

10341

Diagram No. 1227-3

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey Hydrographic
Field No. WH-10-3-90
Registry No. H-10341

LOCALITY

State Virginia
General Locality Atlantic Ocean
Sublocality 12 NM Southeast of
..... Cape Henry
.....
..... 19 90
.....
CHIEF OF PARTY
CDR R.P. Floyd

LIBRARY & ARCHIVES

DATE November 18, 1991

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

10341

EC/G

PRODUCTS

12208 ✓
12207 ✓
12221 ✓
12220 ✓
12200 ✓
12205A ✓

HYDROGRAPHIC TITLE SHEET

H-10341

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

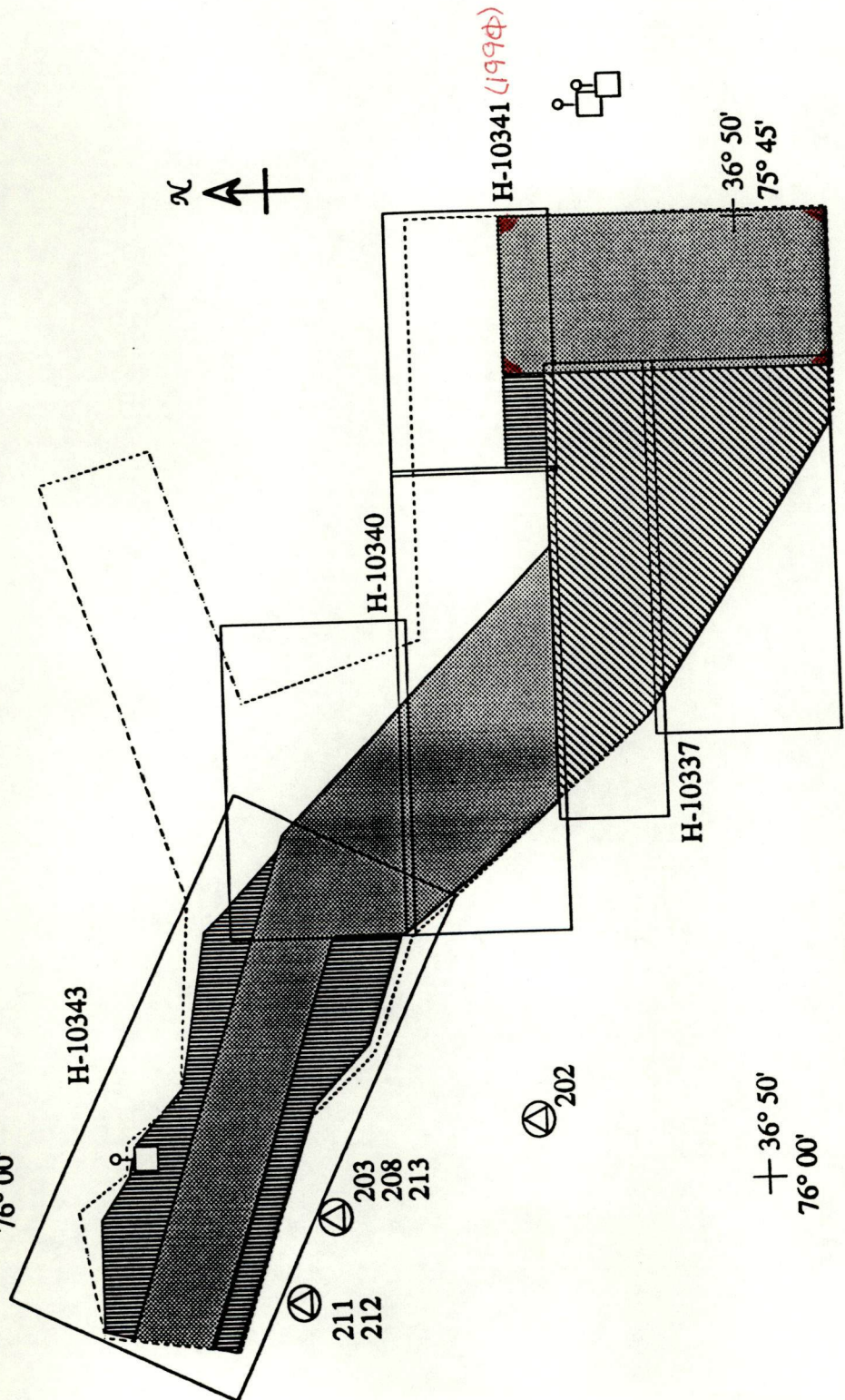
FIELD NO.

WH-10-3-90

State VirginiaGeneral locality Atlantic OceanLocality 12 NM Southeast of Cape HenryScale 1:10000Date of survey 18 MAY 6 JUNE 1990
20 April 20 May 1990Instructions dated 19 March 1990Project No. OPR-D111-WH-90Vessel NOAA Ship Whiting 2930Chief of party CDR Richard P. FloydKathy Timmons, Richard B. Koehler, Nancy L. Crews, Lee M. Cohen,Surveyed by Matthew J. Wingate, Kim T. McDonough, Katharine A. McNitt, Kelly G. TaggartSoundings taken by echo sounder, hand lead, pole DSF 6000NGraphic record scaled by Officers, Survey Technicians and AMC Cartographers and TechniciansGraphic record checked by Officers, Survey Technicians and AMC Cartographers and TechniciansProtracted by _____ Automated plot by BRUNNING ZETA 936XYNETIC 1201 PLOTTER (AKS)Verification by ATLANTIC HYDROGRAPHIC SECTION PERSONNELSoundings in meters ~~fathoms~~ ~~feet~~ at MLW MLLWREMARKS: Junctions with H-10337NOTES IN THE DESCRIPTIVE REPORT WERE MADE IN RED DURING
OFFICE PROCESSING.AWOIS/SURF ✓ 12/24/91 STJSP-1-30-97XW 1-3-92

+ 37° 00'
75° 45'

+ 37° 00'
76° 00'



+ 36° 50'
76° 00'

+ 36° 50'
75° 45'

Legend	April	May	June
Soundings (Inm)	389.0	575.0	272.9
Area (sq. nm)	10.0	21.5	9.0
STD cast	1	2	0
Bottom Samples	24	64	0

