

9203

Diag. Cht. No. 1219-2.

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT
(HYDROGRAPHIC)

Type of Survey ... Hydrographic
Field No. ... WH-10-2-71
Office No. ... H-9203

LOCALITY

State ... Delaware
General Locality ... Cape Henlopen
Locality ... Harbor of Refuge & Vicinity

19

CHIEF OF PARTY
C. H. Nixon

LIBRARY & ARCHIVES

DATE ... 12-7-73

9203

DESCRIPTIVE REPORT

To Accompany

Hydrographic Survey H-9203

Scale 1:10,000

13 September 1971 to 21 October 1971

Coast of Delaware

OPR-492

NOAA SHIP WHITING

Charles H. Nixon, CDR, NOAA, Commanding

H-9203

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 NO.

WH-10-2-71

State Delaware

General locality Cape Henlopen

Locality Harbor of Refuge and Vicinity

Scale 1:10,000 Date of survey September 13, 1971

Instructions dated May 21, July 1, August 5, 1971 Project No. OPR-492

Vessel NOAA Ship WHITING & Launch I & II, NOAA Launch 1257

Chief of party CDR Charles H. Nixon COMDG NOAA

Surveyed by CDR C.H. Nixon, LCDR J.D. Carpenter, LCDR K.F. Burke, LT R.T. LeRoy,
LT D.A. North, LT P.L. Campbell, LTJG J.D. Busman, LTJG A.S. Sikes,
LTJG D.W. Yeager, LTJG R.C. Hoge, CST W.A. Hill

Soundings taken by echo sounder, hand lead, pole

Graphic record scaled by Ship personnel

Graphic record checked by Ship personnel
CALCOMP PLOTTER

ATLANTIC MARINE CENTER

Protracted by Computer plotter System Automated plot by same Calcomp 615

Soundings penciled by same CALCOMP PLOTTER

soundings in ~~XXXXX~~ feet at MLW ~~XXXXX~~

REMARKS:

