

9743

Diag. Cht. No. 6450-2

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT
(HYDROGRAPHIC)

Type of Survey ... Hydrographic
Field No. DA-10-2-78
Office No..... H-9743

LOCALITY

State Washington
General Locality Puget Sound
Locality Pt. Jefferson to
Edmonds

1978

CHIEF OF PARTY
CDR C.W. Hayes

LIBRARY & ARCHIVES

DATE Sept. 25, 1979

9743

1979
18446

HYDROGRAPHIC TITLE SHEET

H-9743

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.

DA-10-2-78

State Washington

General locality Puget Sound

Locality PT Jefferson to Edmonds

Scale 1:10,000 Date of survey 27 March-31 May, 1978

Instructions dated 8 Dec. 1977 Project No. OPR-N100 (412)-DA-78

Vessel Ship DAVIDSON (3130), DA-1(3131), and DA-2(3132)

Chief of party C. William Hayes, Cdr.

Surveyed by CDR C.W. Hayes, LCDR A.N. Bodnar, LCDR D.B. Macfarland, LCDR J.P. Calebaugh
LTJG C.B. Greenawalt, ENS L.F. Haas, ENS E. McDougal

Soundings taken by echo sounder, hand lead, pole Ross Fine line, Model 5000

Graphic record scaled by Ship's Personnel

Graphic record checked by Ship's Personnel

Positions Verified Todd M. Stansbury Automated plot by PMC Xynetics Plotter

~~Protracted by~~ Todd M. Stansbury

Soundings in fathoms feet at MLW MLLW

REMARKS: Survey Time Zone: GMT

Mean Survey Latitude: 47°47'00"

Survey is complete.

Standard

WST 6-6-80

A. PROJECT

Basic survey H-9743, DA-10-2-78, was accomplished in accordance with Project Instructions OPR-N100(412)-DA-78, Puget Sound, Washington, dated 8 December 1977, and Changes Nos. 1, 2 and 3 dated 30 January, 16 March and 14 March, respectively. ✓

B. AREA SURVEYED

The area surveyed includes that portion of Puget Sound, Washington, bounded by Edmonds to Richmond Beach on the east and Apple Cove Pt. Light to the old Naval Degaussing Station on the west. The northern limit of hydrography is latitude 47°49.0'N and the southern limit is latitude 47°45.1'N. Hydrography is bounded on the east and west by the Washington mainland and the Kitsap Peninsula respectively. The northern sounding boundary was extended on the west side in order to junction satisfactorily with H-8895 (1:10,000, 1966). ✓

Tide gages were installed at Meadow Pt. and Edmonds on 28 February 1978 and Pt. Jefferson on 1 March 1978. Hydrography began on 27 March and completed on 19 May 1978. ✓

C. SOUNDING VESSELS

Sounding platforms employed were as follows:

<u>Vessel</u>	<u>Vessel #</u>	<u>JD's</u>	<u>Position Numbers</u>
DA-1	3131	086-102	2001-3009
Ship DAVIDSON	3130	116-123	0001-0473
DA-2	3132	124-139	4001-4617

Data recording and preliminary computer plots from DA-1 were inked in red, from Ship DAVIDSON in black, and from DA-2 in blue. ✓

The survey launches DA-1 and DA-2 ran all near shore sounding lines, providing the Ship DAVIDSON with enough turning room to complete the center-sound, deepwater hydrography. Soundings in areas where the work of the different sounding platforms junctioned were generally in excellent agreement. The few existing discrepancies occurred on a steeply sloping bottom in an area where soundings from the Ship DAVIDSON junction with soundings from DA-1 close to latitude 47°47' 35"N and longitude 122°27'42"W. ✓

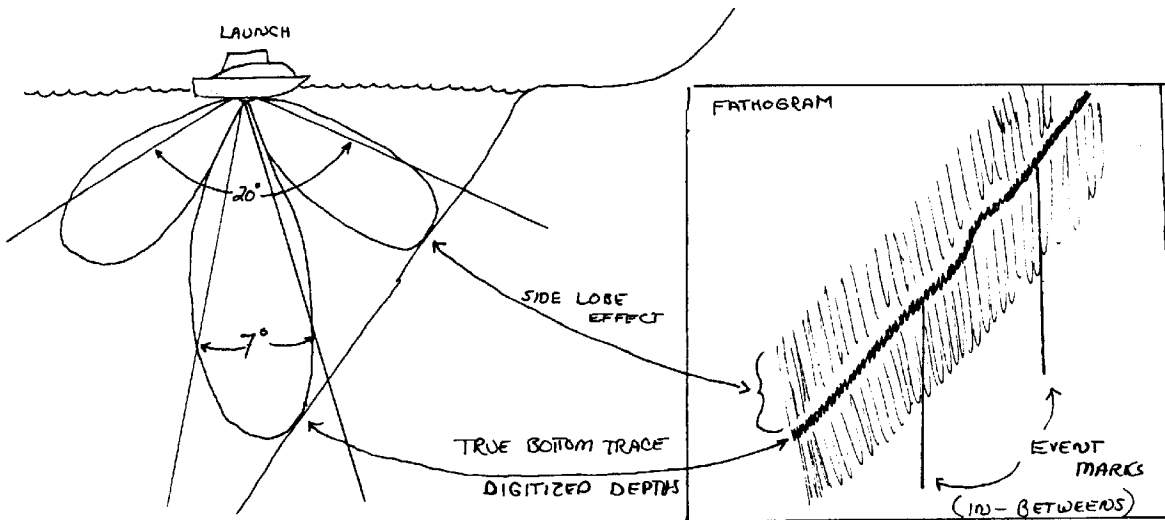
D. SOUNDING EQUIPMENT

Three Ross Fineline Model 5000 fathometers were used for this survey. The two launch fathometers were used mainly in the foot mode in depths ranging from 3 to 400 feet. The fathometer on DA-2 (3132) was used on 19 March in the fathom mode in depths between 58 and 130 fathoms. The ship DAVID-SON fathometer was employed solely in the fathom mode in depths ranging from 7 to 156 fathoms. The fathom mode was chosen over the foot mode for clarity of the bottom. The fathometer trace in feet proved to be unacceptable for hydrographic surveying. Serial numbers are as follows:

<u>Vessel #</u>	<u>Recorder S/N</u>	<u>Transceiver S/N</u>	<u>Digitizer S/N</u>
3130	1077	1081	1048
3131	1048	1036	1081
3132	1080	1077	1077

All fathogram initials were maintained at zero and phase checks were made once or twice daily. Fathograms were scanned and compared to digitized depths. Additions (peaks and deeps) and corrections were either edited into the Master Data Tape or inserted on a separate Corrector Tape.

An interesting phenomenon with regard to the fathogram was encountered while running inshore sounding lines with the launches. Using 30 March (JD 089) as an example, rather large discrepancies exist between the digitized depths and the Ross analogue depths for that day. Owing to the steepness of the slope being surveyed, side lobe effects significantly widened the fathometer trace, positioning the dark, true-bottom trace below a fuzzy, side-lobe induced trace. (See below).



In the above situation, digitized depths were accepted with concurrence by CPM3. The effect was found to be much more pronounced when running toward shore, the situation shown in the above diagram. A significantly clearer trace was obtained in all cases when running sounding lines away from shore and into deeper water. ✓

Soundings on the Final Field Sheets have been corrected for predicted tides and transducer depths. Bar checks for the determination of TRA corrections were made twice daily aboard the launches, weather permitting. The transducer draft of the DAVIDSON was determined by lead line comparisons to digitized depths and fore and aft draft readings. Correction for the DAVIDSON's settlement and squat during hydrographic operations was also applied to soundings on the PSO's and to those on the Final Field Sheets. For more detailed information concerning the above, see the Corrections to Echo Sounders Report appended. ✓

Predicted tides were computed from daily predicted tides for Seattle, Wa., corrected to Edmonds, Wa. (sta. #914, Tide Tables 1978), and were computed at 0.5 foot intervals for soundings in feet and at 0.2 fathom intervals for soundings in fathoms. Bubbler and ADR tide gages were installed by the DAVIDSON at Meadow Pt. and Edmonds. A single bubbler gage was installed at Pt. Jefferson. All gages remained in operation for the duration of the project. (See Field Tide Note.) ✓

Soundings on the Final Field Sheets have been corrected for velocity using correctors determined from Nansen casts taken on 31 March and 25 April 1978. An ending Nansen cast was taken 12 June 1978. (See Corrections to Echo Sounders Report.) ✓

E. HYDROGRAPHIC SHEETS

Field sheets for the survey were prepared using the HYDROPLOT system on the DAVIDSON. A PDP 8/e computer (S/N 10744) was linked with a Complot DP-3 plotter (S/N 5445-6) to produce the sheets. ✓

The survey is comprised of two 1:10,000 scale computer sheets, the north DA-10-2A-78 and the south DA-10-2B-78. In addition, a 1:1,500 scale inset (inset #1) is provided to eliminate sounding congestion in the area of a shoal covered by 18 feet of water just south of the Kingston Ferry Pier. Another inset (inset #2), at a scale of 1:2,500, reduces the sounding ✓

congestion in an area of extensive development south of Pt. Wells. A 1:2,000 scale blow-up is provided of the wire sweep performed on JD 137. Finally, due to the fact that no accurate shoreline was provided for this survey, and after discussion with CPM3, DR soundings taken on JD 102 are plotted on a 1"=100' scale engineer's drawing of the Edmonds Small Boat Harbor.