Scale 1:160,000
from HDAPS
planning sheet

PROGRESS SKETCH, OPR-D111-WH-90
Entrance to Chesapeake Bay, Virginia
NOAA SHIP WHITING
Richard P. Floyd, Commander, NOAA
Commanding Officer

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

SEPARATES

* I. HYDROGRAPHIC SHEETS AND PARAMETERS

* II. BOTTOM SAMPLES

* III. HORIZONTAL POSITION CONTROL AND CORRECTIONS TO POSITION DATA

* IV. SOUNDING EQUIPMENT CALIBRATIONS AND CORRECTIONS

* V. SIDE SCAN SONAR DATA

* VI. ITEM INVESTIGATION DATA

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

**DESCRIPTIVE REPORT TO ACCOMPANY
HYDROGRAPHIC SURVEY
OPR-D111-WH-90
FIELD NUMBER WH-10-3-90
REGISTRY NUMBER H-10341
NOAA SHIP WHITING**

Cdr. Richard P. Floyd, Commanding Officer

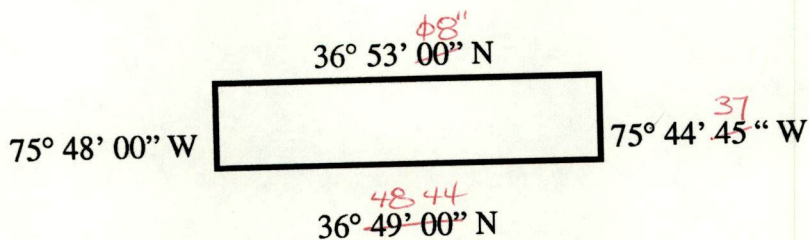
A. PROJECT

Survey operations were conducted in accordance with the March 19, 1990 Hydrographic Project Instructions, OPR-D111-WH-90, Chesapeake Bay Entrance, Virginia and with Change No. 1 dated May 2, 1990 and Change No. 2 dated May 25, 1990.

The purpose of this project was to perform a basic hydrographic survey with 200 percent side scan sonar bottom coverage of the southern approach to Chesapeake Bay. In addition, portions of the precautionary area and entry from sea to Thimble Shoals Channel were surveyed. The project originated from a request by the Fifth Coast Guard District as a result of a Port Access Route Study. This survey was designated as sheet "A" and assigned Registry number H-10341.

B. AREA SURVEYED

Hydrographic survey H-10341 was conducted east of the southern sea-lanes approaching Chesapeake Bay Entrance, approximately 12 nautical miles Southeast of Cape Henry, Virginia. Due to the limited time authorized in the survey area, the northern section of A sheet was not surveyed. The survey was bounded by:



Survey operations began on May 18, 1990 (DOY 138) and ended on June 6, 1990 (DOY 157). Seven days were used to conduct survey H-10341. Data were acquired on the following days:

DOY 138 - DOY 141	May 18 - May 21
DOY 144 - DOY 145	May 24 - May 25
DOY 157	June 6

C. SURVEY VESSEL

The NOAA ship WHITING S-329, EDP number 2930, was the only surveying vessel used to gather hydrographic data. WHITING had two primary functions during survey operations. These functions were to collect and process all hydrographic data.

D. AUTOMATED DATA ACQUISITION AND PROCESSING

A Hydrographic Data Acquisition and Processing System (HDAPS) was used to collect and process data for H-10341. HDAPS software is programmed using the Hewlett Packard (HP) Basic computer language. Program titles and versions numbers were:

POST SURVEY	Version 4.14
CONSTAT	Version 2.05
PLOTALL	Version 1.65
FILE SYSTEM	Version 1.55
SURVEY	Version 4.33
ABST	Version 3.05

Program NADCON version 1.01, dated January 1989, was used to convert AWOIS items and buoys to NAD 83 for plotting and for applying datum shift to master overlays.

All sound velocity corrections were determined using program VELOCITY (1.10 ext, dated 1 July 1989).

E. SIDE SCAN SONAR EQUIPMENT

WHITING maintained 24-hour shipboard data acquisition and processing throughout the survey. An EG&G model 272-T dual-channel towfish was towed from a custom-made block attached to an A-frame support on the fantail of WHITING. The operating frequency of the side scan sonar was 100 KHZ with the range scale set on 100 meters for each channel (port and starboard) resulting in 200-meter swath width. Consequently, 200% bottom

coverage and a swath overlap of 2 millimeters at the scale of the survey was obtained by offsetting the sounding lines 85 meters.

Data were recorded by an EG&G model 260 Image Correcting Side Scan Sonar System. The following is a list of serial numbers and days of use:

<u>Type</u>	<u>S/N</u>	<u>Day Number</u>
Towfish	011902	138-139
Towfish	011904	139-157
260 Recorder	0012105	139-157
260 Recorder	0012106	138-140

The HDAPS on-line swath plot reduces the effective scanning swath whenever the height of the fish is less than 8% of the range scale in use. In areas where the towfish height was 8 meters (using the 100 meter range scale), the swath plots were examined to ensure adequate coverage was maintained. In areas too shallow to acquire adequate swath coverage, data was rejected.

The confidence check method used during H-10341 was to tow the side scan fish past a buoy or Chesapeake Light tower keeping the fish 70 to 90 meters off the object. Two passes were made, one pass per channel. Checks were run at least once per 24-hour period and two times per day when feasible. The analog trace on the port and starboard channel sonargrams were examined by survey personnel to insure proper side scan sonar operation.

Side scan sonar records were scanned by WHITING and Cartographic personnel from the ^{HYDROGRAPHIC PROCESSING UNIT} Verification Branch, ^{HYDROGRAPHIC SECTION} Atlantic Marine Center, Norfolk VA. While scanning records, significant contacts were noted and logged in the side scan sonar target list. The HDAPS Contact Utility Program generated the contact's true height off the bottom and its position. The contact was assigned a index number, placed in a contact table and plotted.

