

H10655

NOAA FORM 76-35A

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

## DESCRIPTIVE REPORT

Type of Survey ... Hydrographic .....  
Field No. .... RA-05-01-95 .....  
Registry No. .... H-10655 .....

### LOCALITY

State ..... Alaska .....  
General Locality .. Prince William Sound .....  
Sublocality ..... Whittier & Vicinity .....

19 95

CHIEF OF PARTY  
CAPT D.R. Seidel

### LIBRARY & ARCHIVES

DATE ..... September 4, 1996 .....

**HYDROGRAPHIC TITLE SHEET**

H-10655

**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.

RA-5-1-95

State Alaska

General locality Prince William Sound

Locality Whittier and Vicinity

Scale 1:5,000 Date of survey October 8 - 18, 1995

Instructions dated July 18, 1995 Project No. OPR-P125-RA

Vessel NOAA Ship RAINIER, 2123, 2125, 2126, 2127

Chief of party CAPT Dean R. Seidel, NOAA

Surveyed by LT D.Haines, LT M.Larsen, LTJG D.Baird, ENS N.Bennett, ENS J.Becker, ENS J.Crocker, CST F.Paranada, SST J.Fleischmann, ST N.Quanbeck

Soundings taken by echo sounder, hand lead, pole DSF-6000N, ~~brv~~

Graphic record scaled by RAINIER Personnel

Graphic record checked by RAINIER Personnel

Evaluation by: Gordon E. Kay Automated plot by HP Design Jet 650C

Verification by Elias Domingo

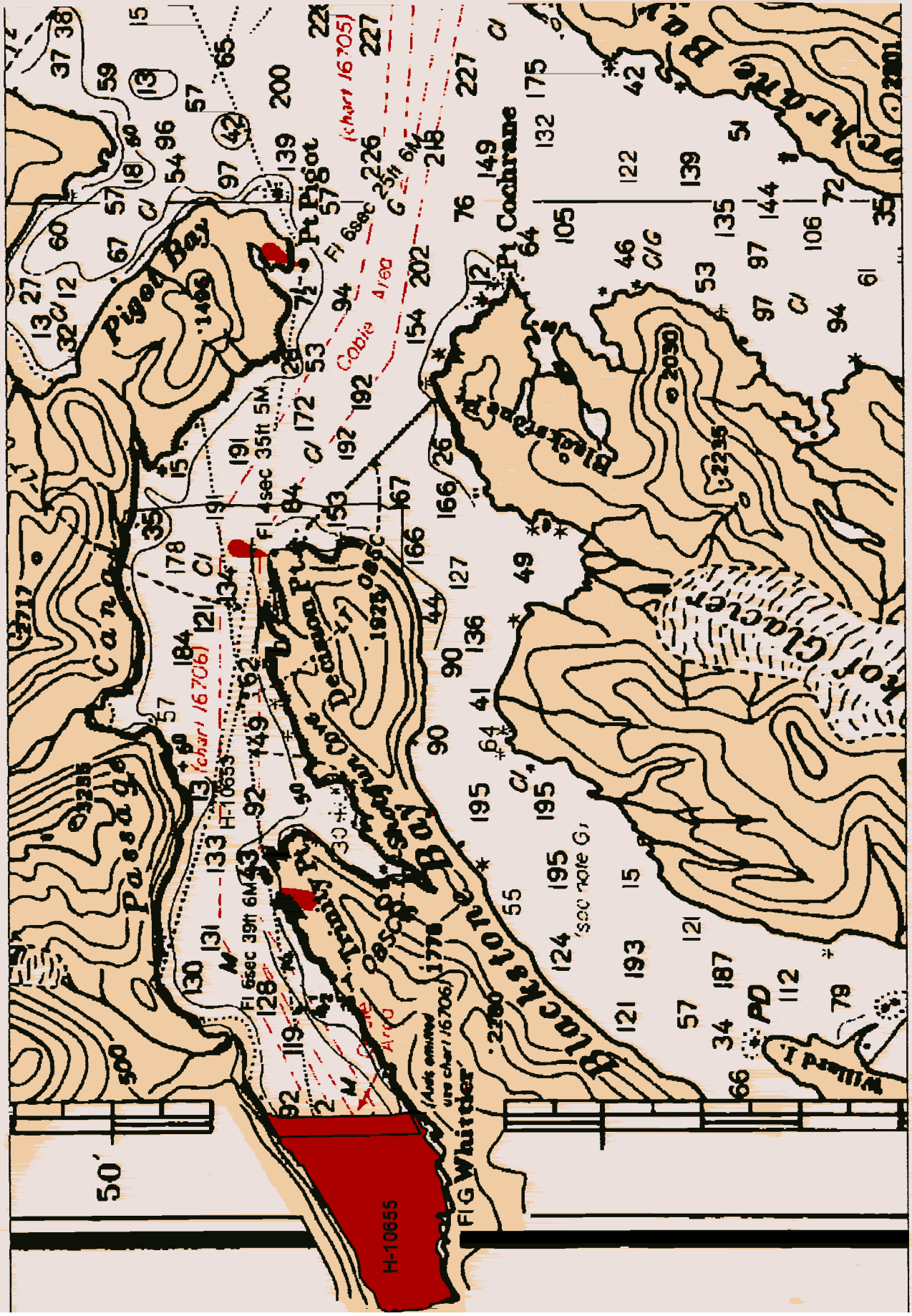
Soundings in fathoms ~~feet~~ at MLLW MLLW Fathoms and 10ms

REMARKS: Time in UTC, revisions and marginal notes in black were generated during office processing. All separates are filed with the hydrographic data, as a result page numbering may be interrupted or non-sequential.

All depths listed in this report are referenced to mean lower low water unless otherwise noted.

AW015 / SURF 7/3/96 MCR  
8 3/20/97 MCR

94-96  
3/25/97



# Descriptive Report to Accompany Hydrographic Survey H-10655

Field Number RA-5-1-95

Scale 1:5,000

October 1995

NOAA Ship RAINIER

Chief of Party: Captain Dean R. Seidel, NOAA

## A. PROJECT ✓

This basic hydrographic survey was completed in Northwest Prince William Sound, Alaska, as specified by Project Instructions OPR-P125-RA dated July 18, 1995 and change number 1 dated August 30, 1995.

Survey H-10655 corresponds to "sheet AL" as defined in the Project Instructions.

This survey will provide contemporary hydrographic survey data for updating existing nautical charts. Requests for hydrographic surveys and updated charts have been received from the Defense Mapping Agency, the Southwest Alaska Pilot's Association, and private interests such as cruise ship lines and local fishermen.

Survey H-10655 data acquisition was conducted October 8, 1995 (DN 281) to October 18, 1995 (DN 291).

## B. AREA SURVEYED *SEE Evaluation Report, section B*

The survey area is located in the vicinity of Whittier, Alaska.

The eastern survey limit is bounded by 148°39.0'W. The remainder of the survey area is bounded by the shoreline of Passage Canal.

## C. SURVEY VESSELS ✓

Data were acquired by RAINIER, three survey launches and one skiff as noted below:

<u>Vessel</u>	<u>EDP #</u>	<u>Operation</u>
RAINIER	2120	Sound Velocity Casts

<u>Vessel</u>	<u>EDP #</u>	<u>Operation</u>
RA-3	2123	Hydrography Shoreline Verification Side Scan Sonar
RA-5	2125	Hydrography Shoreline Verification Bottom Samples
RA-6	2126	Hydrography Shoreline Verification
RA-7	2127	Shoreline Verification

#### D. AUTOMATED DATA ACQUISITION AND PROCESSING ✓

Single beam data were acquired and processed using HDAPS Programs. A complete listing is included in Appendix VI. \*

Velocity corrections were determined using:

<u>Program Name</u>	<u>Version</u>	<u>Date Installed</u>
VELOCITY	2.11	5 Mar 1995

#### E. SONAR EQUIPMENT ✓

Side scan sonar (SSS) operations were conducted using an EG&G Model 260 image corrected SSS recorder and a Model 272-T <sup>dupl</sup> single frequency towfish. RA-3 was equipped with an electrostatic recorder. Serial numbers of the equipment used is located on the raw master printouts.\* ✓

The SSS towfish was configured with a 20° beam depression, the normal setting, which yields the best beam correction. The 100 kHz frequency was used throughout this survey. The towfish was deployed exclusively from the stern of the launch. ✓

Confidence checks were also possible during SSS operations due to numerous rocks and distinct bottom features. The SSS traces were scanned for data quality and contacts. ✓

\* Filed with the survey data.

Problems ✓ See Eval Rpt, section P.

In order to obtain 200% coverage and keep a good trace over the steep terrain, the launch followed the contours of the bottom. As a result, the lines are neither evenly spaced nor parallel to each other.

#### F. SOUNDING EQUIPMENT ✓

The Raytheon DSF-6000N is a dual frequency (100 kHz, 24 kHz), paper trace echo sounder. Serial numbers are included on the headers of the daily Raw Master Printouts.\* No problems which affect survey data were encountered. All DSF-6000N soundings were acquired using the High + Low, high frequency digitized setting or the low frequency digitized setting, depending on water depth.