F. CONTROL STATIONS

Twenty-eight third order triangulation stations were recovered during this survey and ten more were established, five of them temporarily. MINIRANGER transponders were located at two of the recovered stations (COED, 1968; and GOOSE, 1941) and three of the newly established stations [HIGHLANDS, 1978; APPLE COVE PT. LT., 1978; and CAL 1, 1978 (temp)] for the control of hydrography. Computations are based on the 1927 North American Datum. (See Horizontal Control Note.) Refer to the Signal List for signal numbers and geographic positions.

G. POSITION CONTROL

The Motorola MINIRANGER III positioning system was used in the range-range mode for the control of soundings, with the exception of a small area of Range-Azimuth and DR hydrography run within the confines of the Edmonds Small Boat Harbor. The serial numbers of all electronics equipment employed are listed below.

<u>Vessel #</u>	<u>Range Console</u>	<u>R/T Unit</u>
3130	709	716
3131	721	707
3132	719	710

Transponders

Code 1	S/N 723
Code 2	S/N 771
Code 3	S/N 772
Code 4	S/N 773

A Wild T-2 theodolite (S/N 26423) was used in conjunction with MINIRANGER transponder code 2 for control of the R-A soundings.

Each MINIRANGER set-up was calibrated twice daily, bracketing hydrography, by one of the two methods described below:

- 1) Sextant fixes were taken in conjunction with MINIRANGER fixes and computed rates (derived from the sextant using RK-300, function 7) were compared to observed rates (direct range readings from MR console). ✓
- 2) The launch was positioned at station APPLE COVE PT. LT., 1978, and an observer recorded three sets of range readings from the MR console, each set one minute apart. These observed rates were then compared to the computed rates for the known position of the launch. ✓

The differences between the computed and the observed MR rates for either method were within 5 meters of the respective Baseline Calibration Correctors.

Baseline Correctors for the MR's were determined from calibrations conducted on 17 March and 26 May. An additional calibration on 21 April served as an interim systems check. As no significant difference in correctors was observed in April, only the pre- and post-survey calibration results were meant to obtain the Baseline Correctors applied to positions on the Final Field Sheet. (See Electronic Control Note.) ✓

Various "null" zones producing erratic MINIRANGER rates were encountered many times within the working area. These were dealt with by changing launches, switching transponders, and working at different stages of tide. (The zones intensified at lower tides.) Raising and lowering the MINIRANGER transponders on shore by 10 or more feet seemed to have no effect in "quieting" the signals. Only one zone, just east of the Kingston Breakwater, did not seem to respond to any of the above methods. As a result, many soundings in this area were necessarily "time and coursed". ✓

H. SHORELINE

No shoreline manuscripts were provided for this survey. Consequently, no Field Edit work was done. Shoreline on all Field Sheets was derived from a 1:10,000 scale blow-up of chart #18446. Offshore features were located by MINIRANGER fixes and were treated as Hydrographic Detached Positions. 9th Ed. Jan. 1978

Soundings taken along the face of the Edmonds Breakwater indicated that either the breakwater was improperly charted or that there were definite problems with position control. See Verifications Report

that day. The former explanation proved correct. When the width of the Breakwater was measured at low tide on 5 June, the structure was found to be, at the most, half of its charted width. (See Sounding Volume 1, fix #'s 7504-7508.) It is recommended that the Edmonds Breakwater be located more precisely when Field Edit Manuscripts become available. Until then, the breakwater as plotted on DA-10-2A-78 should be used for charting purposes.

*Shown in red on smooth sheet.
Revise Breakwater ON chart*

I. CROSSLINES

Crosslines comprised 19% of the total sounding lines and were in excellent agreement with main scheme hydrography.

J. JUNCTIONS

Scale 1:20000

This survey junctions with H-8895 (1966) to the north. *see verifiers report*
Representative soundings from H-8895 are shown in violet ~~and in report~~
on the Final Field Sheet DA-10-2A-78. All soundings less than 500 feet in depth within the junction area are in excellent agreement. The greatest discrepancy exists at latitude 47°48'32"N and longitude 122°24'14"W, where a junction survey sounding of 546 feet falls between a 492 foot sounding and a 511 foot sounding from the present survey. Seven other junction survey soundings, lying just west of the aforementioned sounding, differ as much as 28 feet from the closest sounding obtained by this survey. (See below.)

<u>Sounding from H-8895 (1966)</u>	<u>Latitude & Longitude</u>	<u>Closest sounding from H-9743 (1978)</u>	<u>Difference</u>
576'	47°48'33"N 122°24'26"W	562'	14'
594'	47°48'33"N 122°24'39"W	579'	15'
564'	47°48'44"N 122°24'43"W	580'	16'
570'	47°48'43"N 122°24'52"W	589'	19'
582'	47°48'42"N 122°25'07"W	598'	16'
570'	47°48'57"N 122°25'08"W	598'	28'
576'	47°48'41"N 122°25'16"W	588'	12'

Excellent crossline agreement during DA-10-2-78 prompts the recommendation that soundings from the present survey supercede those covering a common area from H-8895 for charting purposes.

K. COMPARISON WITH PRIOR SURVEYS AND PRESURVEY REVIEW

Representative soundings from H-5709 (1935) are inked on the Final Field Sheets in green and are in excellent agreement with H-9743 soundings.

Presurvey review items located within the bounds of this survey were those numbered 1, 4, 11, 12, 13, 14, 16, 17 and 18. All were investigated.

Item #1 was found by divers to be a dangerous sunken wreck, as charted. An initial wire drag investigation was conducted after which divers went down. The wire was found to have snagged a tall piling and a long metal structure as well as the wreck itself. Least depths were determined by diver-held lines, with the least depth of the wreck being located at the southeast end. The wreck lies at an angle of approximately 345°T and appears to be about 120 feet long. Local residents confirmed the wreck to be a mine-sweeper which apparently sank at the end of the Naval Degaussing Station Pier at some undetermined time in the past. *See Verifiers Report*

Positions of wreckage are as follows:

	<u>Fix #</u>	<u>Latitude</u>	<u>Longitude</u>
PSR Item #1	4596	47°45'25.147"N	122°28'05.301"W
Metal structure <i>Piling subm.</i>	4597	47°45'26.416"N	122°28'05. ⁹⁷⁶ 823 "W
<i>Piling subm</i>	4598	47°45'26.819"N	122°28'05. ⁸⁸ 740 "W

✓ PSR item #4, charted as a sunken rock, was visible from the launch. A D. P. was taken in conjunction with a lead line depth. The rock was found to exist approximately as charted at latitude 47°48'42.⁴⁷⁶~~476~~"N and longitude 122°23'14.³⁵⁰~~350~~"W (fix #4080). *.49"* *.25"* *See Verifiers Report*

PSR #11 charted visible wreck R.A. lat. 47°46.3', long. 122°28.5' from L-1541 (1974)

✓ There was no visible evidence of PSR item #11 and a wire sweep of the area revealed nothing. Records of sweep coverage may be found in the data for JD 137 (fix #'s 4565 - 4593) and on a separate 1:2,000 scale blow-up. Local residents questioned had no knowledge of any visible or sunken wreck in the area indicated by the charted symbol. It is therefore recommended that this wreck be removed from the chart. *See Verifiers Report*

Chart letter 1049 of 1969
charted Obstr. at lat. 47°47.07', long. 122°29.35' from U.S. P.S. report of 1966

PSR item #12 appears to be exactly as described, a concrete foundation projecting about 10 feet above mean low water. *See Verifiers Report*
The charted position is correct relative to the charted shoreline. *shown on smooth sheet as o (9) conc. obstr.*

PSR #13 is charted dangerous sunken wreck lat 47°48.87', long. 122°23.07' from L93(1969)

A call to the City of Edmonds Department of Recreation confirmed that both PSR items #13 and #14 are located within the confines of the underwater park there. Item #13 is the tugboat ALITAK, as described. Item #14 is an old drydock which sank more than forty years ago. As it is no longer visible even at low tides, it is recommended that its charted symbol be changed to that of a dangerous sunken wreck. *See Verifiers Report*

P.S.R. #14 charted visible wreck lat. 47°48.83', long. 122°23.05' from H-8895 (1966)

PSR item #16 is the clearly visible wreck of the COMMISSION, uncovered at all stages of tide. The wreck was found to be considerably south of its charted position. It was located by three point sextant fixes and a taped distance from CAL 2, 1978 (temp). A local resident with knowledge of the wreck said it was originally a steam tug, built in Mobile, Alabama in 1919. Later it was used as a fishing boat, and finally the housing was removed and the 125 foot ship was used as a barge for many years before grounding in its present position in the winter of 1962-63 (latitude 47°46'21"N; longitude 122°28'42"W). See Field Volume #1 for fix information and wreck description (fix #'s 7501-7503). *Dp. 7502 located wreck 360 meters SSE of charted wreck PA (PSR#16) from unknown source.* *See Verifiers Report*

A wire sweep was used to search for PSR item #17, charted from H-5708 as a dangerous sunken wreck. Divers found the wreck to be approximately in its charted position at latitude 47°48'22.416"N and longitude 122°28'51.801"W, but projecting little over two feet off the bottom at its highest point. Least depth was determined by diver held line. The low wreckage left is heavily covered with vegetation. ~~It is recommended that the charted symbol for PSR item #17 (fix #4562) be changed to that of a non-dangerous, sunken wreck.~~ *Dp. 4562 has wreck covered 1ft MLLW*

Charted sunken wreck from H-5709 (1934-35)

PSR item #18 (fix #4617) was visible in part from the launch. It is located in very shallow water at latitude 47°45'49.642"N and longitude 122°23'10.743"W and consists of low wreckage heavily covered with vegetation and nearly undistinguishable from the natural bottom. ~~Its charted designation is correct.~~ *See Verifiers Report*

Dp. 4617 has wreck covered 0.3 ft MLLW (1/2 awash MLLW) charted stranded wreck.

