

FE320

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. RU-10-3-88 ..
Registry No. ... FE-320SS ..

LOCALITY

State Connecticut--New York ..
General Locality Long Island Sound ..
Sublocality Vicinity of Norwalk Islands ..

19 88

CHIEF OF PARTY
LCDR A.M. Snella

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DATE May 14, 1990 ..

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

FE320
SIDE SCAN

12368
12369
12365
12363
12364 C, D, G

HYDROGRAPHIC TITLE SHEET

FE-320-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.

RU-10-3-88

State Connecticut and New York

General locality Long Island Sound

Locality Vicinity of Norwalk Islands

Scale 1:10000

Date of survey 23 Sept - 18 Nov.
December 1988

Instructions dated May 26, 1988

Project No. OPR-B660

Vessel NOAA Ship RUDE S-590

Chief of party LCDR Andrew M. Snella

Surveyed by LT. Craig L. Bailey, LT(jg) Thomas^{p.} Waddington, AST Mark A. Sramek

Soundings taken by echo sounder, ~~HOUGHTON~~ RAYTHEON DSF-6000 N, Pneumatic Depth Gauge

Graphic record scaled by CLB, TRW, MAS.

Graphic record checked by CLB, TRW, MAS.

Protracted by _____ Automated plot by SYNETICS 1201 Plotter (AHS)
Bruning-Nicolet ZETA
124 CS Plotter. (Field)

Verification by Atlantic Hydrographic Section

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

REMARKS: Notes in red were made during office processing.

AWOIS/SURF M SM 5/17/90

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APPENDIX

* I. Tides

Request For Smooth Tides
Field Tide Note
Predicted Tide Tables
Abstract of Times of Hydrography
AWOIS Items Included in This Report

* II. Instrument Calibrations

Pneumo Depth Guage

* III. Control Station Information

Control Station Table
Control Station Reference List - *filed with Descriptive Report*

* IV. Correctors

Electronic Corrector Abstract
C-D Tables
Offset Tables
Critical System Checks
Effective Transducer Draft
Settlement and Squat Graph

* V. Parameters

Plotter Sheet Descriptions
Project Table
Sheet and Segment Tables

* VI. AWOIS List

* VII. Correspondence

* VIII. Data Processing Abstracts

AWOIS Item 4454
AWOIS Item 6422
AWOIS Item 6423
AWOIS Item 6429 & 6428
AWOIS Item 6802
AWOIS Item 6803
AWOIS Item 6804
AWOIS Item 6805
AWOIS Item 6913
Cable and Anchor Reef

** filed with original field records.*

* IX. Calibration Data (bound seperately)

Baseline Calibration Data
Sound Velocity Data
Pneumo Depth Gauge System Checks.

* X. Geodetic Control (bound seperately)

NGS Adjusted Position Listing
Abstracts of Field Observations
Computation of Positions

** Filed with original field records*

DESCRIPTIVE REPORT

NOAA Ship RUDE (S590)
Lcdr. Andrew Snella
Commanding Officer

Survey FE-320-SS
RU-10-3-88
Scale 1:10,000

AWOIS Items: 4454 6422 6423 6802 6803 6804 6805 6413 6429 6428

A. PROJECT DESCRIPTION

This survey was conducted in accordance with Hydrographic Project Instructions:

OPR-B660-RU/HE-88, dated May 26, 1988
Southern New England Coast
Connecticut and New York
Change No. 1, dated July 06, 1988
Change No. 2, dated September 6, 1988
Change No. 3, dated November 22, 1988
Change No. 4, dated December 8, 1988

The purpose of this project was to verify or disprove the existence of charted submerged wrecks and obstructions in Western Long Island Sound and vicinity.

The survey involved Side Scan Sonar (SSS) investigations utilizing a slant range corrected towfish. Side Scan sonification was supplemented by echo-soundings that were obtained from the ship's echo-sounder. Least depths on targets that were found by diver investigation were taken with a pneumo depth gauge.

B. PROJECT OVERVIEW

This project responds to requests from the Northeast Marine Pilots, Inc., of Newport, Rhode Island, to disprove or verify and provide least depths of wrecks and obstructions in western Long Island Sound. The data from this project will supplement a basic hydrographic survey (OPR-B285) in this area which is scheduled for 1989-91.

The U.S. Navy, and 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.

During the course of this project the RUDE continued to assist in the implementation and testing of the Hydrographic Data Acquisition and Processing System (HDAPS). Three versions of the software were received, tested, and used during this portion of the project.

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C. AWOIS ITEMS SURVEYED

The area surveyed is approximately 4 miles of Western Long Island Sound between Long Neck Point and Southport. The RUDE and HECK were issued an AWOIS Listing dated 11 October, 1988 which is included in Appendix VI*. Ten items were selected by the RUDE for inclusion in this report. The survey requirements cited in the AWOIS listing are summarized below. Dates of survey include September 23, 1988 through November 18, 1988 (DOY 267-327).

AWOIS NO.	LATITUDE	CHARTED LONGITUDE	SEARCH RADIUS	REQUIRED COVERAGE
4454	41° 00' 31.00"N	73° 26' 59.00"W	700 meters	200%
6422	41° 01' 11.00"N	73° 28' 58.00"W	75 meters	200%
6423	41° 00' 36.00"N	73° 28' 54.00"W	500 meters	200%
6428	41° 02' 24.30"N	73° 28' 01.30"W	75 meters	200%
6429	41° 01' 56.00"N	73° 28' 08.00"W	1000 meters	200%
6802	41° 00' 49.97"N	73° 25' 19.85"W	75 meters	200%
6803	41° 01' 31.56"N	73° 26' 44.73"W	75 meters	200%
6804	41° 01' 46.19"N	73° 27' 14.18"W	75 meters	200%
6805	41° 01' 47.00"N	73° 24' 37.00"W	700 meters	200%
6913	41° 04' 44.50"N	73° 18' 26.10"W	200 meters	200%

D. SURVEY SHEETS (field)

Appendix V* contains the complete listing of survey plot sheets and their associated HDAPS parameters. Plot sheets were produced using the the following equipment at a scale of 1:10,000:

HDAPS Computer
Bruning-Nicolet ZETA 824A CS Plotter

Each of the AWOIS items covered by this report has one or more of the following plots included:

on-line swath or track plot
post-processing track plot, 200% coverage
post-processing swath plot, 100% coverage
post-processing depth plot
contact plot

Larger scale sheets (1:1,000) were often used when conducting echosounder developments in order to provide clarity of the plotted soundings. In addition, a 1:20,000 contact plot which displays all AWOIS items, targets investigated, and recommendations is included.

** Filed with original field records*

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E. SURVEY VESSELS

The following vessels were used during the project:

<u>VESSEL</u>	<u>ELECTRONIC DATA PROCESSING NUMBER</u>	<u>PRIMARY FUNCTION</u>
NOAA Ship RUDE (S590)	9040 ✓	Side Scan Operations
RUDE Launch (RU3)	1290 ✓	Diving Operations
RUDE Skiff (RU1)	----	Mini-Ranger Service and Diving Operations

F. DEPTH SOUNDING EQUIPMENT

Depth soundings were taken with the following equipment:

Raytheon DSF6000N Echo-Sounder (S/N 047) ✓
Pneumo Depth Gauge (S/N 8705140N) ✓

Least depths from diver investigated contacts were determined using the pneumo depth gauge. This device is described in Hydrographic Survey Guideline No. 55. Prior to each dive, a systems check was performed at the dive location to ensure the pneumo depth gauge worked properly. Corrector values for the gauge were taken from calibrations performed on 17 February 1988 at Instruments East Labs of Norfolk, VA. The calibration and systems check data are provided in Appendix IX.* *Filed with original field records.*

G. SIDE SCAN SONAR EQUIPMENT

Side Scan coverage was accomplished using the following recorder and towfish:

EG&G Model 260 Slant Range Corrected
Side Scan Sonar (S/N 0010884) ✓
Model 272, 100/500 KHZ Towfish (S/N 0010823) ✓

Side scan sonar confidence checks consisted of periodic "rub tests" performed on the towfish transducers. Proper functioning of the SSS system was assured as the quality of the image displayed on the recorder was critically evaluated during all operations.

Periodically the fish was towed past a 100 KHz pinger as an additional check. This Data Sonics pinger was moored approximately 2 meters off the bottom. The side scan trace produces a pair of hyperbolic arcs as the tow fish nears the pinger. At the closest point of approach to the pinger the apex of the hyperbolic arc will be nearest the center line of the side scan trace.

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H. CORRECTIONS TO ECHO SOUNDINGS

I. Velocity Corrections

Velocity correction data was obtained from MARTEK CTD (s/n 246) cast taken in the survey area. Correctors were calculated using the computer program package VELOCITY. Sound velocity correctors were applied to data by the date of Martek cast. The MARTEK calibration, cast data, and VELOCITY program results are included in Appendix IX.*

** Filed with original field records.*

The Martek cast was taken on the following date at the indicated position:

<u>Date (DOY)</u>	<u>LATITUDE</u>	<u>LONGITUDE</u>	<u>Table No.</u>
September 22 (DOY 266)	41° 00' 45" N	73° 26' 56" W	81

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II. Tide Corrections

The Southern New England Coast has an average tidal range of 8 feet. The operating standard tide station at Bridgeport, Connecticut, was the primary reference station used for determining predicted tides for various sites within the project area. In HDAPS software, these predicted tide correctors were applied to the on-line sounding data collected. Tidal correctors were also applied to the least depths over obstructions taken with the pneumo depth gauge. Following is a list of HDAPS tide tables used in this survey for plotting AWOIS item investigation data.

HDAPS TIDE TABLE NUMBER / Zone	DOY FROM-TO	APPLICATION AWOIS ITEM - DOY
7 / Eatons Neck Point	(21 Sept 88) 265-279	6422 - 267 6423 - 270 6803 - 270, 271 6423 - 277
8 / Greens Ledge	278-292	4454 - 279, 289, 291 6422 - 280, 287 6423 - 279 6802 - 289 6804 - 286 6805 - 286
9 / Greens Ledge	291-305	6429 - 294, 302 6082 - 292, 293 6805 - 292 Cable & Anchor Reef - 293, 298, 300, 301
10 / Greens Ledge	307-321	6429 - 308 6803 - 308 6804 - 308, 309, 314 6913 - 319
11 / Saugatuck River Entrance	320-334 (27 Nov 88)	6913 - 321

It is recommended that smooth tide data be applied to all least depths taken on wrecks and obstructions during the course of this survey.

III. Settlement and Squat Corrections

RUDE's settlement and squat (S&S) measurements were taken on March 17, 1988 (DOY 077) at Little Creek, VA. A level was set up on shore

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and used to sight readings on a staff located on the bridge wing. The ship was initially observed dead in the water, allowing the shore party to observe the static height. The RUDE was then run past the level at varying speeds and the heights recorded. Listed below are the settlement and squat correctors observed.

<u>Shaft RPM</u>	<u>Knots</u>	<u>Meters/Second</u>	<u>S & S Corrector</u>	
200 ✓	4.6 ✓	2.4 ✓	0.15 Ft. ✓	0.04 M ✓
300 ✓	7.0 ✓	3.6 ✓	0.48 Ft. ✓	0.15 M ✓
400 ✓	9.0 ✓	4.6 ✓	0.82 Ft. ✓	0.25 M ✓

Settlement and squat values are applied to the data through the HDAPS Offset Table. This table allows 5 data points to be entered for S&S values. The first and last data points in this table are entered for speeds slower and faster (respectively) than those at which the RUDE operates. These end values are only filler points in the table. S&S corrector values were only calculated for 3 data points, within the range of speeds at which the RUDE operates. Raw Settlement and Squat data can be found in Appendix IV.*

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IV. Heave, Roll, and Pitch Corrections

Heave, roll and pitch were measured by the Datawell B.V. Sensor commonly known as the "Hippy". The HDAPS software applies Hippy data corrections to depths only when in the echosounding mode. All data gathered during on-line side scan operations does not have these corrections applied. All echosounding development was conducted in the echosounding mode and therefore the data has heave corrections applied.

V. Vessel Draft Corrections

Transducer draft marks were painted on the side of the RUDE during the 1988 winter inport dry dock period. These marks are located even with the 100 KHz transducer at frame 13.5. Each mark is 1 inch wide, with three inch spacing between marks. The mark corresponding to 7 feet above the transducer is denoted by pointed ends (this is the fourth mark from the top). Transducer draft can be read directly from these marks in calm weather by observation from small boat.

The transducer draft was also measured from the top of the bridge wing wooden rail. This distance is 19.1 feet and corresponds to frame number 13.5. To calculate the transducer draft using these values subtract the distance from the water to the wooden rail from 19.1 feet. This value is the actual draft of the transducer. Either of these methods can be used to measure transducer draft.

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VI. Effective Transducer Draft

Effective transducer draft is determined by measuring from the wooden rail at frame 13.5 to the ocean bottom and subtracting 19.1 feet. This measurement yields the mean height of transducer off the bottom. The digital depth recorded at the time of the lead line readings is corrected for sound velocity and subtracted from the height of transducer off bottom yielding an instrument error. The effective transducer height is the sum of the instrument error and the physical transducer draft (as measured in the first paragraph above). Ten readings using this method were averaged to obtain the value for effective transducer draft. Appendix IV* contains the computation from this measurement. The effective transducer draft value is entered in the HDAPS Offset Table under transducer height.

I. HORIZONTAL POSITION CONTROL *See section 2. a. of the Evaluation Report*

I. Electronic Positioning Equipment

Positioning information for this survey was provided by the Motorola Mini-Ranger Falcon 484 microwave positioning system. Several control stations were established which provided good lines of position geometry throughout the survey. There were no significant positioning problems experienced in this survey.

II. Electronic Positioning Calibration

All of the Motorola Mini-Ranger Falcon 484 codes were calibrated with each of the two Receiver / Transmitter units and with each of the two Range Processing Units to assure the accuracy that was required for the survey. This calibration was conducted on July 6, 1988, at Fentress Air Station near Norfolk. Appendix IX contains all baseline calibrations.

III. Multiple LOP Positioning

In some areas, classical phase cancellation interference was encountered causing the loss of one or more LOP's from the HDAPS Least Square solution. An algorithm incorporated in the HDAPS software selectively evaluated all four incoming LOPs along with the heading of the vessel, and used only that data which appeared to be accurate. The Minimum Accepted Signal Strengths (MASS) were predetermined from the baseline calibration. MASS values are supplied to the HDAPS Program in the C-O tables. Any LOP received by HDAPS which is below the programmed MASS would be disregarded and not applied in the positioning algorithm. This multiple LOP

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technique greatly reduced the effect of occasional "flyers" and their associated position busts.