F. SOUNDING EQUIPMENT

A Raytheon Digital Survey Fathometer DSF 6000N echo sounder was the only sounding equipment used to determine water depth during the survey. The DSF 6000N operated on a high frequency of 100 kHz and a low frequency of 24 kHz, with an analog trace of both frequencies being printed. The high frequency soundings were incorporated into HDAPS during post processing.

The following is a list of serial numbers and days of use:

<u>S/N</u>	<u>Day Number 1990</u>
A111N	138-139
A122N	139-157

Accuracy tests were performed on the DSF 6000N by electronic technicians whenever data acquisition was interrupted or records were broken.

At the start of survey H-10341, DSF problems were encountered with the analog trace on unit A111N. The stylus was not leaving a readable trace on the echogram and after a short time, completely stopped producing a trace. Electronic technicians switched echosounders to unit A122N which operated until the end of the survey. At no time was the quality of data compromised. Any records that were not readable were rejected and rerun.

G. CORRECTIONS TO SOUNDINGS

One velocity table was used during H-10341. A SEACAT Salinity, Temperature and Depth (STD) profiler (s/n 286) was used to collect velocity data. STD casts were made on May 7, 1990 (DOY 127) and May 30, 1990 (DOY 150). All casts were verified by using a second SEACAT STD profiler (s/n 284). A summary of SEACAT STD casts locations is as follows:

<u>Day of Year</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Depth</u>	<u>Velocity Table #</u>
(DOY 127)	36° 51' 38" N	75° 43' 59" W	22 meters	02
(DOY 150)	36° 57' 12" N	76° 00' 28" W	22 meters	03

The velocity program picked twenty significant depths to describe the water column sound velocity profile. The resulting correctors were entered into HDAPS Velocity Tables and applied to the sounding data during acquisition and post processing. The velocity cast May 30, 1990 (DOY 150) showed no correctors needed to be applied within the depth limits of survey H-10341 so no velocity table was created. *VELOCITY TABLE GENERATED DURING OFFICE PROCESSING.*

A vertical cast in 17.4 meters of water was made on June 8, 1990 (DOY 159) to compare the DSF 6000N echosounder to a leadline. A -0.06 meter instrument correction was calculated for the narrow and wide beam echosounder. Cast data is included in Separate IV. *DATA REMOVED FROM ORIGINAL DESCRIPTIVE REPORT AND FILED WITH FIELD RECORDS.*

Settlement and Squat was determined April 26, 1990 (DOY 116) near Thimble Shoal Channel between the Chesapeake Bay Bridge Tunnel and Buoy 12. These values were determined by steering the ship past a marker buoy at various speeds while measuring the water depth with the DSF 6000N. The values are included in Separate IV. DATA REMOVED FROM ORIGINAL DESCRIPTIVE REPORT AND FILED WITH FIELD RECORDS. A Heave Pitch And Roll sensor (HIPPY) was unable to be interfaced with HDAPS. Therefore, all analog traces from the echograms were scanned to remove sea action.

Tidal datum for project OPR-D111-WH was Mean Lower Low Water. Predicted tides from NOAA Tide Tables, Hampton Roads, VA (station number 863-8610) were used as a reference for this project. The time and height correctors were entered in the predicted tides tables and applied to final sounding plots. APPROVED TIDES APPLIED DURING OFFICE PROCESSING.

Verbal contact was made with Mr. Jim Dixon of the Atlantic Operations Group (N/OMA1213) before transiting to the work area. Mr. Dixon confirmed the tide gages were working properly. Time and height correctors were:

	Time Correctors	Height Correctors
High Water	-1 hr 40 min	x1.35
Low Water	-1 hr 40 min	x1.35

Third-order levels were run from tide station 863-8863, Chesapeake Bay Bridge Tunnel, VA on April 16, 1990 (DOY 106). Closing levels were run on June 11, 1990 (DOY 162). Closing tolerances for the tide staff were within the acceptable limits for a run of under 500 feet. However, due to the excessive vibration along the fishing pier, the tide staff showed a increase in elevation of approximately .1 feet.

Atlantic Operations Group informed WHITING personnel that leveling the tide gage would be extremely difficult. They also mentioned that if the closing tolerance exceeded the allowable limit for the entire run, to call their office and compare our closure to historical values from previous surveys. This was unnecessary due to an acceptable closure.

H. CONTROL STATIONS

All geodetic positions are referenced to the North American Datum (NAD) 83. Four horizontal control stations were occupied with Mini-Ranger positioning equipment operating in the range - range mode. Station descriptions and Geographical Positions are included for each site in Appendix III. Control station DAM NECK BOQ 1981 did not

have a published GP in the Geodetic Control Data. Fortunately the Atlantic Marine Center Coastal Surveys Unit, N/CG 23322, provided WHITING with a position from previous surveys in the area.

I. HYDROGRAPHIC POSITION CONTROL

The Mini-Ranger Falcon 484 short range positioning system was used for project OPR-D111-WH. The ship's position was determined by the intersection of ranges from the shore-based remote stations. HDAPS records include the remote station codes used for each positioning fix, plus an error circle radius, which can be used as a measure of how accurate each fix is. Position busts appeared on the track plot as fliers, and if reliable positions existed on both sides of the flier, the questionable position was smoothed during post processing.

Mini-Ranger Falcon 484 positioning equipment included:

Range Processing Unit	s/n D 0004
Control Display Unit	s/n E 0013
Receiver Transmitter	s/n E 2914
Remote Code 3	s/n F 3571
Remote Code 5	s/n F 3292
Remote Code 6	s/n F 3296
Remote Code 7	s/n E 2889

An opening baseline calibration was performed on 18 April 1990, (DOY 108) at the Atlantic Marine Center, Norfolk, Virginia. Baseline calibrations were performed to the standards of the AMC OPORDER 86 (Falcon 484 Calibration Procedures and Standard Forms). Correctors were placed into HDAPS C-O (corrected-observed) table before survey operations began. The critical system checks were performed by Multiple Lines of Position (MLOP). MLOP were used for the majority of project H-10341. A closing baseline calibration was determined not to be necessary.

The Receiver/Transmitter antenna offset and side scan block offset were computed by WHITING personnel before the start of survey H-10341 and entered into the HDAPS offset table. A table of offsets is included in Separate III. DATA REMOVED FROM ORIGINAL DESCRIPTIVE REPORT AND FILED WITH FIELD RECORDS.

