

H10688

NOAA FORM 78-35A

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

DESCRIPTIVE REPORT

Type of Survey Hydrographic/Side Scan Sonar

Field No. AHP-10-6-96

Registry No. H10688

LOCALITY

State Maryland

General Locality Chesapeake Bay

Locality Ninefoot Knoll to Tolchester Beach

1996

CHIEF OF PARTY
LT J. A. Illg

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DATE AUG 17 1998

HYDROGRAPHIC TITLE SHEET

H-10688

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.

AHP-10-6-96

State Maryland

General locality Northern Chesapeake Bay

Locality Ninefoot Knoll to Tolchester Beach

Scale 1:10,000

Date of survey May 21, 1996 - April 25 1997

Instructions dated 4-25-96

Project No. OPR-346-AHP

Vessel NOAA Launch Nos. 0517, 1017

Chief of party Lt. James A. Illg

Surveyed by Atlantic Hydrographic Party

Soundings taken by echo sounder, hand lead, pole Echosounder

Graphic record scaled by MJM, GDH, JBG, MMC *

Graphic record checked by MJM, GDH, JBG, MMC *

Protracted by HDAPS

Hewlett Packard DesignJet 350c (Office)
Automated plot by Bruning ZETA 824A (Field)

Verification by Atlantic Hydrographic Branch Personnel

Soundings in Meters Feet at MLLW

REMARKS: * MJM - Mark J. McMann

GDH - Glenn D. Hendrix

JBG - John B. Gaskin

MMC - Monica M. Cisternelli

Notes in the Descriptive Report were made in Red during Office Processing.

AWOIS/SURP ✓ 7/20/98 SJV

DESCRIPTIVE REPORT TO ACCOMPANY
HYDROGRAPHIC SURVEY H-10688
FIELD NUMBER AHP-10-6-96
SCALE: 1:10,000
1996-1997
ATLANTIC HYDROGRAPHIC PARTY
CHIEF OF PARTY: LT James A. Illg

A. PROJECT

This survey was conducted in accordance with Hydrographic Project Instructions for OPR-E346-AHP, Northern Chesapeake Bay, Baltimore Harbor, Maryland, Change No. 1, dated April 25, 1996. This survey is designated as Sheet "D" on the sheet layout dated April 19, 1996.

The purpose of this project is to provide contemporary hydrography for updating charts and responds to requests from the Maryland Port Administration, Association of Maryland Pilots, U.S. Army Corps of Engineers, and the U.S. Coast Guard. Most of the area was last surveyed between 1896 and 1897 by the U. S. Coast and Geodetic Survey.

B. AREA SURVEYED

The area surveyed for H-10688 covers northern Chesapeake Bay; north from Nine Foot Knoll to Tolchester Beach. The approximate survey limits are:

North - 39°15'15"N, 076°17'25"W
South - 39°08'00"N, 076°21'00"W
East - 39°12'00"N, 076°14'10"W
West - 39°11'15"N, 076°24'10"W

Two hundred percent side scan sonar coverage was required for this survey except for the rectangular area bounded by the following coordinates:

39°10'10"N, 76°20'35"W
39°11'15"N, 76°24'05"W
39°14'45"N, 76°17'40"W
39°13'35"N, 76°15'10"W

In this area single beam echo sounder hydrography was used. The inshore limit of sounding was the 18-foot depth curve. This survey was conducted from May 21, 1996 (DN 142) to April 25, 1997 (DN 115).

C. SURVEY VESSELS

Vessel 0517, a 21-foot MonArk, and vessel 1017, a 29-foot Jensen, were used to collect sounding data, side scan sonar data and detached positions. There were no unusual vessel configurations nor problems encountered.

D. AUTOMATED DATA ACQUISITION AND PROCESSING *See Also Evaluation Report.*

The Hydrographic Data Acquisition and Processing System (HDAPS) was used to collect data on launch 1017 from May 12, 1996 (DN 142) to August 29, 1996 (DN 242). Vessel 517 was not used from May 12 - August 29, 1996. Coastal Oceanographic's HYPACK was used to collect data aboard both vessels 0517 and 1017 from September 20, 1996 (DN 246) to April 25, 1997 (DN 115). HDAPS was used to process all data for both vessels. A listing of HDAPS programs used for data processing and their corresponding version numbers is appended to this report.*

The following non-HDAPS computer programs were used:

VELOCITY (IBM PC)	Ver. 2.0 (12/18/92)
NADCON (IBM PC)	Ver. 1.01
MS-WORD (PC)	Ver. 7.0

E. SIDE SCAN SONAR EQUIPMENT

Side scan sonar operations were conducted using an EG&G model 260 slant-range corrected side scan sonar recorder and an EG&G 272-T dual-channel, single frequency towfish. The towfish was operated on the 100-kHz frequency and was configured with a 20° beam depression. Serial numbers (S/N) for the side scan sonar (SSS) equipment used throughout the survey are listed below:

