

H-10564

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey Navigable Area Survey (NAS)
Field No. PHP-10-5-94
Registry No. H-10564

LOCALITY

State Washington
General Locality Strait of Juan De Fuca
Sublocality Northwest of Dungeness Spit

1994

CHIEF OF PARTY

LT Guy T. Noll, NOAA
..... LT Richard A. Fletcher, NOAA

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DATE MAY 30 1996

H-10564

HYDROGRAPHIC TITLE SHEET

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

FIELD NO.

PHP-10-5-94

State Washington

General locality Strait of Juan De Fuca

Locality Northwest of Dungeness Spit

Scale 1:10,000 Date of survey Aug 24, 1994-March 29, 1995

Instructions dated May 17, 1994 Project No. OPR-N251-PHP

Vessel Jensen Launch 1101 (0651), MonArk Launch 1102 (0652)

Chief of party LT Guy T. Noll, NOAA and LT Richard A. Fletcher, NOAA

Surveyed by LT G.Noll, LT R.Fletcher, ST L.K.Simmons, ET E.O. Wernicke
ST R.W. Adams

Soundings taken by echo sounder, ~~side scan, DSF~~ Side Scan, DSF 6000N, Innerspace 448,
EG&G Model 260

Graphic record scaled by PHP Personnel

Graphic record checked by PHP Personnel

Evaluated by: L. Deodato Automated plot by HP Design Jet 650C

Verification by J. Stringham, D. Doles, G. Kay, L. Deodato

Soundings in Meters & Decimeters at MLLW

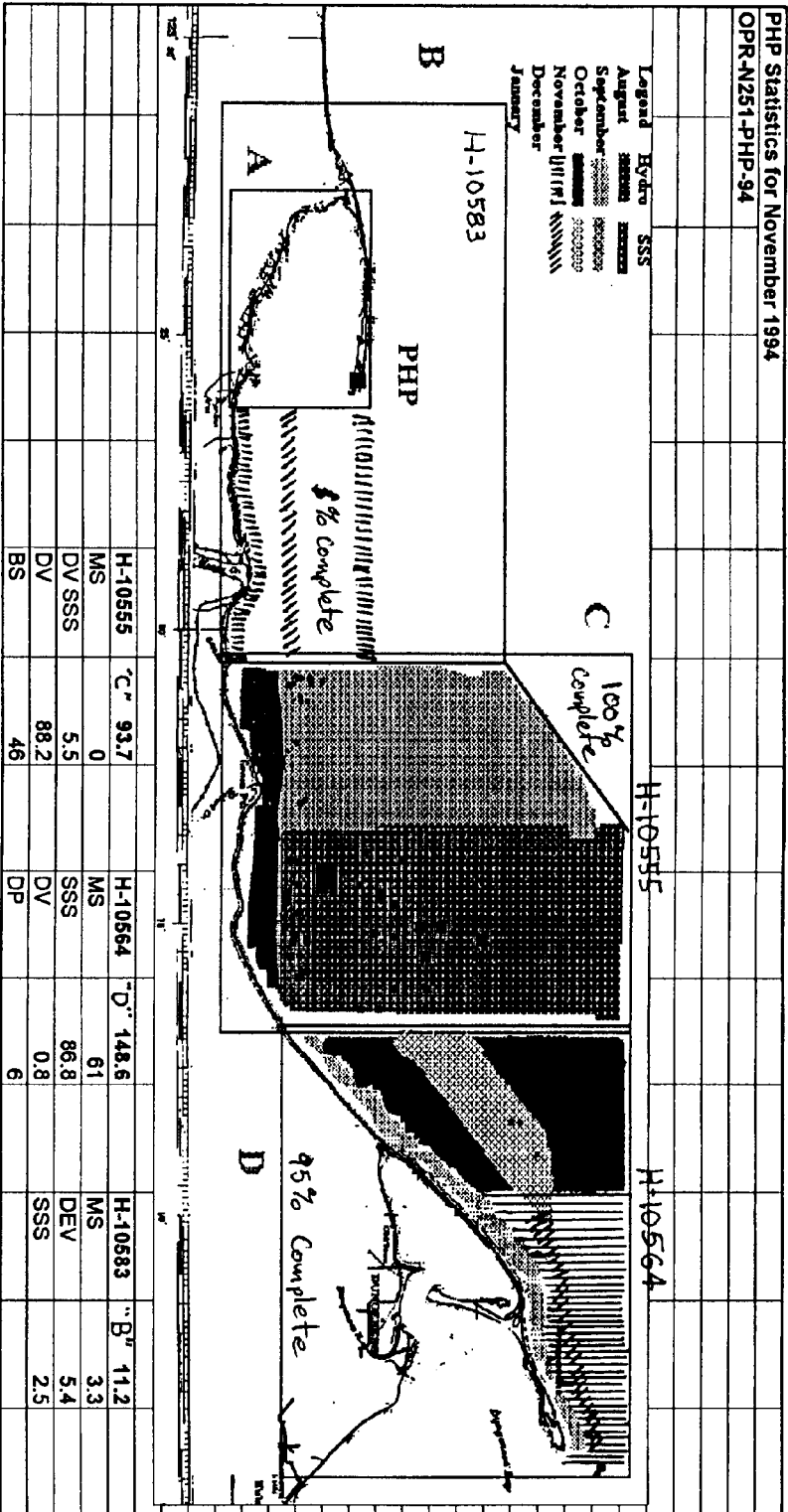
REMARKS: All times are UTC, revisions and marginal notes in black were
generated during office processing. All separates are filed with
the hydrographic data, as a result page numbering may be interrupted
or non-sequential.
All depths listed in this report are referenced to mean lower low
water unless otherwise noted.

MAY 30 1996 *[Signature]*

AWBIS Check
5/13/96 MBH

PHP Statistics for November 1994
OPR-N251-PHP-94

Legend Hydr SSS
 August ██████████
 September ██████████
 October ██████████
 November ██████████
 December ██████████
 January ██████████



	H-10555	H-10564	H-10583
MS	0	61	3.3
DVSSS	5.5	86.8	5.4
DV	88.2	0.8	2.5
BS	46	6	

Descriptive Report to Accompany Hydrographic Survey H-10564

Field Number PHP 10-5-94

Scale 1:10,000

1994

Pacific Hydrographic Party
Chief of Party: LT Guy T. Noll

A. PROJECT ✓

In accordance with project instructions OPR-N251-PHP dated May 17, 1994, a navigable area survey (NAS) of the approaches to Port Angeles, Washington was accomplished in the fall, from August 24 to December 6, 1994 (DN 236-340). Additional work was conducted on March 27-29, 1995 to further investigate ~~ANAS~~ ^{ANAS} Item # 52054.

Hydrography was accomplished on hydrographic survey H-10564 to obtain modern data for the maintenance of existing nautical charts and also in response to requests from the Puget Sound Pilot Association, the Port of Port Angeles, the City of Port Angeles, and local commercial enterprises. The project is in response to the primary concern of updating the charted hydrography and to resolve discrepancies between charted and existing cultural features, and to investigate wrecks and submerged features. The Port of Port Angeles is frequently used by large vessels for refueling, awaiting orders or tugs, and a harbor of refuge when weatherbound. Commercial activities include oil handling and bunkering, liquid bulk handling (caustic soda, chlorine, etc.), dry bulk handling (logs, lumber, wood chips, pulp, limestone, etc.), and general cargo handling that includes seafood. A ferry service is also available between Port Angeles and Victoria, B.C. The Port Angeles Boat Haven accommodates commercial fishing vessels and pleasure craft with approximately 500 berths.

This survey's sheet letter is "D" as specified by the project instructions and is divided into two separate field sheets labelled PHP-10-5E-94 and PHP-10-5W-94, HDAPS plotter sheet tables 16 and 15, respectively. These sheets are the second survey for project OPR-N251-PHP-94.

