processing of this survey required translating the datum to meet S-57 ENC requirements.

C. RESULTS AND RECOMMENDATIONS

C.1 CHART COMPARISON

Chart	Scale	Edition Number	Issue Date
11353	1:40,000	5	January 2008
11363	1:80,000	41	June 2007
11364	1:80,000	42	September 2007

ENC Comparison

Cell Name	Chart	Scale	Edition Number	Issue Date
US4LA34M	11363	1:80,000	1	June 18, 2008
US4LA35M	11364	1:80,000	23	May 29, 2008
US5LA24M	11353	1:40,000	24	June 3, 2008

C.1.1 Hydrography

The charted hydrography originates with prior surveys and requires no further consideration. The hydrographer makes adequate chart comparisons in section “D” and Appendix 1&2 of the Descriptive Report. The following exceptions are noted:

- a) The survey soundings are the result of a reconnaissance survey that employed 1000 meter line spacing and no feature investigation. Ordinarily, the hydrographer would not have chosen to apply bathymetric changes to the chart however. After examining the difference surface changes, the hydrographer deemed that it was prudent to chart bathymetric changes that were shoaler in comparison to previously charted survey depths. **All other soundings are to be retained as charted.**
- b) The *charted Obstruction* charted in Latitude 29° 35' 34.00" N, Longitude 089° 17' 46"W on NOS Chart 11363, 41st edition was previously submitted as a DToN by the field unit and charted as an obstruction with a least depth of 10 feet. After the final application of the tide and the sounding extraction from the shoal grid layer

the least depth of the obstruction was determined to be 8.6 ft. The hydrographer recommends to update the least depth of the charted obstruction.

- c) The southwestern most tip of the Breton Island Chain centrally located in Latitude 29° 27' 50.79" N, Longitude 089° 12' 13.523"W on NOS Chart 11353, 5th edition has eroded. A zero foot contour has been digitized from the orthophoto that outline the new boundaries for the island. The zero foot contour is included in the D00141_SS.000 file that will be submitted with this dataset. It is forwarded to MCD for reference only and is to be used for nautical chart update at the discretion of the hydrographer.
- d) An 8ft shoal sounding exists in the SS layer and is located in the surveyed Latitude 29° 35' 52.032" N, Longitude 089° 15' 11.066"W. This shoal was not carried through to the chart scale sounding layer due to its location in the proximity of an Offshore Platform. Further investigation is needed to prove the shoal and/or disprove the existence of the Offshore Platform. The hydrographer recommends the retention of the Offshore Platform as charted.

C.2. ADDITIONAL RESULTS

To resolve ambiguous issues between the bathymetry and the charted land areas, the compiler used USGS orthoimagery obtained from the USGS seamless database. The relevant metadata for such imagery is as follows:

Originator: U.S. Geological Survey

Publication_Date: 2009

Title: USGS High Resolution State Orthoimagery for the Louisiana Coastal Area

Time_Period_of_Content:

Time_Period_Information:

Range_of_Dates/Times:

Beginning_Date: 20081018

Ending_Date: 20081109

Currentness_Reference: ground condition

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate:-89.2226058

East_Bounding_Coordinate:-89.18761167

*North_Bounding_Coordinate:*29.50783969

*South_Bounding_Coordinate:*29.45365523

C.3. MISCELLANEOUS

Chart compilation was done by Atlantic Hydrographic Branch personnel, in Norfolk, Virginia. Compilation data will be forwarded to Marine Chart Division, Silver Spring, Maryland. See Section D.1. of this report for a list of the Raster Charts and Electronic Navigation Charts (ENC) used for compiling the present survey:

C.4. ADEQUACY OF SURVEY

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The present survey is adequate to supersede the charted bathymetry areas that have been identified as shoaler than pre-existing sounding data. **Any features not specifically addressed either in the H-Cell BASE Cell File or the Blue Notes should be retained as charted.** Refer to the Descriptive Report for further recommendations by the hydrographer.

APPROVAL SHEET
D00141

Initial Approvals:

The completed survey has been inspected with regard to survey coverage, delineation of depth curves, representation of critical depths, cartographic symbolization, and verification or disproval of charted data. All revisions and additions made to the H-Cell files during survey processing have been entered in the digital data for this survey. The survey records and digital data comply with National Ocean Service and Office of Coast Survey requirements except where noted in the Descriptive Report and the Evaluation Report.

All final products have undergone a comprehensive reviews per the Hydrographic surveys Division Office Processing Manual and are verified to be accurate and complete except where noted.

Vanessa Self

Digitally signed by Vanessa Self
DN: cn=Vanessa Self, o=AHB, ou,
email=Vanessa.Self@noaa.gov, c=US
Date: 2009.08.15 10:33:52 -04'00'

Vanessa R. Self

Physical Scientist

Atlantic Hydrographic Branch

I have reviewed the H-Cell files, accompanying data, and reports. This survey and accompanying Marine Chart Division deliverables meet National Ocean Service requirements and standards for products in support of nautical charting except where noted.

Approved: _____

Richard Brennan

Lieutenant Commander, NOAA

Chief, Atlantic Hydrographic Branch