<u>Vessel</u>	<u>SSS Towfish S/N</u>	<u>Recorder S/N</u>	<u>Dates Used</u>
1017	0011901	11443	08/14/96-08/29/96
0517	0011901	0012102	09/20/96-11/19/96
1017	0011901	0012102	11/25/96-04/25/97

The side scan sonar towfish was deployed off launch 1017 using a Superwinch Model W115 in conjunction with an adjustable davit arm on the stern of the launch. The side scan sonar towfish was towed with vinyl-coated Kevlar cable and was connected to the recorder via a slip ring assembly. Launch 0517 was configured for side scan sonar operations with an adjustable stern mounted boom. The side scan sonar towfish was deployed manually. Tow cable and all other connections were identical to those used on launch 1017.

* DATA filed with Field Records.

Side scan sonar data was collected utilizing the 50-meter range scale. In order to acquire the required 200% side scan sonar coverage, main-scheme lines were run at a spacing of 40 meters. Adequate coverage was determined by producing two separate swath plots and ensuring 100% coverage on each plot.

The side scan sonar towfish was maintained at a height off the bottom of 8- to 20-percent of the range scale used. Confidence checks were performed on a routine basis, primarily by noting changes in bottom texture on the outer edges of the sonagram, and on buoys and other contacts in the survey area.

All significant contacts were measured off the sonagrams and entered into an HDAPS contact table.* Field party personnel determined contact heights, positions, and cross-reference correlations using the HDAPS Contact Utility Program. Contacts were investigated using side scan sonar developments followed by echo sounder investigation as needed.

Contact table number 1 was the only table used.* The following contacts were identified on this survey which were not associated with AWOIS items assigned on this survey:

<u>Contact PN</u>	<u>Greatest Height (M)</u>	<u>Surrounding Depths (M)</u>
1793.70 and 21781.07	1.9	7.0
1924.32 and 22013.05	0.4	8.0
1967.28 and 12176.09	1.1	7.5
1967.25 and 12176.07	0.9	6.5
1967.41 and 12178.02	1.0	7.0
1967.42 and 11157.06	1.4	8.0
1967.66 and 11356.00	0.5	6.5
1996.32 and 11316.03	1.0	6.3
21803.08 and 22013.01	0.3	5.0
21785.40 and 22032.06	0.9	6.0

All least depths are computed using predicted tides. All development data except for the lines depicting the least depths over spikes were designated "Not for Smooth Plot (NSP)."

F. SOUNDING EQUIPMENT

An Innerspace model 448 depth sounder, serial number 241, was used to collect all soundings on launch 0517. A Raytheon model DSF-6000 depth sounder, serial number A111N, was used to collect soundings on launch 1017 from May 21, 1996 (DN142) to August 29, 1996 (DN 242). Thereafter, an Innerspace model 448 depth sounder, serial number 187, was used from November 25, 1996 (DN 330) to

* DATA Filed With Field Records.

April 25, 1997 (DN 115).

A standard lead line calibrated in meters, serial number 0517 was used during this survey for comparison readings with the echo sounders.

G. CORRECTIONS TO SOUNDINGS

Soundings were recorded using the Innerspace model 448 and the Raytheon model DSF-6000 depth sounders. Both were calibrated with an assumed speed of sound through water of 1500 meters/second. Changes to the gain and/or chart speed were noted on the echograms. Digitized soundings agreed with the analog trace within 0.2 meter. Necessary corrections were made while scanning the echogram.

Corrections for the speed of sound through water were computed from data obtained with Sea-Bird Electronics, Inc., SEACAT electronic profiler, serial number 192276-287. Data quality assurance tests were performed in accordance with Field Procedures Manual section 2.1.3.2. Program VELOCITY, version 2.0, was used to compute speed of sound through water corrections. Copies of the velocity tables and cast data are in the "Survey Separates."*

Correctors for the velocity of sound through water were determined from the casts listed below:

<u>Velocity</u> <u>Table No.</u>	<u>Cast</u> <u>No.</u>	<u>Deepest</u> <u>Depth (m)</u>	<u>Applicable DN</u>	<u>Position</u>	<u>Cast</u> <u>Day</u>
1	1	9.0	142-158	39°10'30"N 076°26'00"W	144
2	2	22.2	170-186	39°09'30"N 076°22'00"W	170
3	3	21.1	191-193	39°11'00"N 076°27'00"W	191
4	4	22.1	208-215	39°10'30"N	208
5	5	20.1	218	39°10'00"N 076°24'00"W	219
6	6	22.1	227-235	39°10'30"N 076°26'00"W	229

* DATA Filed with Field Records.