#### G. CORRECTIONS TO ECHO SOUNDINGS ✓

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

<u>Velocity Table #</u>	<u>Cast #</u>	<u>DN</u>	<u>Cast Position</u>	<u>Deepest Depth (m)</u>	<u>Applicable DN</u>
7	4	278	60° 48' 06" N 148° 16' 57" W	600	281-286
9	5	296	60° 40' 50" N 148° 03' 02" W	571.7	290-291

*These casts were taken outside the limits of this survey.*

The sound velocity casts were acquired with SBE SEACAT Profiler (S/N 811), calibrated 03/31/95. Velocity correctors were computed using the PC program VELOCITY in accordance with Hydrographic Survey Guideline (HSG) No. 69.

A printout of the Sound Velocity Corrector Table used in the HDAPS Post Survey program is included in the "Separates to be Included with Survey Data, IV. Sounding Equipment Calibrations and Corrections".\* A printout of the Sound Velocity Corrector Tables used for input into the Hydrochart II subsystem is included in the data cahier.\*

#### Static Draft ✓

A transducer depth was determined using FPM Fig 2.2 for vessels 2123-2126 in the spring of 1995. These values were entered into the offset tables\* for each survey platform.

*Filed with the survey records.*

**Settlement and Squat ✓**

Correctors were computed in accordance with Hydrographic Manual Section 4.9.4.2., using FPM Fig. 2.3, and are included with project data for OPR-P125-RA. The data for 2123-2126 was collected in Shilshole Bay, Washington in the Spring of 1995.

**Offset Tables ✓**

Offset tables contain offsets for the GPS antenna, as well as static draft measurements, and settlement and squat data. Offset tables 3-6 correspond to the number of the vessel. The offset tables were compiled with new measurements in the spring of 1995 and are contained in the "Separates to be Included with Survey Data" \*

**Heave ✓**

The launches are not equipped with heave, roll and pitch (HRP) sensors.

**Bar Check and Lead Lines ✓**

Bar check lines were calibrated by RAINIER personnel during the winter inport 1994-1995. Calibration forms are included with project data for OPR-P125-RA. Bar checks were performed weekly and served as a functional check of the DSF-6000N.

**Tide Correctors ✓**

Predicted tides for the project were provided on diskette by N/OES334 through N/CS31 for the Cordova, Alaska reference station (945-4050). Tidal correctors as provided in the project instructions for H-10655 are: *Project Instructions OPR-P125-RA, dated 7/10/96*

Time Correction

0 hr 0 min

Height Correction

X0.97

HDAPS listings of the data used in generating tide corrector tables are included in Appendix V \* of this report.

Valdez, AK (945-4240) was used as the primary control station for datum determination at all subordinate stations.

RAINIER personnel installed an 8200 digital gage at the Whittier Municiple Boatlift Pier, Whittier, AK (945-4949) on September 25, 1995 and removed on October 18, 1995. The staff was connected to five benchmarks during the opening levels run on September 24 and 25, 1995 and closing runs on October 18 and 23, 1995. The tide gage ran without problems

*\* Filed with the survey records.*

during data acquisition.

The station description, field tide record, preliminary field tide note and data (Appendix V) \* have been forwarded to N/OES212 in accordance with HSG 50 and FPM 4.3. A request for approved tides was forwarded to N/OES23 in accordance with FPM 4.2.3. *Approved Tide Note dated April 18, 1996 is attached.*

#### H. CONTROL STATIONS *See Evaluation Report, Section H.*

A listing of the geodetic stations used to control this survey is *attached to* included in ~~Appendix III~~ of this report. The horizontal datum for this project is NAD83.

DGPS stations were installed on existing stations PORT and CAB. Station PORT is located on Esther Rock and station CAB is located on a prominent point west of Pigot Point light. These stations were recovered in accordance with methods stated in Section 5.2.4 of the FPM. *Station PORT was not used for control on Survey H-10655.*

For further information see the "Fall 1995 Horizontal Control Report" that will be submitted at the end of the project.

#### I. HYDROGRAPHIC POSITION CONTROL *SEE Evaluation Report, section I.*

##### Method of Position Control ✓

All soundings and features were positioned using differential GPS. RA-7 was equipped with a mobile GPS setup including a Maxon VHF radio and hand-held Magellan GPS unit (S/N 006892) configured for differential capability. Positions from RA-7 were hand-written onto DP forms to three decimal places and then manually entered into HDAPS. Because no HDOP value was available, positions appearing erroneous were rejected.

##### Ashtech GPS ✓

VHF differential shore stations were established at stations CAB and PORT. The difference between the computed location and the published positions at station CAB and PORT were recorded by the MONITOR 3.0 program on a PC. Data from a 24-hour period were recorded and examined for signs of multi-path signal reflection, which was not evident at any station. Scatterplot results are included in the "Project related data for OPR-P125-RA".

##### Calibrations & Systems Check Methods ✓

System checks were performed in accordance with Section 3.4.4 of the FPM. Two observations of position were made from two independent DGPS base stations. The results were transferred to forms which are included in the project data for OPR-P125-RA. An abstract of the system checks is included in the "Separates to be Included with Survey Data, III. Horizontal Position Control and Corrections to Position Data". \*

*\* Filed with the survey records.*



## Problems ✓

None

## J. SHORELINE ✓ *See Evaluation Report, Section J.*

Shoreline map DM 10184 was supplied by N/CS341 in Standard Digital Data Exchange Format (SDDEF). The digital files were projected using OPR-P125 geodetic parameters with the program Shore Version 2.0, provided by N/CS32, and stored in HYPACK (\*.DIG) format. Shoreline was plotted at survey scale on boat sheets and processing sheets.

## Method of Shoreline Verification ✓

Shoreline verification was conducted near predicted lower low water in accordance with FPM 7.1.

Shoreline verification was accomplished by taking detached positions (DPs) and assigning sequential reference numbers.

Shoreline and DM features verified via visual inspection were assigned sequential reference numbers, described, and recorded in the field using reference forms and corresponding 1:5,000 photocopies of the boatsheet. Reference numbers, descriptions, and heights corrected to MLLW using predicted tides are recorded on the reference form. DPs taken during shoreline verification were recorded on DP forms. These indicate significant DM features and features not found on the DM.

Corresponding notes were annotated on the photocopies of the DM when deemed necessary. The annotated photocopies of the boat sheet and the reference forms are included with the survey data.

Detailed 1:5,000 "Bottom Sample and Detached Position Plots" are provided showing all reference numbers, and notes relating to each feature. The information from these plots was transferred to a final field plot where possible. Verified DM features were retained and shown in black. Changes to the DM are shown in red. Field cartographic codes were assigned using the HDAPS DP editor. Heights are recorded in meters and decimeters and are corrected to predicted MLLW. *\*Field values have been changed after application of actual tides and shown on the smooth sheet in feet. Least depths on submerged features are shown on the smooth sheet in fathoms.*  
Changes and New Features ✓

There were several changes and new features found during shoreline verification. Several new features are rocks and the DM pilings investigated were found to be piers. *The new features and revisions have been shown on the smooth sheet as warranted.*

## Disprovals ✓

A DM rock in the vicinity of 60° 46' 41" N 148° 40' 04" W was searched for and not found (Pos. #1317) on DN 282. Depths in the vicinity are approximately 6 meters, search time 5 minutes, water visibility 3 meters. The hydrographer recommends deleting the DM rock at 60° 46' 41" N 148° 40' 04" W. *CONCUR*

## Recommendations ✓

The hydrographer recommends that the shoreline changes from the survey be used to supersede digital shoreline information. *CONCUR*

## Charted Features

Many of the charted features are fixed aids to navigation addressed in Section Q or investigated as AWOIS items in Section N with the following exceptions: ✓

- **Fix:** 1015    **DN:** 281    **Position:** 60°46' 37.3"N 148°40 '57.7"W  
**Feature:** Charted Pilings

**Method:** Disproval of four charted pilings in the vicinity of above position. Visual search in a 50-meter radius, search time 20 min. Average water depth <sup>3-3.5</sup> 7 meters, visibility 3 meters. Search was conducted at or below MLLW. A new pier with DM pilings is <sup>within 50</sup> 300 meters southeast of the charted pilings. ✓

The hydrographer recommends deleting the charted pilings at 60°46' 37.3"N 148°40 '57.7"W *CONCUR* ✓  
and charting a ~~new pier~~ *Ferry pier catwalk as shown on the smooth sheet.*

- **Fix:** 1016    **DN:** 281    **Position:** 60°46' 37.3"N 148°40 '53.8"W  
**Feature:** Charted Pilings

**Method:** Disproval of four charted pilings in the vicinity of above position. Visual search in a 50-meter radius, search time 20 min. Average water depth 7 meters, visibility 3 meters. *(SEE Ed. sect P(2).)* Search was conducted at or below MLLW. A new pier with DM pilings is <sup>within 50</sup> 300 meters southwest of the charted pilings. ✓

The hydrographer recommends deleting the charted pilings\* at 60°46' 37.3"N 148°40 '53.8"W. *Do not CONCUR* ✓  
*CHART The area as shown on the smooth sheet. \*Chart <sup>the four</sup> visible piles centered at latitude 60/46/37.5N, longitude 148/40/54W as submerged.*

• **Fix:** N/A    **DN:** N/A    **Position:** 60°46' 46"N 148°39 '28"W  
**Feature:** Charted Rock

Unable to investigate charted rock due to location in relation to zero curve of shoreline. The hydrographer recommends retaining the rock as charted. *CONCUR*

- The hydrographer recommends charting the controlling depth of Whittier Harbor as <sup>Small boat</sup> 12.7 feet (1.9 FMS) <sup>11.4</sup> as indicated by position 8071 + 6 on DN 282 at 60°46' 41"N 148°41'24"W. *CONCUR*
- Arcs of visibility of charted lights were investigated and found to be as charted. ✓
- The cable areas within the survey limits were not investigated and should remain as charted. *CONCUR*
- An Obstruction PA charted at 60°46'51"N 148°40 '54"W is also AWOIS item investigation 51984. AWOIS 51984 was investigated by RAINIER in October 1992 with a 250 meter search radius and 100% echosounder bottom coverage. The obstruction was not found and the hydrographer recommends deleting the "OBSTR PA" and blue tint. *CONFIRMED CONCUR*  
*with Mr. Mike Riddle N/CS31, Operation Branch.*

#### K. **CROSSLINES** ✓

Crosslines are within 1-2 meter parameter agreement with mainscheme hydrography except in areas of complex bathymetry. Total mileage was 5.9 nautical miles or 12.3 % of total mainscheme hydrography.