Dive investigations generally proceeded immediately after "hanging" the sweep wire, suspended at a controlled depth between launch and skiff, on the supposed wreckage of the PSR item being sought. After descending, divers released the sweep wire and proceeded to measure the least depth of the wreck. A buoyed line was attached to the wreckage closest to the water's surface and just enough line was let out

to float the buoy on the surface. A Detached Position was carefully taken by the launch, after which divers cut the buoy loose just above the knot securing it to the wreck. The length of line attached to the buoy was then measured by metal tape to determine least depth. ✓

In the case of PSR item #1, divers used compasses to determine the wreck's bearing. Length was roughly determined by counting flipper stroke "paces". ✓

L. COMPARISON TO THE CHART 18446(6445)

A number of charted features were examined during the course of this survey. Hydrographic Detached Positions were used to locate the charted features listed below:

<u>Object</u>	<u>Fix #'s</u>	<u>Latitude</u>	<u>Longitude</u>	
Edmonds small boat harbor piers	2991-2997 (R-A)	vicinity 47°48.5'	122°23.4'	✓
		<i>These piers in brown on smooth sheet from chart blow up.</i>		
Union Oil Fuel Pier	2938-2939	vicinity of 47°48.2'	122°23.8'	✓
		<i>This pier in brown on smooth sheet from chart</i>		
Pt. Wells Fuel Piers	2954-2960	vicinity 47°47.0'	122°23.6'	✓
		<i>shown in brown on smooth sheet except for N. end in red from dp. 2960</i>		
Charted snag from H-5709 (1934-35)	4521 at	47°47'29. ⁸ 7"N (47.50')	122°29'59. ⁸ 8"W (30.0')	see Q.C. report ✓
Kingston ferry pier & dolphins	2805-2812	vicinity of 47°47.6'	122°29.6'	✓
Charted rock from H-5709 (1934-35)	4563*(3) at	47°47'55.0"N (47.92')	122°29'27.0"W (29.45')	} see Q.C. report ✓
Charted rock from H-5709 (1934-35)	4564*(5) at	47°47'51.0"N (47.85')	122°29'34.1"W (29.57')	

In addition to the above items, the charted pile halfway between Edmonds and Pt. Wells was discovered to be a circle of 9 piles approximately 7 feet in diameter, of nine 12 to 15 foot pilings surrounding 6 other pilings broken off below the water level (fix #4446) at lat. 47°47.68', long. 122°23.53' ✓

from H-5709
The charted pier ruins near the southern entrance to Apple-tree Cove were investigated by divers and found to be non-existent with the exception of three visible piles located by hydrographic D. P.'s. *Delete pier ruins from chart and add piles!*

	<u>Fix #</u>	<u>Latitude</u>	<u>Longitude</u>	
	4523	47°47'00.58"N	122°29'10.25"W	
Piles	4524	47°47'00.3"N	122°29'10.25"W	
	4525	47°47'59.9"N	122°29'10.5"W	✓

It is recommended that piling symbols be substituted for the pier in ruins symbol now charted at the above locations. ✓

A short pile was located just offshore of a charted obstruction (PSR item #12) with fix #4526 at latitude 47°47'03.8"N *see p. 8*

and longitude 122°29'19.8"W. *D.P. 4526 is obstr. ~~see p. 8~~*
The pile located in proximity of obstr. is considered part of the feature as plotted.

Representative soundings from chart #18446 are inked on the Final Field Sheets in blue. The only discrepancies found worthy of note are listed below:

Depth from chart #18446	Latitude & Longitude	Closest depth from H-9743	Difference
890 <i>from H5709(1934-35)</i>	47°45'16"N (45.27') 122°25'51"W (25.85')	938	48'
450 <i>from unknown source</i>	47°47'03"N (47.05') 122°24'23"W (24.38')	575 (steep slope) 47° slope	125' 22'
576 <i>from unknown source</i>	47°46'57"N (46.95') 122°24'55"W (24.92')	588	12'

These snags superseded by present survey hydro.
M. ADEQUACY OF SURVEY

This survey is considered complete and adequate to supercede all areas of common soundings. ✓

N. AIDS TO NAVIGATION

Eight fixed aids to navigation were situated within the survey area. Of these, the four listed below were located by standard methods of third order triangulation during OPR-N100(412)-DA-78. (See Horizontal Control Note.) ✓ ~~see p. 8 report~~

- APPLE COVE PT. LT., 1978
- KINGSTON BREAKWATER LT., 1978
- EDMONDS SMALL BOAT HARBOR ENT. LT. 1, 1978 *moved from chart pos.*
- PT. WELLS FORWARD RANGE LT., 1978 *moved from end of pier*

The EDMONDS BREAKWATER LT., 1962, the EDMONDS SMALL BOAT HARBOR ENT. LT. 2, 1962, and the PT. WELLS AFTER RANGE LT., 1976 are listed under recovered triangulation stations in the Horizontal Control Note. A privately maintained light was noted at the north end of the Edmonds breakwater. It is uncharted and was not located during this survey. See Verifiers Report

There were no floating aids within the survey area. No evidence was found of a charted mooring buoy off the north *at lat. 47°48.69', long 122°23.37'* ✓

end of the Edmonds breakwater. It is recommended that this buoy symbol be deleted from the chart.

O. STATISTICS

Position numbers.....	1949
Nautical miles of soundings.....	166.3
Nautical miles of crosslines.....	26.0
Square nautical miles of soundings...	21
Nansen casts.....	3
Bottom samples.....	38
Tide stations.....	3

P. MISCELLANEOUS

Two five-meter sounding grids were run in the project area in order to more clearly define areas of significant shoaling. The first area, south of the Kingston Ferry Pier, contains a markedly jagged, east-west trending ridge. A bottom sample obtained near the top of the ridge consisted of the unconsolidated, sandy material common to the Kingston Small Boat Harbor area. Judging by the bottom sample and the location of the shoal, it would appear that the "ridge" is composed of dredge spoil from the marina.

The second 5-meter grid is a small one south of Pt. Wells. A tall peak was very much in evidence when running north-south lines, but did not show up when east-west lines were run over the same area. The depths of the soundings on the east-west lines increased at relatively the same rate within the developed area as they did to the north and south of the developed area. The peak discovered when running north-south is a jutting extension of the extremely shallow zone to the east.

Q. RECOMMENDATIONS

No additional recommendations are made.

R. DATA PROCESSING PROCEDURES

The data comprising this survey was collected using Ross 5000 digitizing fathometers and HYDROLOT systems program RK-111.

Computer programs used are listed below.