7	7	20.7	241-275	39°10'30"N 076°26'00"W	270
8	8	21.6	276-283	39°11'00"N 076°17'00"W	276
9	9	14.4	289-295	39°10'30"N 076°26'00"W	289
10	10	15.8	296-306	39°10'30"N 076°26'00"W	296
11	11	18.0	298-311	39°10'30"N 076°26'00"W	305
12	12	20.0	324	39°10'30"N 076°26'00"W	323
13	13	14.5	330-338	39°10'30"N 076°26'00"W	330
14	14	18.7	353-06	39°10'30"N 076°26'00"W	353
15	15	10.3	023-030	39°10'30"N 076°25'30"W	023
16	16	20.7	034-044	39°10'30"N 076°26'00"W	034

Correctors were applied to the sounding data using the HDAPS REAPPLY program prior to plotting.

Weather permitting, lead line comparisons were conducted each day in accordance with the Field Procedures Manual section 2.1.3.1. No instrument error was detected from these comparisons. The lead line comparison form is in the "Survey Separates." *

A static draft of 0.3 meters was applied to the on-line data for launch 0517. The draft was measured by subtracting the difference from a punch mark on the side of Launch 0517, 0.6 meters above the transducer, to the water surface.

A static draft of 0.6 meters was applied to the on-line data for launch 1017 prior to November 25, 1996 (DN 330). The static draft information was provided to AHP personnel from The Atlantic Marine Center. After the installation of a new transducer, a static draft of 0.4 meters was applied to data acquired from November 25, 1996 to April 25, 1997 (DN 115). The transducer draft was measured by subtracting the difference from a punch mark on the side of launch 1017 to the water surface.

* DATA Filed with Field Records.

Settlement and squat measurements were performed on December 20, 1994 (DN 346), at Clear Lake, Texas, using Lietz level S/N 08754 for launch 0517, and February 7, 1996 (DN 038) in the Elizabeth River, VA, using Lietz level S/N 08754 for launch 1017. A second Settlement and Squat was performed for launch 1017 as a result of the installation of the new Innerspace transducer. This was conducted on January 31, 1997 (DN 031) at Fort Smallwood Park, Maryland, using Lietz level S/N 08754.

Settlement and squat correctors and the static draft corrector were applied on-line through the offset table. Copies of the field data, the graphs of the settlement and squat correctors vs. speed in meters/second, and the offset table are included in the "Survey Separates." *

The Baltimore, Maryland, tide station number 857-4680, served as control for datum determination. This station is also the reference station for the predicted tides which were applied to the final sounding plot. Zone CB38, shown in the Project Instructions, was the only zone used for this survey. The time corrector used was -6 minutes with a range corrector of 0.93.

Approved tides were requested from the Sea and Lake Levels Branch, N/OES231, in a letter dated June 3, 1997. A copy of the letter is appended to this report. *Approved Tides And Zones were Applied During Office Processing.*

H. CONTROL STATIONS *See Also Evaluation Report.*

The horizontal control datum for this project is the North American Datum of 1983. One station, the USCG Differential GPS (DGPS) Beacon at Cape Henlopen (38°46'36.406"N, 075°05'15.661"W), was used to control this survey.

I. HYDROGRAPHIC POSITION CONTROL

DGPS was used as the method of positioning for all hydrographic data on this survey. The USCG DGPS beacon at Cape Henlopen, Delaware was used as the reference station in conjunction with beacon receiver serial number X-1085 and antenna serial number MBA-M1063 on launch 0517. An Ashtech sensor, serial number 700417B1126 was used as the remote station on vessel 0517.

Magnavox beacon receiver serial number 036 was used on launch 1017 from May 21, 1996 (DN 142) to August 29, 1996 (DN 242). From September 20, 1996 (DN 264) to April 25, 1997 (DN 115) CSI beacon receiver serial number X-1251 and antenna serial number M3118 were used on launch 1017. Ashtech sensor serial number 700417B1270 was used on launch 1017 for the entire survey. This

* DATA Filed With Field Records.

equipment met the accuracy standards for this 1:10,000 scale survey.

Performance checks were conducted daily by resting the launch alongside station CAL 1 1996, at 39°09'02.966"N, 076°29'42.400"W. The raw record and the abstract of these checks are included in the "Survey Separates." The calibration point was established by measuring a single GPS baseline between a third-order, class I station and the calibration point. The computations for CAL 1 1996, are included in the "Survey Separates." *

Occasionally a good position misplotted on the raw track plot. This problem was attributed to good DGPS data following a period of questionable DGPS data. These positions were reviewed, then edited or rejected as necessary.

J. SHORELINE

This was a navigable area survey. No shoreline verification was required.

