H10836

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey Hydrographic/Side Scan Sonar

Field No. Sheet H

Registry No. H10836

LOCALITY

State Texas

General Locality Gulf of Mexico

Locality 12 NM south of Sabine Pass

1999

CHIEF OF PARTY
Jimmie L. Barr

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DATE September 20, 2001

NOAA FORM 77-28 (11-72) | U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION | REGISTER NO. H10836

HYDROGRAPHIC TITLE SHEET

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 NO. Sheet H

State: Texas

General locality: Gulf of Mexico

Locality: 12 ~~Miles~~ NM South of Sabine Pass

Scale: 1:20,000 Date of survey: October 9, 1998 - February 16, 1999

Instructions dated: November 20, 1997 Project No.: OPR-K171-KR

Vessel: M/V Geodetic Surveyor, M/V Universal Surveyor

Chief of party: Jimmie L. Barr (John E. Chance & Associates, Inc.)

Surveyed by: D. Delcambre, C. Pastor, J. Walling, K. Gabik, M. White, D. King, J. Fuselier, W. Smith, M. Bridges, S. Belaire, K. Deshotel, L. Wootan, R. Frentz, J. Guillory, B. Newsome, M. Duos, R. Pickett, M. Harris, J. Boudreaux, K. Swart, S. Cade

Soundings taken by (echo sounder), hand lead, pole: Reson 8101 Seabat Multibeam

Graphic record scaled by: Survey Personnel

Graphic record checked by: Survey Personnel

Protracted by: ____ Automated plot by: HP DESIGNJET 750C (Field) HP Design Jet 2500C (Office)

Verification by: Atlantic Hydrographic Branch Personnel

Soundings in fathoms (feet) at MLW (MLLW)

REMARKS: Contract Number : 50 -DGNC -8-90026

Contractor Name: John E. Chance & Associates, Inc. 200 Dulles Drive Lafayette, LA 70506

Time Reference: UTC

Horizotal Datum: NAD83

Positioning: John E. Chance Starfix

*Handwritten notes in the Descriptive Report were made during office processing.

AWOIS ✓ & SURF ✓ by MEH

NOAA FORM 77-28 SUPERSEDES FORM C&GS-537.

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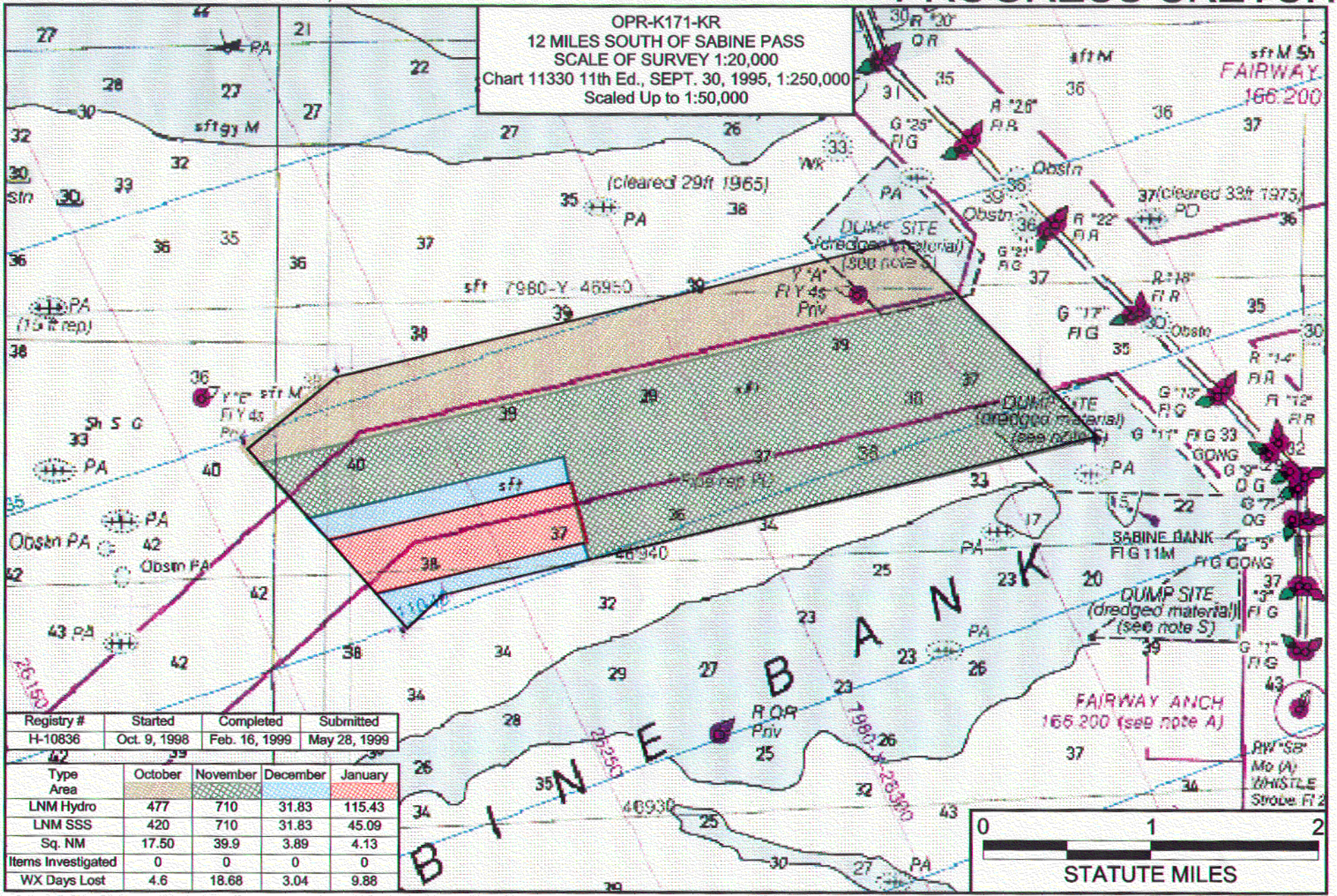
JOHN E. CHANCE & ASSOCIATES, INC.

PROGRESS SKETCH



Registry #	Started	Completed	Submitted
H-10836	Oct. 9, 1998	Feb. 16, 1999	May 28, 1999

Type / Area	October	November	December	January
LNM Hydro	477	710	31.83	115.43
LNM SSS	420	710	31.83	45.09
Sq. NM	17.50	39.9	3.89	4.13
Items Investigated	0	0	0	0
WX Days Lost	4.6	18.68	3.04	9.88

John E. Chance & Associates, Inc. (CHANCE) guarantees only that the survey data collected by CHANCE, delivered to NOAA under Contract 50-DGNC-8-90026, reflect the state of the seafloor in existence on the day and time of data acquisition.

Table of Contents Page

Descriptive Report to Accompany Hydrographic Survey H10836

Sheet H
Scale 1:20,000
October, 1998 – February, 1999
John E. Chance & Associates, Inc.
M/V Geodetic Surveyor, M/V Universal Surveyor
Chief of Party: Jimmie L. Barr, CHANCE

A. PROJECT

Project Number: OPR-K171-KR
Contract Number: 50 DGNC-7-90026
Sheet letter: H
Registry number: H10836

Dates of Instructions:

20 November, 1997 Original Instructions
07 April, 1998 Modification of Contract
28 April, 1998 Modification of Contract
15 July, 1998 Award of Task Order # 2
15 July, 1998 Modification of Contract
01 February, 1999 Modification of Task Order
17 May, 1999 Modification of Task Order

See Appendix F for copies of modifications to Contract 50 DGNC-7-90026.

Purpose: The purpose of this contract is to provide NOAA with modern, accurate hydrographic data acquired using shallow water multibeam and side scan sonar technology with which to update the nautical charts of the assigned area. Numerous obstructions have been reported in this area. Side scan sonar shall be used to locate these obstructions and a shallow-water multibeam sonar system shall be used to determine the least depth over the obstructions as well as determine the depths over the entire project area.

B. AREA SURVEYED

The survey area is located in the Gulf of Mexico, 12 ~~miles~~ nm south of Sabine Pass, Texas. The survey area is somewhat regular in shape. The four outer corners follow:

Latitude	Longitude
29° 32' 51.22" N	093° 47' 55.08"W
29° 29' 34.33" N	093° 44' 03.36"W
29° 26' 12.32" N	093° 57' 28.79"W
29° 29' 13.50" N	094° 00' 37.07"W

The dates of data acquisition are:

M/V Geodetic Surveyor

10/09/98-10/11/98	JD 282-284
10/13/98-10/15/99	JD 286-288
10/27/98-10/31/98	JD 300-304
11/15/98-11/21/98	JD 319-325
11/23/98-11/29/98	JD 327-333
12/02/98-12/03/98	JD 336-337
01/05/99-01/07/99	JD 005-007
01/20/99-01/21/99	JD 020-021
01/24/99-01/26/99	JD 024-026
02/14/99-02/16/99	JD 045-047

M/V Universal Surveyor

01/19/99-01/21/99	JD 019-021

The survey that covers Sheet H consists of 108 parallel northeast-southwest primary tracklines spaced approximately 80-75 meters apart, 15 northwest-southeast crosslines spaced approximately 1,700 meters apart, and 41 infill lines. Survey lines plotted on the enclosed maps are post-plotted as surveyed. Survey lines were run with distinct starting and ending points. Each individual line contains fix marks, or shot points, which were logged every 150 meters. This methodology of line numbering and annotating allows for quick comparison between adjacent lines. This is extremely useful in the comparison between side scan sonar lines.

The initial survey grid, running both side scan sonar and multibeam at 80-meter line spacing, was designed to provide 200 percent lateral coverage with the sonar system and a maximum 50 meter gap between the portion of the multibeam swath meeting specifications. Due to an irregular mounting of the Reson 8101 transducer, it was necessary to decrease the line spacing to 75 meters to meet the multibeam specifications. The change took place on November 10, 1998 (DN 314). The final survey grid was designed to meet or exceed side scan sonar and multibeam specifications. Infill lines were run to provide coverage in areas where the specifications were not met. All aspects of the fieldwork were carried out to meet or exceed NOAA specifications.

The following line numbering conventions were used during this survey:

Lines 1 – 102 are the primary east-west lines. Both side scan sonar and multibeam data were collected.

Lines 103 – 117 are the primary north-south crosslines. Only multibeam was collected on these lines.

Reruns of primary lines will be prefaced by a 1 or 2 in three digit numbers (e.g. the rerun of line 103 would be 1103; the rerun of 1103 would be 2103). Two digit line numbers would be prefaced with 10 or 20 (e.g. the rerun of line 64 would be 1064; the rerun of 1064 would be 2064, etc.).

All lines that were continued after a line break are annotated with an alpha character (e.g. line 23 would be annotated 23a after the first line break and 23b after a second line break). All lines that were broken overlapped at least three shotpoints with the previous segment.

Infill lines begin with either 500 or 600. Reruns and line breaks of infill lines follow the same conventions as the primary lines (e.g. a rerun of line 513 would be 1513 and a re-start would be 513a).

Please see the geophysical logs, which contain detailed information pertaining to the data collected during the project, for additional documentation. The geophysical logs are found in Separate 1, which is included with the survey data.

C. SURVEY VESSELS

M/V Geodetic Surveyor

The *M/V Geodetic Surveyor* (ID # 637873) was used for primary and infill multibeam, single beam, side scan sonar, sound velocity, and bottom sample data collection. All data acquisition, post-processing, and plotting hardware was mounted in the vessel operations room.