		<u>Version Date</u>
RK-111	Range-Range Real Time Hydroplot	1/30/76
RK-201	Grid, Signal and Lattice Plot	4/18/75

		<u>Version Date</u>
RK-211	Range-Range Plot	1/15/76
RK-212	Visual Station Table Load and Plot	4/01/75
RK-216	Range-Azimuth Position and Sounding Plot	2/14/75
RK-300	Utility Computations	1/15/76
RK-330	Reformat and Data Check	3/12/75
RK-407	Geodetic Inverse-Direct Computation	10/23/75
RK-409	Geodetic Utility Package	9/05/73
AM-500	Predicted Tides Generator	11/10/72
RK-530	Layer Correction to Velocity	6/25/74
AM-602	Elinore - Line Oriented Editor	5/21/75

S. REFERENCES TO REPORTS

Horizontal Control Note
Field Tide Note
Corrections to Echo Sounders Report
Coast Pilot Report

Submitted By,

Ellen McDougal

Ellen McDougal
ENS, NOAA

Approved and Forwarded by,

C. William Hayes

C. William Hayes
CDR, NOAA
Commanding Officer

OPR-N100-DA-78
DA 10-2-78(H-9743)
SIGNAL TAPE PRINTOUT

001	1	47	54	47962	122	24	43899	139	0000	000000	WIS, 1975
002	7	47	46	17837	122	23	31210	139	0000	000000	RICHMOND, 1921
003	1	47	54	47645	122	24	42504	139	0000	000000	OLE, 1975
004	7	47	42	41481	122	22	41932	139	0000	000000	PARK, 1934
005	3	47	48	54029	122	28	50136	139 ²⁵⁰	0000	000000	APPLE COVE POINT LIGHT, 1978
006	7	47	48	53993	122	28	52902	139	0000	000000	APPLE, 1921
007	3	47	45	21572	122	28	12557	139 ²⁵⁰	0000	000000	GOOSE, 1941
008	3	47	45	03352	122	28	17163	139	0000	000000	GULL, 1941
009	3	47	44	54503	122	28	19853	139	0000	000000	JEFFERSON, 1921
010	1	47	44	49972	122	32	30150	139	0000	000000	SQU, 1934
011	1	47	44	37293	122	30	47705	139	0000	000000	INDI, 1934
012	3	47	44	28628	122	32	56687	139	0000	000000	AIB, 1934
013	3	47	43	49852	122	32	58166	139	0000	000000	GREEN, 1916
014	3	47	43	27341	122	33	17408	139	0000	000000	AGATE PASS LIGHT, 1934
015	5	47	43	09225	122	32	37930	139	0000	000000	ED 2, 1934
016	6	47	42	31273	122	30	36315	139	0000	000000	POINT MONROE LIGHT, 1965
017	1	47	48	25700	122	23	38782	139	0000	000000	EDMONDS BREAKWATER LIGHT, 1962
018	1	47	46	05558	122	21	05566	139	0000	000000	SEATTLE RADIO STATION KDGJ MAST, 1961
019	4	47	41	30971	122	24	10297	139	0000	000000	SEATTLE GOLDEN GARDENS PARK FLAGPOLE, 1973
020	2	47	42	44477	122	22	42347	250	0000	330645	CARAY, 1978
021	4	47	39	45697	122	25	52490	139	0000	000000	SEWRAY, 1978

*Not used as
arc station*

022	5	47	39	45398	122	25	52408	254	0000	330645
WEST POINT RAYDIST TOWER										
023	3	47	45	59018	122	28	16536	243	0000	000000
CAL 1										
024	3	47	46	51422	122	28	54907	243	0000	000000
CAL 3										
025	1	47	48	24795	122	23	39236	139 ²⁵⁰	0004	000000
COED, 1968										
026	1	47	46	17745	122	23	31194	254	0000	330645
RICHMOND RAYDIST TOWER										
027	1	47	48	34178	122	23	23442	139	0000	000000
EDMONDS SMALL BOAT HARBOR ENTRANCE LIGHT 1, 1978										
028	6	47	48	32858	122	23	26465	139	0000	000000
EDMONDS SMALL BOAT HARBOR ENTRANCE LIGHT 2, 1962										
030	1	47	45	17506	122	27	23896	243	0000	000000
BS ³ TARGET #30										
031	1	47	45	17505	122	27	27305	243	0000	000000
BS ³ TARGET #31										
032	1	47	45	15012	122	27	26967	243	0000	000000
BS ³ TARGET #32										
033	1	47	45	15499	122	27	23463	243	0000	000000
BS ³ TARGET #33										
034	0	47	47	59988	122	29	30532	139	0000	000000
STAFF, 1951										
035	6	47	47	37489	122	29	50602	139 ²⁵⁰	0000	000000
KINGSTON BREAKWATER LIGHT, 1978										
036	1	47	44	37770	122	29	12154	139	0000	000000
THOMAS, 1921										
037	7	47	39	43949	122	26	02974	139	0000	000000
WEST POINT 2, 1956										
038	6	47	40	43071	122	24	40665	139	0000	000000
KURV, 1978										
039	4	47	44	57095	122	22	51944	139 ²⁵⁰	0000	000000
HIGHLANDS, 1978										
040	3	47	46	15249	122	28	40125	243	0000	000000
CAL 2										
041	4	47	39	43724	122	26	04068	139	0000	000000
WEST POINT LIGHTHOUSE, 1921										
042	4	47	47	01348	122	23	35998	139	0000	000000
POINT WELLS FORWARD RANGE LIGHT, 1978										
043	6	47	46	52583	122	23	28197	139	0000	000000
POINT WELLS REAR RANGE LIGHT, 1978										

FIELD GEOPHYSIC POSITIONS

LOCALITY PUGET SOUND NORTH AMERICAN 1927 DATUM third ORDER TRIANGULATION, STATE Washington

STATION	LATITUDE AND LONGITUDE	AZIMUTH	BACK AZIMUTH	TO STATION	DISTANCE	
					- METERS	
APPLE COVE PT LT 1978 d.	047 48 54.029 ✓ 122 28 50.136 ✓	277 58 44.1 ✓ 306 02 31.8 ✓	097 58 44.1 ✓ 126 02 31.8 ✓	COED 1968 RICHMOND 1921	6531.676 ✓ 8204.969 ✓	
KINGSTON BKWTR LT 1978 d.	047 47 37.489 ✓ 122 29 50.602 ✓	287 15 46.07 ✓	107 20 27.05 ✓	RICHMOND 1921	8272.009* ✓	
HIGHLANDS 1978 d.m.	047 44 57.095 ✓ 122 22 51.944 ✓	Located by resection				
CAL 1 (temp) n.d.	047 45 59.018 ✓ 122 28 16.536 ✓	264 22 59.74 ✓	084 26 31.01 ✓	RICHMOND 1921	5969.505* ✓	
CAL 2 (temp) n.d.	047 46 15.249 ✓ 122 28 40.125 ✓	located by intersection				
CAL 3 (temp) n.d.	047 46 51.422 ✓ 122 28 54.907 ✓	246 16 08.93 ✓	066 20 02.75 ✓	COED 1968	7174.724* ✓	
RICHMOND RAYDIST TOWER (temp) n.d.	047 46 17.745 ✓ 122 23 31.194 ✓	173 12 47.96 ✓	353 12 47.95 ✓	RICHMOND 1921	2.850 ✓ (taped)	
EDMONDS SMALL BOAT HBR ENTRANCE LT 1 1978 d.	047 48 34.178 ✓ 122 23 23.443 ✓	048 35 40.61 ✓	228 35 28.91 ✓	COED 1968	438.129* ✓	
PT. WELLS FWD RANGE LT 1978 d.	047 47 01.348 ✓ 122 23 35.998 ✓	117 59 17.8 ✓ 058 04 24.3 ✓	297 59 17.81 ✓ 238 04 24.28 ✓	APPLE COVE PT LT 1978 GULL 1941	7405.948* ✓ 6895.763* ✓	

No check on this position. Abbreviations used: d.-described; m.-marked; n.-not; r.-recovered; l.-lost; p.-probably.
 (Examples: n.d.-not described; p. l.-probably lost.)

OPR-N100-DA-78
DA 10-2-78(H-9743)
VELOCITY TAPE PRINTOUT

TABLE 1:

000100	0	0000	0001	000	313100	009743
000295	0	0002				
000490	0	0004				
000670	0	0006				
000860	0	0008				
001045	0	0010				
001225	0	0012				
001420	0	0014				
001700	0	0016				
002115	0	0020				
002680	0	0025				
003010	0	0030				
003435	0	0035				
003855	0	0040				
004315	0	0045				
004700	0	0050				
005000	0	0055				
999999	0	0055				

OPR-N100-DA-78
DA 10-2-78(H-9743)
VELOCITY TAPE PRINTOUT

TABLE 2:

000330	0	0000	0002	000	313000	009743
000750	0	0005				
001140	0	0010				
001540	0	0015				
001960	0	0020				
002390	0	0025				
002820	0	0030				
003220	0	0035				
003620	0	0040				
004030	0	0045				
004400	0	0050				
004790	0	0055				
005180	0	0060				
005530	0	0065				
005920	0	0070				
006280	0	0075				
006640	0	0080				
007000	0	0085				
007360	0	0090				
007710	0	0095				
008050	0	0100				
008410	0	0105				
008770	0	0110				
009140	0	0115				
009500	0	0120				
010000	0	0125				
999999	0	0125				

OPR-N100-DA-78
DA 10-2-78(H-9743)
VELOCITY TAPE PRINTOUT

TABLE 3:

000085	0	0000	0003	000	313200	009743
000245	0	0002				
000420	0	0004				
000590	0	0006				
000755	0	0008				
000920	0	0010				
001080	0	0012				
001245	0	0014				
001410	0	0016				
001580	0	0018				
001875	0	0020				
002285	0	0025				
002695	0	0030				
003100	0	0035				
003505	0	0040				
003900	0	0045				
004310	0	0050				
004675	0	0055				
005000	0	0060				
999999	0	0060				

