H10707

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey Hydrographic/Side Scan Sonar

Field No. WH-10-1-97

Registry No. H-10707

LOCALITY

State North Carolina

General Locality North Atlantic Ocean

Sublocality 8 NM SE of Lockwoods Folly Inlet

19 97

CHIEF OF PARTY
CDR M.R. Kenny, NOAA

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DATE MAY 1 1998

*U.S. GOV. PRINTING OFFICE: 1997—756-980

NOAA FORM 77-28
(11-72)

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

REGISTRY NUMBER:

H-10707

HYDROGRAPHIC TITLE SHEET

INSTRUCTIONS: The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

FIELD NUMBER:
WH-10-1-97 (D)

State: North Carolina

General locality: North Atlantic Ocean

Locality: 8 NM SE of Lockwoods Folley Inlet, NC

Scale: 1: 10,000 Date of survey: March 18, 1997 to June 16, 1997

Instructions dated: May 03, 1996 Project Number: OPR-G309-WH

Vessel: NOAA Ship WHITING S-329

Chief of Party: CDR Maureen R. Kenny

Surveyed by: M.R. Kenny, E. Christman, P.A. Gruccio, H. Orlinsky, R.C. Jones, J.D. Garte, U.L. Gardner, P.G. Lewit, K.B. Shaver, F.R. Cruz, B. Armbruster D. Pattison, P. Keane

Soundings taken by echo sounder, hand lead-line, or pole: DSF-6000N fathometer

nic record scaled by: WHITING personnel

nic record checked by: WHITING personnel HEWLETT PACKARD DESIGN JET 350C ~~ENGAD NOVA JET III~~ (Office)

Protracted by: N/A Automated plot by: Zeta 936 Plotters & HP PLT 750C Plotter (Field)

Verification by: Hydrographic Surveys Branch Personnel

Soundings in: Feet: ✓ Fathoms: ____ Meters: ~~✓~~ at MLW: ____ MLLW: (*):

Remarks: Basic Hydrographic and 200% Side Scan Sonar.

Electonic Data Processing (EDP) vessels numbers involved in data acquisition: 2930, 2931 and 2932

Time zones used: UTC

Horizontal Datum NAD 83

Notes in Descriptive Report Were Made in Red During Office Processing.

AWOIS and SURF RWD 4/98

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

* U.S. GOVERNMENT PRINTING OFFICE: 1976-665-661/1222 REGION NO.6

DESCRIPTIVE REPORT TO ACCOMPANY
HYDROGRAPHIC SURVEY
OPR-G309-WH
WH-10-01-97
H-10707

NOAA SHIP WHITING
CDR Maureen Kenny, NOAA
Commanding Officer

A. PROJECT

The purpose of this project is to provide contemporary hydrographic survey data to update existing nautical charts of the approaches to Wilmington, North Carolina. The project is being conducted in response to requests from the United States Coast Guard (USCG), the United States Army Corps of Engineers, the North Carolina State Ports Authority, and the Wilmington-Cape Fear Pilots Association. Project OPR-G309-WH consists of twelve survey sheets. The survey described in this report was designated "D" sheet, field sheet number WH-10-01-97, and registry number H-10707. Survey operations were conducted in compliance with the Hydrographic Project Instructions OPR-G309-WH dated May 3, 1996; Change No. 1 dated February 25, 1997; and Change No. #2 dated April 11, 1997.

B. AREA SURVEYED

Hydrographic survey H-10707 is located 8 nautical miles southeast of Lockwoods Folley Inlet, North Carolina. The limits of hydrography are bounded by the following positions:

Position	Latitude	Longitude
1	33° 51' 15" N	078° 12' 00" W
2	33° 51' 15" N	078° 04' 00" W
3	33° 47' 12" N	078° 04' 00" W
4	33° 47' 12" N	078° 12' 00" W

Survey operations commenced on March 18, 1997 (DN 077) and concluded on June 16,1997 (DN 167).

C. SURVEY VESSELS

NOAA Ship WHITING (vessel number 2930), launch 1015 (vessel number 2931), and launch 1014 (vessel number 2932) were used to conduct mainscheme sounding data, side scan sonar, crosslines, sound velocity casts, and bottom samples. Launch 1014 (vessel number 2932) was

used to conduct contact developments and dive operations. No unusual problems or equipment configurations were encountered.

D. AUTOMATED DATA ACQUISITION AND PROCESSING See Also Evaluation Report

Survey data acquisition was accomplished using standard PC's with Coastal Oceanographics' HYPACK software, version 6.4. Pre-survey and data processing was accomplished by using a combination of HPS software and MAPINFO software version 4.1. Sound velocity corrections were determined using *CAT* version 3.00 and *VELOCITY* version 3.00. The DGPS stations were checked using *MONITOR* version 1.2. The MOD III Diver Least Depth Gauge was checked using the *DAILYDQA* program. There were no nonstandard automated acquisition or processing methods used.

E. SIDE SCAN SONAR EQUIPMENT

Side scan sonar (SSS) operations were conducted using an EG&G model 260 slant-range corrected SSS recorder and an EG&G 272-T dual-channel towfish. The towfish was operated on the 100 kHz frequency and configured with a 20° beam depression. The following SSS equipment was used:

Vessel	Type	S/N	DN
2930	Towfish	11904	077-121
		16697	121-156
	Recorder	16942	077-156
2931	Towfish	20642	077-142
	Recorder	16671	077-121
		16669	121-142
2932	Towfish	11908	077-089
		20642	089-167
	Recorder	16946	077-167

On NOAA Ship WHITING, the SSS towfish was deployed from a Reuland winch using one of two armored cables in conjunction with an A-frame on the stern. The armored cable was connected to the SSS recorder by a slip-ring assembly. On launches 1014 and 1015 the SSS towfish was deployed using a Superwinch in conjunction with an adjustable davit arm on the stern. The SSS towfish was towed with a vinyl-coated Kevlar cable and was connected to the recorder by a slip-ring assembly.

This survey required 200% side scan sonar coverage. Proper coverage was achieved by running mainscheme lines with 80-meter line spacing on the 100-meter range scale. This line spacing provided for proper overlap as required by Field Procedures Manual, section 7.3.2.2. Adequate coverage was ensured by plotting alternate mainscheme lines on 'A' and 'B' swath plots and verifying 100% coverage on each plot.

