FE323
SIDE SCAN

Diagram No. 1213-4

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey Side Scan Sonar

Field No. HE-10-1-89

Registery No. FE-323SS

LOCALITY

State Connecticut

General Locality Long Island Sound

Sublocality Georges Rock to Bridgeport

1989

CHIEF OF PARTY
LCDR C.B. Lawrence & LCDR S.R. Iwamoto

LIBRARY & ARCHIVES

DATE June 19, 1990

☆U.S. GOV. PRINTING OFFICE: 1985—566-054

FE323
SIDE SCAN

12369
12363
12364 A E C

12363
12364

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

HYDROGRAPHIC TITLE SHEET

FE-323-SS

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. HE-10-1-89

State Connecticut

General locality Long Island Sound

Locality Georges Rock to Bridgeport

Scale 1:10,000 Date of survey March 21 to June ~~21~~ 22, 1989

Instructions dated May 26, 1989 Project No. OPR-B660-HE-89

Vessel NOAA Ship HECK S-591, EPDN 9140

Chief of party Stanley R. Iwamoto, LCDR, NOAA, Commanding Officer HECK

Surveyed by Grady H. Tuell, LT; Harrie W. Bonnah, ENS; Lee D. Weiner, ENS; Walter R. Morris, ST

Soundings taken by echo sounder, ~~hand lead~~, ~~pole~~ DSF6000 Echosounder, DUAL BEAM, ~~pneumofathometer~~ PNEUMATIC DEPTH GUAGE

aphic record scaled by Automated HDAPS System

Graphic record checked by LT Tuell, ENS Bonnah, ENS Weiner, ST Morris

Protracted by _____ Automated plot by HDAPS: NOAA SHIP HECK XYNETICS 1201 PLOTTER (AHS)

Verification by ATLANTIC HYDROGRAPHIC SECTION PERSONNEL

Soundings in ~~fathoms~~ feet at ~~MLW~~ MLLW

REMARKS: This survey addresses AWOIS items 6881, 6912, 6913, 6931, and 6932

CDR Christopher B. Lawrence was the Chief of Party until June 9, 1989

NOTES IN THE DESCRIPTIVE REPORT WERE MADE IN RED DURING OFFICE PROCESSING.

AWOIS/SURF MSM 7/18/90

KWW 7/12/90

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

☆ U.S. GOVERNMENT PRINTING OFFICE 1978-665-010-1174

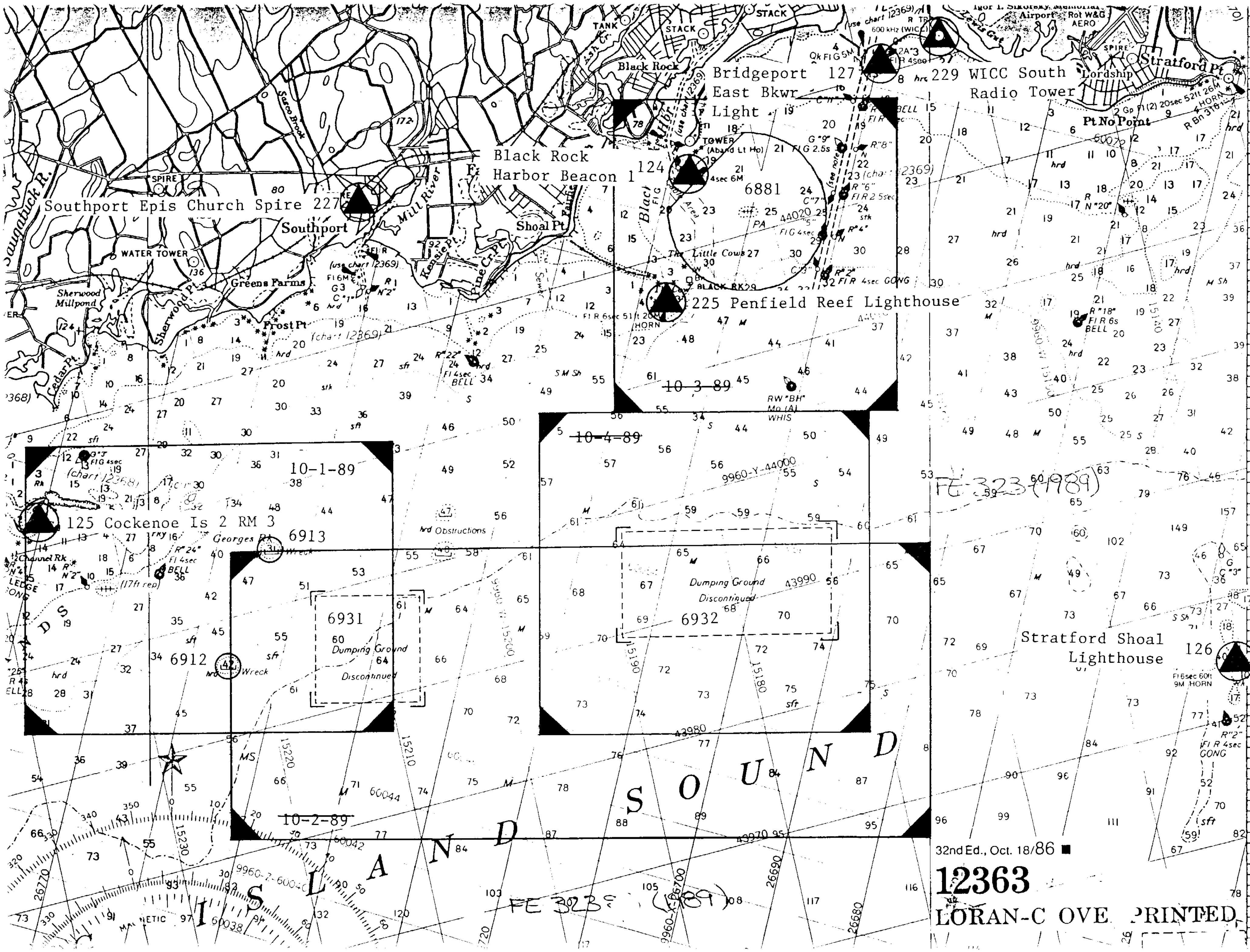

Southport Epis Church Spire 227
Black Rock
Harbor Beacon 1
124
Bridgeport 127
East Bkwr
Light
229 WICC South
Radio Tower
225 Penfield Reef Lighthouse
125 Cockenoe Is 2 RM 3
Stratford Shoal
Lighthouse
126
10-1-89
10-2-89
10-3-89
10-4-89
6881
6912
6913
6931
6932
Dumping Ground
Discontinued
Southport
Greens Farms
Sherwood Pt
Frost Pt
Shoal Pt
Mill River
Kensie Pt
Saugatuck R.
Sherwood Millpond
Cedar Pt
Stratford Pt
Lordship
Pt No Point
Black Rock
WATER TOWER
SPIRE
STACK
TANK
The Little Cows
BLACK RK
Channel Rk
LEDGE
Georges Rk
Wreck
Obstructions
FE 323 (1989)
FE 323 (1989)
I S L A N D   S O U N D
32nd Ed., Oct. 18/86
12363
LORAN-C OVE PRINTED

TABLE OF CONTENTS

APPENDICES

* DATA REMOVED FROM DESCRIPTIVE REPORT AND FILED WITH FIELD DATA.

DESCRIPTIVE REPORT TO ACCOMPANY
SURVEY FE-323-SS
FIELD NUMBER HE-10-1-89
CONNECTICUT
LONG ISLAND SOUND
GEORGES ROCK TO BRIDGEPORT
Scale 1:10000
NOAA SHIP HECK S-591
LCDR Christopher B. Lawrence, CMDG
LCDR STANLEY R. IWAMOTO

A. PROJECT DESCRIPTION

A1. Project Authorization

This survey was conducted in accordance with Hydrographic Project Instructions OPR-B660-RU/HE, Southern New England Coast, Connecticut and New York, dated May 26, 1988; CHANGE NO. 1 dated July 6, 1988; CHANGE NO. 2 dated September 26, 1988; CHANGE NO. 3 dated November 22, 1988; CHANGE NO. 4 dated December 8, 1988; and CHANGE NO. 5, dated February 22, 1989.

A2. Project Purpose

The project purpose was to respond to requests from the Northeast Marine Pilots Inc., of Newport, Rhode Island, to verify or disprove and determine least depths for certain wrecks and obstructions in western Long Island Sound. The data from this project will supplement a basic hydrographic survey (OPR-B285) which is scheduled for this area in 1989-1991. The U.S. Navy, as well as state and local governments, have requested updated bathymetric and hydrographic survey data for western Long Island Sound and vicinity to aid in proposed biological, chemical, environmental, and coastal zone management studies in this region.

B. PROJECT OVERVIEW

B1. General

This report includes all work performed on the following AWOIS items: 6881, 6912, 6913, 6931, and 6932.

Horizontal control recovery and installation of navigation units began on March 17, 1989. Hydrographic survey operations began on March 21, 1989, and continued until April 6, 1989.

No field operations were conducted between the dates of April 7, 1989, and April 21, 1989. During this time period the HECK was engaged in a special project designed to evaluate the feasibility of using a remotely operated vehicle (ROV) for least depth determination on wrecks. Survey operations resumed on OPR-B660 on April 24, 1989 (DOY 114), and concluded on June 22, 1989 (DOY 173).

B2. METHODOLOGY

The survey requirements for each AWOIS item were specified by the Hydrographic Surveys Branch (N/CG24) in an AWOIS listing. This listing was included as a Presurvey Review (PSR) in CHANGE No. 5 to the Project Instructions.

Two types of AWOIS items were specified in the PSR : descrete point hazards to navigation, usually wrecks, and area hydrographic surveys of discontinued dump sites. Three wrecks and two dump sites were completed.

This survey was conducted according to procedures dictated in the Hydrographic Manual Fourth Edition; the Field Procedures Manual for Hydrographic Surveying; the Side Scan Sonar Manual; and the Hydrographic Guidelines.

The general survey technique for SSS operations was to acquire 200% side scan sonar (SSS) imagery of a specified search area by running two sets of search lines oriented orthogonally to each other. All SSS imagery was carefully analyzed both on-line and off-line in order to identify contacts requiring futher investigation. Each contact was evaluated for significance based on a number of factors: water depth, height of target as computed from its acoustic shadow, size and shape of contact, nature of the bottom, and proximity to other contacts. Additional reconnaissance SSS imagery was conducted on several contacts to assist in this evaluation process. Each contact is listed in Appendix IV, SSS Contact Abstracts.*

A team of scuba divers investigated each significant contact. A precise depth was measured over the highest point of the contact using a pneumofathometer. The divers affixed a marker buoy to the high point of the contact. The ship was then manuevered alongside this buoy and a fix was taken using the Motorola MiniRanger navigation system.

Hydrographic soundings were taken over the discontinued dumping grounds using 50 meter line spacing as specified in CHANGE No. 5 to the Project Instructions. Any significant contacts noted were listed on SSS contact abstracts and are also included in Appendix IV. Additional hydrography or side scan imagery was run over the fathometer contacts.*

* DATA REMOVED FROM DESCRIPTIVE REPORT AND FILED WITH FIELD DATA.

Survey data acquisition and processing were accomplished utilizing the HDAPS system and the latest version of the NAVITRONIC NAVISOFT 300 software provided to the ship by N/CG24. The specific survey instrumentation utililzed is discussed in Sections F through H of this text.

C. AREA SURVEYED

This report covers survey operations performed to resolve AWOIS items located in Long Island Sound, along the Connecticut shore, between Georges Rock and Bridgeport, Connecticut.

D. SURVEY VESSELS

All hydrographic and side scan sonar data were collected by the NOAA Ship HECK (EDPN 9140).

A 17 foot Boston Whaler skiff was used for installation and maintenence of MiniRanger shore stations and for general utility work.

A 23 foot SISU launch was used as a dive support boat. The pneumofathometer was mounted in this launch and all diver least depths were measured from the SISU.

E. SURVEY SHEETS (FIELD)

All survey sheets submitted in this report were generated using the Preplot Plotter Sheet utility of the Presurvey menu of the NAVISOFT 300 software on the HDAPS system. A Brunning 824 CS Plotter (S/N 15237) was used as the plotting device. All sheets are Modified Transverse Mercator projections and are plotted on the North American Datum of 1983 (NAD 83).

Due to the very humid weather experienced during this survey, the paper plotter sheets often expanded to the point where they would no longer stay in the plotter. This problem was solved by using mylar field survey sheets. Therefore, some AWOIS items have part of the field data on a paper sheet and another part on a mylar sheet.

Four survey sheets are submitted in this survey. Each sheet is briefly described in the following text. See APPENDIX V, PROJECT and PLOTTER SHEET PARAMETERS, for the technical specifications on each sheet* A raw data and edited data tape are submitted for each survey sheet.

*DATA REMOVED FROM DESCRIPTIVE REPORT AND FILED WITH FIELD DATA.

E1. HE-10-1-89

This 1:10000 scale sheet is oriented East/West and covers the area immediately southeast of Cockenoe Island. Two AWOIS items were surveyed on this sheet; 6912 and 6913. The raw data for this sheet are logged on tape 30810 and the edited data are logged on tape 30811.

Four copies of HE-10-1-89 are submitted:

1 200% field SSS swathplot on paper
1 200% smooth SSS swathplot with contact plot on paper
1 200% smooth SSS trackplot on paper
1 contact plot on paper

E2. HE-10-2-89

This sheet is a 1:10000 plot oriented EAST/WEST and covers the one mile by one mile discontinued dumping grounds located approximately four miles south of Southport, Connecticut. The only AWOIS item on this sheet is 6931. The sheet was originally designed to also cover AWOIS 6932. However, AWOIS 6932 was surveyed on a separate sheet. The raw data for this sheet are logged on tape 8100 and edited data are logged on tape 8101.

Five copies of HE-10-2-89 are submitted:

1 smooth depthplot on mylar
1 smooth SSS swathplot on paper
1 smooth hydrographic trackplot on mylar
1 field swathplot on paper
1 field depthplot on paper

E3. HE-10-3-89

This sheet is a 1:10000 plot oriented EAST/WEST and covers the area immediately west of the Bridgeport, Connecticut, entrance channel. The sheet is centered on AWOIS 6881. The raw data for this sheet are logged on tapes 12810 and 14310. The edited data are logged on tapes 12811 and 14320.

Ten copies of HE-10-3-89 sheet are submitted:

1 1st 100% smooth swathplot on mylar
1 2nd 100% smooth swathplot on mylar
1 200% smooth SSS trackplot on mylar
1 field SSS swathplot on paper
2 field SSS swathplots on mylar
1 contact plot om paper
3 plots rejected SSS data on mylar

E4. HE-10-4-89

This sheet is a 1:10000 scale plot oriented EAST/WEST and is centered on the one mile by two mile discontinued dumping grounds which lie about three miles south of Penfield Reef Lighthouse. AWOIS 6932 is the only AWOIS item on the sheet. Raw data are logged on tapes 9430, 9430"B", and 12910. Edited data are logged on tapes 9431, 9433, and 12911.