TRANSDUCER CORRECTION ABSTRACT

TR4 (FC/PI) TAPE: VESSEL 3130 SURVEY H-9743 PATHOMETER S/N 1077 YR1978 PAGE 1 OF 2

FROM TIME	TR4 CORR.	DAY	VEL. TBL.	TR4 corr. INITIAL	is the algebraic sum of these columns	SCALE-PHASE	DRAFT	F. ARC	S./SQUAT	COMMENTS
183841	1.9fm	116	2	0.0	0.0	1.9fm	0.0	0.0fm		
184809	2.1fm	118	2	0.0	0.0	1.9fm	0.0	0.2fm		
194322	1.9fm	118	2	0.0	0.0	1.9fm	0.0	0.0fm		
194655	2.1fm	118	2	0.0	0.0	1.9fm	0.0	0.2fm		
195730	1.9fm	118	2	0.0	0.0	1.9fm	0.0	0.0fm		
200123	2.1fm	118	2	0.0	0.0	1.9fm	0.0	0.2fm		
195346	2.0fm	121	2	0.0	0.0	1.9fm	0.0	0.1fm		
211903	1.9fm	121	2	0.0	0.0	1.9fm	0.0	0.0fm		
212353	2.0fm	121	2	0.0	0.0	1.9fm	0.0	0.1fm		
188822	2.0fm	122	2	0.0	0.0	1.9fm	0.0	0.1fm		
173702	1.9fm	122	2	0.0	0.0	1.9fm	0.0	0.0fm		
175100	2.0fm	122	2	0.0	0.0	1.9fm	0.0	0.1fm		
182200	1.9fm	122	2	0.0	0.0	1.9fm	0.0	0.0fm		
191835	2.0fm	122	2	0.0	0.0	1.9fm	0.0	0.1fm		
194321	1.9fm	122	2	0.0	0.0	1.9fm	0.0	0.0fm		
194926	2.0fm	122	2	0.0	0.0	1.9fm	0.0	0.1fm		

5

TRANSUDCER CORRECTION ABSYRACF

TRA (TC/PI) TAPS: VESSEL 3130 SURVEY H-9743 FATHOMETER S/N 1077 YR1978 PAGE 2 OF 2

PROG TIME	TRA CORR.	DAY	VEL. TBL.	TRA CORR. INITIAL	SCALE-PHASE	DRAFT	F. ARC	S./SQUAR	COMMENTS
202458 ✓	1.9fm	122	2	0.0	0.0	1.9fm	0.0	0.0fm	
203255 ✓	2.0fm	122	2	0.0	0.0	1.9fm	0.0	0.1fm	
205128 ✓	1.9fm	122	2	0.0	0.0	1.9fm	0.0	0.0fm	
205416 ✓	2.0fm	122	2	0.0	0.0	1.9fm	0.0	0.1fm	
211621 ✓	1.9fm	122	2	0.0	0.0	1.9fm	0.0	0.0fm	
212556 ✓	2.0fm	122	2	0.0	0.0	1.9fm	0.0	0.1fm	
2 163632 ✓	2.0fm	123	2	0.0	0.0	1.9fm	0.0	0.1fm	
194136 ✓	1.9fm	123	2	0.0	0.0	1.9fm	0.0	0.0fm	
194418 ✓	2.0fm	123	2	0.0	0.0	1.9fm	0.0	0.1fm	
235959	2.0fm	123	2	0.0	0.0	1.9fm	0.0	0.1fm	

13

TRANSDUCER CORRECTION ABSTRACT

TR4 (TC/TI) TAPS: VESSEL 3131 SURVEY H-9743 FATHOMETER S/N 1048 YR 1978 PAGE 1 OF 1

FROM TIME	TR4 CORR.	DAY	VEL. TBL.	TR4 corr. is the algebraic sum of these columns				COMMENTS	
				INITIAL	SCALE-PHASE	DEPTH	F. ARC		S. / SQUAD
201048	1.5ft	086	1	0.0	0.0	1.5ft	0.0	0.0	
235959	1.5ft	102	1	0.0	0.0	1.5ft	0.0	0.0	

2/5

TRANSDUCER CORRECTION ABSTRACT

TRA (TC/TI) TAPE: VESSEL 3132 SURVEY H-9743 FATHOMETER S/N 1080 YR 1978 PAGE 1 OF 1

FROM TIME	TRA CORR.	DAY	VEL. TBL.	TRA corr. is the algebraic sum of these columns							COMMENTS
				INITIAL	SCALE-PHASE	DRAFT	F. ARC	S./	SQUAT		
193956	1.3ft	124	3	0.0	0.0	1.3ft	0.0		0.0		
235959	1.3ft	139	3	0.0	0.0	1.3ft	0.0		0.0		

250

FIELD TIDE NOTE
 OPR-N100-DA-78
 Puget Sound, Washington

Field tide reduction of soundings was based on predicted tides from Seattle, Washington, corrected to Edmonds, Washington (station 914, Predicted Tide Tables). Tide tapes were generated using a PDP8/e computer utilizing program AM-500. All times of both predicted and recorded tides are Greenwich Mean Time.

Both Bristol Bubbler and, with the exception of ^{POINT}~~PORT~~ Jefferson, Fischer-Porter ADR tide gages were installed at all sites for this project. Location and period of operation are as follows:

<u>SITE</u>	<u>LOCATION</u>	<u>PERIOD</u>
EDMONDS ✓	47° 48' 48.6" N ✓ 122° 23' 03.2" W	28 February to 01 June 1978
^{POINT} PORT JEFFERSON ✓	47° 45' 22.5" N ✓ 122° 28' 12.0" W	01 March to 19 June 1978
MEADOW POINT <i>outside limits of H-9743</i>	47° 41' 14.2" N 122° 24' 12.0" W	27 February to 19 June 1978

Typical problems with marigram paper jumping sprockets and jamming were encountered with the bubbler gages. Silica-gel dessicants were placed directly under the feed roll of paper. The paper still became distorted and jumped sprockets. The marigrams have been scaled to reflect the correct time.

EDMONDS

Bristol Bubbler gage (s/n 72A226) and Fischer-Porter ADR gage (s/n 7404-A-0407M11) were installed and began operation on 28 February 1978. The existing staff had been installed 13 September 1977 by NOAA Ship McARTHUR. The staff was leveled on 01 March 1978 and again on 01 June 1978 just prior to gage and staff removal.

Gage zero corresponds to a reading of minus 1.10 feet on the staff.

^{POINT}
~~PORT~~ JEFFERSON

Bristol Bubbler gage (s/n 73A234) was installed and began operation on 01 March 1978. The orifice was relocated on 21 March, to ensure that the orifice would not go dry during the upcoming spring tides. Prior to 21 March, the staff readings were 7.8 feet greater than the gage. After 21 March, the staff read 6.1 feet greater than the gage.

The tide staff was installed on 01 March. It was leveled on 03 and 21 March, and on 19 June prior to gage removal.

MEADOW POINT

Two gages were installed and began operation at this site on 27 February 1978. The first gage, Fischer-Porter ADR (s/n 7504 A 2689 M 17), was mounted on the floatwell installed by the NOAA Ship McARTHUR on 07 September 1977. This gage ran relatively trouble free.

The 0-20 foot Bristol Bubbler gage (s/n 66 A 17554) was installed also on 27 February. This gage was the subject of frequent vandalism, resulting in a loss of data. The orifice was moved on 21 March and 23 March to ensure that it would not go dry during the spring tides. The staff was installed 08 September 1977 by NOAA Ship McARTHUR. It was leveled on 27 February 1978 and again on 19 June 1978 prior to gage removal. The staff and floatwell were left intact for future use.

Prior to 21 March 1978 the gage read 0.1 ft greater than the staff. After 23 March the gage read 5.7 ft greater than the staff.

LEVELS

In a comparison of level records, the only observed difference at a station was a 0.007-m fall in the staff at ^{Point}Port Jefferson. The Edmonds and Meadow Point gages showed no shift in the tide staffs.

Levels between bench marks were of third-order accuracy. Differences in elevations between historical bench marks compared well with the published differences, with the exception of BM N7 (1956) RESET at Edmonds. However, the levels agreed with the 2nd order levels done by NOAA Ship McARTHUR on 9/13/77 and 11/15/77.

ZONING RECOMMENDATIONS

The following recommendations are made for tidal zoning:

HYDROGRAPHIC SHEET

- H-9743 : Tide reducers should be applied as a ratio from EDMONDS and PORT JEFFERSON.
- H-9744 : Tide reducers should be applied as a ratio from POINT PORT JEFFERSON and MEADOW POINT.

TELEMETERED TIDES SYSTEM

At all sites, telemetering transmitters were tied into the bubbler gages. The following problems were encountered:

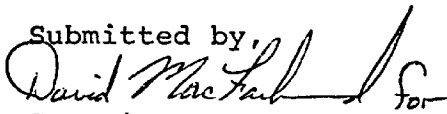
- The shore units were found to be cumbersome. The additional space required for the antenna, transmitter and battery boxes will not always be available, especially in Alaska.

-Battery life averaged 25 days before recharging was necessary.

-Shipboard Equipment:

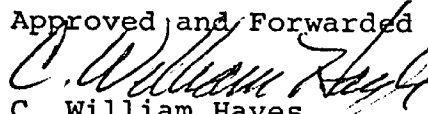
1. The digital and analog scales do not match. This difference varies with each scale change.
2. With our present equipment, there is no way to accurately set or check the time on the analog recorder.