IV. Positioning Quality

Position quality is checked daily through a unique feature which has been added to the HDAPS system menu. A graphic display on the screen shows the LOP's for all stations selected, the geometry of the stations in relation to the ship, angles of intersection between stations, and a 95% Error Circle Radius. This graphical system check is printed daily on the raw data printout. The Error Circle Radius is an approximation of positional accuracy and is a function of LOP geometry and assumed standard errors. It is a theoretical value which is computed without any real-time range data. Station numbers and residual values are also displayed. Residuals are a measure of LOP accuracy. If a significant error exists in one or more of the LOP's, the problem will be reflected in one or more of the LOP's having a large residual value.

V. Critical System Check

Critical system checks were computed using the standard three point fix to four known visible geodetic stations in the survey area. The angles observed by sextant were then entered into the HDAPS Computer for computation and comparison to the ranges received by the Mini-Ranger system. In accordance with the project instructions, these checks were only made when at least one of the following conditions existed:

- 1) Once a month on a given electronic control network.
- 2) Each time the electronic control scheme changed.
- 3) When the maximum residual value consistently (5 minutes) exceeds the larger of the following two values:
 - i) 0.5 mm at the scale of the survey
 - ii) 3 Meters

A closing baseline calibration of the Mini-ranger transponders was not required by project instructions.

VI. Geodetic Positioning Control

The horizontal datum for this project was the North American Datum of 1983. Seven control stations were used as Mini-ranger locations on this survey.

All positions for electronic control and visual calibration stations were obtained from NGS adjusted position listings, with the exception of station EATONS NECK TEMP. Copies of the NGS adjusted

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position listing are contained in Appendix X.* The control station list is provided in Appendix III along with a control station reference list that was generated to aid in the correlation of station names, numbers, and positions.

RUDE personnel established station EATONS NECK TEMP and verified the position of station FISH. The remaining 5 electronic control stations were verified by the NOAA Ship HECK. See Appendix II* of Descriptive Report for FE-221-SS for details on verification of station positions for the following stations:

LLOYD POINT
STAMFORD HBR LH
COCKENOE ISLAND 2 RM 3
BLACK ROCK HARBOR BCN 1
OLD FIELD POINT BCN

Appendix X* contains data, computations and field observations of stations FISH and EATONS NECK TEMP. A description of field operations at stations FISH and EATONS NECK TEMP follows:

FISH

Station FISH was occupied 3 times for horizontal observations. The initial occupation on 20 September, 1988 did not yield an acceptable azimuth check between GREENS LEDGE LH and EATONS NECK LH. The station description does not contain historical observed angles between the reference marks at FISH. These angles were obtained via phone conversation from NGS personnel (N/CG121). These historical angles do not agree with those observed on 20 September. N\CG121 also indicated that adjustment to the NAD 83 datum is inexact in this area.

The second occupation of FISH was conducted on 6 October, 1988. This yielded a check azimuth of 07.6 seconds between stations TWIN A and GREENS LEDGE LH. The initial station of this occupation (NORWALK ISLAND LH) is under reconstruction and its location is suspect. A tank was misidentified and included in these observations. No geodetic position data could be located for this tank.

A position was computed by resection from observations made upon the third occupation of FISH on 9 November, 1988. The inverse distance between the published and resected positions of FISH is 2.46 meters. Horizontal measurements between the station and reference marks were made. Historical and present measurements agree within .005 meter.

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The station was occupied a fourth time to measure a distance to station BELL ISLAND. The difference between measured and computed distances from FISH to BELL ISLAND is .034 meter. This yields a closure of 1:64,253. As previously mentioned the adjustment to NAD 83 positions is suspect in this area. This would account for the poor azimuth checks at station FISH with other stations across Long Island Sound.

Summary of operations at FISH

Horizontal directions were observed at station FISH on three separate occasions. One acceptable azimuth check (GREENS LEDGE LH - TWIN A) was obtained. Horizontal distances to the reference marks agree with historical data. The distance between FISH and BELL ISLAND was measured by EDM. This measured distance resulted in a closure of 1:64,253.

EATONS NECK TEMP

During this survey the Coast Guard was refurbishing the light house at Eatons Neck. This precluded using EATONS NECK LIGHTHOUSE as an electronic control station. An alternate site for locating a Mini-Ranger was chosen atop the main office building at Coast Guard Base Eatons Neck.

EATONS NECK TEMP is a nonmonumented station located by resection methods. This position was entered on the signal list and used for hydrographic operations between 23 September and 8 November, 1988.

The NOAA Ship HECK encountered large azimuth check angles with three of the stations (CAPTAIN 1967, STAMFORD HARBOR LH and GREENS LEDGE LH) used in the resection of EATONS NECK TEMP. NGS personnel reported to both the RUDE and HECK that trouble had been encountered in making the NAD 83 adjustment of this area and that some of the lower order stations might not be tied together strongly.

A blunder in position closure was discovered for EATONS NECK TEMP. The closure for the resected position from data observed on 21 September was 1:6400. The station was reoccupied on 7 November and a new check position determined by resection. This new position was labeled EATONS NECK TEMP 7. Inverse distance between EATONS NECK TEMP 7 and the initial position of EATONS NECK TEMP (labeled EATONS NECK TEMP 1) is .488 meter. This results in a closure of 1:12,865.

Summary of operations at EATONS NECK TEMP

EATONS NECK TEMP is a temporary nonmonumented station. It was occupied twice for horizontal directions and located by resection methods. Closure for this station is 1:12,865.

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The signal list (contained in Appendix III) has 2 positions for EATONS NECK TEMP. Signal no. 122 was used for all data gathered between 23 September and 8 November, 1988 (DOY 276-313). Signal no. 156 was used for all data gathered between 9 November 29 November, 1988 (DOY 314-334). The position calculated on 9 November (signal no. 156) should be used for all post processing plots conducted during the verification of this survey.

J. AUTOMATED DATA PROCESSING

I. Overview

All data collected during this survey was processed using HDAPS. A general description of the steps involved in the data processing sequence is discussed below. In addition, we also present a data tape inventory summarizing the AWOIS data stored on each tape.

Most of the steps involved in the data processing sequence apply only to those items which are disprovals and therefore require accurate post-processing coverage plots. AWOIS items which are investigated and positively identified require only an accurate determination of their detached position and least depth. In conjunction with the AWOIS investigations, we also gathered depth information which allowed us to make general comparisons with prior surveys conducted in these areas.

II. Data Tape Numbering

When conducting survey operations on-line, all HDAPS data is recorded on a raw data tape. The HDAPS tape number is a five digit number assigned according to day of year the tape was first loaded, the tape number for that particular day, and whether it is a raw (0) or smooth tape (1). For example, the second raw tape loaded on DOY 147 would have the tape number 14720.

III. Daily Data Abstracts

Concurrently with HDAPS data collection, we also acquire side-scan and echosounder traces, an on-line plot of the data, and a raw data listing of all selected soundings by survey line. At the completion of a day's work, we scan all side-scan and echosounder traces identifying potential targets and noting any coverage deficiencies. We manually summarize the data collected in a Daily and Post Processing Data Abstract and a Side Scan Sonar Target Abstract. These abstracts are included in Appendix VIII.*

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AWOIS ITEMS: 4454 6422 6423 6802 6803 6804 6805 6913 6429 6428

The Daily and Post Processing Abstracts are grouped by AWOIS item and are a line by line summary of the survey run for that item. For all lines run, this abstract includes the day of year, the raw tape number, the fix numbers for that line, and the sidescan range which was run. In addition, for all data which was smooth plotted this abstract will list the smooth tape number and the effective sidescan range. Finally, any pertinent comments are entered in the far right column of the abstract. The Side Scan Sonar Target Abstracts are also grouped by AWOIS item and are used to account for any potential targets identified on either the sidescan or echosounder traces.

IV. Data Transfer - Tape to Disk

In order to begin post-processing the raw data, we had to transfer the data from the raw data tape onto hard disk. Although we had the ability to transfer and access data by fix number, we found that this method allowed only single line transfers (which is time consuming when dumping a tape onto hard disk), and resulted in missing data. For these reasons we still used the Data Set Number (DSN) when transferring and accessing data.

V. Data Editing

After transferring data to hard disk, we obtained a catalog which listed all the data currently stored on the hard disk along with the renumbered DSNs. HDAPS still does not store detached positions on tape, so all detached position data is on the raw data printout only. Any necessary editing was then performed. This consisted mainly of our ability to hard smooth positioning busts and insert echosounder peaks. Basically, a hard smooth consists of dead-reckoning between two good fixes over any major positioning busts. These edits were noted on the hard disk catalog and the raw data printouts by bracketing the fixes which were hard smoothed.

VI. Smooth Sonar Coverage Plots

After data editing, we smooth plotted the data. In order to illustrate our side-scan coverage, we produced multiple 100% swathplots for all areas surveyed. Using an HDAPS feature, we were able to vary the effective swath range within plots. The effective range is our assessment of the maximum range of acceptable acoustic return on the SSS traces. For each line that was smooth plotted, we have listed the effective swath range in the Daily and Post Processing Abstract. The multiple swathplots, when viewed collectively, provide an accurate picture of the side-scan coverage obtained around each AWOIS item.

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VII. Smooth Depth Plots

In addition to the SSS coverage plots, we also plotted several echo-sounding lines using the HDAPS Depthplot function. These depthplots were used to make comparisons with prior surveys. Because all AWOIS data was gathered in the sidescan mode, we were unable to collect heave, roll, and pitch data. Currently, heave data can be collected only when HDAPS is in the Echosounder mode. In cases where heave appeared to be significant, we manually corrected the depth using the HDAPS Edit Depth function.

VIII. Edited Data Tape

After the data on hard disk was edited and plotted, it was transferred back to a tape which became the edited data tape. Because only one tape file could be stored on the hard disk at a time, it was necessary to perform multiple iterations of the data transfer process when raw data for an AWOIS item was stored on multiple tapes. We then loaded the entire edited tape onto the hard disk and obtained a hard disk catalog of this information. This provided a line by line summary of all data stored on the edited tape, and can be found in Appendix VIII. ** filed with original field records*

IX. Data Tape Inventory

The following table lists the raw and edited tape numbers where the AWOIS item survey data may be found.

<u>AWOIS Item</u>	<u>RAW Data Tapes</u>	<u>EDITED Data Tapes</u>
4454	26710	28111
6422	26710	28111
6423	26710	28111
6428	26710	28111
6429	26710	28111
6802	26710	28111
6803	26710	28111
6804	26710	28111
6805	26710	28111
Cable & Anchor Reef	26710	28111
6913	31910	32011

X. Data Disposition

All data records and tapes have been forwarded to the Hydrographic Surveys Branch at the Atlantic Marine Center in Norfolk, Virginia. Hourly heights of actual recorded water level data (tides) for times

AWOIS ITEMS: 4454 6422 6423 6802 6803 6804 6805 6913 6429 6428

of survey have been requested from the Sea and Lake Levels Branch in Rockville, Maryland to be sent to the Hydrographic Surveys Branch.

K. COMPARISONS WITH PRIOR SURVEYS *see section 6. of the Evaluation Report*

Sounding data from each AWOIS item was plotted at a scale of 1:10,000 and compared with the prior surveys as listed in the table below. *

<u>Survey No.</u>	<u>Date</u>	<u>Scale</u>	<u>AWOIS No.</u>
H-1732	1886	1:20,000	4454 6422 6423 6429 6802 6803 6804 Cable & Anchor Reef
H-5222	1932	1:10,000	4454 6423 6422 6428 6429 Cable & Anchor Reef

In general, depths on this survey agree closely with the prior surveys. A small area in the western portion of AWOIS 6422 shows prior survey depths (H-1732) to be 2 feet shoaler than the present survey.

L. MISCELLANEOUS

Local sport divers indicated that many uncharted wrecks exist in the portion of Long Island Sound covered by this survey. A basic hydrographic survey should be conducted in this area to properly chart all existing wrecks.

<u>* SURVEY No.</u>	<u>DATE</u>	<u>SCALE</u>	<u>AWOIS No.</u>
H-5220	1932	1:20,000	4454 6802
H-5221a	1932	1:10,000	6803 6804 6805
H-6125	1934	1:20,000	6913

AWOIS 4454

AWOIS ITEM 4454 INVESTIGATION

I. Area of Investigation

AWOIS Item: 4454
State: Connecticut
County: Fairfield
Locality: 2.3 nm SE of Long Neck Point
Latitude: 41° 00' 31.00" N
Longitude: 73° 26' 59.00" W
Depth: 75 Feet

II. AWOIS Item Description

AWOIS item 4454 was located by a private diver and reported in CL1095/86. The item as reported is the wreck of a barge in 75 feet of water. The present survey requires 200% side scan sonar coverage of a 700 meter radius area for disproval or least depth if verified.

III. Survey Procedures

The following data summary reflects survey procedures used for investigating this item:

AWOIS Item: 4454
Positioning: Falcon Mini-Ranger
Sonar Search: 5, 15, 17 & 20 October, 1988
(DOY 279, 289, 291, 294)
Diving: 20 October, 1988 (DOY 294)
Echo Sounding: 17 & 20 October, 1988 (DOY 291, 294)
Sonification: 100% SSS coverage plus additional coverage to the southeast of the search area
Targets: One significant target

There were no significant problems encountered with either the positioning or side scan sonar equipment.

The search area for AWOIS item 4454 lies almost entirely within one and adjacent to an additional discontinued dumping ground. Local fishermen and sport divers reported to the RUDE that the area is littered with many wrecks, most of these being barges. 100% side scan coverage was conducted over the assigned search area. Several large barge like contacts were identified on the sonagrams along the southeastern limit of this search area. Side scan coverage was continued to the south and east of the assigned search area. The 130 foot curve was used as the limit of this additional search.

A total of 57 contacts were identified from the side scan records. Shadow heights were calculated for these contacts. Only contacts that appeared to protrude above a depth of 11 fathoms were deemed sufficient for further investigation. Most of these 57 contacts have

a large solid return on the sonargram. However the majority lie in depths over 100 feet. One contact was developed by echosounder.

IV. Target 4454A Investigation

A dive was attempted on this item. Divers/^{strong}descended down the dive marker line to the wreckage in a very ~~high~~ current. Due to poor visibility and potential danger from the current this dive was aborted. Divers spent a total of 5 minutes on the wreck. This target was developed by echosounder as discussed below.