cht
41'
1219
1219
1109
Applied to stds 12-14-73
RB

RWW



Boatsheet Layout

WH-10-2-71

WH-5-1-71

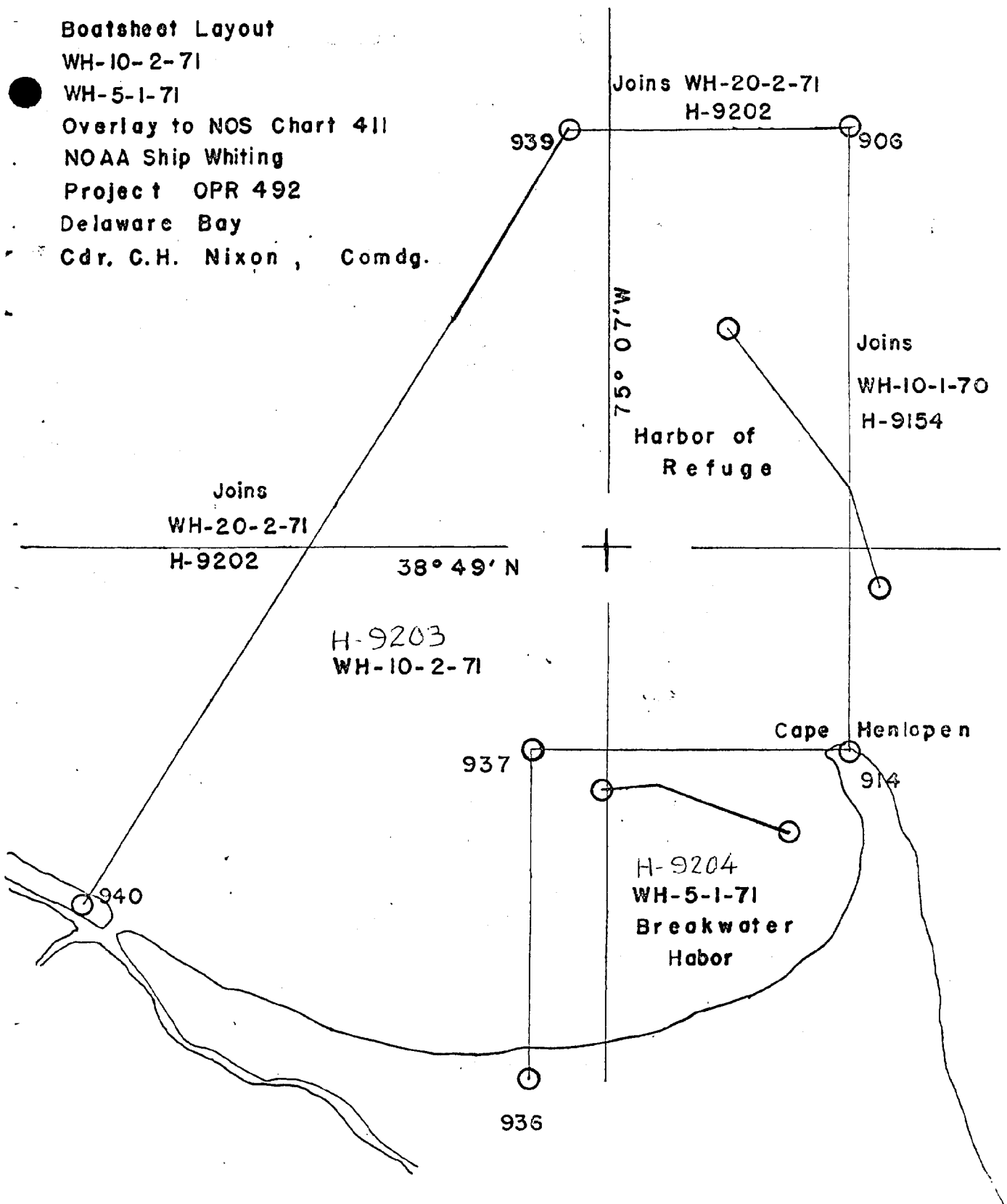
Overlay to NOS Chart 411

NOAA Ship Whiting

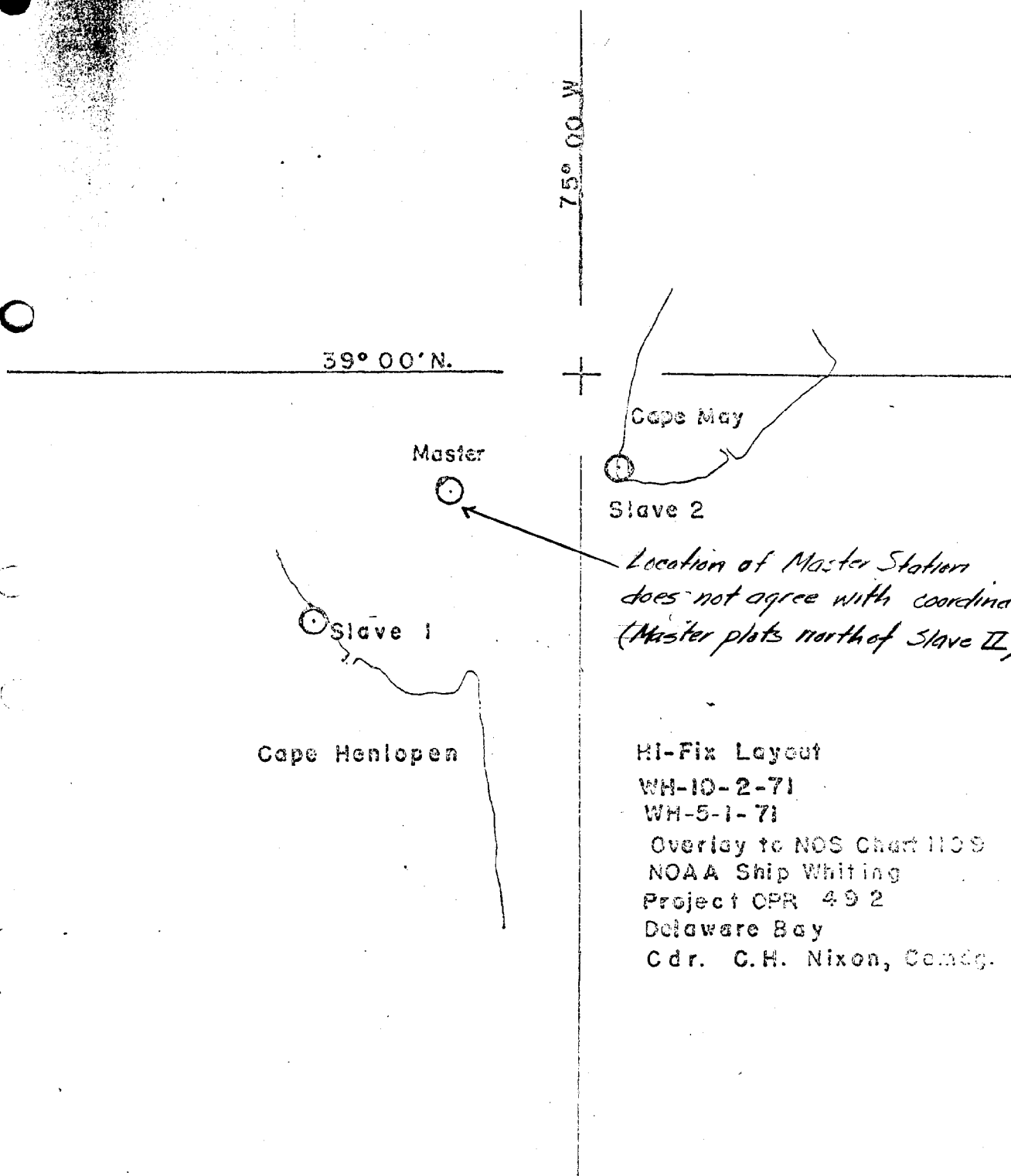
Project OPR 492

Delaware Bay

Cdr. C.H. Nixon, Comdg.



✓



*Location of Master Station
does not agree with coordinates.
(Master plots north of Slave II).*

HI-Fix Layout
 WH-10-2-71
 WH-5-1-71
 Overlay to NOS Chart 1109
 NOAA Ship Whiting
 Project OPR 492
 Delaware Bay
 Cdr. C.H. Nixon, Comdg.

A. PROJECT:

NOAA Ship WHITING launches accomplished this survey in accordance with Project Instructions and Supplemental Instructions dated 21 May, 1 July, and 5 August, 1971. ✓

B. AREA SURVEYED:

The area surveyed includes the Harbor of Refuge in Delaware Bay. The area extends from Roosevelt Inlet northeast three and one-half miles to the Ice Breakers near the Shears thence south to the tip of Cape Henlopen and west to the Cape May-Lewes Ferry Channel and south to the Delaware shore just west of the ferry jetty. The area includes a survey of the Ice Breakers and the Harbor of Refuge outer breakwater. An included sketch shows the boat sheet location. ✓

The survey commenced on 13 September 1971 and concluded on 21 October 1971. ✓

The boatsheet junctions to the north and west with WH 20-2~~8~~-71 H-9202, scale 1:20,000, a contemporary survey of WHITING launches and NOAA Launch 1257 in 1971. It junctions to the east with WH 10-1-70 H-9154, a 1:10,000 contemporary survey done by WHITING launches in 1970. On the south it joins WH 5-1-71 H-9204, a 1:5,000 contemporary survey performed by WHITING launches in 1971. The area surveyed includes that covered by H-7034, ^{and H-7035} 1:10,000 surveys done in 1945. ✓

C. SOUNDING VESSEL:

The sounding vessels were NOAA Ship WHITING launches WH-1 and WH-2. NOAA Launch 1257 conducted one day of special development in the area near latitude 38°49'00"N. and longitude 75°07'20"W. This area is plagued with sand ridges. Time did not permit WHITING launches to further develop the area. However Launch 1257 ran 50 meter spacing to insure adequate coverage and locate shoalest depth. Selected shoal soundings from Launch 1257's work were inked by hand on the WHITING plotter sheet. It was not considered desirable to plot all the data taken by Launch 1257 because of congestion. The records were submitted as part of the WHITING's work. *All of launch 1257 work plotted on this survey (day 294).* ✓

D. SOUNDING EQUIPMENT:

All sounding vessels used the DE-723D survey fathometer. WH-1 had no. 37019, WH-2 no. 37018, and NOAA Launch had no. 1904. Depths were digitized by the Digital Control Unit, since the survey was controlled electronically. ✓

Sounding corrections for the launch fathometers were determined from TDC and Nansen casts in conjunction with daily bar checks and lead line comparisons. Launch fathometer operators continually checked for proper initial settings, stylus arm length, sensitivity anomalies, ✓

Temperature Depth Conductivity

scale checks, and A-F comparisons.

The fathograms were visually scanned daily to check digitizing errors of the DCU. A second random check of fathograms was done by experienced survey personnel to insure proper scanning.

E. SMOOTH SHEET:

The smooth sheet will be plotted on the computer plotter system at the Atlantic Marine Center, Norfolk Virginia.

F. CONTROL:

The launches conducted the survey using electronic control, Hi-Fix in the hyperbolic mode. Some detached positions were taken using visual sextant fixes. The shore stations were located by WHITING personnel and Photo Party 62. The positions are as follows:

<u>STATION</u>	<u>NAME</u>	<u>LATITUDE</u>	<u>LONGITUDE</u>
Master	Wine	38°59'09.271"N.	75°06'48.012"W.
Slave 1	White	38°50'18.490"N.	75°13'33.468"W.
Slave 2	Hi-Fix Joe, 1971	38°56'25.001"N.	74°58'16.975"W.

Chain frequency = 1799.6 KHz.

Refer to the Hi-Fix layout sketch included in this report.

however, all positions have been processed by hi-fix control. and Raydist

Launch personnel calibrated the entire survey area prior to commencing any hydrography to insure no Hi-Fix anomalies existed due to geometry, jetties, ice breakers, shoreline, etc. An additional test was run on the Hi-Fix and is documented in the Visual-Visual, Visual-Hyperbolic Hi-Fix Control Comparison Report. The results indicate the Hi-Fix gives excellent control for hydrography with the geometry used.

Launch personnel calibrated the Hi-Fix preceding and following hydro, or at any time when discrepancies were suspected, by comparing visual and electronic positions. A list of Hi-Fix correctors for this sheet is included in this report. NOAA Launch 1257 used range-range Raydist to conduct the work on 21 October 1971. Refer to the Electronic Control Report.

G. SHORELINE:

Shoreline was transferred to the boatsheet from the appropriate manuscript furnished by the Atlantic Marine Center. The launches ran shoreline to verify the manuscript. Launch personnel also verified the manuscript locations of the Ice Breakers and the Harbor of Refuge outer jetty.

Photo party 62 located each ice breaker individually and the lights on each end of the breakers in 1970. The launch hydrography verifies these positions.

H. CROSSLINES:

Crossline mileage amounted to 8.7% of the main system of sounding lines. Crosslines and main system lines showed excellent agreement.

I. JUNCTIONS:

The boatsheet's junction on the west, north and south with 1971 surveys show excellent agreement. The junction on the east with H-9154 (WH 10-1-70) indicates the area between the Harbor of Refuge Lighthouse and the northern tip of Cape Henlopen has scoured up to 10 feet since the late fall of 1970. Junction with WH 10-1-70 in the area east of the Harbor of Refuge outer jetty showed good agreement with no discrepancies exceeding 3 feet.

H 9202 H 9204

J. COMPARISON WITH PRIOR SURVEYS:

Comparison in the area with H-7034, scale 1:10,000, 1945 indicated the area had changed appreciably since 1945. The survey justifies itself by showing the scouring near the Harbor of Refuge entrance (as much as 15 feet) and throughout the Harbor of Refuge.

See review
discussion
Para. No. 6

Pre-Survey Review Items:

Additional Items (Project Instructions)

A. Two fish havens consisting of clam shells are under construction in the Harbor of Refuge (Chart Letter No. 225 of 1970). One fish haven will extend from latitude $38^{\circ}49'30''N$, longitude $75^{\circ}08'00''W$, to latitude $38^{\circ}49'15''N$, longitude $75^{\circ}07'30''W$. Permission to construct this fish haven was obtained through the Delaware Board of Public Health, Project Director Mr. Richard Howell. Clam shells were dumped in the area until late 1970. Mr. Howell reported to the WHITING that the strong currents in the area did not permit the haven to stabilize. Delaware officials have found the shells to be spread everywhere with no area shoaling in forming a fish haven. Mr. Howell reports that shells are no longer being dumped in the Harbor of Refuge since it was ineffective in the past. He reports the permit to dump remains valid and that in the winter of 1971 attempts may again be made to construct the fish haven. Hydrography was run through the area at 100 meter spacing with no indication of any shoaling or obstruction.