Ten copies of HE-10-4-89 are submitted:

1 smooth depthplot on mylar
1 smooth trackplot on mylar
1 development depthplot on mylar
1 smooth development swathplot on mylar
1 smooth depthplot from SSS on mylar
1 smooth comparison line depthplot on paper ????
1 contour workplot on mylar
1 development field swathplot on mylar
1 field depthplot on paper
1 development field depthplot on paper

F SOUNDING EQUIPMENT AND CORRECTIONS TO ECHO SOUNDINGS

F1. Raytheon DSF 6000N Echosounder

All hydrographic soundings for this survey were acquired using a Raytheon DSF echosounder. System performance was checked daily with an Electronic Depth Simulator Instrument (EDSI) provided by AMC's EEB. The daily tests are included as part of each day's raw data records.

Both low and high frequency depths were digitized, but only the high frequency depths were used for survey operations. The automatic gain function was utilized. The range setting was normally set manually to 80, and phase was set manually as required. The digitizing gate was set at 10 percent of depth.

The only problem encountered with the DSF 6000 was that occassionally the depth grid would suddenly shift one to two millimeters vertically on the fathometer paper. This did not cause an error in the digital depths because the bottom trace also shifted whenever the depth grid shift occurred. However, because of this problem the backup fathometer was installed on May 21, 1989 (DOY 141).

The following two DSF 6000 units were used during this survey:

DSF 6000 S/N	DATES IN USE
A110N	DOY 79 to DOY 139
A107	DOY 141 to DOY 173

F2. EG&G Model 260 Side Scan Sonar

The HECK is equipped with an EG&G Model 260 slant corrected Side Scan Sonar recorder (S/N 0011443) and a model 272 dual frequency towfish (S/N 0011591).

The towfish is led through a fairlead block over the stern and towed astern at speeds of 2 to 5 knots. Fish height over bottom is controlled by a combination of cable out and ship speed. Because of shallow water depths on this survey, the 50 meter range and 100 Khz frequency settings were used. The paper speed on the recorder was set manually. The operator made frequent checks of vessel speed and adjusted the paper speed as necessary. This procedure eliminated paper "speed jumps" caused by spikes in the navigation LOPs and insured that targets were depicted in their correct size and shape.

Side scan operations were conducted in accordance with the Side Scan Sonar Manual dated September 1988. Periodic confidence checks were performed by either towing the fish by a previously located contact, or by noting recognizable bottom characteristics at the edges of the sonar range scale in use. The SSS system worked very well for the duration of the survey.

The large number of lobster pots in the project area required frequent jogs to the left and right of intended course lines. Recent improvements to the towfish pigtail connector assembly have proved to be very valuable in protecting the pigtail from the inevitable "hooks" of the lobster pot marker bouys.

The SSS system worked very well for the duration of the survey. Only one problem was encountered. On May 5, 1989 (DOY 125), the SSS system abruptly failed. The problem was eventually traced to bad connectors on the winch side of the slip ring in the towcable winch. Repairs were made and the SSS system was returned to service on May 9, 1989 (DOY 129).

F3. Pneumofathometers (PNEUMATIC DEPTH GAUGES)

All diver determined least depths were measured with a pneumofathometer. The HECK is equipped with two precision depth gauges, a 0-70 FSW depth gauge, and a 0-140 FSW gauge. The HECK's pneumofathometer is built and operated according to procedures specified in Hydrographic Survey Guideline 55. Both gauges were most recently calibrated on January 5, 1989. A copy of each of these calibrations is included in APPENDIX I.A, PNEUMOFATHOMETER CALIBRATIONS AND SYSTEMS CHECKS.*

Four leadline comparisons were performed as systems checks on the pnumofathometer depths. The results of these checks are also included in APPENDIX I.A.*

The system check values were not applied to the diver determined depths. Weather conditions were not calm enough to yield a corrector that HECK personnel thought was more accurate than the calibration of the gauge itself. This policy is a conservative approach in that application of the correctors from the system checks would make diver determined least depths deeper than the depths submitted.

G CORRECTIONS TO ECHO SOUNDINGS

G1. Velocity Correctors

Velocity correction data for the Raytheon DSF 6000N echosounder were obtained by either MARTEK (S/N 177) or DIGIBAR cast. The MARTEK instrument was most recently calibrated on March 3, 1989. A copy of the calibration report is included in APPENDIX I.D.*

The ODOM DIGIBAR sound velocimeter malfunctioned on its initial use and was returned to the manufacturer for repair. The repaired unit was received back aboard the HECK on May 10. On May 18, simultaneous casts were conducted with the DIGIBAR and MARTEK units yielding similar results.

Due to the rapidly changing water temperatures during this project, several sound velocity casts were conducted. The following table shows the date, location and instrument used for each cast:

DATE	LOCATION		INSTRUMENT
3/21/89 (DOY 80)	41° 01.2'	073° 14.8'	MARTEK
3/28/89 (DOY 87)	41° 03.3'	073° 17.7'	MARTEK
4/25/89 (DOY 115)	41° 01.4'	073° 17.8'	MARTEK
5/05/89 (DOY 125)	41° 00.6'	073° 08.7'	MARTEK
5/18/89 (DOY 138)	41° 01.8'	073° 10.6'	MARTEK/DIGIBAR
6/13/89 (DOY 164)	41° 01.3"	073° 07.1'	MARTEK

* DATA REMOVED FROM DESCRIPTIVE REPORT AND FILED WITH FIELD DATA.

The velocity cast data were reduced and velocity corrections calculated using program VELOCITY. The computed velocity correctors were then applied online to echosounder depths by entering the correction data into the HDAPS sound velocity table. Reference APPENDIX I.B, VELOCITY CORRECTION DATA, for listings of the cast data and output from the VELOCITY software.* HDAPS velocity table listings are shown in APPENDIX I.C.*

Velocity correctors were verified by conducting dual leadline comparisons of echo sounding to leadline depths. Two comparisons were conducted; the first was done on DOY 138 and the second on DOY 167. On the DOY 138 comparison, digital depths were about one foot shoaler than leadline depths. The HECK attributes this discrepency to the soft, muddy bottom and tidal current experienced at the time of the comparison. On the second comparison, digital and leadline depths agreed within 0.5 feet. Results of the comparisons are included in APPENDIX I.E, LEADLINE COMPARISONS.*

G2. Tide Corrections

The tidal datum for this project is mean lower low water. The operating tide station at Bridgeport, Connecticut (846-7150) will serve as control for datum determination. This station was also used for predicted tides. No tide stations were established by the HECK in support of this survey.

All hydrographic and diver determined depths have been corrected for predicted tides. The tidal values were taken from Tide Tables 1989 High and Low Water Predictions, East Coast of North and South America. Correctors for time and height were taken from the nearest tabulated geographic position on Long Island Sound.

Tidal correctors were applied online by entering the appropriate values into the HDAPS predicted tide tables. Nine predicted tide tables were used. These tables are included in APPENDIX I.F, HDAPS PREDICTED TIDES TABLES.*

Contours plotted on the final depth plots for HE-10-2-89 (AWOIS item 6931) indicate inaccuracy of predicted tides of approximately two feet. Clearly defined shifts in the contours correspond directly with changes in dates of hydrography. Another problem exits on sheet HE-10-4-89 (AWOIS item 6932); disagreement between mainscheme and crossline soundings of up to four feet was not resolved. A careful analysis of all HDAPS tables and procedures was made and no errors were found. HECK believes that this problem was caused by strong along-sound winds which served to either augment or diminish the tide and that the application of approved tides will resolve the problem.**

*DATA REMOVED FROM DESCRIPTIVE REPORT AND FILED WITH FIELD DATA.

**SEE ALSO SECTION 3.D. OF THE EVALUATION REPORT.

A Request for Approved Tides was mailed to Chief, Sea and Water Levels Branch, on June 23, 1989. A copy of this letter is enclosed in Appendix I.G.*

G3. Settlement and Squat Correctors

Settlement and squat correctors for the HECK were determined on March 10, 1989 (DOY 69), at Craney Island fuel pier in Norfolk, Virginia. An observer was put ashore with a level instrument, and changes in relative height were measured as the ship passed by the observer while running at various speeds. (Reference APPENDIX I.H, SETTLEMENT AND SQUAT DATA)*

Settlement and squat values were applied online to hydrographic soundings by entering the observed values into the HDAPS offset table. A copy of this table is included in APPENDIX I.I, HDAPS OFFSET TABLE.*

G4. Heave, Roll, Pitch Sensor and Correctors

Heave is measured by a Datawell B.V. (S/N 19110-C) heave, roll, and pitch sensor (HIPPY) located midships near the transducer. The sensor gathers online data which is applied to the soundings in near real time.

All data acquired in the echosounder mode has been corrected by applying HIPPY correctors.

G5. Vessel Draft Corrector

During a February 1988 drydock period, an exact measurement of 19.0 feet was taken from the DSF transducers to a fixed point on each bridge wing of the ship. After refloating the ship, the height above the waterline was determined for this point. The ships static draft was calculated to be exactly 6.9 feet (2.10 meters).

This draft was applied online to hydrographic soundings by entering the value of 2.1 meters as the high frequency transducer height in the HDAPS offset table. See APPENDIX I.I, HDAPS OFFSET TABLE.*

H. HORIZONTAL CONTROL SEE ALSO SECTION 2.9 OF THE EVALUATION REPORT

H1. Survey Navigation

Vessel survey navigation was accomplished by the range-range method, utilizing the Motorola MiniRanger Falcon 484 system.

*DATA REMOVED FROM DESCRIPTIVE REPORT AND FILED WITH FIELD DATA.

The MiniRanger system is interfaced to the HDAPS system in such a way that only the ranges and signal strengths are recorded; the position computation capability of the Falcon system is not utilized. Vessel position is computed by a least squares predictor/corrector algorithm within the NAVITRONIC NAVISOFT 300 software.

The hydrographer must specify each of three interactive parameters which "tune" the positioning algorithm. The following parameters were entered into the Offset Table :

1) acceleration limit ..... 0.2 meters second $^{-2}$

2) angle limit ..... 0.3 degrees second $^{-1}$

3) crabbing limit ..... 0.4 degrees

The algorithm simultaneously uses up to four electronic lines of position (LOP's). Additionally, the ship's gyro heading and speed are used to predict a position. Whenever more than two acceptable LOP's are measured, the position computation is mathematically overdetermined. In order to utilize all available information, a least squares adjusted position is computed.

Three measures of the quality of this adjusted position are: the magnitude of the residuals on each range; the size and orientation of the error ellipse; and the radius of the 95% confidence error circle. HDAPS provides the hydrographer with a continuous graphic display of these data as well as a rough graphic of survey geometry. The required survey navigation positional accuracies are specified in terms of the maximum residual and the error cirle radius. These requirements are stated in the Project Instructions.

The HECK routinely conducted surveying operations using four MiniRanger LOP's, although occassionally one or more ranges were automatically rejected from the solution due to poor signal strength. At no time during this project did the maximum residual consistently exceed 0.5 mm at the survey scale (5 meters). The 95% confidence error circle radius very rarely exceeded 1.5 mm at the survey scale (15 meters).

A pre-project baseline calibration (BLC) of the MiniRanger system was conducted at Fentress ~~Airforce Base~~ AIRFIELD on January 31, 1989. A mid-season BLC was conducted at Port Jefferson, New York, on May 20, 1989. During these calibrations, the range correctors were determined for each combination of transponder and shipboard R/T and RPU. A minimum acceptable signal strength (MASS) was also

determined for each transponder. Reference APPENDIX II.C,* MINIRANGER BASELINE CALIBRATION DATA, for the results of the calibrations. BLC raw data, computations, and graphs are included in Electronic Control Report OPR-B660-HE-89, which is submitted under separate cover.

The range corrector and MASS for each MiniRanger code was entered into the HDAPS system using the Pre-Survey C-O Table Utility. This table provides the mechanism by which HDAPS automatically applies the proper range corrector and removes from the position computation those LOP's with signal strengths below MASS. A new C-O Table was generated each time any change was made to the navigation configuration. Reference APPENDIX II.D,* HDAPS C-O TABLES, for the various C-O tables used during this survey.

Acceptable MiniRanger navigation system performance was verified by comparing individual range-range fixes to simultaneous sextant three-point-fixes. These critical systems checks were conducted monthly or whenever the survey configuration was altered. Non-critical navigation system checks were performed daily to insure that the instrumentation was functioning within specifications. All critical systems check data are included in APPENDIX II.G, RESULTS OF SURVEY NAVIGATION SYSTEMS CHECKS.* A summary of the critical checks is shown on page II.F.1 *

MiniRanger shore station installations were placed directly over Third Order Class I or better geodetic stations. Control station positions were entered into the HDAPS Control Station Tables using the Pre-Survey menu. (See APPENDIX II.A, LIST OF HORIZONTAL CONTROL STATIONS)* The appropriate MiniRanger codes were attatched to the station number on this table. Each time the survey navigation configuration was altered, the control station table was modified so that it reflected the correct MiniRanger code placement. APPENDIX II.E,* DAILY ABSTRACT OF HDAPS TABLES, correlates control stations, MiniRanger codes, position numbers and dates of use.

The MiniRanger system performed well for the duration of this survey. Survey navigation was excellent. However, The following events influenced survey positioning:

1) The HECK began this survey with MiniRanger RPU H0375 and RT E2919 installed as the shipboard navigation hardware. On March 27 (DOY 86), RT E2919 failed, probably due to water taken in during a very rough transit to New London, Conneticut, on the previous weekend.

   On March 29 (DOY 88), the failed RT was replaced with RT G3646. A critical systems check was conducted, a new C-O Table was generated, and survey operations continued.

* DATA REMOVED FROM DESCRIPTIVE REPORT AND FILED WITH FIELD DATA

2) Following installation of the new RT unit on DOY 86, survey personnel accidentally ran hydrographic operations using the wrong C-O table in the HDAPS system. C-O Table 3 was used when the correct table was C-O table 4. This error caused the wrong baseline corrector values to be applied to the MiniRanger LOP's. About 23 miles of hydrography on AWOIS item 6931 were effected.

HDAPS does not provide a method by which to correct this mistake. HECK personnel spoke with the HDAPS development team at N/CG24 to verify that there was no method by which to automatically correct the problem. Examination of the two tables in question (reference APPENDIX II.D)* shows that the maximum diffence on any single LOP is 0.4 meters. Because both the error circle radii and maximum residuals for the hydrographic soundings effected are well within tolerances at the 1:10000 scale, the HECK considers this data to be acceptable for charting. Concur

3) On May 2 (DOY 122), Code 1 (SN C2075) which had been installed at Old Field Point Lighthouse began to behave very erratically. The residual on this LOP was consistently about 300 meters. HECK personnel found that a MiniRanger transponder owned by the Long Island Lighting Company (LILCO) had been placed there.

Communication with LILCO revealed that the company had placed three transponders in the HECK's project area. A mutually agreeable deployment scheme was worked out with LILCO. This agreement necessitated shifting the code switch for the transponder unit from Code 1 to Code A. Therefore, any date after DOY 122 shows transponder s/n C2075 as Code A.

4) On May 3 (DOY 123), Code 3 (S/N G3474) which had been installed at Cockenoe Island was found to have been destroyed by vandals. HECK personnel replaced the unit with code 5 (S/N F3217), however, this transponder malfunctioned. Both transponders were returned to the Atlantic Marine Center for servicing.