Submitted by,



C. Brian Greenwalt
LTJG, NOAA

Approved and Forwarded by,



C. William Hayes
CDR, NOAA
Commanding Officer

U.S. DEPARTMENT OF COMMERCE
September 13, 1978 NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY

TIDE NOTE FOR HYDROGRAPHIC SHEET

Processing Division: Pacific Marine Center:

Hourly heights are approved for Form 362

Tide Station Used (NOAA Form 77-12): 944-7427 Edmonds, Wa.
944-5683 Point Jefferson, Wa.

Period: March 27-May 19, 1978

HYDROGRAPHIC SHEET: H-9743

OPR: N100

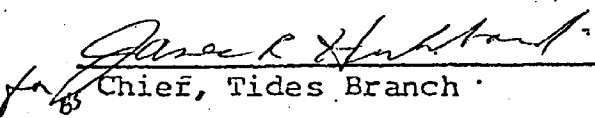
Locality: Puget Sound, Washington

Plane of reference (mean lower low water): 2.71 ft. -Edmonds
3.0 ft. -Point Jefferson

Height of Mean High Water above Plane of Reference is
10.0 ft.

Remarks: Recommended zoning:

- (1). North of 47°47.0' zone direct on Edmonds.
- (2). South of 47°47.0' zone direct on Point Jefferson.


Chief, Tides Branch

GEOGRAPHIC NAMES

H-9743

Name on Survey	A ON CHART NO. 18446 B ON PREVIOUS SURVEY NO. C ON U.S. QUADRANGLE MAPS 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		
APPLE COVE PT.	X										1
APPLETREE COVE	X										2
EDMONDS	X										3
EDWARDS PT	X										4
POINT JEFFERSON	X										5
PRESIDENT PT	X										6
PT WELLS	X										7
PUGET SOUND	X										8
RICHMOND BEACH (Ppl)	X										9
KINGSTON	X										10
											11
											12
											13
											14
											15
										Approved:	16
											17
										<i>Chas. E. Harrington</i>	18
										Chief Geographer. C3x5	19
										13 March 1980	20
											21
											22
											23
											24
											25

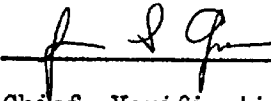
APPROVAL SHEET

FOR

SURVEY H- 9743

- A. All revisions and additions made on the smooth sheet during verification have been entered in the magnetic tape records for this survey. A new final position print-out has been made. A new final sounding print-out has been made.
- B. The verified smooth sheet has been inspected, is complete, and meets the requirements of the Hydrographic Manual. Exceptions are listed in the verifier's report.

Date: 8 Aug 1979

Signed: 

Title: Chief, Verification Branch

HYDROGRAPHIC SURVEY STATISTICS

H-9743

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

RECORD DESCRIPTION		AMOUNT	RECORD DESCRIPTION		AMOUNT	
SMOOTH SHEET		1	BOAT SHEETS & PRELIMINARY OVERLAYS		5 & 7	
DESCRIPTIVE REPORT		1	SMOOTH OVERLAYS: POS. ARC, EXCESS, SMDG.		7	
DESCRIP-TION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS/SOURCE DOCUMENTS
ENVELOPES						
CAHIERS	with 2-printouts	misc. data				
VOLUMES	2					
BOXES			1-Smooth			

T-SHEET PRINTS (List)

SPECIAL REPORTS (List) 1-tide plot, 1-Cht. mark-up, 2-engineer drawings (copies)

OFFICE PROCESSING ACTIVITIES

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

PROCESSING ACTIVITY	AMOUNTS		
	PRE-VERIFICATION	VERIFICATION	TOTALS
POSITIONS ON SHEET			1875
POSITIONS CHECKED		1875	
POSITIONS REVISED		89	
SOUNDINGS REVISED		273	
SOUNDINGS ERRONEOUSLY SPACED		0	
SIGNALS (CONTROL) ERRONEOUSLY PLOTTED		0	
	TIME - HOURS		
CRITIQUE OF FIELD DATA PACKAGE (PRE-VERIFICATION)	5		
VERIFICATION OF CONTROL		6	
VERIFICATION OF POSITIONS		46	
VERIFICATION OF SOUNDINGS		99	
COMPILATION OF SMOOTH SHEET		61	
APPLICATION OF TOPOGRAPHY		4	
APPLICATION OF PHOTOBATHYMETRY			
JUNCTIONS		4	
COMPARISON WITH PRIOR SURVEYS & CHARTS		17	
VERIFIER'S REPORT		25	
OTHER		10	
TOTALS	5	272	

Pre-Verification by	J.S. Green	Beginning Date	8/18/78	Ending Date	8/18/78
Verification by	Todd M. Stansbury	Beginning Date	3/12/79	Ending Date	8/12/79
Verification Check by	A.E. Fichelberger, J.S. Green	Time (Hours)	51	Date	8/1/79
Marine Center Inspection by	HIT	Time (Hours)	32	Date	8/14/79
Quality Control Inspection by	J. T. Buelahan	Time (Hours)	122	Date	11/12/80
Requirements Evaluation by	D. J. Hill	Time (Hours)	7	Date	5/5/80

19 May 11/30/79 14 hrs

Reg. No. _____

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

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

CARDS CORRECTED

DATE _____ TIME REQ'D _____ INITIALS _____

REMARKS:

Reg. No. H-9743

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

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

MAGNETIC TAPE CORRECTED

DATE _____ TIME REQ'D _____ INITIALS _____

REMARKS: The following soundings need to be excessed

<u>Soundings</u>	<u>Lat</u>	<u>Long</u>	<u>Replaced with</u>	<u>from</u>
0Σ	47° 46' 25"	122° 28' 45"	* (3)	H-9744
1	47° 46' 12"	122° 28' 05"	* (2)	H-9744
-2	47° 45' 21"	122° 28' 10"	* (2)	H-9744
-2	47° 45' 18"	122° 28' 12"	* (4)	H-9744
-2	47° 45' 16"	122° 28' 15"	* (4) * (2)	H-9744
-2	47° 45' 15"	122° 28' 17"	* (3)	H-9744

PACIFIC MARINE CENTER
VERIFIER'S REPORT

REGISTRY NO: H-9743

FIELD NO: DA-10-2-78

Washington, Puget Sound, Point Jefferson to Edmonds

SURVEYED: 27 MARCH - 31 MAY 1978

SCALE: 1:10,000

PROJECT NO: DA-10-2-78

SOUNDINGS: Ross Finline Fathometer

CONTROL: Range-Range
Mini Ranger Visual

Chief of Party.....CDR C.W. HAYES
Surveyed by.....CDR C.W. HAYES, LCDR A.N. Bodnar,
LCDR D.B. MacFarland, LCDR J.P.
Calebaugh, LTJG C.B. Greenawalt,
ENS L.F. Haas, ENS E. McDougal
Automated plot by.....PMC Xynetics Plotter
Verified by.....Todd M. Stansbury
2 August 1979

I. INTRODUCTION

The NOAA Ship DAVIDSON S-331, conducted this navigational area survey during the 1978 field season from 27 March - 31 May 1978.

The survey inside the Edmonds Small Boat Harbor Breakwater used range azimuth and dead reckoning for control. Since this survey has no shoreline manuscripts for the area, the positions taken by dead reckoning inside the harbor cannot be accurately plotted. This data is contained in the hydrographic records and if an accurate shoreline source becomes available and large scale charting of this area is required, this data could be used in the future. *See Quality Control Report*

Two smooth position overlays have been submitted to clarify the position numbers and sounding lines of the development at Latitude 47° 47.5' N, Longitude 122° 29.3' W. The secondary position overlay and the 1:2,500 enlargement of the positions have had lines and position numbers removed where accompanying soundings are all excess. Due to congestion, a 1:2,500 enlargement of soundings plotted on the smooth sheet has been included.

Projection parameters used to plot the field sheets have been revised to center the hydrography on the smooth sheet. Parameters used by PMC are listed in the sounding printout. All correctors used to plot and reduce soundings are listed in the sounding printout.

This survey has been verified by Todd M. Stansbury, a verifier trainee, under the supervision of Arnold E. Eichelberger, Team Leader.

II. CONTROL AND SHORELINE

The source of control is adequately described in Section F and G of the Descriptive Report.

Since there are no shoreline manuscripts for this survey the shoreline, in brown ink, on the smooth sheet was transferred from chart 18446, 9th Ed., 1:25,000, 28 January 1978, for orientation purposes. The Edmonds Breakwater was transferred from the smooth field sheet.

III. HYDROGRAPHY

The hydrography in this survey is adequate to delineate the bottom configuration and to determine least depth. The crosslines are in good agreement, generally within 2 feet.

Depth curves could be drawn adequately to portray the bottom configuration.

Bottom sample #4618 was deleted as there is no raw record of the sample being taken. The position of sample #4618 on the smooth field sheet is only 3 cm. westerly of sample #2907.