J. SHORELINE SEE SECTION 2.6. OF THE EVALUATION REPORT.

No shoreline existed in the survey area.

K. CROSS-LINES SEE ALSO SECTION 3.9. OF THE EVALUATION REPORT.

A total of 21.5 nautical miles of crosslines were run on H-10341 and equaled 9 percent of main-scheme lines. All soundings at cross lines agreed to within one-half meter of main-scheme soundings.

L. JUNCTIONS SEE ALSO SECTION 5. OF THE EVALUATION REPORT.

Survey H-10341 scale junctioned with contemporary survey H-10337. Both surveys junctioned along longitude 075° 47' 45" W between latitudes 36° 52' 30" N to 36° 49' 00" N. Compared depths ranged from 15.8 meters to 18.5 meters. The two contemporary surveys showed excellent agreement with the difference in depth varying from 0.0 meters to 0.2 meters.

M. COMPARISONS WITH PRIOR SURVEYS SEE ALSO SECTION 6. OF THE EVALUATION REPORT.

A comparison with prior survey soundings showed excellent agreement with H-10341. Two prior surveys were compared to soundings in H-10341 sheet area. The prior surveys compared were:

<u>Registry Number</u>	<u>Scale</u>	<u>Year Surveyed</u>
H-9922	1:20,000	1980
H-9959	1:20,000	1981

Prior surveys H-9922 and H-9959 were plotted using NAD 1927. Survey H-10341 was plotted using NAD 83, therefore for comparison purposes a datum shift was applied to H-10341.

Twenty-two soundings from survey H-10341 were selected and compared to the same positions on Prior surveys H-9222 and H-9959. All soundings were in agreement from 0.0 meters to .6 meters.

AWOIS 788

AWOIS item 788 is listed as an unknown wreck reported in 1942 at 36° 51' 45" N, 075° 46' 00" W. The wreck was cleared to a depth of 56 feet at 36° 51' 43" N, 075° 46' 02" W in 1976 by survey H-9871 WD 1976. No search radius was specified in the OPR-D111-WH-90 AWOIS list, however, no significant contacts were located near the reported area. *SEE ALSO SECTION 7.9. OF THE EVALUATION REPORT.*

AWOIS 796

AWOIS item 796 is listed as an unknown wreck reported at 36° 53' 04" N, 075° 47' 00" W. The reported position was cleared to a depth of 54 feet by wire drag during survey H-9871 WD 1976. No significant contacts were located within the search radius. *CONCUR ENTIRE SEARCH RADIUS NOT COMPLETE. FINAL DISPOSITION WILL BE MADE IN DESCRIPTIVE REPORT OR EVALUATION REPORT FOR SURVEY FE-355SS(199Φ).*

AWOIS 1608

AWOIS 1608 is listed as the wreck of the "Stormy", a 40-foot fishing vessel, reported sunk at 36° 51' 48.0" N and 075° 47' 01.8" W. A least depth of 53 feet was determined during survey H-9⁸71 WD 76 using a Bryson Gage at position 36° 51' 48" N, 075° 47' 18" W. *Φ2*

A significant contact was located on DOY 138 at fix number 466.39, position 36° 51' 49.62" N, 075° 47' 00.33" W and again located on DOY 144 at fix number 1536.26, position 36° 51' 49.96" N, 075° 47' 00.51" W. This contact was approximately 40 - 50 meters north of the listed location of AWOIS item 1608. The wreck had a calculated height off the bottom 0.6 meters in 18 meters of water.

It is recommended that a diver investigation and least depth determination be accomplished by a future field unit to fully resolve this item. *CONCUR THE 16²WK WAS NOT BROUGHT FORWARD BECAUSE OF POSITION DISAGREEMENT. RETAIN 16²WK (53FT) UNTIL FINAL DISPOSITION HAS BEEN MADE IN DESCRIPTIVE REPORT OR EVALUATION REPORT FOR SURVEY FE-355SS(199Φ) ON THE CONTACT DISCUSSED ABOVE.*

AWOIS 7528

AWOIS item 7528 is listed as an uninvestigated obstruction with a cleared wire drag depth to 59 feet (18 meters) located at position 36° 52.46' N, 075° 45.36' W from survey H-9871 WD 1976. No significant contacts were located within the 200-meter search radius. *CONCUR 4ΦΦ% SIDE SCAN SONAR COVERAGE NOT OBTAIN. BROUGHT FORWARD FROM SURVEY H-9871WD(1976) TO SUPPLEMENT PRESENT SURVEY.*

FINAL DISPOSITION WILL BE MADE IN DESCRIPTIVE REPORT OR EVALUATION REPORT FOR SURVEY FE-355SS(199Φ).

AWOIS 7529

AWOIS item 7529 is listed as an old navigation buoy anchor weight (4 ft x 4 ft concrete block, 2 ft high). Survey H-9871 WD 76 cleared by wire drag a depth of 57 feet (17.4 meters) in only one direction.

A significant contact was located on DOY 145 at fix number 1883.27, position 36° 51' 58.13" N, 075° 45' 02.89" W. The same contact was located again on an adjacent line at fix number 1927.17, position 36° 51' 57.31" N, 075° 44' 59.54" W.

It is recommended that a diver investigation and least depth determination be accomplished by a future field unit to fully resolve this item. CONCUR THE 1740BSTR WAS NOT BROUGHT FORWARD BECAUSE OF POSITION DISAGREEMENT. RETAIN 1740BSTR (57 FT) CLEARED BY WIRE DRAG UNTIL FINAL DISPOSITION HAS BEEN MADE IN DESCRIPTIVE REPORT OR EVALUATION REPORT FOR FE-35555 (1990) ON CONTACT DISCUSSED ABOVE.

N. COMPARISON WITH THE CHART SEE SECTION T. C. OF THE EVALUATION REPORT.

Comparisons of soundings from H-10341 with charted soundings were not made during data acquisition, even though the Project Instructions state otherwise. No on-line sounding comparisons were made because HDAPS software at the present time does not print depths on the on-line sheet; only the vessel track and swath width are plotted when using side scan sonar. A 1:10,000-scale enlargement of chart 12221, Chesapeake Bay Entrance, 57th edition, January 28, 1989 was used for the comparisons. All soundings agreed to within 1 meter of the charted depths.