5) During this survey, an incorrect MASS value of 10 was used for MiniRanger component combination RPU H0375/ RT G3646/ TRANSPONDER C2075. The correct MASS from the preseason BLC was MASS = 15. This error was made on C-O Tables 4,6,7, and 8. Consequently, much of the data submitted in this survey was effected (Reference APPENDIX II.E* DAILY ABSTRACT OF HDAPS TABLES).

* DATA REMOVED FROM DESCRIPTIVE REPORT AND FILED WITH FIELD DATA

The HECK believes that this error did not seriously deteriorate position quality for the following reasons: Concur

a) Although the preseason BLC did not calibrate the combination below a signal strength of 15, the midseason BLC indicated acceptable performance at the signal strength of 10. Both calibration corrector curves are essentially flat and the two BLC values differ by only 2.4 meters. (Reference ELECTRONIC CONTROL REPORT OPR-B660-HE-89.)

b) Two critical systems checks were obtained using signal strength values below 15 for transponder C2075. Acceptable residual values on the measured range were :

DOY 124 .... SS = 14 .... RESIDUAL = 3.4 meters

DOY 143 .... SS = 11 .... RESIDUAL = 2.1 meters

c) All survey navigation was conducted using multiple LOPs. Position quality was generally very good with maximum residual values seldom exceeding 5 meters and 95% confidence ECR rarely exceeding 15 meters.

H2. GEODETIC CONTROL SEE ALSO SECTION 2.a. OF THE EVALUATION REPORT.

The horizontal datum for this project is the North American Datum of 1983 (NAD 83). The coordinates for all published stations were taken from the NGS publication: Geodetic Control Data, NAD 83 coordinates for New York and Connecticut. Recovery notes for these stations are included in Appendix II.B.* All stations used as navigation sites were recovered by HECK personnel.* DATA REMOVED FROM DESCRIPTIVE REPORT AND FILED WITH FIELD DATA.
No new stations were established. However, two non-published stations were used.

COCKENOES ISLAND 2 RM 3 was established by HECK personnel in October 1988. Field observations and data computations were submitted in the Descriptive Report to Accompany Survey FE-321-SS. Field coordinates computed during FE-321-SS were used for the station during this survey.

EATONS NECK TEMP was positioned by personnel from the NOAA Ship RUDE during the fall of 1988. Field observations and data computations were submitted in support of survey FE-320-SS. Field computed coordinates were provided to the HECK by the RUDE and were used during this survey.

I. AUTOMATED DATA PROCESSING

Hydrographic and side scan sonar data acquisition and processing were accomplished using the HDAPS hardware and the most recent version of the Navitronic NAVISOFT 300 software provided to the ship. This software is still under development and some problems do exist:

1) The positioning algorithm occassionally generates a "flyer" which causes the plotter sheet to scroll in an unpredictable manner. HECK personnel tried unsuccessfully to edit these "flyers" in the nightly processing. Therefore, the plotter continued to scroll even in the offline data processing mode.

2) Coordinates for control stations are altered by the software after they have been entered. This problem is most likely caused by rounding errors in the GP > MTM > GP conversion process. The potential errors are quite small (decimeter). However, the reader must be aware that the error is introduced by the software and that the coordinates were originally entered correctly.

3) Data transfer problems sometimes created the necessity to reject data because the data could not be transferred to the hard disk from the raw data tape. This problem occurred whenever there was an abnormal interrupt of a survey line; the final data set number (DSN) was not written to the raw data tape. If this interrupt occurred, the entire line was irretrievable. One known souce of this problem was the delay in writing HIPPY data to the tape. If the HDAPS system is taken offline before waiting out the HIPPY delay, then the survey line cannot be written to the hard disk for editing. Not all such problems were caused by HIPPY delay. Occasionally data could not be transferred from the raw tape and the problem could not be identified.

   Data transfer problems were also encountered when transferring data from the hard disk to the edited data tape. Some edited data could not be plotted or listed from edited data tape 9431. HECK personnel are unsure as to what the source of the problem was nor could any fix be found. Eventhough all data had been logged to the tape, a glitch in the data prevented access beyond fix 786. Therefore, the edited data for raw tape 6930 are stored on two tapes. Tape 9431 contains all data: fixes 468 - 2541. Tape 9433 contains fixes only 786 - 2541.

4) Although the block edit utility permits the editing of a wide variety of the survey data, it does not provide a mechanism by which to alter the BLC data applied to the LOP's. As metioned in Section H.1 of this text, the HECK used an incorrect C-O table on DOY 88. The mistake was discovered after running over twenty miles of hydrography. There is no procedure to correct the LOP's. Fortunately, the magnitude of the errors introduced in this instance is insignificant at the scale of this survey.

5) HDAPS provides for the use of only nine C-O Tables. Eleven tables were used during this survey (Reference Appendix II.D.* C-O Tables). This limit creates the necessity to cycle back through tables. Therefore, there are two tables numbered 1 and two tables numbered 2. The reader should make certain to reference the C-O tables by date as well as table number. * DATA REMOVED FROM DESCRIPTIVE REPORT AND FILED WITH FIELD DATA

MARTEK velocity cast data was processed on the ship's IBM-PC XT using program VELOCITY.

Geodetic computations were performed on the ship's IBM-PC XT using the MTEN ENHANCEMENTS routines which were obtained from the National Geodetic Survey.

J. COMPARISON WITH CHARTS AND PRIOR SURVEYS

SEE ALSO SECTIONS 6. AND 7. OF THE EVALUATION REPORT.

Hydrographic soundings from this survey were compared with the largest scale chart of the area:

NOS Chart 12369
Stratford Pt. to Sherwood Pt.
1:20000
20th Edition March 2, 1985

The survey was also compared against four prior surveys:

1) H-6123a
Blackrock Harbor to Saugatuck River
1:10000 1933-1934

2) H-6124a
Stratford Point to Fayerweather Island
1:10000 1934

3) H-6125
Approaches to Bridgeport Harbor
1:20000 1934

4) H-8952
Vicinity of Smithtown Bay
1:20000 1967

The chart and prior survey comparisons were conducted by plotting only the fixes of selected sounding lines on 1:20000 overlays, or by direct comparison to 1:10000 scale surveys. The approximate 40 meter datum shift between NAD 27 and NAD 83 was compensated for by offsetting the overlay. This technique was considered adequate for purposes of the general comparisons.

Specific details of the comparisons are discussed in Section K of this report, under the Item Investigation Reports for each AWOIS item.

K. AWOIS ITEM INVESTIGATION REPORTS

Five AWOIS items were investigated on the sheets covered by this report. Each item is discussed individually in the remaining text. If more than one contact was investigated, each is discussed separately as a subsection of the appropriate AWOIS item.

SSS imagery covering each contact is abstracted on the target abstract for the individual AWOIS item (See APPENDIX IV)* Reconnaissance SSS imagery using different range scales was sometimes acquired of a target before diving.* DATA REMOVED FROM DESCRIPTIVE REPORT AND FILED WITH FIELD DATA.
AWOIS items 6931 and 6932 were area hydrographic surveys of discontinued dumpsites. Contacts discovered on the fathometer records are abstracted on SSS target abstracts for ease of analysis.

The following table summarizes the results of the investigations.

AWOIS ITEM	STATUS
6881	RESOLVED
6912	RESOLVED
6913	RESOLVED
6931	RESOLVED
6932	RESOLVED

K 1. INVESTIGATION REPORT FOR AWOIS ITEM 6881

AREA OF INVESTIGATION :

State:	Connecticut
County:	Fairfield
Locality:	Approximately 1 mile SE of Black Rock Harbor Channel.
Latitude:	41°07'54.00"
Longitude:	73°12'19.00"
Reported Depth:	Sunk in 23 feet

AWOIS ITEM DESCRIPTION : Item charted as a position approximate wreck. Twenty four foot cabin cruiser reported gutted by fire and sunk in 23 feet of water. Charted from Local Notice Mariners number 47 in 1972.

SURVEY PROCEDURES :

Positioning:	Falcon Mini-ranger
Side Scan Sonar Search:	22 March 1989 (DOY 081)
	08 May 1989 (DOY 128)
	09 May 1989 (DOY 129)
	12 May 1989 (DOY 132)
	16 May 1989 (DOY 136)
	17 May 1989 (DOY 137)
	18 May 1989 (DOY 138)
	19 May 1989 (DOY 139)
	23 May 1989 (DOY 143)
	24 May 1989 (DOY 144)
	25 May 1989 (DOY 145)
Diver Investigations:	19 June 1989 (DOY 170)
	21 June 1989 (DOY 172)
Echo Sounder Investigation:	N/A
Contacts:	ten contacts

The portion of the search area which could be safely navigated was surveyed using 200% SSS coverage oriented at right angles. Ten contacts were noted on the sonargrams. Four contacts were deemed significant and were investigated by divers. The wreck was found to be contact number 10 and is discussed in Section K1.4 below.

K 1.1 CONTACT INVESTIGATION REPORT CONTACT PLOT NUMBER 6

DIVER INVESTIGATION SUMMARY : The contact was originally located by SSS at position 1626 on DOY 137. The initial estimate was that the target was a rock rising about three feet off the bottom. The contact was investigated by divers on 21 June 1989 (DOY 172). Ens. Bonnah and Ens. Weiner descended a marker buoy line to the bottom at 30 feet. Visibility was about 1 foot. A circle search of 7 meters was conducted around the buoy anchor.

CONTACT DESCRIPTION : Divers found a field of rocks rising about three feet from the muddy bottom. One of the larger rocks was a pinnacle and the pneumofathometer least depth was taken there.

LEAST DEPTH DETERMINATION :

Fathometer evidence indicates that the divers may have missed the highest rock in the area due to poor visibility. A diver least depth of 21.5 feet was obtained. However, the HECK drifted slowly over the position while taking a fix, and the echo sounder least depth was 19.7 feet.

	DIVER:	ECHO SOUNDER:
Date of measurement:	21 June (DOY 172)	(DOY 172)
Time (UTC):	17:59 Zulu	18:14 Zulu
Average pneumo depth:	~~28.6 ft~~ 27.0 FT	19.~~5~~7 ft
~~PREDICTED~~ tidal corrector:	~~-7.2 ft~~ -6.8 FT	~~-7.1~~ ft
		6.9 TRA
Least depth:	~~21.4 ft~~ 20.2 FT	~~19.7 ft~~
PLOTTED DEPTH:	20.0 FT	26.6
		.4 VEL
		27.0 FT

POSITION DETERMINATION :

Fix number: 3259
Number of LOP's: 3
Maximum residual: 0.8 meters
Error circle radius: 6.1 meters

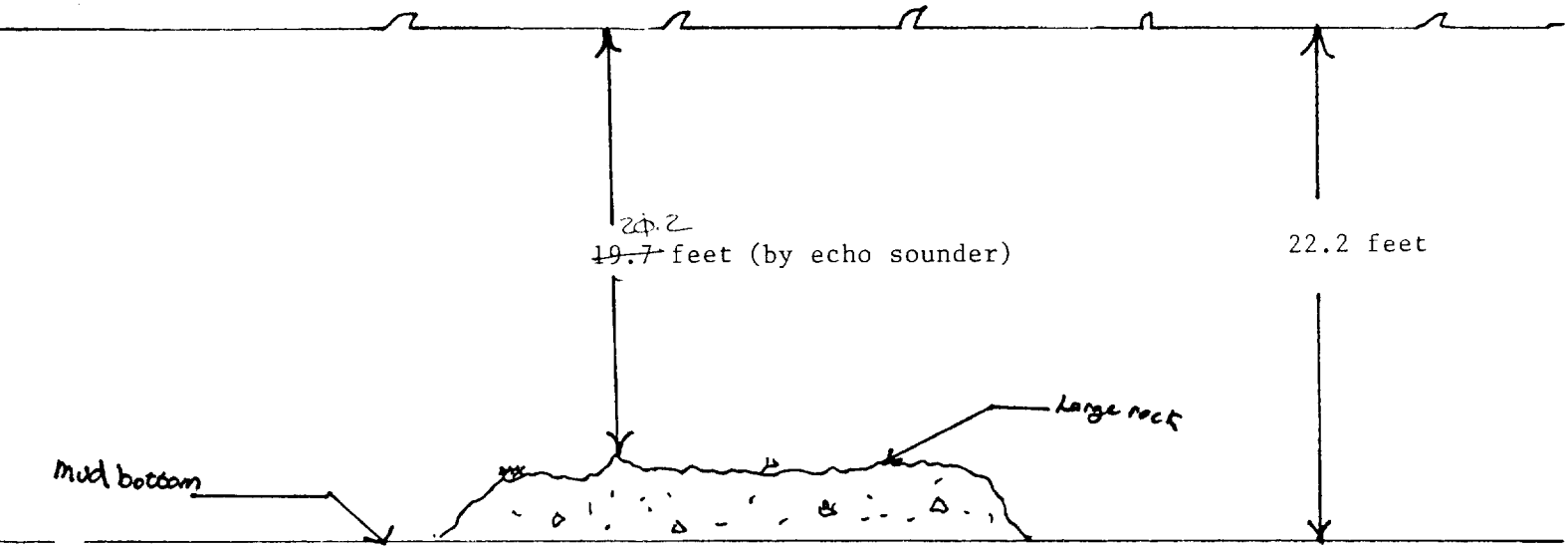
Easting: 137744.8
Northing: 42185.6

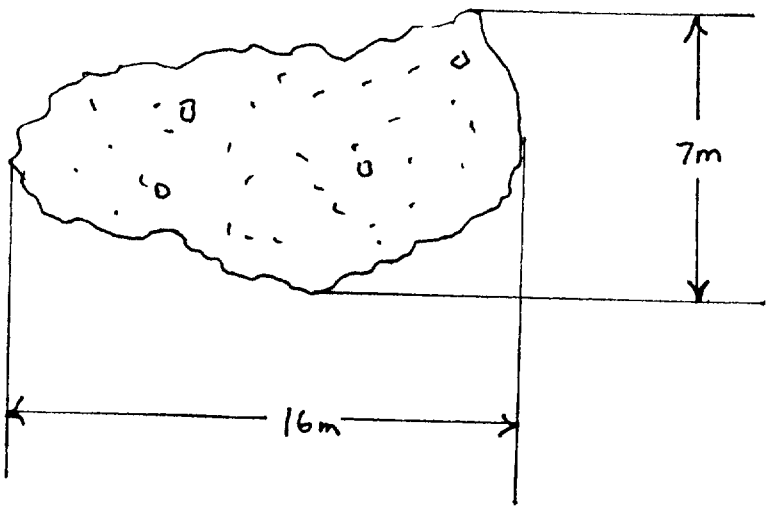
Latitude: 041° 07' 44.40~~2~~" N
Longitude: 073° 13' 01.7~~76~~8" W

Loran-C Rates: not taken

RECOMMENDATIONS : This rock is not charted on NOS chart 12369, 20th Ed. The depth obtained in this survey of ~~19.7~~ 20.2 feet is shoaler than the nearest charted depth which is 23 feet. The charted depths of this area were apparantly taken from the 1916 survey, H-3936. However, a copy of this survey was not provided to the ship.

The HECK recommends that the rock be charted as a submerged rock, ~~not~~ dangerous to surface navigation, with a known depth of ~~19.7~~ 20.0 feet, AND A DANGER CURVE.