(a) Target Echo Sounding Summary

Target 4454A was first identified at the following location during the initial side scan search.

<u>DOY</u>	<u>Fatho Contact</u>	<u>Sonar Contact</u>
279	--	353.00S

Echo sounding lines were run to provide 100% coverage over the target area and are summarized below.

<u>DOY</u>	<u>No. of Lines</u>	<u>Position Numbers</u>
291	6	609 - 663

Five meter spacing echosounding lines were run over this area.

(b) Target Description

Target 4454A appeared to be a wooden barge. A complete dive investigation was not conducted because this wreck was considered to be dangerous to divers. The fathograms indicate that this item projects 9 feet above the surrounding bottom. A star pattern development with the side scan was conducted and shows no masts or spars projecting from the wreckage. Dimensions taken from the side scan records show the vessel to be 25 X 7 meters.

(c) Least Depth Determination

Least depth was determined using echosounding methods.

Target:	4454A
Date:	17 Octoberr 1988 (DOY 291)
Time:	1548 Z
Position:	615.6F

Least Depth Reading:	67.0 68.0 Ft.
Velocity Corrector:	2.6 +2.4
Effective Draft Corrector:	7.9 +7.5
PREDICTED Tidal Zone Cor:	-2.2 -2.3
	^{NIP} + 0.1
Actual Least Depth:	75.8 Ft.

(d) Target Positioning

This target's position was determined by scanning the fathograms for the least depth recorded over this area and selecting the following shoalest sounding.

Target:	4454A	/
HDAPS Position Numbers:	615.6F	/
Average Easting:	118937.0 E	/
Average Northing:	28166.6 N	/
Computed Latitude:	41° 00' 12.3 ²⁰ 15 " N	/
Computed Longitude:	73° 26' 29.6 ⁷⁰ 61 " W	/

(e) Target Recommendation

The following data have been collected for this target.

Target:	4454A
Description:	Wreck over which depth is known
Latitude:	41° 00' 12.3 ²⁰ 15 " N
Longitude:	73° 26' 29.6 ⁷⁰ 61 " W
Least Depth:	75.8 Feet
Surrounding	
Chart Depth:	85 Feet

Target 4454A should be charted as a wreck that is not dangerous to surface navigation, using symbol No. 16, section "O" (Dangers), Nautical Chart No. 1. *Chart as 75 Wk (barge) See also section 7.2.3 of The Evaluation Report.* ✓

IV. Target 4454B Investigation

(a) Target Echo Sounding Summary

Several "donut" shaped contacts were encountered during the side scan investigation of AWOIS item 4454. These contacts indicate a shadow in the center surrounded by a solid return. Shadow length of these contacts suggest large objects projecting several meters above the surrounding bottom. The fathogram indicates only a slight depression on the order of 1 to 2 feet. An investigation by divers and echosounder was conducted to determine the exact nature of these contacts. All "donut" contacts identified on the initial side scan sonar coverage have been tabulated below.

<u>DOY</u>	<u>Fatho Contact</u>	<u>Sonar Contact</u>
279	--	297.00P
279	--	298.20S
279	--	332.03S
279	--	347.25S
279	--	347.32S
293	--	835.14P
293	--	844.15P
293	--	844.25S

Contact 844.15S was chosen as representative of and investigated by echosounder and divers. Echo sounding lines were run to provide 100% coverage over the target area, and are summarized below.

<u>DOY</u>	<u>No. of Lines</u>	<u>Position Numbers</u>
294	3	888 - 903

Five meter spacing echosounding lines were run over this area.

(b) Target Description

The fathograms show Target 4454B to be a flat area approximately 12 meters across encircled by a 1 to 2 feet rise. Divers report that the flat area is composed of flat, slate type rock in a small area about 10 meters in diameter. Lobsters inhabit the many cracks and crevices created by these overlapping rocks. Surrounding this rocky area is a mound of silt projecting 1 - 2 feet above the bottom. These areas appear to be man made lobster havens. Due to the current action of the water, silt and sediment will not adhere to the rocks hence, the encircling mound. These items present no danger to navigation; no further investigation of the above contacts was conducted. *Concur. Do not chart.*

V. AWOIS Item 4454 Summary

Target 4454A appears to be the object as described in the AWOIS listing, due to its location and the depth of water. A positive statement to this effect cannot be made due to the large number of wrecks encountered in the area. A note should be added to the chart to indicate that the two discontinued dumping grounds bordering AWOIS item 4454 are foul with wrecks which present no danger to surface navigation. *Do not Concur. Discontinued dumping ground should be retained as charted. See sheet 1 of 10.*

AWOIS 6422

AWOIS ITEM 6422 INVESTIGATION

I. Area of Investigation

AWOIS Item: 6422
State: Connecticut
County: Fairfield
Locality: 1.1 nm SSW of Long Neck Point
Latitude: 41° 01' 11.00" N
Longitude: 73° 28' 58.00" W
Depth: Cleared to 25 feet

II. AWOIS Item Description

AWOIS item 6422 was located during survey H5142/31WD conducted in 1931 and is described as a 29 foot obstruction cleared by 25 feet. Survey requirements call for 200% sidescan coverage to a 75m radius for disproval, or diver investigation and least depth if found.

III. Survey Procedures

The following data summary reflects survey procedures used for investigating this item:

AWOIS Item: 6422
Positioning: Falcon Mini-Ranger
Sonar Search: 23 September 1988 (DOY 267)
Diving: 06 October 1988 (DOY 280)
Echo Sounding: 06 October 1988 (DOY 280)
13 October 1988 (DOY 287)
Sonification: 200% SSS coverage
Targets: One significant target: 6422A

There were no significant problems encountered with either the positioning or side scan sonar equipment.

All sidescan lines were run at a 75m range setting and coverage was good throughout. Several contacts were identified during this search, primarily rocks along a shoal which ran through the survey area. The dive investigation conducted on the most prominent rock, Target 6422A, is summarized below.

While deploying the marker buoy for a planned dive on another prominent rock (contact no.12.00P), the echosounder showed the nearby shoal to be shallower than the rock. Because of this, we cancelled the dive and instead ran echosounder lines at 25m spacing in order to define the limits of this shoal. After defining these limits, we then developed the shoal by running echosounder lines spaced 4m apart. This echosounder development produced a least depth much deeper than Target 6422A.

IV. Target 6422A Investigation

(a) Target Dive Summary

Target 6422A was investigated by divers on 6 October 1988 (DOY 280). Divers descended down the dive buoy line to a depth of 35 feet and

after a short search located a large rock. The buoy anchor was moved to the highest point on this rock and a 10 meter radius constant depth circle search was conducted about this point. Although numerous smaller rocks were observed, no shoaler obstructions were encountered. Divers obtained a least depth on this high point.

(b) Target Description

Target 6422A was found to be a large rock approximately 7 feet in diameter and projecting almost 4 feet off the bottom. The rock rested on a firm gravel bottom and was surrounded by many smaller rocks. The least depth was obtained from the rounded top of the rock.

This rock projected much less off the bottom than we had expected, based upon the target height which we had derived from the side scan acoustic shadow. However, because this rock rests upon a prominent shoal, the computed target height must be taken relative to the bottom surrounding this shoal. This accounts for the discrepancy between our computed target height and the actual target height observed by the divers.

(c) Least Depth Determination

Least depth of target 6422A was taken by divers with a pneumo depth gauge.

Target:	6422A
Date:	6 October 1988 (DOY 280)
Time:	1757 Z
Average Pneumo Depth:	33.1 Ft.
Pneumo Gauge Corrector:	+0.26
PREDICTED Tidal Zone Cor:	-1.22
Actual Least Depth:	32.0 31.9 Ft.

(d) Target Positioning

Three detached positions were taken as the ship drifted over the target that was marked by the dive buoy.

Target:	6422A			
HDAPS Position Numbers:	366-368			
Average Easting:	115521.3 E			
Average Northing:	29945.0 N			
Computed Latitude:	41° 01' 10.228" N			
Computed Longitude:	73° 28' 55.661" W			
Loran-C Rates:	9960-W	9960-X	9960-Y	9960-Z
Average Loran:	15290.7	26833.7	43991.2	60040.8

(e) Target Recommendation

The following data have been collected for this target.

Target:	6422A
Description:	Rock over which depth is known
Latitude:	41° 01' 10.228" N
Longitude:	73° 28' 55.661" W
Least Depth:	32.0 Feet
Surrounding	
Chart Depth:	25 Feet (as presently charted)

Target 6422A should be charted as a rock over which the depth is known, using symbol No. 5, Section "O", (Dangers) from Nautical Chart No. 1 at the prescribed location. *Concur. Chart as 32 RK*

V. AWOIS Item 6422 Summary

AWOIS item 6422, as reported, is considered disproved by diver investigation. The charting of this item should be updated as specified in the recommendations for Target 6422A. The ship ran tightly spaced echosounder development lines over the shoal which ran through this survey area, none of the lines produced a depth shallower than the least depth obtained on Target 6422A: Our search failed to locate any object at 29 feet. *Concur. Recommend the charted obstruction with a cleared wire drag depth of 25 feet (25, obstr) be removed from the chart. See sheet 2 of 10.*

2

AWOIS 6423

AWOIS ITEM 6423 INVESTIGATION

I. Area of Investigation

AWOIS Item: 6423
State: Connecticut
County: Fairfield
Locality: 1.6 nm S of Long Neck Point
Latitude: 41° 00' 36.00" N
Longitude: 73° 28' 54.00" W
Depth: Unknown (wreck)

II. AWOIS Item Description

AWOIS item 6423 is described in CL339/84 as a dangerous submerged wreck charted as a Position Approximate with a reported depth of 40 feet. The Corps of Engineers reports that this M/V sank on 7 December 1983. Survey requirements call for 200% sidescan coverage to a 500 meter radius for disproval, or diver investigation and least depth if found.

III. Survey Procedures

The following data summary reflects survey procedures used for investigating these items:

AWOIS Item: 6423
Positioning: Falcon Mini-Ranger
Sonar Search: 26 September 1988 (DOY 270)
3 & 5 October 1988 (DOY 277, 279)
Diving: 3 October 1988 (DOY 277)
Echo Sounding: N/A
Sonification: 100% SSS coverage
Targets: One significant target: 6423A

There were no significant problems encountered with either the positioning or side scan sonar equipment.

One significant contact was identified on the 100% side scan sonar coverage. This contact was investigated by divers, a least depth and position were determined.

IV. Target 6423A Investigation

(a) Target Dive Summary

Target 6423A was investigated by divers on 3 October 1988 (DOY 277). Divers descended down the marker buoy line to to the bottom at 60 feet. A circle search of 10 meter radius was conducted about the marker buoy anchor. The hull of a tug boat was located on this

search at 50 feet depth. Divers ascended the hull to the bow and began a search of the entire wreck. A least depth was obtained by pneumo depth gauge.

(b) Target Description

Target 6423A is a tug boat resting upright on a flat bottom. Its length as determined by sonargram is 65 feet. A thorough search of this wreck by divers found the least depth to be on a stanchion atop the pilot house. There are no masts or spars rising above this point. The deck house appears to be of steel construction.

(c) Least Depth Determination

Least depth of target 6423A was taken by divers with a pneumo depth gauge.

Target:	6423A
Date:	3 October 1988 (DOY 277)
Time:	1743 Z
Average Pneumo Depth:	46.2 Ft.
Pneumo Gauge Corrector:	+0.2
PREDICTED Tidal Zone Cor:	-2.0
Actual Least Depth:	44.4 Ft.

(d) Target Positioning

Three detached positions were taken as the ship drifted over the target that was marked by the dive buoy.

Target:	6423A			
HDAPS Position Numbers:	230-233			
Average Easting:	115491.3 E			
Average Northing:	28598.6 N			
Computed Latitude:	41° 00' 26.580" N			
Computed Longitude:	73° 28' 57.067" W			
Loran-C Rates:	9960-W	9960-X	9960-Y	9960-Z
Average Loran:	15292.1	26831.9	43984.6	60038.2

(e) Target Recommendation

The following data have been collected for this target.

Target: 6423A (Wreck)
Description: Wreck with known depth
Latitude: 41° 00' 26.580" N
Longitude: 73° 28' 57.067" W
Least Depth: 44.9 Feet - 70
Surrounding
Chart Depth: 69 Feet

Target 6423A should be charted as a wreck over which the depth is known, using symbol No.15, Section "O", (Dangers) from Nautical Chart No.1 at the prescribed location. *Concur. Chart as 44 Wk (tug)*

V. AWOIS Item 6423 Summary

AWOIS item 6423, as reported, is considered verified by diver investigation. The charting of this item should be updated as specified in the recommendations for Target 6423A. *Concur. Recommend the charted dangerous sunken wreck with the notation 40ft rep 1984 be removed from the chart. See sheet 3 of 10.*

AWOIS 6802

AWOIS ITEM 6802 INVESTIGATION

I. Area of Investigation

AWOIS Item: 6802
State: Connecticut
County: Fairfield
Locality: Cable and Anchor Reef
Latitude: 41° 00' 49.97' N
Longitude: 73° 25' 19.85' W
Depth: 22 feet cleared in 1931

II. AWOIS Item Description

AWOIS 6802 is identified as a 25 feet sounding over boulders with a cleared depth of 22 feet from project H5142/31WD. Survey requirements call for 200% sidescan coverage to a 75 meter radius for disproval, echosounder development or diver investigation and least depth if found.

III. Survey Procedures

The following data summary reflects survey procedures used for investigating this item:

AWOIS Item: 6802
Positioning: Falcon Mini-Ranger
Sonar Search: 15 October, 1988 (DOY 289)
Diving: 04 November, 1988 (DOY 309)
Echo Sounding: 18, 19 October 1988 (DOY 292, 293)
Sonification: 200% at 75 meter radius
Targets: One significant target: 6802 A

There were no significant problems encountered with either the positioning or side scan sonar equipment.

The 200% side scan sonar coverage indicated a rocky shoal within the the search area. This shoal was developed by echosounder. A "questionable" trace was detected on the fathogram which rose above the bottom 5 feet. This "questionable" trace appeared to be a school of fish, however the corrected least depth and location matched the AWOIS description for item 6802. A dive at this site and additional echosounding development yielded no indication of this trace. A complete discussion of this item is contained under Target 6802A.