The towfish was maintained at a height off the bottom of 8-20 percent of the range scale. Side scan operations were limited to a speed-over-ground of 4-5 knots. Confidence checks were performed by noting changes in linear bottom features extending to the outer edges of the sonargram, by passing aids to navigation, or by towing the sonar by a known contact.

Contacts were measured off the sonargram and entered into an HPS contact table* which automatically determined contact heights, positions, and correlation to other contacts. Contacts appearing significant were further investigated by SSS development and then by divers if deemed necessary. Least depths were determined by a MOD III Diver Least Depth Gauge (S/N 68332) and final positioning of significant items was determined with detached positions taken on diver-placed buoys.

F. SOUNDING EQUIPMENT

Raytheon Digital Survey Fathometer (DSF-6000N) echosounders were used to measure water depths during the survey. The DSF-6000N produced a graphic record of the high frequency (100 kHz) and low frequency (24 kHz) depths. The high and low frequency digital depths were recorded by the HYPACK acquisition system. The high frequency depths were selected as the primary depths and were used for plotting. All echograms were scanned and check-scanned for significant features. Significant features that were not automatically selected as primary soundings were manually inserted.

The following fathometers were used:

Vessel	S/N	DN
2930	B046N	077-156
2931	B054N	079-082
	A118N	082-101
	A116N	101-115
	A110N	115-142
2932	A108N	079-167

Electronic technicians performed accuracy checks and preventive maintenance on all of the DSF-6000N echosounders used.

* DATA filed with Field Records.

Least depths on diver investigations in the survey area were acquired by using the MOD III Diver Least Depth Gauge.

G. CORRECTIONS TO SOUNDINGS

Sound velocity profiles of the water column were determined using a Seacat Conductivity, Temperature and Depth (CTD) profiler (model SBE-19, S/N 286 and S/N 1060). The CTD profilers were calibrated on January 2, 1997. The Seacat calibration records are included in the Separates, section IV.*

A corrector table was generated for WHITING and both launches for each velocity cast taken. The following table shows the dates, locations and the table depths of each velocity cast that was applied to the data collected in this survey area:

DN	Velocity Table #	Latitude	Longitude	Depth
075	53 (launches)	33° 47' 48" N	078° 12' 00" W	20.6 m
075	54 (launches)	33° 47' 48" N	078° 12' 00" W	20.6 m
087	63 (ship)	33° 39' 18" N	077° 58' 54" W	16.6 m
106	73 (launches)	33° 51' 15" N	078° 06' 37" W	15.0 m (dives)
107	69 (ship)	33° 49' 36" N	078° 06' 03" W	18.0 m
111	75 (launches)	33° 47' 45" N	078° 07' 14" W	17.5 m (dives)
124	80 (ship)	33° 47' 48" N	078° 08' 36" W	20.0 m
124	81 (launches)	33° 47' 48" N	078° 08' 36" W	20.0 m
149	92 (ship)	33° 47' 24" N	078° 07' 36" W	16.5 m
149	93 (launches)	33° 47' 24" N	078° 07' 36" W	16.5 m
154	94 (launches)	33° 51' 06" N	078° 06' 42" W	15.0 m (dives)

Additional sound velocity casts were taken to ensure a uniform water column over the project area. When the shallow water casts were similar to the deeper casts, only the deeper casts were used. Each cast was processed and corrector tables generated using *CAT* version 3.00 and *VELOCITY* version 3.00. The velocity correctors were manually entered into an HPS velocity table where correctors were applied to both the high and low frequency beams during data processing. Velocity profile data are included in the Separates, section IV.*

Data Quality Assurance (DQA) for the Seacat CTD profilers was performed by using a hydrometer and a thermometer to measure the density and temperature of a surface water sample taken during the CTD cast. The *CAT* program compared these values to the Seacat's surface values and confirmed that the Seacat was working properly. WHITING hydrometers were calibrated on March 3, 1997. Correctors were applied to the readings taken from the hydrometer.

The *DAILYDQA* program used in conjunction with the ship's barometer was used to assure that the MOD III Diver Least Depth Gauge was working properly. Daily results fell within specified operating ranges. CTD casts were used in the *SMLGAUGE* program to calculate least depth measurements.

* DATA Filed with Field Records.

Bar checks were performed on launch 1014 and 1015 on April 24, 1997 (DN 114). No corrections to soundings were needed. Copies of the bar and lead-line check data are included in the Separates, section IV.*

Leadline comparisons were performed on WHITING on April 3, 1997 (DN 093) and on June 5, 1997 (DN 156). Weather and sea conditions were calm and proved ideal for performing the leadline comparison. In both cases, the results showed excellent agreement with DSF-6000N high frequency depths averaging 0.04 meters deeper than leadline depths. No corrections to soundings were needed. Copies of the leadline comparison data are included in the Separates, section IV.* Leadlines used were calibrated on February 11, 1997, and the calibration confirmed that the leadline error was negligible.

The static draft correction for launches 1014 and 1015 is 0.55 meters, and was measured on July 28, 1993. The corrector was entered into HPS Offset Tables 2 and 1,* respectively. The correction for static draft for WHITING is 3.2 meters, a historical value which WHITING divers confirmed with a MOD III Diver Least Depth Gauge on May 11, 1995. The corrector was entered into Offset Table 9.* Static draft correctors were applied during data processing for each survey platform.

Settlement and squat values for launch 1014 were determined on March 7, 1997, and were entered into HPS Offset Table 2.* Settlement and squat values for launch 1015 were determined on March 10, 1997, and were entered into HPS Offset Table 1.* Settlement and squat values for WHITING were determined on March 26, 1996, and were entered into HPS Offset Table 9.* The settlement and squat correctors were applied to the sounding data in real time for each survey platform. Offset tables are included in the Separates, section II.*

Heave correctors for data acquired by WHITING, launch 1014, and launch 1015 were determined by a TSS Dynamic Motion Sensor DMS-05. The HYPACK data acquisition computer logged and applied these calculations in real-time. Serial numbers for these sensors were as follows:

VESSEL	SN
2930	2066
2931	2062
2932	2068

The tidal datum for this project was Mean Lower Low Water (MLLW). The operating tide station at Springmaid Pier, North Carolina (866-1070) served as the reference station for predicted tides. The back-up water level sensor was located at Yaupon Beach, North Carolina (865-9182) and was maintained by WHITING. Tidal data used during data acquisition were based on Table 2 of the East Coast of North and South America Tide Tables. Digital tidal data was received on floppy disk from N/CS33, Hydrographic Surveys Branch, and applied in HPS to the digital data during data processing. A request for smooth tide data was submitted to Product Services Branch, Datum Section, on June 30, 1997. Approved Tides and Zoning were applied during Office Processing.