B. AREA SURVEYED ✓ *See Eval Report, Section B*

The area surveyed for H-10564 ^{generally} extends from latitude 48°11'47" N, longitude 123°13'37" ⁰W, south to latitude 48°07'32" N, and east to longitude 123°05'35" W. The field sheets were skewed 090 degrees with sheet dimensions of 58 cm by 77 cm (PHP-10-5W-94) and 52 cm by 28 cm (PHP-10-5E-94). Hydrographic limits for H-10564 are within those required by the Hydrographic Manual for smooth sheet production (Section 1.2.3, pp. 1-6). *Dungeness Bay was not surveyed as part of this specific sheet. This survey lies entirely on the offshore side of Dungeness Bay.*

C. SOUNDING VESSELS ✓

NOAA Launch 1101 (EDP Vessel No. 0651), a 29-foot Jensen, and NOAA Launch 1102 (VN 0652), a 21-foot SeaArk, were used for all hydrography and velocity casts. No changes to the standard vessel sounding configuration were necessary.

D. AUTOMATED DATA ACQUISITION AND PROCESSING ✓

The NOS Hydrographic Data Acquisition and Processing System (HDAPS), and its PC-compatible variant PC-DAS, were used for field survey data acquisition and processing. Program names and versions are listed in the appendix. The PHP-modified version of the Side Scan Sonar Contact Utility ("CONTACT") was used. This program contains a subprogram module which "sifts" contacts with the selected sounding data stored in the Zoom Edit "GRAPHDATA" file. A more detailed description can be found in the separates for OPR-N251-PHP-94, H-10555.

The following non-HDAPS NOAA-developed computer programs were used in field work for data supporting this survey:

<u>Program Name</u>	<u>Version</u>	<u>Date</u>	<u>Usage</u>
VELOCITY	2.21	1994	Sound Velocity Corrections
SEASOFT	4.52	1994	SeaCat Sound Velocity Probe
NADCON	1.01	1989	NAD83 to NAD27
INVERS3D	1.00	1991	Horizontal Control
MONITOR	2.00	1994	DGPS beacon check
GEOID93	1.00	1993	GPS ellipsoidal elevation

E. SONAR EQUIPMENT ✓

Side scan sonar (SSS) operations were conducted using an EG&G model 260 slant-range corrected SSS recorder (S/N 015602) and an EG&G 272-T-dual channel towfish (S/N 015598). The towfish was operated on the 100 Khz frequency except for specific item coverage when the 500 Khz frequency was used. The towfish was configured with a 10° beam depression to maximize coverage by keeping most of the sonar signal within similar sound velocity conditions.

The SSS towfish was towed with a 43 meter EG&G lightweight towcable. The towfish was deployed with an electric winch through a block mounted to a swing-arm davit on the starboard quarter of launch 1101 (VN 0651). The length of towcable deployed was determined by noting the measured markings on the towfish cable as these markings met the block. The SSS towfish was maintained at a height off the bottom of 8 to 20 percent of the range scale except for the edge of the shelf offshore of the spit and for areas close inshore, where the fish height above the bottom could not be kept within these limits. The 50-, 75-, 100-, and 150-meter range scales were used. SSS operations were conducted at or less than the maximum speed of 5 knots while operating with the 50-, 75-, or 100-meter range scales and 4 knots while operating with the 150-meter range scale.

The inshore limit of SSS collection was the 5-meter curve, safe navigation with a SSS towfish, or the limit of collecting acceptable SSS sonargrams. Degraded sonargrams were rejected and rerun, or the acceptable swath width was adjusted so that the new acceptable

range is stored in the digital data record; several days of SSS have degraded swath range due to non-linear speed of sound throughout the survey area (see sound velocity data). A swath plot depicting adjusted SSS bottom coverage indicates that 100% SSS coverage was completed. The recorder gain setting was set for the best return for the most prevalent bottom material. Contacts or identifiable features, such as a change in bottom texture, were seen in the outer portion of the usable SSS sonargram and were periodically marked as confidence checks.

Side scan sonargrams were manually scanned for significant contacts in accordance with section 7.3.2 of the project instructions and entered into ~~the~~ HDAPS contact tables.* In areas of numerous small contacts only the contacts with the largest computed heights were entered; significance was quickly judged with the PHP-developed "Contact-O-Meter", an easy to use scale proportioned for fish height above the bottom (a copy is included in the data files). Almost all contacts found were small (0.5 to 2 meter diameter) rocks. All objects which appeared to be man-made were reviewed by the Chief-of-Party for further investigation (see Danger to Navigation and Item Investigation reports).

F. SOUNDING EQUIPMENT ✓

The following echosounding equipment was used on this survey:

<u>Model</u>	<u>Vessel</u>	<u>Day Numbers</u>	<u>Frequency</u>
DSF-6000N	0651	237-335	24/100 Khz
DSF-6000N	0651	340	24/100 Khz
Innerspace 448	0652	286, 307, 333	208 Khz

Digitized soundings displayed on line were compared in the field with the analog trace to ensure reasonable agreement. No on-line calibration adjustments can be performed on the IN-448 or DSF-6000N. *There were three main areas where the fathometer was not functioning properly. In each case approximately 200 meters along the bottom was not sonified on the graphic record. Depths in these areas are over one hundred meters.* Soundings were recorded in meters with an assumed speed-of-sound through water of 1500 m/sec. The deepest depth of this survey is 147.9 meters at position number 625 (DN 291) based on predicted tides. *Depths on the smooth sheet range from 1.7 to 145 meters after application of approved tides.*

Metric leadlines were used for depth comparisons with the echosounder and for least depths on items N1 and N3. PHP fabricated the leadlines following Hydrographic Survey Guideline (HSG) 69. Each leadline is 1/4-inch steering tiller rope. Shrink tubing, secured with "Scotchkote", marks one-meter intervals from 1 to 30. With the line under six pounds of constant tension, markings were calibrated with a steel surveyor's tape. The throwing end is a standard six-pound lead weight shackled to a stainless steel thimble bent to the bitter end. Leadline calibration forms were included in Separate IV⁷ (Sounding Equipment Calibration and Corrections) of survey OPR-N264-PHP, 10-2-94, H-10534, Guemes Channel, Anacortes, Washington descriptive report.

G. CORRECTIONS TO SOUNDINGS ✓

Velocity of Sound

Corrections for the speed of sound through the water column were computed from data obtained with an Applied Microsystems Laboratories (AML) Velocity of Sound Profiler (S/N's 3004 & 3042) and with an SBE Seabird Electronics, Inc. sound velocity profiler (S/N 193864-579). The following casts were used for this survey:

<u>Cast</u>	<u>DN</u>	<u>Depth</u>	<u>Day Number</u>	<u>Table</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Device</u>
5	235	177.4	228-242	5	48°11'17"N	123°14'01"W	AML 3004
9	280	175.6	280-299	9	48°11'30"N	123°15'00"W	SeaCat 579
10	300	166.0	300-313	10	48°11'27"N	123°15'05"W	SeaCat 579
11	314	166.7	314-325	11	48°11'05"N	123°14'05"W	AML 3042
12	340	168.7	335-340	12	48°11'04"N	123°13'03"W	AML 3042

Separate IV* contains copies of all velocity cast data and HDAPS Velocity Corrector Tables.

The AML instruments (S/N 3004 and S/N 3042) were calibrated by Northwest Regional Calibration Center on April 15, 1994 (DN 105). A copy of this calibration report was included in Separate IV* of the Descriptive Report for H-10555.

Data collected with AML profiler S/N 3004 on DN 273 could not be used by VELOCITY. On DN 280 another cast was taken using an SBE Seabird Electronics, Inc. sound velocity profiler (S/N 193864-579) which was loaned to PHP by NOAA SHIP SURVEYOR. Comparisons between the various instruments' casts were made using VELOCITY, and all casts are consistent, with no significant differences. *Casts 5, 9, 10, and 11 plot outside the survey limits.*

Leadline Comparisons

Leadline comparisons were taken periodically to confirm proper digitization of the echosounder depths. These are annotated on the echograms.*

Static Draft

Static draft for VN 0652 was determined on April 12, 1994. The depth of the transducer face from a reference mark on the hull was measured, then with the launch in the water (fuel tanks half full and two crewmen aboard) the depth from this reference mark to the launch's waterline was measured. Combining the two measurements, a static draft of 0.4 meters was calculated.

A static draft of 0.5 meters was determined for VN 0651 on May 3, 1994, at the same location using a method similar to the one above. This was after the annual work, including a new engine and jet pump, was completed in Seattle.

Dynamic Draft ✓

Settlement and squat measurements for VN 0651 were conducted on May 4, 1994 and for VN 0652 on April 12, 1994. Field records were included in Separate IV of the Descriptive Report for OPR-N264, H-10534. HDAPS offset table 1 corresponds to VN 0651; offset table 2 corresponds to VN 0652.