IV. Target 6802A Investigation

(a) Target Echo Sounding Summary

Target 6802A was identified while conducting echosounder development of the shoal identified on the initial side scan coverage. The position number is stated below.

<u>DOY</u>	<u>Fatho Contact</u>	<u>Sonar Contact</u>
292	704.30F	--

Echo sounding lines were run to provide 100% coverage over the target area and also determine the extent of shoaling or fouling. Echo sounding development is summarized below.

<u>DOY</u>	<u>No. of Lines</u>	<u>Position Numbers</u>
292	18	657 - 753
293	8	754 - 783

Two meter spacing was used on this echosounding development.

(b) Diving Operations

To investigate contact 704.30F a dive was conducted at the following location.

<u>DOY</u>	<u>Position Numbers</u>
309	¹ 276 - ² 278

On 4 November, 1988 a dive buoy was deployed in the vicinity of fathometer contact number 704.30F. Divers descended down this line to a depth of 35 feet and conducted a 10 meter radius circle search about this point. No highpoints were encountered during the search, only small rocks which rose above the bottom approximately 1 foot. Divers ascended and dive operations were complete. The RUDE was then positioned alongside the dive buoy and three detached positions were obtained to mark the location of the dive.

(c) Target Description

Target 6802A was found to be a large rocky shoal. The shoal rose gradually to a flattened peak; no further projections were evident. Divers describe the shoal as composed of rocks 1 to 2 feet in diameter.

(d) Least Depth Determination

Least depth was determined using echosounding methods.

Target:	6802A
Date:	18 October 1988 (DOY 292)
Time:	1828 Z
Position:	714.99F
Least Depth Reading:	23.6 Ft.
Velocity Corrector:	+0.6 1.0
Effective Draft Corrector:	+7.5 7.9
PREDICTED Tidal Zone Cor:	-4.3 4.4 ----- HD - .2
Actual Least Depth:	27.4 Ft.

(e) Target Positioning

This target's position was determined by scanning the fathograms for the least depth recorded over this area and selecting the following shoalest sounding.

Target:	6802A
HDAPS Position Numbers:	714.99F
Average Easting:	120593.9 E
Average Northing:	29399.5 N
Computed Latitude:	41° 00' 52. ¹⁷ 37" N
Computed Longitude:	73° 25' 18.6 ₂ 12" W

(f) Target Recommendation

The following data have been collected for this target.

Target:	6802A (Shoal)
Description:	Shoal over which depth is known
Latitude:	41° 00' 52. ¹⁷ 37" N
Longitude:	73° 25' 18.6 ₂ 12" W
Least Depth:	27.4 Feet
Surrounding	28.0
Chart Depth:	22 Feet

Target 6802A should be charted as a 2⁸ foot sounding. The presently charted 22 feet cleared depth symbol should be removed from the chart. *Concor. The notation should be charted as shown on the present survey. See sheet 4 of 10.* *on a shoal*

V. AWOIS Item 6802 Summary

AWOIS item 6802 is considered disproved by 200% side scan sonar coverage and echosounder development. The least depth obtained on this survey is ⁶⁵ feet greater than the presently charted ^{WIRE DRAG CLEARANCE} depth. An extensive investigation was conducted on a "questionable" fathometer trace which turned out to be a school of fish. The chart should be updated as per the recommendations above. *CONCOR. See sheet 4 of 10.* ✓

AWOIS 6803

AWOIS ITEM 6803 INVESTIGATION

I. Area of Investigation

AWOIS Item: 6803
State: Connecticut
County: Fairfield
Locality: 1.5 nm ESE Long Neck Point
Latitude: 41° 01' 31.56" N
Longitude: 73° 26' 44.73" W
Depth: Cleared to 29 feet

II. AWOIS Item Description

AWOIS item 6803 is a 31 foot sounding identified as small boulders. It was identified during survey H5142/31WD and was cleared at a 29 foot depth. Present survey requirements are for 200% sidescan coverage to a 75m radius for disproval or diver investigation and least depth if found.

III. Survey Procedures

The following data summary reflects survey procedures used for investigating this item:

AWOIS Item: 6803
Positioning: Falcon Mini-Ranger
Sonar Search: 26 September 1988 (DOY 270)
3 November 1988 (DOY 308)
Diving: None
Echo Sounding: 26-27 September 1988 (DOY 270, 271)
Sonification: 400% total SSS coverage
200% @ E/W line scheme
200% @ N/S line scheme
Targets: No significant contacts

There were no significant problems encountered with either the positioning or side scan sonar equipment.

No significant contacts were identified during the initial 200% sidescan coverage, however a shoal area was evident on the echosounder trace. We then ran multiple echosounder development lines at 3m spacing in order to define the limits of the shoal and determine its least depth. Approximately 35 lines were run, encompassing a large portion of the required search area. These lines were run in the echosounder mode so heave correctors were applied to the data in post-processing.

Because of uncertainty over the quality of our initial sidescan coverage, we completed an additional 200% sidescan coverage towards the end of this project; again, no significant contacts were identified.

IV. Target 6803A Investigation

(a) Target Echo Sounding Summary

Echo sounding lines were run to provide 100% coverage over the target area and also determine the extent of shoaling or fouling. Echo sounding development is summarized below.

<u>DOY</u>	<u>No. of Lines</u>	<u>Position Numbers</u>
270	4	52 - 65
271	32	66 - 229

Three meter spacing echosounding lines were run over this area.

(b) Target Description

Target 6803A was found to be a large rocky shoal projecting approximately 7 feet above the surrounding bottom. The shoal rose gradually to a flattened peak; no further projections were evident rising from this shoal.

(c) Least Depth Determination

Least depth was determined using echosounding methods.

Target:	6803A
Date:	27 September 1988 (DOY 271)
Time:	1317 Z
Position:	83.70F
Least Depth Reading:	29.2 ⁰ Ft.
Velocity Corrector:	+1.2
Effective Draft Corrector:	+7.49
PREDICTED Tidal Zone Cor:	-2.6 / 3.2
	H.P. = 8.6
Actual Least Depth:	35.2 Ft.
	34.3

(d) Target Positioning

This target's position was determined by scanning the fathograms for the least depth recorded over this area and selecting the following shoalest sounding.

Target:	6803A
HDAPS Position Numbers:	83.70F
Average Easting:	118578.4 E
Average Northing:	30607.2 N
Computed Latitude:	41° 01' 31.462" N
Computed Longitude:	73° 26' 44.741" W

(e) Target Recommendation

The following data have been collected for this target.

Target:	6803A (Shoal)
Description:	Shoal over which depth is known
Latitude:	41° 01' 31.462" N
Longitude:	73° 26' 44.741" W
Least Depth:	35.2 Feet - 9
Surrounding	34.0
Chart Depth:	29 Feet

Target 6803A should be charted as a rock over which the depth is known, using symbol No. 5, section "O" (Dangers), Nautical Chart No. 1. *Do not correct. See section 6.6.3) of the Evaluation report.*

V. AWOIS Item 6803 Summary

AWOIS item 6803, as reported, is considered verified by echosounder development. The charting of this item should be updated as specified in the recommendation for Target 6803A. In addition to 400% sidescan coverage of this area, we ran tightly spaced echosounder development lines over the shoal which comprizes AWOIS item 6803. Our recommended least depth is 6 feet greater than the presently charted, wire drag clearance depth of 29 feet. *- Do not correct. See section 6.6.3) of the Evaluation Report. See sheet 5 of 10.*

AWOIS 6804

AWOIS ITEM 6804 INVESTIGATION

I. Area of Investigation

AWOIS Item: 6804
State: Connecticut
County: Fairfield
Locality: 1.2 nm SW of Long Neck Point
Latitude: 41° 01' 46.19" N
Longitude: 73° 27' 14.18" W
Depth: 34 feet cleared to 31 feet

II. AWOIS Item Description

AWOIS item 6804 is reported as a 34 feet sounding on rocks, cleared to 31 feet. This data is from project H5142/31WD conducted in 1931. Present survey requirements are to determine if this feature exists and measure least depth if found, or disapproval through 200% side scan coverage at a 75 meter search radius.

III. Survey Procedures

The following data summary reflects survey procedures used for investigating this item:

AWOIS Item: 6804
Positioning: Falcon Mini-Ranger
Sonar Search: 12 October 1988 (DOY 286)
3 November 1988 (DOY 308)
Diving: None
Echo Sounding: 12 October 1988 (DOY 286)
9 November 1988 (DOY 314)
Sonification: 200% coverage, 75 meter radius
Targets: One significant target

There were no problems encountered with either the positioning or side scan sonar equipment.

200% side scan sonar coverage indicated a large rocky shoal within the search area. Two contacts appeared to have a "boat like" image on the sonagram. 100% echosounding coverage was conducted in the vicinity of these contacts and a least depth was obtained by scanning the fathograms. These data are compiled as Target 6804A. Additional side scan coverage was conducted on the "boat like" contacts (428.27S and 436.15S) to determine if these were indeed boats. These data were not plotted. The search was conducted to

determine whether any wreckage existed in this area. The sonargrams show no man made features nor wreckage in this area.

An additional contact was identified from the sonargrams and reconnaissance echosounding was conducted. These data are compiled as Target 6804B.

IV. Target 6804A Investigation

(a) Target Echo Sounding Summary

Target 6804A was first identified at the following locations during the initial side scan search.

<u>DOY</u>	<u>Fatho Contact</u>	<u>Sonar Contact</u>
286 ✓	-	428.27S ✓
286 ✓	-	436.15S ✓

Echo sounding lines were run to provide 100% coverage over the target area and also determine the extent of the shoal indicated on the sonargrams. Echo sounding development is summarized below.

<u>DOY</u>	<u>No. of Lines</u>	<u>Position Numbers</u>
286 ✓	11 ✓	442 ✓ - 496 ✓

Four meter spacing echosounding lines were run over this area.

(b) Target Description

Target 6804A was found to be an irregular rocky feature. The item appears to be a rocky shoal rising 14 feet off the bottom.

(c) Target Least Depth Determination

Least depth was determined using echosounding methods.

Target:	6804A
Date:	12 October, 1988 (DOY 286)
Time:	1706 Z
Position:	458.99F
Least Depth Reading:	32.8 Ft.
Velocity Corrector:	+1.2
Effective Draft Cor:	+7.59
PREDICTED Tidal Zone Cor:	-7.50
Actual Least Depth:	34.0 Ft.

(d) Target Positioning

This target's position was determined by scanning the fathograms for the least depth recorded over this area and selecting the following shoalest sounding.

Target:	6804A
HDAPS Position Number:	458.99F
Easting:	117914.3 E
Northing:	31046.6 N
Computed Latitude:	48° 01' 45.759" N
Computed Longitude:	73° 27' 13.122" W

(e) Target Recommendation

It is recommended that target 6804A be charted as a sounding over a rock, using symbol No.5, section "O" (Dangers), Nautical Chart No.

1. See section 6.6.4) of the Evaluation Report.

IV. Target 6804B Investigation

(a) Target Echo Sounding Summary

Target 6804B was first identified at the following location during a side scan search for contact numbers 428.27S and 436.15S.

<u>DOY</u>	<u>Fatho Contact</u>	<u>Sonar Contact</u>
308	-	1244.34P

Two echosounding lines were run over Target 6804B. Echosounding development is summarized below.

<u>DOY</u>	<u>No. of Lines</u>	<u>Position Numbers</u>
314	2	1299 - 1307

Four meter spacing echosounding lines were run over this area.

(b) Target Description

This target is a small rock ^{rising} ~~raising~~ 3 feet off the surrounding bottom. It is insignificant as it is located at the edge of the shoal which comprizes Target 6804A.

(c) Target Least Depth Determination

Least depth was determined using echosounding methods.

Target:	6804B
Date:	9 November, 1988 (DOY 314)
Time:	1904 Z
Position:	1303.15F
Least Depth Reading:	43.8 Ft.
Velocity Corrector:	+1.6
Effective Draft Cor:	+7.5
PREDICTED Tidal Zone Cor:	-3.1
Actual Least Depth:	49.8 Ft.

(d) Target Positioning

This target's position was determined by scanning the fathograms for the least depth recorded over this area and selecting the following shoalest sounding.

Target:	6904A
HDAPS Position Number:	1303.15F
Easting:	117752.4 E
Northing:	31029.0 N
Computed Latitude:	48° 01' 45.201" N
Computed Longitude:	73° 27' 20.055" W

(e) Target Recommendation

Target 6804B lies at the edge of a rocky shoal which has a least depth of 45 feet. This item is insignificant as the nearby shoal is much shoaler. No symbol needs to be charted for Target 6804B. *Concur.* ✓

VI. AWOIS Item 6804 Summary

Two significant contacts were identified on AWOIS item 6804. Target 6804A is the item as cited in the AWOIS listing. The present survey position of this item differs by 28 meters from the historical position. A second contact, Target 6804B was investigated by echosounder, and is found to be insignificant. The chart should be updated to reflect the position of item 6804A as specified in the target recommendation. *Concur. See also section 6.b.4) of the EVALUATION Report. See sheet 6 of 10.* ✓

AWOIS 6805

AWOIS ITEM 6805 INVESTIGATION

I. Area of Investigation

AWOIS Item: 6805
State: Connecticut
County: Fairfield
Locality: 1.2 nm SSE of Sheffield Island
Latitude: 41° 01' 47.0" N
Longitude: 73° 24' 37.0" W
Depth: 33 feet reported in 1986

II. AWOIS Item Description

AWOIS 6805 is described as a sunken tugboat and barge in 60 feet of water with approximate clearance of 33 feet. Present survey requirements call for 200% sidescan coverage to a 700 meter radius for disproval, or diver investigation and least depth if found.

III. Survey Procedures

The following data summary reflects survey procedures used for investigating this item:

AWOIS Item: 6805
Positioning: Falcon Mini-Ranger
Sonar Search: N/A item marked by surface buoy
Diving: 18 October, 1988 (DOY292)
Echo Sounding: N/A
Sonification: N/A
Targets: One significant target: 6805A

There were no significant problems encountered with either the positioning or side scan sonar equipment.

AWOIS item 6805 is known as the CELTIC by local divers. Several divers informed the RUDE of the position of the CELTIC and noted that a surface buoy marked the location of the wreck. Local knowledge indicates that the CELTIC was towing a barge loaded with scrap metal when both sank in 1986.