There were 38 bottom samples taken in this survey.

IV. CONDITION OF SURVEY

The smooth sheet and other hydrographic records are adequate and conform to the requirements of the Hydrographic Manual except for the following:

- a. On approximately 70% of the days which hydrography was run, only one of the two daily calibration sheets are included for each day.
- b. The Edmonds North Breakwater Light, which is privately maintained, was not located by the ship.
- c. There was no Form 76-40 "Non Floating Aids of Landmarks for Charts" submitted by the ship.
- d. No mention was made in the Descriptive Report concerning H-9744 junctioning to the south with H-9743.
- e. Visible wreck, pos. 7502 was not plotted on the Smooth Field Sheet.

V. JUNCTIONS

H-9743 junctions to the north with H-8895 (1:10,000, 1966). Because of the differences in age resulting in natural and man induced changes, a butt junction was accomplished. The data from H-9743 supersedes that of H-8895 where overlap exists. The depth curves have been inked, and H-8895 should be amended to reflect the superseded butt junction area and to make the depth curves coincident with that of H-9743. *see Quality Control Report*

This survey junctions to the south with H-9744 (1978) with good agreement. Depth curves were left in pencil as H-9744 is unverified.

VI. COMPARISON WITH PRIOR SURVEYS

H-5709 (1934-35) 1:20,000
Soundings from H-5709 are in excellent agreement with H-9743.

No field edit of the Shoreline was required or accomplished during this survey. Several rocks plotted on H-5709 were Transferred to H-9743.

With the above additions, H-9743 (1978) is adequate to supersede H-5709 within the area of common coverage.

VII. COMPARISON WITH THE CHART

18446, 9th Ed., Jan 1978
(6445)

a. Hydrography

H-9743 was compared to the chart with good agreement. The Descriptive Report does not refer to which chart edition, and year that was used by the ship.

The soundings underlined in red on the attached chartlet, originate with prior survey H-5709, (1935, 1:20,000).

Comparisons to the chart indicate differences in the shoreline as listed below.

<u>OBJECT</u>	<u>POSITION #</u>	<u>LATITUDE</u>	<u>LONGITUDE</u>
Dolphin	2805	47°47'39.53"N	122°29'35.82"W
Dolphin	2806	47°47'39.39"N	122°29'37.74"W
Dolphin	2807	47°47'40.80"N	122°29'35.15"W
Dolphin	2808	47°47'40.07"N	122°29'36.46"W
Dolphin	2810	47°47'41.64"N	122°29'36.30"W
Pile	4523	47°47'00.52"N	122°29'10.44"W
Pile	4524	47°47'00.28"N	122°29'10.46"W
Pile	4525	47°46'59.87"N	122°29'10.64"W
Kelp		47°48'00"N	122°23'38"W
Kelp		47°47'45"N	122°23'53"W
Kelp		47°46'14"N	122°23'03"W
Kelp		47°45'52"N	122°23'12"W

PSR Item #1, a dangerous sunken wreck^{charted} at Latitude 47°45.47'N' Longitude 122°28.13'W. The wreck was located ^{charted} 60 meters south of its charted position. Recommend the wreck be removed from the chart at its present location and be charted from H-9743.

PSR Item #4, a sunken rock^{charted} at Latitude 47°48.7'N, Longitude 122°23.2'W; the rock was located approximately as charted with a depth of 6 feet at MLLW.

PSR Item #11, a visible wreck^{charted} at Latitude 47°46.3'N, Longitude 122°28.5'W. A wire sweep search did not reveal any obstruction at this location. Recommend the wreck symbol be removed from the chart.

PSR Item #12, an obstruction^{charted} at Latitude 47°47.07', Longitude 122°29.35'W. Located as an obstruction bare 9 feet at MLLW at Latitude 47°47'03.4"N, Longitude 122°29'19.94"W, pos. 4526. Recommend obstruction be charted from H-9743.

PSR Item #13, a sunken wreck^{charted} at Latitude 47°48.87'N, Longitude 122°23.07'W. Adequately disposed of in Section K of the Descriptive Report.

PSR Item #14, a visible wreck^{charted} at Latitude 47°48.83'N, Longitude 122°23.05'W. Transferred from ^{junctional} ~~prior~~ Survey H-8895 (1966). Wreck is no longer visible and has been ~~plotted~~ as a sunken wreck on H-9743. See Section K of the Descriptive Report. *brought forward*

PSR Item #16, ^{is} a visible wreck ^{PA. charted} at Latitude 47°46.53'N, Longitude 122°28.88'W. No wreck exists at this location. Recommend the wreck symbol be removed from the chart. ~~This~~ visible wreck was located at Latitude 47°46'22.36"N, Longitude 122°28'42.50"W, pos. 7502. Recommend the wreck located on H-9743 be charted in lieu of PSR Items ~~11~~ and 16.

PSR Item #17, dangerous sunken wreck ^{charted} at Latitude 47°48.38'N, Longitude 122°28.88'W. The wreck was located in shallow water and is dangerous to navigation. Recommend the wreck be charted from H-9743.

PSR Item #18, a sunken wreck ^{charted} at Latitude 47°45.83'N, Longitude 122°23.15'W. Adequately disposed of in Section K of the Descriptive Report.

A snag charted at Latitude 47°47.53'N, Longitude 122°29.97W has been re-located on H-9743. Recommend the snag be removed from the chart at its present location. Recommend the snag (pos. 4521) be charted from H-9743. *concur*
The charted snag from H-5709 (1934-35) is 80 meters NNE of present survey snag.
b. CONTROLLING DEPTHS

The charted controlling depth of 12 feet 1976, in Kingston Harbor was not disproven by this survey. The field unit did not conduct hydrography within the harbor area.

The charted controlling depth is 12 feet in the Edmonds Small Boat Harbor. H-9743 contains a ~~11~~ ¹⁰ foot sounding within the designated area.

The present survey is adequate to supersede the charted hydrography.

c. AIDS TO NAVIGATION

1. Point Wells Range Front Light has been relocated ^{about 120} meters south east of its charted location on the high water line. Its new position is Latitude 47°47'01.348"N, Longitude 122°23'35.998"W. *Chart 18446 (1978 Ed. has this Lt. at end of wharf. 1979 L.L. has the revised pos.*
2. The privately maintained charted flashing buoy, which is 200 meters north of the Edmonds Ferry Pier, was not in place at the time of survey. *This buoy charted from Notice to Mariners 35 of 1974 falls outside hydro limits of H-9743*
~~The charted position is Latitude 47°48'N, Longitude 122°23'05"W.~~
lat. 47°46.95' long 122°23.8'
The fog signals (horn) charted on the wharf at PT. Wells and the fuel pier at Edwards PT. were not located during hydrography. Recommend the two aids continue to be charted as shown. *at lat. 47°48.2', long 122°23.8'*
3. The privately maintained charted navigation light (Edmonds North Breakwater Light) on the north end of the Edmonds Breakwater at Latitude 47°48'42"N, Longitude 122°23'15"W was not located in the survey and ~~should continue to be charted as shown.~~ *This Lt. to be deleted from 1979 Ed of chart from LNM 17 of 1979.*
4. The position of the Edmonds Small Boat Harbor Entrance Light 1 is charted as being positioned on the Edmonds Breakwater. The light is ^{see} described in the light list as being positioned on a dolphin off shore of the high water line. *GC report*

It is recommended that this light be charted according to this survey.

The navigation lights as they are presently positioned in the survey area adequately mark the features intended.

There was no Form 76-40 submitted for supporting the positions of the navigations lights and landmarks.

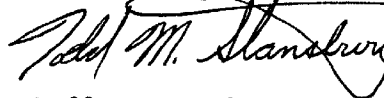
VIII. COMPLIANCE WITH INSTRUCTIONS

H-9743, 1978 is in compliance with the Project Instructions dated December 8, 1977, Change No. 1 dated January 30, 1978, Change No. 2 dated March 16, 1978 and Change No. 3 dated March 14, 1978.

IX. ADDITIONAL FIELD WORK

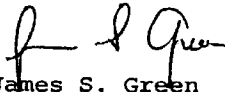
This is a good basic survey. No additional field work is recommended.

Respectfully submitted,



Todd M. Stansbury
Cartographic Technician
August 2, 1979

Examined and approved,



James S. Green
Chief, Verification Branch

ADDENDUM:

After the smoothsheet was plotted it was noted that the baseline calibration correctors for three days of launch DA-1 hydrography were incorrectly applied. The maximum difference between what was applied and what should have been applied was two meters. To confirm that this error is negligible at the scale of this survey a corrected sounding overlay was plotted and has been included with the records for this survey. The smoothsheet has not been replotted since the error is negligible at plot scale, however, the survey has been recomputed and the printout contains the corrected information.