#### L. **JUNCTIONS** ✓ *SEE Evaluation Report, Section L.*

This survey junctions at its east limit with H-10653 (1:10,000, 1995) and is bounded by shoreline at its north, south and west limits.

Soundings were found to be in general agreement. Final comparison will be made at the Pacific Hydrographic Branch (PHB).

#### M. **COMPARISON WITH PRIOR SURVEYS** *SEE Evaluation Report, Section M*

One prior survey was compared: H-8310 (1:5,000, 1956). Preliminary comparisons revealed prior least depths shoaler than the current survey. USGS analyses of the aftermath of the 1964 Good Friday Earthquake indicate widespread subsidence of approximately 5.2 feet in the area covered by this survey. This could account for the shoaler depths found in the prior surveys. H-7161 was unavailable for comparison. Final comparisons will be done at PHB.

#### N. **ITEM INVESTIGATIONS** *See Eval Rpt, Section N.*

Seven AWOIS item investigations were assigned to H-10655.

AWOIS ITEM 52236 ✓

(Recommendation next page)

### 1. Area of Investigation

*State:* Alaska  
*Locality:* Whittier, Passage Canal, Prince William Sound  
*Reported Latitude:* 60°46'55.2"N ✓  
*Reported Longitude:* 148°39'18.5"W ✓  
*Datum:* NAD 83  
*Depth:* N/A  
*Feature:* Mooring Buoy

### 2. Description of Source Item

A mooring buoy was identified by USC&GS Ship Surveyor in a survey conducted in April-  
May, 1964. ✓

### 3. Survey Requirements

Verify or disprove mooring buoy by visual search or salvage documentation. Search is only  
required inside 20 fathom curve.

### 4. Method of Investigation

Visual search.

### 5. Results of Investigation

*Date:* 281  
*Time (UT):* 22:45:55  
*Measured Depth:* N/A  
*Predicted Tide Corrector:* N/A  
*Corrected Least Depth:* N/A  
*Position Number:* 5840  
*Latitude:* N/A  
*Longitude:* N/A  
*Datum:* NAD 83

### 6. Comparison with Prior Surveys

A buoy is charted on prior survey H-8310 ( 1:5,000, 1956).

## 7. Comparison with Chart and Charting Recommendations

The buoy was searched for and not found during hydrography. Average depth in the area is 25 meters and sloping steeply toward shore. The hydrographer recommends removing the buoy charted at 60°46'55.2"N 148°39'18.5"W. *CONCUR*

- AWOIS ITEM 52237 ✓ (*Recommendation Next page*)

### 1. Area of Investigation

*State:* Alaska  
*Locality:* Whittier, Passage Canal, Prince William Sound  
*Reported Latitude:* 60°46'40.0"N ✓  
*Reported Longitude:* 148°39'54.0"W ✓  
*Datum:* NAD 83  
*Depth:* N/A  
*Feature:* Submerged wharf and pier structure ruins

### 2. Description of Source Item

Wharf and pier structures shown in the vicinity of the above latitude and longitude did not appear in a post-earthquake damage survey photos taken on 4/4/64.

### 3. Survey Requirements

Verify or disprove submerged ruins by visual search, bottom drag or diver investigation

### 4. Method of Investigation

Diver investigation.

### 5. Results of Investigation

*Date:* DN 283  
*Time (UT):* 18:36:47 ✓  
*Measured Depth:* 4.6 meters ✓  
*Predicted Tide Corrector:* -1.7<sup>5</sup> meters  
*Corrected Least Depth:* 3.41 meters = 1.7 fathoms  
*Position Number:* 9230  
*Latitude:* 60°46'41.82"N ✓  
*Longitude:* 148°39'54.68"W ✓  
*Datum:* NAD 83

The bottom in this area is sloping with scattered rocks. The detached position marks the

seaward extent and shoalest depth of a group of pilings. Search radius 40 meters, search time 60 minutes, water visibility 10 meters. In addition to the pilings, diver investigation found various submerged wreckages. Position 9229 (60°46'42.42"N 148°39'48.9"W, least depth 9.9m) marks the seaward extent of these wrecks.

## 6. Comparison with Prior Surveys

Prior survey H-8310 (1:5,000, 1956) shows a pier structure at 60°46'44.0"N 148°39'45.0"W.

## 7. Comparison with Chart and Charting Recommendations

*DELETE the submerged ruins NOTE and limit line.*

A submerged ruins area is charted on NOS chart 16706, 9th Edition, May 12, 1990 1:10,000

(NAD 83). The hydrographer recommends charting wrecks at 60°46'42.42"N 148°39'48.9"W *CHART AREA AS SHOWN ON SMOOTH SHEET.*

and piles at 60°46'41.8"N 148°39'54.7"W, *Enclosed by a Foul limit line. (Pos. #9229)*

*17065th (Subm piles) (Pos. #9270)*

- AWOIS ITEM 52238 ✓ *(RECOMMENDATION next page)*

### 1. Area of Investigation

State: Alaska  
Locality: Whittier, Passage Canal, Prince William Sound  
Reported Latitude: 60°46'35.0"N ✓  
Reported Longitude: 148°40'50.10"W ✓  
Datum: NAD 83  
Depth: 12 feet  
Feature: Obstruction, 2 railway rails in vertical position

### 2. Description of Source Item

*(CL 461/64)*

A USCG teletype reported two railway rails connected by ties in a vertical position located at marginal wharf, 30 meters east of west end of wharf and 15 meters off the wharf.

### 3. Survey Requirements

Verify or disprove railway rails by visual search, 200% side scan sonar, bottom drag, echo sounder, diver investigation or salvage documentation. A 15 meter search radius is required.

### 4. Method of Investigation

Diver investigation.

## 5. Results of Investigation

Date: DN 283  
Time (UT): 194726  
Measured Depth: N/A  
Predicted Tide Corrector: N/A  
Corrected Least Depth: N/A  
Position Number: 9231 ✓  
Latitude: 60°46'35.3"N ✓  
Longitude: 148°40'50.70"N ✓  
Datum: NAD 83

Nothing significant found. Search radius 30 meters, search time 24 minutes, water visibility 10 meters. The bottom is generally flat and littered with small debris less than 1 foot high. ✓

## 6. Comparison with Prior Surveys

No obstruction appears on prior survey H-8310 (1:5,000, 1956).

## 7. Comparison with Chart and Charting Recommendations

An obstruction area is charted on NOS chart 16706, 9th Edition, May 12, 1990 1:10,000 (NAD 83). The hydrographer recommends removing the charted obstruction at position 60°46'35.0"N 148°40'50.10"W. Chart a 4 1/2 fm sounding at latitude 60/46/36.08, longitude 148/40/49.53. This sounding is approximately 17 feet shallower than the surrounding depths and plots 40 meters north of the AWOIS item. ✓  
43chtd.  
CONCUR

• AWOIS ITEM 52239 ✓

### 1. Area of Investigation (RECOMMENDATION NEXT PAGE)

State: Alaska  
Locality: Whittier, Passage Canal, Prince William Sound  
Reported Latitude: 60°46'41.30"N ✓  
Reported Longitude: 148°41'33.5"W ✓  
Datum: NAD 83  
Depth: N/A  
Feature: Obstruction

### 2. Description of Source Item

Alaska department of public works reports anchored cables to secure concrete breakwater. The cables extend from all four corners and extend 90 feet inshore and 180 feet offshore from breakwater.

### 3. Survey Requirements

Verify or disprove cables and anchors using visual search, 400% side scan sonar, salvage documentation, bottom drag or diver investigation. Determine the extent of anchored cables from floating concrete breakwater.

### 4. Method of Investigation

Diver investigation.

### 5. Results of Investigation

Date:	DN 283
Time (UT):	22:01:31
Measured Depth:	N/A
Predicted Tide Corrector:	N/A
Corrected Least Depth:	N/A
Position Number:	9233-9238 ✓
Latitude:	60°46'35.0"N ✓
Longitude:	60°46'35.0"W ✓
Datum:	NAD 83

Six mooring lines secured by chains to anchor blocks on the bottom are connected to the floating pier.