On 18 October (DOY292) RUDE located the CELTIC by positioning herself alongside the surface marker buoy (placed by local sport divers). The echosounder indicated an object rising approximately 40 feet off the bottom in 70 feet of water. Two passes with the side scan sonar were made along the wreckage indicating a tug and barge. The sonargram showed that the tug had settled with her stern resting on the barge. Divers investigated this item and obtained a least depth by pneumo depth gauge.

IV. Target 6805A Investigation

(a) Target Dive Summary

On 18 October 1988 divers descended down the existing marker buoy line to the bow of the CELTIC at a depth of approximately 55 feet. Divers conducted a search of the forward portion of the wreck and found the least depth to be on a stanchion atop the pilot house. No masts, spars or cranes protruded above the top of the pilot house. A least depth was obtained by pneumo depth gauge.

Divers conducted a second dive searching the remainder of the tug and the barge. The barge lies upright against the stern of the tug. No objects protrude above the sides of the barge. The least depth obtained on the stanchion atop the pilot house is indeed the shoalest sounding on this wreckage.

(b) Target Description

AWOIS item 6805 was found to be the wreckage of a tug and tow. Both lay upright in approximately 70 feet of water. The barge is loaded with scrap metal. Most of the hatches and all removable fixtures have been scavenged by divers.

(c) Target least Depth Determination

Least depth was taken by divers with a pneumo depth gauge.

Target:	6805A
Date:	October 18, 1988 (DOY 292)
Time:	1515 Z
Average Pneumo Depth:	33.6 Ft.
Pneumo Gauge Corrector:	+0.2
PREDICTED Tidal Zone Cor:	-1.34
Actual Least Depth:	32.5 Ft.

(d) Target Positioning

Three detached positions were taken as the ship drifted over the target.

Target:	6805A ✓			
HDAPS Position Numbers:	653-655 ✓			
Average Easting:	121595.6 E ✓			
Average Northing:	31140.6 N ✓			
Computed Latitude:	41° 01' 48.485" N ✓			
Computed Longitude:	73° 24' 35.522" W ✓			
Loran C Rates:	9960-W	9960-X	9960-Y	9960-Z
Average Loran:	15261.7 ✓	26798.6 ✓	43989.7 ✓	60036.8 ✓

(e) Target Recommendation

It is recommended that Target 6805A be charted as a sounding over a wreck with a least depth of 32 feet using symbol No. 15, section "O" (Dangers) from Nautical Chart No. 1 at the prescribed position. *Concur.*
Chart as a dangerous sunken wreck with a least depth of 32 feet (32 WK "CELTIC" in the position found by the present survey. See sheet 7 of 10. ✓

V. AWOIS Item 6805 Summary

AWOIS item 6805 was located by echosounder. Divers conducted a thorough investigation and obtained a least depth by pneumo depth gauge. This item should be charted as per the above recommendation. *Concur. Delete the charted dangerous sunken wreck, PA and the notation "33 ft rep 1986".* ✓

AWOIS 6913

AWOIS ITEM 6913 INVESTIGATION

I. Area of Investigation

AWOIS Item: 6913
 State: Connecticut
 County: Fairfield
 Locality: 2.2 nm E of Cockenoe Island
 Latitude: 41° 04' 44.50" N
 Longitude: 73° 18' 26.10" W
 Depth: 34 feet cleared to 31 feet

II. AWOIS Item Description

AWOIS item 6913 is described as a 34 feet sounding taken on wreckage and cleared to 31 feet during project CL821/32. Present survey requirements call for 200% sidescan coverage to a 200 meter radius for disproval, or diver investigation and least depth if found.

III. Survey Procedures

The following data summary reflects survey procedures used for investigating this item:

AWOIS Item: 6913
 Positioning: Falcon Mini-Ranger
 Sonar Search: 14, 16 & 18 November 1988 (DOY 319, 321, 323)
 Diving: N/A
 Echo Sounding: N/A
 Sonification: 200% coverage at 200 meter radius
 Targets: No significant targets

There were no significant problems encountered with either the positioning or side scan sonar equipment.

200% side scan coverage was conducted on this item. No significant contacts were identified. The two lines of side scan coverage data gathered on 18 November, (DOY 323) were inadvertently lost. These data were gathered on a raw data tape that was misplaced before processing. To verify the side scan coverage of these two lines the on-line swath plot must be used. All other side scan coverage data has been retained on both the raw data and edited data tapes.

No significant contacts were identified. This item is considered disproved. *Do not concur!*

V. AWOIS Item 6913 Summary

200% side scan coverage was conducted on this item, no significant contacts were identified. The presently charted symbol representing AWOIS item 6913 should be removed from the chart. *Do not concur.*
See sections 4.6 and 7.2.4) of the Evaluation Report.

See sheet 8 of 10.

CABLE & ANCHOR REEF

CABLE AND ANCHOR REEF INVESTIGATION

I. Area of Investigation

Item: Cable and Anchor Reef
State: Connecticut
County: Fairfield
Locality: Cable and Anchor Reef
Latitude: 41° 00' 30" N
Longitude: 73° 25' 12" W
Depth: 22 Feet

II. Item Description

Loran C coordinates of several wrecks within the project area were submitted to RUDE by Richard Taracka, Head of the Greenwich, Connecticut Police Diving Unit. Mr. Taracka is an avid sport diver who has explored most of the local wrecks within Long Island Sound. These positions were plotted on the chart and those near assigned AWOIS items were investigated. Four of these wreck positions plotted near AWOIS item 6802, these are discussed in this report.

III. Survey Procedures

The following data summary reflects survey procedures used for investigating this item:

Item: Cable & Anchor Reef
Positioning: Falcon Mini-Ranger
Sonar Search: 19 & 24 Octber, 1988 (DOY 293,298)
Diving: N/A
Echo Sounding: 26 & 27 October, 1988 (DOY 300,301)
Sonification: N/A
Targets: Five significant targets: ALPHA1, ALPHA2, BRAVO1, BRAVO2 & CHARLIE

There were no significant problems encountered with either the positioning or side scan sonar equipment.

100% side scan sonar coverage was completed in two areas surrounding the plotted positions of these reported wrecks. All contacts indicated as significant on the sonargram were investigated by echosounder. Descriptions of these investigations follow.

IV. Target "ALPHA" investigation

Target area "ALPHA" consisted of 2 items with Loran-C rates listed below. These two items were echosounder developed and plotted on plotter sheet no. 33, and are denoted as "ALPHA1" and "ALPHA2".

Item	9960 - X	9960 - Y	<i>AW015 #</i>
ALPHA 1	26797.9	43977.6	7668
ALPHA 2	26797.7	43976.1	7678

(a) Target "ALPHA1" Echo Sounding Summary

Target "ALPHA1" was first identified at the following location during the initial side scan search.

DOY	Fatho Contact	Sonar Contact
293	-	873.21P

Echo sounding lines were run to provide 100% coverage over the above target. Echo sounding development is summarized below.

DOY	No. of Lines	Position Numbers
301	4	1101 - 1117

Four meter spacing echosounding lines were run over this area. This data is plotted on plotter sheet no. 33.

(b) Target Description

Target "ALPHA1" appears to be a rock, the fathogram indicates that it ~~raises~~ ^{*11523*} 8 feet off the bottom. *CONCVR.*

(c) Target Least Depth Determination

Least depth was detremined using echosounding methods.

Target:	"ALPHA1"
Date:	27 October, 1988 (DOY 301)
Time:	1354Z
Position:	1106.6F
Least Depth Reading:	44.4 Ft.
Velocity Corrector:	+1.46
Effective Draft Cor:	+7.59
PREDICTED Tidal Zone Cor:	-3.46
Actual Least Depth:	49.9 Ft. 50.3

(d) Target Positioning

This target's position was determined by scanning the fathograms for the least depth recorded over this area and selecting the following shoalest sounding.

Target: "ALPHA1"
 HDAPS Position Number: 1106.6F
 Easting: 121305.6 E
 Northing: 28751.8 N
 Computed Latitude: 41° 00' 31.078" N
 Computed Longitude: 73° 24' 48.223" W

(e) Target Recommendation

It is recommended that target "ALPHA1" not be charted as it plots near a presently charted ~~34 feet~~ ^{54 foot} sounding. *Do not concor. Chart as 50Rk* ✓
See sheet 9. of 10.

(a) Target "ALPHA2" Echo Sounding Summary

Target "ALPHA2" was first identified at the following location during the initial side scan search.

DOY	Fatho Contact	Sonar Contact
293	-	861.15P

Echo sounding lines were run to provide 100% coverage over the above target. Echo sounding development is summarized below.

DOY	No. of Lines	Position Numbers
300	9	1032 - 1076
301	5	1077 - 1100

Four meter spacing echosounding lines were run over this area. This data is plotted on plotter sheet no. 33.

(b) Target Description

Target "ALPHA2" appears to be a rock. The fathogram indicates that it ~~raises~~ ¹¹⁵⁸⁵ 7 feet off the bottom. *Concor* ✓

(c) Target Least Depth Determination

Least depth was determined using echosounding methods.

Target:	"ALPHA2"
Date:	27 October, 1988 (DOY 301)
Time:	1339 Z
Position:	1098.9F
Least Depth Reading:	49.1 Ft.
Velocity Corrector:	+1.68
Effective Draft Cor:	+7.59
PREDICTED Tidal Zone Cor:	-2.6 = 3.0
Actual Least Depth:	55.6 Ft.

(d) Target Positioning

This target's position was determined by scanning the fathograms for the least depth recorded over this area and selecting the following shoalest sounding.

Target:	"ALPHA2"
HDAPS Position Number:	1098.9F
Easting:	121438.3 E
Northing:	28512.4 N
Computed Latitude:	41° 00' 23.302" N
Computed Longitude:	73° 24' 42.584" W

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(e) Target Recommendation

It is recommended that target "ALPHA2" be charted as a ^{56-foot}~~55 feet~~ sounding and the 10 fathom curve encircling Cable and Anchor Reef be amended to include this sounding. ~~The area is well marked as foul with rocks. A rock symbol would be redundant and serve no useful purpose to the mariner. Concur. Chart as 56Rk. See sheet 9 of 10.~~ + ✓

IV. Target "BRAVO" Investigation

Target area "BRAVO" is the same general area as "ALPHA" above, however the echosounding development was conducted on a separate plotter sheet. "BRAVO" is plotted on plotter sheet no. 32. Two areas were developed by echosounder and are denoted as "BRAVO1" and "BRAVO2".

(a) Target "BRAVO1" Echo Sounding Summary

Targets within area "BRAVO1" were first identified at the following locations during the initial side scan search.

<u>DOY</u>	<u>Fatho Contact</u>	<u>Sonar Contact</u>
293 ✓	-	865.28P ✓
293 ✓	-	865.31P ✓

Echo sounding lines were run to provide 100% coverage over the above targets. Echo sounding development is summarized below.

<u>DOY</u>	<u>No. of Lines</u>	<u>Position Numbers</u>
301 ✓	9 ✓	1118 ✓ - 1149 ✓

Four meter spacing echosounding lines were run over this area. This data is plotted on plotter sheet no. 32.

(b) Target Description

Target "BRAVO1" appears to be a rock. The sonargram and fathogram are not conclusive as to what this target is. It ^{lies} ~~raises~~ 7 feet off the surrounding bottom as determined by the fathogram.

(c) Target Least Depth Determination

Least depth was detremined using echosounding methods.

Target:	"BRAVO1"
Date:	27 October, 1988 (DOY 301) ✓
Time:	1421 ✓
Position:	1119.3F ✓
Least Depth Reading:	44.5 ✓ Ft.
Velocity Corrector:	+1.28
Effective Draft Cor:	+7.59
PREDICTED Tidal Zone Cor:	-4.34
Actual Least Depth:	49.1 ✓ 8 Ft..

(c) Target Least Depth Determination

Least depth was determined using echosounding methods.

Target:	"BRAVO2"
Date:	27 October, 1988 (DOY 301)
Time:	1839 -
Position:	1152.1F -
Least Depth Reading:	61.5 Ft.
Velocity Corrector:	+2.24
Effective Draft Cor:	+7.5 A
PREDICTED -Tidal Zone Cor:	-7.2 -6.6
Actual Least Depth:	64.0 Ft. 65.2

(d) Target Positioning

This target's position was determined by scanning the fathograms for the least depth recorded over this area and selecting the following shoalest sounding.

Target:	"BRAVO2"
HDAPS Position Number:	1152.1F -
Easting:	120932.2 E -
Northing:	28120.7 N -
Computed Latitude:	41° 00' 10.652" N -
Computed Longitude:	73° 25' 04.298" W -

7762
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(e) Target Recommendation

It is recommended that target "BRAVO2" be charted as a sounding over a wreck with a least depth of 64.5 feet using symbol No. 15, section "O" (Dangers), Nautical Chart No. 1. *Concurr. Chart as 65 Wk.*

IV. Target "CHARLIE" Investigation

See sheet 90 P. 10.

Target area "CHARLIE" consisted of 2 items with Loran-C rates as follows.

<u>9960 - X</u>	<u>9960 - Y</u>
26798.9 -	43983.6 -
26799.1 -	43983.8 -

} AWOIS #
7405

(a) Target Echo Sounding Summary

The target within area "CHARLIE" was first identified at the following location during the initial side scan search.

<u>DOY</u>	<u>Fatho Contact</u>	<u>Sonar Contact</u>
298	-	1015.05P

Echo sounding lines were run to provide 100% coverage over the target area and is summarized below.

<u>DOY</u>	<u>No. of Lines</u>	<u>Position Numbers</u>
301	10	1183 - 1221

Four meter spacing echosounding lines were run over this area.

(b) Target Description

Target "CHARLIE" appears to be the wreckage of a vessel with dimensions (scaled from the sonargram) of 55 x 15 meter. It ^{raises} ~~raises~~ 12 feet off the bottom.

(c) Target Least Depth Determination

Least depth was determined using echosounding methods.

Target:	"CHARLIE"
Date:	27 October, 1988 (DOY 301)
Time:	1954 Z
Position:	1186.2F
Least Depth Reading:	49.3 Ft.
Velocity Corrector:	+1.66
Effective Draft Cor:	+7.59
<u>PREDICTED</u> Tidal Zone Cor:	-5.0 -4.4
Actual Least Depth:	33.4 Ft. 54.6

(d) Target Positioning

This target's position was determined by scanning the fathograms for the least depth recorded over this area and selecting the following shoalest sounding.