Iconair
-Den

The other fish haven is to be centered in the vicinity of latitude 38°50'15"N, longitude 75°07'30"W. Mr. Howell reports that no dumping has been done in this area and that none is planned due to the ineffectiveness of attempts to build the other one. Hydrography in the area at 100 meter spacing shows no indication of any shoaling. *however see * below.*

I concur
✓
DEN

B. The light on the north end of the Harbor of Refuge breakwater in latitude 38°49'57"N, longitude 75°06'22"W, has been relocated further back from the end of the breakwater (L. N. M. No. 25 of 1970). The end of the breakwater has also been reported falling away (Chart Letter No. 728 (1970) ~~738 of 1970~~). The vicinity of the north end of the breakwater was surveyed with care to determine the extent of the submerged portion of the breakwater. Any portion falling from the breakwater is dropping into an enormous hole which is scouring by the excessive currents in the area. It is conjectured that this breakwater will continue to be eroded and fall into the bay. At this time, however, the submerged portion presents no danger to surface navigation.

I concur
DEN

* WHITING's launch #1 located an obstruction just south of the eastern-most ice breakers. A general bottom of 21 feet has an obstruction with relief to 11 feet (MLW by predicted tides). NOAA Launch 1257 also developed the area to 50 meter spacing and found identical results as the WHITING's launch. The best position on the obstruction is latitude 38°50'13.0"N, longitude 75°06'38.0"W. The fathograms by both vessels mentioned were carefully scanned. The graphic display is not similar to those of a wreck. The obstruction has no scouring at its base. The bottom rises 5 feet slowly and then peaks sharply another 5 feet.

I concur
obstruction
of 10 feet
DEN

Divers were not available to check the obstruction for clear identification. It is recommended that this be charted as an obstruction. A letter describing the obstruction and its position was sent to the Director, Atlantic Marine Center. A copy of this letter is included as an appendix to this report. - Chart Letter No. 1848 (1971)

I concur
DEN

K. COMPARISON WITH THE CHART:

Comparison with NOS Chart 411 of the area indicated the same effect as described in section J. of this report: the area is scouring as much as 15 feet at the entrance and 2-3 feet in the northwest portion of the Harbor of Refuge.

L. ADEQUACY OF THE SURVEY:

This survey is complete and adequate and should supersede all prior surveys for charting purposes.

✓

M. AIDS TO NAVIGATION:

The following non-floating aids to navigation plot on WH 10-2-71.

<u>Name</u>	<u>Characteristic</u>
Harbor of Refuge Light	Fl W., 2R Sector 5 ^S
Harbor of Refuge North End Light	Fl R., 4 ^S
Delaware Bay East Icebreaker Light	Qk. Fl. W.
Delaware Bkw. West End Light	Fl. G., 4 ^S
Delaware Bay West Icebreaker Light	Fl. W., 4 ^S
Delaware Bkw. Lt.	E. Int. W., R. Sector 5 ^S
Roosevelt Inlet South Jetty Light	Fl. G., 4 ^S
Roosevelt Inlet North Jetty Light	Fl. R., 4 ^S

WHITING launches located the one floating aid to navigation on the sheet: Fourteen-foot Lump Buoy, red and black banded nun, which is charted at latitude 38°48.9'N, longitude 75°07.0'W in 27 feet of water. Actually located at latitude 38°49.9', longitude 75°07.0', launch day 266.294 ✓

N. STATISTICS:

<u>Vessel</u>	<u>Nautical Miles of Sounding Line</u>	<u>Number of Positions</u>	<u>Bottom Samples</u>
Launch I	159.7	698	53
Launch II	57.2	376	20
NOAA Launch 1257	40.2	308	
TOTALS	257.1	1382	73

Area surveys = 5.6 sq. mi.

Percent crosslines = 8.7%

O. REFERENCES TO REPORTS:

1. Corrections to Echo Soundings, (Fathometer Report), OPR-492, Delaware Bay, 1971. NOAA Ship WHITING ✓
2. Electronic Control Report, OPR-492, Delaware Bay, 1971. NOAA Ship WHITING.
3. Visual-Visual, Visual-Hyperbolic Hi-Fix Control Comparison Report, NOAA Ship WHITING, OPR 492-WH-71, Delaware Bay, 1971 field season.
4. Season's Report, NOAA Ship WHITING, 1971 field season. OPR 492 Delaware Bay.



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration

Date: December 1, 1971
Reply to: Commanding Officer
Attn of: NOAA Ship WHITING
Subject: Obstructions Located In
Delaware Bay
To: Director
Atlantic Marine Center
Attn: CAM 1

National Ocean Survey
NOAA Ship WHITING
439 W. York St.
Norfolk, Va. 23510

Chart Letter
1848 (1971)

this is a print of a wreck

WHITING Launch I located an obstruction just south of the easternmost icebreakers in Breakwater Harbor, Delaware Bay.

The bottom in the area is generally 21 feet with the obstruction showing relief to 11 feet (MLW by predicted tides). The obstruction was located on 14 September 1971, (257 day) by WHITING Launch I and later verified by NOAA Launch 1257 which developed the area to 50 meter spacing and produced identical results as WH-I.

The best position on the obstruction is: Latitude $38^{\circ}50'13.0''N.$, Longitude $75^{\circ}06'38.0''W.$ The fathograms from both vessels mentioned were carefully scanned and it is believed that the graphic display is not similar to that of a wreck. The obstruction has no scouring at its base. The bottom rises 5 feet slowly and then peaks sharply another 5 feet.

Divers were not available and the obstruction has not been further identified. Since the obstruction has not been charted, it is recommended that this obstruction be noted and possibly included as a Notice to Mariners.

Charles H. Nixon
Charles H. Nixon
CDR, NOAA

APPROVAL SHEET

R. L. Kay

Submitted by:

for David Yeager
LTJG, NOAA

Supervision of field and office work on this hydrographic survey was continuous on a day to day basis to insure completeness of the survey and to insure that the work was in accordance with instructions.

Hydrography completed on this boat sheet is complete and adequate to supersede prior surveys for charting.

Approved and Forwarded:

Charles H. Nixon

Charles H. Nixon
CDR, NOAA

WH-10-2-71

WHITING LAUNCH I

CALIBRATION ABSTRACT

<u>Day</u>	<u>PI</u>	<u>PII</u>
256	-0.02	-0.06
257	-0.03	-0.10
259	-0.02	-0.11
260	-0.03	-0.13
261	-0.07 0.05	-0.13 -1.15
262	-0.08 -0.07	-0.17
265	-0.02	-0.12
266	-0.04	-0.16
270	-0.09	-0.14
271	-0.08	-0.14
272	-0.02	-0.16
286	-0.06	-0.20
287	-0.06	-0.10
292	-0.05	-0.15
263	-0.08	-0.11 (From Raw Data Source)

✓
lane corrections
applied during
verification
processing

✓

WH-10-2-71

WHITING LAUNCH II

CALIBRATION ABSTRACT

<u>Day</u>	<u>PI</u>	<u>PII</u>	
263	-0.08	-0.13	<i>see launch I abstract</i>
268	-0.01	-0.12	
269	0.00	-0.15	
*278	-0.11	-0.15	
279	-0.05	-0.14	
282	-0.02	-0.11	
285	-0.04	-0.15	
286	-0.05	-0.15	
291	-0.05	-0.15	

* Hi-Fix equipment malfunctioned on 278 day, it was repaired and found to have a calibration that was inconsistent, this adjusted out as soon as it was serviced.