~~19.7~~ feet (by echo sounder)
22.2 feet
Large rock
Mud bottom


7m
16m

K 1.2 CONTACT INVESTIGATION REPORT CONTACT PLOT NUMBER 8

DIVER INVESTIGATION SUMMARY : The contact was originally located by SSS at position 1704.35P on DOY 137. The initial estimate was that the target was a rock rising about five feet off the bottom. The contact was investigated by divers on 19 June 1989 (DOY 170). Lt. Tuell and Ens. Bonnah descended a marker buoy line to the bottom at 30 feet. Visibility was about 1 foot. A circle search of 12 meters was conducted around the buoy anchor.

CONTACT DESCRIPTION : Divers found a field of rocks rising about three feet from the muddy bottom. One of the larger rocks was a pinnacle and the pneumofathometer least depth was taken there.

LEAST DEPTH DETERMINATION :

Date of measurement:	19 June (DOY 170)
Time (UTC):	18:56 Zulu
Average pneumo depth:	24.2 ft
~~PREDICTED~~ tidal corrector:	-4.1 ft
Least depth:	20.1 ft
PLOTTED DEPTH:	20.0 FT

POSITION DETERMINATION :

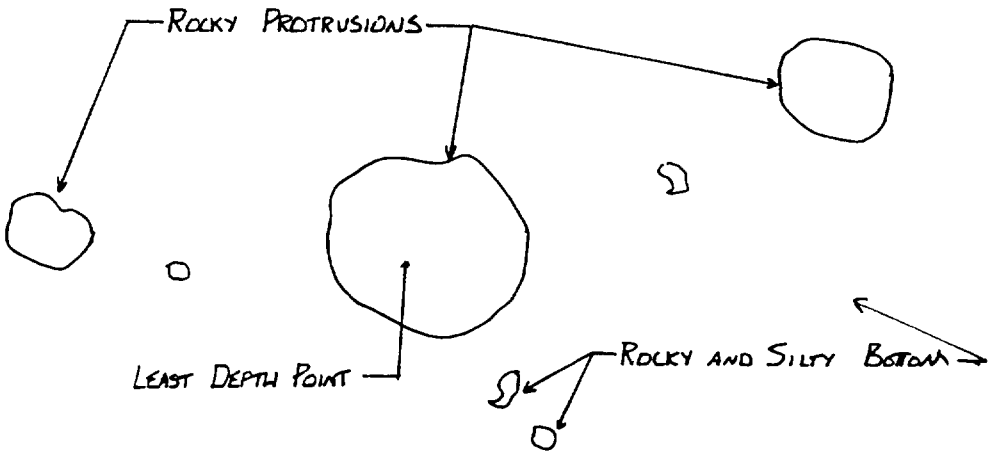
Fix number:	mean between 3249 and 3250
Number of LOP's:	4
Maximum residual:	2.9 meters
Error circle radius:	5.1 meters
Easting:	137648.4
Northing:	42492.7
Latitude:	041° 07' 54.373" N
Longitude:	073° 13' 05.841" W

Loran-C Rates:	9960-W	9960-X	9960-Y	9960-Z
	15176.5	26717.2	44023.7	15176.5

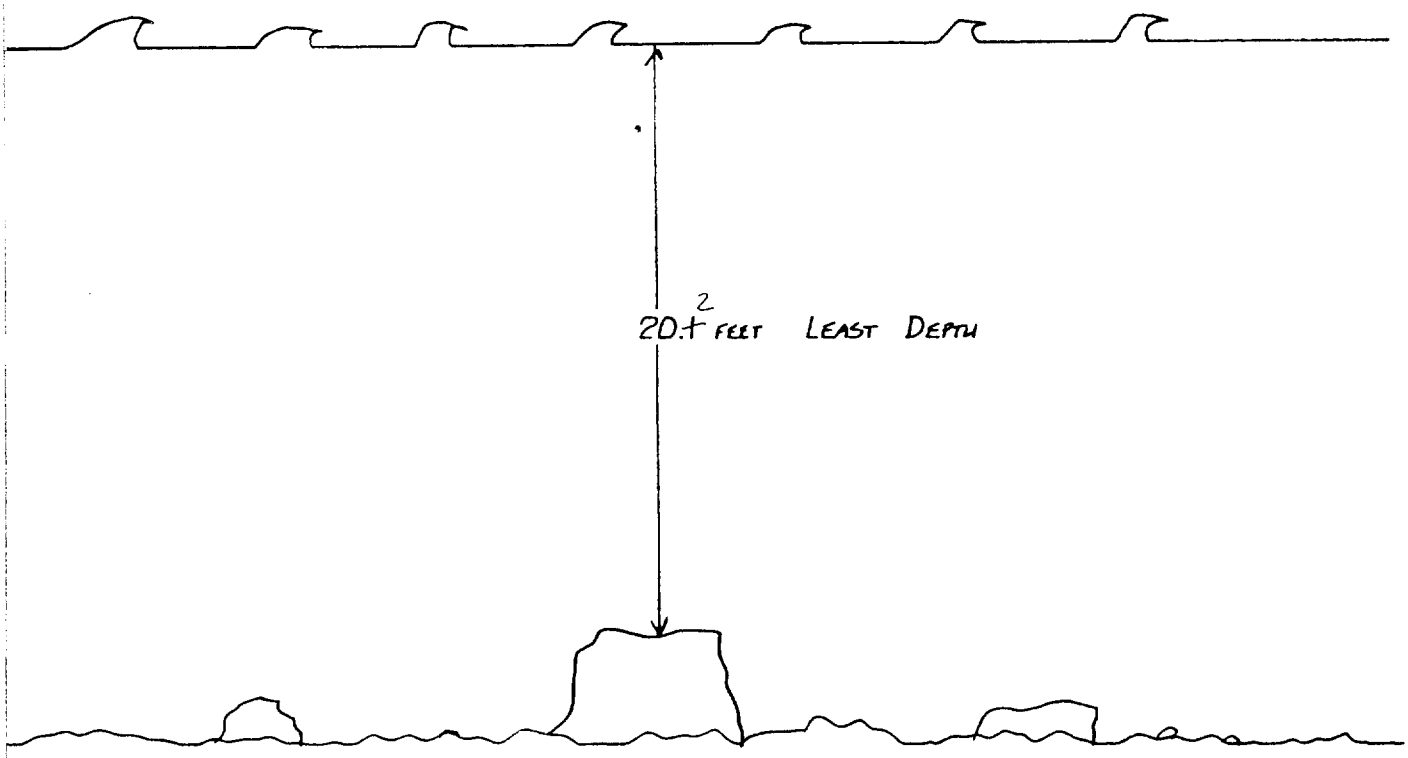
RECOMMENDATIONS : This rock is not charted on NOS chart 12369, 20th Ed. The depth obtained in this survey of 20.1 feet is shoaler than the nearest charted depth which is 22 feet. The charted depths of this area were apparantly taken from the 1916 survey, H-3936. However, a copy of this survey was not provided to the ship.

The HECK recommends that the rock be charted as a submerged rock, ~~not~~ dangerous to surface navigation, with a known depth of 20.~~1~~0 feet, AND A DANGER CURVE

AWOIS 6881
SHEET 10-3-89 CONTACT # 8
OPR-B660-HE-89



NOTE: ACCURATE SCHEMATIC IMPOSSIBLE DUE TO POOR VISIBILITY



K 1.3 CONTACT INVESTIGATION REPORT CONTACT PLOT NUMBER 9

DIVER INVESTIGATION SUMMARY : The contact was originally located by SSS at position 2338.2P on DOY 145. The initial estimate was that the target was a rock rising about three feet off the bottom. The contact was investigated by divers on 21 June 1989 (DOY 172). Ens Weiner and Ens. Bonnah descended a marker buoy line to the bottom at 30 feet. Visibility was about 1 foot. A circle search of 22 meters was conducted around the buoy anchor.

CONTACT DESCRIPTION : Divers found a single rock rising about two feet from the muddy bottom. The rock was found about 10 meters from the buoy.

LEAST DEPTH DETERMINATION :

Date of measurement:	21 June 1989 (DOY 172)
Time (UTC):	14:30 Zulu
Average pneumo depth:	23.9 ft
~~PREDICTED~~ tidal corrector:	-3.~~7~~ 2 ft
Least depth:	20.~~2~~ 7 ft

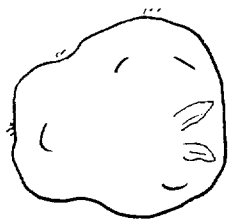
POSITION DETERMINATION :

Fix number:	3256 (taken at time of buoy drop)
Number of LOP's:	4
Maximum residual:	0.5 meters
Error circle radius:	5.3 meters
Easting:	139290.3
Northing:	42495.4
Latitude:	041° 07' 54.~~373~~ 18" N
Longitude:	073° ~~13' 05.841~~ 11' 55.45" W
Loran-C Rates:	not taken

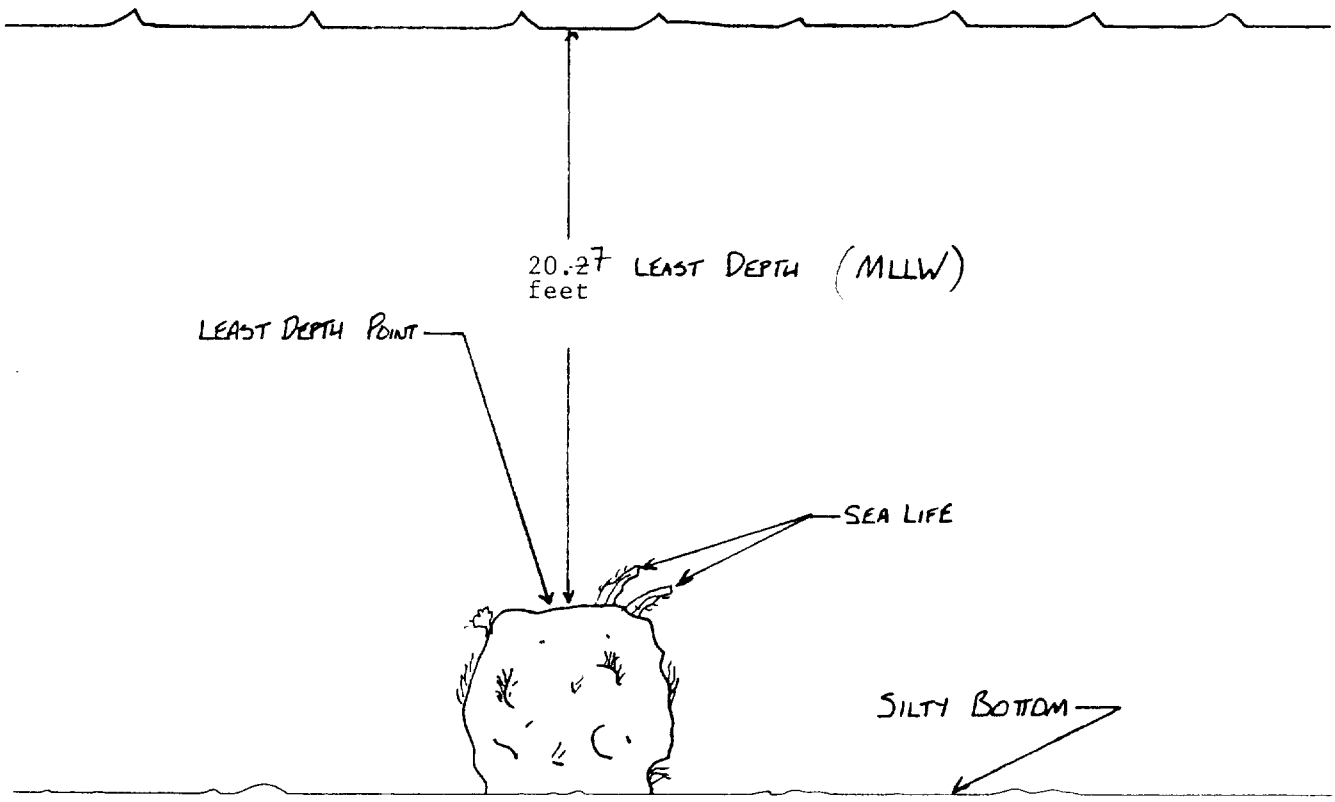
RECOMMENDATIONS : This rock is not charted on NOS chart 12369, 20th Ed. The depth obtained in this survey of 20.2 feet is shoaler than the nearest charted depth which is 23 feet. The charted depths of this area were apparantly taken from the 1934 survey, H-6124a.

The HECK recommends that the rock be charted as a submerged rock, not dangerous to surface navigation, with a known depth of 20.~~2~~0 feet, AND A DANGER CURVE.

AWOIS 6881
SHEET 10-3-89 CONTACT #9
OPR-B660-HE-89



OVERHEAD VIEW



K 1.4 CONTACT INVESTIGATION REPORT CONTACT PLOT NUMBER 10

DIVER INVESTIGATION SUMMARY : The contact was originally located by SSS at position 2448.1P on DOY 145. The initial estimate was that the contact was a wreck of about 8 meters in length rising about 2 feet off the bottom. The contact was investigated by divers on 19 June 1989 (DOY 170). Lt. Tuell and Ens. Bonnah descended a marker buoy line to the bottom at 35 feet. Visibility was about 3 feet. A circle search of 20 meters was conducted around the buoy anchor.

CONTACT DESCRIPTION : Divers found the remains of a small boat. The wreckage was badly broken up but did appear to be the AWOIS item. Visibility was not good, but divers covered the entire wreck site. The wreck was wooden; its metal fittings which were not badly deteriorated. The least depth measurement was made on a large mound of wooden wreckage protruding about two feet above the bottom.