Tide Correctors ✓

Predicted tide correctors from the existing primary station at Port Angeles, 944-4090, were applied to soundings in field processing. Final correctors will be applied from data collected by this station. In compliance with Section 5.9 of the Project Instructions, two zones were established for this survey based on data for reference station 944-4090, Port Angeles, WA. Reference lines ^{west of longitude 123° 10' 00" W} primarily within the limits of PHP-10-SW-94 had a +30 minute time correction and a 1.04 range ratio. Lines ^{east of longitude 123° 08' 00" W} within the limits of PHP-10-SW-94 had a +45 minute time correction and a 1.08 range ratio applied. No problems with predicted tide usage was apparent with this survey. ^{Concur}
Tide Notes dated April 6, 1995 and June 20, 1995 are attached.

H. CONTROL STATIONS ✓ *See Eval Rpt, section H.*

Horizontal Datum

The horizontal control datum for this project is North American Datum of 1983 (NAD 83). A copy of the HDAPS Control Station Table is included in Appendix III (List of Horizontal Control Stations). A separate Horizontal Control Report OPR-N251, Port Angeles, was submitted in September of 1994. *HDAPS control station table is attached to this report.*

I. HYDROGRAPHIC POSITION CONTROL ✓ *See Eval Rpt, section I.*

Reference Position Control

Differential GPS (DGPS) was used for position control throughout this survey. Race Rocks, Victoria, British Columbia, Canada, at a frequency of 309 Khz and Point Atkinson, Vancouver, B.C., at a frequency of 320 Khz served as reference stations with an assumed Estimated System Error of 4.0 meters. The results of the MONITOR program performed for these stations are in ^{Appendix III-A} ~~the records for OPR-N251-PHP-94, H-10555.~~

GPS Performance Checks

Per Field Procedure Manual (FPM), Section 3.4.4.1, DGPS performance checks were obtained daily during the survey using the site established at the USCG small boat pier (west side) at Air Station Ediz Hook, Port Angeles for OPR-N251-PHP-94.

Positioning Equipment

The unique numbers for all equipment serial numbers are annotated on the echograms.* No problems with the Ashtech GPS sensors were apparent in daily operation, however, PHP did experience several instances of loss of beacon differential correctors from the 309 Khz station near Victoria. When this occurred, the hydrographer-in-charge of the survey launch switched to Vancouver (320 Khz) with no ill effect on the overall data quality. These instances are annotated on the echograms,* and with HP-DAS (VN 0651), are reflected in the digital data. Data was analyzed during office processing and found to contain no significant problems.

J. SHORELINE *see Eval Report, Section J.*

Two 1:20,000 DM-Sheet mark-ups, with notes to the hydrographer, are forwarded with the survey records. Items inside of Dungeness Spit were outside of the project limits, and were not addressed by the hydrographer, although the mile markers charted and positioned on the DM plot were noted by the hydrographer on DN 325 while operating in the area (photos taken by the hydrographer did not come out). Mile markers have been shown on the smooth sheet 25 positioned from the DM.

Two piles were positioned by VN 0651 on DN 325 at the end of Dungeness Spit. These are not on the chart nor on the DM plot. These piles are in navigable water and the hydrographer conjectures that they are used by small boat traffic as aids to navigation marking the end of the spit. No other changes are noted in the area of this survey. Both piles being 5 meters (16 Ft) have been shown on the smooth sheet.

K. CROSSLINES ✓

There are approximately 14 nautical miles of crosslines, including buffer line along shore, SSS oblique to the mainscheme, and normal crosslines, which represents 11% of the hydrography on H-10564. Because SSS was oriented parallel to the shore, there are really two separate sets of lines which check each other; agreement is good. GPN

L. JUNCTIONS ✓ *See Eval Rpt., section L.*

The west side of this survey ^{joins} adjoins the east end of H-10555. The northern end of this survey junctions with H-6651, 1:10,000, 1940.

M. COMPARISON WITH PRIOR SURVEYS ✓ *See Eval Rpt., section M.*

This survey was compared to H-6650, Green Point to Dungeness, 1:10,000, 1940. NAD 27 corrected grid ticks have been plotted on the final excess plot to ease comparison. No significant change in the contours is evident; in particular, the 50-, 30- and 5-fathom contour are basically the same as found in 1940. A pile was positioned near the northern tip of Dungeness Spit (position number 1039, DN 325) which appears to be similar to a pile positioned on H-6650 near the tip of the spit, which was not as far northeast as it is now. H-6651, 1:10,000, 1940 also compared favorably. H-8927, 1:20,000, 1967 did not have much data (AWOIS 52054 investigation and a single track line). Survey H-8929 (1:10,000, 1967)

* Filed with the hydrographic data.

was compared to field sheet PHP-10-5E-94. Contours compared well, even at the edge of the shelf north of the end of Dungeness Spit. Significant kelp beds exist on this shelf, as annotated on DN 236, VN 0652 during the buffer line and on DN 325, VN 0651 during SSS operations. The hydrographer does not consider these beds to be hazardous to navigation. *The smooth sheet has been annotated with kelp symbols in the areas described above.*

N. ITEM INVESTIGATION REPORTS ✓

Individual disposition reports for the following items are included in ~~Separate VI~~ ^{this report}.
All copies are attached.

<u>Description</u>	<u>Report Number</u>	<u>Source</u>	<u>Danger to Navigation?</u>
Wreck PA	N1	AWOIS 52054	Yes
Crane wreckage	N2	H-10564	Yes
Boulder	N3	H-10564	Yes

O. COMPARISON WITH THE CHART ✓ *See Eval Rpt, section O.*

Dangers to Navigation

Three dangers to navigation were reported to the US Coast Guard, 13th district, DMAHTC, and NCG221. The two separate letters submitted are included ~~as Separate I~~ ^{in this report}. Detailed description of the items found are in Section N of this report.
All copies are attached.

Sounding comparisons

Comparison with Chart 18465, 29th Ed., March 6, 1993 showed most areas to be in agreement, except for the Dangers to Navigation noted above. See Section M for contour comparison.

P. ADEQUACY OF SURVEY

This survey is complete and adequate to supersede prior surveys within their common areas offshore of the 5-meter curve. *CONCUR*

Q. AIDS TO NAVIGATION

New Dungeness Sand Spit Lighted Bell Buoy "2", Light List number 16355, was found to be on station at Latitude 48°11'35.413"N, 123°05'35.207"W (position 1038). The observed characteristics match those found in the Light List. The position of New Dungeness Light (LL 16335) was not confirmed as shown on the digital map DM-10162 "Notes to the Hydrographer", 1:20,000, but appears to be charted correctly based on observations by the hydrographer on DN 325. *CONCUR* *New Dungeness Light is shown on the smooth sheet as positioned from DM-10162.*

ITEM INVESTIGATION REPORT ✓

ITEM NO.: N1
AWOIS 52054

CHART NO.: 18465 (1:80,000)
EDITION: 29th Edition
CHART DATE: March 6, 1993

SURVEY: H-10564

DESCRIPTION AND SOURCE OF ITEM:

Fishing vessel "Puget Girl", 34 feet in length, reported sunk via broadcast Local Notice to Mariners. CL 457/67 PMC to NOS.

SOURCE POSITION: latitude 48°09'41.33" N
longitude 123°12'46.64" W (NAD83)

SURVEY REQUIREMENTS: S2, ES, DI, SD, ##
(2000 m search radius)

METHOD OF INVESTIGATION:

Side Scan Sonar, followed by echosounder and dive for least depth.

RESULTS OF INVESTIGATION: A 10-meter man-made contact was discovered with SSS on DN 279. This contact was echosounded on DN 279 with 5-meter line spacing to find the least depth of 11.4 meters corrected for predicted tides at latitude 48°09'50.39"N, longitude 123°12'11.12"W. This position is approximately 782 meters from the AWOIS position. A dive was performed at this position on DN 292, but no wreck was found after an extensive search. The wreck was found again with SSS on DN 292, and a dive was made on DN 293, with a leadline least depth of 12.9 meters at latitude 48°09'55.97"N, longitude 123°12'11.63"W (approximately 176 meters due north of original position). The wreck was an upright 34-foot fishing vessel whose name/number were obscured by growth. A buoy was attached to the wreck's rail by diver for tracking any further movement. The buoy was positioned on DN 307 at latitude 48°09'59.8"N, longitude 123°12'12.5"W, though no echosounder of the wreck was obtained. SSS was obtained near the buoy on DN 319, and the fish snagged the buoy line just as the sonargram began displaying the wreck, but the fish safety line was tripped and no further contact was made with the wreck until DN 325, contact 1022.45P (echosounder here on this date of 15.9 meters at position 1024+2). This contact was echosounded again with 5 meter line spacing on DN 340, least depth of 16.5 at position 9514+2. On DN 325 the track made by the wreck is evident on the sonargram, which supports the moving wreck hypothesis.