VELOCITY CORRECTION

OPR 492 - 1971

✓

000051 0 0000 0001 000 000000 000000
000110 0 0002
000167 0 0004
000227 0 0006
000287 0 0008
000345 0 0010
000402 0 0012
000463 0 0014
000522 0 0016
000582 0 0018
000642 0 0020
000702 0 0022
000761 0 0024
000822 0 0026
000880 0 0028
000940 0 0030
001000 0 0032
001058 0 0034
001118 0 0036
001178 0 0038
001238 0 0040
001298 0 0042
001356 0 0044
001414 0 0046
001474 0 0048
001532 0 0050
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001720 0 0056
000059 0 0000 0002 000 000000 000000
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000181 0 0004
000243 0 0006
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000713 0 0020
000780 0 0022
000850 0 0024
000915 0 0026
000989 0 0028
001065 0 0030
001141 0 0032
001220 0 0034
001299 0 0036

001450 0 0040
001530 0 0042 ✓
001610 0 0044
000052 0 0000 0003 000 000000 000000
000106 0 0002
000159 0 0004
000210 0 0006
000264 0 0008
000313 0 0010
000367 0 0012
000421 0 0014
000478 0 0016
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000589 0 0020
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000150 0 0004
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000345 0 0012
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000444 0 0016
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001349 0 0044
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001479 0 0048
001541 0 0050
001609 0 0052
000055 0 0000 0005 000 000000 000000
000111 0 0002

v

000228 0 0006
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000376 0 0012
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000536 0 0018
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000900 0 0028
000959 0 0030
001018 0 0032
001076 0 0034
001133 0 0036
001191 0 0038
001250 0 0040
001308 0 0042
001365 0 0044
001426 0 0046
001486 0 0048
001546 0 0050
001603 0 0052
001663 0 0054

FIG. 18.

DESCRIPTIVE REPORT DATA RECORD		
PART I SMOOTH SHEET PREPARATION		
	PREPARED BY/OPERATOR	DATE
A. PLOTTER OPERATOR		
B. DISTORTION MARKS PLOTTED		
C. PROJECTION INTERSECTIONS PLOTTED		
D. POINTS OF ELECTRONIC CONTROL ARCS PLOTTED		
E. OVERLAYS PREPARED BY		
1. POSITION NUMBER		
2. EXCESS SOUNDINGS		
3. PRELIMINARY SMOOTH PLOT		
4. LIST OTHERS		
A.		
B.		
F. SOUNDING SELECTION BY		
G. PLOTTER INPUT	PREPARED	
H.	CHECKED	
I. DESCRIPTIVE REPORT ADDENDUMS		
PART II SMOOTH SHEET COMPLETION		
	B.J. STEPHENSON	11/15/73
	CARTOGRAPHER	DATE
A. DISTORTION SCALE TICKS IDENTIFIED BY NOTE		
B. PROJECTION INTERSECTIONS VERIFIED BY	EDP-AMC	8/28/72
C. PROJECTION LINES RULED BY	EDP-AMC	"
D. ELECTRONIC CONTROL ARCS RULED AND LOCATION VERIFIED	EDP-AMC	8/25/72
E. OVERLAYS COMPLETED BY	B.J. STEPHENSON	10/4/73
1. POSITION NUMBER LEADERS ADDED	B.J. STEPHENSON	11/12/73
2. EXCESS SOUNDING OVERLAY COMPARED	B.J. STEPHENSON	6/26/73
3. PRELIMINARY SMOOTH PLOTS COMPARED	B.J. STEPHENSON	11/8/73
4. OTHERS UTILIZED		
A.		
B.		
F. DESCRIPTIVE REPORT ADDENDUM		
G. CONTROL STATIONS VERIFIED	C.M. MEEKINS	2/24/73
H. POSITIONS MANUALLY PLOTTED	E.J. FIELDS	7/19/73
I. MANUAL PLOT VERIFIED		
J. SHORLINE ADDED	B.J. STEPHENSON	11/8/73
K. BATHYMETRIC DATA ADDED	B.J. STEPHENSON	11/8/73
L. BORDERS AND OTHER DATA ADDED	B.J. STEPHENSON	11/8/73

VERIFIER: W. L. Jonns

Norfolk, Virginia
Jan. 24, 1972

D. R. cc

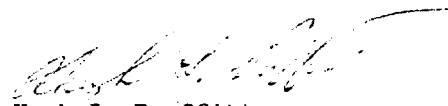
VERIFICATION BRANCH
PLOTTER NOTE TO
EDP (AMC)

SURVEY H-9203 (WH-10-2-71), OPR-492, Delaware Bay

An inspection of the field records for survey H-9203 disclosed the discrepancies listed below. They should be considered and/or corrected before the survey is plotted.

- (1) On days 286 and 287, Launch 2, positions 9901 thru 9973, which were D P's for bottom samples, the soundings were logged 0001. They should be destroyed before the plot is made or these incorrect depths will appear on the sounding overlay. ✓
- (2) Personnel of the Branch rescanned the fathograms for Days 291 and 292, Launch 2, as heavy wave action was not meant in the field. ✓
- (3) On Day 291 the fathogram and original raw data printout were marked Launch 2. The master and the corrector printouts were marked Launch 1. This Day is believed to be Launch 2 work and its correctors should be used. ✓
- (4) All depth changes were entered on the corrector tape printout. It is suggested that a new corrector tape and printout be logged before the sounding overlay is made.

Launch 2
correctors
are used. ✓
was
not done
corrected
in review


Hugh L. Proffitt
Chief, Verification Br., AMC

Verifier:..E.J.Fields

Aug. 28, 1972
Norfolk, Va.

PLOTTER NOTE TO EDP (AMC)
Survey H-9203 (WH-10-2-71)

Note: See
review discussion
4

This office has completed the verification of the preliminary position overlay for this survey.

We are returning the position record printout with needed corrections marked in red or violet pencil.

There are about 31 routine changes and 2 days where the wrong launch number was assigned.

On day 286, records 6248 thru 6443, positions 987-1015, is to be changed to launch 1. The Hi-Fix correctors are to be changed accordingly.

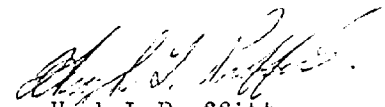
was not done in verification but checked in review. I concur

On day 291, records 10025 thru 10374, positions 1016-1049, is to be changed to launch 2. The correct Hi-Fix correctors were used on this day.

Destroy records 5880 thru 5899. These positions were rejected by the field.

When the above changes have been made, please furnish this office with a sounding overlay.

WLJ


Hugh L. Proffitt
Chief, Ver., Br. AMC

VERIFIER: W. L. Jonns

Norfolk, Virginia
Jan. 24, 1972

D. R. cc

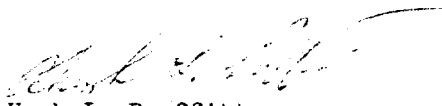
VERIFICATION BRANCH
PLOTTER NOTE TO
EDP (AMC)

SURVEY H-9203 (MH-10-2-71), OPR-422, Delaware Bay

An inspection of the field records for survey H-9203 disclosed the discrepancies listed below. They should be considered and/or corrected before the survey is plotted.

- (1) On days 286 and 287, Launch 2, positions 9901 thru 9973, which were D P's for bottom samples, the soundings were logged 0001. They should be destroyed before the plot is made or these incorrect depths will appear on the sounding overlay. ✓
- (2) Personnel of the Branch rescanned the fathograms for Days 291 and 292, Launch 2, as heavy wave action was not meant in the field. ✓
- (3) On Day 291 the fathogram and original raw data printout were marked Launch 2. The master and the corrector printouts were marked Launch 1. This Day is believed to be Launch 2 work and its correctors should be used. ✓
- (4) All depth changes were entered on the corrector tape printout. It is suggested that a new corrector tape and printout be logged before the sounding overlay is made.

Launch 2
correctors
are used. ✓
was
not done
corrected
in review


Hugh L. Proffitt
Chief, Verification Br., AMC

Verifier: Billy J. Stephenson

Norfolk, Va.
Sept 11, 1973

Verification Note to EDP-AMC
Survey H-9203 (WH 10-2-71)

The verification Branch is requesting the following:

1. Second preliminary sounding overlay with new edit routine and position dots plotted.
2. Excess overlays levels one and two.

The reason for requesting a second overlay is because the TRA was in error for three days, plus the spacing between soundings in one area were not spaced properly. The error in spacing was believed to be caused by the breakwater causing some kind of interference between the MASTER and SLAVE stations. There was no other explanation. Area just north of the breakwater.

Cards have been punched for all these changes and will accompany this note.

