8086

Diag. Cht. No. 6380-2.

Form 504

U. S. COAST AND GEODETIC SURVEY

DEPARTMENT OF COMMERCE

DESCRIPTIVE REPORT

Type of Survey Hydrographic

Field No. LJ-1353 *Office No.* H-8086

LOCALITY

State Washington

General locality San Juan Islands

Locality Haro Strait

19 53-55

CHIEF OF PARTY

K. S. Ulm and P. Taylor

LIBRARY & ARCHIVES

DATE November 4, 1957

8-1870-1 (1)

8086

Form 537
(Ed. June 1946)

DEPARTMENT OF COMMERCE

U. S. COAST AND GEODETIC SURVEY

HYDROGRAPHIC TITLE SHEET

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

REGISTER No. H-8086

Field No. LJ-1353

State WASHINGTON

General locality SAN JUAN ISLANDS

Locality HARO STRAIT

Scale 1:10000 Date of survey 10 Sept. - 15 Oct. 1953, 9 Sept. 1955

Instructions dated 11 March and 8 May 1953, 3 May 1955, File No. 511-LSH/pf

Vessel LESTER JONES & HODGSON

Chief of party KENNETH S. ULM & PAUL TAYLOR

Surveyed by Kenneth S. Ulm, Charles A. Schoene, and Jack E. Guth & Paul Taylor

Soundings taken by ~~fathometer~~, graphic recorder, hand lead, wire

Fathograms scaled by George C. Palms and Gary H. Jones L.H., M.J.T. & W.M.M.

Fathograms checked by Kenneth S. Ulm, Charles A. Schoene and Jack E. Guth

Protracted by William M. Martin

Soundings penciled by William M. Martin

Soundings in fathoms ~~feet~~ at ~~MLW~~ MLLW are true depths

REMARKS:

U. S. GOVERNMENT PRINTING OFFICE 777032

DESCRIPTIVE REPORT TO ACCOMPANY

HYDROGRAPHIC SURVEY H-8086 (FIELD NO. LJ-1353)

HARO STRAIT - WASHINGTON

SCALE 1:10000 SEPTEMBER & OCTOBER 1953

SHIP LESTER JONES KENNETH S. ULM, COMDG.

Charles A. Schoene, CDR., C&GS, in charge of field work

A. PROJECT:-

Authority for this project is contained in SUPPLEMENTAL INSTRUCTIONS - PROJECT CS-241 to Commanding Officer, LESTER JONES, dated 11 March 1953 and 8 May 1953.

B. SURVEY LIMITS AND DATES:-

This survey covers a section of Haro Strait from Latitude 48°-30' (1.4 miles south of Lime Kiln Lighthouse) north to Latitude 48°-36'10", and from the west shore of San Juan Island westward to the International Boundary Line. The index of hydrographic sheets is shown on the monthly progress sketch for this project. Fieldwork was begun by signal building and location on 10 September and completed on 15 October.

This survey makes a junction to the south with contemporary survey H-8085 (Field No. LJ-1253) and with prior survey H-6818, scale 1:20000, 1942-43. In the south entrance to Mosquito Pass a junction is made with prior survey H-2216. On the west side of Henry Island there is a junction with prior surveys H-2216 and H-4607.

C. VESSEL AND EQUIPMENT:-

Sounding on this sheet was done by the ship LESTER JONES and Launch No. 92 (a standard diesel powered motor launch) operating from the ship. Launch 92 has a turning radius of about 20 meters and the ship about 100 meters. The launch was used to carry the survey from the shoreline out to deep water. The ship was used in deep water, offshore, and mostly in depths over 100 fms.

808 fathometers No. 75 and 102 were used for all the echo sounding in this survey. The leadline was used in depths up to 20 fms. to verify the least depths on shoals and to obtain bottom characteristics. Eight wire soundings were taken in a small area of greater depths than the fathometers would record (over 160 fms.)

D. TIDE AND CURRENT STATIONS:-

Not on survey sheet

A portable tide gage at Kanaka Bay was used without time or range corrections for the reduction of all soundings on this survey.

No current stations were observed in the area covered by this sheet.

E. SMOOTH SHEET:-

The smooth sheet is to be plotted by the Seattle Processing Office.

F. CONTROL STATIONS:-

Triangulation in this area was executed by J.J.G. in 1894, F.M. in 1909, and C.M.D. in 1942. Kellett Bluff Light has been rebuilt recently and was relocated by this party in 1953. All triangulation is on the North American Datum 1927.

The major portion of the hydrographic signals were located by pricking on the photographs and then transferring the positions to Topographic Manuscripts T-5590-S & T-5590-N. It is understood that the Seattle Processing Office relocated these signals by radial plot to obtain positions for the smooth sheet.