* Data Filed with Field Records.

Time and height correctors used for this survey are as follows:

Time Correction	00 hrs 00 mins
Height Ratio	x 0.97

H. CONTROL STATIONS See Also Evaluation Report.

The horizontal datum for this project is the North American Datum of 1983 (NAD 83). The source of differential correctors used was a USCG maintained Differential Global Positioning System (DGPS) station at Fort Macon, North Carolina, and at Charleston, South Carolina. Positions obtained from USCG reference listings are:

Station	Latitude	Longitude
Charleston USCG DGPS Beacon	32° 45.45357' N	079° 50.57225' W
Fort Macon USCG DGPS Beacon	34° 41.84333' N	076° 40.98706' W

WHITING used *MONITOR* 1.2 to verify station positions and to check for multipath in the area. Printouts from the *MONITOR* program are included in the Separates, section III. ✳

I. HYDROGRAPHIC POSITION CONTROL

DGPS was used as the navigation system for this survey. The launch and the ship used an Ashtech Sensor GPS receiver with a CSI MBX1 beacon receiver supplying correctors for DGPS navigation. Ashtech receivers were automatically initialized by HSDutils and the CSI MBX1's were preset to the appropriate station and frequency.

DGPS positioning was accomplished in accordance with the Field Procedures Manual, section 3.4. The HDOP limit for a 1:10,000 scale survey using the Charleston and Fort Macon stations is 3.2. No position flyers were encountered. All suspect positions (high HDOP, DR'ed positions, high EPE) were examined for reliability. Questionable positions were either smoothed or rejected.

The serial numbers of the Ashtech Sensor and CSI MBX1 receivers on the data acquisition platforms are as follows:

Vessel	Device	Serial Number
2930	Ashtech Sensors	700417B1203 (system A)
		700417B1191 (system B)
	CSI MBX1	X-1318 (system A)
		X-1081 (system B)

✳ DATA Filed with Field Records.

2931	Ashtech Sensor CSI MBX1	700417B1194 X-1088
2932	Ashtech Sensor CSI MBX1	700417B1055 X-1079

DGPS performance checks on NOAA Ship WHITING were determined by using *SHIPDIM* version 2.1. The position determined using correctors from the Fort Macon DGPS tower was compared to the position determined using correctors from the Charleston DGPS beacon using two independent DGPS systems. *SHIPDIM* routinely showed the positions given by the two systems to be within 2-3 meters of each other.

DGPS performance checks for launch 1014 and launch 1015 were conducted while secured in the WHITING davits using correctors from the Fort Macon DGPS tower. Simultaneous HYPACK positions were compared with WHITING. An offset in distance and azimuth was then calculated between the ship and launch system. A summary of the DGPS performance checks is included in the Separates, section III* All DGPS performance checks confirmed that the equipment was working properly.

DGPS antenna offsets were measured on March 19, 1993, for WHITING. Offsets and laybacks were measured using the high frequency echosounder transducer as the reference. The DGPS antennae were installed on launches 1014 and 1015 on April 2, 1996, directly over the echosounder transducer. Antenna height was also measured on the same respective dates shown above, using the water line as the reference. The offsets and laybacks were applied by HYPACK on-line. A minimum of four satellites were used during survey H-10707 (1:10,000) providing altitude unconstrained positioning.

Offset, layback and height corrections for the launches' SSS aft towing boom were measured on July 28, 1993, verified on April 5, 1994, and applied by HYPACK on-line. Offset, layback and height for WHITING's SSS towfish A-frame was measured on July 27, 1992, using the forward high frequency transducer as the reference. The offset and layback correctors were adjusted slightly on March 11, 1997, due to a small shift of the A-frame. Correctors were entered into Offset Table 9.*

J. SHORELINE See Also Evaluation Report.

There is no shoreline within the limits of survey H-10707.

K. CROSSLINES

A total of 75 nautical miles of crosslines, or 12% of the mainscheme mileage, was run on H-10707. Agreement between mainscheme and crossline soundings is adequate. In general, crossline soundings agree with mainscheme soundings within 0.3 meters and were randomly

* DATA Filed with Field Records.

shoal and deep with no noticeable trends. Discrepancies of up to 0.6 meters were noted and could possibly be due to inclement weather in the area and/or inaccurate predicted tides.

L. JUNCTIONS *See Also Evaluation Report.*

H-10707 junctions with the following four surveys: H-10687 (Sheet "G", 1:20,000) to the south, H-10700 (Sheet "C", 1:10,000) to the west, H-10728 (Sheet "B", 1:10,000) to the north, and H-10741 (Sheet "E", 1:10,000) to the east. A minimum overlap of at least one sounding line was required with adjacent sheets as stated in the Hydrographic Manual, Sec. 1.4.4. Agreement between overlapping soundings at the junction of H-10687, H-10700, H-10728, and H-10741 is adequate with soundings agreeing to within 0.6 meters. Alignment between contour lines at these junctions is also adequate.

M. COMPARISONS WITH PRIOR SURVEYS *See Also Evaluation Report.*

A comparison was made between H-10707 and prior survey H-9115 (1970, 1;20,000). All comparisons were made in feet. The prior survey was referenced to NAD 27. The datum shift between NAD 27 and NAD 83 was calculated using *CORPSCON* (version 2.1) software and determined to be insignificant (1.0 mm at 1:20,000). No datum shift was applied in the comparison. In general, the soundings agree within 2 feet with prior survey H-9115. The mainscheme soundings of H-10707 were generally deeper. The greatest difference noted in the general soundings was 3 feet.

N. ITEM INVESTIGATIONS *See Also Evaluation Report.*

The following items were investigated by WHITING during this survey. Least depths of features and surrounding depths are corrected to MLLW.

N.1. UNCHARTED FISH HAVEN "AR420" (Tom McGlammery Reef)

The North Carolina Department of Environmental, Health, and Natural Resources, Division of Marine Fisheries (NC Marine Fisheries) has established many artificial reefs. A booklet was forwarded to WHITING which describes the contents of these numerous fish havens. Tom McGlammery Reef fish haven (presently uncharted) falls within the limits of this survey. A copy of the pages pertaining to "AR420" (Tom McGlammery Reef) is included in Appendix VI of this report.