### 6. Comparison with Prior Surveys

No anchor cable area or floating pier is shown on prior survey H-8310 (1:5,000, 1956).

### 7. Comparison with Chart and Charting Recommendations

An anchor cable area is charted on NOS chart 16706, 9th Edition, May 12, 1990 1:10,000 (NAD 83). The hydrographer recommends charting anchor cable area limits at the following positions:

FIX	POSITION
9233	60°46' 42.4"N 148°41 '33.1"W ✓
9234	60°46' 42.2"N 148°41 '35.0"W
9235	60°46' 41.8"N 148°41 '37.1"W
9236	60°46' 40.9"N 148°41 '31.8"W
9237	60°46' 40.4"N 148°41 '33.1"W
9238	60°46' 40.2"N 148°41' 33.5"W

*CHART AREA AS SHOWN ON  
THE SMOOTH SHEET.*



- AWOIS ITEM 52240 ✓ *(Recommendations on next page)*  
*SEE ER, item N and item P*

### 1. Area of Investigation

*State:* Alaska  
*Locality:* Whittier, Passage Canal, Prince William Sound  
*Reported Latitude:* 60°46'45.0"N ✓  
*Reported Longitude:* 148°41'30.0"W ✓  
*Datum:* NAD 83  
*Depth:* N/A  
*Feature:* Submerged Debris Ruins (Charted)

### 2. Description of Source Item

Earthquake damage survey photos dated 4/4/64.

### 3. Survey Requirements

Locate and determine limits of debris by echosounder, 200% side scan sonar, bottom drag or diver investigation.

### 4. Method of Investigation

200% side scan sonar.

### 5. Results of Investigation

*Date:* 282  
*Time (UT):* N/A  
*Measured Depth:* N/A  
*Predicted Tide Corrector:* N/A  
*Corrected Least Depth:* N/A  
*Position Number:* 1323-1364 ✓  
*Latitude:* 60°46'45.0"N ✓  
*Longitude:* 148°41'30.0"W ✓  
*Datum:* NAD 83

Because of the steeply sloping bottom, parallel lines within the search area were difficult to maintain. However, 200% side scan sonar revealed nothing significant in the area.

## 6. Comparison with Prior Surveys

A logs and pilings obstruction area is shown on prior survey H-8310 (1:5,000, 1956) at 60°46'45.0"N 148°41'30.0"W.

## 7. Comparison with Chart and Charting Recommendations *(also see eval. report, item N&P)*

A submerged ruins area is charted on NOS chart 16706, 9th Edition, May 12, 1990 1:10,000 *Do NOT* (NAD 83). The hydrographer recommends removing the charted submerged ruins limits. *CONCUR* *sketch* *chart*

### • AWOIS ITEM 52241 *✓ (Recommendations on Next Page)*

#### 1. Area of Investigation

*State:* Alaska  
*Locality:* Whittier, Passage Canal, Prince William Sound  
*Reported Latitude:* *@* 60°46'52.0"N *✓*  
*Reported Longitude:* 148°42'55.0"W *✓*  
*Datum:* NAD 83  
*Depth:* N/A  
*Feature:* Submerged Ruins

#### 2. Description of Source Item

*@* An earthquake damage survey photo data 4/4/64 indicated an area of submerged ruins. The position given in the AWOIS item description was incorrect. The Hydrographic Survey Division was contacted and the correct position was given as 60°46' 55"N *✓* 148°42' 55"W *✓*.

#### 3. Survey Requirements

Verify or disprove submerged ruins by visual search, bottom drag or diver investigation, 50-meter search radius.

#### 4. Method of Investigation

Diver investigation. Straight line search, 15 meters between divers, 50 meter search radius, 15 meter water visibility.

#### 5. Results of Investigation

*Date:* DN 283  
*Time (UT):* 00:12:01  
*Measured Depth:* N/A

*Predicted Tide Corrector:* N/A  
*Corrected Least Depth:* N/A  
*Position Number:* 9239 ✓  
*Latitude:* 60°46' 55.2"N ✓  
*Longitude:* 148°42' 54.9"W ✓  
*Datum:* NAD 83

No ruins found. Bottom is flat with a steep drop off. ✓✓

## 6. Comparison with Prior Surveys

No ruins are shown on prior survey H-8310 (1:5,000, 1956). H-7161 was not available for comparison.

## 7. Comparison with Chart and Charting Recommendations

A submerged ruins area is charted on NOS chart 16706, 9th Edition, May 12, 1990 1:5,000 (NAD 83). The hydrographer recommends removing the submerged ruins symbol. *CONCUR* ✓

## • AWOIS ITEM 52244 ✓ (*RECOMMENDATION ON NEXT PAGE*)

### 1. Area of Investigation

*State:* Alaska  
*Locality:* Whittier, Passage Canal, Prince William Sound  
*Reported Latitude:* 60°46'37.0"N ✓  
*Reported Longitude:* 148°40'28.0"W ✓  
*Datum:* NAD 83  
*Depth:* N/A  
*Feature:* 25 ft dredged area

### 2. Description of Source

A dredging project intended for a car barge was completed on October 11, 1971 for the Alaska railroad. The area was to be dredged to 25 feet.

### 3. Survey Requirements

Determine least depth within charted "L" shaped dashed line out to 8.5 meter curve by echosounder.

### 4. Method of Investigation

The area was investigated with echosounder, 25 meter line spacing, orthogonal to the channel

(Positions 1367 - 1368, DN 282; 1667 - 1673, DN 284; 5805 - 5810, DN 281; 5614 - 5615, DN 281).

## 5. Results of Investigation

Date: DN 284  
Time (UT): 211612  
Measured Depth: 9.0 meters  
Predicted Tide Corrector: -3.1<sup>1</sup>/<sub>2</sub> meters  
~~Predicted~~ <sup>ACTUAL</sup> Corrected Least Depth: 6.7<sup>0</sup> meters = 3.3 fathoms (20 FT)  
Position Number: 1668  
Latitude: 60°46'37.0"N  
Longitude: 148°40'26.0"W  
Datum: NAD 83

## 6. Comparison with Prior Surveys

Prior survey H-8310 (1:5,000, 1956) does not show a dredged channel. *Dredge work performed in 1971.*

## 7. Comparison with Chart and Charting Recommendations

A DTON was submitted on December 11, 1995.

- A <sup>Oct 1971</sup> 25-foot reported depth is charted on NOS chart 16706, 9th Edition, May 12, 1990 1:10,000 <sup>at latitude 60/46/38.5<sup>N</sup>, Longitude 148/40/26 W</sup> ~~concur~~ (NAD 83). The hydrographer recommends charting a depth of ~~20.6~~ <sup>20.8</sup> feet. The hydrographer also recommends developing the area further with lines run parallel to the channel. *See Eval. Rpt. sec N, T*  
*see eval rpt sect N for HSIW comments*

## O. COMPARISON WITH THE CHART *SEE Evaluation Report section O.*

This survey was compared to NOS chart 16706, 9th Edition, May 12, 1990 1:10,000 (NAD 83) which incorporated soundings from recon survey BP 65295 (1:20,000, 1964). Preliminary comparisons revealed least depths shoaler than the current survey. Final comparisons to be done at PHB.

Non-sounding charted features are discussed in Section J, Shoreline. Final comparisons to be made at PHB.

## Dangers to Navigation

Four dangers to navigation were submitted for H-10655 on December 11, 1995. *(are attached)*

## P. ADEQUACY OF SURVEY *See Eval Rpt, section P.*

Survey H-10655 is complete and adequate to supersede charted depths and features in their

common areas. *Consur*

**Q. AIDS TO NAVIGATION** *See Eval Rpt, Section Q.*

There were ~~seven~~ <sup>Five Fixed</sup> aids to navigation ~~were~~ <sup>\*</sup> within the limits of survey H-10655. One fixed pier light and one floating pier light were positioned to third order accuracy with GPS on DN 280. ~~Three Fixed aids to navigation were positioned using detached positions. One Fixed aid to navigation was disapproved. All Five aids are discussed in Section Q, Descriptive Report Insert.~~ ✓

One tank <sup>(LANDMARK)</sup> was positioned on DN 282 with a hand-held MAGELLAN GPS unit configured for differential GPS. Positioning was calculated by accounting for a 40 meter offset in the latitude of position 758 and a 50 meter offset in the longitude of position 759. The two positions were then averaged. *See Section Q, Following this Report, for Position.*

~~Two aids to navigation were positioned using detached positions. One aid to navigation was disapproved. All seven aids are discussed in Section Q, (following page 19).~~  
*FIVE*

**R. STATISTICS** ✓

NM Hydrography	86.3
Velocity Casts	2
Detached Positions	105
Selected Soundings	7997
Bottom Samples	28
Tide Stations	1
NM <sup>2</sup> Hydrography	2.3

**S. MISCELLANEOUS** ✓

Bottom samples were collected but not retained in accordance with Project Instructions.

No unusual tidal currents were observed. Tidal currents flood in a generally west direction and ebb in a generally east direction.

No unusual magnetic variations were noted.