Basic vessel descriptors follow:

Length (LOA):	122
Beam:	30'
Draft:	7'-10'
Gross Tonnage:	97
Power:	1,300 Hp

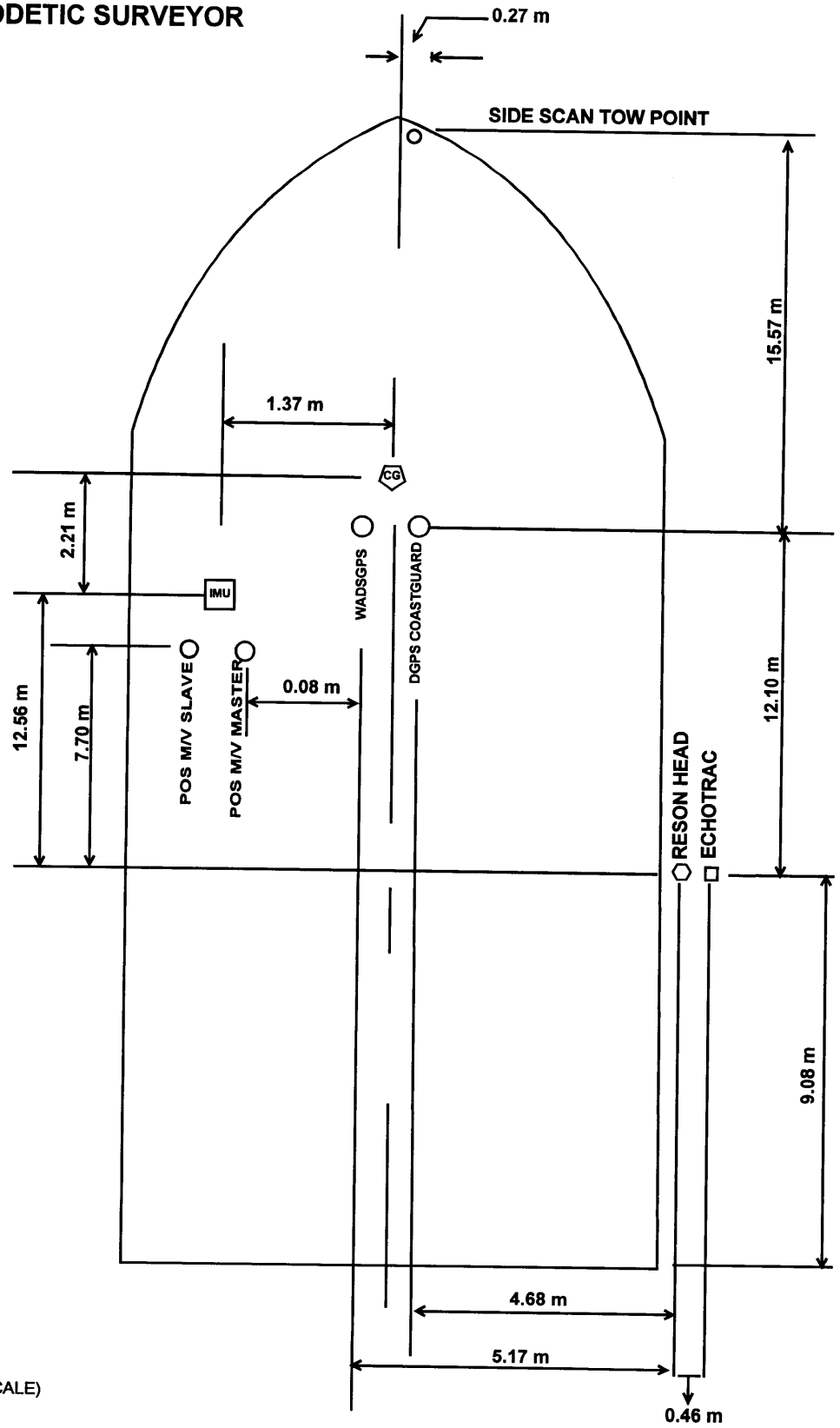
Additional vessel specifications for the *M/V Geodetic Surveyor* are in Separate 2 (filed with survey data).

The Reson 8101 Seabat multibeam transducer was mounted on the starboard side of the vessel at the end of a 9-inch diameter swivel pole. The pole mount and the alignment bracket were welded to the ship. The pole was located 9.08 m from the stern of the vessel. The one MHz model DF3200 Odom Hydrographics single beam transducer was mounted 0.46-m starboard of the multibeam transducer on the same pole. The navigation antenna location was assigned to the center of the multibeam transducer (see vessel diagram on page 5).

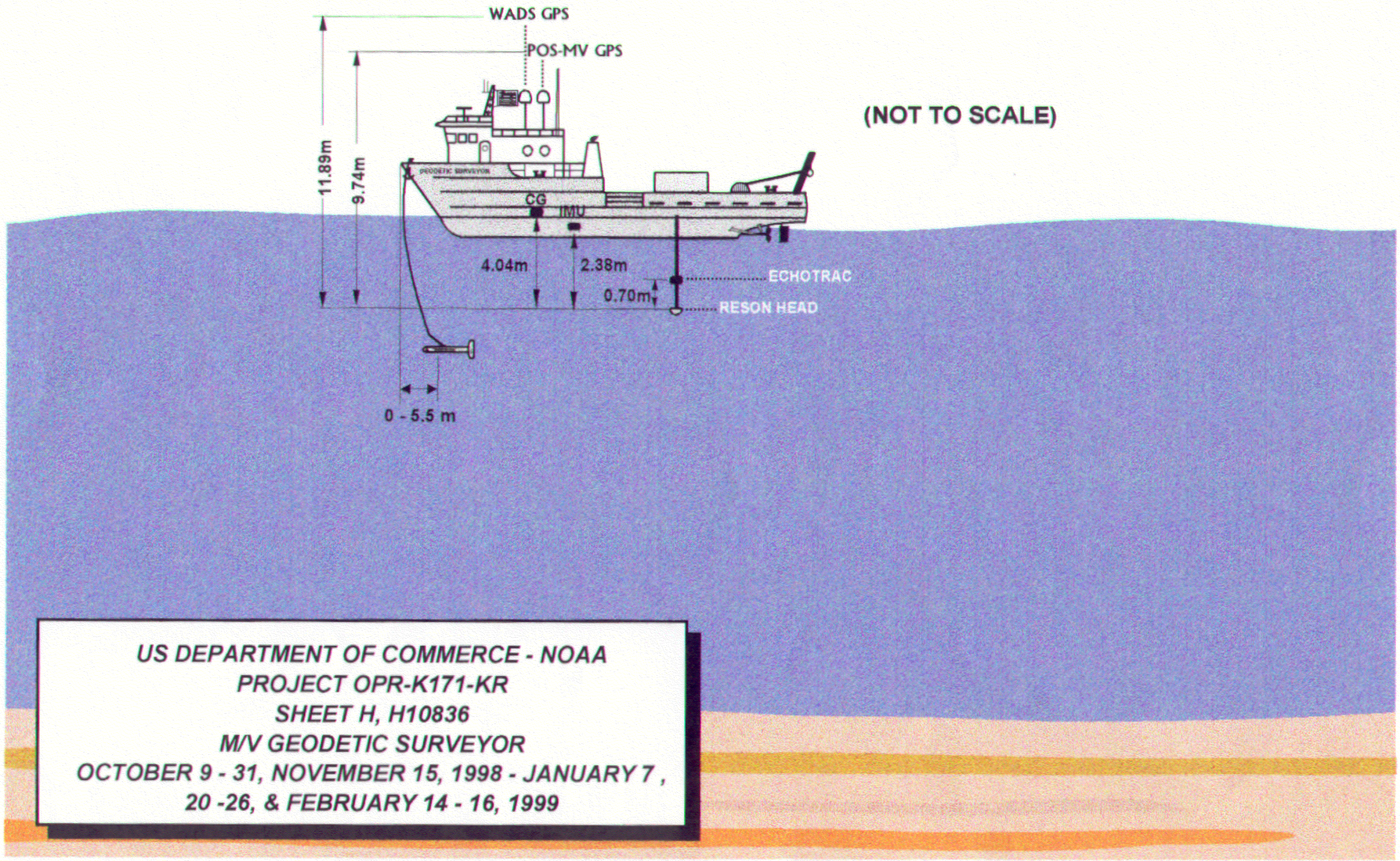
The side scan sonar tow position was located at the bow of the vessel. A Kevlar cable deployed manually was used for the bow configuration (see vessel diagram on page 6).

When the Reson 8101 Seabat was originally mounted on the M/V Geodetic Surveyor, the multibeam transducer head was cocked with the port side up. The displacement was not visually evident. When the patch test determined that the transducer was cocked, a decision was made to collect data because all beams were correctly positioned. The outer port beams, however, produce very noisy data due to the increased water column and increased angle of incidence with the seafloor.

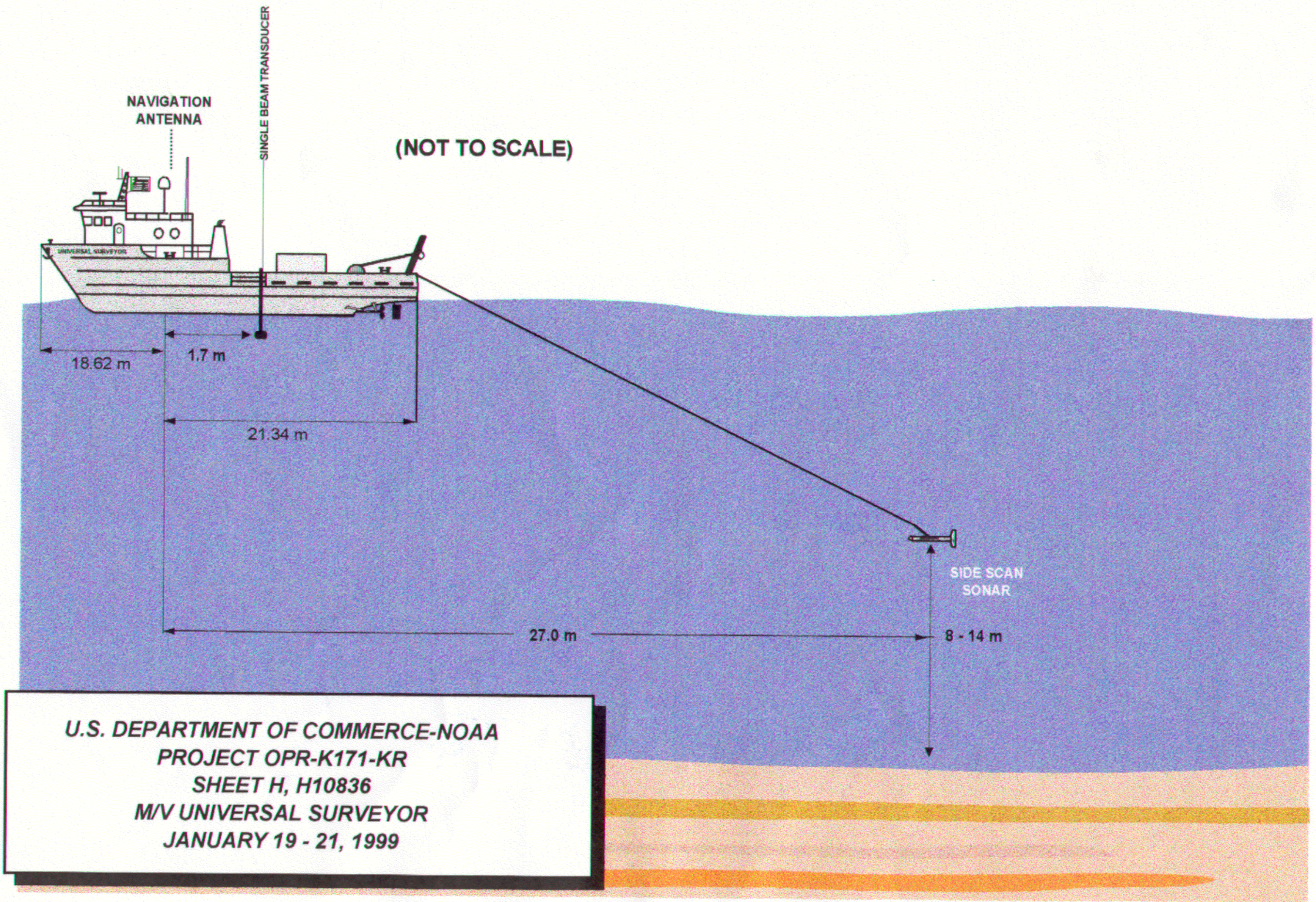
M/V GEODETIC SURVEYOR



(NOT TO SCALE)



US DEPARTMENT OF COMMERCE - NOAA
PROJECT OPR-K171-KR
SHEET H, H10836
M/V GEODETIC SURVEYOR
OCTOBER 9 - 31, NOVEMBER 15, 1998 - JANUARY 7 ,
20 -26, & FEBRUARY 14 - 16, 1999



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M/V UNIVERSAL SURVEYOR
JANUARY 19 - 21, 1999

To decrease editing time, the outer port beams are removed during processing. The exact number of beams varies with local conditions, such as sea state, velocity, and current. It is the responsibility of the data processor to edit these beams from the data set. Removing the_outer beams requires a decrease in line spacing to provide coverage. The beam numbers affected in this survey are 0000-0010, 0090, and 0100. See Separate 5 (filed with the survey data) for multibeam processing log.

M/V Universal Surveyor

The *M/V Universal Surveyor* (ID # 627510) was used for side scan sonar infill data collection. All data acquisition, post-processing, and plotting hardware was mounted in the vessel operations room.

The side scan sonar tow position was located at the center of the aft "A" frame. An armored cable, remotely operated with a hydraulic winch, was used for stern deployment (see vessel diagram on page 8).

Basic vessel descriptors follow:

Length (LOA):	122'
Beam:	30'
Draft:	7'-10'
Gross Tonnage:	94
Power:	1,200 Hp

Additional vessel specifications for the *M/V Universal Surveyor* are in Separate 2 (filed with survey data).

Coordinate Systems

The Reson 8101 Seabat and the IP400 acquisition and processing software have similar coordinate systems. They refer to the Positive X value to the Starboard, the Positive Y value to the to the bow, and the Positive Z upward. This coordinate system differs from the POS/MV coordinate system, which designates Positive X to the bow, Positive Y to starboard, and Positive Z down. The importance of these differences must be stressed to avoid confusion when entering offset values (see page 9 for related figure).

The following vessel configuration values are based upon the CARIS coordinate system: Y is Positive Up, X is Positive Starboard, Z is Positive Down.