K. CROSSLINES

A total of 34.9 nautical miles of crosslines were run, representing 14% of the main scheme hydrography. Crossline soundings agree within 0.6 meters of the main scheme soundings.

L. JUNCTIONS *See Also Evaluation Report.*

This survey junctions with Sheet "E", H-10703, to the north and sheet F to the south which will be started later in the project.

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

The prior survey comparison will be performed by AHB. The prior surveys covering this area are H-2345 (1896-1897), H-2399 (1898), H-2347 (1897), H-6374 (1938), H-6597 (1940) and miscellaneous USACE surveys.

The hydrographer recommends that data from the present survey be used to supersede that of the prior surveys within their common areas.

N. ITEM INVESTIGATION REPORTS *See Also Evaluation Report*

Three AWOIS items were assigned to this survey.

* DATA Filed with Field Records.

N.1. (AWOIS 9519) and N.2. (AWOIS 9751)

Item Description: 9519 - Exposed Wreck (Barge)
9751 - Fish Haven

Source: LNM26/80 (9519), CL62/90 (9751)

AWOIS Position: 9519 - 39°12'48.39"N, 76°15'58.83"W
9751 - 39°12'06.39"N, 76°19'46.84"W

Required Investigation: SD, VS, DI, S2

Charts Affected: 12273, 12278

Date(s)/DN(s): 1-30-97/030, 2-3-97/034, 4-25-97/115
(OPR-E346-AHP2, H-10688)

Position Number: 21701-22063, 22218-22275, 22861-22883

Launch Number: 1017

Investigation Used: Side Scan Sonar

Position Determined By: DGPS

Investigation Summary: Two-hundred percent side scan sonar coverage was run over the required search area for both items. The entire fish haven (AWOIS 9751) was also surveyed with single beam hydrography at 100-meter line spacing. Charted shoals and areas found less than the authorized minimum depth of 15 feet were developed with single beam hydrography using 50-meter line spacing. All of the contacts located within the entire area (AWOIS 9519 and 9751) were investigated on DN 115. The following table lists these contacts:

<u>Position Number</u>	<u>Detached Position</u>	<u>Least Depth (M)</u>	<u>Contact Position</u>	<u>Recommendation</u>
1793.70	22858	^{4.5} 5.0	39°12'56.98"N 76°16'09.10"W	Chart a ¹⁴ 16 foot * sounding.
1967.28	22861	³ 5.8	39°12'50.37"N 76°16'05.16"W	Chart a ¹⁷ 19 foot * sounding.
1967.25	22862	⁰ 5.5	39°12'48.76"N 76°16'05.78"W	Chart a 16 foot * sounding.

* Do not chart. Shoaler depths in vicinity

1967.41	22865	6.2 ^{5.7}	39°12'50.73"N 76°16'03.57"W	Chart a 20 ¹⁸ foot * sounding.
1967.42	22869	7.0 ^{6.4}	39°12'50.17"N 76°16'02.88"W	Chart a 23 ²¹ foot * sounding.
1967.66	22871	5.3 ^{4.7}	39°12'53.07"N 76°16'00.15"W	Chart a 17 ¹⁵ foot * sounding.
1996.32	22873	4.9 ³	39°12'48.94"N 76°16'03.09"W	Chart a 16 ¹⁴ foot * sounding.
21803.08	22874	3.7 ¹	39°12'54.53"N 76°16'02.64"W	Chart a 12 ¹⁰ foot sounding.
21785.40	A star pattern development was run and no contact was located.		76°16'01.54"W	Chart surveyed soundings. sounding.

* Do not chart. Shoaler depths in vicinity

CHARTING RECOMMENDATION: Along with the recommendations made in the table above, the hydrographer recommends removing the charted exposed wreck symbol (AWOIS 9519) and retaining the currently charted fish haven limits and authorized depth notation. *CONCUR*

N.3. - AWOIS 9747

Item Description: Submerged Wreck (Sunken Barge)

Source: LNM32/72

AWOIS Position: 39°12'06.39"N, 76°19'46.84"W

Required Investigation: SD, S2, DI

Charts Affected: 12278

Date(s)/DN(s): 2-3-97/ DN034 (OPR-E346-AHP2, H-10688)

Position Numbers: 22064-22217

Launch Number: 1017

Investigation Used: Side Scan Sonar

Position Determined By: DGPS

Investigation Summary: A 200-meter radius side scan sonar investigation was conducted with 200-percent coverage around the AWOIS listed position. No contacts were found.