Nautical chart 12205, Cape Henry to Pamlico Sound Including Albermarle Sound, 20th edition, January 21, 1989, 1:80,000 scale, covered the survey area; however, an enlarged section of Rudee Inlet was printed on chart 12205 directly over the location where survey H-10341 was conducted. The 1:10,000-scale enlargement of nautical chart 12205 did not cover survey area H-10341.

Nautical chart 12207, Cape Henry to Currituck Beach light, 1:80,000 scale, 16th edition, August 3, 1985 was also compared to survey H-10341. Twelve soundings from chart 12207 that were within the survey limits were compared to H-10341. Soundings were in general agreement with a difference ranging from .2 to .8 meters.

There were no additional dangers to navigation found in the survey area.

O. ADEQUACY OF SURVEY

This hydrographic survey is adequate to supersede prior surveys of the area. No part of this survey is considered to be substandard.

This survey is a complete basic hydrographic survey, with the exception that contacts identified by 200% side scan coverage have been left for further investigation and least depth determination by a future field unit. SEE ALSO SECTION 9. OF THE EVALUATION REPORT

P. AIDS TO NAVIGATION SEE ALSO SECTION 7. C. OF THE EVALUATION REPORT.

Although floating aides to navigation did exist in the survey area, Project Instructions, section 4.2, stated data on the aids were not applicable to this project.

Q. STATISTICS

Number of Positions	2136
Nautical Miles of Main-Scheme Sounding Lines	248.2
Nautical Miles of Cross-Line Sounding Lines	21.5
Square Nautical Miles Surveyed	10.5
Days of Production	10
Detached Positions	0
Bottom Samples	36
Tide Stations	1
Current Stations	0
Number of STD Casts	2
Magnetic Stations	0

R. MISCELLANEOUS

The length of time allotted to WHITING to conduct this survey was far too short. Several factors might not have been considered in estimating the time needed. These include:

1. It had been 2 years since WHITING conducted this type of survey. Corporate knowledge was lacking and equipment did not operate properly. Substantial time was needed to learn and perfect procedures, and to restore the side scan sonar system to a properly functioning condition.
2. In water depths of 11 meters or less, the ship must run at a slower speed and/or the side scan sonar range must be reduced. Both of these measures cause a substantial decrease in the rate of production.

3. Vessel traffic in the survey area was very congested. This required that special schemes be utilized to run with the general flow of traffic. The schemes required more time to complete a given area than the usual "mowing the grass" method. Heavy traffic also caused WHITING to abort lines and to veer off line in order to comply with nautical rules of the road.

Side scan sonar operations are limited to a speed of 6 knots or slower. WHITING's main engines were not designed to run for prolonged periods under such a light load. Excessive engine wear results, as well as a heavy build up of oil in the exhaust piping, which increases the chance of stack fire. For this reason, WHITING suspended side scan operations twice daily to run the engines under full load. All of this time was used to advantage in such tasks as running crosslines, repairing equipment, transiting and processing survey data.

Project instructions did not provide a clear and accurate objective of the project. Priorities were indicated by survey sheet layout, rather than by the actual areas of importance (i.e., about 1/2 mile either side of the mid channel buoys for the southeast sea lane, and the pilotage and precautionary areas).

Data processing takes an enormous amount of time. The ratio of processing to acquisition time is on the order of 3:1.

Bottom samples from H-10341 were taken for submission to the Smithsonian Institution, as directed in section 6.7 of the Project Instructions. Thirty-six samples were obtained.

S. RECOMMENDATIONS

In estimating the time required to complete this type of survey, consider not only the size of the area, but also:

1. Start-up time
2. Depth of water
3. Traffic density
4. Extra sea days at sea needed for processing

If 24-hour per day acquisition is expected, the vessel will need two independent processing systems and more people to run the survey. Otherwise a 12-hour acquisition period followed by a 12-hour processing period (or similar routine) will be needed.

WHITING was very fortunate to have personnel from the Atlantic Hydrographic section assist in data processing. Shipboard personnel welcomed the expertise of the

verifiers to help determine what constituted a significant contact. However, personnel aboard WHITING experienced some confusion with the rotating verifiers in identifying contacts. What one verifier marked as significant another would mark as insignificant. To correct this problem, training is recommended in scanning side scan records for ship personnel.

Side scan sonar contacts which are recommended for further investigation are included in Separate V. DATA REMOVED FROM ORIGINAL DESCRIPTIVE REPORT AND FILED WITH FIELD RECORDS.

T. REFERRAL TO OTHER REPORTS

The following reports will be submitted as part of OPR-D111-WH-90.

Horizontal Control Report (N/CG 233)

Tides and Water Levels Station Report (N/OMA 1212)

Submitted By:

Matthew J. Wingate

Ens. Matthew J. Wingate, NOAA

Reviewed By:

Richard B. Koehler

Lt. Richard B. Koehler, NOAA
Field Operations Officer

Approved By:

Richard P. Floyd

Cdr. Richard P. Floyd, NOAA
Commanding Officer

No	Type	Latitude	CONTROL STATIONS		H	Cart	Freq	Vel	Code	MM/DD/YY
			Longitude							
201	F	036:47:18.059	075:57:33.734	15	250	0.0	0.0	5	06/04/90	
202	F	036:52:58.936	075:59:04.040	20	250	0.0	0.0	6	04/19/90	
203	F	036:55:34.911	076:00:25.834	47	250	0.0	0.0	7	04/19/90	
206	F	036:46:14.233	075:57:50.724	40	139	0.0	0.0		05/07/90	
207	F	036:55:34.865	076:00:25.973	47	139	0.0	0.0		05/07/90	
208	F	036:55:32.862	076:00:29.270	30	139	0.0	0.0		05/07/90	
209	F	037:05:36.757	075:58:16.308	10	250	0.0	0.0	3	05/28/90	