LEAST DEPTH DETERMINATION :

Date of measurement:	19 June 1989 (DOY 170)
Time (UTC):	17:20 Zulu
Average pneumo depth:	28.0 ft
~~PREDICTED~~ tidal corrector:	-6.~~3~~ 0 ft
	~~22.0 FT~~
Least depth:	~~21.7~~ ft
PLOTTED DEPTH:	22.0 FT

POSITION DETERMINATION :

Fix number:	3246 (taken at time of buoy drop)
Number of LOP's:	4
Maximum residual:	0.5 meters
Error circle radius:	5.2 meters
Easting:	138148.2
Northing:	42372.8
Latitude:	041° 07' 50.3~~77~~ 8" N
Longitude:	073° 12' 44.4~~48~~ 5" W

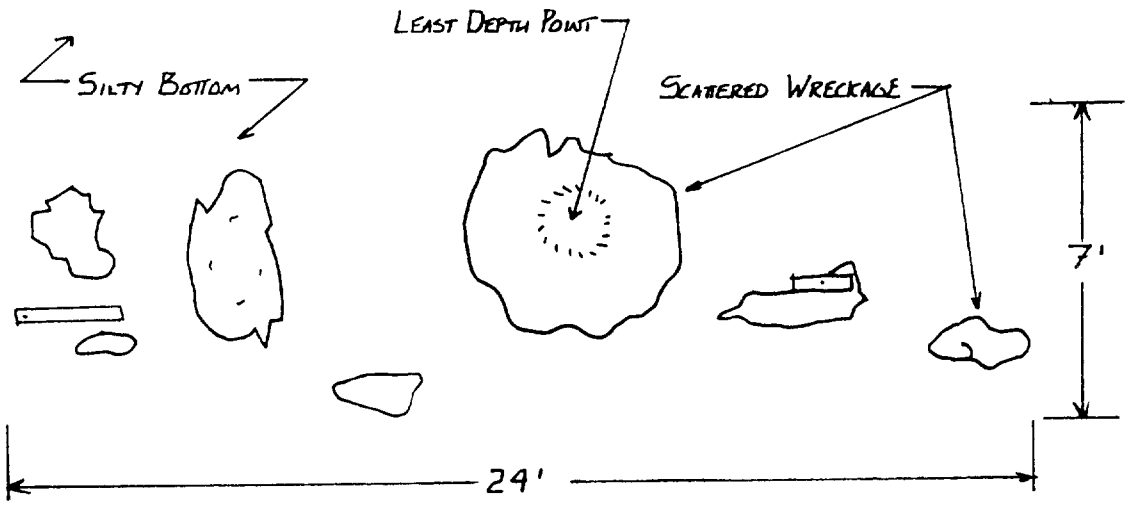
Loran-C Rates:	9960-W	9960-X	9960-Y	9960-Z
	15174.4	26714.0	44022.6	60067.4

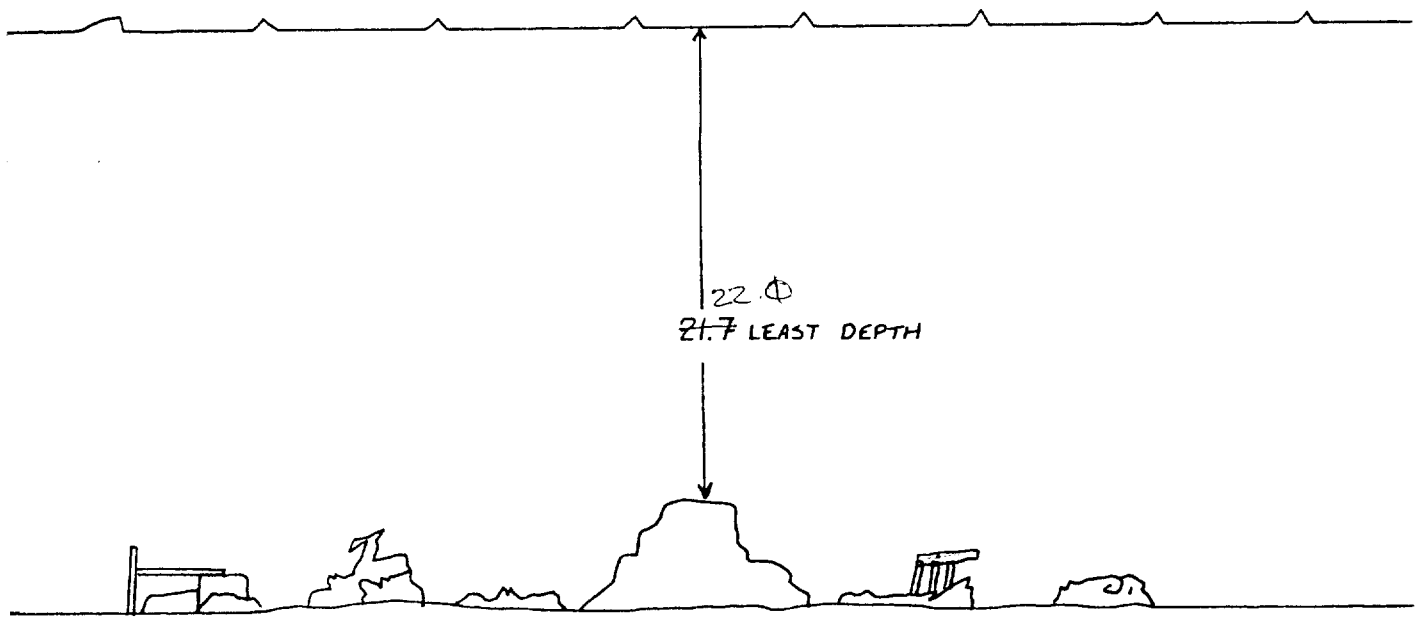
RECOMMENDATIONS : This wreck is charted on NOS chart 12369, 20th Ed., as a position approximate wreck at the coordinates listed for the AWOIS item. The surveyed position of the wreck is approximately one half mile west of its charted position.

The HECK recommends that the PA wreck be deleted from the chart. The wreck should be charted at the position determined by this survey as a wreck, ~~not~~ dangerous to surface navigation, with a known depth of ~~21.7~~ 22.0 feet. CONCUR SEE ALSO SECTION 6.9 OF THE EVALUATION REPORT.

AWOIS ITEM 6881 IS CONSIDERED RESOLVED.

AWOIS 6881
SHEET 10-3-89 CONTACT # 10
OPR-B660-HE-89





K2. INVESTIGATION REPORT FOR AWOIS ITEM 6912

AREA OF INVESTIGATION :

State:	Connecticut
County:	Fairfield
Locality:	2nm SE of Cockenoe Is.
Latitude:	41°03'38.90"
Longitude:	73°18'59.10"
Reported Depth:	42.0 feet

AWOIS ITEM DESCRIPTION : Item charted as a 42 ft wire drag clearance depth ~~sounding~~ from 1932 wire drag survey. Survey requirements specify 200% sidescan coverage to a 200 meter radius for disproval. Least depth required on all contacts found and diver investigation required if conditions permit.

SURVEY PROCEDURES :

Positioning:	Falcon Mini-ranger
Side Scan Sonar Search:	22 March 1989 (DOY 081)
	23 March 1989 (DOY 082)
Diver Investigations:	23 March 1989 (DOY 082)
Echo Sounder Investigation:	N/A
Contacts:	one contact, #1

K2.1 CONTACT INVESTIGATION REPORT CONTACT PLOT NUMBER 1

DIVER INVESTIGATION SUMMARY : The contact was investigated by divers on 23 March 1989 (DOY 082). Lt. Tuell and Ens. Weiner descended a marker buoy line to the bottom at 70 feet. A circle search of 20 meter radius was conducted about the marker bouy anchor. The location of the least depth was found by visual inspection. Visibility in the location of the wreck was 8 feet. A least depth was measured by pneumo-fathometer.

CONTACT DESCRIPTION : The wreckage appeared to be a barge which had sunk into the muddy bottom. Left behined were numerous barrels or kegs scattered about the bottom. These containers were made of metal and showed signs of rust and fairly heavy barnacle growth. The wreck's dimensions were scaled as 6 meters by 20 meters from the sonargram. These dimensions were verified by the divers. The least depth of the wreck was the highest point off of the bottom of the largest pile of containers. The contents of the containers is unknown.

LEAST DEPTH DETERMINATION :

Date of measurement: 23 March 1989 (DOY 082)
Time (UTC): 18:40 Zulu

Average pneumo depth: 46.9 ft
~~PREDICTED~~ tidal corrector: ~~-0.7~~ ft
-4.8
42.1
Least depth: ~~46.2~~ ft
PLOTTED DEPTH: 42.0 FT

POSITION DETERMINATION :

Fix number: 160
Number of LOP's: 4
Maximum residual: 3.6 meters
Error circle radius: 5.1 meters

Easting: 129477.0
Northing: 34572.6

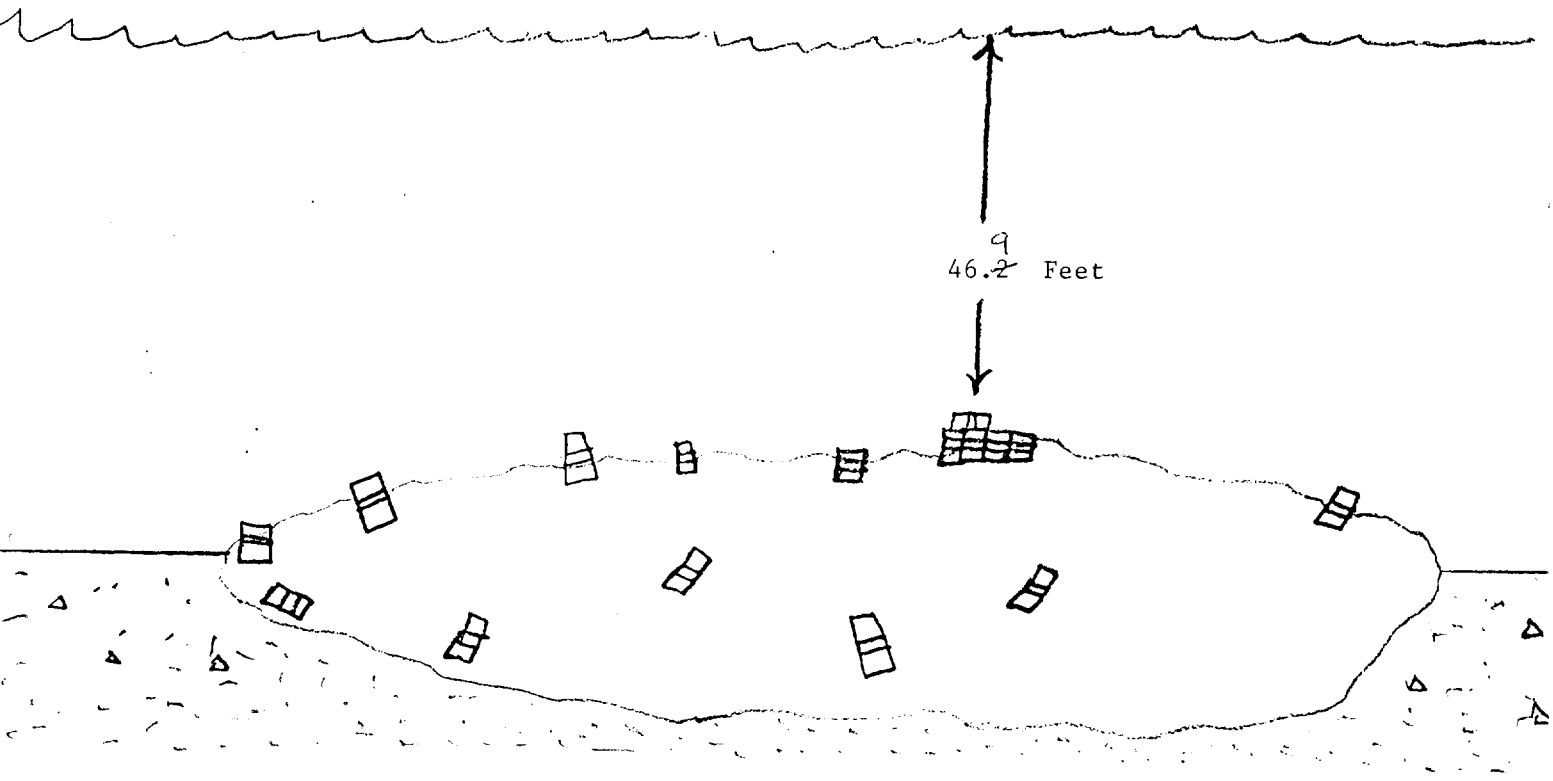
Latitude: 041° ~~03~~ ~~30~~ 38.8 ~~49~~ 6" N
Longitude: 073° 18' 57.54 ~~5~~ " W

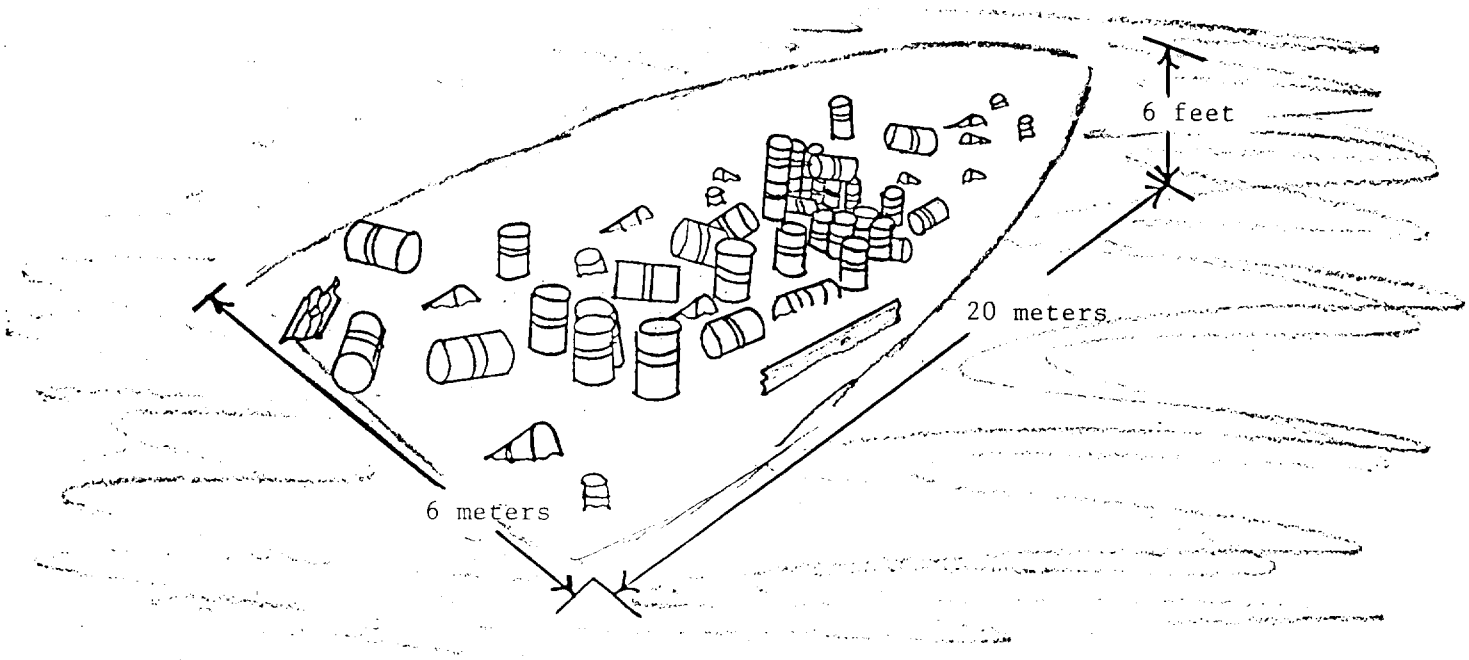
Loran-C Rates:	9960-W	9960-X	9960-Y	9960-Z
	15222.6	26756.1	43996.9	60058.1

RECOMMENDATIONS : This wreck is presently charted on NOS chart 12363, 32nd Ed. 18 Oct. 1986 and on NOS chart 12369, 20th Ed. 2 Mar. 1985, as ~~an obstruction~~, cleared by wire drag to a depth of 42 feet. WRECKAGE

This wreck was the only SSS contact found in the search area and is believed to be the wreckage which caused the wire to ground. ~~The HECK recommends that the charted symbol be changed to depict wreckage dangerous to navigation with a known depth of 46 feet.~~ SEE ALSO SECTION 6.b.) OF THE EVALUATION REPORT.