CHARTING RECOMMENDATION: The hydrographer recommends removal of the submerged wreck symbol from the chart and charting current survey soundings in this area. *CONCUR*

O. COMPARISON WITH THE CHART *See Also Evaluation Report.*

Comparisons were made with chart 12278, 65th Edition, September 28, 1996. Survey soundings compare very well with those charted. Any discrepancies were generally 1 meter or less deeper than currently charted soundings. There are no soundings charted inside of the U.S. Army Corps of Engineers maintained channels, but current survey soundings are within the project depths shown on the chart for Tolchester Channel. The area from the 18-foot depth curve east towards Tolchester Beach, including Tolchester Channel, was surveyed with 200% side scan sonar coverage. In this area survey soundings were generally within 1-meter of charted depths.

Sounding discrepancies are as follows:

<u>Position</u>	<u>Charted Depth(F)</u>	<u>Method of Development</u>	<u>Least Depth(F)</u>	<u>Recommendation</u>	
39°11'05"N 76°20'53"W	11	25 M line spacing	14	Replace charted depth with surveyed soundings	<i>CONCUR</i>
39°11'15"N 76°20'15"W	11	"	14 ¹³	"	" <i>CONCUR</i>
39°11'25"N 76°21'00"W	11	"	14	"	" <i>CONCUR</i>
39°12'03"N 76°20'53"W	12	50 M line spacing	14 ¹⁵	"	" <i>CONCUR</i>
39°11'26"N 76°20'33"W	12	"	14	"	" <i>CONCUR</i>

39°11'36"N 76°20'30"W	8	"	12	"	"	Concur
39°11'40"N 76°20'18"W	10	25 M line spacing	17 ¹⁴	"	"	Concur
39°11'51"N 76°20'32"W	11	50 M line spacing	13 ¹²	"	"	Concur
39°12'09"N 76°20'09"W	12	"	14	"	"	Concur
39°12'12"N 76° 12'12" 19' 40"W	14	"	18	"	"	Concur
39°11'00"N 76°19' 19" 36"W	14	25 M line spacing	18	"	"	Concur
39°12'00"N 76° 19'19" 18' 38"W	12	"	15	"	"	Concur

A charted shoal located on the west edge of the sheet between 39°11'00"N, 076°23'30"W and 39°11'00"N, 076°21'30"W was developed with 50-meter line spacing. Survey soundings agree at the 12-foot contour but the 6-foot contour no longer exists. Differences range from 4 to 6 feet deeper than charted depths within this contour. The hydrographer recommends removal of the 6-foot contour and charting current survey soundings in this area. *concur*

The charted shoal on the northwestern edge of the sheet extending from 39°12'00"N, 076°18'38"W to 39°12'00"N, 076°19'19"W, was developed with 50-meter line spacing. The 12-foot contour no longer exists. A least depth of 13⁰ feet was found within the area but no distinct contour was apparent. The hydrographer recommends removal of the 12-foot contour and charting soundings from this survey. *concur w/clarification: Geographical positions in error chart as shown on the present survey*
The charted shoal extending from 39°13'21"N, 076°18'50"W to 39°13'42"N, 076°19'34"W, was developed with 50-meter line spacing. The charted 12-foot contour has generally eroded

throughout. Depths in this area are now 17 to 20 feet with least depths of 11 and 12 feet scattered throughout the original area of the shoal. The bottom is very irregular in this area of 100 year old soundings. The hydrographer recommends removal of the charted 12 foot contour, and charting soundings from this survey. *CONCUR*

The tip of the shoal charted at 39°14'33"N, 076°17'40"W was developed with 50-meter line spacing. This shoal has eroded towards the south, leaving just scattered 12-foot soundings over the northern tip. The bottom is very irregular in this area of 100 year old soundings. The hydrographer recommends revising the 12-foot contour and charting soundings from this survey. *CONCUR*

The hydrographer recommends that sounding data from this survey should supersede charted depths.

P. ADEQUACY OF SURVEY *see also Evaluation Report.*

This survey is complete and adequate to supersede all prior surveys within the common area.

Q. AIDS TO NAVIGATION

There are seventeen aids to navigation in the survey area. Sixteen are lighted buoys, and one is the Craighill Channel Front Range Light. Ten of the aids have a published position in the USCG Light List, Volume II, Atlantic Coast, 1996. Detached positions were taken on all aids to navigation. The comparison of the surveyed position with the charted location was:

Sandy Point to Susquehanna River

Craighill Channel

Craighill Channel Range Front Light (Light List #8040)

Light List Published Position - 39°11'18"N, 076°23'42"W
Surveyed Position (No. 22367) - 39°11'19.28"N, 076°23'39.63W
Surveyed position is 50 meters east of the charted position.

Upper Chesapeake Channel

Lighted Buoy 13 (Light List #8455)

Light List Published Position - 39°09'48"N, 076°18'24"W
Surveyed Position (No.22291) - 39°09'47.80"N, 076°18'21.87"W
Surveyed position is 20 meters east of charted position.