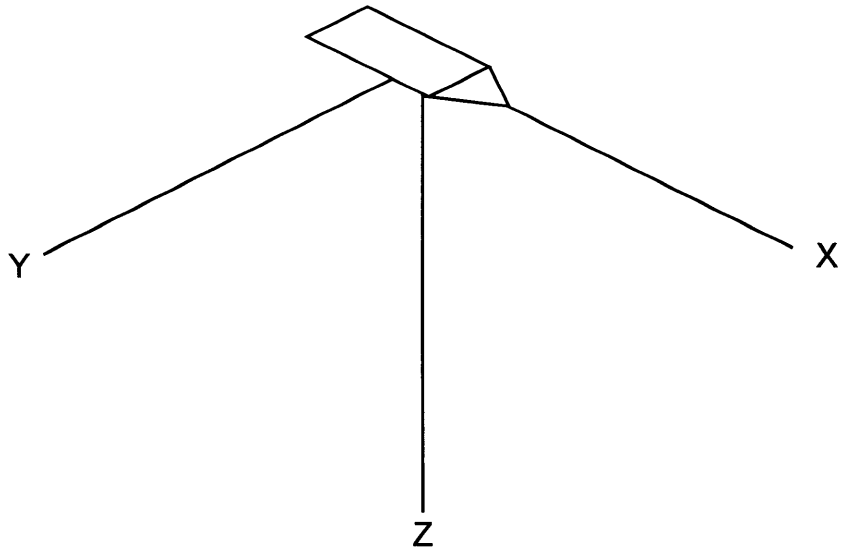
- The vessel attitude is relative to the POS IMU. The POS IMU relative to the CG in meters is:
  X=-1.37 Y=-2.21 Z=+1.66

- The vessel position is relative to the Seabat transducer unless noted in the geophysical logs (found in Separate 1). The Seabat transducer relative to the CG in meters is:
  X=-4.93 Y=-12.56 Z=+4.04

- The waterline relative to CG is: Z= +0.15

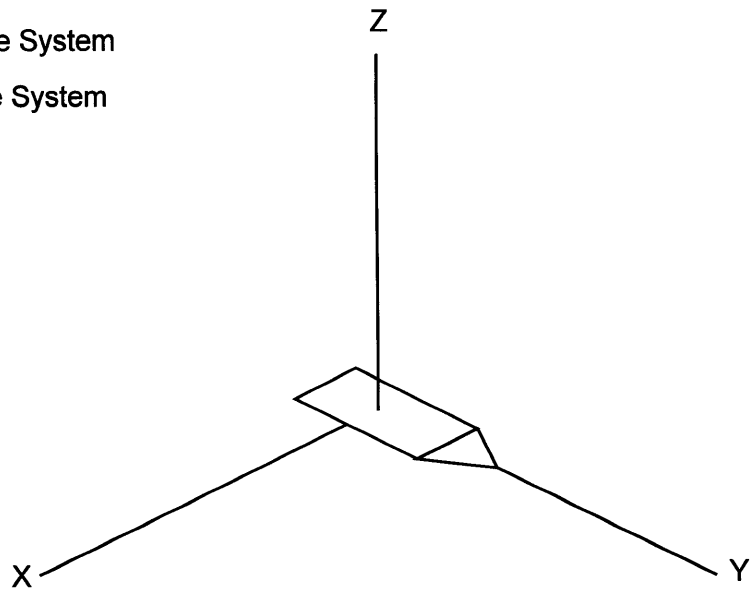
*Data filed with field records

POS/MV Coordinate System



Reson Coordinate System

IP400 Coordinate System



The navigation center for the multibeam data provided to NOAA is the Reson transducer head. Therefore, the XTF data are already corrected for offsets, and a zero (0) value should be entered into CARIS.

D. AUTOMATED DATA ACQUISITION AND PROCESSING - See also Evaluation Report

Hardware/Software:

The software used for data acquisition and processing was an "in-house" FUGRO software package entitled IP400, version 6.01.01. This software possesses a data acquisition package (DAP), a post processing package (PPROC), a charting package (CHART), and a digital terrain modeling package (DTM). The software is UNIX driven and runs on GML scripts, IP400 programs, and basic UNIX scripts. TerraModel version 9.4 software packages by Spectra Precision Software, in Atlanta, Georgia were used to manually edit the data of noise spikes.

Hardware used for data acquisition and processing consisted of three (3) 266 MHz Pentium II computers utilizing UnixWare version 2.1. The PCs contained 4 Gig hard drives and 64 Megabytes of memory. One computer was updated to contain 384 MB memory. These computers were used for data acquisition, processing, charting, and quality control measures while onboard the vessel. Two (2) external 9 gig hard drives were also used for data storage.

The IP400 software was used to apply velocity corrections to the data. The software referenced the most recent velocity cast, which was manually input into the CONFIG file, and applied the necessary velocity corrections.

Processing Methods:

The multibeam data were collected utilizing a Reson 8101 Multibeam transducer and monitored on the Reson Console during data acquisition. During collection, the data were brought into the IP400 software, stored on a Data Acquisition computer (DAP) in raw format, and time tagged. The data were then sent to the Post Processing Computer (PPROC) via a network connection* (see Appendix I for additional information).

Once the data were transcribed to the PPROC computer, processing of the raw data occurred. Immediately following processing, the data were reduced using the ReduceXYZ IP400 script, and were then brought into TerraModel for manual cleaning and for a visual check of data quality* (see Appendix I for additional information).

Cleaning Filters:

During data processing, the data were sent through several cleaning filters within the IP400 software as a means of cleaning "noise" and "out-of-specification" beams out of the data. To achieve data cleaning, the batching routine used the Clipscanpolar, Tracescan, Three-point trace, and Four-point trace IP400 scripts that used predetermined parameters that were manually inserted* (see Appendix I for additional information).

* Data filed with field records

E. SIDE SCAN SONAR

Side scan sonar operations were conducted using an EG&G Model 260 TH slant-range corrected side scan sonar recorder, two EG&G Model SMS-272 side scan sonar towfish, and Triton/Elics digital acquisition software version 3.22.

M/V Geodetic Surveyor

Recorder	14524	282-284 286-288 302-303 319-325 327-332 337 024-026 045-047
Towfish	13657 (Bow)	282-284 286-288 302-303 319-325 327-332 337 024-026 045-047

M/V Universal Surveyor

Recorder	015340	019-021
Towfish	015667 (Stern)	019-021

The vertical beam width of the EG&G SMS 272 side scan sonar was 50 degrees at 3dB. A depression angle of 20 degrees was used on the towfish. The 100 kHz frequency was used during all data collection of this survey. The side scan sonar was towed from the bow on the *M/V Geodetic Surveyor* and the stern on the *M/V Universal Surveyor*. Aboard the *M/V Geodetic Surveyor*, the navigation center was assigned to the center of the multibeam transducer pole for all side scan sonar work. The setback information specified in the geophysical logs* (Separate 1) for the *M/V Geodetic Surveyor* is based upon a cable length from the bow. The navigation center aboard the M/V Universal Surveyor was located at the navigation antenna. The geophysical logs* (Separate 1) for the *M/V Universal Surveyor* have a setback value, which is the distance measured from the navigation center to the towfish. On the *M/V Geodetic Surveyor* a block was mounted on a swing-arm at the bow of the vessel. The side scan sonar fish, attached to a Kevlar cable, was manually deployed. The amount of cable deployed was noted from markings on the cable. On the *M/V Universal Surveyor*, the side scan was attached to an armored cable when towed from the stern. A winch was used to control cable length.

* Data filed with field records.

Side scan sonar operations were run at a speed 4.4 knots or slower. All side scan sonar coverage was run in a northeast-southwest direction. All side scan sonar data were collected using a 100-meter range scale with a towfish depth off seafloor between 8 and 14 meters.

Side scan sonar recorder gain was adjusted to provide the best image of the seafloor. Confidence checks were performed at least twice daily, but more often several times daily. Drag scars and platforms were used as confidence checks. Where possible, drag scars were traced across the record, checking both port and starboard channels. However, if that was not possible, confidence checks were performed separately. Interim coverage plots were created utilizing the Triton/Elics Isis system coverage command. Final coverage plots were created in AutoCAD.

At least 200 percent coverage was obtained over the entire survey area. Infill lines were run in areas that were disrupted by noise which included boat wakes, thermocline noise, marine life, other noise in water column, losing bottom track, and data glitches. On several occasions when a boat wake obscured the record, the vessel immediately circled around to collect data to fill the gap, and continued on with the line. One side scan sonar line was rerun because the side scan was not run on the first pass of data collection. One line was shot to provide 200 % coverage.

The analog data records were manually scanned by at least two people. All contacts were recorded, adjacent lines were compared, and heights were calculated from shadows measured on the analog records. Questionable contacts were compared with multibeam data where possible to determine the significance (as defined in section 5.6.2 of the SOW) of the item. Significant contacts were labeled and recorded to the side scan sonar contact list* (see Separate 3) and side scan sonar contact plot. If a contact fell out of the multibeam range, it was flagged for further investigation.

No Dangers to Navigation were found during this survey. However, two objects discovered during survey operations were investigated and discussed in Section N of this report.

Digital side scan sonar data were acquired using Triton/Elics ISIS version 3.22 software. The software was run on a 300 MMX, Pentium II computer with 128 MB RAM and 4 GB hard disk space (serial number RK-MT-071). Digital data were recorded in XTF format and backed up to Exabyte tape using UNIX tar command.

F. SOUNDING EQUIPMENT

A Reson 8101 Seabat system was utilized for the multibeam source. The Reson 8101 transducer head serial number is 049702. The Reson 8181 Seabat has 101 beams labeled 001-101. It runs at a frequency of 240 kHz. There were no depth limits used during data collection. A ping rate of 7 pings per second and a range scale of 50m were also utilized. An average velocity was applied to the data online. The IP400 system numbers the beam numbers starting at 000, so the beam numbers on the raw data will be one value greater than the data that have been processed.

* Data filed with field records.

Reson console serial number 13984 was used during the entire project. On November 23, 1998 (DN 327), Line 1051 was run with an incorrect gain setting, which made the outer beams very noisy. The line was rerun.

A one MHz Odom Hydrographics single beam echosounder (model DF3200, serial number 3371) was used to check the multibeam data. Single beam and multibeam data were compared daily to provide a depth confidence check as required in section 4.11.4 of the SOW. The results of these comparisons are provided in Appendix G.* The SOW does not require delivery of single beam data; therefore, no single beam records are included with this survey.

G. CORRECTIONS TO SOUNDINGS

1. Speed of Sound

Three velocimeters were used aboard the *M/V Geodetic Surveyor.* Two primary velocimeters were used during the survey. The SeaBird Electronics SBE19 serial number 1918619-2625 was used from October 8-10, 14, 28, 1998 (DN 281-283, 287, 301). Calibration values were applied to the data with SEASOFT software. The Applied Microsystems Ltd. SV^{PLUS}, serial number 3257, calibrated on September 28 (DN 271) and October 2, 1998 (DN 275) was the other primary velocimeter used during data collection on October 12, 13, November 14-December 30, 1998, January1- February 16, 1999 (DN 285, 286, 318-364, 001-47). Calibration values were applied to the data through the Total System Software processing software. The Applied Microsystems SVP-16, serial number 3045, calibrated on May 7-8, 1998 (DN 127, 128) was the secondary velocimeter for this sheet. Calibration values were applied to the data through the AML processing software. In addition, an Applied Microsystems Ltd. Sound Velocity Smart Sensor, serial number 4164, calibrated on April 16, 1998 (DN 106) was mounted on the Echotrac transducer pole at a depth equivalent to the Reson multibeam transducer head. The Smart Sensor data were displayed using HyperTerminal. They provided a continuous check on the velocity at the depth of the multibeam transducer head.

Velocity casts were obtained at least twice daily and more frequently if necessary. The frequency of velocity cast collection was based upon degradation of the multibeam outer beams. Degradation of the multibeam outer beams was monitored real-time by observing the Reson monitor and the smart sensor data. An observed difference of more than 2 meters/second was used as a guide when observing the Smart Sensor. In addition, the IP400 Profile application was utilized after processing as a velocity QC.

On November 18, 1998 (DN 322) there were problems with the outer beams of the multibeam exceeding specifications along the line. Velocity casts were taken along the line and it was discovered that there was a discrepancy in velocity values along the line. The decision was made to split the remainder of the survey area into three segments to provide more accurate velocity values for the multibeam data. It appeared that the extreme velocity changes were directly related to the sea state, with greater differences seen during periods of calm seas, and less differences seen when seas were 1 meter or greater.

* Data filed with field records.