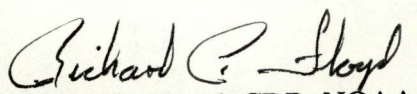
201 DAM NECK BOQ, (1981)
 202 RAMADA, (1980)
 203 DEL NORTE SITE at Cape Henry Lighthouse LHO, (1977)
~~206 DAM NECK MILLS NAVY TANK~~
~~207 CAPE HENRY LIGHTHOUSE 1887~~
~~208 CAPE HENRY LIGHTHOUSE OLD~~
 209 FEN, (1960)

APPROVAL SHEET

HYDROGRAPHIC AND SIDE SCAN SONAR SURVEY OPR-D111-WH WH-10-3-90 H-10341

This combined hydrographic and side scan sonar survey was conducted in accordance with the Project Instructions for OPR-D111-WH-90, Hydrographic Manual, AMC OPORDERS, Hydrographic Survey Guidelines, Side Scan Sonar Manual (dated Feb 6, 1989) and the Field Procedures Manual for Hydrographic Surveying (dated May 1, 1990). The survey and reports were completed under daily supervision. All boat sheets and final transmitted sheets were reviewed in their entirety and all supporting records were checked as well.

This survey is complete for the intended purposes of identifying items requiring further investigation by a different field unit.


Richard P. Floyd, CDR, NOAA
Commanding Officer
NOAA Ship WHITING

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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: July 25, 1990

MARINE CENTER: Atlantic

OPR: D111-WH-90

HYDROGRAPHIC SHEET: H-10341

LOCALITY: Chesapeake Bay Entrance, VA.

TIME PERIOD: May 18 - June 8, 1990

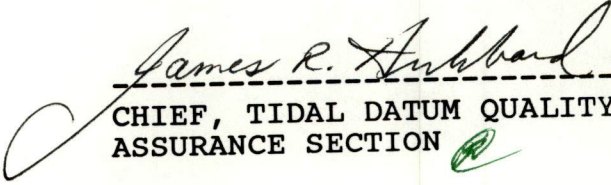
TIDE STATION USED: 863 8863 Chesapeake Bay Bridge Tunnel, VA.


PLANE OF REFERENCE (MEAN LOWER LOW WATER): = 24.84 ft.

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: = 2.7 ft.

REMARKS: RECOMMENDED ZONING

Apply a x1.26 range ratio to all heights, and a -0 hr. 40 min.
time correction, for Chesapeake Bay Bridge Tunnel.



CHIEF, TIDAL DATUM QUALITY
ASSURANCE SECTION 

GEOGRAPHIC NAMES

H-10341

Name on Survey	A	B	C	D	E	F	G	H	K	
	ON CHART NO.	ON PREVIOUS SURVEY NO.	ON U.S. QUADRANGLE MAPS	FROM LOCAL INFORMATION	ON LOCAL MAPS	P.O. GUIDE OR MAP	GRAND MCNALLY ATLAS	U.S. LIGHT LIST		
ATLANTIC OCEAN (title)										1
HENRY, CAPE (title)										2
VIRGINIA (title)										3
										4
										5
										6
										7
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										24
										25

Approved

Charles E. Harrington
Chief Geographer - N/CG 2x5

JUL - 3 1991

11/06/91

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NUMBER: H-10341

NUMBER OF CONTROL STATIONS

4

NUMBER OF POSITIONS

1915

NUMBER OF SOUNDINGS

8914

	TIME-HOURS	DATE COMPLETED
PREPROCESSING EXAMINATION	35	03/04/91
VERIFICATION OF FIELD DATA	65	05/14/91
ELECTRONIC DATA PROCESSING	50	
QUALITY CONTROL CHECKS	44	
EVALUATION AND ANALYSIS	55	11/01/91
FINAL INSPECTION	7	10/08/91
TOTAL TIME	256	
ATLANTIC HYROGRAPHIC SECTION APPROVAL		11/06/91

N/CG244-77-91

LETTER TRANSMITTING DATA

TO:

Chief, Data Control Section, N/CG243
NOAA/National Ocean Service
Room 151, WSC-2
Rockville, MD 20852

L

DATA AS LISTED BELOW WERE FORWARDED TO YOU
BY (Check):☐ ORDINARY MAIL☐ AIR MAIL☐ REGISTERED MAIL☐ EXPRESS☐ GBL (Give number) _____

FEDERAL EXPRESS

DATE FORWARDED

12 November 1991

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-10341

Virginia, Atlantic Ocean12 NM Southeast of Cape Henry

- 1 Final Smooth Sheet
- 1 Final Position Overlay
- 2 Final Excess Sounding Overlays
- 1 Original Descriptive Report
- 2 Final Field Sheets

***** ADDITIONAL FIELD DATA TO FOLLOW AT A LATER DATE *****

FROM: (Signature)

Norris A. Wike

Return receipted copy to:

Atlantic Hydrographic Section, N/CG24411
439 W. York Street
Norfolk, VA 23510-1114

L

RECEIVED THE ABOVE
(Name, Division, Date)

D. S. Clark
11/18/91

**COAST AND GEODETIC SURVEY
ATLANTIC HYDROGRAPHIC SECTION
EVALUATION REPORT**

SURVEY NO.: H-10341

FIELD NO.: WH-10-3-90

Virginia, Atlantic Ocean, 12 NM Southeast of Cape Henry

SURVEYED: 18 May through 6 June 1990

SCALE: 1:10,000

PROJECT NO.: OPR-D111-WH-90

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

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

Chief of Party.....R. P. Floyd

Surveyed by.....K. A. Timmons
.....R. B. Koehler
.....N. L. Crews
.....L. M. Cohen
.....M. J. Wingate
.....K. T. McDonough
.....K. A. McNitt
.....K. G. Taggart

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

1. INTRODUCTION

a. This is a combined basic hydrographic/side scan sonar survey. Side scan sonar was operated simultaneously with the fathometer during survey operations. Side scan sonar contacts located by the field unit during hydrographic operations were not investigated by the field unit. In cases where the side scan sonar was used to determine the estimated depth of an item or object, the item is shown on the present survey with the upper case letter 'A' in parenthesis. This note is shown on the present survey smooth sheet in proximity to the title block. See also the memorandum titled: "Showing Estimated Side Scan Sonar Depths on Smooth Sheets":, dated 23 February 1989, for an explanation of the note shown on the survey smooth sheet. Depths on these obstructions were estimated by scaling heights off the bottom from side scan sonar records. Positions were determined by computing offsets from the vessel's track. This survey has been processed before the results of the recommended additional investigations are available. The Descriptive Report and Evaluation Report for survey FE-355SS (1990) provides more definitive information concerning these features.

b. No unusual problems were encountered during office processing.