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY
Pacific Marine Center
1801 Fairview Avenue E
Seattle, WA 98102

DATE : September 6, 1979 OA/CPM32/JSG

TO : OA/CPM - Eugene A. Taylor

FROM : OA/CPM3 - John W. Carpenter *John W. Carpenter*

SUBJECT: PMC Hydrographic Inspection Team Report for Survey H-9743

8
This survey is a basic hydrographic survey of Point Jefferson to Edmonds, Puget Sound Washington. This survey was conducted by NOAA Ship DAVIDSON in 1970, in accordance with Project Instructions OPR-N100-DA-78 dated December 8, 1977, Change 1 dated January 30, 1978, Change 2 dated March 16, 1978 and Change 3 dated March 14, 1978.

The project instructions are ambiguous as to whether this survey is basic or conducted under the navigational area concept. On Section I. GENERAL, it is stated that "It shall provide the basic surveys required to update the chart coverages of the area." Section IV. HYDROGRAPHY, states that hydrographic survey operation shall be in accordance with "... and Basic Guidelines for Navigable Area Surveys, dated June 24, 1977." As survey coverage limits differ between basic and navigable area surveys, specific and clear project instructions are essential to preclude unnecessary expenditure of resources, particularly when photo support is not provided.

The survey would have been improved if additional development had been accomplished in the following areas centered at:

Latitude 47° 47' N Longitude 122° 29' W
47° 48' N Longitude 122° 24' W

The inspection team finds H-9743 to be a good basic survey adequate to supersede common areas of prior surveys and charted hydrography. Administrative approval is recommended.

Glen R. Schaefer
Glen R. Schaefer

Patrick D. Harman
Patrick D. Harman

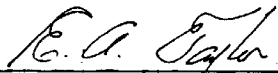
James W. Steensland
James W. Steensland

James L. Stringham
James L. Stringham



ADMINISTRATIVE APPROVAL
H-9743

The smooth sheet and reports of this survey have been examined and the survey is adequate for charting and to supersede common areas of prior surveys.



Eugene A. Taylor, RADM
Director
Pacific Marine Center

Sept. 7, 1979
Date



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY
Rockville, Md. 20852

OA/C352:GKM

November 29, 1979

TO: Glen R. Schaefer *GRS.*
Chief, Hydrographic Surveys Division

FROM: *George K. Myers*
George K. Myers
Chief, Quality Control Branch

SUBJECT: Quality Control Report for H-9743 (1978), Washington, Puget
Sound, Pt. Jefferson to Edmonds

A quality control inspection of H-9743 was accomplished to monitor the survey for obvious deficiencies with respect to data acquisition, delineation of the bottom, determination of least depths, navigational hazards, junctions, sounding line crossings, shoreline transfer from chart, smooth plotting, decisions and actions taken by the verifier, and the cartographic presentation of data. In general, it was found to conform to the National Ocean Survey's standards and requirements except as stated in the Verifier's Report, the HIT Report, and as follows:

1. Daybeacons charted in the vicinity of latitude $47^{\circ}47.7'N$, longitude $122^{\circ}29.9'W$ at Kingston Harbor were not mentioned by the hydrographer as required in section 6.3 of the project instructions.
2. Two rocks awash charted at latitude $47^{\circ}46.45'N$, longitude $122^{\circ}28.8'W$ and latitude $47^{\circ}47.35'N$, longitude $122^{\circ}23.54'W$ were not discredited by the hydrographer. These features originating with H-5709 (1934-35) were carried forward to the present survey during quality control.
3. Four questionable soundings plotted on the smooth sheet in the areas of latitude $47^{\circ}47.4'N$, longitude $122^{\circ}28.9'W$ and latitude $47^{\circ}46.2'N$, longitude $122^{\circ}24'W$ were noted by the quality evaluator. These depths were found to be considerably different than values indicated on the fathogram trace. The smooth plot was appropriately corrected.
4. Charted piles in latitude $47^{\circ}48.7'N$, longitude $122^{\circ}23.1'W$ from H-8895 (1966) that fall within the junctional area of the present survey were not investigated by the hydrographer. These features, therefore, were transferred to the smooth sheet during quality control.



5. The quality evaluator added 12 detached soundings to the smooth sheet in Edmonds Harbor. Positions of these soundings determined from dead reckoned plots are considered sufficiently accurate at the scale of the survey.

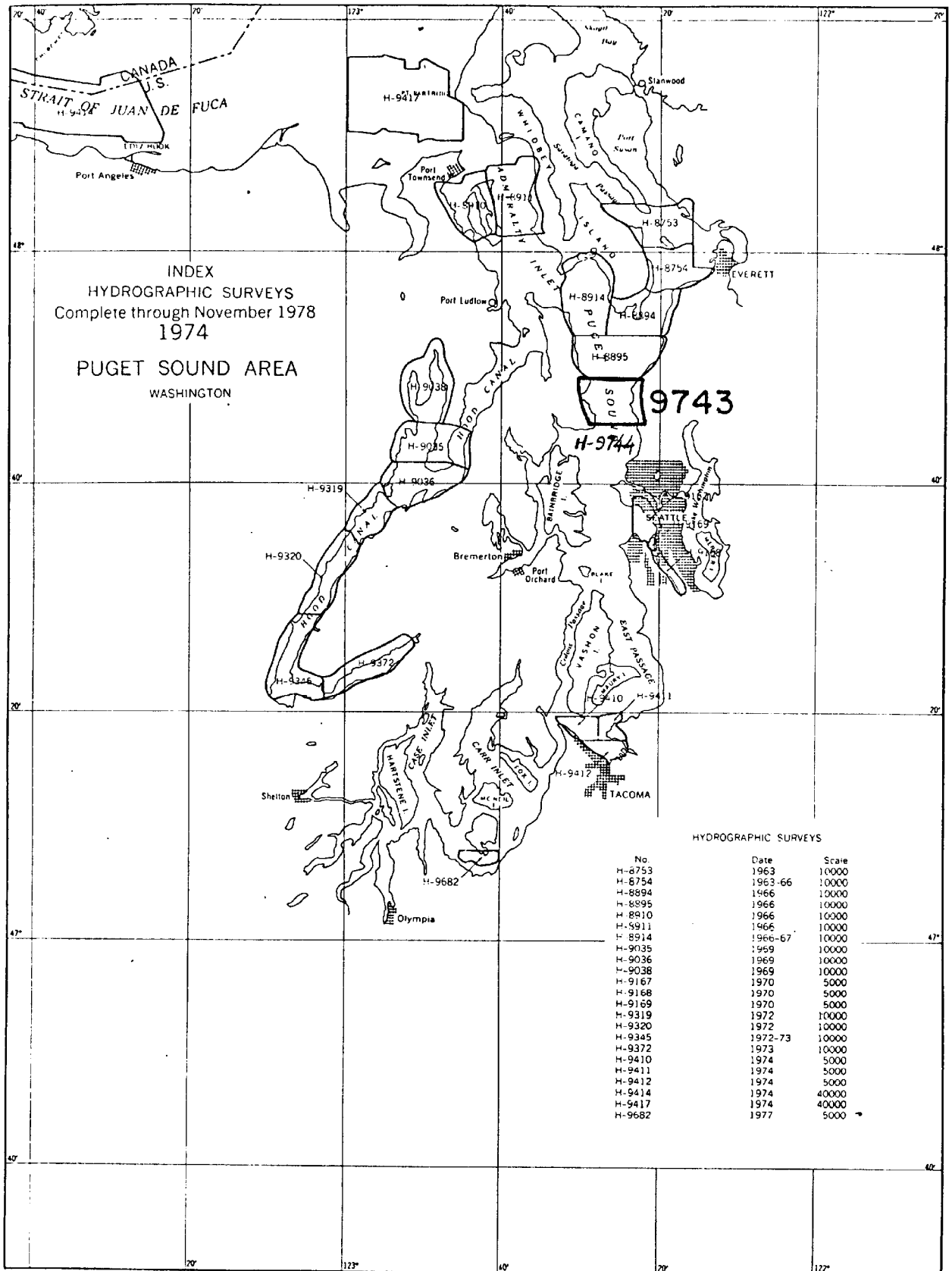
6. A 3wk mistakenly shown on the smooth sheet was corrected to a visible wreck symbol labeled "awash at MLLW" during quality control. This correction is substantiated by hydrographic data.

7. Several rocks carried forward from H-5709 (1934-35) were plotted in error during verification. Apparently the difference in scales between the two surveys was not considered when the rocks were transferred.

cc:
OA/C35
OA/C351

DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Ocean Survey
Rockville, Maryland

Hydrographic Index No. 1041





UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY
Rockville, Md. 20852

OA/C351:DJH

MAY 13 1980

TO: OA/CPM - Eugene A. Taylor
FROM: OA/C3 - Roger F. Lanier *Roger F. Lanier*
SUBJECT: H-9743 (1978), OPR-N100(412), Washington, Puget Sound, Pt. Jefferson
to Edmonds, Report of Compliance with Project Instructions

The smooth sheet and Descriptive Report for the subject survey have been examined. This survey, except as noted in the Quality Control Report, dated November 29, 1979 (copy attached), and the Hydrographic Survey Inspection Team Report, dated September 6, 1979, is complete and adequate for the purposes intended and is in compliance with Project Instructions OPR-N100(412)-DA-78, dated December 8, 1977.

Attachment

cc:
OA/C352 w/o att.



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