The sound velocity casts that were applied to the multibeam data follow:

Date	Primary Cast Number	Latitude	Longitude	Cast Depth
10/08/98	1v282c	29 17'08.4891"	-93 53'33.4333"	13.7
10/08/98	1v282d	29 30'16.2365"	-93 59'51.0178"	13.2
10/09/98	1v283a	29 32'50.2891"	-93 46'31.0139"	12.5
10/10/98	1v284a	29 29'44.5281"	-94 00'39.3331"	12.6
10/10/98	1v284c	29 32'54.7925"	-93 46'37.9465"	12.6
10/12/98	1v286b	29 32'02.6603"	-93 46'52.3342"	13.0
10/13/98	1v286c	29 32'32.7539"	-93 46'34.2482"	12.4
10/14/98	1v287a	29 29'05.9070"	-94 01'12.8781"	13.2
10/14/98	1v287b	29 29'08.9570"	-94 01'13.3914"	12.6
10/15/98	1v288a	29 32'16.2509"	-93 46'11.6445"	12.7
10/28/98	1v302a	29 31'44.1730"	-93 45'56.6529"	12.4
10/28/98	1v302b	29 28'50.0446"	-94 01'26.6062"	12.2
10/28/98	1v303a	29 27'59.5318"	-93 46'31.7566"	10.5
10/28/98	1v303b	29 31'56.5102"	-93 46'09.4145"	12.5
11/14/98	1v319a	29 32'00.4621"	-93 45'14.7942"	12.4
11/14/98	1v319b	29 29'11.3045"	-93 50'16.2972"	11.7
11/15/98	1v320a	29 28'26.8449"	-94 00'35.9893"	12.9
11/15/98	1v320b	29 28'14.8715"	-94 00'59.6323"	12.9
11/16/98	1v321a	29 28'17.8822"	-94 01'18.0034"	13.2
11/16/98	1v321c	29 28'10.3171"	-94 00'43.3623"	13.1
11/17/98	1v322a	24 41'06.0176"	-57 28'27.4845"	12.2
11/17/98	1v322b	29 30'54.0470"	-93 49'22.4291"	12.6
11/17/98	1v322c	29 30'12.3671"	-93 52'59.6226"	12.5
11/17/98	1v322d	29 29'29.3762"	-93 56'20.0048"	12.0
11/17/98	1v322e	29 28'40.5007"	-94 00'21.7182"	12.7
11/17/98	1v322f	29 30'12.4568"	-93 49'01.9998"	12.7
11/18/98	1v323a	29 30'09.7670"	-93 48'02.1081"	12.5
11/18/98	1v323b	29 29'59.1044"	-93 47'30.5673"	11.9
11/19/98	1v324b	29 29'50.6702"	-93 47'00.9395"	12.6
11/19/98	1v324c	29 31'35.5510"	-93 45'47.4865"	12.4
11/22/98	1v327a	29 30'02.1180"	-93 53'26.2367"	12.0
11/22/98	1v327b	29 29'47.4035"	-93 46'58.4261"	12.6
11/23/98	1v328a	29 29'04.1684"	-93 47'02.5126"	11.5
11/23/98	1v328b	29 29'26.4380"	-93 52'18.6350"	12.5
11/24/98	1v329a	29 28'09.2970"	-93 51'45.5252"	11.9
11/24/98	1v329b	29 28'04.5793"	-93 53'10.6180"	12.1
11/24/98	1v329c	29 28'41.5117"	-93 52'02.7668"	11.7
11/25/98	1v330a	29 29'24.9351"	-93 52'19.9219"	12.4
11/25/98	1v330b	29 28'55.3463"	-93 52'08.6402"	11.7
11/26/98	1v331a	29 28'22.0196"	-93 53'16.4504"	11.9
11/26/98	1v331b	29 26'47.4101"	-93 57'38.6528"	12.1
11/27/98	1v332a	29 28'20.4068"	-93 56'42.3145"	12.6
11/27/98	1v332b	29 28'41.2872"	-93 52'02.3194"	11.9
12/01/98	1v336a	29 28'53.9959"	-93 52'06.4750"	11.8

Date	Primary Cast Number	Latitude	Longitude	Cast Depth
12/01/98	1v336b	29 27'19.0728"	-93 55'52.6345"	11.5
12/02/98	1v337a	29 27'23.2464"	-93 56'21.1072"	12.5
12/02/98	1v337b	29 28'19.0332"	-93 54'16.2107"	12.5
01/05/99	1v005d	29 28'10.3722"	-93 57'22.6160"	12.9
01/06/99	1v006a	29 29'03.3876"	-93 51'36.1058"	11.6
01/07/99	1v007a	29 28'20.8973"	-93 56'41.8735"	12.0
01/20/99	1v020c	29 28'48.2855"	-93 53'38.5127"	11.9
01/24/99	1v024a	29 28'19.4335"	-93 53'24.2249"	11.9
01/25/99	1v025a	29 27'28.8453"	-93 56'10.3559"	12.4
01/25/99	1v025b	29 28'49.3856"	-93 51'46.0132"	12.3
01/25/99	1v025c	29 30'10.6364"	-93 48'24.9191"	12.3
01/25/99	1v025d	29 30'01.7770"	-93 48'38.2506"	12.3
02/14/99	1v045a	29 29'32.1877"	-93 46'43.5366"	10.9
02/15/99	1v046a	29 32'07.5138"	-93 50'05.2605"	13.0
02/15/99	1v046b	29 27'40.2630"	-93 57'53.5595"	12.3
02/16/99	1v047a	29 28'20.2356"	-93 53'29.3779"	12.1

Daily confidence checks were performed utilizing data from the primary and secondary velocimeters that were dropped simultaneously. The cast data were checked and the velocimeter was redropped if there were any problems. The casts were visually compared and all comparisons fell within specifications.

The velocimeter data from the primary system were loaded into the IP400 system. The downcast profile was applied during post-processing. Every attempt was made to drop the velocimeters to 95 percent of the water depth at the deepest point of the surveyed area. To provide complete depth coverage, the velocity data were extrapolated by taking ten percent of the deepest depth and adding that value to the deepest depth. The velocity data were extended to the extrapolated depth based upon the velocity curve above the extrapolated depth values. Lines 1032 and 1033 were reshot because the velocimeter was not dropped within 95 percent of the deepest water depth. *See Appendix J for table containing additional velocity information.

2. Instrument Corrections

The POS/MV was recalibrated on two occasions. See section G.6 for a discussion of these recalibrations.

3. Corrections determined from bar checks and vertical cast.

As mentioned in G.1 velocity casts were applied to the data within the IP400 software.

4. Static Draft

Static draft was observed daily by reading markings on the transducer pole while the vessel was stationary during velocity casts. When the static draft value differed from that previously recorded, it was noted and applied in the IP400 CONFIG file. A table containing

*Data filed with field records

the static draft information can be found in Appendix G. It is necessary to apply the static draft values from the T-DRAFT column in CARIS.

5. Settlement and Squat

A squat/settlement survey was performed on the *M/V Geodetic Surveyor* on August 26, 1998 (DN 238) to meet requirements set in section 4.9.1 of the NOAA Statement of Work. The vessel was mobilized at Survey Boats, Inc. dock in Patterson, LA. The test was performed in the Bayou Teche, in water depths ranging from 4 to 8 meters. Before mobilization, a current GPS almanac was downloaded and consulted in order to perform the survey when the maximum number of GPS satellites were available.

The vessel was mobilized with two Ashtech Z-12 dual channel GPS receivers: one mounted at the stern and the other mounted approximately mid ship. Both receivers were mounted along the centerline of the vessel. A third Ashtech Z-12 GPS receiver was set at the dockyard to be used as a base station. All receivers were set with consideration of 360 degrees of visibility in order to make best use of available GPS satellites.

Data were logged by the receivers at one-second intervals with an elevation mask of 10 degrees. GPS data were downloaded using Ashtech's Prism software and processed into xyz coordinates using John E. Chance and Associates version of On the Fly (OTF) software. This software takes collected L1 and L2 RINEX formatted GPS data strings and solves for position by differentiating carrier phase observations between the base and each rover. The OTF refers to the ability to resolve the ambiguities, while the rover is in motion without returning to the reference sight for reinitialization. The solutions were then read into a spreadsheet and averaged and compared for each separate speed run.

The results of the test and comparison indicate that squat and settlement based on vessel motion will be a very small factor in determining the dynamic draft of the *M/V Geodetic Surveyor* at normal survey speeds. Settlement and squat test data are included in Appendix G.

6. Heave, Roll, and Pitch

The TSS POS/MV Model 320 serial number 005 was used as the multibeam motion sensor. The accuracy of the sensor is better than 0.05 for roll, pitch measurement, 5% of heave amplitude for periods up to 10 seconds, 0.05 for true heading, and 0.75-5 meters circular error of probability (CEP) depending on reference station.

TSS Heave Compensator Model 320B serial number 135 was used with the single beam echosounder. The accuracy of the Model 320B is ±5 cm or a percentage of the measured range whichever is greater:

Short wave period	5% 1 to 7 seconds
Medium wave period	5% 1 to 12 seconds
Long wave period	5% 1 to 16 seconds
Extended wave period	5% 10 to 20 seconds
	9% 1 to 20 seconds

* Data filed with field records.

±10 meter range, and 1 cm resolution.

The POS/MV was down intermittently from October 9 – 11, 1998 (DN 282-284). During this time, accuracy values exceeded specifications, due to a bad coax cable. The cable was replaced and the system was recalibrated. In addition, there were problems with the POS/MV system on December 1, 1998 (DN 335). Repairs were made and the system was once again recalibrated on December 2, 1998 (DN 336).

On January 7, 1999 DN (007) the POS/MV console was shipped back to TSS and was reinstalled on January 20, 1999 (DN 020). The system was recalibrated before commencing data collection.

When the POS/MV system was returned from the factory, the output baud rate on COM port 1 was incorrect. Consequently, the POS/MV shipped data to the IP400 data acquisition computer, which in turn built a file of unusable data. The corrupted POS/MV file contained beam calculation heading values. This was not recognized as a problem at the time because there were also problems with the 1999 tide files, hanging up batch processing. Multibeam data collected on January 20-26, 1999 (DN 020-026) utilized Sperry gyro data for the heading values. To verify that the data processed with the Sperry gyro data would meet specifications, the Sperry gyro was substituted for POS/MV heading data, and previously processed lines were reprocessed. The data were compared and the outer beams differed less than 1.5 meters. A difference in the horizontal distance was observed between the two different processing methods. Preliminary investigation shows that the outside beams (the ones most effected by a heading error) have differed by 1.25 and 1.42 meters, while the nadir beams differ by .54 meters. The other file created by POS/MV on port 2, containing the heave, pitch, and roll, was not effected with the mentioned baud rate change.

The POS/MV was once again recalibrated on February 14, 1999 (DN 46) because there was excessive resetting of the system.

Calibration of Multibeam echo sounder

Aboard the *M/V Geodetic Surveyor*, the Reson multibeam echo sounder was calibrated using the IP400 software by sailing several lines in opposite directions, using different speeds, over a distinct feature. Roll, pitch, heading, and time delay biases were determined by running a patch test over a fish haven south of the field area* (see details in Appendix G).

Multibeam calibration (patch test) at 'Fish Haven', October 2, 1998 (DN 275), position Northing = 3241550, Easting = 413704

System	Time Delay	Pitch	Roll	Yaw
DGPS2	0.45	0	2.65	1.6
DGPS1	-0.5	0	2.65	1.6

The XTF data provided to NOAA is corrected for patch test offsets; an offset value of zero (0) should be applied to the data in CARIS.

*Data filed with field records.

Tide Correctors

As specified in the SOW, predicted tides from Galveston Pleasure Pier 8771510 were used as preliminary tide values. Sheet H fell within two zones of the Galveston Pleasure Pier zonation. Zone 6 has a time corrector of –12 minutes with a range ratio of X1.13; Zone 7 has a time corrector of –24 minutes and a range ratio of X1.17.

As specified in a memorandum to Andrew Armstrong from Michael Szabados* (see Appendix F), final verified tides from the Texas Coastal Ocean Observation Network (TCOON) were used for final post-processing. Tidal data from the Sabine Pass Offshore gauge (8771081) located at 29°29.9'N, 93°38.4'W were utilized for Sheet H. Sheet H fell within two tidal zones: G315 and G318. The correctors used are located in the table below.

Station Number	Tidal Zone	High Water Correction	Low Water Correction	Average Time Correction	Range Correction
8771081	G315	0 mins.	0 mins.	0 mins.	X1.00
8771081	G318	-18 mins.	-12 mins.	-18 mins.	X0.95

The verified six-minute tide data from the Sabine Pass Offshore gauge were downloaded from the Oceanographic Products and Services Division (OPSD) Hydro Hot List web page (http://www.opsd.nos.noaa.gov/hydro.html). The tide information was applied to the data using the IP400 data processing software. Approved tides and zoning were applied during field processing.

Lines 65a-79a and 1077a were collected on January 20- 21, 1999 (DN 020-021) with a -1 hour time difference. The time values associated with the edited data sets have been corrected. However, the raw data in the XTF format will still have the erroneous times.

H. CONTROL STATIONS – See also Evaluation Report.

The Horizontal datum for the survey is North American Datum of 1983 (NAD-83). The John E. Chance and Associates, Inc. StarFix® system provided primary navigation. StarFix® is a satellite navigation system developed by CHANCE. The CHANCE Multi-Site DGPS is the first system in the industry that implements the concept of Wide Area DGPS (WADS). The CHANCE system uses the MX 4200 GPS receiver and differential corrections from the CHANCE DGPS network transmitted via StarFix®. The current CHANCE DGPS network covers the continental United States.