**T. RECOMMENDATIONS** *SEE Evaluation Report, section T*

None

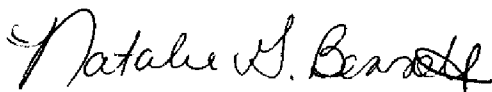
**U. REFERRAL TO REPORTS** ✓

The following supplemental reports contain additional information relevant to this survey:

\* Light List Numbers: 25888, 25893, 25895, 25900

<u>Title</u>	<u>Date Sent</u>	<u>Office</u>
Fall 1995 Horizontal Control Report for OPR-P125-RA.	December, 1995	N/CS34
Fall 1995 Coast Pilot Report for OPR-P125-RA.	December, 1995	N/CS26
Project related data for OPR-P125-RA.	Incremental	N/CS34
Secchi Disk Observations for OPR-P125-RA	November, 1995	N/CS31

Respectfully Submitted,



Natalie G. Bennett  
Ensign, NOAA

Approved and Forwarded,



Dean R. Seidel  
Captain, NOAA  
Commanding Officer

**Section Q: Descriptive Report Insert**

<sup>AID</sup>  
 Name of ~~Landmark~~ Delong Pier Lights ✓  
 Light List #: 25888 ✓

Method of Positioning: Detached Position  
 Differential GPS

**Positioning Info**

<i>Light List</i>	Latitude N ✓	Longitude W
<del>Charted Pos.</del>	60°46' 42"N ✓ <i>485"</i>	148°40' 00"W ✓ <i>34T"</i>
Survey Pos. #1318	60°46' 42.8"N	148°39' 57.2"W
Survey Pos. #1319	60°46' 43.4"N ✓ <i>356"</i>	148°39' 58.0"W ✓ <i>57.969"</i>

*Southern light - removed*  
*Northern light*

Note The Light List gives one position and indicates three lights. Only two lights exist.

Difference between Survey/Charted position: 43.7 m 69 deg T

**Characteristics**

Do Characteristics Match Light List? (y/n) Y  
 If NO, what are the characteristics?

**New/Uncharted Aids** (if info is known or easily obtained)  
 Date Established:  
 Maintained By: Private (y/n)  
 Frequency of Maintenance:  
 Purpose:

**Section Q: Descriptive Report Insert**

Name of <sup>410</sup>Landmark: Whittier Passenger ✓

Dock Lights

Light List #: 25893 ✓

Method of Positioning: Detached Position  
Differential GPS

**Positioning Info**

	Latitude N	Longitude W
Charted Pos.	60°46'42"N ✓	148°41 '42"W ✓
Survey Pos.	60°46'41 <sup>.715</sup> "N ✓	148°41 '39 <sup>.037</sup> "W ✓

**Note** The Light List gives one position and indicates two lights. One of the two lights on the dock was destroyed. Both lights are planned to be remounted.

Difference between Survey/Charted position: 45.0 m 97 deg T

**Characteristics**

Do Characteristics Match Light List? (y/n) Y

If NO, what are the characteristics?

**New/Uncharted Aids** (if info is known or easily obtained)

Date Established:

Maintained By: Private (y/n)

Frequency of Maintenance:

Purpose:



**Section Q: Descriptive Report Insert**

<sup>A10</sup>  
Name of ~~Landmark~~: Marginal Wharf Light ✓  
Light List #: 25895 ✓

Method of Positioning: 3rd Order

**Positioning Info**

<i>Light List</i>	Latitude N	Longitude W
<del>Charted</del> Pos.	60°46' <sup>42</sup> 38"N ✓	148°40'34"W ✓
Survey Pos.	60°46' 37.597"N ✓	148°40'32.260"W ✓

Difference between Survey/Charted position: 29.1 m 115 deg T

**Characteristics**

Do Characteristics Match Light List? (y/n) Y

If NO, what are the characteristics?

**New/Uncharted Aids** (if info is known or easily obtained)

Date Established:

Maintained By: Private (y/n)

Frequency of Maintenance:

Purpose:

Section Q: Descriptive Report Insert

Name of Aid: Whittier Breakwater Light 1 ✓  
Light List #: 25900 ✓

Method of Positioning: 3rd Order

Positioning Info

	Latitude N	Longitude W
<i>LIGHT LIST</i> <del>Charted Pos.</del>	60°46' 42"N ✓	148°41 '36"W ✓
Survey Pos.	60°46' 40.692"N ✓ 962 *	148°41 '34.719"W ✓

Difference between Survey/Charted position: 44.9 m 154 deg T

Characteristics

Do Characteristics Match Light List? (y/n) Y  
If NO, what are the characteristics?

New/Uncharted Aids (if info is known or easily obtained)

Date Established:

Maintained By: Private (y/n)

Frequency of Maintenance:

Purpose:

\* Corrected from Horizontal Control Report

**Section Q: Descriptive Report Insert**

Name of Landmark: Tank ✓

Method of Positioning: Detached Position  
Differential GPS

**Positioning Info**

	Latitude N	Longitude W
Charted Pos.	60°46'43.2"N	148°43 '27.0"W
Survey Pos.	60°46'48.2"N ✓	148°43 '18.2"W ✓

Difference between Survey/Charted position: 204.0 m 40 deg T

**Characteristics**

Do Characteristics Match Light List? (y/n) N/A

If NO, what are the characteristics?

**New/Uncharted Aids** (if info is known or easily obtained)

Date Established:

Maintained By: Private (y/n)

Frequency of Maintenance:

Purpose:

CONTROL STATIONS as of 24 Oct 1995 ✓

No	Type	Latitude	Longitude	H	Cart	Freq	Vel Code	MM/DD/YY	Station Name
100	F	060:14:18.000	146:38:48.000	0	250	0.0	0.0	08/22/95	CAPE HINCHINBROOK(BEACON)
<del>101</del>	<del>F</del>	<del>061:03:24.000</del>	<del>146:41:40.000</del>	<del>0</del>	<del>250</del>	<del>0.0</del>	<del>0.0</del>	<del>08/22/95</del>	<del>POTATO PT(BEACON)</del>
102	F	060:48:12.825	148:23:12.976	19	250	0.0	0.0	08/22/95	CAB 1914 (GPS STATION)
<del>103</del>	<del>F</del>	<del>060:48:05.091</del>	<del>148:10:45.240</del>	<del>17</del>	<del>250</del>	<del>0.0</del>	<del>0.0</del>	<del>08/22/95</del>	<del>PORT 1914 (GPS STATION)</del>
<del>104</del>	<del>F</del>	<del>060:43:26.490</del>	<del>148:01:11.543</del>	<del>19</del>	<del>250</del>	<del>0.0</del>	<del>0.0</del>	<del>10/20/95</del>	<del>ABOVE(GPS STATION)</del>

NOAA FORM 76-40  
(8-74)

Replaces C&GS Form 567

TO BE CHARTED  
 TO BE REVISED  
 TO BE DELETED

REPORTING UNIT  
*(Field Party, Ship or Office)*  
NOAA Ship RAINIER

STATE  
Alaska

LOCALITY  
Whittier and vicinity

DATE  
11/15/95

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

ORIGINATING ACTIVITY  
 HYDROGRAPHIC PARTY  
 GEODETIC PARTY  
 PHOTO FIELD PARTY  
 COMPILATION ACTIVITY  
 FINAL REVIEWER  
 QUALITY CONTROL & REVIEW GRP.  
 COAST PILOT BRANCH

NONFLOATING AIDS OR LANDMARKS FOR CHARTS

The following objects  HAVE  HAVE NOT  been inspected from seaward to determine their value as landmarks.

CHARTING NAME	DESCRIPTION	D.A.T.U.M.	P.O.S.I.T.I.O.N				M.E.T.H.O.D. A.N.D. D.A.T.E. O.F. L.O.C.A.T.I.O.N		C.H.A.R.T.S. A.F.F.E.C.T.E.D.
			L.A.T.I.T.U.D.E.		L.O.N.G.I.T.U.D.E.		O.F.F.I.C.E.	F.I.E.L.D.	
			°	'	°	'			
OPR PROJECT NO. OPR-P125-RA	J.O.B. N.U.M.B.E.R. H-10655								
L.L. NO. 25895	MARGINAL WHARF LIGHT	60 46	37.597	148 40	32.260		F - 7 - L	16700* 16705 16706	
L.L. NO. 25900	WHITTIER BREAKWATER LIGHT	60 46	40.762	148 41	34.719		F - 7 - L	16700 16705 16706	
L.L. NO. 25893	WHITTIER PASSENGER DOCK LIGHTS	60 46	41.775	148 41	39.037		F - 9 - L	16700* 16705* 16706*	
L.L. NO. 25888	DELONG PIER LIGHTS <i>SOUTH LIGHT</i>	60 46	42.485	148 39	57.347		F - 9 - L	16700* 16705 16706	
TANK	TANK Offshore of a Group of Tanks	60 46	48.200	148 43	18.200		F - 9 - L	16700* 16705 16706	
L.L. No. 25888	DELONG PIER LIGHT <i>NORTH LIGHT</i>	60 46	43.356	148 39	57.989		F - 9 - L	16700* 16705 16706	
							* Not On Chart		