Fish Haven "AR420" was surveyed with 200% side scan coverage. The contacts found within the fish haven agree with the orientation and position of those described in the documentation stated above. The least depth of the fish haven as determined by divers was found to be ~~18.4~~ 18.0 ft

(5.6m) on a section of bridge span. All contacts within this artificial reef are described in Section N1.1 through N1.5.

WHITING recommends that this fish haven be charted. Mr. Steve Murphey of the NC Marine Fisheries informed WHITING by telephone on June 23, 1997, that the Tom McGlammery Reef Fish Haven, "AR420", is covered under general permit number 198500194 that was issued in 1988. The fish haven originally was under permit SAWC085-N-010-0202. concur

The buoy which the NC Marine Fisheries placed to mark the uncharted fish haven was found to be approximately 1700 meters SW of the reef material (see Section Q). Mr. Murphey was notified of this descrepancy on June 23, 1997. He stated he would send a vessel out within a few weeks to move the buoy to the correct location and would contact the WHITING with the new GPS position.

Further information on this fish haven may be obtained by contacting:

Mr. Steve Murphey
The North Carolina Department of Environmental, Health, and Natural Resources
Division of Marine Fisheries
P.O. Box 769
Morehead City, North Carolina 28557-0769
Telephone: (919) 726-7021

N1.1. Obstruction

Contact No.:	48051.70
Detached Position:	523
Least Depth:	~~5.6m (18.4ft)~~ 5.5m (18 Ft)
Time of Least Depth:	1430 UTC
Position of Least Depth:	Lat: 33°51' 08.~~335"~~ ok N 08.335
	Long: 078°06' 33.~~952"~~ ok W 33.952
Description:	Divers investigated this item on April 16, 1997 (DN 106), and found the northern YSD barge of Tom McGlammery Reef. Lying beside the barge was a section of bridge span which rose above the bottom significantly higher than the barge. The least depth was taken from the highest point of this bridge section.
Recommendation:	Chart an obstruction with a least depth of 18 feet at the above location. - concur ~~chart 18 obstr~~

See also E+A Report

N1.2. Wreck

Contact No.:	47737.80
Detached Position:	~~524~~ 1ΦΦ2

Least Depth: ~~8.4m (27.6ft)~~ 9.0m (29 ft)
Time of Least Depth: 1900 UTC
Position of Least Depth: Lat: 33°51' 14.~~522~~58" N
Long: 078°06' 38.~~019~~" 10" W
Description: Divers investigated this item on April 16, 1997 (DN 106), and found what appeared to be wreckage. It was again dove upon on June 3, 1997 (DN 154), to conclusively determine that it was not AWOIS #9675.
Recommendation: Chart an obstruction with a least depth of ~~28~~ 29 feet at the above location. - concur
Chart: 29 Obstn
SEE ALSO E+A REPORT

N1.3. Obstruction

Contact No.: 48996.90
Detached Position: ~~665~~ 666
Least Depth: ~~9.8m (32.2 ft)~~ ✓ 9.8 32 ft ~~7.4m (24 FT.)~~
Time of Least Depth: 1908 UTC
Position of Least Depth: Lat: 33°51' 01.~~795~~80" N
Long: 078°06' 33.~~462~~31" W
Description: Divers investigated this item on and found several sections of I-beam lying on the bottom.
Recommendation: Do not chart. Items N1.1, N1.2, and N1.5 are more significant. - Concur
~~SEE ALSO E+A REPORT~~

N1.4. Obstruction (Piles)

Contact No.: 48998.15
Detached Position: 1006
Least Depth: ~~11.0m (36.1ft)~~ 10.8m (35 ft)
Time of Least Depth: 1750 UTC
Position of Least Depth: Lat: 33°51' 01.71~~1~~"N
Long: 078°06' 37.93~~2~~"W
Description: Divers investigated this item on June 3, 1997 (DN 154), and found numerous rectangular concrete ~~piles~~. Pipes
Recommendation: Do not chart. Items N1.1, N1.2, and N1.5 are more significant. - Concur
SEE ALSO E+A REPORT

N1.5. Wreck

Contact No.: 48998.40
Detached Position: ~~666~~ 665
Least Depth: ~~7.5m (24.6ft)~~ 7.4m (24ft)

Time of Least Depth:	1950 UTC 80
Position of Least Depth:	Lat: 33°51' 01.795" N Long: 078°06' 33.307" W .462
Description:	Divers investigated this item on May 22, 1997 (DN 142), and found the wreckage of a barge. An I-beam was protruding approximately 8-10 ft above the least depth of the wreck itself. This I-beam is the location of the least depth of this item.
Recommendation:	Chart a wreck with a least depth of 24 ft. ~~Do not concur. See section N.1. Same as N.1. These Two Items are the Same Item, Pos.# 523 has the least Depth.~~ Concur, ~~See~~ also the E+A Report

N2. AWOIS #9671

AWOIS #9671 is listed as a large stock anchor with a least depth of 32ft (MLW) at position 33°48'57.63"N and 078°06'14.97"W. Mainscheme side scan sonar of 200% coverage, which encompasses the required 50-meter radius search area, thoroughly covered the site; no contacts were found. To further investigate this item, an additional 200% side scan development was conducted at a radius of 200m over the reported position (fixes 60,638 - 60,772). No significant contacts were found during operations.

Recommendation:	Remove charted obstruction. - Concur. Delete 32 OBSTN

N.3. AWOIS #9672

AWOIS #9672 is listed as a large stock anchor with a least depth of 34ft (MLW) at position 33°49'14.63"N and 078°05'42.97"W. Mainscheme side scan sonar of 200% coverage, which encompasses the required 50-meter radius search area, thoroughly covered the site; no contacts were found. To further investigate this item, an additional 200% side scan development was conducted at a radius of 200m over the reported position (fixes 60,341 - 60,495). No significant contacts were found during the development.

Recommendation:	Remove charted obstruction. - Concur. Delete 34 OBSTN

N.4. AWOIS #9673

AWOIS #9673 is listed as a 16" unexploded artillary shell with a least depth of 31ft (MLW) at position 33°50'05.62"N and 078°05'12.97"W. Mainscheme side scan sonar of 200% coverage, which encompasses the required 50-meter radius search area, thoroughly covered the site; no contacts were found. To further investigate this item, an additional 200% side scan development was conducted at a radius of 200m over the reported position (fixes 960 - 1,001, and 60,316 - 60340). No significant contacts were found during the development. However, WHITING could not disprove the existence of the shell if the item was covered with sand.