The basic idea of Long-Range or Wide Area Multi-Site DGPS is to extend the range of operation of typical stand-alone DGPS systems from 300 km to at least 1000 km. The degradation of accuracy with distances longer than 300 km occurs due to the decorrelation of errors. These errors do not cancel out in the differencing process. However, the errors tend to be a linear function of the distance and frequently tend to affect the individual DGPS position solutions with opposite signs, depending on relative location of DGPS stations, with respect to satellite passes. Therefore the combined solution of several DGPS baselines has an advantage of canceling out most of the systematic errors that are present in individual stand-alone DGPS solutions. An additional important advantage of Multi-Site DGPS is a redundancy necessary for monitoring integrity of pseudo-range corrections from DGPS stations.

* Data filed with field records.

Correctors were computed using the Gulf Coast network of StarFix® OMNISTAR sites. These sites included Mercedes, TX, Houston, TX, Pensacola, FL, and Cocoa Beach, FL. The United States Coast Guard Differential Station at Galveston, TX was used for secondary navigation in this survey. The POS/MV & CGDGPS positioning was not applied to the survey data.

Please see ~~Appendix C~~ D.R. for a list of horizontal control stations.

I. HYDROGRAPHIC POSITION CONTROL

The method of sounding position control was exclusively Differential GPS (DGPS) using the CHANCE StarFix® system mentioned above.

1. The hydrographic position control met or exceeded specifications. A minimum of five satellites was used to compute positions. The mask on the GPS receivers was configured to accept data from satellites that were 10 degrees above the horizon. The age of navigation corrections never exceeded 20 seconds for the primary system and no data were collected while dead reckoning.

Hourly comparisons between the primary and secondary positioning systems were recorded and printed. Differences were typically sub-meter. Daily comparisons, as required by Section 4.11.2 of the SOW, are included in ~~Appendix~~ H.*

Primary positioning system:

WADS Magnavox T-4000	S/N 3422A06234
Starfix II differential receiver	S/N 630023 and 630138

Correctors were computed using the Gulf Coast network of OMNISTAR sites mentioned above. The correctors were computed using CHANCE's Wide Area Differential (WADS) software, version 2.1.

Secondary positioning system:

Leica 12 channel GPS receiver	S/N 2232
CSI differential receiver (USCG DGPS)	S/N 3344A04447

2. No malfunctions affecting the accuracy or operation of the positioning system occurred during the survey. PDOP (position dilution of precision) and HDOP (horizontal dilution of precision) were monitored throughout the survey. The system was set to sound an audible alarm whenever a PDOP value of 6.0 was exceeded. Survey operations were then suspended until the PDOP value became acceptable (< 6.0). On all occasions the HDOP value stayed below 2.5.

3. No unusual atmospheric conditions were noted.

4. The signal from the Coast Guard Differential site at Galveston, TX was weak on a regular basis. On the last two days of data collection the secondary positioning was weak, which caused the comparison between primary and secondary positioning systems to appear faulty.

* Data filed with field records.

5. No systematic errors were discovered during the survey.

6. Aboard the *M/V Geodetic Surveyor*, the multibeam transducer was the navigation center. The navigation center on the *M/V Universal Surveyor* was the navigation antenna. The side scan sonar offsets varied depending on the amount of cable deployed. The offsets from the navigation center to the side scan sonar tow points are shown on the figures on pages 6 and 8.

J. SHORELINE

Not Applicable

K. CROSS LINES

In accordance with section 4.11.3 of the SOW, the lineal kilometers of crosslines were approximately 5% of the planned total kilometers. Crosslines were run at angles between 45° and 90°. For 10% of all mainscheme lines, evenly spaced throughout the dataset, the nadir beam of each crossline was compared to each of the nearest unsmoothed soundings contained within the mainscheme line. For all crosslines, the nadir beam of 5% of the mainscheme lines, evenly spaced throughout the dataset were compared to each of the nearest unsmoothed soundings of the crosslines. Separate statistical analyses were performed as a function of beam number for each of the mainscheme lines and crosslines used for comparison. Due to the installation error, beam 52 was the assigned nadir beam for these comparisons. See the processing logs in Separate 5, included with the survey data for the beams numbers omitted in the final data set.

All comparisons fell within 10 centimeters, except for the outermost beam (beam 0) which was affected by the distance between points that were not thrown away. The average distances are 31 and 78 meters, as seen below in the compilation table. A graph showing the difference values vs. the beam number can be found on page 28. The results of the crossline comparisons follow.

Primary Lines - Beam Number - Average Values

Beam Number	Mean Depth (m)	Min. (m)	Max. (m)	Difference (m)	Distance between Points (m)	Stnd. Dev. Of Differences (m)
0	11.66130	11.18019	11.96023	0.23051	78.18597	0.21599
1	11.80436	11.53381	12.08678	0.02795	2.91978	0.14544
2	11.84685	11.59527	12.11128	-0.06198	0.21117	0.12432
3	11.85579	11.60132	12.12114	-0.07304	0.14524	0.09344
4	11.86117	11.59923	12.10593	-0.07736	0.13890	0.08259
5	11.85454	11.60352	12.10399	-0.07930	0.13407	0.07616
6	11.85216	11.60513	12.09458	-0.08092	0.13125	0.07188
7	11.85300	11.60608	12.09571	-0.07059	0.13802	0.07508
8	11.85154	11.61238	12.09114	-0.06923	0.13725	0.07005
9	11.85509	11.62275	12.09894	-0.06747	0.13623	0.07015
10	11.85315	11.61678	12.08044	-0.06883	0.14549	0.06280

*Data filed with field records)

Beam Number	Mean Depth (m)	Min. (m)	Max. (m)	Difference (m)	Distance between Points (m)	Stnd. Dev. Of Differences (m)
11	11.85385	11.61890	12.08201	-0.05678	0.14864	0.06992
12	11.85132	11.61429	12.08520	-0.05179	0.14546	0.06815
13	11.85165	11.60802	12.08491	-0.05344	0.14505	0.07461
14	11.85194	11.60722	12.07949	-0.04538	0.14410	0.07323
15	11.84458	11.61132	12.07945	-0.04861	0.14612	0.06612
16	11.83927	11.60125	12.06553	-0.04894	0.13465	0.07226
17	11.84341	11.59139	12.07212	-0.04784	0.15201	0.07297
18	11.83941	11.59341	12.07212	-0.03839	0.14308	0.07635
19	11.83333	11.59897	12.05374	-0.03828	0.14766	0.06819
20	11.83440	11.58919	12.06253	-0.04026	0.15084	0.07639
21	11.83462	11.60022	12.07132	-0.03586	0.14593	0.07369
22	11.83465	11.59231	12.06117	-0.03220	0.15040	0.07134
23	11.83568	11.61018	12.07077	-0.02480	0.13967	0.07106
24	11.83593	11.60326	12.06286	-0.03190	0.15733	0.07256
25	11.83462	11.60696	12.06029	-0.02810	0.15187	0.06744
26	11.83502	11.60128	12.05597	-0.03070	0.16681	0.08043
27	11.83542	11.60619	12.06315	-0.02549	0.16868	0.07632
28	11.83505	11.60780	12.05418	-0.02465	0.16168	0.07049
29	11.83220	11.60143	12.06330	-0.02927	0.16608	0.07413
30	11.82930	11.60403	12.05407	-0.02989	0.17839	0.06875
31	11.83231	11.59205	12.05073	-0.02802	0.18440	0.07094
32	11.83161	11.60128	12.05289	-0.01971	0.13674	0.06876
33	11.82945	11.61502	12.04952	-0.02484	0.12993	0.06543
34	11.83037	11.61220	12.05234	-0.02103	0.13703	0.06667
35	11.82630	11.60407	12.05099	-0.02147	0.13473	0.06656
36	11.82952	11.60670	12.05048	-0.01619	0.13355	0.06954
37	11.82509	11.60432	12.03930	-0.02322	0.12875	0.06304
38	11.82967	11.60667	12.05388	-0.02286	0.12875	0.06890
39	11.82952	11.60736	12.05304	-0.01377	0.13821	0.06746
40	11.82740	11.61264	12.05538	-0.01667	0.13802	0.06708
41	11.82729	11.61484	12.06875	-0.01125	0.13407	0.06879
42	11.82608	11.60429	12.05300	-0.02084	0.13784	0.06912
43	11.83183	11.60747	12.07227	-0.01538	0.13311	0.06881
44	11.82549	11.60132	12.05817	-0.01004	0.13304	0.07120
45	11.83055	11.60952	12.05425	-0.01396	0.13645	0.07306
46	11.82839	11.60183	12.05630	-0.01546	0.13751	0.07890
47	11.82692	11.61212	12.04985	-0.02348	0.14117	0.05886
48	11.83136	11.60685	12.06487	-0.02590	0.13176	0.07111
49	11.83000	11.61249	12.04663	-0.02527	0.13205	0.07059
50	11.82560	11.61319	12.04696	-0.02366	0.13366	0.07103
51	11.82454	11.60553	12.04733	-0.02421	0.14062	0.07017
52	11.82747	11.60462	12.04495	-0.02044	0.13817	0.07144
53	11.82399	11.60597	12.04106	-0.01692	0.13487	0.07605
54	11.82795	11.60857	12.05645	-0.01549	0.13901	0.06635

Beam Number	Mean Depth (m)	Min. (m)	Max. (m)	Difference (m)	Distance between Points (m)	Stnd. Dev. Of Differences (m)
55	11.83410	11.60685	12.06656	-0.01476	0.14073	0.07154
56	11.83440	11.61641	12.06385	-0.02059	0.12996	0.07448
57	11.82806	11.60018	12.06454	-0.01806	0.13267	0.07240
58	11.82777	11.60348	12.04286	-0.02645	0.13366	0.06645
59	11.83077	11.60766	12.06612	-0.00714	0.13615	0.07869
60	11.82780	11.60908	12.05359	-0.01663	0.12484	0.06304
61	11.82458	11.60480	12.05103	-0.01751	0.13227	0.07143
62	11.83066	11.60689	12.05575	-0.01278	0.13264	0.06907
63	11.82458	11.60608	12.04209	-0.01777	0.13637	0.06861
64	11.83044	11.61198	12.04128	-0.01678	0.12949	0.06308
65	11.83315	11.60982	12.04553	-0.01432	0.12835	0.06423
66	11.83037	11.60381	12.04978	-0.01289	0.13201	0.06483
67	11.82780	11.60234	12.04560	-0.02059	0.12945	0.06371
68	11.83114	11.60667	12.05842	-0.01253	0.13132	0.07434
69	11.83300	11.60571	12.04923	-0.01590	0.13114	0.07470
70	11.82861	11.60271	12.05348	-0.02861	0.12436	0.06621
71	11.83110	11.60388	12.05634	-0.02802	0.12341	0.06362
72	11.83348	11.60996	12.05689	-0.02216	0.12586	0.07192
73	11.83238	11.59985	12.05784	-0.03044	0.13714	0.07550
74	11.82879	11.60425	12.04212	-0.03092	0.12681	0.06478
75	11.83209	11.59689	12.06344	-0.03018	0.12436	0.07393
76	11.83681	11.61092	12.06319	-0.02810	0.12330	0.07308
77	11.83220	11.60883	12.06223	-0.02791	0.13366	0.06593
78	11.82978	11.61418	12.04725	-0.02993	0.13359	0.06641
79	11.83026	11.61040	12.05337	-0.03359	0.13425	0.06518
80	11.83381	11.61018	12.05249	-0.02758	0.13341	0.07709
81	11.83040	11.60652	12.06520	-0.03326	0.13260	0.07583
82	11.83216	11.61322	12.05168	-0.02678	0.12762	0.06806
83	11.83344	11.59780	12.06062	-0.02198	0.12934	0.08403
84	11.83278	11.61326	12.05366	-0.03015	0.12634	0.07303
85	11.83374	11.60919	12.04066	-0.03542	0.12879	0.06261
86	11.83520	11.61407	12.05930	-0.02546	0.12901	0.06216
87	11.83300	11.60919	12.04051	-0.02502	0.12348	0.06807
88	11.83278	11.60322	12.05571	-0.02509	0.13099	0.06681
89	11.82729	11.59385	12.05099	-0.01714	0.12795	0.07741
90	11.83253	11.60333	12.05044	-0.02267	0.13960	0.07010
91	11.82788	11.58993	12.05348	-0.00597	0.13179	0.08407
92	11.82927	11.60579	12.05319	-0.01930	0.13630	0.07214
93	11.82890	11.58608	12.07081	-0.00407	0.13209	0.09488
94	11.82147	11.58044	12.05260	-0.01026	0.13209	0.08610
95	11.83000	11.60344	12.07857	-0.01766	0.13802	0.07607
96	11.82678	11.59828	12.04912	-0.02256	0.12850	0.06817
97	11.82963	11.57835	12.06678	-0.01487	0.13051	0.08290
98	11.82546	11.58956	12.05897	-0.01311	0.14231	0.08779