AWOIS 6912, contact #0023.2S
least depth = ~~46.2~~ 42.1 feet on barrels





K3. INVESTIGATION REPORT FOR AWOIS ITEM 6913

AREA OF INVESTIGATION :

State:	Connecticut
County:	Fairfield
Locality:	2.2 nm East of Cockonoe Is.
Latitude:	41°04'44.50" N
Longitude:	73°18'26.10"
Reported Depth:	31 feet

wire drag clearance depth

AWOIS ITEM DESCRIPTION : Item charted as a 31 ft ~~sounding~~ from a 1932 wire drag survey. Survey requirements specify 200% sidescan coverage to 200 meter radius for disproval. Least depth required on all contacts found and diver investigation required if conditions permit.

SURVEY PROCEDURES :

Positioning:	Falcon Mini-ranger
Side Scan Sonar Search:	21 March 1989 (DOY 80)
Diver Investigations:	24 April 1989 (DOY 114)
	25 April 1989 (DOY 115)
Echo Sounder Investigation:	N/A
Contacts:	one contact #1

K3.1 CONTACT INVESTIGATION REPORT CONTACT PLOT NUMBER 1

DIVER INVESTIGATION SUMMARY : The contact was sucessfully located by divers on 25 April 1989 (DOY 115). Lt. Tuell and Ens. Bonnah decended a marker bouy line to the bottom at 48 feet. A circle search of 24 meter radius was conducted about the marker bouy anchor. The location of the least depth was found by circle search. The visibility in the location of the wreck was 4.5 feet. A least depth was measured by pneumo-fathometer.

CONTACT DESCRIPTION : The wreckage appears to be a wooden coal barge which had sunk into the muddy bottom. The starboard sheer strake protrudes from the sea floor running most of the barges' length. The stem and the upper most end of the prow are exposed and rise two feet above the sea floor. Exposed frames run the length of the exposed sheer strake. Clumps of coal surround the the wreck becoming numerous nearer to the wreck. A mound of coal rising above the sea floor follows the probable outline of the barge. The coal mound appears to have spilled over the port side of the barge. The least depth was found at the top of the coal pile. The wrecks' dimensions were scaled as 15 meters by 35 meters from the sonargram. These dimensions were verified by the divers.

LEAST DEPTH DETERMINATION :

Date of measurement: 25 April 1989 (DOY 115)
Time (UTC): 14:21 Zulu

Average pneumo depth: 40.4 feet
~~PREDICTED~~ tidal corrector: ~~-3.2~~ -1.0 feet
39.4
Least depth: ~~37.2~~ feet
PLOTTED DEPTH: 39.0 FT

POSITION DETERMINATION :

Fix number: 667
Number of LOP's: 3
Maximum residual: 0.2 meter
Error circle radius: 7.0 meter

Easting: 130227.0
Northing: 36598.6

Latitude: 41° 04' 44.4~~26~~ 3" N
Longitude: 73° 18' 25.0~~66~~ 7" W

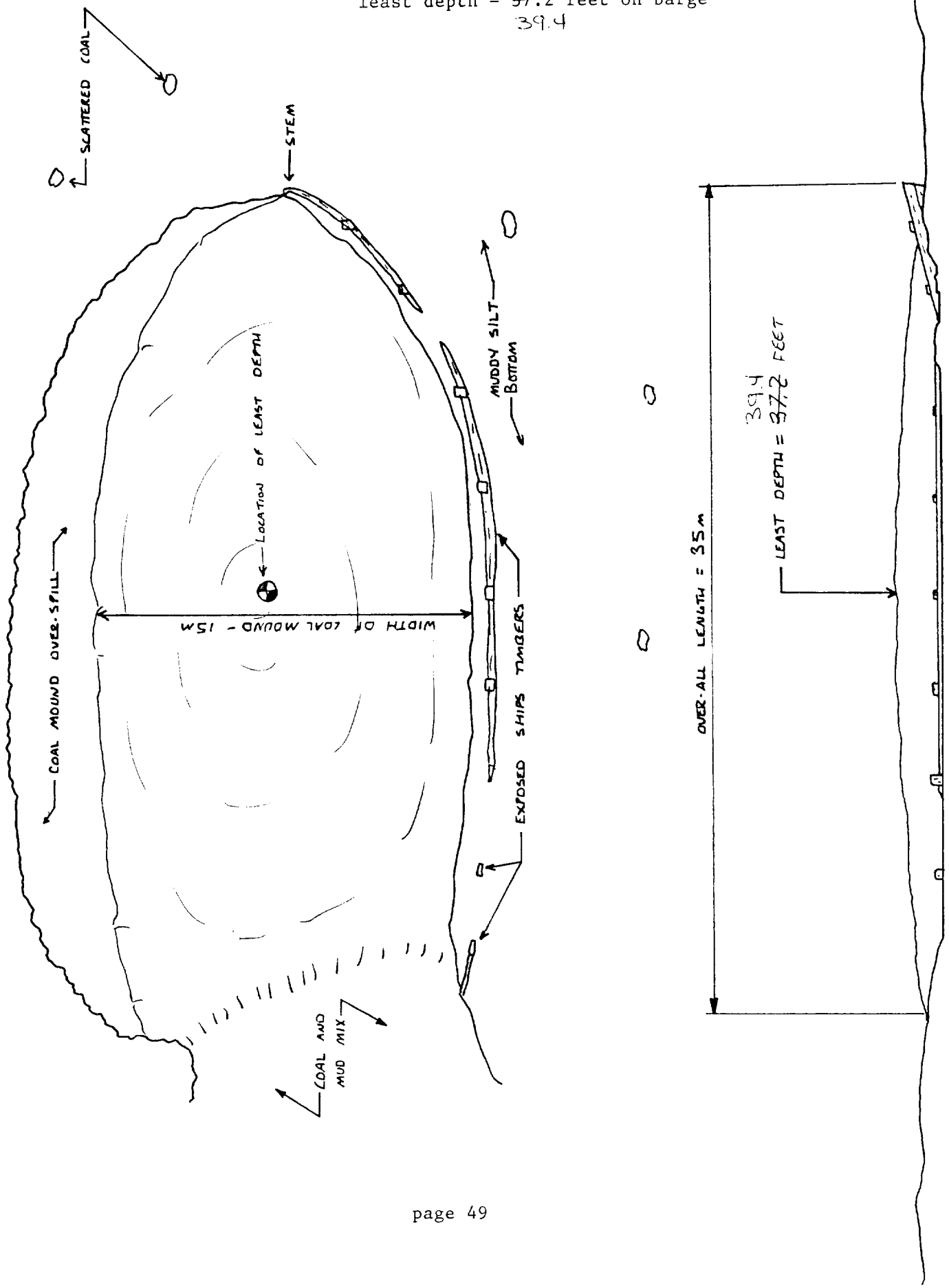
Loran-C Rates:	9960-W	9960-X	9960-Y	9960-Z
	~~15176.6~~	~~26685.4~~	~~43968.7~~	~~60047.9~~

LORAN COORDINATES ARE INCORRECT.

RECOMMENDATIONS : This wreck is presently charted on NOS chart 12363, 32nd Ed. 18 Oct 1986 and on NOS chart 12369, 20th Ed. 2 March 1985, as ~~an obstruction~~, cleared by wire drag to a depth of 31 feet. WRECKAGE

This was the only SSS contact found in the search area and is believed to be the wreckage which caused the wire to ground. The ~~HECK recommends that the charted symbol be changed to depict wreckage dangerous to navigation with a known depth of 37 feet.~~ SEE ALSO SECTION 6.b.2) OF THE EVALUATION REPORT.

AWOIS 6913 item #1 contact #0006.0
least depth = ~~37.2~~ 39.4 feet on barge



K4. INVESTIGATION REPORT FOR AWOIS ITEM 6931

AREA OF INVESTIGATION :

State:	Connecticut
County:	Fairfield
Locality:	3 Miles South of Southport
Latitude:	41° 03' 48.00"
Longitude:	73° 17' 09.00"
Reported Depth:	Shoalest Charted Depth = 55 feet

AWOIS ITEM DESCRIPTION : Item is charted as discontinued Southport Dumping Ground, a one nautical mile square with sides running north-south and east-west. Dumping grounds originally established in 1950 and discontinued in 1977.

SURVEY PROCEDURES :

Positioning:	Falcon MiniRanger
Side Scan Sonar Search:	27 April 1989 (DOY 117)
Diver Investigations:	(none)
Echo Sounder Investigation:	22 March 1989 (DOY 81)
	~~23 March 1989 (DOY 82)~~
	29 March 1989 (DOY 88)
	31 March 1989 (DOY 90)
	03 April 1989 (DOY 93)
Contacts:	Five

The dumpsite was surveyed using fifty meter hydrographic line spacing. All hydrographic data are shown on the various copies of sheet HE-10-2-89 submitted in this survey.

Five contacts were noted on the fathometer records and are shown in the target abstract in APPENDIX IV* Side scan sonar imagery was acquired over each contact. This imagery is correlated to the fathometer contacts on the abstracts. All five contacts were found to be insignificant.** No diver investigations were made.
* DATA REMOVED FROM DESCRIPTIVE REPORT AND FILED WITH FIELD DATA.
** CONCUR

K4.1 INVESTIGATION REPORT

Generally, soundings obtained in this survey are two to three feet shoaler than depths charted on NOS Chart 12369, 20th Edition.

The dumping grounds is covered by prior survey H-6125, a 1:20000 scale survey completed in 1934 using 200 meter line spacing. This prior survey appears to have been the primary source of charted depths for the dumpsite and provided development of the

sixty foot curve. Soundings were compared to the prior by plotting only the "fixes" for selected lines on a 1:20000 overlay. The prior survey soundings were one to four feet deeper than soundings from this survey. CONCUR

Survey H-8952 is a 1:20000 scale survey completed in 1967 using 100 meter line spacing. H-8952 covers the southern one third of the dumpsite. Soundings from the prior are two to three feet deeper than soundings from this survey. This comparison was also performed by direct overlay of selected soundings. CONCUR

RECOMMENDATIONS :

Continuous use of the dumpsite for the twenty seven years that it was active has likely caused some of the shoaling noted since the prior surveys were completed. The mainscheme and crossline soundings from this survey did not agree well. The HECK attributes this disagreement to inaccurate predicted tides (Reference Section G.2 of this report). HECK recommends that a second chart comparison be performed after the application of approved tides. SEE SECTION 3.b. OF THE EVALUATION REPORT.

No significant protrusions above the bottom were found. Contact plot number 2 appears to be a wreck which has settled into a current scour. Careful analysis of fathometer and side scan records indicates that the wreck lies in the bottom of the scour and that the highest point of the wreck is deeper than the surrounding bottom. CONCUR

The discontinued dumping ground limits should be removed from the chart. The charted depths should be changed to reflect the soundings acquired during this survey. CONCUR

K5. INVESTIGATION REPORT FOR AWOIS ITEM 6932

AREA OF INVESTIGATION :

State:	Connecticut
County:	Fairfield
Locality:	4 Miles South of Bridgeport
Latitude:	41° 04' 23.00"
Longitude:	73° 12' 35.00"
Reported Depth:	Shoalest Charted Depth = 62 feet

AWOIS ITEM DESCRIPTION : Item is charted as discontinued Bridgeport Dumping Ground, a one nautical mile by two nautical mile rectangle with sides running north-south and east-west. Dumping grounds originally established in 1950 and discontinued in 1977.

SURVEY PROCEDURES :

Positioning:	Falcon MiniRanger
Side Scan Sonar Search:	26 May 1989 (DOY 146)
Diver Investigations:	(none)
Echo Sounder Investigation:	04 April 1989 (DOY 94)
	05 April 1989 (DOY 95)
	25 April 1989 (DOY 115)
	28 April 1989 (DOY 118)
	04 May 1989 (DOY 124)
	05 May 1989 (DOY 125)
	09 May 1989 (DOY 129)
	25 May 1989 (DOY 145)
	31 May 1989 (DOY 151)
	14 June 1989 (DOY 165)
	16 June 1989 (DOY 167)
Contacts:	twenty three

The dumpsite was surveyed using fifty meter hydrographic line spacing. All hydrographic data are shown on the various copies of sheet HE-10-4-89 submitted in this survey.

Twenty three contacts were noted on the fathometer records and are shown in the target abstract in APPENDIX IV* Additional hydrography or side scan sonar imagery was acquired over each contact. These records are correlated to the fathometer contacts on the abstracts. All contacts were found to be insignificant. CONCUR Most contacts were found to be spurious "hits" on fish. No diver investigations were made. * DATA REMOVED FROM DESCRIPTIVE REPORT AND FILED WITH FIELD DATA.

K5.1 INVESTIGATION REPORT

Soundings obtained in this survey are up to six feet shoaler than than depths charted on NOS Chart 12369, 20th Edition.

The dumping grounds is covered by prior survey H-6125, a 1:20000 scale survey completed in 1934 using 200 to 300 meter line spacing. This prior survey appears to have been the source of charted depths for the dumpsite. Soundings were compared to the prior by plotting only the "fixes" for selected lines on a 1:20000 overlay. The prior survey soundings were generally five to six feet deeper than soundings from this survey. CONCUR

The bottom in the dumping ground is slightly irregular, as would be expected. However, no significant protrusions above the bottom were found. The shoalest soundings found were 54 feet at position 551. This sounding is in the area of a shoal rising about four feet above the general trend of the bottom. This shoal is shoreward of the sixty foot curve.

RECOMMENDATIONS :

Continuous use of the dumpsite for the twenty seven years that it was active has likely caused some of the shoaling noted since the prior surveys were completed. HECK recommends that a second chart comparison be performed after the application of approved tides.

The discontinued dumping ground limits should be removed from the chart. The charted depths should changed to reflect the soundings acquired during this survey. CONCUR

Submitted By,

Grady H. Tuell, LT., NOAA
Executive Officer
NOAA Ship HECK

L. LETTER OF APPROVAL

During the period March 21, 1989, to June 9, 1989, field operations contributing to the accomplishment of this survey were conducted under my direct supervision with frequent personal checks of progress and data quality. This report, field sheets, and data records have been closely reviewed and are complete and adequate for charting.

Christopher B. Lawrence, CDR, NOAA
Commanding Officer
NOAA Ship HECK

During the period June 9, 1989, to June 21, 1989, field operations contributing to the accomplishment of this survey were conducted under my direct supervision with frequent personal checks of progress and data quality. This report, field sheets, and data records have been closely reviewed and are complete and adequate for charting.