In addition to the investigation already conducted on AWOIS #9673, an Explosive Ordinance Disposal (EOD) unit from the U.S. Navy in Charleston, S.C., has agreed to perform a subsequent search for this "unexploded shell" on July 21, 1997. If found, the item will be removed. A follow-up should be done by Atlantic Hydrographic Branch (N/CS33) after EOD's search to determine the status of this item.

Follow-up information may be obtained by contacting:

Lt. Glenn Allen
E.O.D. Mobile Unit #6
U.S. Navy
Charleston, SC
Phone: (803) 743-1276

Recommendation: Keep charted "unexploded shell" with the presently charted clearance depth if this item is not located by EOD. If EOD finds this item and removes it from the area, WHITING recommends removing it from the chart. CONCUR ~~Do not concur - Delete from chart~~ - See documentation attached to the DESCRIPTIVE ~~Evaluation~~ Report SEE ALSO EVA REPORT

Delete UNEXPLODED SHELL (31) OBSTN

N.5. AWOIS #9674

AWOIS #9674 is listed as a section of wooden drydock with a least depth of 30ft (MLW) at position 33°50'42.62"N and 078°06'32.97"W. Mainscheme side scan sonar covered this area thoroughly with 200% side scan sonar coverage. No indications of wooden drydocks were found within the 50-meter search radius or the entire survey. To further investigate this item, an additional 200% side scan development was conducted at a radius of 200m over the reported position (fixes 60,496 - 60,772). No contacts were found during the development.

Recommendation: Remove charted wreck. - Concur.

Delete (30) WK

N.6. AWOIS #9675

AWOIS #9675 is listed as section of wooden dry dock with a least depth of 30ft (MLW) at position 33°51'05.62"N and 078°06'45.97"W. Mainscheme side scan sonar covered this area thoroughly with 200% side scan sonar coverage. No indications of wooden drydocks were found within the 50-meter search radius or the entire survey.

Recommendation: Remove charted wreck. - Concur.

Delete (30) WK

O. COMPARISON WITH THE CHART – See also the Evaluation Report.

Comparisons were made between survey H-10707 and charts 11536 (12th edition, dated Sept 4/93, 1:80,000), and 11537 (30th edition, dated 4/97, 1:40,000). Comparisons were made in

meters at 1:10,000 scale. In general, agreement is adequate with charted depths agreeing with survey soundings to within 0.7 meters. The overall trend appears to be a slight deepening throughout the survey area. The five charted AWOIS items (9671, 9672, 9673, 9674, and 9675) were investigated and discussed in Sec. N.2 through N.6.

P. ADEQUACY OF SURVEY See Also Evaluation Report.

This survey is complete and adequate to supersede all prior surveys in their common area.

Q. AIDS TO NAVIGATION See Also Evaluation Report.

There are three charted floating Aids to Navigation (ATON) in the survey area:

Floating ATON	Position from Survey	Date Located
Buoy G "1" (lighted)	Lat: 33°48' 45.732" Lon: 078°04' 41.666"	May 30, 1997
Buoy R "2" (lighted)	Lat: 33°48' 40.009" Lon: 078°04' 36.800"	May 30, 1997
Buoy "CF" (lighted)	Lat: 33°48' 15.~~246~~ 64" Lon: 078°05' 10.601"	May 29, 1997

The positions of these ATON's were verified with their charted positions (chart 11537, 30th edition, dated 4/97, 1:40,000).

An uncharted and unlit aid to navigation, that is supposed to mark an uncharted fish haven in the survey area, was located and positioned with DGPS (see section N.1 for a discussion of the buoy). The U.S. Coast Guard was notified of the following:

"AR420"	Lat: 33°~~48'~~ 50' 24.422" ~~15.264~~" N Lon: 078°~~05'~~ 07' 14.349" ~~10.601~~" W	May 19, 1997

R. STATISTICS

Number of Positions	23592
Main-scheme Sounding Lines (Nautical Miles)	562
Crosslines (Nautical Miles)	75
Square Nautical Miles Surveyed	24.3
Days of Production	37
Detached Positions	14
Bottom Samples	18

Tide Stations Installed	1
Current Stations	None
Number of CTD Casts	10
Magnetic Stations	None

S. MISCELLANEOUS SEE ALSO EVALUATION REPORT

No anomalies in either tides or current were observed and no unusual magnetic variations were encountered in the survey area. No unusual submarine features were discovered. Bottom samples were not required to be submitted to the Smithsonian Institution.

T. RECOMMENDATIONS SECTION P. See Also Evaluation Report.

No additional field work is required. There may be future plans to increase the controlling depth of the channel leading to the Cape Fear River.

U. REFERRAL TO OTHER REPORTS

A Chart User Evaluation Report was submitted on February 1997 and a Coast Pilot Report was submitted on December 1996.

Submitted by:

Kevin B Shaver, Senior Survey Technician
NOAA Ship WHITING

HORIZONTAL CONTROL STATIONS

Station:	**Charleston Coast Guard Beacon**
Latitude:	32° 45.45357' N
Longitude:	079° 50.57225' W
Frequency:	298 MHZ
Station ID (Antennae A):	016
Transmission Rate:	100 BPS

Station:	**Fort Macon Coast Guard Beacon**
Latitude:	34° 41.84333' N
Longitude:	076° 40.98706' W
Frequency:	294 MHZ
Station ID (Antennae A):	014
Transmission Rate:	100 BPS

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Office of NOAA Corps Operations
NOAA Ship WHITING S-329
439 W. York Street
Norfolk, VA 23510-1114

May 7, 1997

Commander, Fifth Coast Guard District
Federal Building
431 Crawford Street
Portsmouth, Virginia 23704-5004

ADVANCE INFORMATION

Dear Sir:

The NOAA Ship WHITING, while conducting hydrographic survey operations in the approaches to Wilmington, North Carolina, located two features which are dangers to navigation. Our findings are summarized below.