Lighted Buoy 14 (Light List #8460)

Light List Published Position - None
Surveyed Position (No.22290) - 39°09'43.17"N, 076°18'14.69"W
Surveyed position is 20 meters north of charted position.

Lighted Buoy 15 (Light List #8465)

Light List Published Position - None
Surveyed Position (No.22289) - 39°10'33.66"N, 076°17'32.29"W
Surveyed position is 30 meters east of charted position.

Lighted Buoy 16 (Light List #8470)

Light List Published Position - None
Surveyed Position (No.22288) - 39°10'26.87"N, 076°17'25.45"W
Surveyed position is 60 meters south of charted position.

Lighted Buoy 18 (Light List #8475)

Light List Published Position - 39°11'18"N, 076°16'42"W
Surveyed Position (No.22287) - 39°11'03.36"N, 076°16'43.54"W
Surveyed position is 50 meters southeast of charted position.

Lighted Buoy 19 (Light List #8480)

Light List Published Position - None
Surveyed Position (No.22286) - 39°11'26.01"N, 076°16'31.06"W
Surveyed position is 60 meters southeast of charted position.

Lighted Buoy 21 (Light List #8485)

Light List Published Position - 39°11'36"N, 076°16'6"W
Surveyed Position (No.22285) - 39°11'37"N, 076°16'03.99"W
Surveyed position is 20 meters east of charted position.

Lighted Buoy 22 (Light List #8490)

Light List Published Position - 39°11'30"N, 076°16'00"W
Surveyed Position (No.22284) - 39°11'29.93"N, 076°15'59.52"W
Surveyed position is 50 meters southeast of charted position.

Lighted Buoy 24 (Light List #8495)

Light List Published Position - 39°11'42"N, 076°15'24"W
Surveyed Position (No.22283) - 39°11'44.3"N, 076°15'24.90"W
Surveyed position is 10 meters south of charted position.

Lighted Buoy 25 (Light List #8505)

Light List Published Position - 39°12'00"N, 076°15'30"W
Surveyed Position (No.22282) - 39°11'59.47"N, 076°15'30.05"W
Surveyed position agrees with charted position.

Lighted Buoy 27 (Light List #8510)

Light List Published Position - 39°12'36"N, 076°15'12"W
Surveyed Position (No.22281) - 39°12'33.49"N, 076°15'10.65"W
Surveyed position is 50 meters west of charted position.

Lighted Buoy 27A (Light List #8515)

Light List Published Position - 39°12'42"N, 076°15'48"W
Surveyed Position (No.22279) - 39°12'43.38"N, 076°15'46.37"W
Surveyed position is 20 meters south of charted position.

Lighted Buoy 28 (Light List #8520)

Light List Published Position - 39°12'30"N, 076°15'00"W
Surveyed Position (No.22280) - 39°12'32.12"N, 076°15'00.12"W
Surveyed position is 20 meters northeast of charted position.

Pool's Island Flats Channel

Lighted Buoy 2 (Light List #8646)

Light List Published Position - None
Surveyed Position (No.22366) - 39°12'53.98"N, 076°21'06.66"W
Surveyed position is 50 meters north of charted position.

Lighted Buoy 4 (Light List #8655)

Light List Published Position - None
Surveyed Position (No.22364) - 39°13'52.90"N, 076°19'21.08"W
Surveyed position is 50 meters west of charted position.

Lighted Buoy 6 (Light List #8665)

Light List Published Position - None
Surveyed Position (No.22363) - 39°14'45.54"N, 076°17'47.55"W
Surveyed position is 50 meters north of charted position.

The aids serve their intended purpose but should be re-charted using current surveyed positions.

R. STATISTICS

<u>Description</u>	<u>Quantity</u>
Total Number of Positions	22856
Total Lineal Nautical Miles of Hydrography	669.3
Square Nautical Miles of Hydrography	22.5
Days of Production	53
Detached Positions	26
Bottom Samples	65
Tide Stations	1
Velocity Casts	16

S. MISCELLANEOUS *See Also EVALUATION Report.*

No anomalous currents or tides were observed during this survey. Sixty-five bottom samples were taken and all surveyed bottom

characteristics agreed with those charted. The samples were submitted to the Smithsonian Institution. Bottom sample positions are listed on the Oceanographic Log Sheet-M, NOAA Form 75-44, included in the "Survey Separates." *

T. RECOMMENDATIONS

No additional field work was identified after field office processing was completed. Specific recommendations are made on the Item Investigation Reports in section N., and in sections J., O. and Q. of this report.