Target:	"CHARLIE"
HDAPS Position Number:	1186.2F -
Easting:	121191.8 E -
Northing:	29782.9 N -
Computed Latitude:	40° 01' 04.510" N -
Computed Longitude:	73° 24' 52.976" W -

(e) Target Recommendation

It is recommended that target "CHARLIE" be charted as a sounding over a wreck with a least depth of 53¹/₂ feet using symbol No. 15, section "O" (Dangers), Nautical Chart No. 1. *Concur. Chart as 54 WK.* ✓ +

VI. CABLE & ANCHOR REEF Summary

Five significant targets were identified within the area searched by side scan sonar on this item. Specific recommendations have been made for the five investigated targets. Discussions with local fishermen and sport divers indicate that many more wrecks lie on the bottom in the area west of Cable and Anchor Reef. A basic hydrographic survey should be conducted in this area to determine the possible dangers to navigation these wrecks present. *Concur.* ✓

See Sheet 9 of 10.

AWOIS 6429 & 6428

AWOIS ITEM 6429 & 6428 INVESTIGATION

I. Area of Investigation

AWOIS Item: 6429
State: Connecticut
County: Fairfield
Locality: 0.5 nm SE Long Neck Point
Latitude: 41° 01' 56.00" N
Longitude: 73° 28' 08.00" W
Depth: Unknown (wreck)

AWOIS Item: 6428
State: Connecticut
County: Fairfield
Locality: 0.6 nm NE Long Neck Point
Latitude: 41° 02' 24.30" N
Longitude: 73° 28' 01.30" W
Depth: 12 feet (wreck)

II. AWOIS Item Description

AWOIS item 6429 was first reported in the 3rd USCG District Local Notice to Mariners, volume 37/71, dated September 02, 1971. It is described as a sailboat 31 feet in length and is charted as a submerged dangerous wreck with position approximate. Survey requirements are for 200% sidescan coverage to a 1000m radius (or the limits of safe navigation) for disproval or diver investigation and least depth if found.

AWOIS item 6428 was located during survey H5219/32WD and is described as a 12 foot sounding taken on a hang identified as wreckage. Survey requirements call for 200% sidescan coverage to a 75m radius for disproval, or diver investigation and least depth if found.

III. Survey Procedures

The following data summary reflects survey procedures used for investigating these items:

AWOIS Item: 6429 & 6428
Positioning: Falcon Mini-Ranger
Sonar Search: 20 October 1988 (DOY 294)
28 October 1988 (DOY 302)
Diving: 28 October 1988 (DOY 302)
4 November 1988 (DOY 309)
Echo Sounding: No echo sounding development
Sonification: 200% SSS coverage to safe navigation limit.
Targets: Two significant targets: 6429A, 6429B

There were no significant problems encountered with either the positioning or side scan sonar equipment.

Because of their close proximity, the search for these two items was run concurrently. Sidescan lines were run parallel to the shoals that extend seaward from Long Neck Point. We began at the outside of the required search area and worked our way towards the center, running lines spaced to provide 200% coverage; this allowed us to detect potentially hazardous shoal areas before running directly over them. We ran these lines at the 100m range setting and coverage was generally good throughout; a shoal on the northwest portion of the search area did reduce the effective range in this area. We eventually completed sidescan coverage over half of the required search area; we felt this was the safe navigation limit.

We also attempted to run two lines in the vicinity of AWOIS 6428, but shallow depths and the risk of obstructions limited our effectiveness in this area.

IV. Target 6429A Investigation

(a) Target Dive Summary

Target 6429A was investigated by divers on 28 October 1988 (DOY 302). Divers descended down the dive buoy line to a depth of 50 feet and found a small partially buried wreck resting upright on a silty bottom. Divers swam around the perimeter of the wreck, searching for a high point and any identifying marks. The buoy anchor was moved to the highest point on this wreck and a 10 meter radius constant depth circle search was conducted about this point. No shoaler obstructions were encountered during this search. Divers obtained a least depth on this high point.

(b) Target Description

Target 6429A was found to be a wooden cabin cruiser approximately 22 feet long and 6 feet wide. The wreck was largely buried in the silty bottom and only projected two to three feet off the bottom. The least depth was obtained from a portion of the deteriorated cockpit which projected slightly above the rest of the deck. The wreck was covered with marine growth, and no identifying marks were visible on or around the wreckage.

(c) Least Depth Determination

Least depth of target 6429A was taken by divers with a pneumo depth gauge.

Target: 6429A
 Date: 28 October 1988 (DOY 302)
 Time: 1314 Z
 Average Pneumo Depth: 48.3 Ft.
 Pneumo Gauge Corrector: +0.2
~~PREDICTED Tidal Zone Cor:~~ ~~-0.7~~ = 1.4
 Actual Least Depth: 47.8 Ft.

(d) Target Positioning

Three detached positions were taken as the ship drifted over the target that was marked by the dive buoy.

Target: 6429A
 HDAPS Position Numbers: 1150-1152
 Average Easting: 117177.1 E
 Average Northing: 30916.4 N
 Computed Latitude: 41° 01' 41.595" N
 Computed Longitude: 73° 27' 44.692" W
 Loran-C Rates: 9960-W 9960-X 9960-Y 9960-Z
 Average Loran: 15282.2 26825.2 43993.9 60033.6

(e) Target Recommendation

The following data has been collected for this target.

Target: 6429A (Wreck)
 Description: Wreck over which depth is known # 7763 +
 Latitude: 41° 01' 41.595" N
 Longitude: 73° 27' 44.692" W
 Least Depth: 47.8 Feet
 Surrounding
 Chart Depth: 41 Feet

Target 6429A is a deteriorating wooden wreck which poses no danger *CONCERN* to navigation. Surrounding depths are shoaler than this wreck. This item should ~~not~~ be charted. *Chart as 47 WH. See sheet 10 of 10.*

V. Target 6429B Investigation

(a) Target Dive Summary

Target 6429B was investigated on 4 November 1988 (DOY 309). Divers descended down the dive buoy line to a depth of 40 feet and discovered a small fiberglass wreck resting upright on the bottom. Divers then swam the perimeter of the wreck, searching for a high point and any identifying marks. The marker buoy was moved to the high point and 10m radius circle search was conducted about this point. No shoaler obstructions were encountered, a least depth was obtained from this point.

(b) Target Description

Target ^{6429B}~~1736B~~ was found to be a fiberglass sailboat approximately 30 feet long and 6 feet wide. The boat was largely deteriorated and no masts or other projections remained on the wreck. The least depth was obtained on the metal railing which ran along the bow. Some deck hardware was still present which helped to identify the wreck as a sailboat. In addition, sporadic lettering was evident on the broken transom, but not enough to deduce a vessel name.

(c) Target Least Depth Determination

Least depth for Target 6429B was determined by divers using a pneumo depth gauge.

Target:	6429B
Date:	4 November 1988 (DOY 309)
Time:	1526 Z
Average Pneumo Depth:	36.8 Ft.
Pneumo Gauge Corrector:	+0.2
PREDICTED Tidal Zone Cor:	-3.84
	-----2-----
Actual Least Depth:	33.2 Ft.

(d) Target Positioning

Three detached positions were taken as the ship drifted over the target that was marked by the dive buoy.

Target:	6429B			
HDAPS Position Numbers:	1266-1268 ✓			
Average Easting:	116880.3 E ✓			
Average Northing:	31302.6 N ✓			
Computed Latitude:	41° 01' 54.137" N ✓			
Computed Longitude:	73° 27' 57.360" W ✓			
Loran-C Rates:	9960-W	9960-X	9960-Y	9960-Z
	-----	-----	-----	-----
Average Loran:	15283.2 ✓	26827.6 ✓	43996.1 ✓	60034.5 ✓

(e) Target Recommendation

The following data have been collected for this target.

Target:	6429B (Wreck)
Description:	Wreck over which depth is known
Latitude:	41° 01' 54.137" N ✓
Longitude:	73° 27' 57.360" W ✓
Least Depth:	33.8 feet ✓
Surrounding	
Chart Depth:	41 Feet ✓

Target 6429B matches the description of AWOIS 6429. It is recommended that this target be charted as symbol No. 15, section "O" (Dangers), Nautical Chart No. 1, and that the presently charted "PA" (position approximate) symbol for AWOIS 6429 be deleted. *Concur.*

Chart 15 to 38 WK. See sheet 10 of 10. ✓

VI. AWOIS Items 6429 & 6428 Summary


AWOIS item 6429, as reported, is considered verified by diver investigation. The charting of this item should be updated as specified in the recommendation for Target 6429B. The other investigated contact, Target 6429A, is a small deteriorating wreck and does not warrant charting. Numerous small rock contacts were not investigated due to the presence of adequately charted rocky shoals in this area.

AWOIS item 6428 could not be fully investigated by the RUDE due to the shallow depths and the potential for hazardous obstructions. On the limited sidescan coverage we did obtain, no obvious wreck-like objects were identified. The search for this item should be completed on the next basic hydrographic survey of this area. *Concur.*

See also section 6.6.5) of the Evaluation Report. See sheet 10 of 10 ✓

N. AUTHORS

The preceding descriptive report has been prepared and reviewed aboard the NOAA Ship RUDE. It is submitted to the Commanding Officer for final review, signature, and submission.



Lt. Craig L. Bailey
Executive Officer
NOAA Ship RUDE

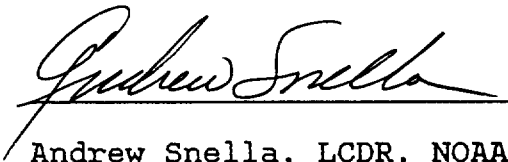
O. LETTER of APPROVAL

FIELD NO. RU-10-3-88

REGISTRY NO. FE-320-SS

OPR-B660-88-RU/HE-88

Field operations contributing to the accomplishment of this survey were conducted under the Commanding Officer's supervision with frequent personal checks of progress and adequacy. This report and field sheets have been closely reviewed and are considered complete and adequate for charting.



Andrew Snella, LCDR, NOAA
Commanding Officer
NOAA Ship RUDE

CONTROL STATION REFERENCE LIST

STATION NAME	STATION NUMBER	GEOGRAPHIC POSITION
Lloyd Point	119	Lat. 040° 56' 41.572" N ✓ Long. 073° 29' 14.429" W ✓
Stamford Harbor LH	120	Lat. 041° 00' 49.148" N ✓ Long. 073° 32' 33.278" W ✓
Fish	121	Lat. 041° 02' 53.827" N ✓ Long. 073° 27' 27.364" W ✓
Eatons Neck Temp	122	Lat. 040° 57' 13.070" N ✓ Long. 073° 23' 50.097" W ✓
Greens Ledge Lighthouse	123	Lat. 041° 02' 29.936" N ✓ Long. 073° 26' 37.872" W ✓
Old Field Point Beacon	153	Lat. 040° 58' 37.199" N ✓ Long. 073° 07' 06.820" W ✓
Black Rock Harbor Beacon 1	154	Lat. 041° 08' 13.536" N ✓ Long. 073° 13' 02.055" W ✓
Cockenoes Island 2 RM 3	155	Lat. 041° 05' 00.984" N ✓ Long. 073° 21' 21.187" W ✓
Eatons Neck Temp 7	156	Lat. 040° 57' 13.058" N ✓ Long. 073° 23' 50.111" W ✓
Bayville Tank	213	Lat. 040° 54' 22.762" N ✓ Long. 073° 34' 00.340" W ✓
Great Captain Lighthouse	214	Lat. 040° 58' 57.043" N ✓ Long. 073° 37' 24.955" W ✓
Penfield Reef Lighthouse	225	Lat. 041° 07' 01.512" N ✓ Long. 073° 13' 19.526" W ✓
Pecks Ledge lighthouse	226	Lat. 041° 04' 38.394" N ✓ Long. 073° 22' 11.290" W ✓
Southport Episcopal Church Spire	227	Lat. 041° 08' 00.195" N ✓ Long. 073° 17' 15.359" W ✓
Saugatuck Railroad Bridge South Transmission Tower	228	Lat. 041° 07' 10.364" N ✓ Long. 073° 22' 02.056" W ✓

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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: January 19, 1989

MARINE CENTER: Atlantic

OPR: B660

HYDROGRAPHIC SHEET: FE-320-SS (RU-10-3-88)

LOCALITY: Western Long Island Sound

TIME PERIOD: September 23 - November 18, 1988

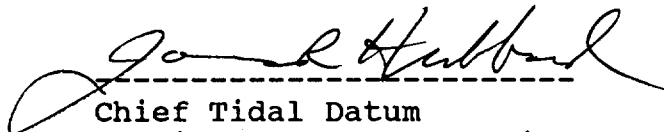
TIDE STATION(S) USED: 846-7150 Bridgeport, CT

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

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

REMARKS: RECOMMENDED ZONING

1. For AWOIS items 4454, 6422, 6423, 6428, 6429, 6802, 6803, 6804, 6805, 6913, zone direct.



Chief Tidal Datum
Quality Assurance Section

02/01/90

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NUMBER: FE-320SS

NUMBER OF CONTROL STATIONS	5
NUMBER OF POSITIONS	1110
NUMBER OF SOUNDINGS	6577

	TIME-HOURS	DATE COMPLETED
PREPROCESSING EXAMINATION	22	03/21/89
VERIFICATION OF FIELD DATA	125	06/14/89
QUALITY CONTROL CHECKS	67	
EVALUATION AND ANALYSIS	102	01/26/90
FINAL INSPECTION	20	01/25/90
TOTAL TIME	336	
MARINE CENTER APPROVAL		01/29/90

OFFICE OF CHARTING AND GEODETIC SERVICES
ATLANTIC HYDROGRAPHIC SECTION
EVALUATION REPORT

SURVEY NO.: FE-320SS

FIELD NO.: RU-10-3-88

Connecticut--New York, Long Island Sound, Vicinity of Norwalk Islands

SURVEYED: 23 September through 18 November 1988

SCALE: 1:10,000

PROJECT NO.: OPR-B660-RU/HE-88

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.....A. M. Snella

Surveyed by.....C. L. Bailey
.....T. R. Waddington
.....M. A. Sramek

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

1. INTRODUCTION

a. This is primarily a side scan sonar survey. A Raytheon DSF-6000N fathometer was operated concurrently with the side scan sonar. The hydrography is considered reconnaissance hydrography and is not to be charted except for the shoalest soundings and least depths determined. Pneumatic depth gauges were used to determine least depths. Fathometer developments were conducted to search for items and to determine the least depth when dive operations could not be conducted. No wire drag was accomplished during this survey.

b. Seven (7) 1:10,000 scale and three (3) 1:2,500 scale page size plots were generated during office processing and are attached to this report. These plots are considered the smooth plots for this survey.

c. No unusual problems were encountered during office processing.