Feature	Latitude	Longitude	Depth
Obstruction	33° 51' 08.3" N	078° 06' 34.0" W	18.4 feet (3.0 fathoms)
Wreck	33° 32' 30.2" N	077° 56' 53.8" W	48.9 feet (8.1 fathoms)

In addition, NOAA Ship WHITING located the following uncharted floating aids to navigation (ATON):

Floating ATON	Latitude	Longitude	Date Located
Y, Round "AR 425"	33° 53' 03.7" N	078° 06' 32.8" W	April 16, 1997
Y, Round "AR 420"	33° 50' 24.4" N	078° 07' 14.3" W	April 21, 1997

Differential GPS was used to determine the survey positions the dangers to navigation and ATONS listed above. Positions are referenced to NAD 83. All depths are referenced to MLLW using predicted tides. Charts 11536 (12th edition) and 11537 (29th edition) are affected by this report.

A copy of this letter has been forwarded to the following offices:

Chief, Marine Charting Division, NOAA
Chief, AMC Operations Division, NOAA
Chief, Atlantic Hydrographic Branch, NOAA
Director, Defense Mapping Agency
Hydrographic/Topographic Agency
President, Wilmington Cape Fear Pilots Association

Sincerely,

Maureen R. Kenny

Maureen R. Kenny
Commander, NOAA
Commanding Officer

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Coast Survey
Silver Spring, Maryland 20910-3282

OCT 22 1997

MEMORANDUM FOR: Captain Andrew A. Armstrong, NOAA
Chief, Hydrographic Surveys Division

FROM: Lieutenant (jg) Eric J. Sipos, NOAA
Staff Assistant, HSD Operations Branch

SUBJECT: U.S. Navy Investigation of a 16 Inch Unexploded Shell shown on Chart 11537

I. Background

The 1965 NOS wire drag survey FE-203 located what divers described as a 16 inch unexploded artillery shell at Lat 33° 50' 05" N, Long 078°05' 14" W (NAD83), with a wire drag clearance of 31 ft MLLW and a diver lead line least depth of 33 ft MLLW. This item is listed as AWOIS item 9673 and is charted on Chart 11537 (30th ed. April 5, 1997) as an obstruction with a wire drag clearance of 31 ft MLLW. AWOIS item 9673 was investigated by 1996 NOS survey H-10707 using 400% side scan sonar coverage. There was no evidence of any sonar contacts within 200 meters of the charted position. At NOAA's request, the US Navy Mobile Unit Six Explosive Ordnance Disposal Team conducted a further investigation.

II. Search Area and Search Methods

The search area was defined as a circle with a 50 meter radius centered at Lat 33° 50' 05" N, Long 078°05' 14" W (NAD83).

The methods of investigation included a diver search of the area using a hand-held sonar set to detect objects rising off the sea floor, followed by a diver search using a MK-29 Ordnance Locator to detect buried metal objects. In addition, the towing of a MK-26 Ordnance Locator from a small boat was planned but heavy sea conditions forced its operation to be aborted.

III. Personnel

The investigation was performed Monday August 4, 1997 - Friday August 8, 1997 with Ensign Gregory Zach, USN as Officer in Charge of the seven man team. LTJG Eric J. Sipos, NOAA was present as the NOS representative and observed and advised the Navy on their

operations.

EOD Unit Address:

Lieutenant Glenn Allen, USN
Executive Officer
Explosive Ordnance Disposal
Mobile Unit Six, US Navy
1050 Remount RD BLDG 3675
N. Charleston, SC 29406
(803) 743-5448 x119
(803) 743-1274 Fax

EOD Team Members:

ENS Gregory Zach, USN (Officer In Charge)
SMCS David Loring, USN
HTC David Wilkinson, USN
HT1 Lionel Weinmann, USN
EM2 Chris Fornes, USN
RM2 Travis O'Leary, USN
AO2 Kevin Wascak, USN

IV. Equipment (See enclosures for ratings)

Positioning System -- AN PSN-11 Rockwell "PLGR", SN 6850
Hand-held Sonar -- AN PQS 2A, SN B-289
Ordnance Locator -- MK-29, SN 317
Ordnance Locator -- MK-26

V. Daily Log of Investigation

Monday, August 4, 1997

1400	US Navy team arrived at USCG Station Oak Island. ENS Zach and LTJG Sipos held a briefing to define the search area and discuss search techniques. ENS Zach stated that the MK 29 Ordnance Locator is rated to detect a 35 x 35 x 2 mm stainless steel test plate to a burial of 11.8 inches and that it would easily detect a larger object the size of a 16" diameter shell to a burial of 2-3 feet. The MK-26 Ordnance Locator can detect a large shell to a burial of six feet but it can only be used in extremely calm sea conditions.
1500	Underway from USCG Station Oak Island.
1530	Aborted operations due to heavy seas at the mouth of the river. Seas: 4-5 ft. Wind: 15-20 KTS SW. Returned to USCG Station Oak Island.

Tuesday, August 5, 1997

0815 Underway from USCG Station Oak Island.

0842 Buoy drop on site at Lat 33° 50' 05" N, Long 078°05'14" W (NAD 83)

0920 Diver search using AN PQS 2A Hand-held Sonar complete. No objects rising off the ocean floor were detected within the 50 meter search radius. Divers reported that visibility was 2-4 ft with minimal current.

1042 Divers located a large ferrous object buried at Lat 33° 50' 03.4" N, Long 078°05' 13.3" W (NAD 83)using MK-29 Ordnance Locator. The object was buried only a few inches.

1120 The object was excavated and determined to be a large ferrous rock, with excavated portions covering a 5 ft by 10 ft area, with still more rock buried beneath the sea floor. Excavations ceased when it was concluded that the rock was much larger than a growth encrusted shell would be. In addition, a portion of the rock was brought to the surface for physical examination and was determined not to be high explosive material leaked from a shell casing.

1400 Operations end with 1/8th of the 50 meter radius project area completed.

1430 Returned to USCG Station Oak Island.

Wednesday, August 6, 1997

0800 Underway from USCG Station Oak Island.
To improve the coverage rate, the EOD team shifted from a jack stay search using one diver to a circle search using two divers, each with a MK-29 Ordnance Locator, In addition, additional SCUBA tanks were brought to the site to increase total available diver bottom time. With the improvements in coverage rate and increased bottom time, MK-29 investigation of the entire 50 meter search was completed. The ferrous rock found on the previous day was once again located at Lat 33° 50' 03.4" N, Long 078°05' 13.3" W (NAD 83). No other ferrous contacts were found.