U. REFERRAL TO REPORTS

<u>Title</u>	<u>Transmittal Information</u>
Descriptive Report for H-10703	Atlantic Hydrographic Branch N/CS33, Norfolk, VA
Descriptive Report for H-10757	Atlantic Hydrographic Branch N/CS33, Norfolk, VA
Coast Pilot for OPR-E346-AHP	Atlantic Hydrographic Branch N/CS33, Norfolk, VA
User Evaluation for OPR-E346-AHP	Atlantic Hydrographic Branch N/CS33, Norfolk, VA

Submitted by:

John B. Gaskin


John B. Gaskin

* DATA Filed with Field Records.

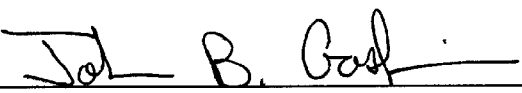
APPROVAL SHEET
Basic Hydrographic Survey
OPR-E346-AHP
AHP-10-6-96
H-10688
1996-97

This basic hydrographic survey was completed in accordance with the Project Instructions for OPR-E346-AHP, the Hydrographic Manual, the Hydrographic Survey Guidelines, and the Field Procedures Manual. All reports, records, and survey sheets were reviewed by Mr. Brian A. Link, Assistant Chief, AHP. Project reports were also reviewed by the Chief, AHP. The chief of party did not directly supervise any part of this survey.

This survey is a complete basic hydrographic survey for the area described in Section B of this report.



Lt. James A. Illg, NOAA
Chief, Atlantic Hydrographic Party



John B. Gaskin
Hydrographer-in-charge of daily operations



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: August 1, 1997

HYDROGRAPHIC BRANCH: Atlantic

HYDROGRAPHIC PROJECT: OPR E346-AHP

HYDROGRAPHIC SHEET: H-10688

LOCALITY: Ninefoot Knoll to Tolchester Beach, MD.

TIME PERIOD: February 12, 1996 - April 11, 1997

TIDE STATION USED: 857-3364 Tolchester Beach, MD.
Lat. 39° 12.8'N Lon. 76° 14.7'W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 m
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 0.433 m

TIDE STATION USED: 857-4680 Baltimore, MD.
Lat. 39° 16.0'N Lon. 76° 34.7'W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 m
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 0.411 m

REMARKS: RECOMMENDED ZONING

Use zone(s) identified as: CB31, CB38, CB39 & CB40

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



GEOGRAPHIC NAMES

H-10688

Name on Survey	<div style="display: flex; justify-content: space-between;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">A PH CHART NO. 12278, 12273</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">B ON PREVIOUS SURVEY NO.</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">C ON U.S. QUADRANGLE MAPS</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">D FROM LOCAL INFORMATION</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">E ON LOCAL MAPS</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">F P.O. GUIDE OR MAP</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">G GRAND DENALLY ATLAS</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">H U.S. LIGHT LIST</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">K</div> </div>										
	A	B	C	D	E	F	G	H	K		
CHESAPEAKE BAY	X		X							1	
MARYLAND (title)	X		X							2	
NINEFOOT KNOLL	X		X							3	
TOLCHESTER CHANNEL	X									4	
										5	
										6	
										7	
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Approved:

James J. Somers
Chief Engineer

JUL 29 1998

LETTER TRANSMITTING DATA

N/CS33-64-98

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

ORDINARY MAIL AIR MAIL

REGISTERED MAIL EXPRESS

GBL (Give number) _____

TO:

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

DATE FORWARDED

17 JULY 1998

NUMBER OF PACKAGES

ONE 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-10688

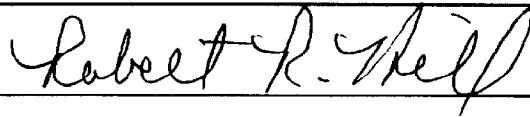
CHESAPEAKE BAY, MARYLAND, NINEFOOT KNOLL TO TOLCHESTER BEACH

1 (ONE) Tube containing the following:

- 1 SMOOTH SHEET (H-10688)
- 2 Composite Drawings for chart #12278
- 1 H-Drawing for chart #12278
- 1 Descriptive Report for H-10688
- 1 Drawing History Form #76-71 for chart #12278

FROM: (Signature)

Robert R. Hill Jr.



RECEIVED THE ABOVE

(Name, Division, Date)

Return receipted copy to:

Atlantic Hydrographic Branch
N/CS33
439 West York Street
Norfolk, VA 23510-1114

07/15/98

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NUMBER: H10688

NUMBER OF CONTROL STATIONS		2
NUMBER OF POSITIONS		22856
NUMBER OF SOUNDINGS		22856
	TIME-HOURS	DATE COMPLETED
PREPROCESSING EXAMINATION	28	09/08/97
VERIFICATION OF FIELD DATA	55	07/15/98
EVALUATION AND ANALYSIS	33	
FINAL INSPECTION	32	05/21/98
COMPILATION	54	07/15/98
TOTAL TIME	247	
ATLANTIC HYDROGRAPHIC BRANCH APPROVAL		05/27/98

**ATLANTIC HYDROGRAPHIC BRANCH
EVALUATION REPORT FOR H10688 (1996)**

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
MicroStation 95, version 5.05
SiteWorks, version 2.01
I/RAS B, version 5.01

The smooth sheet was plotted using an Hewlett Packard DesignJet 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 0.393 seconds (12.114 meters or 1.21 mm at the scale of the survey) north in latitude, and 1.156 seconds (27.747 meters or 2.77 mm at the scale of the survey) east in longitude.