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

2. CONTROL AND SHORELINE

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

Horizontal control used for this survey during data acquisition is based upon the North American Datum of 1983 (NAD83). Office processing of this survey is based on these values. The smooth sheets have been annotated with ticks showing the computed mean shift between the survey datum and the North American Datum of 1927 (NAD27).

To place the 1:10,000 scale sheets 1, 2, 3, and 7 through 10, on the NAD27 datum move the projection lines 0.349 seconds (10.8 meters or 1.08 mm at the scale of the survey) north in latitude, and 1.564 seconds (36.5 meters or 3.65 mm at the scale of the survey) east in longitude.

To place the 1:2,500 scale sheets 4, 5, and 6 on the NAD27 datum move the projections lines 0.349 seconds (10.8 meters or 4.32 mm at the scale of the survey) north in latitude, and 1.564 seconds (36.5 meters or 14.6 mm at the scale of the survey) east in longitude.

All geographic positions listed in this report that are from other sources are on the North American Datum of 1927. Any computations made during office processing have been converted to the present survey datum, NAD83.

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

3. HYDROGRAPHY

Except as shown on the smooth plots, the hydrographic data collected on this survey during side scan sonar operations is of reconnaissance value only and was not verified. Hydrography run and shown on the smooth plots included in this report to determine least depths has had all correctors applied, and may be used to supplement the present charted hydrography in the common area.

4. CONDITION OF SURVEY

The smooth sheets and accompanying overlays, hydrographic records, and reports are adequate and conform to the requirements of the HYDROGRAPHIC MANUAL, SIDE SCAN SONAR MANUAL, and Project Instructions with the following exceptions:

a. Not all the prior surveys listed in section 7.8. of the Project Instructions were compared with as required. Prior wire drag survey H-5142WD (1931), which is a source document for three of the AWOIS items investigated, was not compared with the present survey. Prior wire drag survey H-5219WD (1932) is also a source document for one of the AWOIS items investigated. Although not listed in the Project Instructions, it was not compared with the present survey. See section 6.b. of this report.

b. The hydrographer stated that no significant contacts were identified on the side scan sonargrams for the investigation for AWOIS item #6913, and the item was considered disproved. A contact is shown four times on the sonargrams, and is erroneously identified by the hydrographer as appearing to be a change in bottom texture. This contact is referenced by the hydrographer as being the same as contacts with similar features seen and identified during a separate investigation (AWOIS #4454). A diver investigation was not conducted for AWOIS item #6913. At position 1329.17 on the sonargram, the contact shows no apparent shadow. However, at the same time, the contact is also shown on the fathogram as an obstruction with a height of three feet. This was apparently overlooked by the hydrographer and not correlated to the contact shown on the sonargram. It was determined during office processing that the contact is AWOIS item #6913. During subsequent operations, a dive investigation of the same item was conducted. The subsequent survey is FE-323SS (1989). Divers from the NOAA Ship HECK dove on the contact and confirmed the contact to be a sunken barge as described in the AWOIS listing for item #6319. See also section 7.a.4) of this report and the Descriptive Report for FE-323SS (1989).

c. The field unit did not obtain adequate confidence checks as required by section 1.2.6. of the SIDE SCAN SONAR MANUAL. Rub tests and Pinger tests are not considered adequate confidence checks.

d. A list of electronic positioning equipment was not provided in the Descriptive Report. See section 5.3.4(G) of the HYDROGRAPHIC MANUAL and Figure 6-1, page 6-18 of the FIELD PROCEDURES MANUAL.

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-5220	(1932)	1:20,000
H-5221a	(1932)	1:10,000
H-5222	(1932)	1:10,000
H-6125	(1934)	1:10,000

The prior surveys listed above are common to the entire present survey. Comparisons between present hydrography shown on sheets 1, 2, 3, 7, 9 and 10 and prior hydrography were not made since all present survey hydrography, except the detached soundings on items located, is considered reconnaissance hydrography. Comparison between

hydrography shown on sheets 4, 5, 6, and 8 and prior survey hydrography is in good agreement.

The present survey is considered adequate to supersede the prior survey in the common areas.

b. Wire Drag

H-5142WD (1931) 1:20,000

H-5219WD (1932) 1:20,000

1) AWOIS items #6422, 6802, 6803, and 6804 originate with prior wire drag survey H-5142WD. ✓

2) Adequate discussions and charting recommendations for AWOIS items #6422 and #6802 are found in section M., pages 19 through 28, of the Descriptive Report. See sheets 2 and 4 of 10. ✓

3) AWOIS item #6803 is a charted dangerous submerged rock with a wire drag clearance depth of 29 feet in Latitude 41°01'31.56"N, Longitude 73°26'44.73"W originating with the prior wire drag survey as a 31 foot sounding on small boulders. The area was developed by the hydrographer and was found to be a rocky shoal. A fathometer least depth of 34 feet was found in Latitude 41°01'31.46"N, Longitude 73°26'44.79"W. Present survey depths in the area surveyed range from 35 to 63 feet. It is recommended that the dangerous submerged rock with a wire drag clearance depth of 29 feet be removed from the chart. It is also recommended that a 34-foot sounding on a shoal and the notation "rky" be charted in the position shown on the present survey. See sheet 5 of 10. ✓+

4) AWOIS item #6804 is a charted dangerous submerged rock with a wire drag clearance depth of 31 feet in Latitude 41°01'46.19"N, Longitude 73°27'14.18"W originating with the prior wire drag survey as a 34 foot sounding on rocks. The area was developed by the hydrographer and a fathometer least depth of 35 feet was found in Latitude 41°01'45.76"N, Longitude 74°27'13.17"W. Present survey depths in the area surveyed range from 35 to 61 feet. It is recommended that the dangerous submerged rock with a wire drag clearance depth of 31 feet be removed from the chart. It is also recommended that a rock and limits with a depth of 35 feet (35 Rk) be charted in the position determined and shown on the present survey. See sheet 6 of 10. ✓+

5) AWOIS item #6428 is a charted as a 12-ft sounding on wreckage originating with prior wire drag survey H-5219WD (1932) in Latitude 41°02'24,30"N, Longitude 73°28'01.30"W. Adequate coverage of the area was not completed by the hydrographer because of vessel safety. It is recommended that the 12-ft sounding and the notation wreckage be retained ✓+

as charted. Additional investigation of AWOIS item #6428 is recommended at an opportune time.

Two contacts noted but not investigated by the hydrographer were examined during office processing and are considered significant. These contacts are shown on the present survey and are as follows:

<u>SS Contact</u>	<u>Latitude (N)</u>	<u>Longitude (W)</u>	<u>Estimated Depth</u>	<u>Prior Depth</u>
Obstr	41°02'05.99"	73°28'13.11"	25ft	29ft 7764 ✓
Obstr	41°02'24.02"	73°27'58.99"	21ft	21ft ↓

Both contacts were scaled from the side scan sonar records and a height off the bottom was computed. The computed depths of the obstructions should be considered a reported depth. The obstruction with a computed depth of 21 feet is 90.5 meters east of AWOIS item #6428 and may be the remains of the AWOIS item. The obstruction should not be charted. The obstruction should be included in the recommended investigation for AWOIS item #6428. The obstruction with a computed depth of 25 feet should be charted in the position determined by the present survey in accordance with Cartographic Order 004/89, dated 3 July 1989. See sheet 10 of 10. AWOIS #7764 ✓

7. COMPARISON WITH CHARTS 12363 (32nd Ed., Oct. 18/86)
 12368 (19th Ed., Aug. 30/86)
 12369 (6th Ed., Apr. 13/85)

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. Attention is directed to the following:

1) Adequate discussions and charting recommendations for AWOIS items #6423, #6805, and #6429 are found in the Descriptive Report. See sheets 3, 7, and 10 of 10 respectively. ✓

2) Adequate discussions and charting recommendations for items found during the investigation of Cable and Anchor Reef are found in section M., pages 41 through 49, of the Descriptive Report. See sheet 9 of 10.

3) AWOIS item #4454 is an uncharted sunken wreck originating with Chart Letter 1095 of 1986 (CL1095/86) in Latitude 41°00'31.0"N, Longitude 73°26'59.0"W. This position falls within the limits of a charted discontinued dumpsite. No contacts were found at the AWOIS position. No change in charting is recommended. ✓ +

Sixteen (16) additional uncharted contacts considered insignificant by the hydrographer were examined during office processing and are considered significant. These contacts were scaled from the side scan sonar records and heights off the bottom were computed. The computed depths of the obstructions should be considered as reported depths. These obstructions fall within the limits of a charted discontinued dumpsite, and are listed as follows:

<u>Contact</u>	<u>Latitude (N)</u>	<u>Longitude (W)</u>	<u>Estimated Depth</u> AWOIS #
Obstr (A)	41°00'04.12"	73°26'10.23"	89ft 7744 ✓
Obstr (A)	40°59'50.62"	73°26'22.86"	92ft 7745 ENC
Obstr (A)	40°59'51.11"	73°26'28.52"	95ft 7746 ENC ✓
Obstr (A)	40°59'42.39"	73°26'13.62"	95ft 7747 ✓
Obstr (A)	40°59'49.87"	73°25'41.72"	103ft 7748 ✓
Obstr (A)	40°59'51.43"	73°25'40.93"	99ft 7749 ✓
Obstr (A)	40°59'58.43"	73°25'38.91"	98ft 7750 ENC
Obstr (A)	41°00'09.62"	73°25'51.31"	71ft 7751 ENC
Obstr (A)	41°00'02.97"	73°25'53.34"	77ft 7752 ENC
Obstr (A)	41°00'02.24"	73°25'55.45"	87ft 7753 ENC
Obstr (A)	40°59'39.82"	73°25'57.28"	116ft 7754 ✓
Obstr (A)	41°00'18.00"	73°25'57.87"	72ft 7755 ENC
Obstr (A)	40°59'52.29"	73°26'09.70"	95ft 7756 ENC
Obstr (A)	40°59'51.01"	73°26'06.48"	96ft 7757 ENC
Obstr (A)	40°59'51.33"	73°25'44.30"	91ft 7758 ✓
Obstr (A)	40°59'43.01"	73°25'52.07"	107ft 7759 ✓
Obstr (A)	40°59'53.44"	73°26'07.43"	100ft 7760 ENC

checked by [unclear]

It is recommended that these obstructions be charted in accordance with Cartographic Order 004/89, dated 3 July 1989 in the position determined by the present survey provided the chart scale will permit. See sheet 1 of 10.

One uncharted sunken wreck was located and developed outside the limits of the discontinued dumpsites. # 4454 An adequate discussion and charting recommendation for this wreck is found in section M., pages 16 and 17, of the Descriptive Report. See sheet 1 of 10.

4) AWOIS item #6913 is charted dangerous sunken wreckage with a wire drag clearance depth of 31 feet in Latitude 41°04'44.50"N, Longitude 73°18'26.10"W originating with CL821/32 and preliminary list of shoals and wire drag hangs as a 34 foot sounding on wreckage. The AWOIS item was considered disproved by the hydrographer. During office examination of the fathogram, an obstruction with a depth of 42 feet in Latitude 41°04'44.43"N, Longitude 73°18'25.15"W was seen in present survey depths of 45 feet. During office processing of the present survey it was noted that AWOIS item #6913 was also assigned to subsequent survey FE-323SS (1989). The item was located by the subsequent survey, and described as a wreck (barge) by divers. A pneumatic depth gauge least depth of 39 feet was obtained on the wreck in Latitude

41°04'44.43"N, Longitude 73°18'25.07"W. The 39 foot depth on a wreck was brought forward from FE-323SS (1989) to supersede the present survey. FE-323SS (1989) recommended the dangerous sunken wreckage with a wire drag clearance depth of 31 feet be deleted from the chart, and the dangerous sunken wreck with a depth of 39 feet (39 Wk) be charted in the position determined by the subsequent survey. See sheet 8 of 10. ✓
*

Additional discussion of AWOIS item #6913 can be found in the Descriptive Report for survey FE-323SS (1989).

The present survey is adequate to supersede the charted hydrography in the common areas.

b. Aids to Navigation

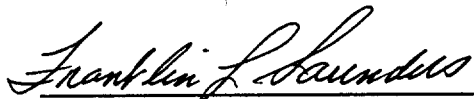
There are no fixed or floating aids to navigation within the limits of this survey.

8. COMPLIANCE WITH INSTRUCTIONS

This survey adequately complies with the Project Instructions except as noted in this report.

9. ADDITIONAL FIELD WORK

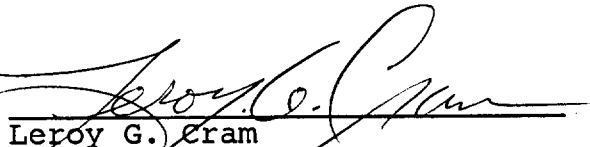
This is an adequate side scan sonar survey. Additional work is recommended for AWOIS item #6428 as discussed in section 6.b.5) of this report and in section M., page 54, of the Descriptive Report.



Franklin L. Saunders
Cartographic Technician
Verification of Field Data



Richard H. Whitfield
Cartographer
Evaluation and Analysis





Leroy G. Cram
Supervisory Cartographic Technician
Verification Check

INSPECTION REPORT
FE-320SS


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 disproof of charted data. This survey, except as noted in the Evaluation Report, is considered complete and adequate to meet National Ocean Service standards. Processing is considered complete. The survey records comply with NOS requirements except as noted in the Evaluation Report.