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

2. CONTROL AND SHORELINE

a. Control is adequately discussed in sections H., I., and T. of the Descriptive Report.

Horizontal control used for this survey during data acquisition is based upon the North American Datum of 1983 (NAD 83). Office processing of this survey is based on these values. The smooth sheet has been annotated with ticks showing the computed mean shift between the survey datum and the North American Datum of 1927 (NAD 27). To place this survey on the NAD 27 datum move the projection lines 0.529 seconds (16.32 meters or 1.63 mm at the scale of the survey) north in latitude, and 1.249 seconds (30.91 meters or 3.09 mm at the scale of the survey) east in longitude.

All geographic positions listed from sources other than the present survey are on NAD 27 datum unless otherwise specified. All inverse distance computations are made after geographic positions have been converted to the present survey datum. Any data brought forward from prior surveys to supplement the present survey has been converted to the present survey datum.

b. There is no shoreline within the area surveyed.

3. HYDROGRAPHY

a. Soundings at crossings are in excellent agreement and comply with the criteria found in sections 4.6.1. and 6.3.4.3. of the HYDROGRAPHIC MANUAL.

b. The standard fifteen (15) and twenty (20) meter depth curves were drawn in there entirety. Some dashed curves were also drawn to show additional bottom relief.

c. The development of the bottom configuration and determination of least depths is considered adequate with the following exceptions:

Additional work was recommended for the five (5) contacts listed below. The additional work was accomplished on survey FE-355SS (1990).

<u>Item</u> (FM)	<u>Latitude (N)</u>	<u>Longitude (W)</u>
16 ⁸ Obstr (A)	36°52'46.75"	75°45'47.23"
17 ⁴ Obstr (A)	36°51'49.96"	75°47'00.51"
19 ⁸ Obstr (A)	36°49'15.12"	75°44'58.46"
17 ⁸ Obstr (A)	36°51'57.31"	75°44'59.54"
17 ² Obstr (A)	36°51'41.70"	75°46'25.86"

It is recommended that further discussion and charting recommendations of the items listed above be deferred until the completion of office processing of survey FE-355SS (1990) and final disposition of the investigated items has been made.

4. CONDITION OF SURVEY

The smooth sheet and accompanying overlays, hydrographic records and reports conform to the requirements of the HYDROGRAPHIC MANUAL and the SIDE SCAN SONAR MANUAL.

5. JUNCTIONS

H-10337 (1990) to the west

An adequate junction was effected with junctional survey H-10337 (1990) and the present survey.

There are no contemporary junctional surveys to the north south or east of the present survey. Charted hydrography is in harmony with the present survey.

6. COMPARISON WITH PRIOR SURVEYS

a. Hydrographic

H-9922	(1980)	1:20,000
H-9959	(1981)	1:20,000

Prior survey depths from H-9922 (1980) show a general trend of varying plus or minus (\pm) 0² meter from the present survey soundings. There are some scattered depths from H-9922 (1980) that are 0³ to 0⁵ meter deeper than present survey soundings.

Prior survey depths from H-9959 (1981) show a general trend of being 0¹ to 0³ meter deeper than present survey soundings.

The present survey is adequate to supersede the above prior surveys in the common area.

The differences between the above prior surveys and the present survey depths may be attributed to natural changes, and improved hydrographic surveying methods and equipment.

b. Wire Drag

H-9871WD (1976) 1:20,000

There are three (3) hangs that originate with H-9871WD (1976) and fall within areas common to the present survey. Each hang has been assigned an AWOIS item number and is discussed in section M., pages 8-9, of the Descriptive Report.

There are no conflicts between effective depths of H-9871WD (1976) and the present survey soundings.

7. COMPARISON WITH CHART 12205 (20th Edition, Jan. 21/89)
12207 (16th Edition, Aug. 3/85)
12221 (57th Edition, 28 Jan. 28/89)

a. Hydrography

The charted hydrography in the area common to the present survey on the 57th edition of chart 12221 does not originate with the previously discussed prior surveys. The surveys which were the sources for the charted hydrography were not discussed in this report because they have been superseded by the subsequent prior surveys discussed in section 6.a. of this report. The previously discussed prior surveys require no further consideration. The prior surveys discussed in section 6.a. of this report have been applied to the 58th edition of chart 12221. The hydrographer makes adequate chart comparisons in section N. of the Descriptive Report. In addition to the recommendations in the Descriptive Report the following should be noted:

AWOIS item #788, an uncharted non-dangerous wreck in depths to 60 feet (18² meters), in Latitude 36°51'43"N, Longitude 75°46'02"W (NAD 27) originates with Notice to Mariners 21 of 1942 (NM 21/42). During survey operations, no indication of the wreck was obtained. Present survey soundings in the vicinity of the shoal are 18⁷ meters to 19⁸ meters. No change in charting status is recommended.

Except as noted above the present survey is adequate to supersede the charted hydrography within the common area.

b. Dangers to Navigation

There were no dangers to navigation submitted by the field unit. No dangers were noted during office processing.

c. Aids to Navigation

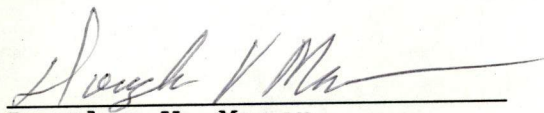
There were no fixed or floating aids to navigation verified or located within the limits of the present survey.

