

# 8596

Diag. Cht. No. 1219-2.

FORM C&GS-504

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

## DESCRIPTIVE REPORT

Type of Survey Hydrographic

Field No. EX-10-1-61 Office No. H-8596

### LOCALITY

State Delaware

General locality Coast of Delaware

Locality Indian River Inlet to Bethany

Beach

1961-63

### CHIEF OF PARTY

E. L. Jones & H. R. Lippold, Jr.

### LIBRARY & ARCHIVES

DATE 3-20-62

USCOMM-DC 37022-P66

8596

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY

HYDROGRAPHIC TITLE SHEET

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

REGISTER No. H-8596

Field No. EX-10-1-61

State DELAWARE

General locality COAST OF DELAWARE

Locality INDIAN RIVER INLET TO BETHANY BEACH

*See other  
Title Sheet*

Scale 1:10,000 Date of survey Aug. 9 to 14, 1961

*Aug 6, 1963*

Instructions dated June 16, 1961 & July 12, 20 & 26, 1961

Vessel SHIP EXPLORER LAUNCHES NOS. 1, 2, 3 & 4

Chief of party EDMUND L. JONES H. R. LIPPOLD, JR.

Surveyed by C.A. Burroughs, W.K. Jeffers, A.J. DeLuzio & J.S. Midgley

Soundings taken by ~~XXXXXXXX~~, graphic recorder, ~~XXXXXXXX~~

Fathograms scaled by SHIP PERSONNEL & NORFOLK PROCESSING OFFICE

Fathograms checked by " " " " "

Protracted by R.D. Lynn & A.G. ATwill

Soundings penciled by A.G. ATwill

Soundings in ~~XXXXXX~~ feet at MLW ~~XXXXXX~~

REMARKS: This survey was smooth plotted in the Norfolk Processing Office.

*KWW 2/14/62*

*KWW*

DESCRIPTIVE REPORT  
to accompany  
Hydrographic Survey H- 8596 (Field No. EX-10-1-61)  
Scale 1:10,000  
USC&GSS EXPLORER  
E. L. Jones, Comdg.

A. PROJECT:

Hydrography was accomplished in accordance with Instructions for Special Project 11-61 dated 16 June 1961, and Amended Instructions dated 12, 20, and 26 July 1961. ✓

B. AREA SURVEYED:

This area covers an area on the Delaware Coast extending south from Indian River for four miles and seaward for two and one-half miles. The limits are as follows: ✓

Northwest corner: Lat.  $38^{\circ} 36.45'$ ; Long.  $75^{\circ} 03.64'$   
Northeast corner: Lat.  $38^{\circ} 36.66'$ ; Long.  $75^{\circ} 00.52'$   
Southwest corner: Lat.  $38^{\circ} 32.45'$ ; Long.  $75^{\circ} 03.25'$   
Southeast corner: Lat.  $38^{\circ} 32.65'$ ; Long.  $75^{\circ} 00.00'$

Field work was done between 9 and 14 August 1961. Junctions were not made to prior surveys in accordance with paragraph 11 of the Instructions. Critical depths and shoals from prior surveys H-4093, H-4164, and H-4942 were transferred to the boat sheets for comparison only. ✓

C. SOUNDING VESSEL:

Hydrography was done by Launches 1, 2, and 3, all operating from the ship. The area surveyed by each launch is as follows: ✓

Launch No. 1 ENS Anthony J. DeLuzio, O in C  
From Latitude  $38^{\circ} 34'$  to the southern limit using blue day letters.

Launch No. 2 LT Charles A. Burroughs, O in C  
Between Latitude  $38^{\circ} 34'$  and  $38^{\circ} 35\frac{1}{2}'$  using red day letters.

Launch No. 3 LT (jg) K. William Jeffers, O in C  
Shoreline and from Latitude  $38^{\circ} 35\frac{1}{2}'$  to northern limit using violet day letters.

Bottom samples on the entire project area were obtained from Launch 4 using the snapper, fish scoop, and skin divers. ✓

Launch No. 5 was used on 12, 13, and 14 August with skin divers to obtain underwater photographs.

D. SOUNDING EQUIPMENT:

All hydrography was done using 808 Fathometers: Serial Nos. 5221, 5727, 137SP, and 57-21. The calibrated speed of the Fathometers is 820 fathoms per second. ✓

E. SMOOTH SHEET:

The smooth sheet <sup>was</sup> ~~is to be~~ plotted <sup>in the Norfolk Processing Office.</sup> by ~~Mr. David Moody~~ under supervision ~~at the Washington Office.~~ All records and boat sheets are being turned over to Mr. Moody <sup>for temporary use</sup> at the conclusion of this project. ✓

F. CONTROL:

All control stations were photo-hydro points located by Mr. Elgan Jenkins, Chief of Air-Photo Party No. 726. Standard visual three-point fix methods <sup>used for sounding (1961) and control (1961)</sup>. ✓

Manuscripts T-12131 and T-12134 at 1:10,000 scale were furnished to the EXPLORER for plotting the photo-hydro points and shoreline on the boat sheets. ✓

At no time during the hydrography was there any evidence of jumps when fixes were changed. ✓

G. SHORELINE:

The shoreline was transferred to the boat sheets from manuscripts T-12131 and T-12134. ✓  
(1961) (1961)

Low water was not defined by the launches due to the surf and wave action, and danger of going aground. ✓

No discrepancies were found with the shoreline or photo-hydro stations established.