WLJ/bjs

W. L. Jonns for

William L. Jonns
Chief, Verification Branch

Verifier: Billy J. Stephenson

Norfolk, Virginia
October 1, 1973

Verification Note to AMC-EDP
Survey H-9203 (WH 10-2-71)

The personnel of this office has completed the verification of the sounding overlay for this survey. Correction cards have been punched and will accompany the printout. When the changes have been entered to the I & R files for this survey please furnish this office with the following:

1. Smooth sheet with blue ball point projection lines and black tick marks liquid ink 10 MM long. Do not plot signal numbers.

2. Final position overlay with electronic arcs.

There were approximately 150 minor changes to this overlay, because most of the changes were corrected on the first sounding overlay.

WLJ/bjs

William L. Jonns
William L. Jonns
Chief, Verification Branch

11/20/73 H 9203

Final - AMC

THE FOLLOWING LISTING GIVES THE TRA AND VELOCITY TABLE FOR EACH DAY AND VESS
WHENEVER EITHER OF THOSE VALUES CHANGES DURING THE DAY

Refer to Corrections to Echo Soundings, (Fathometer Report) OF
Delaware Bay 1971 for Velocity Tables

VES ID	YEAR	DAY	TIME	IND	VEL TABLE	TRA	PDS. NO.	RECORD
1257	71	294	144800	0	6	3.2	8001	894
1257	71	294	154800	0	6	2.6	8084	925
1257	71	294	162300	0	6	2.7	8085	925
1257	71	294	163300	0	6	3.0	8093	928
1257	71	294	193200	0	6	2.7	8288	997
1257	71	294	194100	0	6	3.0	8292	997
1257	71	294	195900	0	6	2.7	8307	1002
2931	71	256	123200	0	4	0.3	1	
2931	71	257	124900	0	4	0.3	78	78
2931	71	259	125200	0	4	0.3	144	132
2931	71	260	131600	0	4	0.3	193	178
2931	71	261	172100	0	4	0.3	244	228
2931	71	262	174400	0	4	0.3	281	264
2931	71	263	173900	0	4	0.3	324	312
2931	71	265	124100	0	4	0.3	375	362
2931	71	266	174400	0	4	0.3	493	479
2931	71	270	141900	0	5	0.3	625	514
2931	71	271	124700	0	5	0.3	645	531
2931	71	272	175500	0	5	0.3	717	590
2931	71	272	190400	0	5	-0.3	743	600
2931	71	286	213900	0	5	0.3	987	620
2931	71	287	124100	0	6	-0.2	9921	1050
2931	71	292	132500	0	6	0.3	1050	1030
2932	71	268	173500	0	5	0.3	530	640
2932	71	269	124400	0	5	0.3	575	680

2931	71	259	125200	0	4	0.3	144	1325.
2931	71	260	131600	0	4	0.3	193	1785.
2931	71	261	172100	0	4	0.3	244	2283.
2931	71	262	174400	0	4	0.3	281	2649.
2931	71	263	173900	0	4	0.3	324	3123.
2931	71	265	124100	0	4	0.3	375	3637.
2931	71	266	174400	0	4	0.3	493	4792.
2931	71	270	141900	0	5	0.3	625	5145.
2931	71	271	124700	0	5	0.3	645	5357.
2931	71	272	175500	0	5	0.3	717	5900.
2931	71	272	190400	0	5	-0.3	743	6065.
2931	71	286	213900	0	5	0.3	987	6248.
2931	71	287	124100	0	6	-0.2	9921	10571.
2931	71	292	132500	0	6	0.3	1050	10375.
2932	71	268	173500	0	5	0.3	530	6444.
2932	71	269	124400	0	5	0.3	575	6834.
2932	71	278	123200	0	5	0.3	773	7242.
2932	71	279	125000	0	5	0.3	789	7380.
2932	71	282	123100	0	5	0.3	836	7772.
2932	71	285	133700	0	5	0.3	912	8318.
2932	71	286	124400	0	5	0.3	942	8552.
2932	71	286	185300	0	5	-0.2	9901	10551.
2932	71	291	175700	0	6	0.3	1016	10025.

FINAL AMC

SIGNALS PLOTTED FOR H 9203

38 47 49.22	75 06 01.24	Delaware Bkw Lt.,	Lighthouse	1927-62	
38 48 01.38	75 07 01.27	Delaware Bkw W. End Lt.,		1927-62	33
38 48 51.83	75 05 33.98	Harbor of Refuge Lt. (New),	Lighthouse	1927-62	
38 49 56.88	75 06 22.00	Harbor of Refuge N. End Lt.,		1970	←
38 47 37.20	75 09 23.45	Roosevelt Inlet S. Jetty Lt.,		1962	
38 47 39.87	75 09 28.74	Roosevelt Inlet N. Jetty Lt.,		1962	

Note:

For Harbor of Refuge North End Light 1970 a ~~topographic~~ location was used from the 1970 Field edit of the advanced manuscript for TP-00062. During update of the automated data for H-9023 (1971) the position for Harbor of Refuge North End Light 1970 should be digitized from the smooth sheet of H-9203 (1971) and entered into the data bank for H-9203.

✓

FINAL AMC

11/20/73

H 9203 VESSEL	I + R STATISTICS			RECORD Nos.		
	YR	DAY	START STIME	END ETIME	START SCONT	END ECONT
1257	71	294	144852	200001	8949.	10024.
2931	71	256	123240	153100	1.	788.
2931	71	257	124910	153120	789.	1324.
2931	71	259	125230	150610	1325.	1784.
2931	71	260	131600	145300	1785.	2282.
2931	71	261	172130	185210	2283.	2648.
2931	71	262	174440	191400	2649.	3122.
2931	71	263	173920	193430	3123.	3636.
2931	71	265	124120	193320	3637.	4791.
2931	71	266	174410	193630	4792.	5144.
2931	71	270	141930	145330	5145.	5356.
2931	71	271	124720	150809	5357.	5899.
2931	71	272	175534	194720	5900.	6247.
2931	71	286	213940	223740	6248.	6443. — o/c
2931	71	287	124121	205416	10571.	10633.
2931	71	292	132540	140100	10375.	10550.
2932	71	268	173550	191800	6444.	6833.
2932	71	269	124440	145210	6834.	7241.
2932	71	278	123220	133650	7242.	7379.
2932	71	279	125040	145400	7380.	7771.
2932	71	282	123100	143500	7772.	8317.
2932	71	285	133729	143810	8318.	8551.
2932	71	286	124400	144050	8552.	8948. — o/c
2932	71	286	185348	203855	10551.	10570. — o/c
2932	71	291	175700	190300	10025.	10374.

ATLANTIC MARINE CENTER
ELECTRONIC CONTROL PARAMETERS

1. Project # OPR-492 2. Reg. # H-9203 3. Field # WH-10-2-71
 4. Type of Control Hi-Fix (Hi-Fix, Raydist, EPI, etc.)
 5. Frequency 1799.6 KCS (for conversion of electronic lanes to meters)
 6. Mode of Operation (check one):

Range-Range

Range One (R₁)
 Station I.D. _____
 Range Two (R₂)
 Station I.D. _____

Range-Visual

Lat. _____ ° _____ ' _____ "
 Long. _____ ° _____ ' _____ "
 Lat. _____ ° _____ ' _____ "
 Long. _____ ° _____ ' _____ "

Hyperbolic (3-station)

Slave One
 Station I.D. White (111)
 Master
 Station I.D. Wine (222)
 Slave Two
 Station I.D. HI FIX JOE, 1971 (333)

Hyper-Visual

Lat. 38 ° 50 ' 18.49 "
 Long. 75 ° 13 ' 33.468 "
 Lat. 38 ° 59 ' 09.271 "
 Long. 75 ° 06 ' 48.012 "
 Lat. 38 ° 56 ' 25.001 "
 Long. 74 ° 58 ' 16.915 "

7. Location of Survey:

Range-Range

Imagine an observer is standing at R₁ Station and looking directly at R₂ (check one):

Survey area is to observer's Right A=0

Survey area is to observer's Left A=1

Hyperbolic

Looking from survey area toward Master Station:

Slave One must be to observer's Left.

Slave Two must be to observer's Right.

8. This form is submitted as an aid in preparing a boat sheet.

This form applies to all data on this survey.

This form applies to part of the data on this survey.