99	11.82396	11.58264	12.07198	-0.01458	0.13604	0.09637

Cross Lines - Beam Number - Average Values

Beam Number	Mean Depth (m)	Min. (m)	Max. (m)	Difference (m)	Distance between Points (m)	Stnd. Dev. Of Differences (m)
0	11.52476	10.90095	12.02607	0.35440	31.83393	0.22865
1	11.87589	11.30789	12.23722	0.07156	4.59578	0.11378
2	11.92278	11.35178	12.28189	0.00833	0.15489	0.11353
3	11.94622	11.38589	12.29533	-0.02122	0.14456	0.08244
4	11.93556	11.37944	12.26811	-0.00733	0.13433	0.06643
5	11.93800	11.37578	12.27156	-0.01067	0.13656	0.07546
6	11.94067	11.39678	12.27922	-0.01333	0.13756	0.06384
7	11.93756	11.39333	12.27156	-0.02289	0.14656	0.05872
8	11.94011	11.39222	12.25422	-0.01933	0.12867	0.06263
9	11.93811	11.39400	12.26189	-0.02500	0.14433	0.07014
10	11.94067	11.38589	12.25367	-0.01911	0.12944	0.06040
11	11.93400	11.39422	12.25844	-0.01667	0.12356	0.07086
12	11.93578	11.39222	12.25567	-0.01878	0.11978	0.06112
13	11.93667	11.39844	12.25422	-0.01622	0.12689	0.06236
14	11.93422	11.39122	12.24511	-0.01567	0.13167	0.06980
15	11.93344	11.40133	12.25056	-0.00944	0.13889	0.05847
16	11.93144	11.38344	12.25578	-0.00833	0.13600	0.05920
17	11.93122	11.40011	12.24344	-0.01156	0.13556	0.05366
18	11.93300	11.40278	12.23722	-0.00333	0.13456	0.05462
19	11.92456	11.38422	12.25333	-0.00622	0.14078	0.06258
20	11.92567	11.38778	12.24356	-0.00711	0.13222	0.04567
21	11.93167	11.38967	12.25222	0.00611	0.13278	0.05892
22	11.92544	11.39078	12.23878	-0.00244	0.13322	0.04945
23	11.92644	11.39589	12.24100	0.00178	0.14256	0.05176
24	11.92867	11.40656	12.25233	0.00244	0.14256	0.05323
25	11.92667	11.39922	12.24589	0.00000	0.14122	0.06132
26	11.92322	11.37756	12.23756	0.00889	0.14122	0.05439
27	11.92200	11.39389	12.24889	0.00300	0.13989	0.05282
28	11.92567	11.38978	12.24300	0.00767	0.13922	0.06299
29	11.92833	11.39322	12.24889	0.00589	0.13489	0.06366
30	11.92422	11.38911	12.24100	0.00522	0.13400	0.06650
31	11.90513	11.38833	12.20887	-0.00116	0.13396	0.06765
32	11.92678	11.39978	12.24867	0.01267	0.13922	0.07160
33	11.92078	11.38078	12.23589	-0.00044	0.13756	0.06517
34	11.92000	11.37767	12.23489	0.00122	0.13867	0.06912
35	11.92122	11.38289	12.24622	0.00889	0.14278	0.05253
36	11.92811	11.38144	12.25089	0.02256	0.14889	0.06863
37	11.92556	11.38511	12.23756	0.00822	0.14656	0.06160
38	11.92400	11.38456	12.24533	0.00967	0.13556	0.06407
39	11.92356	11.38389	12.24378	0.01478	0.11622	0.06783

Beam Number	Mean Depth (m)	Min. (m)	Max. (m)	Difference (m)	Distance between Points (m)	Stnd. Dev. Of Differences (m)
40	11.92156	11.38111	12.23289	0.01067	0.12467	0.05821
41	11.92367	11.38233	12.25156	0.01033	0.12689	0.05503
42	11.92256	11.39178	12.23756	0.00000	0.12256	0.04983
43	11.92233	11.38511	12.23833	0.00056	0.12789	0.05691
44	11.93000	11.38700	12.25167	0.00644	0.12544	0.05933
45	11.92911	11.39422	12.24956	0.00489	0.13389	0.05903
46	11.92544	11.37711	12.23900	-0.00589	0.15867	0.05251
47	11.93078	11.38800	12.26778	-0.01644	0.15378	0.06952
48	11.92911	11.39156	12.25100	0.00344	0.13767	0.07003
49	11.92711	11.39311	12.25122	-0.00589	0.13989	0.06043
50	11.92522	11.39367	12.24922	-0.01511	0.13811	0.07281
51	11.91956	11.37600	12.23589	0.00744	0.13867	0.06663
52	11.92656	11.37333	12.24678	0.01544	0.13889	0.06324
53	11.92622	11.37778	12.25289	-0.00244	0.13322	0.05848
54	11.93100	11.38911	12.24956	-0.01244	0.13122	0.06610
55	11.93789	11.39822	12.27322	-0.01167	0.13944	0.06599
56	11.94300	11.39989	12.27500	-0.01244	0.13244	0.07956
57	11.93956	11.39978	12.27767	-0.01100	0.13789	0.07160
58	11.93778	11.39156	12.27889	-0.01689	0.14056	0.06156
59	11.93289	11.39344	12.25889	-0.00389	0.13100	0.06351
60	11.92678	11.38389	12.24756	0.00656	0.14000	0.06155
61	11.92356	11.37811	12.24067	0.00278	0.13578	0.05749
62	11.92533	11.38789	12.24800	0.01078	0.12233	0.04938
63	11.92133	11.38489	12.25033	0.00811	0.13500	0.06599
64	11.92278	11.39044	12.25389	0.00189	0.11933	0.06530
65	11.92433	11.39467	12.24189	-0.00078	0.12711	0.05170
66	11.92367	11.38644	12.24444	0.00800	0.14500	0.05835
67	11.92656	11.38989	12.25489	0.00189	0.13800	0.05685
68	11.92444	11.38367	12.22667	0.01500	0.12900	0.06497
69	11.93022	11.38656	12.25733	0.00122	0.13211	0.05761
70	11.93044	11.39333	12.24744	-0.00078	0.15167	0.05137
71	11.92756	11.39878	12.24833	0.00111	0.15211	0.06072
72	11.93233	11.40567	12.26011	-0.00822	0.15689	0.05929
73	11.92711	11.39200	12.23700	-0.00656	0.15433	0.05841
74	11.93322	11.40400	12.24289	0.00044	0.15100	0.05191
75	11.92978	11.38822	12.25089	-0.01000	0.15244	0.05314
76	11.93244	11.39622	12.24300	0.00011	0.16656	0.06727
77	11.93222	11.39622	12.24700	0.00033	0.16678	0.05183
78	11.92989	11.39122	12.25178	-0.00678	0.16678	0.05742
79	11.92744	11.39822	12.24067	-0.00644	0.16433	0.05386
80	11.93056	11.39344	12.26644	-0.00744	0.17778	0.06252
81	11.93200	11.40322	12.24889	-0.00500	0.19044	0.05289
82	11.93200	11.40011	12.25389	-0.00244	0.20467	0.05900
83	11.92867	11.39989	12.24589	-0.01222	0.19344	0.06052

Beam Number	Mean Depth (m)	Min. (m)	Max. (m)	Difference (m)	Distance between Points (m)	Stnd. Dev. Of Differences (m)
84	11.92933	11.39078	12.25844	-0.00678	0.21900	0.05445
85	11.93767	11.41889	12.24867	0.00067	0.13178	0.06268
86	11.93556	11.41533	12.25622	-0.00844	0.13589	0.05143
87	11.93211	11.41511	12.25689	-0.01156	0.12778	0.05076
88	11.93400	11.41611	12.24744	-0.00133	0.12756	0.05387
89	11.93644	11.41522	12.25511	0.01033	0.13389	0.06406
90	11.93556	11.41600	12.25644	-0.00067	0.13867	0.04993
91	11.93456	11.40844	12.25367	0.00478	0.13167	0.05374
92	11.93311	11.41044	12.26389	0.00344	0.12933	0.05774
93	11.93022	11.40378	12.25000	0.00822	0.14122	0.06058
94	11.92856	11.40256	12.24756	0.00767	0.12789	0.06082
95	11.93100	11.40578	12.24478	0.01033	0.14911	0.06005
96	11.93167	11.40744	12.25489	0.00589	0.12644	0.07524
97	11.92556	11.39678	12.24978	0.00011	0.13478	0.06820
98	11.92633	11.39133	12.25911	0.00689	0.12789	0.05762
99	11.93244	11.39967	12.25722	0.01444	0.13311	0.06015
Primary Line/ Cross Line Combined Average						
0	11.59303	11.04057	11.99315	0.29246	55.00995	0.22232
1	11.84012	11.42085	12.16200	0.04975	3.75778	0.12961
2	11.88481	11.47353	12.19659	-0.02682	0.18303	0.11893
3	11.90100	11.49360	12.20823	-0.04713	0.14490	0.08794
4	11.89836	11.48934	12.18702	-0.04235	0.13662	0.07451
5	11.89627	11.48965	12.18777	-0.04499	0.13531	0.07581
6	11.89641	11.50095	12.18690	-0.04712	0.13440	0.06786
7	11.89528	11.49971	12.18363	-0.04674	0.14229	0.06690
8	11.89582	11.50230	12.17268	-0.04428	0.13296	0.06634
9	11.89660	11.50837	12.18041	-0.04624	0.14028	0.07015
10	11.89691	11.50133	12.16705	-0.04397	0.13747	0.06160
11	11.89392	11.50656	12.17023	-0.03672	0.13610	0.07039
12	11.89355	11.50325	12.17043	-0.03529	0.13262	0.06464
13	11.89416	11.50323	12.16957	-0.03483	0.13597	0.06849
14	11.89308	11.49922	12.16230	-0.03053	0.13788	0.07152
15	11.88901	11.50633	12.16500	-0.02903	0.14250	0.06229
16	11.88536	11.49234	12.16065	-0.02864	0.13533	0.06573
17	11.88731	11.49575	12.15778	-0.02970	0.14379	0.06332
18	11.88621	11.49809	12.15467	-0.02086	0.13882	0.06548
19	11.87894	11.49160	12.15353	-0.02225	0.14422	0.06538
20	11.88003	11.48849	12.15304	-0.02368	0.14153	0.06103
21	11.88314	11.49494	12.16177	-0.01487	0.13936	0.06630
22	11.88005	11.49154	12.14997	-0.01732	0.14181	0.06040
23	11.88106	11.50304	12.15588	-0.01151	0.14111	0.06141
24	11.88230	11.50491	12.15760	-0.01473	0.14994	0.06290

Beam Number	Mean Depth (m)	Min. (m)	Max. (m)	Difference (m)	Distance between Points (m)	Stnd. Dev. Of Differences (m)
25	11.88064	11.50309	12.15309	-0.01405	0.14655	0.06438
26	11.87912	11.48942	12.14676	-0.01090	0.15402	0.06741
27	11.87871	11.50004	12.15602	-0.01125	0.15429	0.06457
28	11.88036	11.49879	12.14859	-0.00849	0.15045	0.06674
29	11.88027	11.49733	12.15609	-0.01169	0.15048	0.06890
30	11.87676	11.49657	12.14753	-0.01233	0.15619	0.06763
31	11.86872	11.49019	12.12980	-0.01459	0.15918	0.06930
32	11.87919	11.50053	12.15078	-0.00352	0.13798	0.07018
33	11.87511	11.49790	12.14271	-0.01264	0.13374	0.06530
34	11.87518	11.49493	12.14362	-0.00990	0.13785	0.06789
35	11.87376	11.49348	12.14861	-0.00629	0.13875	0.05955
36	11.87882	11.49407	12.15068	0.00318	0.14122	0.06909
37	11.87532	11.49472	12.13843	-0.00750	0.13766	0.06232
38	11.87684	11.49561	12.14961	-0.00660	0.13216	0.06649
39	11.87654	11.49563	12.14841	0.00050	0.12721	0.06764
40	11.87448	11.49687	12.14414	-0.00300	0.13134	0.06265
41	11.87548	11.49858	12.16016	-0.00046	0.13048	0.06191
42	11.87432	11.49803	12.14528	-0.01042	0.13020	0.05947
43	11.87708	11.49629	12.15530	-0.00741	0.13050	0.06286
44	11.87775	11.49416	12.15492	-0.00180	0.12924	0.06527
45	11.87983	11.50187	12.15190	-0.00453	0.13517	0.06604
46	11.87692	11.48947	12.14765	-0.01067	0.14809	0.06570
47	11.87885	11.50006	12.15882	-0.01996	0.14747	0.06419
48	11.88023	11.49920	12.15794	-0.01123	0.13471	0.07057
49	11.87856	11.50280	12.14893	-0.01558	0.13597	0.06551
50	11.87541	11.50343	12.14809	-0.01939	0.13589	0.07192
51	11.87205	11.49077	12.14161	-0.00838	0.13964	0.06840
52	11.87701	11.48897	12.14586	-0.00250	0.13853	0.06734
53	11.87511	11.49187	12.14698	-0.00968	0.13405	0.06727
54	11.87947	11.49884	12.15300	-0.01397	0.13512	0.06622
55	11.88600	11.50254	12.16989	-0.01321	0.14009	0.06876
56	11.88870	11.50815	12.16942	-0.01652	0.13120	0.07702
57	11.88381	11.49998	12.17110	-0.01453	0.13528	0.07200
58	11.88277	11.49752	12.16087	-0.02167	0.13711	0.06400
59	11.88183	11.50055	12.16250	-0.00552	0.13358	0.07110
60	11.87729	11.49649	12.15057	-0.00504	0.13242	0.06230
61	11.87407	11.49145	12.14585	-0.00737	0.13402	0.06446
62	11.87800	11.49739	12.15188	-0.00100	0.12749	0.05922
63	11.87296	11.49548	12.14621	-0.00483	0.13569	0.06730
64	11.87661	11.50121	12.14759	-0.00744	0.12441	0.06419
65	11.87874	11.50224	12.14371	-0.00755	0.12773	0.05797
66	11.87702	11.49513	12.14711	-0.00245	0.13851	0.06159
67	11.87718	11.49612	12.15025	-0.00935	0.13373	0.06028
68	11.87779	11.49517	12.14255	0.00124	0.13016	0.06965