*On smooth sheet HWL from T-12131 was from 1961 photos and applied before revision from 1962 photos were made to drawing.*

H. CROSSLINES:

Crosslines made up to 8% of the hydrography. There was generally good agreement on the crosslines, and no resolving on the boat sheet was necessary. ✓

I. JUNCTIONS:

Junctions to prior surveys were not required on this project. See paragraph 6 of the Instructions. ✓

J. COMPARISON WITH PRIOR SURVEYS:

Boat sheet comparisons were made with the following prior surveys:

- (1) H-4942, 1929, 1:20,000 ✓
- (2) H-4093, 1919, 1:40,000
- (3) H-4164, 1920, 1:40,000

There was general agreement between the old and new survey along

the shoreline, southeast of the Indian River Inlet, and in the area of the "Fingers". The offshore features have shifted slightly and the depths have varied a few feet, but no general trend was noted. ✓

Along the shoreline, the 6 foot depth curve is now about 50 meters or less off the beach. It appears that there has been a change of depth of about 10 feet in this area. The shoreline compares favorably with the old survey. ✓

The breakwater that has been established at the Indian River Inlet since the old survey, has made obvious changes on that area. There is a general shoaling south and southeast of the breakwater, and a least depth of  $\frac{5}{2}$  feet was located at latitude  $38^{\circ} 36.4'$  North and longitude  $75^{\circ} 03.2'$  West. (4.6' Vol. 15 page 21, pos 99 - Superseded by H-8710 1962) ✓  
.07'

The "Fingers" that are shown on the old surveys were found to be very similar in shape. There appears to be a shift to the south of the tips of the "Fingers" approximately 100 to 200 meters. ✓

#### K. COMPARISON WITH CHART:

The largest scale chart of this area is Chart 411. ✓

A comparison of this chart with the boat sheets indicates general agreement with the soundings and depth curves except along the shoreline, near the Indian River Inlet, and in the area of the "Fingers". ✓

The 6 foot contour now extends close to the beach, varying from 30 to 50 meters, rather than the distances shown on the chart. It is recommended that the new charts show this change. ✓

The area just south and southeast of the breakwater has shoaled more than is indicated on the chart. A least depth of  $\frac{5}{2}$  feet was found at latitude  $38^{\circ} 36.4'$  North and longitude  $75^{\circ} 03.2'$  West. ✓  
.07' 4.6

The tips of the "Fingers" appear to have shifted southward from 100 to 200 meters. In addition, there appears to be developing a fourth finger north of the three that are charted. ✓

#### L. ADEQUACY OF SURVEY:

The survey of the project area is believed to be complete and adequate. ✓

#### M. AIDS TO NAVIGATION:

In accordance with paragraph 8 of the Instructions, Fixed Aids to Navigation were located by the Air-Photo Party assisting on this project. ✓

The following floating aids to navigation fell within the project area and were located: ✓

- (1) Indian River Inlet Lighted Gong Buoy "1" -
- (2) Indian River Inlet Buoy "2"

(4)

- (3) Indian River Inlet Buoy "3"
- (4) W Or C "M" Buoy (Marking firing range off Bethany Beach)

All buoys with the exception of (4) above were found to be correctly charted. This buoy was determined to be 0.2 nautical miles S x E of the charted position. No additional buoys are believed necessary for this area.

In accordance with the Hydrographic Manual, Section 2-48, the required chart sections, for locating the floating aids to Navigation, were forwarded to the U. S. Coast Guard.

N. STATISTICS:

<u>LAUNCH NO.</u>	<u>NUMBER OF POSITIONS</u>	<u>NAUT. MILES SOUNDING</u>
1	741	101.0
2	835	120.2
3	1,023	115.7
4 Bottom Samples	138	
	<u>2,737</u>	<u>336.9</u>

A total of 9.6 square miles were surveyed on this sheet.

In addition, 138 bottom samples were obtained, 300 feet of underwater film was shot, and 150 dives were made by skin divers at 75 locations.

O. MISCELLANEOUS:

Sand waves present in the project area are to be the subject of a doctorate thesis by Mr. David Moody of *John Hopkins University*

P. REFERENCE TO REPORTS:

A Special Report covering the operations on this project is being prepared and will be submitted to the Washington Office.

Respectfully submitted,

*Charles A. Burroughs*  
Charles A. Burroughs  
LT, USC&GS Ship EXPLORER

LIST OF SIGNALS  
to accompany  
H-8596 , EX-10-1-61

Name used on Hydrographic Survey	Origin of Station
APE	T-12131
BAG	Vol 1, Page 3
CAN	T-12131
DIX	T-12131
DOG	T-12134
EAT	Vol 1, Page 3
EGG	T-12131
FAR	T-12131
FOX	T-12134
GOT	T-12131
GUT	T-12134
HIS	T-12131
HOG	T-12134
CUPOLA	Indian River Coast Guard <u>Cupola</u> , T-12131
IKE	T-12131
INN	T-12134
JAR	T-12131
JIM	T-12134
KIM	T-12131
KIT	T-12134
LAY	T-12131
LOT	T-12134
MAN	T-12134
MAX	Vol 1, Page 3
MOP	Vol 1, Page 3
NUN	T-12134
OFF	T-12134
PAP	T-12134
POP	T-12131
RUT	T-12134
SIT	T-12134
TANK	T-12134
TAP	T-12131
UKE	T-12131
VET	Vol 1, Page 3
WAR	T-12131
YES	T-12131
ZIP	T-12131
TAN	Vol. 1, Page 3 H-8596 Ad.Wk. 1963

## ABSTRACT OF CORRECTIONS TO ECHO SOUNDINGS

LAUNCH NO. 1808 Fathometer No. 57-21

"a" day:	0-24 ft.-----	+0.3 ft.
	24-30 ft.-----	+0.4 ft.
	30-36 ft.-----	+0.6 ft.
	36-40 ft.-----	+0.8 ft.
	40-45 ft.-----	+1.0 ft.