L. JUNCTIONS

H10703 (1996) to the north

H10703 has not arrived at the Atlantic Hydrographic Branch and is not available for junctioning at this time. Present survey depths are in harmony with the charted hydrography to the east, west, north and south.

M. COMPARISON WITH PRIOR SURVEYS

H2345 (1896-97)	1:20,000
H2347 (1897)	1:10,000
H2399 (1898)	1:20,000
H6374 (1939)	1:10,000

H6597 (1940) 1:10,000

The prior surveys listed above cover the present survey area in its entirety.

1) H2345 (1896-97) covers the northern three quarters of the present survey. Prior survey depths compare favorably and show a general trend of being 1-2 ft (0^3-0^6 m) deeper than the present survey depths. However, within the Tolchester channel, the general trend is from 8-20 ft (2^4-6 m) deeper than the present survey depths.

2) H2347 (1897) covers the southwest corner of the present survey. Prior survey depths compare favorably and show a general trend of being 1-2 ft (0^3-0^6 m) deeper than the present survey depths.

3) H2399 (1898) covers the northwest corner of the present survey. Prior survey depths compare favorably and show a general trend of being 1-2 ft (0^3-0^6 m) deeper than the present survey depths.

4) H6374 (1938) covers the northeast corner of the present survey. Prior survey depths compare favorably and show a general trend of being 1-2 ft (0^3-0^6 m) deeper than the present survey depths. However, within the Tolchester channel the general trend is from 8-20 ft (2^4-6^1 m) deeper than the present survey depths.

5) H6597 (1940) covers a small portion of the eastern quarter of the present survey. Prior survey depths compare favorably and show a general trend of being 1-2 ft (0^3-0^6 m) deeper than the present survey soundings. However, within the Tolchester channel, in the vicinity of Latitude $39^{\circ}10'45''N$, Longitude $76^{\circ}16'45''W$, soundings are from 8-20 ft (2^4-6^1 m) deeper than the present survey.

Differences between the present and prior surveys can be attributed to natural changes in the bottom configuration, cultural change, and/or improved hydrographic surveying methods.

Except as noted above the present survey is adequate to supersede the above prior surveys within the common area.

O. COMPARISON WITH CHARTS 12278 (66th Edition, Jun. 7/97)

1. Hydrography

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

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

2. Controlling Depths

There are no conflicts between the present survey depths and the controlling depths of Tolchester Channel.

P. ADEQUACY OF SURVEY

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

S. MISCELLANEOUS

Chart compilation using the present survey data was done by Atlantic Hydrographic Branch personnel in Norfolk, Virginia. NOS chart 12278 (67th Edition, Nov. 15, 1998) was used for compilation of the present survey. Compiled data will be forwarded to Hydrographic Survey Division, Silver Springs, Maryland upon completion of the project.

Robert Snow

Robert Snow
Cartographic Technician
Verification of Field Data
Evaluation and Analysis

**APPROVAL SHEET
H-10688**

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 R. Hill Jr. Date: 5-28-98
Robert R. Hill Jr.
Cartographer
Atlantic Hydrographic Branch

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

Nicholas E. Perugini Date: 5-27-98
Nicholas E. Perugini,
Commander, NOAA
Chief, Atlantic Hydrographic Branch

Final Approval:

Approved: Andrew A. Armstrong, III Dated: Aug 17, 1998
Andrew A. Armstrong, III
Captain, NOAA
Chief, Hydrographic Surveys Division

MARINE CHART BRANCH
RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10688

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
12278	5-29-98	Robert Hill	Full Part Before After Marine Center Approval Signed Via Drawing No. 14 Pwg BP-165599
12278	9-2-98	MBass JB	Full Part Before After Marine Center Approval Signed Via Drawing No. 82 Thru 6/165599
12272	9-2-98	MBass JB	Full Part Before After Marine Center Approval Signed Via Drawing No. 41 Thru 12278
12273	9-2-98	MBass JB	Full Part Before After Marine Center Approval Signed Via Drawing No. 74 Thru 12278
12280	9-2-98	MBass JB	Full Part Before After Marine Center Approval Signed Via Drawing No. 2 Thru 12272-73
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
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