Stanley R. Iwamoto, LCDR, NOAA
Commanding Officer
NOAA Ship HECK

LIST OF HORIZONTAL CONTROL STATIONS

NUMBER	NAME	POSITION
122	EATONS NECK TEMP	40° 57' 13.07019" 73° 23' 50.09740"
123	OLD FIELD POINT BEACON	40° 58' 37.19911" 73° 07' 06.81994"
124	BLACK ROCK HARBOR ~~BEACON~~ BCN 1	41° 08' 13.53627" 73° 13' 02.05538"
125	COCKENOES ISLAND 2 RM 3	41° 05' 01.40164" 73° 21' 19.64906"
126	STRATFORD SHOAL LTHSE	41° 03' 35.72832" 73° 06' ~~40~~ 04.58926"
127	BRIDGEPORT E ~~BRKWTR~~ BREAKWATER LH	41° 09' 17.35211" 73° 10' 36.45716"
~~129~~	~~STRATFORD POINT LTHSE~~	~~41° 09' 07.14923"~~ ~~73° 06' 11.96759"~~
~~215~~	~~EATONS NECK LIGHTHOUSE~~	~~40° 57' 14.345"~~ ~~73° 23' 43.781"~~
~~225~~	~~PENFIELD REEF LIGHTHOUSE~~	~~41° 07' 01.51228"~~ ~~73° 13' 19.52621"~~
~~226~~	~~PECKS LEDGE LIGHTHOUSE~~	~~41° 04' 38.39376"~~ ~~73° 22' 11.28969"~~
~~227~~	~~SOUTHPORT EPIS CHURCH SPIRE~~	~~41° 08' 00.19506"~~ ~~73° 17' 15.35859"~~
~~228~~	~~SAUGATUCK RR BRDGE S TRANSM TR~~	~~41° 07' 10.36406"~~ ~~73° 22' 02.05553"~~
~~229~~	~~WICC SOUTH RADIO TOWER~~	~~41° 09' 33.14657"~~ ~~73° 09' 50.37084"~~

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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: August 1, 1989

MARINE CENTER: Atlantic

OPR: B-660

HYDROGRAPHIC SHEET: FE-3~~1~~2 3-SS (HE 10-1-89)

LOCALITY: Southern New England Coast, Connecticut and New York

TIME PERIOD: March 21 - June 21, 1989

TIDE STATIONS USED: 846 7150 Bridgeport, CT.

PLANE OF REFERENCE (MEAN LOWER LOW WATER): = 1.81 ft.

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: = 7.0 ft.

REMARKS: RECOMMENDED ZONING

Zone direct

James E. Hubbard

CHIEF, TIDAL DATUM QUALITY
ASSURANCE SECTION

NOAA FORM 76-155
(11-72)

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

GEOGRAPHIC NAMES

SURVEY NUMBER

FE-323SS

Name on Survey	A ON CHART NO.	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	
BRIDGEPORT	X									1
CONNECTICUT	X									2
GEORGES ROCK	X									3
LONG ISLAND SOUND	X									4
										5
										6
										7
										8
										9
										10
										11
										12
										13
										14
										15
										16
										17
										18
										19
										20
										21
										22
										23
										24
										25

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/CG244-34-90

LETTER TRANSMITTING DATA

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

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

TO:

Chief, Data Control Branch, N/CG243
Room 151, WSC-1
National Ocean Service - NOAA
Rockville, MD 20852

DATE FORWARDED
16 APRIL 90

NUMBER OF PACKAGES
THREE (3)

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.

FE-323SS (HE-10-1-89)
OPR-B660-HE-89, CONNECTICUT,
LONG ISLAND SOUND,
GEORGES ROCK TO BRIDGEPORT

PKG. 1 (BOX)

~~32~~ ENVELOPES containing FATHOGRAMS, DATA TAPE PRINTOUTS, and SIDE SCAN SONARGRAMS for the following days of the year (DOY): 80-81, 117, 128-129, 132, 136-139, 143-146, 315
FATHOGRAM ONLY 87, 138 SONARGRAM ONLY 323
NO SONARGRAM 82, 88, 90, 93-95, 115, 118, 124-125, 151, 165, 167, 170-172, NO PRINTOUT 321

PKG. 2 (BOX)

~~1~~ CAHIER containing FINAL POSITION PRINTOUT DATA
~~1~~ CAHIER containing FINAL SOUNDING PRINTOUT DATA and L-FILE DATA

FROM: *(Signature)*
NORRIS A. WIKE

RECEIVED THE ABOVE
(Name, Division, Date)
D. L. Clark
6/20/90

Return receipted copy to:

Chief, Atlantic Hydrographic Section,
N/CG244
Atlantic Marine Center
439 W. York Street
Norfolk, VA 23510-1114

NOAA FORM 61-29 SUPERSEDES FORM C&GS 413 WHICH MAY BE USED.

☆U.S.GPO:1983-0-664-006/1192

NOAA FORM 61-29 (12-71)

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

REFERENCE NO.
N/CG244-34-90

LETTER TRANSMITTING DATA

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

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

TO:

Chief, Data Control Branch, N/CG243
Room 151, WSC-1
National Ocean Service - NOAA
Rockville, MD 20852

DATE FORWARDED
16 APRIL 90

NUMBER OF PACKAGES
THREE (3)

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.

FE-323SS (HE-10-1-89)
OPR-B660-HE-89, CONNECTICUT,
LONG ISLAND SOUND,
GEORGES ROCK TO BRIDGEPORT

PKG. 2 (BOX)

~~1~~ ENVELOPE containing SUPPLEMENTAL DATA from PRINTOUTS
~~1~~ NOTEBOOK BINDER containing DATA REMOVED FROM ORIGINAL DESCRIPTIVE REPORT
~~1~~ ENVELOPE containing EXCESS LEVEL SHEETS

PKG. 3 (TUBE)

~~10~~ SMOOTH FIELD SHEETS
~~1~~ ORIGINAL DESCRIPTIVE REPORT with SMOOTH SHEETS INSERTED

FROM: *(Signature)*
NORRIS A. WIKE Norris A. Wike

RECEIVED THE ABOVE
(Name, Division, Date)

Return receipted copy to:

Chief, Atlantic Hydrographic Section,
N/CG244
Atlantic Marine Center
439 W. York Street
Norfolk, VA 23510-1114

NOAA FORM 61-29 SUPERSEDES FORM C&GS 413 WHICH MAY BE USED.

☆U.S.GPO:1983-0-664-006/1192

05/15/90

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NUMBER: FE-323SS

NUMBER OF CONTROL STATIONS	6
NUMBER OF POSITIONS	2284
NUMBER OF SOUNDINGS	13185

	TIME-HOURS	DATE COMPLETED
PREPROCESSING EXAMINATION	56	07/28/89
VERIFICATION OF FIELD DATA	85	11/08/89
QUALITY CONTROL CHECKS	44	
EVALUATION AND ANALYSIS	103	03/01/90
FINAL INSPECTION	13	01/31/90
TOTAL TIME	309	

MARINE CENTER APPROVAL 03/01/90

OFFICE OF CHARTING AND GEODETIC SERVICES
ATLANTIC HYDROGRAPHIC SECTION
EVALUATION REPORT

SURVEY NO.: FE-323SS FIELD NO.: HE-10-1-89

Connecticut, Long Island Sound, Georges Rock to Bridgeport

SURVEYED: 21 March through 21 June 1989

SCALE: 1:10,000 PROJECT NO.: OPR-B660-RU/HE-89

SOUNDINGS: RAYTHEON DSF-6000N Fathometer, EG&G Model 260 Side Scan Sonar, and Pneumatic Depth Gauge

CONTROL: MOTOROLA Falcon 484 Mini-Ranger (Range/Range)

Chief of Party.....S. R. Iwamoto
.....C. B. Lawrence

Surveyed by.....G. H. Tuell
.....H. W. Bonnah
.....L. D. Weiner
.....W. R. Morris

Automated Plot by.....XYNETICS 1201 Plotter (AHS)

1. INTRODUCTION

a. This is a side sonar and hydrographic survey. A RAYTHEON DSF-6000N fathometer was operated concurrently with the side scan sonar; however, the soundings exclusive of least depths shown for AWOIS items #6881, #6912, and #6913, are of reconnaissance value only. These soundings are not included under the cover of this report. No wire drag was accomplished during this survey. In cases where side scan sonar was used to determine the estimated depth of an item or object, the item is shown on a plot included in this report. An appropriate note is shown on the smooth plot. See also the memorandum titled: "Showing Estimated Side Scan Sonar Depths on Smooth Sheets", dated 23 February 1989. Basic hydrography was required to adequately define the bottom configuration in the two discontinued dumping grounds that were investigated.

b. Five (5) 1:10,000 scale page size smooth plots were generated during office processing, and are attached to this report. Sheets 1 through 3 show only the items found by the field unit. Sheets 4 and 5 show the hydrographic data acquired by the field unit during the investigations of AWOIS items #6931 and #6932.

c. During the investigation of AWOIS item #6881 numerous targets were not identified by the field unit subsequently causing additional time to be spent during office processing.

The targets have been incorporated into the present survey and are plotted on sheet 1 of 5.

d. Notes in the Descriptive Report were made in red during office processing.

2. CONTROL AND SHORELINE

a. Control is adequately discussed in section H. of the Descriptive Report.

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 survey datum and the North American Datum of 1927 (NAD27).

To place this survey on the NAD27 datum move the projection lines 0.351 seconds (10.8 meters or 1.08 mm at the scale of the survey) north in latitude, and 1.597 seconds (37.3 meters or 3.73 mm at the scale of the survey) east in longitude.

b. AWOIS item geographic positions listed in the Descriptive Report and the Evaluation Report are referenced to NAD27. Geographic positions of AWOIS items were converted to the present survey datum, NAD83, before inverse distance computations were made during office processing.

c. There is no shoreline within the limits of this survey.

3. HYDROGRAPHY

a. The hydrography collected on this survey during side scan sonar operations is of reconnaissance value only and was not verified for AWOIS items #6881, #6912, and #6913. This does not pertain to the depths shown on smooth plots for AWOIS items #6931 and #6932.

b. Soundings at crossings are in good agreement. Crosslines run by the field unit meet the criteria found in section 1.4.2. of the HYDROGRAPHIC MANUAL. The discrepancy between mainscheme hydrography and crosslines discussed in section G2., page 8, of the Descriptive Report was alleviated with the application of approved tidal data to the survey data.

Depths curves could be adequately drawn in the areas of the surveyed dumping grounds.

c. The development of the bottom configuration and determination of least depths for the survey areas of the dumping grounds and of items found and shown on the smooth plots is considered adequate.

4. CONDITION OF SURVEY

The smooth plots and accompanying overlays, hydrographic records and reports are adequate and conform to the requirements of the HYDROGRAPHIC MANUAL, FIELD PROCEDURES MANUAL for HYDROGRAPHIC SURVEYING, and the SIDE SCAN SONAR MANUAL. The following should be noted:

a. The field unit did not verify or identify numerous contacts in the search area of AWOIS item #6881. These contact were labeled insignificant on the side scan sonargrams. During office processing of the present survey the contacts were deemed significant. A position was determined for these contacts, and they have been incorporated into the present survey. As discussed in section 3.1.1. of the SIDE SCAN SONAR MANUAL, all contacts will be listed on the side scan sonar contact list which should be maintained for each day of side scan sonar operations. A discussion of each contact can be found in section 6.a. of this report.

b. Section H. of the Descriptive Report did not provide the required information for electronic control equipment used during survey operations. Section 5.3.4.(G) of the HYDROGRAPHIC MANUAL and page 6-18 of the FIELD PROCEDURES MANUAL for HYDROGRAPHIC SURVEYING outline the necessary information to be provided in the Descriptive Report.

5. JUNCTIONS

There are no contemporary junctional surveys. There are no junctional requirements in the Project Instructions.

6. COMPARISON WITH PRIOR SURVEYS

a. Hydrographic

H-6124a	(1934)	1:10,000
H-6125	(1934)	1:20,000
H-8952	(1967)	1:20,000

The prior surveys listed above cover the search areas of the entire present survey. Comparisons between present survey and prior hydrography were made only in the immediate area of the items investigated. In general the reconnaissance hydrography compared favorably with the prior survey soundings. In addition to the comparisons in sections J. and K. of the Descriptive Report, the following should be noted:

1) Automated Wreck and Obstruction Information System (AWOIS) item #6881, a charted dangerous sunken wreck, PA, in Latitude 41°07'54.00"N, Longitude 73°12'19.00"W originates with Local Notice to Mariners 47 of 1972 (LNM 47/72). Depths from prior survey H-6124a (1934) and soundings from the search area of the item agree. The prior survey depths are one (1) foot

deeper than present survey soundings. During field operations four (4) significant targets were located by the field unit. Detached positions were taken on all the targets. AWOIS item #6881 was located in Latitude 41°07'50.38"N, Longitude 73°12'44.45"W with a pneumatic depth gauge least depth of twenty-two (22) feet. The sunken wreck found by the field unit is 643 meters WSW of the charted location. It is recommended that the charted dangerous sunken wreck, PA, be deleted and a dangerous sunken wreck with a known depth of 22 feet, (22Wk) and a danger curve be charted in present survey location. See sheet 1 of 5.

Four additional targets in the search area of AWOIS item #6881 were scaled from the side scan sonargrams during office processing of the present survey. The targets were labeled insignificant during field operations but were deemed significant during office processing. The following is a list of these targets:

DESCRIPTION	LD	POSITION	SURROUNDING DEPTHS
ROCK	25.0	41°07'26.47"N 73°12'54.13"W	28
ROCK	21.0	41°07'29.03"N 73°12'58.23"W	26
ROCK	18.0	41°07'27.03"N 73°12'55.61"W	27
ROCK OUTCROP	26.0	41°07'12.36"N 73°12'44.01"W	33

The targets were plotted on smooth plot 1 of 5 with a limit line drawn to show the approximate limits of the rocky area. It is recommended that the note rocky and the depths on rocks from the present survey be charted. Additional work at an opportune time should be performed to completely define the extent of the Penfield Reef area. See sheet 1 of 5.

2) Five uncharted oyster stakes are shown on prior survey H-6124a (1934) within the search area of AWOIS item #6881. The following is a list of the stakes:

LATITUDE	LONGITUDE	SURROUNDING DEPTHS
41°08'38.75"N	73°12'11.50"W	19
41°08'31.25"N	73°12'01.70"W	20-21
41°08'20.25"N	73°12'05.50"W	21-22

41°08'11.65"N	73°12'08.40"W	22
41°08'04.15"N	73°11'55.60"W	23-24

The side scan records were examined during office processing and no trace of the oyster stakes were seen. No change in charting status is recommended; no additional work is recommended.

b. Wire Drag and Side Scan Sonar

H-5219WD (1932) 1:20,000
FE-320SS (1988) 1:10,000

Prior wire drag survey H-5219WD (1932) covers the search areas of AWOIS items #6912, #6913, and #6931. AWOIS items #6912 and #6913 originate with the prior wire drag survey. The following should be noted:

1) AWOIS item #6912, a charted dangerous sunken wreck with a 42-ft wire drag clearance, in Latitude 41°03'38.90"N, Longitude 73°18'59.10"W originates with survey H-5219WD (1932). The item is a 44-ft sounding taken on wreckage with a wire drag clearance depth of 42 feet. Wreckage was located by the present survey in Latitude 41°03'38.86"N, Longitude 73°18'57.54"W with a pneumatic depth gauge least depth of 42 feet. It is recommended that the dangerous sunken wreck with a 42-ft wire drag clearance be deleted and a dangerous sunken wreck with a known depth of 42 feet, (42Wk) and a danger curve be charted in present survey location. See sheet 2 of 5.