COMPARISON WITH PRIOR SURVEYS: In comparison with prior surveys there was no indication of a wreck. An attempt was made in 1967 on survey H-8929 by the USC&GSS HODGSON to search for the wreck reported by the Broadcast NM, but it was not found.

COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS:

Chart 18465 shows a dangerous wreck position approximate. PHP produced two danger to navigation updates to this wreck; the original dive least depth and the updated position. The hydrographer recommends deleting the charted wreck symbol and retaining the position approximate dangerous wreck symbol from the original danger to navigation report with a least depth of 7 fathoms (12.9 meters) at latitude 48°09'55.97"N, longitude 123°12'11.63"W. In addition, the hydrographer recommends that this item be a separate 200% Side Scan field examination next year to resolve final position and depth information, since the winter weather will likely move the wreck the final 200 meters north into the 60 fathom Juan de Fuca channel. Chart 16 WK (PA) 21 position latitude 48/10/00.2' N, longitude 123/12/11.6 W based on danger letter dated Nov 23, 1994. Refer to Memorandum dated May 10, 1995 and revised AWOIS item discussion/recommendation following this page.

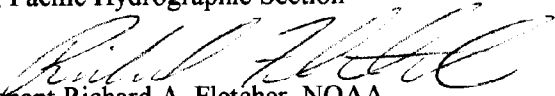
*Do not Concur
See revised
AWOIS recommendation
Concur*



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Coast and Geodetic Survey
Seattle, Washington 98115-0070

May 10, 1995

MEMORANDUM FOR: Commander Kathryn Timmons, NOAA
Chief, Pacific Hydrographic Section

FROM: 
Lieutenant Richard A. Fletcher, NOAA
Chief, Pacific Hydrographic Party

SUBJECT: AWOIS 52054 (Puget Girl Wreck)

PHP submits these additional data to accompany H-10564.

During project OPR-N251-PHP, Sheet D, H-10564. AWOIS 52054 was investigated with 100% SSS coverage. A wreck was discovered with SSS within the search radius and investigated by divers. PHP found the wreck fit the AWOIS description but was not positively identified. During survey operations PHP found the wreck had physically moved. The last known position was reported as a Danger to Navigation. Due to the possibility that winter storms may cause the wreck to move again, PHP recommended returning at a later date to complete 200% SSS coverage within the search radius and determine a final position and least depth for the wreck.

After survey data for H-10564 had been submitted PHP learned through local knowledge that the wreck found was not the Puget Girl (AWOIS 52054) but the fishing vessel "Easy Eight". The Easy Eight went down November 13 1992. The owner is Mr. John Sikes (206) 963-2836. Due to the length of the project PHP was able to return to the site and complete the investigation. The AWOIS investigation report and supporting data are attached.



AWOIS INVESTIGATION

AWOIS # 52054

DN: 86-87

CHART # 18465

VN: 1101 (EDP 0651)

ITEM DESCRIPTION: 34' Fishing Vessel "Puget Girl".

SOURCE: CL1260/67

GEOGRAPHIC POSITION

	LATITUDE	LONGITUDE	POSITION #
CHARTED:	48°09'41.33"N	123°12'46.64"W	-NA-
OBSERVED:	Not Found		
POSITIONED BY:	DGPS		

METHOD OF INVESTIGATION: 200% SSS; 100% SSS coverage was completed during initial survey operations on H-10564 and H-10555. PHP returned to the area on March 27, 1995 (DN 086) and began an additional 100% SSS coverage of AWOIS 52054 search radius. 200% SSS coverage was completed in depths less than 40 meters. Depths greater than 40 meters were surveyed with a dual frequency echosounder while running hydrographic line spacing of 100 meters. Local knowledge.

FINDINGS: The wreck Easy Eight, owned by Mr. John Sikes (206) 963-2836, went down November 13 1992. The previously investigated wreck was located again by SSS within 12 meters of its last known position (contact 1249.60S, DN 087). No further investigation of Easy Eight was attempted. Seven additional contacts were located within the search radius. Two of which were located with the second 100% SSS coverage and investigated by divers and found to be rocks (see attached least depth printouts). The additional contacts appear similar to the rocks investigated by divers. No indication of the fishing vessel "Puget Girl" was found.

CHARTING RECOMMENDATIONS

This additional data is sufficient to disprove AWOIS 52054. Delete wreck symbol charted at latitude 48°09'41.33"N longitude 123°12'46.64"W. Chart dangerous wreck cleared by divers at latitude 48°10'00.2"N longitude 123°12'11.6"W. See attached least depth printouts for charting recommendations for rocks found. *Chart 16 WK* *Concur*

COMPILATION USE ONLY

Chart

Applied

ITEM INVESTIGATION REPORT ✓

ITEM NO.: N2 *Obstruction*
Crane ~~Wreckage~~

CHART NO.: 18465 (1:80,000)
EDITION: 29th Edition
CHART DATE: March 6, 1993

SURVEY: H-10564

DESCRIPTION AND SOURCE OF ITEM:

100% Side Scan coverage during survey H-10564 discovered odd looking man-made item at the edge of the 10-fathom shelf northwest of Dungeness Spit on DN 298.

SOURCE POSITION: latitude 48°10'28.7" N
Contact 725.21P longitude 123°10'33.8" W (NAD83)

SURVEY REQUIREMENTS: 100% SSS, Dive, Echosounder

METHOD OF INVESTIGATION:

Side Scan Sonar, followed by echosounder and dive; echosounder is least depth.

RESULTS OF INVESTIGATION: Several passes at an odd-shaped SSS contact were made on DN 298 with VN 0651. A dive and additional echosounder investigation (drift search at target) was accomplished on DN 322 with VN 0651 (divers Fletcher and Wernicke). The divers reported a least depth on the top of the crane house of 65 feet using their depth gages, echosounder least depth at position 983+5 was 17.9 meters (9 3/4 fathoms) using predicted tides. *Obstruction* Wreckage is serving as a man-made reef. A danger to navigation report was generated and forwarded 23 November 1994 (DN 327) based on the proximity of the *Obstruction* wreckage to the VTS inbound lane.