"b" day:	0-12 ft.-----	0.0 ft.
	12-18 ft.-----	+0.2 ft.
	18-24 ft.-----	+0.4 ft.
	24-30 ft.-----	+0.4 ft.
	30-36 ft.-----	+0.6 ft.

"c" day:	0-24 ft.-----	+0.3 ft.
	24-40 ft.-----	+0.2 ft.

808 Fathometer No. 52-21

"d" day:	0-18 ft.-----	0.0 ft.
	18-30 ft.-----	-0.4 ft.
	30-36 ft.-----	-0.0 ft.
	36-42 ft.-----	-0.2 ft.

"e" day:	0-6 ft.-----	+0.1 ft.
	6-12 ft.-----	+0.3 ft.
	12-18 ft.-----	0.0 ft.
	18-24 ft.-----	0.0 ft.

*See NPO  
Fath Corrections*



LAUNCH NO. 2808 Fathometer No. 137SP

"a" day: 0-6 ft.----- +0.5 ft.  
 6-12 ft.----- +1.5 ft.  
 12-24 ft.----- +2.1 ft.

"b" day: 0-12 ft.----- -1.6 ft.  
 12-24 ft.----- -1.0 ft.

"c" day: 0-18 ft.----- -1.0 ft.  
 18-30 ft.----- -0.9 ft.  
 30-36 ft.----- -0.8 ft.

"d" day: 0-12 ft.----- +0.9 ft.  
 12-18 ft.----- -0.8 ft.  
 18-24 ft.----- -1.0 ft.  
 24-30 ft.----- +0.7 ft.

"e" day: 0-30 ft.----- -0.8 ft.

*See NPD  
Fath Corrections*

LAUNCH NO. 3808 Fathometer No. 57-27

"a" day: 0-6 ft.----- 0.0 ft.  
 6-12 ft.----- +0.3 ft.  
 12-18 ft.----- +0.6 ft.  
 18-24 ft.----- +0.8 ft.  
 24-30 ft.----- +1.0 ft.  
 30-36 ft.----- +1.2 ft.  
 36-42 ft.----- +1.4 ft.

"b" day: 0-6 ft.----- -0.4 ft.  
 6-18 ft.----- +0.2 ft.  
 18-24 ft.----- +0.5 ft.

"c" day: 0-6 ft.----- +0.1 ft.  
 6-30 ft.----- +0.2 ft.

"d" day: 0-6 ft.----- +0.3 ft.  
 6-18 ft.----- +0.6 ft.  
 18-24 ft.----- +0.5 ft.

"e" day: 0-6 ft.----- +0.1 ft.  
 6-12 ft.----- +0.3 ft.  
 12-24 ft.----- 0.0 ft.

## GEOGRAPHIC NAME LIST

V  
JMB  
3/62

It is recommended that one new geographic name be added on Chart 411 as follows:

Name: THE FINGERS

Position: Latitude 38° 34' N.  
Longitude 75° 02' W.

Although this name is not in popular usage by the local residents, it seems appropriate for this unusual bottom configuration to be named "The Fingers". Further, this name would call attention to the Coast Survey's recent research project which has had wide publicity in the area.

The only geographic name that was charted in the project area was:

INDIAN RIVER INLET

(9)

TIDE NOTE  
to accompany Hydrography Survey  
H- 8596 , EX-10-1-61  
USC&GSS EXPLORER

Final tide reducers for the project area are to be adjusted from the standard gage at Lewes, Delaware, and will be furnished to Mr. Moody by the Washington Office. *Compiled by Norfolk Office*

No portable gage was installed on this project in accordance with verbal instructions from the Washington Office on 3 August 1961.

APPROVAL SHEET

For

Hydrographic Sheet H-8596 (Field No. EX-10-1-61)  
Special Project 11-61  
Sand Wave Research - Delaware Coast  
USC&GS Ship EXPLORER

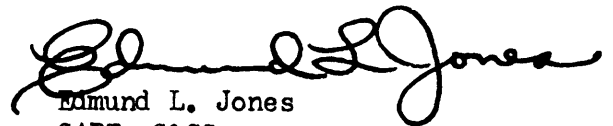
Except for the officer-in-charge of each of the three launches all others doing this work were inexperienced in launch hydrography and visual fix control. As a result, it was necessary for the Field Operations, the Field Records Officer, and myself to spend much more time on supervision and in checking records than is usually required or accomplished. The sheets and records were examined nightly.

Hydrography was omitted in the southwest corner of the project because it fell within an artillery range and the launches were denied access by a patrol boat. To have completed this area would have required a delay of at least another day in the project and this was not considered warranted in view of the 12 July Amendment to the Instructions.

At the request of Mr. Moody additional cross lines were run on and normal to the axis of the "the fingers" in order to assist him in determining the slopes of these features.