Beam Number	Mean Depth (m)	Min. (m)	Max. (m)	Difference (m)	Distance between Points (m)	Stnd. Dev. Of Differences (m)
69	11.88161	11.49613	12.15328	-0.00734	0.13162	0.06616
70	11.87953	11.49802	12.15046	-0.01469	0.13801	0.05879
71	11.87933	11.50133	12.15234	-0.01346	0.13776	0.06217
72	11.88291	11.50782	12.15850	-0.01519	0.14137	0.06561
73	11.87975	11.49593	12.14742	-0.01850	0.14574	0.06696
74	11.88101	11.50412	12.14251	-0.01524	0.13891	0.05834
75	11.88093	11.49255	12.15717	-0.02009	0.13840	0.06354
76	11.88463	11.50357	12.15309	-0.01399	0.14493	0.07017
77	11.88221	11.50253	12.15462	-0.01379	0.15022	0.05888
78	11.87983	11.50270	12.14952	-0.01835	0.15018	0.06191
79	11.87885	11.50431	12.14702	-0.02002	0.14929	0.05952
80	11.88218	11.50181	12.15947	-0.01751	0.15559	0.06981
81	11.88120	11.50487	12.15705	-0.01913	0.16152	0.06436
82	11.88208	11.50667	12.15279	-0.01461	0.16614	0.06353
83	11.88105	11.49885	12.15326	-0.01710	0.16139	0.07228
84	11.88106	11.50202	12.15605	-0.01846	0.17267	0.06374
85	11.88570	11.51404	12.14466	-0.01738	0.13028	0.06265
86	11.88538	11.51470	12.15776	-0.01695	0.13245	0.05680
87	11.88256	11.51215	12.14870	-0.01829	0.12563	0.05942
88	11.88339	11.50967	12.15158	-0.01321	0.12927	0.06034
89	11.88187	11.50453	12.15305	-0.00340	0.13092	0.07073
90	11.88404	11.50967	12.15344	-0.01167	0.13913	0.06002
91	11.88122	11.49919	12.15357	-0.00060	0.13173	0.06890
92	11.88119	11.50812	12.15854	-0.00793	0.13282	0.06494
93	11.87956	11.49493	12.16040	0.00208	0.13666	0.07773
94	11.87501	11.49150	12.15008	-0.00129	0.12999	0.07346
95	11.88050	11.50461	12.16167	-0.00366	0.14357	0.06806
96	11.87922	11.50286	12.15200	-0.00834	0.12747	0.07170
97	11.87759	11.48756	12.15828	-0.00738	0.13265	0.07555
98	11.87590	11.49045	12.15904	-0.00311	0.13510	0.07270
99	11.87820	11.49115	12.16460	-0.00007	0.13458	0.07826

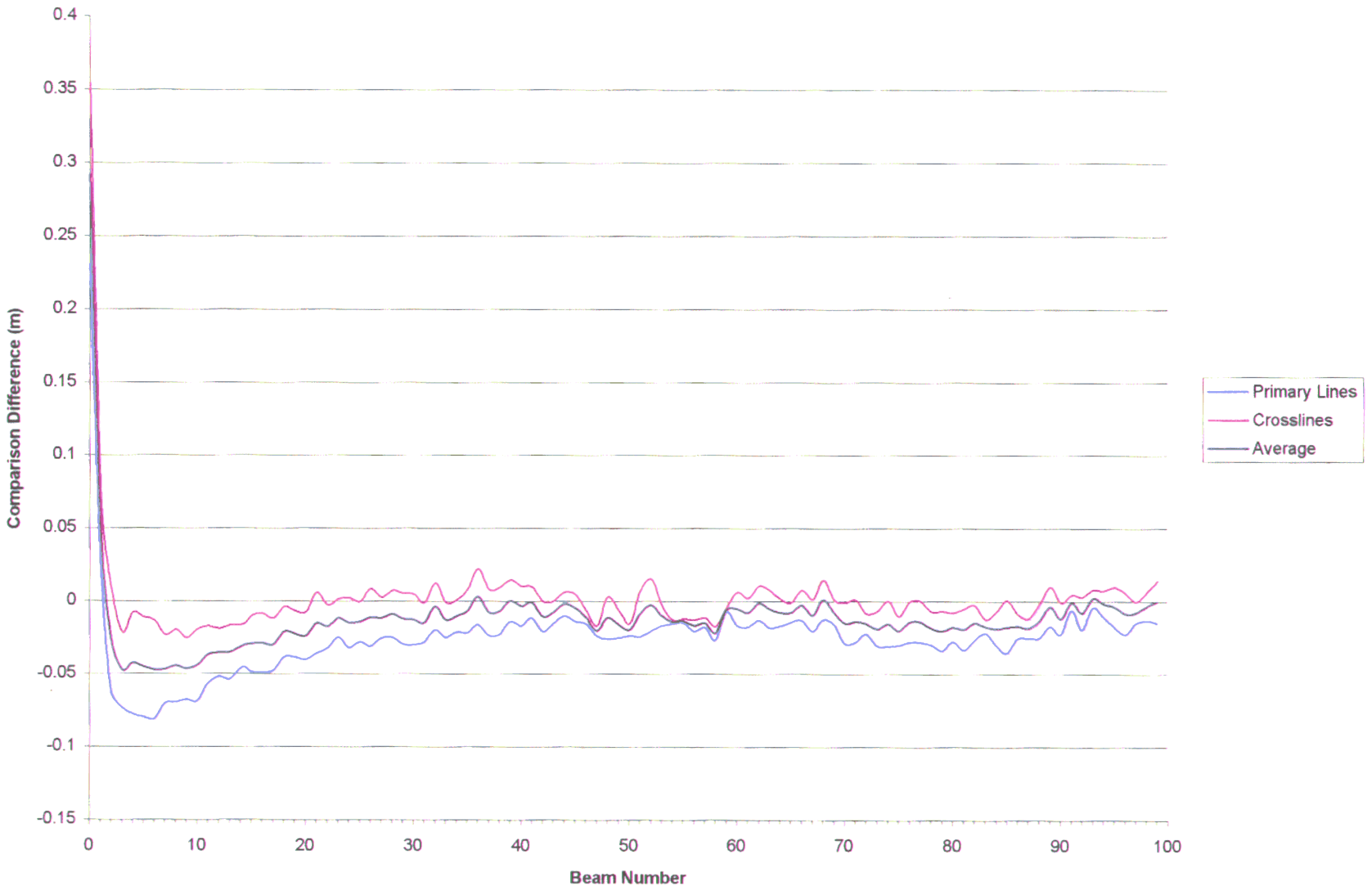
L. JUNCTIONS- See also Evaluation Report

OPR-K171-KR, Sheet H, H10836 junctions with the northwest corner of OPR-K171-KR, Sheet I, H10804. H10804 is a 1:20,000 scale survey submitted on March 1, 1999. It overlaps at the southeast corner of the present survey. Both data sets were processed using verified tides.

Agreement between H10836 and H10804 is very good. The soundings generally agree within 0.30 meters. The differences in the depths may possibly be attributed to the variations in the tidal data.

No adjustments to soundings, features, or depth curves are recommended.

OPR-K171-KR
Sheet H
H10836



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M. COMPARISON WITH PRIOR SURVEYS - See assoc Evaluation Report

Comparison with prior surveys was not required under this contract. See Section N for comparison to the nautical charts.

N. COMPARISON WITH THE CHART - See also Evaluation Report

This survey was compared with the following charts:

Chart	Scale	Edition	Date
11332	1:80,000	~~26th~~ 27th	~~January 10, 1998~~ APRIL 3, 1998
11341	1:80,000	37th	October 25, 1997

Neither any Dangers to Navigation were found during the survey, nor were any obstructions documented. One object that was investigated falls outside of the smooth sheet area, and shows a two-foot height off the surrounding seafloor. This object is not considered an obstruction and is discussed in the first item investigation report.

Charts 11332 and 11341 were compared to each other. Sounding values within the survey area were digitized from Chart 11332 and compared to sounding values on the smooth sheet at a 1:20,000 scale. The majority of the data from this survey either compared exactly to the chart or the value fell within 150 meters of the value on the chart. Twelve values are 1 foot deeper than those reported on the nautical chart. Four values are 2 feet deeper than those reported on the nautical chart. Two of the discrepancies are 1-foot shoaler than those reported on the chart. Some of these differences are seen in the vicinity of Sabine Bank shoal areas, and others are found in the middle of the fairway. The differences in depths could indicate possible shoal migration, sediment movement due to storms, or dredging of the fairway. For the soundings that lie relatively near the correct depth value, the differences may be due to the increased precision in navigation since the original data were collected.

A reported pipe (PD) is charted on the edge of the fairway of charts 11332, and 11341 (Latitude 29° 28.8' N, Longitude 93° 52.3' W). This survey showed no evidence of a pipe at that location. It is recommended that the charted pipe be removed from the charts.

Delete o pipe rep PD (AWOIS # 7009)

ITEM INVESTIGATION REPORT

Item Description (as charted): N/A

Source: SSS Contact 98328203044

Charted Position: N/A

Charts Affected: 11332, 11341

INVESTIGATION

Date(s)/ Day Number(s): 2/15/99 / 46 Survey Vessel Name: M/V Geodetic Surveyor

Investigation Method: Side scan sonar at 50m range and shallow water multibeam were run. A 225 meter search radius and 25 meter line spacing was used to investigate the object centered at Latitude = 29° 29' 21.5079" N, Longitude = 93° 44' 48.6648" W (N= 3262430.99, E=427600.90). One line was run up the long axis of the feature, with two parallel lines flanking the central line and three perpendicular to the long-axis.

Surveyed Position (NAD 83): 29° 29' 21.3754"N, 93° 44' 48.6538"W (N= 3262426.91, E=427601.17)

Position Determined By: Shallow water multibeam

Investigation Summary: 1. Line 98c

This object was documented during the original survey on side scan sonar data, but fell outside the multibeam swath. It appeared to be a man-made object rising 1.9 meters above the seafloor.

Lines 620si-625si were run during the investigation. Line 624 produced the best image of the contact, which rose 1.05 meters above the seafloor. This feature falls outside of the survey area, but a least-depth value of 32 feet is depicted on the Smooth Sheet. The object only showed a difference of two feet on the smooth sheet, and is not considered an obstruction. The feature was located at 29° 29' 21.3754"N, 93° 44' 48.6538"W (N= 3262426.91, E=427601.17). DO NOT CONCUR -

It is recommended that a 32' obstruction be charted in the present survey location.

ITEM INVESTIGATION REPORT

Item Description (as charted): N/A

Source: SSS Contact 98328065047

Charted Position: N/A

Charts Affected: 11332, 11341

INVESTIGATION

Date(s)/ Day Number(s): 02/14/99 / 45 **Survey Vessel Name:** M/V Geodetic Surveyor

Investigation Method: Side scan sonar at 50m range and shallow water multibeam were run. A 225 meter search radius and 25 meter line spacing was used to investigate the object centered at Latitude = 29° 29' 14.5813" N, Longitude = 93° 47' 13.5698" W (N= 3262243.51, E=423697.40). One line was run up the long axis of the feature, with two parallel lines flanking the central line and three lines perpendicular to the long-axis.

Surveyed Position (NAD 83): Item not seen

Position Determined By: Item not seen

Investigation Summary: 2. Line 89c

This object was documented during the original survey on side scan sonar data, but fell within the noisy outer beams of the multibeam swath. It appeared to be a man-made object rising 0.9 meters above the seafloor. Line numbers 626si-631si were run during the investigation. Side scan sonar and multibeam data collected during the investigation did not show evidence of the previously documented contact. Concur - No changes in charting are recommended.

O. <NOT USED BY CONTRACTOR>

P. AIDS TO NAVIGATION · See also Evaluation Report

There are no aids to navigation on Sheet H, but there are several platforms and pipelines within the survey area. It is required that pipelines in the survey area be buried. There is no evidence that the pipelines on Charts 11332 and 11341 are exposed or suspended. Concur

The *M/V Geodetic Surveyor* was used to confirm platform locations and investigate all platforms found on Charts 11332 and 11341. The center of navigation was moved to the bow of the vessel plus 6 meters, the vessel nosed as close as possible to the structure, and a fix was taken. All platforms found within the survey area are provided in the tables below. The Local Notice to Mariners (LNM) mentioned three of the surveyed platforms or drill rigs. LNM 44-97 states that the rig Ocean Champion is removed, but an aid remains at the HI36 Satellite location. LNM 03-98 mentions that a rig is removed from SA10 and a well is on site. In addition, the rig identified as the semi-submersible drill rig SE by the *M/V Geodetic Surveyor* is mentioned in LNM 41-98 as Falcon 203 rig in HI19. For additional information, see the geophysical logs in Separate 1 filed with original data.