Vessel EDP #	From Time Day	To Time Day	Position Numbers (inclusive)
_____	_____	_____	_____ to _____
_____	_____	_____	_____ to _____
_____	_____	_____	_____ to _____

9. Remarks: _____

CFN3-1
2-18-71

✓

ATLANTIC MARINE CENTER

PROJECTION PARAMETERS

POLYCONIC OR MODIFIED TRANSVERSE MERCATOR

1. Project No. OPR-492 4. Requested By Commanding Officer
2. Reg. No. H-9203 5. Ship or Office NOAA Ship WHITING
3. Field No. WH-10-2-71 6. Date Required _____

7. Polyconic Modified Transverse Mercator

8. Central Meridian of Projection _____ ° _____ ' _____ "

9. Survey Scale: 1: 10,000

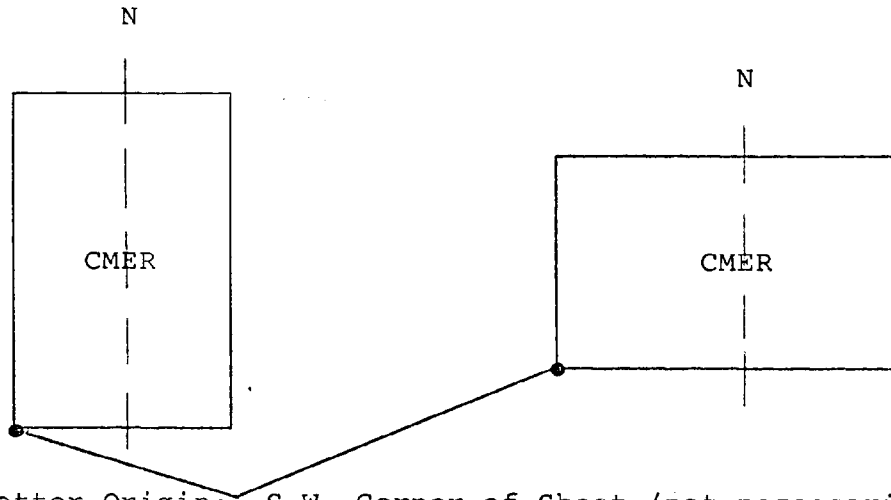
10. Size of Sheet (check one):

36 x 54 36 x 60 Other Specify _____

11. Sheet Orientation (check one):

NYX = 1

NYX = 0



12. Plotter Origin: S.W. Corner of Sheet (not necessarily a grid intersection)

Latitude 38 ° 46 ' 35 "

Longitude 75 ° 10 ' 35 "

13. G.P.'s of triangulation and/or signals attached

14. Material Desired: Tracing Paper Mylar

Smooth Sheet Other Specify _____

15. Remarks: _____

ATLANTIC MARINE CENTER



ELECTRONIC CONTROL PARAMETERS

H-9203

1. Project # OPR-492 2. Reg. # (H-9202) 3. Field # WH-10-2-71
 4. Type of Control: Raydist (Hi-Fix, Raydist, EPI, etc.)
 5. Frequency 3296.495 (for conversion of electronic lanes to meters)
 6. Mode of Operation (check one):

Range-Range

Range-Visual

Range One (R ₁)		Lat.	<u>38</u> °	<u>47</u> '	<u>27.39N</u> ''
Station I.D.	<u>Bayside Lab (444)</u>	Long.	<u>75</u> °	<u>09</u> '	<u>43.78W</u> ''
Range Two (R ₂)		Lat.	<u>38</u> °	<u>59</u> '	<u>45.62N</u> ''
Station I.D.	<u>JIM (555)</u>	Long.	<u>75</u> °	<u>19</u> '	<u>31.40W</u> ''

Hyperbolic (3-station)

Hyper-Visual

Slave One		Lat.	_____ °	_____ '	_____ ''
Station I.D.	_____	Long.	_____ °	_____ '	_____ ''
Master		Lat.	_____ °	_____ '	_____ ''
Station I.D.	_____	Long.	_____ °	_____ '	_____ ''
Slave Two		Lat.	_____ °	_____ '	_____ ''
Station I.D.	_____	Long.	_____ °	_____ '	_____ ''

7. Location of Survey:

Range-Range

Imagine an observer is standing at R₁ Station and looking directly at R₂ (check one):

Survey area is to observer's Right A=0

Survey area is to observer's Left A=1

Hyperbolic

Looking from survey area toward Master Station:

Slave One must be to observer's Left;

Slave Two must be to observer's Right.

8. This form is submitted as an aid in preparing a boat sheet.

This form applies to all data on this survey.

This form applies to part of the data on this survey.

Vessel	From		To		Position Numbers
EDP #	Time	Day	Time	Day	(inclusive)
_____	_____	_____	_____	_____	_____ to _____
_____	_____	_____	_____	_____	_____ to _____
_____	_____	_____	_____	_____	_____ to _____

9. Remarks: Launch 1257 ONLY.

ATLANTIC MARINE CENTER
APPROVAL SHEET
FOR
AUTOMATED SURVEY H-9203

- A. All revisions and additions made on the smooth sheet during verification have been entered in the magnetic tape records for this survey. A new final position printout has/~~XXXXXX~~ been made. A new final sounding printout has/~~XXXXXX~~ been made.

Date: Nov.29,1973

Signed: William L. Jones

Title: Chief, Verification Branch

- B. The verified smooth sheet has been inspected, is complete, and meets the requirements of the Hydrographic and AMC Manuals. Exceptions are listed in the verifier's report.

Date: Nov.29,1973

Signed: Henry R. Bass

Title: Chief, Processing Division

TIDE NOTE

See AMC
Tide Note -

Smooth tides for WH 10-2-71 were obtained from the standard tide gage at Lewes, Delaware, latitude $38^{\circ} 47.1$ N, $75^{\circ} 07.0$ W.

Mean low water on the staff was 2.5 feet as determined by Tides Division, Rockville, Maryland.

WHITING personnel logged the smooth tide hourly heights furnished by Rockville; and submitted these tapes to AMC with the rest of the data.

The time meridian was 0° West, Greenwich Mean Time.

All soundings on WHITING launch sheets are based on predicted tides for Breakwater Harbor.

~~(see written review item 4)~~

ATLANTIC MARINE CENTER
VERIFICATION OF SMOOTH TIDES

SURVEY H-9203

PLANE OF REFERENCE _____ MLW OR MLLW
TIME MERIDIAN _____ GMT
HEIGHT DATUM ON STAFFS 1. 2.5 2. _____ 3. _____

TIDE STATIONS	POSITION	TYPE GAGE	TIME CORR.		HEIGHT CORR. *	
			H.W.	L.W.	H.W.	L.W.
1. Lewes, Delaware	ϕ 38-47.1 Y 75-07.0	STD	0.00	0.00	0.00	0.00
2.	ϕ Y					
3.	ϕ Y					

HOURLY HRIGHTS FROM ROCKVILLE OFFICE
 FROM FIELD MARIGRAMS VERIFIED BY: GFT

TIDE ZONING NOT APPLICABLE
 BY COMPUTER
 FROM TWO OR MORE GAGES

LIMITS AND DESCRIPTION OF ZONING METHODS

TIDE CORRECTIONS COMPILED BY COMPUTER VERIFIED BY: GFT
 MANUALLY VERIFIED BY: _____

HEIGHT OF MHW ABOVE PLANE OF REFERENCE 4.1

TIDE CORRECTIONS VERIFIED ON SOUNDING PRINTOUT BY: GFT

DATE OF VERIFICATION July 24, 1973

*OR RATIO

Alfred J. Puff
EXAMINED & APPROVED

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY

TIDE NOTE FOR HYDROGRAPHIC SHEET

Processing Division: Atlantic Marine Center

Hourly heights are approved for 362

Tide Station Used (NOAA form 77-12): Lewes, Delaware

Period: Sept 13, - Oct. 28, 1971

HYDROGRAPHIC SHEET: H-9203

OPR: 492

Locality: Delaware Bay

Plane of reference (mean ~~lower~~ low water): 2.5 feet

Height of Mean High Water above Plane of Reference is 4.1 feet

Remarks:

Zoning: Use Lewes, Delaware, gage directly.

Note: Tide gage location was obtained from Tide Br. sketch.