The field work on the basic hydrographic survey part of this project is believed to be complete and no additional work is recommended. Since the boat sheets and records are being transferred to Mr. Moody for smooth plotting, an additional statement about the completeness should be made after this work is finished.

16 August 1961



Edmund L. Jones  
CAPT, C&GS  
Comdg., Ship EXPLORER

(11)

LANDMARKS FOR CHARTS

Form 567, Landmarks for Charts, was submitted with a recommendation affecting Chart 1219.

UNITED STATES GOVERNMENT

# Memorandum

(12)

U.S. DEPARTMENT OF COMMERCE  
COAST AND GEODETIC SURVEY

TO : Norfolk District Officer  
Coast and Geodetic Survey

DATE: January 25, 1962

FROM : Assistant Director for the  
Office of Oceanography

In reply refer to:  
211/pt

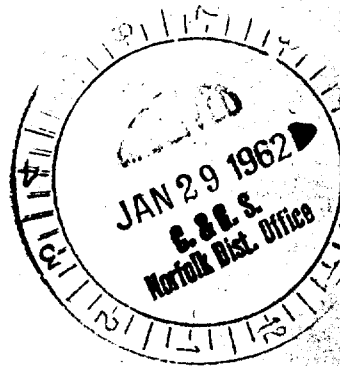
Your reference:  
Your letter dated  
January 18, 1962

SUBJECT: Smooth plot of EX-10-1-61, SP 11-61

Mr. David Moody failed to transmit Sounding Volume No. 4 for Survey EX-10-1-61 to the Washington Office. Therefore, it was not included in the transmittal of survey data to you. Your assumption that this was a record of bottom samples and their positions was verified by Mr. Moody. He assured us that the missing volume would be returned if found.

You shall instruct your Processing Office to transfer boat sheet positions for use in smooth plotting the missing bottom samples.

*Max G. Ricketts*  
Max G. Ricketts



RECEIVED  
JAN 29 1962  
E. & S.  
Norfolk Dist. Office

NORFOLK PROCESSING OFFICE  
FLOATING AIDS TO NAVIGATION

EX-10-1-61

<u>BUOYS - 1961 LIGHT LIST</u>	<u>LATITUDE</u>	<u>LONGITUDE</u>	<u>DEPTH</u>	<u>POS.</u>	<u>DATE</u>
INDIAN RIVER INLET					
Lighted Gong Buoy 1	38-36.54	75-02.78	39.4'	189d	8/12/61
Buoy 2	38-36.55	75-03.36	-	96e	8/13/61
Buoy 3	38-36.47	75-03.33	-	97e	"
Bethany Beach Buoy M	38-33.24	74-59.90	40.7	1d	8/12/61



NORFOLK PROCESSING OFFICE  
 TABULATION OF BAR CHECK CORRECTIONS  
 EX-10-1-61

EXPLORER LAUNCH #1

FATHOMETERS NOS. 57-21 &amp; 52-21

a thru f days

/ 0.2'	0.0'	to 18.0'
0.0'	18.1'	to End

EXPLORER LAUNCH #2

FATHOMETER NO. 137SP

a dayb thru e days

/ 1.8'	0.0'	to 8.0'
/ 2.0'	8.1'	" 14.0'
/ 2.2'	14.1'	" End

- 1.0'	0.0'	to End
--------	------	--------

EXPLORER LAUNCH #3

FATHOMETER No. 57-27

a thru e days

0.0'	0.0'	to 9.0'
/ 0.2'	9.1'	to 28.0'
/ 0.4'	28.1'	to End

GEOGRAPHIC NAMES  
Survey No. H-8596

(14)

Name on Survey	(14)										
	A	B	C	D	E	F	G	H	K	BLN	
Indian River Inlet ✓										✓	1
Bethany Beach ✓											2
Atlantic Ocean											3
											4
											5
											6
											7
											8
											9
											10
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											26
											27

*George M. Saxe*  
*Geographic Names*  
*30 March 1962*

*If additional names are added to this sheet - fill out the attached form and return it to C 3614 for verification.*

Hydrographic Surveys (Chart Division)

HYDROGRAPHIC SURVEY NO. 8596....

Records accompanying survey: Smooth sheets .1....;

1-B.S. IN 3 Parts +2 Add WK. boat sheets .....; sounding vols. 16.....; wire drag vols. ....;

Descriptive Reports .1...; graphic recorder envelopes ..9...;

special reports, etc. 2-Crenaflex prints, T-12131 & T-12134.....

and 1-Overlay, Bottom Samples.....

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

Number of positions on sheet	.....	2737
Number of positions checked	.....	210
Number of positions revised	.....	35
Number of soundings revised (refers to depth only)	.....	75
Number of soundings erroneously spaced	.....	about 1/3
Number of signals erroneously plotted or transferred	.....	0
Topographic details	Time	8
Junctions	Time	12
Verification of soundings from graphic record <i>LCurves</i>	Time	170 + 16
Special adjustments	Time	..... + 4

Verification by *Krus Larson* Total time <sup>+ 20</sup> 190 Date 6-8-72

Reviewed by *Robert W. DeKazarian* Time 88 Date July 23 1973  
*Insp Carstens* 7 14/18/73

H-8596

Items for Future Pre-Survey Reviews

Future surveys should include determination of least depth on the following feature.

Sounding	Lat.	Long.
25 Feet	38°32.68'N	75°00.88'W (Charted from H-4942 (1929))

The bottom is generally rather stable although some shifting of sand occurs close inshore and in the vicinity of the inlet.