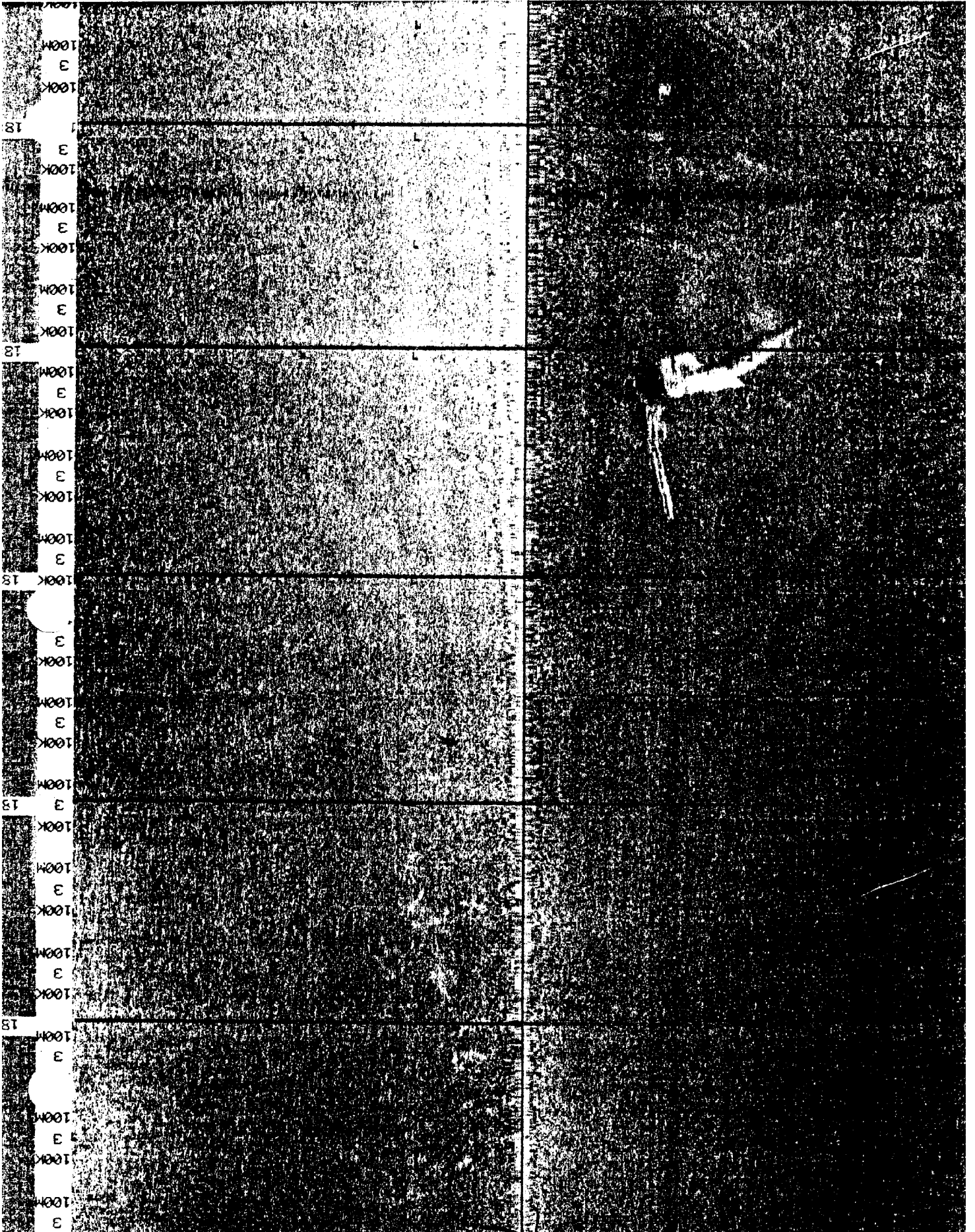
COMPARISON WITH PRIOR SURVEYS: There is no indication of wreckage in any data forwarded to PHP for this project.

COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS: *

The hydrographer recommends retaining the dangerous wreckage reported in the danger to navigation report with a least depth of 9-3/4 fathoms (17.9 meters) at latitude 48°10'28.7"N, longitude 123°10'33.5"W.

Do not Concur

* Delete the charted wreck symbol (cov 9 3/4 fms) and chart obstruction, submerged 17.9 meters (9 3/4 fms) at MLW at the position listed above. (9 3/4 Obstr) ✓



ITEM INVESTIGATION REPORT ✓

ITEM NO.: N3
Glacial Erratic

CHART NO.: 18465 (1:80,000)
EDITION: 29th Edition
CHART DATE: March 6, 1993

SURVEY: H-10564

DESCRIPTION AND SOURCE OF ITEM:

100% Side Scan coverage during survey H-10564 discovered large object at base of Dungeness Spit on DN 301.

SOURCE POSITION: latitude 48°08'28.6" N
Contact 790.39P longitude 123°12'51.1" W (NAD83)

SURVEY REQUIREMENTS: 100% SSS, Dive, Echosounder

METHOD OF INVESTIGATION:

Side Scan Sonar, followed by echosounder and dive; echosounder is least depth.

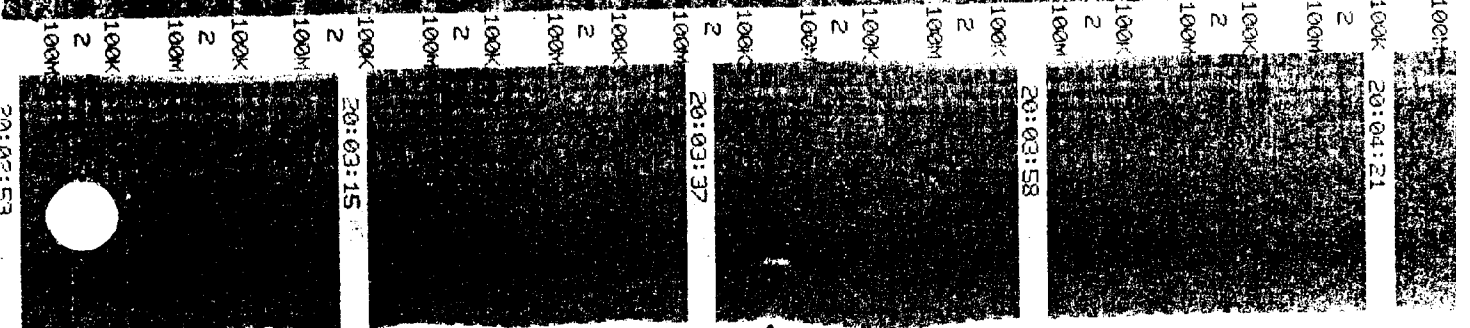
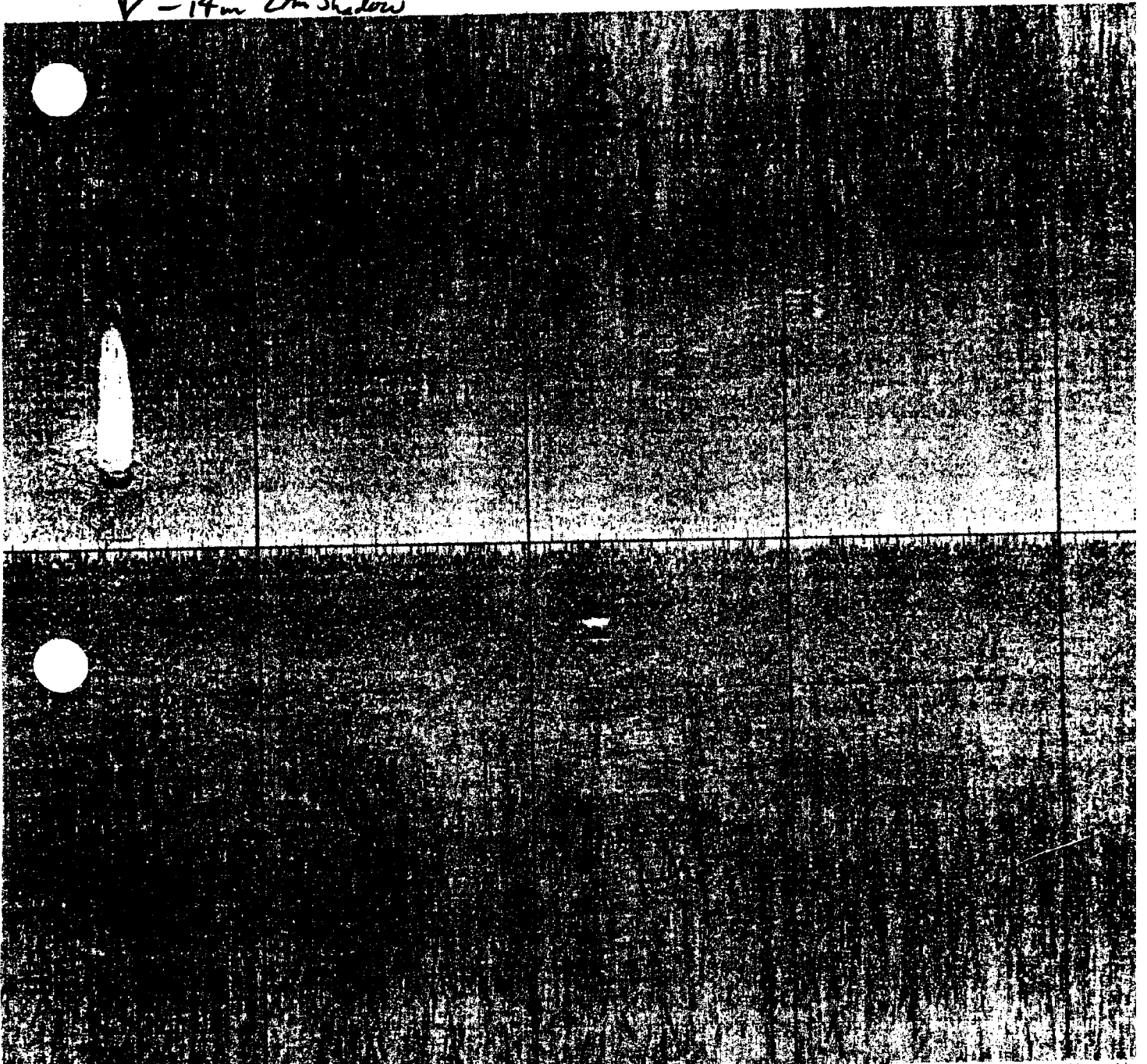
RESULTS OF INVESTIGATION: A large object was found on DN 301 with VN 0651. Additional SSS was performed on DN 312 with 50 meter range scale and 500 Khz frequency to determine if object was man-made; echosounder investigation on DN 319 found a 5-6 meter shoal at latitude 48°08'28.37" N, longitude 123°12'51.01" W (position 970+0, ^{actual} 6.1 meters at MLLW with predicted tides). A dive was accomplished on DN 322 with VN 0651 (divers Fletcher and Wernicke). The divers reported a lead line depth on the top of the boulder of ^{actual} 3.1 meters (3-1/4 fathoms) using predicted tides. ~~Wreckage is serving as a man-made reef. A danger to navigation report was generated and forwarded 23 November 1994 (DN 327) based on the proximity of the wreckage to the VTS inbound lane.~~