RESPONSIBLE PERSONNEL		ORIGINATOR
TYPE OF ACTION	NAME	
OBJECTS INSPECTED FROM SEAWARD	CAPT D. R. Seidel	<input type="checkbox"/> PHOTO FIELD PARTY <input checked="" type="checkbox"/> HYDROGRAPHIC PARTY <input type="checkbox"/> GEODETIC PARTY <input type="checkbox"/> OTHER
POSITIONS DETERMINED AND/OR VERIFIED	CAPT D. R. Seidel	FIELD ACTIVITY REPRESENTATIVE
FORMS ORIGINATED BY QUALITY CONTROL AND REVIEW GROUP AND FINAL REVIEW	CAPT D. R. Seidel	OFFICE ACTIVITY REPRESENTATIVE
		<input type="checkbox"/> REVIEWER <input type="checkbox"/> QUALITY CONTROL AND REVIEW GROUP REPRESENTATIVE
<b>INSTRUCTIONS FOR ENTRIES UNDER 'METHOD AND DATE OF LOCATION'</b> <i>(Consult Photogrammetric Instructions No. 64)</i>		
<b>OFFICE</b> <b>1. OFFICE IDENTIFIED AND LOCATED OBJECTS</b> Enter the number and date (including month, day, and year) of the photograph used to identify and locate the object. EXAMPLE: 75E (C) 6042 8 - 12 - 75	<b>FIELD (Cont.)</b> <b>B. Photogrammetric field positions** require entry of method of location or verification, date of field work and number of the photograph used to locate or identify the object.</b> EXAMPLE: P - 8 - V 8 - 12 - 75 74L (C) 2982	
<b>FIELD</b> <b>1. NEW POSITION DETERMINED OR VERIFIED</b> Enter the applicable data by symbols as follows: P - Photogrammetric Vis - Visually 5 - Field identified 6 - Theodolite 7 - GPS 8 - Sextant 9 - DGPS	<b>II. TRIANGULATION STATION RECOVERED</b> When a landmark or aid which is also a triangulation station is recovered, enter 'Triang. Rec.' with date of recovery. EXAMPLE: Triang. Rec. 8 - 12 - 75	
<b>A. Field positions* require entry of method of location and date of field work.</b> EXAMPLE: F - 2 - 6 - L 8 - 12 - 75	<b>III. POSITION VERIFIED VISUALLY ON PHOTOGRAPH</b> Enter 'V-Vis.' and date. EXAMPLE: V-Vis. 8 - 12 - 75	
<b>** PHOTOGRAMMETRIC FIELD POSITIONS are</b>		



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
Office of NOAA Corps Operations  
Pacific Marine Center  
1801 Fairview Avenue East  
Seattle, Washington 98102-3767

NOAA Ship RAINIER

December 11, 1995

Commander  
Seventeenth Coast Guard District  
Post Office Box 3-5000  
Juneau, Alaska 99802

**ADVANCE  
INFORMATION**

Dear Sir:

During the processing of hydrographic survey H-10655, in Northwest Prince William Sound four dangers to navigation have been discovered. These dangers affect the following charts:

<u>Chart</u>	<u>Edition/Date</u>	<u>Datum</u>
16705	15th Ed., Sept. 1/90 1:80,000	NAD83
16706	9th Ed., May 12/90 1:20,000	NAD83
16700	24th Ed., Jan 11/92 1:200,000	NAD83

It is recommended that these dangers to navigation be included in the Local Notice to Mariners.

Questions concerning this report should be directed to the Pacific Hydrographic Branch at (206) 526-6835.

Sincerely,

Dean R. Seidel  
Captain, NOAA  
Commanding Officer  
NOAA Ship RAINIER

Enclosure

cc: DMA/HTC  
PMC  
N/CS26



Hydrographic Survey Registry Number: H-10655

**ADVANCE  
INFORMATION**

Survey Title:           State:           Alaska  
                          Locality:       Prince William Sound  
                          Sublocality:   Whittier and Vicinity

Project Number:       OPR-P125-RA

Survey Date:           October, 1995

Features are reduced to Mean Lower Low Water using predicted tides.

Affected Nautical Charts:

<u>Chart</u>	<u>Edition/Date</u>	<u>Datum</u>
16705	15th Ed., Sept. 1/90 1:80,000	NAD83
16706	9th Ed., May 12/90 1:20,000	NAD83
16700	24th Ed., Jan 11/92 1:200,000	NAD83

<u>Item</u>	<u>Danger</u>	<u>Depth</u>	<u>Latitude(N)</u>	<u>Longitude (W)</u>
A.	ROCK	AWASH	60/46/40.4	148/41/36.5
B.	SOUNDING	4 3/4 FM	60/46/36.1	148/40/49.5
C.	SOUNDING	3 3/4 FM	60/46/36.3	148/40/41.8
D.	SOUNDING	<del>20 FT</del> <sup>^</sup> 3 1/4 FM	60/46/37.2	148/40/25.9

Questions concerning this report should be directed to the Pacific Hydrographic Branch at (206) 526-6835.



PORT OF WELLS

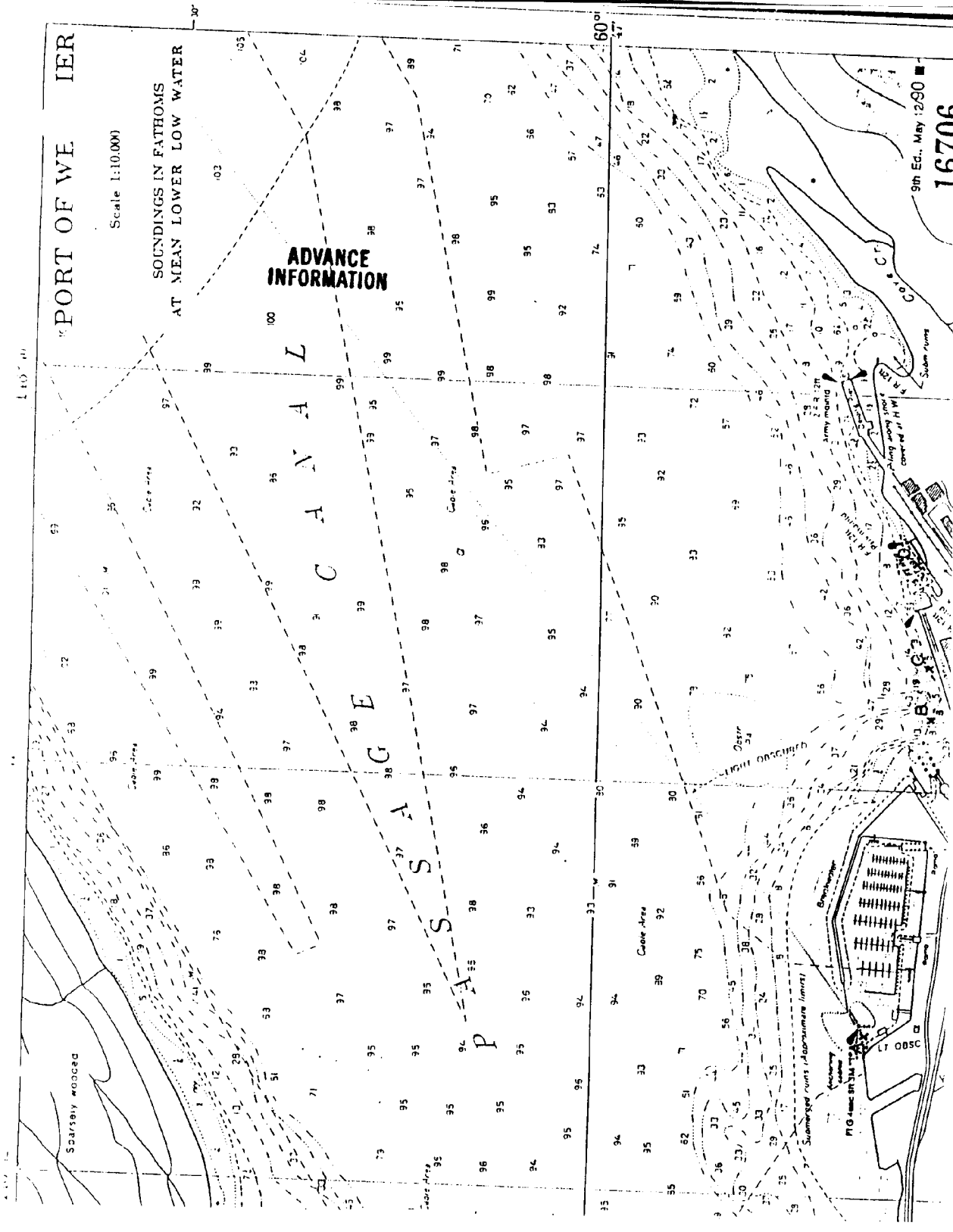
Scale 1:10,000

SOUNDINGS IN FATHOMS  
AT MEAN LOWER LOW WATER

ADVANCE  
INFORMATION

PASSAGE CANALS

9th Ed., May 1980  
16706



APPROVAL SHEET

for

H-10655

RA-5-1-95

Standard procedures were followed in accordance with the Hydrographic Manual, Fourth Edition; the Hydrographic Survey Guidelines; and the Field Procedures Manual in producing this survey. The data were examined daily during data acquisition and processing.