1530 Returned to USCG Station Oak Island.

Thursday, August 7, 1997

0800 Operations using the MK-26 Ordnance Locator were planned. Calibration checks took most of the morning. The required line spacing was determined to be 1.5 meters. Afternoon operations were canceled due to

high winds (NE 15-20 KTS) which would have made it difficult to stay on line at the required slow drift speed.

Friday, August 8, 1997

0800 Operations using the MK-26 Ordnance Locator were planned but aborted due to high winds (NE 15-20 KTS).

1300 ENS Zach and LTJG Sipos held a final meeting to discuss results. Both agreed that 100% coverage of the search area was achieved and that the existence of the 16 inch shell was disproved in the search area to burial of at least two feet.

VI. Conclusions and Charting Recommendation

The unexploded shell charted at Lat 33° 50' 05" N, Long 078°05'14" W (NAD 83) was investigated by US Navy divers using ordnance locating equipment. The unexploded shell was not found. It is recommended that the unexploded shell be removed from the chart.

Affected Charts: 11537, 11536

enclosures

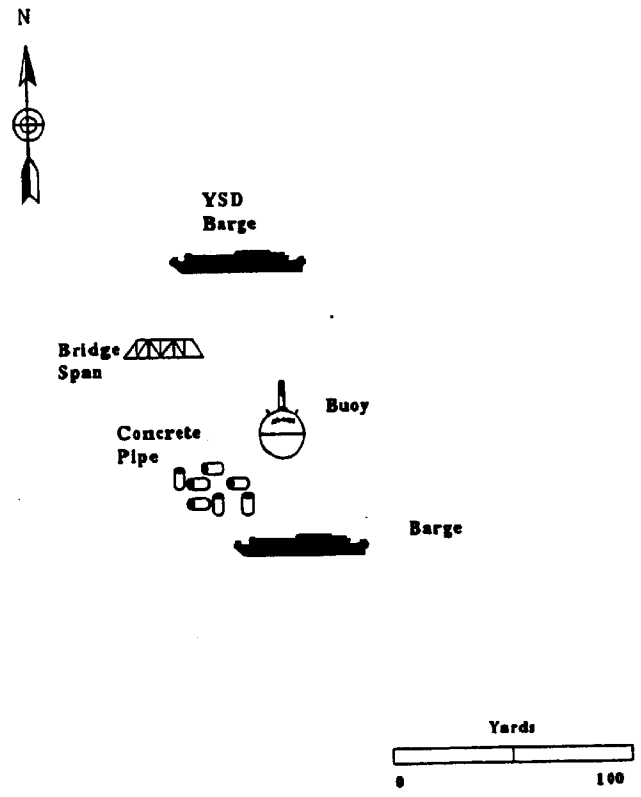
AR-420
TOM McGLAMMERY REEF

RANGE	315° magnetic - 3.0 nm from Cape Fear River sea buoy.
BUOY	**45347.9/59184.8** [All 400 series reef locations are given in Loran Chain (GRI) 7980 unless otherwise noted.]
AVG. DEPTH	30 ft.

REEF MATERIAL	DEPLOYED	LOCATION
104 ft YSD barge	1986	**45348.0-.2/59184.5-.6**
180 ft barge **HT-85**	1987	**200' south of buoy**
230 ft bridge span	1987	**45348.1/59185.0**
60 pieces concrete pipe and manhole sections	1992	**45348.0/59185.0-.1** **45348.7/59183.6** **45348.4/59184.7**

NOTES AND ADDITIONS:

AR-420



APPROVAL SHEET
HYDROGRAPHIC SURVEY
OPR-G309-WH
1996
WH-10-8-96
H-10704

The data for this survey were acquired and checked under my daily supervision. Position and sounding accuracy meet the requirements specified in the Project Instructions, Hydrographic Manual, Hydrographic Survey Guidelines and the Field Procedures Manual for Hydrographic Surveying. This survey is complete and adequate for the intended purpose of delineating bottom topography, determining depths, and identifying all potential dangers to navigation. No final field sheets were prepared for this survey. The survey data and accompanying records are complete for the preparation of the smooth sheet.

Approved by:

Maureen R. Kenny

Commander Maureen R. Kenny, NOAA
Commanding Officer, NOAA Ship WHITING

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Ocean and Earth Sciences
Silver Spring, Maryland 20910

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: September 19, 1997

HYDROGRAPHIC BRANCH: Atlantic

HYDROGRAPHIC PROJECT: OPR G309-WH

HYDROGRAPHIC SHEET: H-10707

LOCALITY: North Atlantic Ocean

TIME PERIOD: March 18 - June 16, 1997

TIDE STATION USED: 865-9182 Yaupon Beach, N.C..
Lat. 33° 54.1'N Lon. 78° 4.9'W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 m
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.512 m

REMARKS: RECOMMENDED ZONING

Use zone(s) identified as: SEC105 & SEC110

Refer to attachment(s) for zoning information.

Note: Provided time series data are tabulated in metric units (meters) and on Greenwich Mean Time.

CHIEF, TIDAL ANALYSIS BRANCH

NOAA FORM 76-155
(11-72)

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

GEOGRAPHIC NAMES

SURVEY NUMBER

H-10707

Name on Survey	A ON CHART NO. 11536, 11537, 11520	B ON PREVIOUS SURVEY NO.	C ON U.S. QUADRANGLE MAPS	D FROM LOCAL INFORMATION	E ON LOCAL MAPS	F P.O. GUIDE OR MAP	G RAND MCNALLY ATLAS	H U.S. LIGHT LIST	K	
CAPE FEAR RIVER (title)	X		X							1
NORTH ATLANTIC OCEAN	X		X							2
NORTH CAROLINA (title)	X		X							3
										4
										5
										6
										7
										8
										9
										10
										11
										12
										13
										14
										15
										16
										17
										18
					Approved:					19
										20
					Chief Geographer					21
					AUG 7 1997					22
										23
										24
										25

NOAA FORM 76-155 SUPERSEDES C&GS 197

NOAA FORM 61-29
(12-71)

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

REFERENCE NO.