COMPARISON WITH PRIOR SURVEYS: ~~There is no indication of wreckage in any data forwarded to PHP for this project.~~

COMPARISON WITH THE CHART AND CHARTING RECOMMENDATIONS:

The hydrographer recommends ^{charting} retaining the submerged rock ~~reported in the danger to navigation report~~, with a least depth of 3-1/4 fathoms (^{actual} 6.1 meters) at latitude 48°10'28.4" N, longitude 123°10'51.1" W.

20:03p3 | 898.15P
✓ -14m 27m shadow



27m ↑ 200345
898.335

1000
1000
3
1000
1000
3
1000

18:39:14

1000
3
1000
1000
3
1000
1000
3
1000

18:38:52

1000
3
1000
1000
3
1000
1000
3
1000

18:38:29

1000
3
1000
1000
3
1000
1000
3
1000

18:38:08

1000

183850 790 39P



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Coast and Geodetic Survey

Seattle, Washington 98115-0070
Pacific Hydrographic Party
Post Office Box 760
Port Angeles, WA 98362-9998

October 21, 1994

Commander
Thirteenth Coast Guard District (oan)
Federal Building, Room 3410
915 Second Avenue
Seattle, WA 98174-1067

**ADVANCE
INFORMATION**


Dear Sir:

The NOAA Pacific Hydrographic Party discovered a danger to navigation while conducting hydrographic survey H-10564, Northwest of Dungeness Spit, Strait of Juan de Fuca. This danger to navigation, a wrecked 34-foot fishing vessel, lies upright in approximately 10 fathoms of water with a least depth of 7 fathoms reduced to Mean Lower Low Water with predicted tides. I recommend this wreck be included in the next Local Notice to Mariners to be plotted as a dangerous wreck with a Position Approximate "PA" at latitude 48/09/55.97 N, longitude 123/12/11.64 W. Although we used differential GPS to position the wreck, it is an approximate position because it has moved during the period of our survey. PHP will continue to position a small buoy we have attached to the wreck, and if the wreck moves by a significant amount at the scale of chart 18465 (1:80,000) while we are surveying in this area, I will notify your office. Positions are given in NAD 83 horizontal datum coordinates.

This danger to navigation ^{*} has been reported to DMAHTC via facsimile transmission.

* See letter dated Nov. 25, 1994 which updates position/depth of wreck (attached).

Sincerely,


Guy T. Noll
Lieutenant, NOAA
Chief, Pacific Hydrographic Party

Attachment#

cc: DMAHTC;
N/CG221
N/CG245





UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Coast and Geodetic Survey
Seattle, Washington 98115-0070
Pacific Hydrographic Party
Post Office Box 760
Port Angeles, WA 98362-9998

November 23, 1994

Commander
Thirteenth Coast Guard District (oan)
Federal Building, Room 3410
915 Second Avenue
Seattle, WA 98174-1067
Dear Sir:

**ADVANCE
INFORMATION**


The NOAA Pacific Hydrographic Party recently discovered two additional dangers to navigation while conducting hydrographic survey H-10564, Northwest of Dungeness Spit, Strait of Juan de Fuca. An uncharted submerged rock with a least depth of 3-1/4 fathoms should be charted at latitude 48°08'28.4"N, longitude 123°12'51.1"W. Pieces of a crane were found at latitude 48°10'28.7"N, longitude 123°10'33.5"W with a least depth of 9-3/4 fathoms, and should be charted as dangerous wreckage* due to its proximity to the shipping lanes and the nature of the wreckage. Least depths are reduced to Mean Lower Low Water using predicted tides, and positions are given in NAD 83 horizontal datum coordinates. Please include these features in the next Local Notice to Mariners.

I also wish to update the position of the wreck submitted as a Danger to Navigation on 21 October 1994. The wreck has moved north 130 meters from the previous position (latitude 48°09'56.0" N, longitude 123°12'11.6" W) to latitude 48°10'00.2"N, longitude 123°12'11.6"W. The current least depth is 8-1/2 fathoms.

Attached is a copy of chart 18465 (1:80,000, 29th edition, March 6, 1993) showing the features with the current depth information. This danger to navigation has been reported to DMAHTC via facsimile transmission. If you wish additional information regarding these items, please contact me at (206) 457-4206.

* Chart as 9 3/4 Obsth.

Sincerely,


Guy T. Noll
Lieutenant, NOAA
Chief

Attachment

cc:DMAHTC
N/CG221
N/CG245



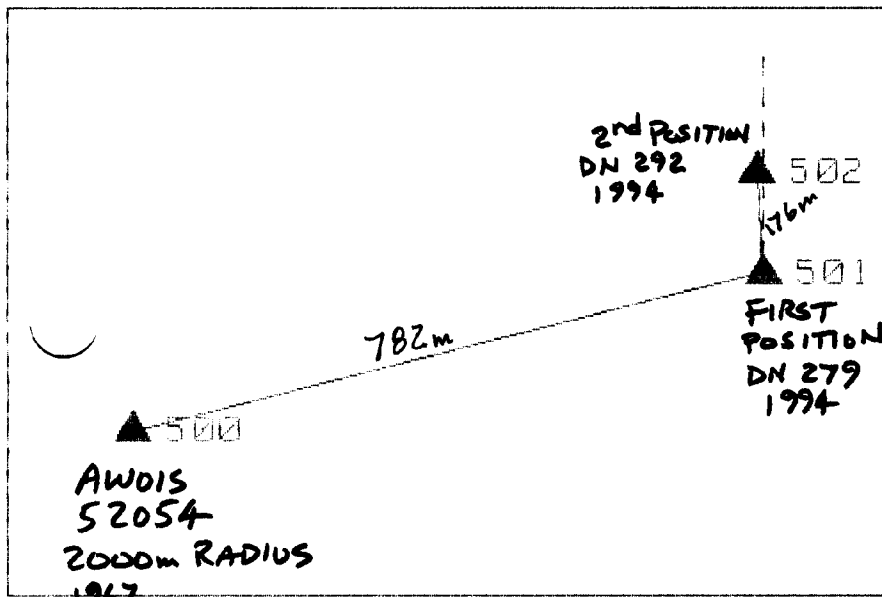
STATIONS AVAILABLE

001
007
10
101
102

Projects	She
ANACORTES	She
FRIDAYHBR	She
FORTANGEL	She
	She
	She
	She
	She
	She
	She