The field sheet and accompanying records have been examined by me, are considered complete and adequate for charting purposes, and are approved.



Dean R. Seidel  
Captain, NOAA  
Commanding Officer



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

ORIGINAL

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: April 18, 1996

HYDROGRAPHIC SECTION: Pacific

HYDROGRAPHIC PROJECT: OPR-P125-RA

HYDROGRAPHIC SHEET: H-10655

LOCALITY: Whittier and Vicinity, Prince William Sound, Alaska

TIME PERIOD: October 8 - 18, 1995

TIDE STATION USED: 945-4949 Whittier, Ak.  
Lat. 60° 46.5'N Lon. 148° 41.5'W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): -0.30 ft.  
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 11.2 ft.

TIDE STATION USED: 945-4721 Perry Island (South Bay), Ak.  
Lat. 60° 40.8'N Lon. 147° 55.5'W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): -1.42 ft.  
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 10.9 ft.

REMARKS: RECOMMENDED ZONING

Times and heights are direct on Whittier, Ak. (945-4949).

If additional data are needed beyond the time period available for Whittier, Ak. (945-4949), times are direct, and apply a X1.02 range ratio to heights using Perry Island, Ak. (945-4721).

Note: Times are tabulated in Greenwich Mean Time.

*William M. Gibson*  
CHIEF, DATUMS SECTION



GEOGRAPHIC NAMES

H-10655

Name on Survey	A 1606, 16705, 16700 B ON PREVIOUS SURVEY C ON U.S. QUADRANGLE D FROM LOCAL INFORMATION E ON LOCAL MAPS F P.O. GUIDE OR MAP G RAND McNALLY ATLAS H U.S. LIGHT LIST K									
	A	B	C	D	E	F	G	H	K	
ALASKA (title)	X		X							1
COVE CREEK	X		X							2
PASSAGE CANAL	X		X							3
PRINCE WILLIAM SOUND	X		X							4
(title)										5
WHITTIER	X		X							6
WHITTIER CREEK	X		X							7
										8
										9
										10
										11
										12
										13
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										24
										25

Approved

*Chris C. Long*  
Chief Geographer

APR 26 1996

**HYDROGRAPHIC SURVEY STATISTICS**

H-10655

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

RECORD DESCRIPTION		AMOUNT	RECORD DESCRIPTION		AMOUNT
SMOOTH SHEET		1	SMOOTH OVERLAYS: POS., ARC, EXCESS		NA
DESCRIPTIVE REPORT		1	FIELD SHEETS AND OTHER OVERLAYS		NA
DESCRIP-TION	DEPTH/POS RECORDS	HORIZ. CONT. RECORDS	SONAR-GRAMS	PRINTOUTS	ABSTRACTS/SOURCE DOCUMENTS
ACCORDION FILES	2				
ENVELOPES					
VOLUMES					
CAHIERS					
BOXES					

SHORELINE DATA	
SHORELINE MAPS (List):	DM-10184
PHOTOBATHYMETRIC MAPS (List):	None
NOTES TO THE HYDROGRAPHER (List):	None
SPECIAL REPORTS (List):	None
NAUTICAL CHARTS (List):	16706 9th Ed., 5/12/90, 1:10,000

OFFICE PROCESSING ACTIVITIES

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

PROCESSING ACTIVITY	AMOUNTS			
	VERIFICATION	EVALUATION	TOTALS	
POSITIONS ON SHEET				
POSITIONS REVISED				
SOUNDINGS REVISED				
CONTROL STATIONS REVISED				
	TIME-HOURS			
	VERIFICATION	EVALUATION	TOTALS	
PRE-PROCESSING EXAMINATION				
VERIFICATION OF CONTROL				
VERIFICATION OF POSITIONS				
VERIFICATION OF SOUNDINGS				
VERIFICATION OF JUNCTIONS				
APPLICATION OF PHOTOBATHYMETRY				
SHORELINE APPLICATION VERIFICATION				
COMPILATION OF SMOOTH SHEET	180		180	
COMPARISON WITH PRIOR SURVEYS AND CHARTS				
EVALUATION OF SIDE SCAN SONAR RECORDS				
EVALUATION OF WIRE DRAGS AND SWEEPS				
EVALUATION REPORT		10	10	
GEOGRAPHIC NAMES				
OTHER*				
*USE OTHER SIDE OF FORM FOR REMARKS	TOTALS	180	10	190

Pre-processing Examination by	Beginning Date 12/20/95	Ending Date 12/20/95
Verification of Field Data by E. Domingo, R. Mayor, J. Stringham	Time (Hours) 180	Ending Date 5/7/96
Verification Check by B.A. Olmstead	Time (Hours) 5	Ending Date 5/26/96
Evaluation and Analysis by G.E. Kay	Time (Hours) 10	Ending Date 5/30/96
Inspection by B.A. Olmstead	Time (Hours) 17	Ending Date 6/5/96

## **EVALUATION REPORT**

**H-10655**

### **A. PROJECT**

Project information is discussed in the hydrographer's report.

### **B. AREA SURVEYED**

Survey H-10655 is a basic survey that was conducted in Whittier and the surrounding waters of Passage Canal. Specifically, Whittier is situated on the south side of Passage Canal in the northwestern portion of Prince William Sound. Marine facilities include two deep-draft facilities, two railroad car facilities and a small boat harbor. The Alaska Railroad terminus in Whittier operates as a transfer point between water and rail shipping routes.

The bottom within the survey area consists mainly of gray mud. Depths range from zero curve out to 113 fathoms.

### **C. SURVEY VESSELS**

Survey vessel information is found in the hydrographer's report.

### **D. AUTOMATED DATA ACQUISITION AND PROCESSING**

Survey data were processed using the same Hydrographic Data Acquisition/Processing System (HDAPS) software used by the hydrographer, the Hydrographic Processing System (HPS) and AutoCad, Version 12.0.

At the time of the survey certification the format for transmission of digital data had not been formally approved. In the interim, digital data for this survey exists in the standard HPS format which is a database format using the .dbf extension. In addition, the sounding plot was created with .dbf (extension) and enhanced using the AutoCad system, are filed both in the AutoCad drawing format, .dwg (extension), and in the more universally recognized graphics transfer format, .dxf (extension). Copies of these files will be retained at PHB until data transfer protocols are developed and improved.

The drawing files necessarily contain information that is not part of the HPS data set such as geographic names text, line-type data, and minor symbolization. In addition, those soundings deleted from the drawing for clarity purposes, remain unrevised in the HPS digital files to preserve the integrity of the original hydrographic data set. Cartographic codes used to describe the digital data are those authorized by Hydrographic Survey Guideline No. 75.

The field sheet parameters have been revised to center the hydrographer on the office plot. The data is plotted using a Modified Transverse Mercator projection and are depicted on a single sheet.

#### **E. SONAR EQUIPMENT**

Side scan sonar was used on survey H-10655, and is discussed in the hydrographer's report.

#### **F. SOUNDING EQUIPMENT**

Sounding equipment is discussed in the hydrographer's report.

#### **G. CORRECTIONS TO SOUNDINGS**

The sounding data have been reduced to Mean Lower Low Water (MLLW). The reducers include corrections for actual tides, dynamic draft, and sound velocity. These reducers have been reviewed and are consistent with NOS specifications. Actual tide reductions are derived from the Whittier, Alaska, gage, (945-4949) and the Perry Island (South Bay), Alaska, gage, (945-4721).

#### **H. CONTROL STATIONS**

Control stations are discussed in the hydrographer's report and separates. A list of control stations used on survey H-10655 is attached to this report.

The positions of horizontal control stations used during hydrographic operations are published and field values based on NAD 83. The geographic positions of all survey data are based on NAD 83. The smooth sheet is annotated with an NAD 27 adjustment tick based on values determined with the NGS program NADCON.

Data based on NAD 27 may be referenced to this survey by applying the following corrections:

Latitude: -2.075 seconds (-64.212 meters)  
Longitude: 7.663 seconds (115.933 meters)

The year of establishment of the control stations originates with the above mentioned horizontal control report and the hydrographer's signal list.

#### **I. HYDROGRAPHIC POSITION CONTROL**

Differential GPS (DGPS) was used to control this survey. A horizontal dilution of precision (HDOP) not to exceed 3.75 was computed for survey operations. Several positions exceeds the limits in terms of horizontal dilution of precision (HDOP). These positions are isolated and occur randomly throughout the survey area. A review of the data, however, indicates that none of these fixes are used to position dangers to

navigation. The features or soundings located by these fixes are consistent with the surrounding information. These fixes are considered acceptable. Additional information concerning calibrations and system checks can be found in the hydrographer's report and in the separates related to Horizontal Position Control and Corrections to Position Data.

#### **J. SHORELINE**

The following registered shoreline map compiled on NAD 83 applies to this survey.

<u>Map Number</u>	<u>Photo Date</u>	<u>Scale</u>
DM-10184	July 1993	1:20,000

Shoreline from DM-10184 was supplied in a "Standard Digital Data Exchange Format". The digitized shoreline was merged with the survey file during office ACAD processing. Alongshore and offshore features shown on the shoreline manuscript were verified and or revised as warranted during survey operations. Mean high waterline changes have been shown in red ink on the smooth sheet.