Robert A. Cummins

Chief, Tides Branch

GEOGRAPHIC NAMES

H-9203

Name on Survey	Source of Name											
	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	RAND McNALLY ATLAS	U.S. LIGHT LIST				
Breakwater Harbor												1
Cape Henlopen												2
Delaware Bay												3
Harbor of Refuge												4
Roosevelt Inlet												5
Lewes Beach ^{sk} _{cell}												6
The Shears												7
												8
												9
												10
												11
												12
												13
												14
												15
												16
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												21
												22
												23
												24
												25

Approved by
Chas. E. Harrington
 Staff Geographer
 Feb. 27, 1974

FORM C&GS-946
(REV. 11-83)
(PRESC. BY
HYDROGRAPHIC
MANUAL 20-2,
6-94, 7-13)

U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
COAST AND GEODETIC SURVEY
NAUTICAL CHART DIVISION

HYDROGRAPHIC SURVEY STATISTICS
HYDROGRAPHIC SURVEY NO. H-9203

RECORDS ACCOMPANYING SURVEY: To be completed when survey is registered.

RECORD DESCRIPTION	AMOUNT	RECORD DESCRIPTION	AMOUNT			
SMOOTH SHEET & PNO	1	BOAT SHEETS	23			
DESCRIPTIVE REPORT	1	OVERLAYS	26			
DESCRIPTION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS/SOURCE DOCUMENTS
Accordion folders ENVELOPES			4			
CAHIERS	1					
VOLUMES						
BOXES			1			

T-SHEET PRINTS (LIST) ~~TP-00062~~, ~~TP-00063~~

SPECIAL REPORTS (LIST)
Letter to Director outlining an obstruction the Whiting Located In Delaware Bay.

OFFICE PROCESSING ACTIVITIES

The following statistics will be submitted with the cartographer's report on the survey

PROCESSING ACTIVITY	AMOUNTS			
	PRE-VERIFICATION	VERIFICATION	REVIEW	TOTALS
POSITIONS ON SHEET				1455
POSITIONS CHECKED		152	122	
POSITIONS REVISED		28	20	
DEPTH SOUNDINGS REVISED		200	371	
DEPTH SOUNDINGS ERRONEOUSLY SPACED		243	40	
SIGNALS ERRONEOUSLY PLOTTED OR TRANSFERRED		0	0	
	TIME (MANHOURS)			
TOPOGRAPHIC DETAILS		8	10	
JUNCTIONS		16	8	
VERIFICATION OF SOUNDINGS FROM GRAPHIC RECORDS *	4	17	* Scanning Pathograms	
SPECIAL ADJUSTMENTS **	7		** Key punching	
ALL OTHER WORK		240	80	
TOTALS	11	281	237	

PRE-VERIFICATION BY C.M. Meekins, E.J. Fields, G.F. Trefethen	BEGINNING DATE 2/24/72	ENDING DATE 7/25/73
VERIFICATION BY R.J. Stephenson	BEGINNING DATE 8/17/73	ENDING DATE 11/14/73
REVIEW BY C. X. H. Tyle & D. E. Neumann Snap. G. Meyers, Asst. Dir. Cartography	BEGINNING DATE 1-8-75	ENDING DATE 3-25-75

Reg. No. H 9203

The Computer and Excess Sounding Cards for this survey have not been corrected to reflect the changes made to the Computer Card and Excess Card Printouts at this time of the review.

When the cards have been updated to reflect the final results of the survey the following shall be completed:

CARDS CORRECTED

DATE ~~4/85~~ TIME REQ'D _____ INITIALS ~~LG~~

REMARKS:

Reg. No. H-9203 (1971)

The magnetic tape containing the data for this survey has not been corrected to reflect the changes made during evaluation and review.

When the magnetic tape has been updated to reflect the final results of the survey, the following shall be completed:

MAGNETIC TAPE CORRECTED

DATE 4/85 TIME REQ'D _____ INITIALS LG

REMARKS:

H-9203

Items for Future Pre-Survey Review

The development of bottom configuration on the present survey is considered excellent. However, the hydrographer did not investigate Pre-Survey Review item #17, ruins charted at lat. 38°47'00", long. 75°07'47". These ruins should be investigated to ascertain their present condition.

Position Index		Bottom Change	Use	Resurvey
<u>Lat.</u>	<u>Long.</u>	<u>Index</u>	<u>Index</u>	<u>Cycle</u>
384	0751	6	9	10 Years
385	0751	5	9	10 Years

OFFICE OF MARINE SURVEYS AND MAPS
MARINE CHART DIVISION
HYDROGRAPHIC SURVEY REVIEW

REGISTRY NO. H-9203

FIELD NO. WH-10-2-71

Delaware, Cape Henlopen, Harbor of Refuge and Vicinity

SURVEYED: September 13 thru October 21, 1971

PROJECT NO.: OPR-492

SCALE: 1:10,000

SOUNDINGS: DE-723D Depth Recorders
and Leadline

CONTROL: Hi Fix (Hyperbolic)
Raydist (Range-
Range)

Chief of Party C. H. Nixon
Surveyed by J. D. Carpenter
..... K. F. Burke
..... R. T. LeRoy
..... D. A. North
..... P. L. Campbell
..... J. D. Busman
..... A. S. Sikes
..... D. W. Yeager
..... R. C. Hoge
..... W. A. Hill
Automated Plot by Calcomp Plotter 618 - AMC
Verified and Inked by B. J. Stephenson
Reviewed by D. E. Neumann
Date: 3-25-75
Inspected by G. K. Myers

1. Description of the Area

This survey, at the entrance of Delaware Bay, covers the area of Harbor of Refuge from a line of ice breakers north of Cape Henlopen to Lewes Beach.

The bottom is gently sloping except for the shoal ridge that extends in a northwesterly direction from Cape Henlopen. Here, least depths of 9-12 feet are found in bottom depths of 20-25 feet. Between the shoal ridge and the Harbor of Refuge breakwater, the bottom is irregular from numerous sand ridges. Maximum depths of 95 ft. are found in the entrance to the harbor.

Predominant bottom characteristics in the area of the present survey are sand, mud, and shells.

2. Control and Shoreline

The source of control is adequately given in Part F of the Descriptive Report.

The shoreline originates with Class I maps Tp-00062 (1969-1970) and Tp-00063 (1969-1970).

3. Hydrography

A. Depths at crossings are in good agreement. However, in some areas sounding lines were 1-2 feet shoaler than crosslines. These differences are attributed to sea conditions and bottom irregularities.

B. The usual depth curves were adequately delineated. Dashed depth curves have been added to emphasize lesser depths in areas of deeper soundings.

C. The development of bottom configuration and investigation of least depths are considered adequate.

4. Condition of the Survey

The field work, various sounding printouts, smooth plotting, and Descriptive Report are adequate and conform to the requirements of the Hydrographic Manual, supplemented by the Instruction Manual-Automated Hydrographic Surveys, except for the following:

A. Rescanning of fathograms by the reviewer in many instances was required to resolve sounding differences due to heavy seas and provide additional soundings to adequately define the character of the sand waves.

B. Segments of sounding lines were rejected by the hydrographer in areas of close development due to congestion. It would have been desirable to excess these soundings.

C. Calibration corrections for electronic control on days 261, 262, 263, and 286 were found to be in conflict between the calibration abstracts and smooth position printout. However, these differences were negligible and did not effect the final plot.

D. Harbor of Refuge North End Light located at lat. 38°49.99', long. 75°06.37' erroneously plotted as a triangulation station was changed to a landmark from prior information and Tp-00062.

5. Junctions

An adequate junction was effected with H-9202 (1971) on the north and west, and H-9153 (1971) on the northeast. The junctions with H-9154 (1970) on the east and H-9204 (1971) on the south are discussed in the reviews of those surveys.

6. Comparison with Prior Surveys

A. H-117 (1841) 1:40,000	H-2532 (1901) 1:20,000
H-118 (1842-43) 1:20,000	H-2653 (1903) 1:10,000
H-119 (1842) 1:20,000	H-3076 (1910) 1:10,000
H-148 (1841-43) 1:80,000	1:20,000
H-670 (1859) 1:400,000	H-2532b (1910) 1:20,000
H-801 (1863) 1:3,600	H-3526 (1913) 1:10,000
H-1566 (1883) 1:20,000	H-4164 (1920) 1:40,000
<u>H-2192 (1894) 1:10,000</u>	<u>H-4942 (1929) 1:20,000</u>

Within the area common to the present survey, these prior surveys have been compared and are superseded in the reviews of the surveys discussed below. Further consideration in the present review is considered unnecessary.