Position Lat.	Index Long.	Bottom Change Index	Use Index	Resurvey Cycle
383	0751	4	2	25 Years

OFFICE OF MARINE SURVEYS AND MAPS

MARINE CHART DIVISION

HYDROGRAPHIC SURVEY REVIEW

REGISTRY NO.: H-8596

FIELD NO. EX-10-1-61

Delaware, Coast of Delaware, Indian River Inlet to Bethany Beach

SURVEYED: August 9 thru 14, 1961  
August 6, 1963

SCALE: 1:10,000

PROJECT NO.: Special Project  
NSP 11-61

SOUNDINGS: 808, DE-723 Depth Recorders

CONTROL: Visual fixes on  
shore signals

Chief of Party.....	E. L. Jones
.....	H. R. Lippold, Jr.
Surveyed by .....	C. A. Burroughs
.....	W. K. Jeffers
.....	A. J. DeLuzio
.....	J. Collins
.....	J. W. Bricker
Protracted by .....	R. D. Lynn
.....	A. G. Atwill
Soundings plotted by.....	A. G. Atwill
Verified and inked by.....	K. A. Larson
Reviewed by .....	R. W. DerKazarian
.....	Date: July 23, 1973
Inspected by .....	R. H. Carstens

1. Description of the Area

This is an inshore survey on the east coast of Delaware, in the vicinity of Indian River Inlet.

The bottom is irregular from the shoreline to approximately 1½ miles seaward as a result of shifting sand ridges which are aligned north-east to southwest in a finger like pattern. The bottom slope is very gentle thereafter with random shoal areas.

The predominant characteristic of the bottom is fine gray sand with shells.

## 2. Shoreline and Control

The origin of control is adequately covered in Part F of the Descriptive Report. All signals listed in the Descriptive Report were used in 1961 and 1963 work except for signal "Tan" which was located by sextant cuts prior to running lines of additional work of 1963.

The shoreline originates with reviewed photogrammetric manuscript T-12134 of 1961 and from unreviewed sheet T-12131 compiled from 1961 photography which was applied only to the present survey. Registered photogrammetric survey T-12131 (1961-1962) reflects revisions applied from the 1962 photographs subsequent to the present survey and storm, and was not used on the present survey.

## 3. Hydrography

- A. Depths at crossings are in good agreement. No significant differences were noted with the plot of the 1963 crosslines.
- B. The usual depth curves are adequately delineated. The 36-foot depth curve was added to define the bottom configuration more distinctly. The low water line was not defined because of wave action close inshore.
- C. The development of the bottom configuration and the investigation of least depths are considered adequate.

## 4. Condition of the Survey

The field work, sounding records, smooth plotting and Descriptive Report are adequate and conform to the requirements of the Hydrographic Manual except for the following:

1. Throughout the survey improper entry in Stamp 33 under calibrated velocity, 800 fathoms per second was used in place of the actual calibration of 820 fathoms per second.
2. Vol. 4 containing the bottom characteristics has been misplaced presumably by Mr. Moody during his investigation. The plot of bottom characteristics on the present survey is from a boat sheet plot.
3. During the smooth plotting correctors for tides and bar checks were recomputed and soundings at half interval spacings were scanned.

## 5. Junctions

There are no contemporary surveys in the area of the present survey except H-8710 (1962) to the northwest which is subsequent to the present survey. It supersedes the present survey in the common area. A butt junction was made because of changes in the bottom resulting from the storm of 1962.

## 6. Comparison with Prior Surveys

- A. H-212 (1848) 1:40,000  
H-1697 (1886) 1:40,000

These prior surveys cover the present survey<sup>area.</sup> The sparsity of soundings preclude a detailed comparison with the present survey.

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

- B. H-4093 (1919) 1:40,000  
 H-4164 (1920) 1:40,000  
H-4942 (1929) 1:20,000

These prior surveys taken together cover the area of the present survey. No significant changes in depths have occurred from the 18-foot curve to seaward. Inshore, deepening of 6 to 10 feet has occurred within 50-100 meters of the beach, moving the 6 and 12-foot curves approximately that distance shoreward. A 4-foot shoal has developed in lat.  $38^{\circ}36.4'$ , long.  $75^{\circ}03.1'$  subsequent to 1929 probably as a result of dredging the Indian River Inlet Channel and the construction of breakwaters. The shoreline has receded approximately 30 meters between lats.  $38^{\circ}32'50''$  and  $38^{\circ}33'40''$  since 1929.

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

## 7. Comparison with Chart 411 (latest print date Feb. 3, 1973)

### A. Hydrography

The charted hydrography originates largely with the partial application of depths from the boat sheet (Bps. 61313-15) and the unverified smooth sheet of the present survey. The remaining hydrography originates with the previously discussed surveys which require no further consideration. The fish haven charted in lat.  $38^{\circ}34.62'$ , long.  $75^{\circ}02.82'$  from C. L. 1470 (1966) is subsequent to the present survey and should be retained on the chart.

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

B. Aids to Navigation

There are no fixed aids to navigation within the limits of this survey. The floating aid on the present survey is in agreement with the charted position and adequately marks the feature intended.


8. Compliance with Instructions

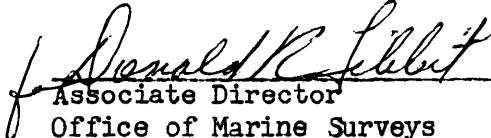
This survey adequately complies with project instructions.