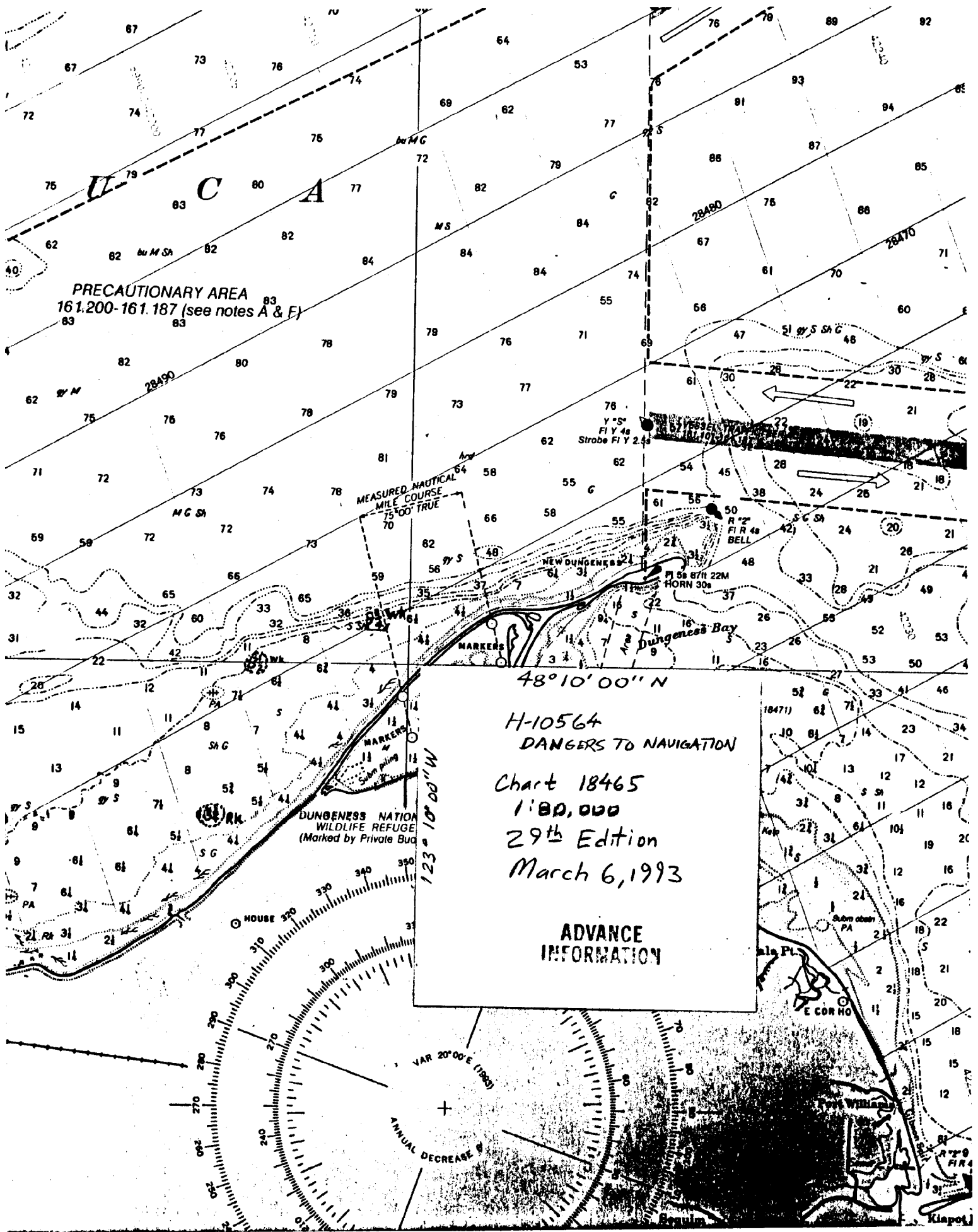
FROM Station	TO Station	Distance	Forward azimuth
501 048:09:50.200 123:12:11.200	502 048:09:41.330 123:12:46.640	781.901	249:29:33.505
	TO 502 048:09:55.900 123:12:11.600	176.250	357:18:43.795

Angle 500 to 502
197:49:10.289



ADVANCE INFORMATION

AWOIS 52054
"PUGET GIRL"
34 ft F/W



PRECAUTIONARY AREA
161.200-161.187 (see notes A & F)

MEASURED NAUTICAL
MILE COURSE
75° 00' TRUE

48° 10' 00" N
H-10564
DANGERS TO NAVIGATION
Chart 18465
1:80,000
29th Edition
March 6, 1993

ADVANCE
INFORMATION

DUNGENESS NATION
WILDLIFE REFUGE
(Marked by Private Buoy)

VAR 20° 00' E (1985)
ANNUAL DECREASE 0

CONTROL STATIONS as of 22 Nov 1994

No	Type	Latitude	Longitude	H	Cart	Freq	Vel	Code	MM/DD/YY	Station Name
001	G	049:19:49.402	123:15:52.444	22	130	0.0	0.0	A	09/15/94	PT ATKINSON, S.C. (VANC DGPS)
002	G	048:17:52.258	123:31:54.747	-6	130	0.0	0.0	J	09/15/94	RACE ROCKS, B.C. (VICT. DGPS)
100	G	048:08:23.134	123:24:50.121	-19	250	0.0	0.0		07/30/94	DGPS CNK PT. (USCG DOCK)
101	G	048:07:25.144	123:27:04.024	-17	130	0.0	0.0		07/30/94	944 4090 A TIDAL
102	G	048:08:23.414	123:24:10.221	-18	130	0.0	0.0		07/30/94	TUCKER 1872

APPROVAL SHEET

for

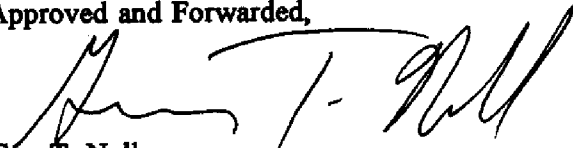
SURVEY H-10564

Standard field surveying and processing procedures were followed in producing this survey in accordance with the Hydrographic Manual, Fourth Edition; the Hydrographic Survey Guidelines; and the Field Procedures Manual, as updated for 1994. The data were reviewed daily during acquisition and processing.

The digital data and supporting records have been reviewed by me, are considered complete and adequate for charting purposes, and are approved. All records are forwarded for final review and processing to N/CG245, Pacific Hydrographic Section.

Approved and Forwarded,

DATE: December 7, 1994



Guy T. Noll
Lieutenant, NOAA
Chief, Pacific Hydrographic Party



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 6, 1995

HYDROGRAPHIC SECTION: Pacific

HYDROGRAPHIC PROJECT: OPR-N251

HYDROGRAPHIC SHEET: H-10564

LOCALITY: Washington, Strait of Juan de Fuca, Northwest of
Dungeness Spit

TIME PERIOD: August 24 - December 6, 1994

TIDE STATION USED: 944-4090 Port Angeles, Strait of Juan de Fuca,
Wa.
Lat. $48^{\circ} 7.5'N$ Lon. $123^{\circ} 26.4'W$

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 30.20 ft.

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 6.5 ft.

REMARKS: RECOMMENDED ZONING

1. West of $123^{\circ} 10.0'W$, apply a +30 minute time correction and a X1.04 range ratio to heights using Port Angeles, Wa. (944-4090).
2. East of $123^{\circ} 10.0'W$, apply a +45 minute time correction and a X1.08 range ratio to heights using Port Angeles, Wa. (944-4090).

Notes: 1. Times are tabulated in Greenwich Mean Time.
2. Data for Port Angeles, Wa. (944-4090) is temporarily stored in file #744-4090.


CHIEF, DATUMS SECTION





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: June 20, 1995

HYDROGRAPHIC SECTION: Pacific

HYDROGRAPHIC PROJECT: OPR-N251

HYDROGRAPHIC SHEET: H-10564 (additional)

LOCALITY: Washington, Strait of Juan de Fuca, Northwest of
Dungeness Spit

TIME PERIOD: March 27 - 29, 1995

TIDE STATION USED: 944-4090 Port Angeles, Strait of Juan de Fuca,
Wa.
Lat. 48° 7.5'N Lon. 123° 26.4'W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 30.20 ft.

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 6.5 ft.

REMARKS: RECOMMENDED ZONING

1. West of 123° 10.0'W, apply a +30 minute time correction and a X1.04 range ratio to heights using Port Angeles, Wa. (944-4090).
2. East of 123° 10.0'W, apply a +45 minute time correction and a X1.08 range ratio to heights using Port Angeles, Wa. (944-4090).