B. H-7034 (1945) 1:10,000 H-7035 (1945) 1:10,000

Those prior surveys cover the area of the present survey.

Considerable change has occurred in portions of the area since the time of the prior surveys as a result of storm and current action. Cape Henlopen has accreted northwestward about 530 meters into depths as great as 50 feet. The channel off the end of the cape leading into Breakwater Harbor has maintained itself, however.

The crest of the sand ridge extending northwestward of the cape has shifted about 150 meters southwestward and numerous changes in the position and depths on the shoals in this vicinity have occurred. The prior 18-foot shoal in lat. $38^{\circ}49.2'$, long. $75^{\circ}06.8'$ has deepened to depths of about 24 feet on the present survey. The 11-ft. shoal charted in lat. $38^{\circ}50.1'$, long. $75^{\circ}06.38'$ from H-7034 has deepened to 16 to 22 ft. A deepening of 4 to 6 feet has occurred in the area northeastward of the Harbor of Refuge Breakwater. In the vicinity of Roosevelt Inlet, a deepening of 2 to 4 feet has occurred in inshore depths. However, little change has occurred in the flat bottom offshore from this area.

Submerged pier ruins and pilings, located in the immediate vicinity of lat. $38^{\circ}47.0'$, long. $75^{\circ}07.78'$ have been brought forward from H-7034.

With the addition of the aforementioned item, the present survey is adequate to supersede the prior surveys within the common area.

C. F.E. No. 12(1951) 1:10,000

The scarcity of sounding lines on the earlier survey precludes a detailed comparison with present depths. However, accretion at Cape Henlopen of as much as 325 meters has occurred.

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

D. F.E. No. 9-50 (1949) W.D.

The effective wire-drag depths from the prior survey are not in conflict with the present survey.

7. Comparison with Chart 12216 (formerly C&GS 411)
(Latest print date October 12, 1974)A. Hydrography

The charted hydrography originates with the previously discussed prior surveys which need no further consideration, supplemented by partial application of the boat sheets and verified smooth sheet of the present survey and with other miscellaneous sources.

Attention is directed to the following:

(1) These items listed below, charted from subsequent sources indicated, should be retained as charted:

<u>Item</u>	<u>Location</u>	<u>Source</u>
(a) Fish Havens	lat. 38°49.30', long. 75°07.50'	C.L. 271 (72)
	lat. 38°50.10', long. 75°07.00'	C.L. 271 (72)
(b) Sunken wreck (16 ft. rep.)	lat. 38°48.20', long. 75°07.30'	LN 3/71

(2) The 15-foot sounding charted at lat. 38°49.05', long. 75°07.48' from the boat sheet (Bp 82900) was erroneously plotted on the boat sheet and should be deleted from the chart.

(3) The mooring buoy charted at lat. 38°49.25', long. 75°06.03' from Notice to Mariners 22 of 1969 was not located by the hydrographer and should be retained on the chart.

(4) Refer to paragraph J of the Descriptive Report for additional discussion of pre-survey review items.

With the exception of items listed above or charted from sources subsequent to the present survey, the present survey is adequate to supersede the charted information in the common area.

B. Controlling Depths

The charted controlling depth tabulation of Roosevelt Inlet originates with Corps of Engineer surveys of 1974 and supersedes the present survey information.

C. Aids to Navigation

The charted aids to navigation are in agreement with the present survey and adequately mark the features intended.


8. Compliance with Instructions

This survey adequately complies with the Project Instructions.

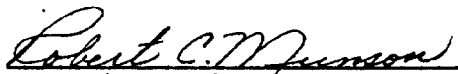
9. Additional Field Work

This is a very good basic survey and no additional field work is recommended.

Inspected and Approved:



Chief
Marine Chart Division

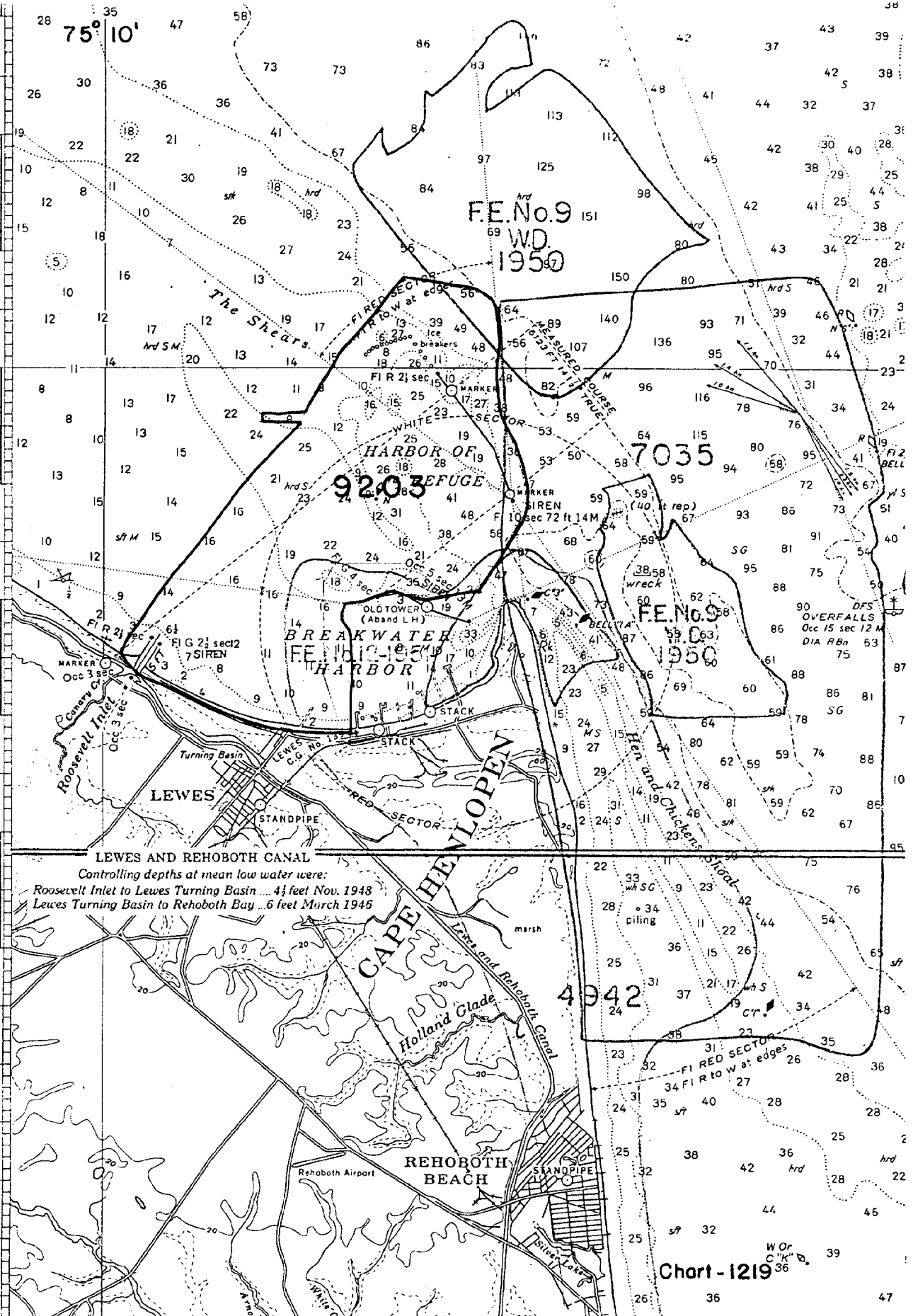


Associate Director
Office of Marine Surveys and Maps

JOINS CHART 1218

38° 50'

75° 10'



F.E. No. 9
W.D.
1950

9203

7035

F.E. No. 9
W.D.
1950

4942

Chart - 1219

LEWES AND REHOBOTH CANAL
 Controlling depths at mean low water were:
 Roosevelt Inlet to Lewes Turning Basin... 4 1/2 feet Nov. 1948
 Lewes Turning Basin to Rehoboth Bay... 6 feet March 1946

Rehoboth Airport

REHOBOTH BEACH

STANDPIPE

STANDPIPE

STANDPIPE

W Or C

36

47