9. Additional Field Work

This is considered to be a very good basic survey and no additional work is recommended.

Examined and Approved:

  
\_\_\_\_\_  
Chief  
Marine Chart Division

  
\_\_\_\_\_  
Associate Director  
Office of Marine Surveys  
and Maps



RH C

(15)

### TIDE NOTE FOR HYDROGRAPHIC SHEET

~~DIVISION OF COASTAL SURVEYS~~

May 10, 1962

Division of Charts: R. H. Carstens

Plane of reference approved in  
16 volumes of sounding records for

HYDROGRAPHIC SHEET 8596

Locality Coast of Delaware

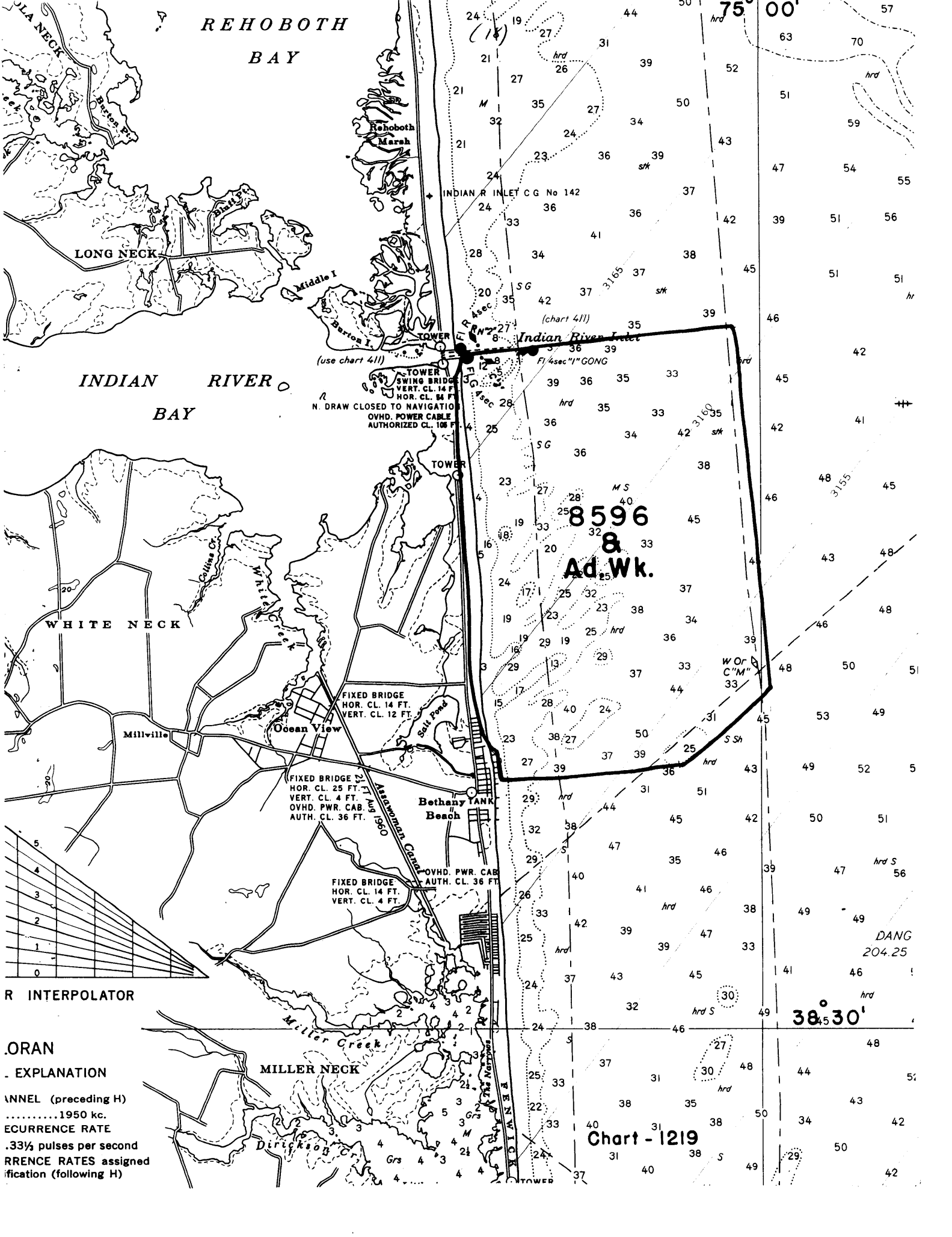
Chief of Party: E. L. Jones (1961)  
Plane of reference is mean low water  
ft. on tide staff at  
ft. below B. M.

Height of mean high water above plane of reference is: 4 feet

Condition of records satisfactory except as noted below:

J. M. Symons  
Chief, Tides and Currents Branch

~~Chief, Division of Tides and Currents~~



REHOBOTH BAY

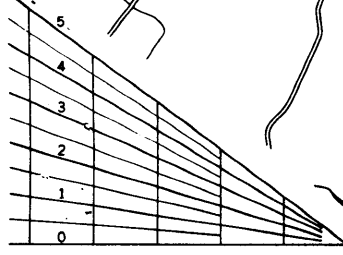
INDIAN RIVER BAY

75° 00'

38° 30'

8596 & Ad Wk.