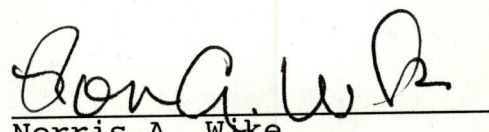
8. COMPLIANCE WITH INSTRUCTIONS

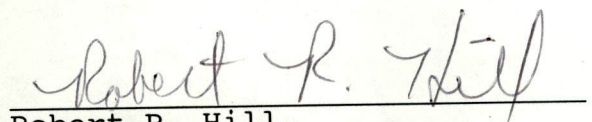
This survey complies with the Project Instructions.

9. ADDITIONAL FIELD WORK

This is a good basic hydrographic/side scan sonar survey. With the exception of the items listed in sections 3.c. of this report, no other field work is recommended.


Douglas V. Mason
Cartographic Technician
Verification of Field Data


Norris A. Wike
Cartographer
Evaluation and Analysis


Robert R. Hill
Senior Cartographic Technician
Verification Check

APPROVAL SHEET
H-10341

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 disproof 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 magnetic tape record for this survey. Final control, position, and sounding printouts of the survey have been made. The survey records and digital data comply with NOS requirements except where noted in the Evaluation Report.

Robert G. Roberson
Robert G. Roberson
Chief, Evaluation and Analysis Team
Atlantic Hydrographic Section

Date: 6 November 1991

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.

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

Date: 6 November 1991

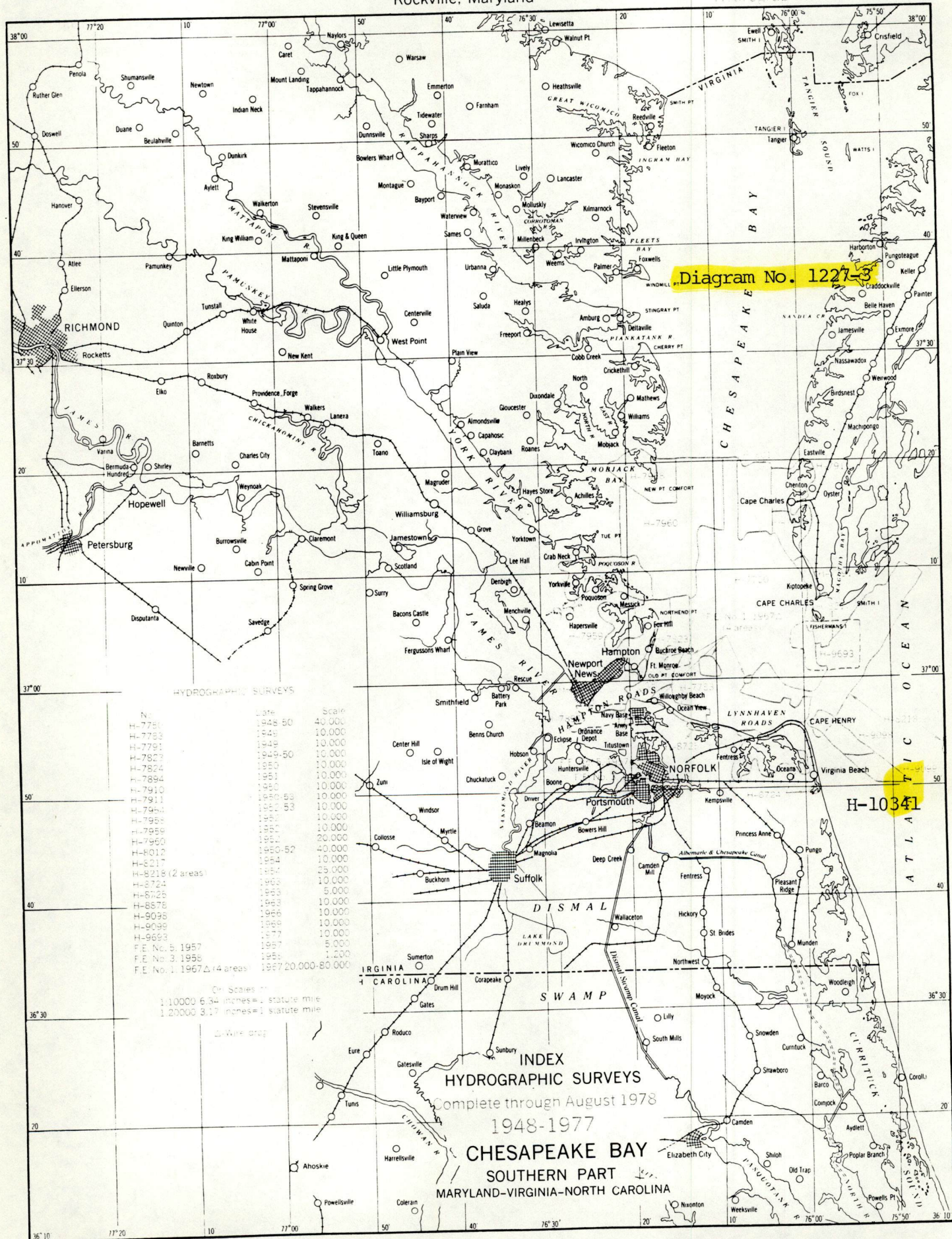
Final Approval:

Approved: J. Austin Yeager
J Austin Yeager
Rear Admiral, NOAA
Director, Coast and Geodetic Survey

Date: 11/22/91

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

Hydrographic Index No. 70 M



MARINE CHART BRANCH
RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10341

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
12207	3/3/92	L. ARKENA	Full Part Before After Marine Center Approval Signed Via Drawing No. 26
12221	3/6/92	L. ARKENA	Full Part Before After Marine Center Approval Signed Via Drawing No. 87
12221	9/21/92	L. ARKENA	Full Part Before After Marine Center Approval Signed Via Drawing No. 88 Then 12208
12220	1/28/93	L. ARKENA	Full Part Before After Marine Center Approval Signed Via Drawing No. 55, APPD Then cht 12221
12208	6/19/92	J. ROBINSON	Full Part Before After Marine Center Approval Signed Via Drawing No. 11, RECONSTRUCTION
12207	1/28/93	L. ARKENA	Full Part Before After Marine Center Approval Signed Via Drawing No. 27, APPD Then chart 12221
12205A	7/7/93	R. G. Lillis	Full Part Before After Marine Center Approval Signed Via Drawing No. 23 Appl'd thru cht 12221
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.