2) AWOIS item #6913, a charted dangerous sunken wreck with a 31-ft wire drag clearance, in Latitude 41°04'44.50"N, Longitude 73°18'26.10"W originates with survey H-5219WD (1932). A contact was located by survey FE-320SS (1988) but was considered insignificant and was not investigated. During office processing of prior survey FE-320SS (1988) it was determined that the contact was significant. The item was positioned from the fathogram. The target was located in Latitude 41°04'44.43"N, Longitude 73°18'25.15"W with a fathometer least of 42 feet on the prior survey. The item was located by the present survey in Latitude 41°04'44.43"N, Longitude 73°18'25.07"W with a pneumatic depth gauge least depth of 39 feet. The prior survey, FE-320SS (1988), contact is approximately six (6) meters to the southwest of the present survey location. It is recommended that the charted dangerous sunken wreck with a 31-ft wire drag clearance be deleted from the chart. It is also recommended that a dangerous sunken wreck with a known depth of 39 feet, (39Wk) and a danger curve be charted in present survey location. See sheet 3 of 5.

per telecon 2 N/CG 24421, 7/18/90 mbm

There are no conflicts between prior wire drag survey H-5219WD (1932) effective depths and the present survey reconnaissance soundings.

7. COMPARISON WITH CHART 12369 (20th Edition, Mar. 2/85

a. Hydrography

The charted hydrography originates with the previously discussed prior surveys and sources not readily ascertainable. The previously discussed prior surveys require no further consideration. The following should be noted:

AWOIS items #6931 and #6932 are charted discontinued dumping grounds centered in Latitude 41°03'48"N, Longitude 73°17'09"W, and Latitude 41°04'23"N, Longitude 73°12'35"W, respectively. Basic hydrography was conducted in these areas. The field unit conducted basic hydrographic operations in these areas, and the results are shown on sheets 4 and 5 of 5.

The present survey is adequate to supersede the charted hydrography in the areas of the surveyed dumping grounds and to supplement the charted information in the other areas.

c. Aids to Navigation

There are no fixed or floating aids to navigation within the limits of this survey.

8. COMPLIANCE WITH INSTRUCTIONS

This survey adequately complies with the Project Instructions except as noted in this report. This is a good side scan sonar survey for the AWOIS items resolved by the survey. Additional work at an opportune time is recommended in section 6.a.1) of this report.

Franklin L. Saunders
Cartographic Technician
Verification of Field Data

Norris A. Wike
Cartographer
Evaluation and Analysis

Robert R. Hill
Senior Cartographic Technician
Verification Check

INSPECTION REPORT
FE-323SS

The data that make up this Side Scan Sonar survey have been inspected to gain insight into its overall completeness regarding survey coverage, presentation of survey results, and the verification or disproval of charted data. This survey, except as noted in the Evaluation Report, is considered complete and adequate to meet National Ocean Service standards.

Inspection

Robert G. Roberson
Chief, Evaluation and Analysis Group

Christopher B. Lawrence CDR, NOAA
Chief, Atlantic Hydrographic Section

Approved: 1 March 1990

Ray E. Moses, RADM, NOAA
Director, Atlantic Marine Center

6/28/90
Wesley V. Hull, RADM, NOAA
Director, Office of Charting and Geodetic Services

73°13'00"

73°12'30"

73°12'00"

41°08'00"

41°07'30"

41°07'00"

73° 12' 00"
41° 08' 00"
NAD 27
XYNETICS 1201
F.L.S 10/18/89

20 Rk

22 Wk

20 Rk

20 Rk

rky

21 Rk (A)

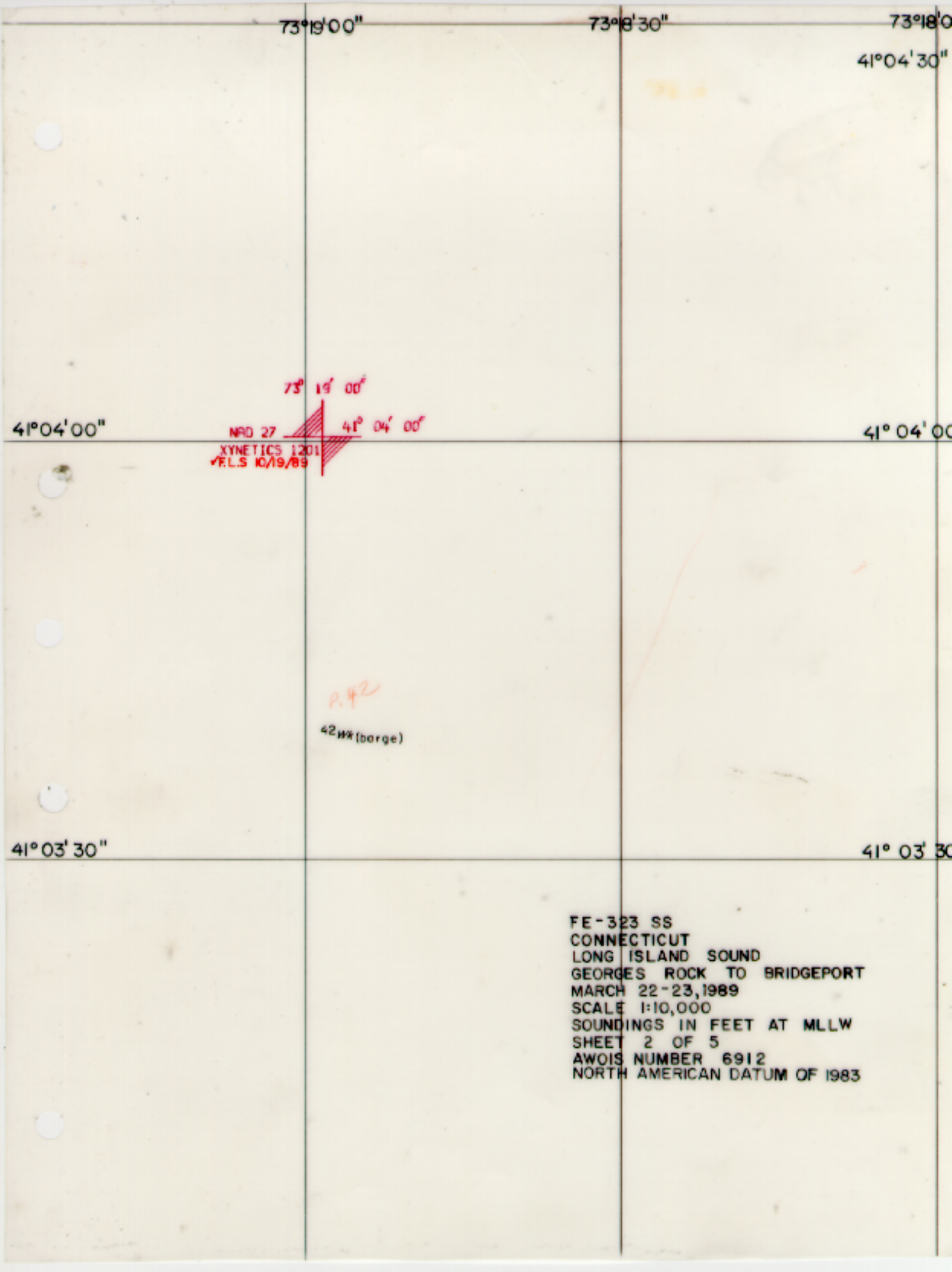
18 Rk (A)

25 Rk (A)

26 Rk
(A)

(A) The depths on these rocks were estimated by scaling heights off the bottom from side scan sonar records. Positions were determined by computing offsets from the vessel's track.

FE-323 SS
CONNECTICUT
LONG ISLAND SOUND
GEORGES ROCK TO BRIDGEPORT
MARCH 22 - JUNE 21, 1989
SCALE 1:10,000
SOUNDINGS IN FEET AT MLLW
SHEET 1 OF 5
AWOIS NUMBER 6881
CONTACTS 6,8,9,10
NORTH AMERICAN DATUM OF 1983



FE-323 SS
CONNECTICUT
LONG ISLAND SOUND
GEORGES ROCK TO BRIDGEPORT
MARCH 22-23, 1989
SCALE 1:10,000
SOUNDINGS IN FEET AT MLLW
SHEET 2 OF 5
AWOIS NUMBER 6912
NORTH AMERICAN DATUM OF 1983

73°19'00"

73°18'30"

73° 18'00"

73° 18' 00"

NAD 27

41° 05' 00"

XYNETICS 1201
✓F.L.S 10/18/88

41°05'00"

41° 05' 00

P17

39 WK (barge)

FE-323 SS
CONNECTICUT
LONG ISLAND SOUND
GEORGES ROCK TO BRIDGEPORT
MARCH 21 - APRIL 25, 1989
SCALE 1:10,000
SOUNDINGS IN FEET AT MLLW
SHEET 3 OF 5
AWOIS NUMBER 6913
NORTH AMERICAN DATUM OF 1983

04'30"

41° 04' 30"

41°04'00"

41° 04' 00

73°19'00"

73° 18' 30"

73°18'00"

73°18'00"

73°17' 30"

73° 17' 30"

73°17'00"

73°16'30"

41° 04' 30"

NAD 27

XYNETICS 1201

F.L.S 11/8/89

41° 04' 30"

41° 04' 00"

41° 04' 00"

41° 03' 30"

41° 03' 30"

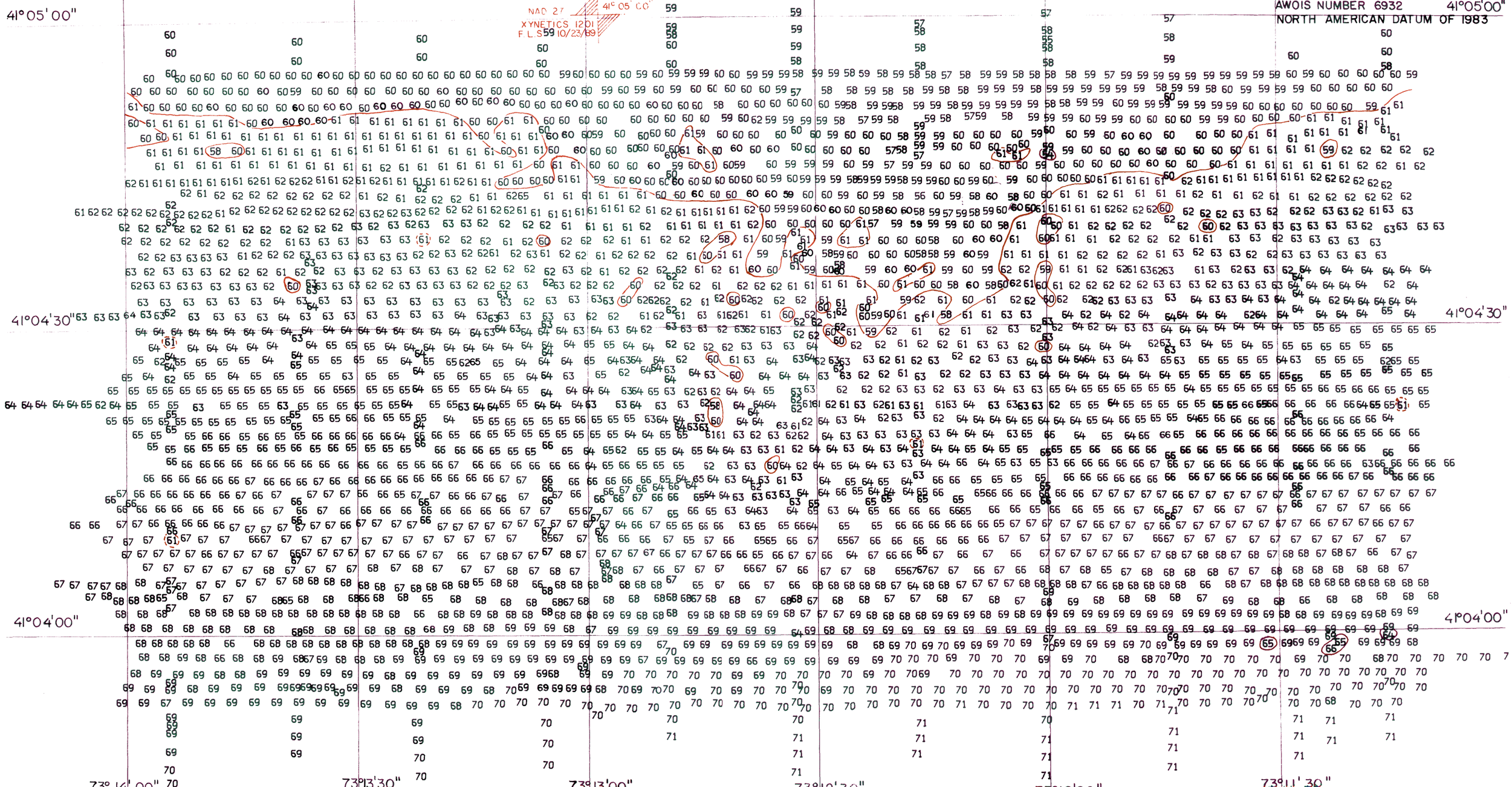
FE-323 SS
CONNECTICUT
LONG ISLAND SOUND
GEORGES ROCK TO BRIDGEPORT
MARCH 22 - APRIL 27, 1989
SCALE 1:10,000
SOUNDINGS IN FEET AT MLLW
SHEET 4 OF 5
AWOIS NUMBER 6931
NORTH AMERICAN DATUM OF 1983

73°14'00"
73°13'30"
73°13'00"
73°12'30"
73°12'00"
73°11'30"

41°05'00"
41°04'30"
41°04'00"

73° 13' 00"
41° 05' 00"
NAD 27
XYNETICS 1201
F.L.S 10/23/89

FE-323 SS
CONNECTICUT
LONG ISLAND SOUND
GEORGES ROCK TO BRIDGEPORT
APRIL 4 - JUNE 16, 1989
SCALE 1:10,000
SOUNDINGS IN FEET AT MLLW
SHEET 5 OF 5
AWOIS NUMBER 6932
NORTH AMERICAN DATUM OF 1983



DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Ocean Survey
Rockville, Maryland

Hydrographic Index No. 63 L

LONG ISLAND SOUND AND VICINITY

CONNECTICUT-NEW YORK

INDEX
HYDROGRAPHIC SURVEYS
Complete through August 1978
1967-1975

Diagram 1213-4

FE-3235S

HYDROGRAPHIC SURVEYS

No.	Date	Scale
H-8926	1966-68	10,000
H-8949	1967	10,000
H-8950	1967	10,000
H-8951	1967	10,000
H-8952	1967	20,000
H-8967	1967-68	20,000
H-8996	1968	10,000
H-8997	1968-69	10,000
H-9008	1968	20,000
H-9061	1969	10,000
H-9088	1969	20,000
H-9093	1969	10,000
H-9181	1970-71	20,000
H-9212	1971	20,000
H-9554	1975	40,000
H-9555	1975	80,000
H-9568	1975	20,000
H-9577	1975	40,000

On Scales of
1:10000 6.34 inches=1 statute mile
1:20000 3.17 inches=1 statute mile

A-4767

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. FE-323SS

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
12369	12-7-90	John Pierce	Full ~~Part Before After~~ Marine Center Approval Signed Via
			Drawing No. 32
12363	1-28-91	John Pierce	Full ~~Part Before After~~ Marine Center Approval Signed Via
			Drawing No. 51
12364	4-9-91	John Pierce	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. 27
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.

SUPERSEDES C&GS FORM 8352 WHICH MAY BE USED