Chart - 1219



R INTERPOLATOR

EXPLANATION

UNNEL (preceding H)  
.....1950 kc.  
ECURRENCE RATE  
.33 1/2 pulses per second  
RRENCE RATES assigned  
ification (following H)

(use chart 411)  
N. DRAW CLOSED TO NAVIGATION  
OVHD. POWER CABLE  
AUTHORIZED CL. 106 FT.

FIXED BRIDGE  
HOR. CL. 14 FT.  
VERT. CL. 12 FT.

FIXED BRIDGE  
HOR. CL. 25 FT.  
VERT. CL. 4 FT.  
OVHD. PWR. CAB.  
AUTH. CL. 36 FT.

FIXED BRIDGE  
HOR. CL. 14 FT.  
VERT. CL. 4 FT.  
OVHD. PWR. CAB.  
AUTH. CL. 36 FT.

W Or  
C "M"

DANG  
204.25

# NAUTICAL CHARTS BRANCH

SURVEY NO. H-8596

## Record of Application to Charts

DATE	CHART	CARTOGRAPHER	REMARKS
5-21-62	1109	G.R. Johnson	Before <del>After</del> Verification and Review Examined No. Correction.
9/1/62	411	Helmer	Before <del>After</del> Verification and Review <i>apd critical</i> <i>sdgs curves</i>
10/25/62	1219	H. Quimby	Before <del>After</del> Verification and Review <i>apd critical</i> <i>soundings and curves thru Chrt 411</i> <span style="float: right;"><i>✓ RND 11-3-62</i></span>
3/16/76	411	Richard L. Hoyer	<del>Before</del> After Verification and Review <i>5 SIGNED</i> FULLY APPLIED EXCEPT FOR SUPERSEDED AREAS
4/26/76	1219	Richard L. Hoyer	<del>Before</del> After Verification and Review <i>5 SIGNED</i> FULLY APPLIED THRU CHART 411
1/3/77	1109	Richard L. Hoyer	<del>Before</del> After Verification and Review <i>5 SIGNED</i> FULLY APPLIED THRU CHART 1219
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
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			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review

M-2168-1

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

DEPARTMENT OF COMMERCE

U. S. COAST AND GEODETIC SURVEY

HYDROGRAPHIC TITLE SHEET

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

REGISTER No. 8596 Ad. Wk.

Field No. S.P. LL-61

State Delaware

General locality Delaware Coast

Locality Bethany Beach

Scale 1:10,000 Date of survey 8/6/63

Instructions dated \_\_\_\_\_

Vessel WHITING

Chief of party H. R. Lippold

Surveyed by \_\_\_\_\_

Soundings taken by fathometer, graphic recorder, hand lead, wire \_\_\_\_\_

Fathograms scaled by \_\_\_\_\_

Fathograms checked by \_\_\_\_\_

Protracted by \_\_\_\_\_

Soundings penciled by \_\_\_\_\_

Soundings in fathoms feet at MLW MLLW \_\_\_\_\_

REMARKS: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

*Verifies - plot separately  
on tracing cloth overlay*

*RH Carotenow 11/18/63*

REPORT ON SPECIAL PROJECT 11/61

In accordance with Supplemental Instructions--Special Project 11/61, SAND WAVE RESEARCH, DELAWARE, dated 18 April 1963, three lines of hydrography were run by the USC&GSS WHITING's launches Number 1 and Number 2. The Raytheon model DE-723 fathometer was used for all soundings: Serial Number 250 in launch 1 and Number 251 in launch 2. Three-point fixes were used exclusively as the method of control. The signals used were all fixed objects, and all, with the exception of signal TAN, were previously located--during the 1961 season of the USC&GSS EXPLORER. Signal TAN was located by sextant fixes prior to running the lines, and appears to be adequately located since no "jumps" were observed.

The boat-sheet soundings, reduced to MLW with pre-<sup>No major</sup>dicted tides, show in some instances a marked difference from <sup>difference</sup>the previous soundings. It is felt, however, that comparison <sup>in depths</sup>of smooth-sheet soundings will have to be made before any conclusion can be reached.

Bar checks were taken preceding and following the running of the hydrography, the results being shown in the appendix of this report.

Submitted by:

*James Collins*

James Collins, LT, C&GS

Approved and forwarded:

*H. R. Lippold, Jr.*  
H. R. Lippold, Jr.  
LCDR, C&GS

1963

## BAR CHECK DATA

## Launch # 1

fathometer depth-corr. to 3.0 draft	true depth fm. lines on bar	D-M depth correction
---	-----------------------------------	----------------------------

(all depths in feet)

11.7	10	- 1.7
16.2	15	- 1.2
21.0	20	- 1.0
25.6	25	- 0.6
25.8	25	- 0.8
21.2	20	- 1.2
16.2	15	- 1.2
11.5	10	- 1.5

11.5	10	- 1.5
16.2	15	- 1.2
21.0	20	- 1.0
25.7	25	- 0.7
30.7	30	- 0.7
35.2	35	- 0.2
30.5	30	- 0.5
25.7	25	- 0.7
20.9	20	- 0.9
16.4	15	- 1.4
11.6	10	- 1.6

## Launch # 2

7.0	5	- 2.0
11.6	10	- 1.6
16.6	15	- 1.6
21.6	20	- 1.6
26.2	25	- 1.2
30.8	30	- 0.8
35.8	35	- 0.8
40.4	40	- 0.4
45.2	45	- 0.2
40.3	40	- 0.3
35.3	35	- 0.3
30.8	30	- 0.8
26.2	25	- 1.2
21.3	20	- 1.3
16.3	15	- 1.3
11.8	10	- 1.8
7.3	5	- 2.3