Platform Name	Owner	Survey Position	Charted Position	Charted Name	
HI36 Satellite		29° 28' 20.4968" N 93° 53' 48.7176" W	29° 28.30' N 93° 53.80' W	IP HI-37-1	No changes in charting
HI38 Well #1	LL&E	29° 28' 29.2128" N 93° 48' 46.6486" W	29° 28.50' N 93° 48.70' W	LLE HI-38-1	No changes in charting
SX40JC	Shell	29° 29' 40.6238" N 93° 47' 12.3187" W	29° 29.68' N 93° 47.20' W	SH SA-40-JC	No changes in charting
SA10A – NW	Shell	29° 29' 54.6193" N 93° 46' 51.2087" W	29° 29.90' N 93° 46.85' W	SH SA-10-JA	No changes in charting
SA10A - SE	Shell	29° 29' 50.5385" N 93° 46' 51.5069" W	29° 29.85' N 93° 46.85' W	SH SA-10-A	No changes in charting
HI14 L4	Sonat	*29° 32' 10.5354" N *93° 47' 50.5415" W	29° 32.15' N 93° 47.80' W	Sonat HI-14-L-4 *	NOT Charted Add Platform
HI14 L7	Sonat	29° 32' 40.7589" N 93° 48' 18.3203" W	29° 32.70' N 93° 48.30' W	Unnamed platform	No changes in charting
SP18 CG	TGP	29° 31' 38.1847" N 93° 49' 13.9043" W	29° 31.70' N 93° 49.25' W	Unnamed platform	No changes in charting
SPSA18A	Sonat	29° 31' 31.9746" N 93° 49' 37.7136" W	29° 31.51' N 93° 49.60' W	PPC SA-18-PROD (Not on Chart 11341)	No changes in charting
SPSA 18AD	Sonat	29° 31' 31.8240" N 93° 49' 41.1831" W	29° 31.49' N 93° 49.65' W	Sonat SA-18-A	No changes in charting
SP SA18B	Chevron	29° 31' 10.8676" N 93° 51' 09.7716" W	29° 31.20' N 93° 51.15' W	Sonat SA –18-B	No changes in charting

The platforms in the table below were positioned by the *M/V Geodetic Surveyor*, but are not depicted on Charts 11332 and 11341. It is recommended that the uncharted platforms below be charted in the present survey locations, except as otherwise specified.

Platform Name	Owner	Survey Position	
HI 39 - B	Sonat	29° 29' 27.5851" N 93° 48' 03.8281" W	No change in charting; already charted

* Data filed with field records.

HI 14-L	Sonat	29° 32' 09.2587" N 93° 47' 48.5074" W	Add platform
HI 14–L3	Sonat	29° 32' 45.0796" N 93° 47' 57.9971" W	Add platform
HI 14–L5	Sonat	29° 32' 45.5959" N 93° 47' 55.0149" W	Add platform
HI 14–L6	Sonat	29° 32' 43.0516" N 93° 47' 55.1365" W	Add platform

The three features below were not previously charted. The semi-submersible drill rigs are believed to be temporary features. It is unknown at this time whether permanent platforms will replace the drill rigs. Their surveyed positions follow: Concur

Feature Name	Surveyed Position
Hang Off Buoy	29° 31' 30.2108" N 93° 50' 01.3694" W
Semi-submersible Drill Rig SE	29° 30' 58.6385" N 93° 52' 32.5297" W
Semi-submersible Drill Rig NW	29° 31' 02.8455" N 93° 52' 37.2990" W

Temporary structures. No changes in charting Recommended -

The platforms in the table below are depicted on Charts 11332 and 11341. The *M/V Geodetic Surveyor* did not find these platforms during an investigation. No changes in charting are recommended.

Platform Name	Charted Position
Sonat HI-14–L1	29° 32.65' N 93° 48.90' W
Sonat HI-14–L2	29° 32.70' N 93° 47.90' W
SEC HI-39A-AP/F	29° 28.70' N 93° 47.80' W

Q. STATISTICS

	M/V Geodetic Surveyor	M/V Universal Surveyor	Total
Lineal nautical miles of sounding data (side scan sonar acquisition concurrent with multibeam acquisition or side scan sonar acquisition alone)	1107	150	1257
Lineal nautical miles of sounding data (multibeam with out concurrent side scan)	259	0	259
Square nautical miles	48	-	48
Number of velocity casts	65	0	65
Number of supplemental tide stations installed	0	0	0
No. horizontal control stations occupied/established	0	0	0
Number of items investigated	2	0	2

R. MISCELLANEOUS - See also Evaluation Report -

Abundant drag marks throughout the survey area and occasional can holes were documented on the side scan sonar records. These seafloor deformations may rise above the seafloor, but may not necessarily be hazardous to the mariner. A drill spoil area located at 29° 32' 11.9732" N, 93° 47' 50.0743" W (N= 3267710.2, E= 422751.8) near the Sonat HI14-L Platform shows 1 meter relief off the surrounding seafloor. Concur

Bottom samples were collected and described, but were not retained in accordance with section 7.1 of the SOW. A table of the sediment descriptions is located in Separate 4 included with survey data.

S. RECOMMENDATIONS

While no present construction or dredging will affect the results of this survey, the transient nature of the oil industry in the area may result in the addition of new platforms or removal of existing platforms. Concur

T. REFERRAL TO REPORTS

None noted.

* Data filed with field records

LETTER OF APPROVAL

REGISTRY NO. H10836

This report and the accompanying smooth sheet are respectfully submitted.

Field operations contributing to the accomplishment of survey H-10836 were conducted under my direct supervision with frequent personal checks of progress and adequacy. This report and smooth sheet have been closely reviewed and are considered complete and adequate as per the Statement of Work.

Jimmie L. Barr
Hydrographer
John E. Chance & Associates, Inc.
March 27, 1999

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NOAA FORM 76-155
(11-72)

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

GEOGRAPHIC NAMES

SURVEY NUMBER

H-10836

Name on Survey	A ON CHART NO. 11332, 11341	B ON PREVIOUS SURVEY NO.	C ON U.S. QUADRANGLE MAPS	D FROM LOCAL INFORMATION	E ON LOCAL MAPS	F P.O. GUIDE OR MAP	G RAND MCNALLY ATLAS	H U.S. LIGHT LIST	K	
GULF OF MEXICO	X		X							1
SABINE BANK	X		X							2
SABINE PASS (title)	X		X							3
TEXAS (title)	X		X							4
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Approved:

Chief Cartographer

NOV 23 1999

NOAA FORM 76-155 SUPERSEDES C&GS 197

NOAA FORM 61-29
(12-71)

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

REFERENCE NO.
N/CS33-39-01

LETTER TRANSMITTING DATA

DATA AS LISTED BELOW WERE FORWARDED TO YOU BY (Check)

☐ ORDINARY MAIL ☐ AIR MAIL
☐ REGISTERED MAIL ☒ EXPRESS
☐ GBL (Give number)_____

DATE FORWARDED
08/17/2001

NUMBER OF PACKAGES
1

TO:

CHIEF, DATA CONTROL GROUP, N/CS3x1
NOAA / NATIONAL OCEAN SERVICE
STATION 6815, SSMC3
1315 EAST-WEST HIGHWAY
SILVER SPRING, MARYLAND 20910-3282

NOTE: A separate transmittal letter is to be used for each type of data, as tidal data, seismology, geomagnetism, etc. State the number of packages and include an executed copy of the transmittal letter in each package. In addition the original and one copy of the letter should be sent under separate cover. The copy will be returned as a receipt. This form should not be used for correspondence or transmitting accounting documents.

H10836

TEXAS, GULF OF MEXICO, 12 NM SOUTHWEST OF SABINE PASS

ONE TUBE CONTAINING THE FOLLOWING:

1 SMOOTH SHEET FOR SURVEY H10836
1 ORIGINAL DESCRIPTIVE REPORT
1 RECORD OF APPLICATION TO CHART FORM (NOAA FORM #75-96) FOR SURVEY H10836
1 H-DRAWING ON MYLAR FOR NOS CHART 11332
1 COMPOSITE DRAWING ON PAPER FOR NOS CHART 11332

FROM: (Signature)
Deborah A Blair

RECEIVED THE ABOVE
(Name, Division, Date)

Return receipted copy to:

NOAA \ NATIONAL OCEAN SERVICE
ATLANTIC HYDROGRAPHIC BRANCH N/CS33
439 WEST YORK STREET
NORFOLK, VA. 23510-1114

NOAA FORM 61-29 SUPERCEDES FORM C AND GS 413 WHICH MAY BE USED.

☆ U.S. GOVERNMENT PRINTING OFFICE: 1988 - 554-006-61309

09/18/2001

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NUMBER: H10836

NUMBER OF CONTROL STATIONS	2
NUMBER OF POSITIONS	17883
NUMBER OF SOUNDINGS	17883

	TIME-HOURS	DATE COMPLETED
PREPROCESSING EXAMINATION	7.0	11/17/1999
VERIFICATION OF FIELD DATA	23.0	06/09/2000
QUALITY CONTROL CHECKS	0.0	
EVALUATION AND ANALYSIS	4.5	
FINAL INSPECTION	0.0	12/01/1999
COMPILATION	101.0	08/17/2001
TOTAL TIME	135.5	

ATLANTIC HYDROGRAPHIC BRANCH APPROVAL 02/08/2000

ATLANTIC HYDROGRAPHIC BRANCH
EVALUATION REPORT FOR H10836 (1999)

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.

D. AUTOMATED DATA ACQUISITION AND PROCESSING

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

NADCON, version 2.10
MicroStation 95, version 5.05
I/RAS B, version 5.01
SITEWORKS 02.01
Caris HIPS/SIPS
AutoCAD, Release 14

The smooth sheet was plotted using an Hewlett-Packard DesignJet 2500CP plotter.

H. CONTROL STATIONS

Horizontal control used for this survey during data acquisition is based upon the North American Datum of 1983 (NAD 83). Office processing of this survey is based on these values. The smooth sheet has been annotated with ticks showing the computed mean shift between the NAD 83 and the North American Datum of 1927 (NAD 27).

To place this survey on the NAD 27, move the projection lines 0.825 seconds (25.415 meters or 1.271 mm at the scale of the survey) north in latitude, and 0.605 seconds (16.287 meters or 0.814 mm at the scale of the survey) west in longitude.

L. JUNCTIONS

H10804 (1998) to the southeast

A standard junction was effected between the present survey and survey H10804 (1998). There are no junctional surveys to the north, south or to the west. Present survey depths are in harmony with the charted hydrography to the north, east and west.

M. COMPARISON WITH PRIOR SURVEYS

A comparison with prior surveys was not done during office processing in accordance with section 4. of the memorandum titled "Changes to Hydrographic Survey Processing," dated May 24, 1995.

N. COMPARISON WITH CHART 11332 (27th Edition, Apr 3/99) 11341 (37th Edition, Oct 25/97)

Hydrography

The charted hydrography originates with the prior surveys and requires no further consideration. The hydrographer makes adequate chart comparisons in section N. and P. of the Descriptive Report.

The present survey is adequate to supersede the charted hydrography within the common area.

Controlling Depths

There are no conflicts between the tabulated depths shown on charts 11341 and 11332 and the present survey.

P. AIDS TO NAVIGATION

There are no aids to navigation located within the bounds of the present survey, however there are numerous lighted platforms throughout the survey area. These are adequately discussed in the Descriptive Report.

R. MISCELLANEOUS

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

The following NOS Chart was used for compilation of the present survey:

11332 (27th ED., APR 3/99)

Robert Snow

Robert Snow
Cartographic Technician
Verification of Field Data
Evaluation and Analysis

APPROVAL SHEET
H10836

Initial Approvals:

The completed survey has been inspected with regard to survey coverage, delineation of depth curves, development of critical depths, cartographic symbolization, and verification or disproval of charted data. The digital data have been completed and all revisions and additions made to the smooth sheet during survey processing have been entered in the digital data for this survey. The survey records and digital data comply with NOS requirements except where noted in the Evaluation Report.

Deborah A Bland Date: 2/8/00

Deborah A. Bland
Cartographer,
Atlantic Hydrographic Branch

I have reviewed the smooth sheet, accompanying data, and reports. This survey and accompanying digital data meet or exceed NOS requirements and standards for products in support of nautical charting except where noted in the Evaluation Report.

Andrew L Beaver Date: 2/8/00

Andrew L. Beaver
Lieutenant Commander, NOAA
Chief, Atlantic Hydrographic Branch

****

Final Approval:

Approved: Samuel P. De Bow Jr. Date: September 20, 2001

Samuel P. De Bow, Jr.
Captain, NOAA
Chief, Hydrographic Surveys Division

NOAA FORM 75-96
(10-83)

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

MARINE CHART BRANCH

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H10836

INSTRUCTIONS

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart.

1. Letter all information.
2. In "Remarks" column cross out words that do not apply.
3. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

CHART	DATE	CARTOGRAPHER	REMARKS
11332	2/09/200	D. A. Bla	Full [redacted] After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
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SUPERSEDES C&GS FORM [illegible] WHICH MAY BE USED