#### **K. CROSSLINES**

Crosslines are discussed in the hydrographer's report.

#### **L. JUNCTIONS**

Survey H-10655 junctions with the following survey.

<u>Survey</u>	<u>Year</u>	<u>Scale</u>	<u>Area</u>
H-10653	1995	1:10,000	East

The junction with survey H-10653 is complete. There is good agreement between depth curves and soundings within the common areas.

#### **M. COMPARISON WITH PRIOR SURVEYS**

Survey H-10655 was compared with the following prior surveys.

<u>Survey</u>	<u>Year</u>	<u>Scale</u>
H-7161	(1948)	1:10,000
H-7161 Additional Work	(1951)	1:10,000
H-8310	(1956)	1:5,000

The prior surveys listed above cover the entire area of the present survey and comprise a large portion of the charted soundings data around Whittier and the surrounding areas. Comparison with depths in the deeper portions of Passage Canal reflect general differences of 1-2 fathoms with no consistent pattern of shoaling or an increase in depths. However, major difference exists inside the 30-fathom depth curve in the southwestern portion of Passage Canal along longitude 148/42/45W. Comparisons with depths



originating from survey H-7161 reveal the present survey is 10-30 fathoms deeper. As an example, the prior survey zero curve now falls in depths of 5-30 fathoms. Significant change is also evident along the northern and southern shorelines in Passage Canal.

Survey H-8310 covers only the area around the Whittier Small Boat Marine, Marginal Wharf, and Delong Pier and extends from near shore to approximately 90 fathoms offshore. Comparison with this prior survey conducted in 1956 reveals the area has experienced significant change. The largest differences are found west of longitude 148/40/42W and inside the 50-fathom depth curve. Here, present survey depths are 5-15 fathoms deeper than the prior survey. Present survey depths east of longitude 148/40/32W are generally deeper from 2-5 fathoms.

The largest shoreline changes are found near the Whittier Small Boat Marina and Marginal Wharf. The piers present in 1956 no longer exist and have been replaced by a large breakwater protecting the Whittier Small Boat Marina.

With the exception of the following features from survey H-8310, the present survey is adequate to supersede the prior surveys within the common area.

<u>Feature</u>	<u>Latitude North</u>	<u>Longitude West</u>
1. rock	60/46/45	148/39/26
2. rock	60/46/54	148/39/03.5

Changes along the southern shoreline and Whittier are largely attributed to the 1964 Good Friday Earthquake and subsequent extensive dredging that has occurred as the Port of Whittier has flourished. Other differences can be attributed to better bottom coverage and less accurate positioning and soundings methods available between 1948-1956.

H-10655 is adequate to supersede the prior surveys H-7161, H-7161 Additional Work and survey H-8310 within the common area.

#### N. ITEM INVESTIGATIONS

There were seven item investigations assigned to survey H-10655. These AWOIS items are numbered 52236, 52237, 52238, 52239, 52241 and 52244 and are adequately discussed in the descriptive report. Item number 52244 was adequately discussed in the descriptive report, however, the hydrographer recommends additional field work to better define the channel, (see section T). HSD review concludes that existing coverage in the vicinity of the basin east of the barge pier (AWOIS 52244) is adequate for this area. This is a privately maintained basin, not a project channel. Further work is not warranted. There is a charted "Obstn PA" at latitude 60/46/50N, longitude 148/40/54W. This charted feature is AWOIS item 51984 and was investigated and adequately disproven by the NOAA Ship RAINIER in 1992. Therefore, the chart compiler should delete this note, "Obstn PA" and blue tint from the chart. Delete "25 FT REF OCT 1971" and chart sndgs from this survey

AWOIS item 52240 was investigated using side scan sonar by running parallel lines to the item. However, the parallel lines were run in essentially in the same place relative to the

item, such that only one aspect of the item was ensounded. The single aspect investigation cannot be considered as sufficient for 200% coverage as a minimum of two independent aspects are required. Thus the item, having been covered by only one aspect (100% coverage) from an up slope orientation, where a steep gradient exists, cannot be considered disproven. During office processing numerous contacts were discovered in the areas where 200% coverage was maintained, however, no future investigation was made by the hydrographer. Hence, this feature "Submerged ruins (Approximate limits)" should remain on the chart, with soundings from this survey shown within the limits.

## O. COMPARISON WITH CHART

Survey H-10655 was compared with the following chart.

<u>Chart</u>	<u>Edition</u>	<u>Date</u>	<u>Scale</u>	<u>Datum</u>
16706	9th	May 12, 1990	1:10,000	NAD 83

### a. Hydrography

Charted data originates from prior surveys, shoreline source documents, and reconnaissance survey BP-65295 (1964). The prior surveys have been discussed in section M and require no further discussion. Comparison with BP-65295 (1964) reveals general differences of 1-3 fathoms with the present survey constantly deeper.

The following charted features were neither investigated or disproven during this survey and therefore, should remain as charted.

<u>Charted feature</u>	<u>Latitude North</u>	<u>Longitude West</u>
1. rock	60/47/26	148/42/04
2. subm piles (4)	60/46/37.5	148/40/51

With the exceptions noted above, survey H-10655 is adequate to supersede the charted data within the common area.

### b. Dangers to Navigation

The hydrographer reported four dangers to navigation. These dangers were reported to the local United States Coast Guard District, DMAHTC and N/CS34. A copy of this report is attached. No additional dangers to navigation were generated during office processing.

## P. ADEQUACY OF SURVEY

Hydrography contained on survey H-10655 is adequate to:

- a. delineate the bottom configuration, determine least depths, and draw the required depth curves;

b. reveal there are no significant discrepancies or anomalies requiring further investigation; and

c. show the survey was properly controlled and soundings are correctly plotted.

With the following exceptions, the hydrographic records and reports received for processing are adequate and conform to the requirements of the Hydrographic Manual, 4th Edition, revised through Change No. 3, the Hydrographic Survey Guidelines, and the Field Procedures Manual, April 1994 Edition.

1.) Procedural documentation as it pertains to the setup, operation, and processing of side scan sonar data does not conform to the required specifications or guidelines.

Examples are as follows:

a.) Raw records were not annotated to indicate what features were scanned or developed.

b.) Confidence checks were not recorded or annotated on the raw records.

c.) One day of side scan operation is useless due to the complete lack of any bottom tracking.

d.) No fix marks of reference annotations is apparent on the raw side scan trace. As such, positions cannot be computed or determined for features appearing on this record.

2. Visual searches alone are not sufficient to disprove charted features, especially when water visibility is less than the water depth. A total of four charted piles plot in 5 to 7 meters of water. These piles were visibly searched for, however, due to the limited water visibility of only 3 meters doubt still exists as to whether these features remain as submerged. These features should remain and charted as submerged. See section O of this report.

3. Standard side scan sonar procedures were not followed, see item N, in this report.

#### **Q. AIDS TO NAVIGATION**

There are five fixed aids to navigation located within the survey area and one landmark (TANK). These aids were adequately located during survey operations and serve their intended purpose and have been adequately discussed in the hydrographer's report, section Q, and the descriptive report inserts (attached).

#### **R. STATISTICS**

Statistics are itemized in the hydrographer's report.

**S. MISCELLANEOUS**

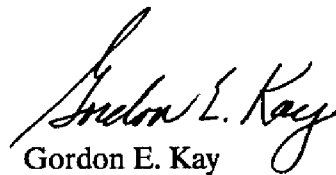
Miscellaneous information is discussed in the hydrographer's report. No additional miscellaneous items were noted during office processing.

**T. RECOMMENDATIONS**

This is a good hydrographic survey. As per the hydrographer's request (see descriptive report, AWOIS item 52244, page 16-17), additional work is recommended to further develop the channel located at latitude 60/46/37N, longitude 148/40/28W, (AWOIS 52244). Do not concur, see Section N.

**U. REFERRAL TO REPORTS**

Referral to reports is discussed in the hydrographer's report.

  
Gordon E. Kay  
Cartographer

APPROVAL SHEET  
H-10655

Initial Approvals:

The completed survey has been inspected with regard to survey coverage, delineation of the depth curves, development of critical depths, cartographic symbolization, comparison with prior surveys and verification or disproval of charted data. The survey records and digital data comply with NOS requirements except where noted in the Evaluation Report.

Bruce A. Olmstead Date: 6/6/96  
Bruce A. Olmstead  
Senior Cartographer, Cartographic Section  
Pacific 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.

Kathy Timmons Date: 6/12/96  
Kathy Timmons  
Commander, NOAA  
Chief, Pacific Hydrographic Branch

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Final Approval

Approved:

Andrew A. Armstrong III Date: Mar 29, 1997  
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-10655

**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
16706	1/9/97	<i>[Signature]</i>	Full Part Before After Marine Center Approval Signed Via <i>Full application of Drawing No. sndgs. &amp; features from smooth sheet.</i>
<del>16706</del>			
16700	9/26/96	A Chappell	Full Part Before After Marine Center Approval Signed Via Drawing No. <i>Applied thru SANDS - revised sndgs</i>
16705	1/24/97	<i>[Signature]</i>	Full Part Before After Marine Center Approval Signed Via <i>Full application of Drawing No. sndgs. &amp; features thru Chart 16706</i>
			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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