Inspected


Robert G. Roberson
Chief, Evaluation and Analysis
Team
Hydrographic Processing Unit


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

Approved: 2 March 1990


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

73° 26' 30"

73° 26' 00"

73° 25' 30'

41°00'30"

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

72 obstr (A)

75 Wk (wooden barge)

71 obstr (A)

73° 26' 30"

89 obstr (A)

77 obstr (A)
87 obstr (A)

41°00'00"

NAD 27

41° 00' 00"

XYNETICS 1201

✓ R.H.W. 1/3/90

98 obstr (A)

95 obstr (A)
92 obstr (A)

100 obstr (A)
95 obstr (A)
96 obstr (A)

obstr (A)
91 99 obstr (A)
103 obstr (A)

95 obstr (A)

107 obstr (A)

116 obstr (A)

40°59'30"

FE-320SS
CONNECTICUT--NEW YORK
LONG ISLAND SOUND
VICINITY OF NORWALK ISLANDS
OCT 17 & 19, 1988
SCALE 1:10,000
SOUNDING IN FEET AT MLLW
NAD 83 DATUM
SHEET 1 OF 10
AWOIS NUMBER 4454

+

73° 29' 30"

73° 29' 00"

73° 28' 30"

73° 29' 00"

NAD 27
XYNETICS 1201
✓F.L.S 6/12/89

41° 01' 30"

41° 01' 30"

32 *Rk*

41° 01' 00"

FE-320 SS
CONNECTICUT--NEW YORK
LONG ISLAND SOUND
VICINITY OF NORWALK ISLANDS
OCT 6, 1988
SCALE 1:10,000
SOUNDINGS IN FEET AT MLLW
SHEET 2 OF 10
AWOIS NUMBER 6422
NAD 1983 DATUM

41° 00' 30"

2

73°29'30"

73°29'00"

73°28'30"

73° 29' 00"

NAD 27
XYNETICS 1201
✓F.L.S 6/12/89

41° 01' 00"

41° 01' 00"

41° 00' 30"

44 Wk (tug)

FE-320SS
CONNECTICUT--NEW YORK
LONG ISLAND SOUND
VICINITY OF NORWALK ISLANDS
OCT 3, 1988
SCALE 1:10,000
SOUNDINGS IN FEET AT MLLW
SHEET 3 OF 10 ✓
AWOIS NUMBER 6423
NAD 83 DATUM

41° 00' 00"

73°25'20"

73° 25'10"

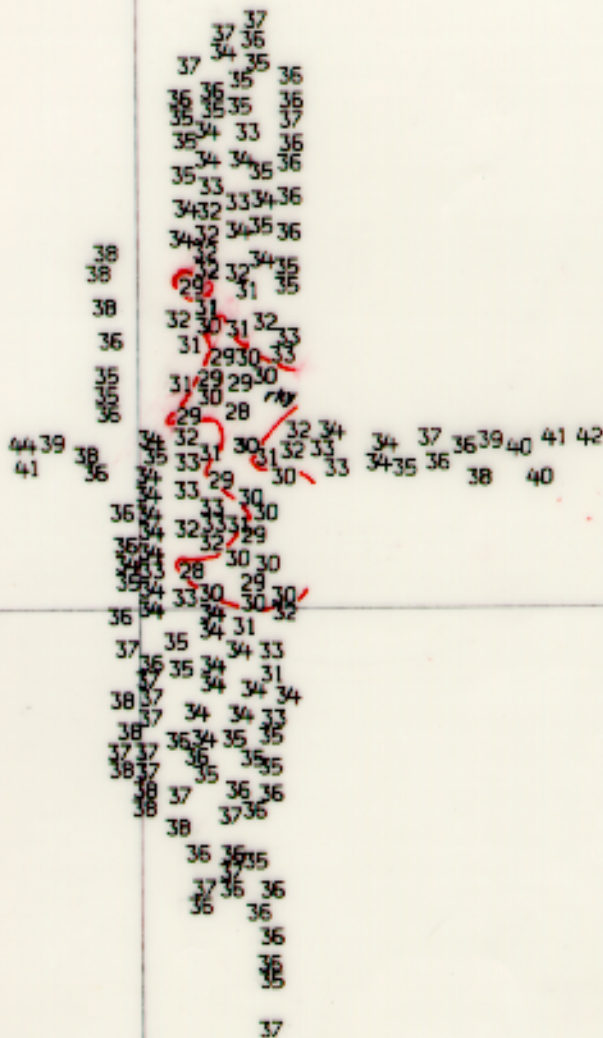
73° 25' 20"

NAD 27

41° 01' 00"

XYNETICS 1201
V.F.L.S 6/12/89

41°01'00"



40° 00' 50"

FE - 320SS
 CONNECTICUT--NEW YORK
 LONG ISLAND SOUND
 VICINITY OF NORWALK ISLANDS
 OCT 18-19, 1988
 SCALE 1:2,500
 SOUNDINGS IN FEET AT MLLW
 SHEET 4 OF 10
 AWOIS NUMBER 6802
 NAD 83 DATUM

1257

4

73° 26' 50"

73° 26' 40"

73° 26' 50"

NAD 27

41° 01' 40"

XYNETICS 1201

41° 01' 40"

✓F.L.S 6/12/89

454544 44 44 4341 393940
 47 46 4544444343 42 413939 39 4041424344454647
 48 47 45 4545 4443 424141414039 38 38 39 41 424343
 48 46 45 4444 43 42 41 40 38 38 37 38 39 41 424343 434446474951
 45 44 43 42 42 42 3938 37 37 36 36 38 40 41 43
 43 42 43 41 41 42 41 39 36 36 35 35 36 36 39 41 42 45
 43 42 41 41 42 42 41 39 37 35 35 35 35 37 40 40 41 44
 43 43 42 41 41 41 42 41 393836 35 36 35 37 36 39 41 41
 43 41 41 40 424241 41 40 39 37 37 38 38 41 4546
 43 41 41 3938 37 3940 39 4244

52 52

52

63

63 63

41° 01' 30"

43 43 42 45 54

FE-320 SS
 CONNECTICUT -- NEW YORK
 LONG ISLAND SOUND
 VICINITY OF NORWALK ISLANDS
 SEPT 26 - 27, 1988
 SCALE 1:2,500
 SOUNDINGS IN FEET AT MLLW
 SHEET 5 OF 10 ✓
 AWOIS NUMBER 6B03
 NAD 83 DATUM

12.57

73°27'20"

73°27'10"

73° 27' 10"
 NAD 27
 XYNETICS 1201
 ✓F.L.S 6/12/89
 41° 01' 50"
 41°01'50"

53 53 54 56 57 58 59 58 52 42 41 50 51 51 51 51 55
 52 53 54 55 56 58 59 55 45 37 43 49 51 51 50 53
 55 57 59 60 58 48 40 38 42 50 49 49 49 49 51 53 45 2
 56 58 60 61 60 52 45 40 38 42 50 50 48 51 55 44 46 47 49 52 53
 60 59 55 52 45 40 38 42 50 50 48 51 51 50 49 51 47 44 44 45

41° 01' 40"

FE-320SS
 CONNECTICUT -- NEW YORK
 LONG ISLAND SOUND
 VICINITY OF NORWALK ISLANDS
 OCT 12, 1988
 SCALE 1:2,500
 SOUNDINGS IN FEET AT MLLW
 SHEET 6 OF 10 ✓
 AWOIS NUMBER 6804
 NAD 83 DATUM

1258

73° 25' 00"

73° 24' 30"

73° 24' 00"

41° 02' 30"

73° 25' 00"

41° 02' 00"

NRD 27

KYNETICS 1301

✓F.L.S. 6/12/89

41° 02' 00"

32 ~~wt~~ "CELTIC" (tug & barge)

41° 01' 30"

FE-320 SS
CONNECTICUT-- NEW YORK
LONG ISLAND SOUND
VICINITY OF NORWALK ISLANDS
OCT 18, 1988
SCALE 1:10,000
SOUNDINGS IN FEET AT MLLW
SHEET 7 OF 10
AWOIS NUMBER 6805
NAD 83 DATUM

73° 19' 00"

73° 18' 30"

73° 18' 00"

73° 19' 00"

41° 05' 00"

NAD 83
SYNETICS 1201

41° 05' 00"

41
 42 42 44
 42 43 43 44
 42 43 43 44
 42 43 43 43 43 43 44 44 44 44 44 45
 43 43 43 43 44 45 45 45
 43 43 44 43 43 43 44 45 44 45 45
 44 43 44 44 44 45 45 44 45 45 45 46 46
 44 44 44 44 44 45 44 45 45 45 46 46 47
 44 45 45 45 46 46 46 47
 45 45 45 45 46 46 46 47 46 47 47 47
 46 46 48 46
 47
 47

39 Wk (borge)

from FE-32355 (1989)

41° 04' 30"

FE-32055
 CONNECTICUT -- NEW YORK
 LONG ISLAND SOUND
 VICINITY OF NORWALK ISLANDS
 NOV 14-18, 1988
 SCALE: 1:10,000
 SOUNDINGS IN FEET AT MLLW
 SHEET 8 OF 10
 AWOIS NUMBER 6913
 NAD 83 DATUM

*
 # 1012309
 # 12364
 12683A

41° 04' 00"

73° 25' 30"

73° 25' 00"

73° 24' 30"

54_{RR}

41° 01' 00"

50_{RR}

41° 00' 30"

56_{RR}

50_{RR}

65_{RR}

73° 25' 30"

41° 00' 00"

NRO 27
XYMETICS 1201
✓F.L.S 6/12/89

FE-320 SS
CONNECTICUT -- NEW YORK
LONG ISLAND SOUND
VICINITY OF NORWALK ISLANDS
OCT 19-24, 1988
SCALE 1:10,000
SOUNDINGS IN FEET AT MLLW
SHEET 9 OF 10
CABLE & ANCHOR REEF
NAD 83 DATUM

41° 00' 00"

73° 28' 30"

73° 28' 00"

73° 27' 30"

41° 02' 30"

21 *obstr (A)*

25 *obstr (A)*

73° 27' 30"

NAD 27

XYNETICS 1201

41° 02' 00"

41° 02' 00"

33 *Wk (fiberglass)*

47 *Wk (wood)*

41° 01' 30"

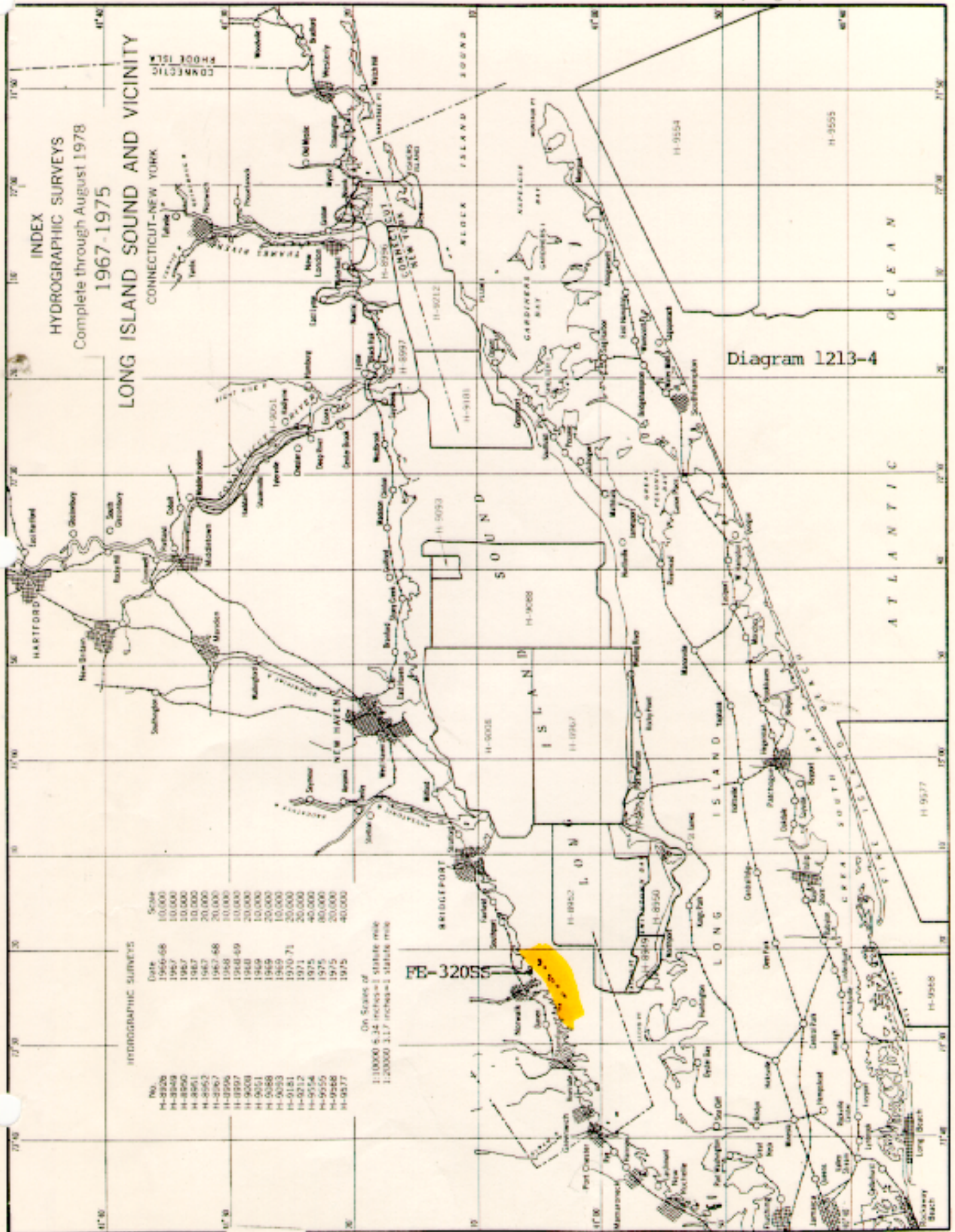
FE-320SS
CONNECTICUT-- NEW YORK
LONG ISLAND SOUND
VICINITY OF NORWALK ISLANDS
OCT 28 & NOV 4, 1988
SCALE 1:10,000
SOUNDINGS IN FEET AT MLLW
NAD 83 DATUM
SHEET 10 OF 10 ✓
AWOIS NUMBERS 6428 & 6429

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

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

Hydrographic Index No. 63 L



INDEX
HYDROGRAPHIC SURVEYS
Complete through August 1978
1967-1975
LONG ISLAND SOUND AND VICINITY
CONNECTICUT-NEW YORK

Diagram 1213-4

HYDROGRAPHIC SURVEYS

No.	Date	Scale
H-3206	1956-68	10,000
H-3249	1957	10,000
H-3250	1957	10,000
H-3251	1957	10,000
H-3252	1957	20,000
H-3267	1967-68	20,000
H-3268	1968	10,000
H-3269	1968-69	10,000
H-3270	1969	20,000
H-3271	1969	20,000
H-3272	1969	20,000
H-3273	1969	20,000
H-3274	1970-71	20,000
H-3275	1971	20,000
H-3276	1971	40,000
H-3277	1972	80,000
H-3278	1972	20,000
H-3279	1973	20,000
H-3280	1975	40,000

On Scales of
1:10000 & 1:20000 = 1 statute mile
1:20000 & 1:40000 = 1 statute mile

FE-320SS