N/CS33-35-98

LETTER TRANSMITTING DATA

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

☐ ORDINARY MAIL ☐ AIR MAIL

☐ REGISTERED MAIL ☒ EXPRESS

☐ GBL *(Give number)* _____

TO:

NOAA/National Ocean Service
Chief, Data Control Group, N/CS3x1
SSMC3, Station 6815
1315 East-West Highway
Silver Spring, MD 20910-3282

DATE FORWARDED

April 20, 1998

NUMBER OF PACKAGES

1 Tube

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

H-10707

North Carolina, North Atlantic Ocean
8 NM SE of Lockwoods Folly Inlet

Tube containing:

1 Mylar Smooth Sheet

1 Mylar H-Drawing for NOS Chart 11536
1 Mylar H-Drawing for NOS Chart 11537

1 Paper Composite plot for NOS Chart 11537
2 Paper Composite plots for NOS Chart 11536

1 Descriptive Report
2 Drawing History Forms #76-71 for NOS Charts 11536, 11537

FROM: *(Signature)* Maxine Fetterly

Maxine Fetterly

RECEIVED THE ABOVE
(Name, Division, Date)

Return receipted copy to:

Atlantic Hydrographic Branch
439 W. York Street
Norfolk, VA 23510-1114

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

*U.S.GPO:1983-0-664-006/1192

This form was electronically produced by ELite Federal Forms' Forms Manager

04/20/98

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NUMBER: H-10707

NUMBER OF CONTROL STATIONS	2
NUMBER OF POSITIONS	23529
NUMBER OF SOUNDINGS	23529

	TIME-HOURS	DATE COMPLETED
PREPROCESSING EXAMINATION	8	07/08/97
VERIFICATION OF FIELD DATA	48.50	01/23/98
EVALUATION AND ANALYSIS	15	
FINAL INSPECTION	15	01/23/98
COMPILATION	67.50	04/17/98
TOTAL TIME	154	

ATLANTIC HYDROGRAPHIC BRANCH APPROVAL 02/11/98

ATLANTIC HYDROGRAPHIC BRANCH
EVALUATION REPORT FOR H-10707 (1997)

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

D. AUTOMATED DATA ACQUISITION AND PROCESSING

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

Hydrographic Processing System
NADCON, version 2.10
SiteWorks, version 2.01
MicroStation 95, version 5.05
I/RAS B, version 5.01

The smooth sheet was plotted using an Hewlett Packard Design Jet 350C plotter.

H. CONTROL STATIONS

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

To place this survey on the NAD 27, move the projection lines 0.629 seconds (19.390 meters or 1.94 mm at the scale of the survey) north in latitude, and 1.020 seconds (26.287 meters or 2.63 mm at the scale of the survey) east in longitude.

L. JUNCTIONS

H-10687 (1996) to the south
H-10700 (1996) to the west
H-10728 (1997) to the north

H-10741 (1997) to the east

Standard junctions were effected between the present survey and H-10687 (1996),H-10700 (1996),H-10728 (1997), and H-10741 (1997).

M. COMPARISON WITH PRIOR SURVEYS

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

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

N. ITEM INVESTIGATIONS

N.1 The following uncharted wrecks and obstruction are located in the vicinity of Latitude 33°51'06"N, Longitude 78°06'35"W:

Description	Depth (m/ft)	Latitude (N)	Longitude (W)
wreck	$9^{0}/29$	33°51'14.58"	078°06'38.10"
wreck	$5^{5}/18$	33°51'08.34"	078°06'33.95"
wreck	$7^{4}/24$	33°51'01.80"	078°06'33.46"
obstruction	$10^{8}/35$	33°51'01.71"	078°06'37.93"

It is recommended that the three wrecks with depths of 18 feet, 24 feet and 29 feet be charted as shown on the present survey on chart 11537. The obstruction with a depth of 35 feet should not be charted.

N.4. Automated Wreck and Obstruction Information System item (AWOIS) 9673, is a charted Obstruction "Unexploded Shell" with a wire drag clearance depth of 31 feet originating with FE-203WD (1965) in Latitude 33°50'05.62"N, Longitude 78°05'12.97"W. The obstruction was investigated by the field unit and U.S. Navy divers with negative results. It is recommended that the Obstruction "Unexploded Shell" with a

wire drag clearance depth of 31 feet be removed from the chart.

O. COMPARISON WITH CHART 11536 (12th Edition, Sept 4/93) 11537 (30th Edition, April 4/97)

Hydrography

The charted hydrography originates with the prior surveys and requires no further consideration. The hydrographer makes adequate chart comparisons in sections N. and O. of the Descriptive Report. The following should be noted:

1. An uncharted rock with a least depth of 40 feet (12^3 m), in Latitude 33°49'38.11"N and Longitude 078°06'35.40"W, was located by the field unit. It is recommended that the rock be charted as shown on present survey.

2. An uncharted obstruction with a least depth of 41 feet (12^5 m), in Latitude 33°50'22.93"N and Longitude 078°06'02.07"W, was located by the field unit. Surrounding present survey depths are 38-40 feet. It is recommended that the obstruction not be charted.

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

Dangers to Navigation

One Danger to Navigation report was submitted to Commander(oan), Fifth Coast Guard District, Portsmouth, Virginia for inclusion in the Local Notice to Mariners, and to the Marine Chart Division, N/CS3x1, Silver Spring, Maryland. A copy of this report is appended to the Descriptive report.

P. ADEQUACY OF SURVEY

This is an adequate hydrographic/side scan sonar survey. No additional work is recommended.

S. MISCELLANEOUS

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

The following NOS charts were used for compilation of the present survey: 11536 (13th Edition, March 15/97)
11537 (30th Edition, April 5/97)

WHITING Processing Team

Robert Snow

Robert Snow
Cartographic Technician
Verification of Field Data
Evaluation and Analysis

APPROVAL SHEET
H-10707

Initial Approvals:

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

Robert G. Roberson Date: FEBRUARY 11, 1998
Robert G. Roberson
Chief, Cartographic Section

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

Nicholas E. Perugini Date: February 11, 1998
Nicholas E. Perugini
Commander, NOAA
Chief, Atlantic Hydrographic Branch

****

Final Approval:

Approved: Andrew A. Armstrong, III Date: May 1, 1998
Andrew A. Armstrong, III
Captain, NOAA
Chief, Hydrographic Surveys Division

NOAA FORM 75-96
(10-83)

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

MARINE CHART BRANCH

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10707

INSTRUCTIONS

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart.
1. Letter all information.
2. In "Remarks" column cross out words that do not apply.
3. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

CHART	DATE	CARTOGRAPHER	REMARKS
11537	4/9/98	[signature]	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No.
11536	4/14/98	[signature]	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
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			Drawing No.

SUPERSEDES C&GS FORM 8352 WHICH MAY BE USED