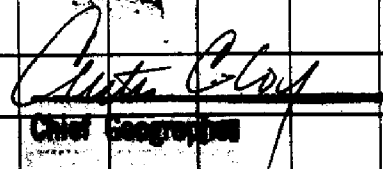
Notes: 1. Times are tabulated in Greenwich Mean Time.
2. Data for Port Angeles, Wa. (944-4090) is temporarily
stored in file #744-4090.


CHIEF, DATUMS SECTION



GEOGRAPHIC NAMES

Name on Survey	A ON CHART NO. 18465 B ON PREVIOUS SURVEY NO. IV-10160-62 C ON U.S. QUADRANGLE MAPS D FROM LOCAL INFORMATION E ON LOCAL MAPS F P.O. GUIDE OR MAP G GRAND McNALLY ATLAS H U.S. LIGHT LIST K									
	A	B	C	D	E	F	G	H	K	
DUNGENESS BAY	X	X	X							1
DUNGENESS SPIT	X	X	X							2
JUAN DE FUCA, STRAIT OF	X	X	X							3
MCDONALD CREEK	X	X	X							4
NEW DUNGENESS (locale)	X	X	X							5
WASHINGTON (title)	X	X	X							6
										7
										8
										9
										10
										11
										12
										13
										14
										15
										16
										17
										18
										19
										20
										21
										22
										23
										24
										25


 Chief Geographer

JUL 25 1995

HYDROGRAPHIC SURVEY STATISTICS

H-10564

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

RECORD DESCRIPTION		AMOUNT	RECORD DESCRIPTION		AMOUNT
SMOOTH SHEET		1	SMOOTH OVERLAYS: POS., ARC, EXCESS		
DESCRIPTIVE REPORT		1	FIELD SHEETS AND OTHER OVERLAYS		
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-10160, DM-10161, DM-10162
PHOTOBATHYMETRIC MAPS (List):	
NOTES TO THE HYDROGRAPHER (List):	
SPECIAL REPORTS (List):	
NAUTICAL CHARTS (List):	18465 30th Ed.

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			1608	
POSITIONS REVISED				
SOUNDINGS REVISED				
CONTROL STATIONS REVISED				
	TIME-HOURS			
	VERIFICATION	EVALUATION	TOTALS	
PRE-PROCESSING EXAMINATION				
VERIFICATION OF CONTROL				
VERIFICATION OF POSITIONS	4.5		4.5	
VERIFICATION OF SOUNDINGS	29.0		29.0	
VERIFICATION OF JUNCTIONS				
APPLICATION OF PHOTOBATHYMETRY				
SHORELINE APPLICATION/VERIFICATION				
COMPILATION OF SMOOTH SHEET	203.5		203.5	
COMPARISON WITH PRIOR SURVEYS AND CHARTS		7	7	
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	237.0	17	254

Pre-processing Examination by LT M. Larsen	Beginning Date 12/7/94	Ending Date 12/8/94
Verification of Field Data by J. Stringham, D. Doles, G. Kay, L. Deodato	Time (Hours) 237.0	Ending Date 7/28/95
Verification Check by B. Olmstead	Time (Hours) 3.0	Ending Date 2/6/96
Evaluation and Analysis by L. Deodato	Time (Hours) 17	Ending Date 1/26/96
Inspection by B.A. Olmstead	Time (Hours) 13	Ending Date 2/15/96

EVALUATION REPORT

H-10564

A. PROJECT

Project information is discussed in the hydrographer's report.

B. AREA SURVEYED

This survey was conducted in Washington, and is located inside the Strait of Juan de Fuca, northwest of Dungeness Spit. The surveyed area is bounded by latitude 48/11/40N to the north and latitude 48/07/32N to the south. The eastern limit is longitude 123/14/30W and the western limit is longitude 123/05/30W. The southern side of the Strait of Juan de Fuca is the only shoreline on this survey. Depths range from 1.7 meters to 145 meters.

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 PHS until data transfer protocols are developed and improved.

The drawing files necessarily contain information which 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 hydrography 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-10564. Refer to section E of the hydrographer's report concerning set-up, operation and processing of survey data.

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 an actual tide, dynamic draft, and sound velocity. These reducers have been reviewed and are consistent with NOS specifications. Actual tide reduction is derived from the Port Angeles, Washington, gage 944-4090.

H. CONTROL STATIONS

Control stations are discussed in the hydrographer's report and separates. A list of control stations used on survey H-10564 is attached to this report.

The positions of horizontal control stations used during hydrographic operations are 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: -0.665 seconds (-20.540 meters)
Longitude: 4.645 seconds (95.990 meters)

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. The quality of several positions exceeds 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, suggests 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 digitally compiled shoreline maps on NAD 83 apply to this survey.

<u>Map Number</u>	<u>Photo Date</u>	<u>Scale</u>
DM-10160	July 1991	1:20,000
DM-10161	July 1991	1:20,000
DM-10162	July 1991	1:20,000

Shoreline from DM-10160, DM-10161, and DM-10162 were merged with the survey file during ACAD processing. There are no changes to the digitized shoreline.

K. CROSSLINES

Crosslines are discussed in the hydrographer's report.

L. JUNCTIONS

Survey H-10564 junctions with the following survey.

<u>Survey</u>	<u>Year</u>	<u>Scale</u>	<u>Area</u>
H-10555	1994	1:10,000	west

The junction with survey H-10555 is complete. Soundings and depth curves are in good agreement within the common area.

M. COMPARISON WITH PRIOR SURVEYS

H-6650 (1940) 1:10,000
H-6651 (1940-41) 1:10,000
H-6653 (1940-43) 1:40,000
H-8927 (1967) 1:20,000
H-8929 (1967) 1:10,000

The prior surveys listed above cover the entire present survey area. Sounding agreement is good with present survey depths deeper by approximately one meter (1/2 fathom). Differences can be attributed to increase bottom coverage and less accurate positioning and sounding methods available in 1940. Comparison with standard depth curves and shoreline reveal little change.

H-10564 is adequate to supersede the prior surveys within the common area.

N. ITEM INVESTIGATIONS

AWOIS item 52054 (submerged wreck) was adequately investigated during survey operations. Additionally, items N2 (17.9 Obstr) and N3 (5.9 Rk) were discovered during survey operations and have been adequately investigated. Refer to the hydrographer's report for discussion and disposition of these items.

O. COMPARISON WITH CHART

Survey H-10564 was compared with the following chart.

<u>Chart</u>	<u>Edition</u>	<u>Date</u>	<u>Scale</u>	<u>Datum</u>
18465	30th	January 7, 1995	1:80,000	NAD83

a. **Hydrography**

Charted hydrography originates with the above mentioned prior surveys and requires no further discussion.

Survey H-10564 is adequate to supersede charted hydrography within the common area.

P. ADEQUACY OF SURVEY

Hydrography contained on survey H-10564 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.

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.

Q. AIDS TO NAVIGATION

There is one fixed and one floating aid to navigation. In addition, four measured mile markers exist within the survey area. Bell Buoy "2" was located and adequately serves its intended purpose. The New Dungeness Light and four markers were visually verified. These features have been digitized as part of the shoreline manuscript and graphically portrayed on the smooth sheet.

There are no features of landmark value located within the survey area.

R. STATISTICS

Statistics are itemized in the hydrographer's report.

S. MISCELLANEOUS

Miscellaneous information is discussed in the hydrographer's report.

T. RECOMMENDATIONS

This is a good hydrographic survey. Additional work was recommended by the hydrographer to resolve final position and depth information on AWOIS item 52054. Further investigation conducted on March 27-29, 1995 has adequately addressed this item. This wreck appears to be moving in a northerly direction and additional work is recommended on a low priority basis to monitor its position.

Refer to the hydrographer's report regarding project requirements for side scan sonar in Puget Sound.

U. REFERRAL TO REPORTS

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

Leonardo T. Deodato
Leonardo T. Deodato
Cartographer

APPROVAL SHEET
H-10564

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 digital data have been completed and all revisions and processing have been entered in the magnetic tape record for this survey. The survey records and digital data comply with NOS requirements except where noted in the Evaluation Report. Final control, position and sounding printouts have been included with the survey records.

Bruce A. Olmstead Date: 2/15/96
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: 2/27/96
Kathy Timmons
Commander, NOAA
Chief, Pacific Hydrographic Branch

Final Approval

Approved:

Andrew A. Armstrong III Date: 5/30/96
Andrew A. Armstrong III
Captain, NOAA
Chief, Hydrographic Surveys Division