## BAR CHECK DATA (cont)

## Launch # 2

fathometer depth-corr. to 3.0 draft	true depth fm. lines on bar	D-M depth correction
7.0	5	- 2.0
11.5	10	- 1.5
16.5	15	- 1.5
20.7	20	- 0.7
26.0	25	- 1.0
30.5	30	- 0.5
35.5	35	- 0.5
30.5	30	- 0.5
26.0	25	- 1.0
21.0	20	- 1.0
16.5	15	- 1.5
11.7	10	- 1.7
7.0	5	- 2.0

FORM C&GS-117  
(4-62)

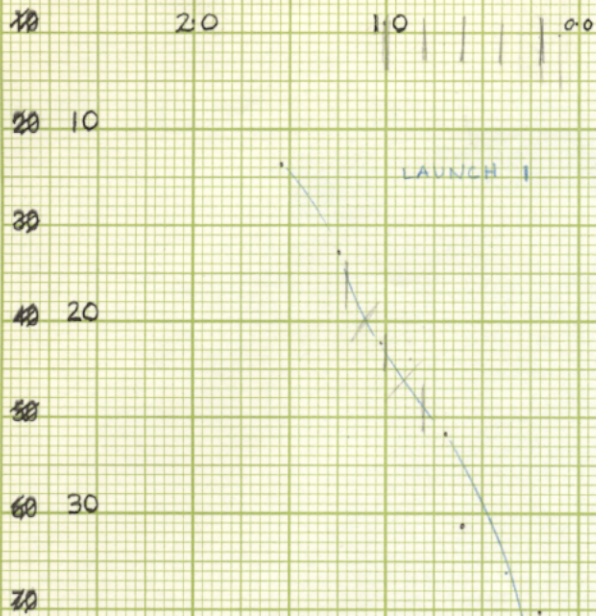
U.S. DEPARTMENT OF COMMERCE  
COAST AND GEODETIC SURVEY

VELOCITY CORRECTIONS

Ship WHITING  
LCDR. H. R. LIPPOLD, JR. Comdg.

These corrections are to be used  
between 6 AUGUST 1963 and 6 AUGUST 1963  
in the locality BETHANY BEACH, DELAWARE

for hydrographic surveys Nos. \_\_\_\_\_



(For deep water add a 0 to these figures)



VELOCITY CORRECTIONS  
 (Based on a 3.0 foot draft)

## Launch # 1

fm.	to		correction to apply to sdg.
9.5	12.5	feet	- 1.6 feet
12.5	15.3		- 1.4
15.3	20.0		- 1.2
20.0	23.0		- 1.0
23.0	25.6		- 0.8
25.6	30.0		- 0.6
30.0	37.5		- 0.4
37.5	----		- 0.2

## Launch # 2

7.0	8.5		- 2.0
8.5	10.8		- 1.8
10.8	15.5		- 1.6
15.5	20.0		- 1.4
20.0	24.0		- 1.2
24.0	27.0		- 1.0
27.0	29.5		- 0.8
29.5	33.0		- 0.6
33.0	37.5		- 0.4
37.5	----		- 0.2

Hydrographic Surveys (Chart Division)

HYDROGRAPHIC SURVEY NO. 8596 Ad. Wk.

Records accompanying survey: Smooth sheets .....;  
 boat sheets .....; sounding vols. <sup>2</sup>...; wire drag vols. ....;  
 Descriptive Reports <sup>1</sup>...; graphic recorder envelopes <sup>1</sup>...;  
 special reports, etc. ....  
 .....

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

Number of positions on sheet		61	.....
Number of positions checked	all smooth plotted		.....
Number of positions revised			.....
Number of soundings revised (refers to depth only)			.....
Number of soundings erroneously spaced			.....
Number of signals erroneously plotted or transferred			.....
Topographic details	Time		.....
Junctions	Time		.....
Verification of soundings from graphic record	smooth plotting Time	16	.....
Special adjustments	correction of mistakes Time	4	.....

Verification by *Krus Larson* ..... Total time 20 ..... Date 6-6-72

Reviewed by ..... Time ..... Date .....

(See consolidated statistics sheet  
 for H-8596 and H-8596 Ad. Wk. 17)

TIDE NOTE FOR HYDROGRAPHIC SHEET

April 9, 1964

Nautical Chart Division: R. H. Carstens

Plane of reference approved in  
2 volumes of sounding records for

HYDROGRAPHIC SHEET 8596 (Add.Wk.)

Locality Bethany Beach, Delaware

Chief of Party: H. R. Lippold, Jr. (1963)

Plane of reference is mean low water

ft. on tide staff at

ft. below B. M.

Height of mean high water above plane of reference at the  
working grounds is 4.0 feet.

Condition of records satisfactory except as noted below:

  
Chief, Tides and Currents Branch

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-8596 Ad. Wk.

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
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
411	3/10/76	RL Hogan	Full <del>Part Before</del> After Verification Review Inspection Signed Via
			Drawing No.
1219	4/26/76	Richard L. Hogan <i>off.</i>	Full <del>Part Before</del> After Verification Review Inspection Signed Via
			Drawing No. CHART 411
1109	1/3/77	Richard L. Hogan	Full <del>Part Before</del> After Verification Review Inspection Signed Via
			Drawing No. THRU CHART 1219
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
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