Two signals (KIM & COW) were originally located by photo-topo but their positions were found to be slightly in error during the progress of the hydrography. They were relocated by sextant cuts from other control stations and should be shown on the smooth sheet with blue circles. On the west side of Henry Island the pictures did not show the shoreline clearly and it was necessary to locate 5 of the hydrographic signals by sextant cuts taken from the launch. The locations of all signals are considered sufficiently accurate for the hydrography on this survey.

The Seattle Processing Office should comment on this paragraph after smooth sheet is plotted.

See Processing Office Notes

G. SHORELINE AND TOPOGRAPHY:-

The shoreline for this survey should be obtained from Topographic Manuscripts T-5590-N & T-5590-S, scale 1:10000, compiled about 1952. (Field Edit 1954) The shoreline appeared to be accurate except on the west side of Henry Island. Mr. Bishop, of the Division of Photogrammetry, recently revised a section of this shoreline by planetable during the field edit of the topo manuscripts. He furnished the Seattle Processing Office with a tracing of this revision for use in plotting the smooth sheet.

No important discrepancies were noted between the topographic surveys and the hydrographic surveys except as mentioned above.

The low-water line is adequately defined by the soundings except where the beach is steep and rocky.

H. SOUNDINGS:-

See paragraph "H" of Descriptive Report for Survey H-8084.

I. CONTROL OF HYDROGRAPHY:-

See paragraph "I" of Descriptive Report for Survey H-8084.

J. ADEQUACY OF SURVEY:*

This survey is considered complete and should supersede all prior surveys for charting. In several areas of this survey it was impossible to obtain satisfactory fathometer soundings with the 808 fathometers because of the exceedingly steep slopes. A few wire soundings were taken in the vicinity of Bellevue Pt. to supplement the fathometer soundings. In spite of these deficiencies, it is believed that the area can be adequately charted without additional soundings.

The junction with survey* H-6818 south of Lime Kiln Lighthouse was not complete because the soundings were too deep for the 808 fathometers (over 160 fms.). The junction to the south with contemporary survey H-8085 is satisfactory and depth curves can be adequately drawn. The

* Junction with H-6818 (1942-43) considered adequate.

junctions to the north with surveys H-2216 & H-4607 are satisfactory considering that the area will be resurveyed in the near future as a part of this project.

K. CROSSLINES:-

Crosslines run on this survey were about 10% of the regular system of lines. In general the soundings are in good agreement at the crossings except on the steep slopes and also where the soundings taken by one fathometer cross those of the other fathometer. In the latter case the crossings should be satisfactory on the smooth sheet after phase corrections have been applied. There is a difference of about 8 fms. between the uncorrected "D" scale soundings of the two fathometers.

The Processing Office should comment on this paragraph after soundings are penciled on the smooth sheet. — See Processing Office Notes & Review 7(A).

L. COMPARISON WITH PRIOR SURVEYS:-

There are two prior surveys of this area No. H-4607, scale 1:20000, 1926 and No. H-2216, scale 1:10000, 1894.

In general there is good agreement between the new survey and H-4607 but the following soundings shown on H-4607 appear to be in error.

(a) The sounding of "No Bottom at 146 fms. (Lat. 48°-34.6', Long. 123°-11.5') has been disproved. Well developed on present survey, with 80-90 fm. depths.

(b) The 55,44 & 31 fm. soundings in Lat. 48°-34.2', Long. 123°-10.8' are apparently displaced. 41,36 & 29 fms., respectively on present close dev

(c) The 92 fm. sounding in Lat. 48°-34.1', Long. 123°-11.0' is apparently displaced. Well dev on pres survey, with depths in order of 80 fms.

(d) The 23,17 & 14 fm. soundings in Lat. 48°-33.1', Long. 123°-10.2' are apparently displaced. Error in plotting on H-4607; fall in comparable depths after correcting positions.

(e) The 14 fm. sounding in Lat. 48°-32.0', Long. 123°-09.9' is apparently displaced to the west about ~~100~~ 80 meters. Could also move north about 100 meters.

(f) A sounding of 1.9 fms. by lead line (Pos. 145; Vol.9) was obtained on the rocky shoal south of Low Island (Lat. 48°-32'-30", Long. 123°-09'-50"). The shoalest sounding obtained on H-4607 was 3½ fms. It is recommended that the new sounding of 1.9 fms. be charted. This shoal is mentioned in Item 2 of PRELIMINARY REVIEW for Project CS-241.

(g) The 1 fathom sounding shown on H-4607 (Lat. 48°-30'-12", Long. 123°-08'-24") was verified by a leadline sounding of 0.5 fm. (Pos. 60c, Vol. 2). About 80 meters southeast of this shoal, a sounding of 1.9 fms. by leadline was obtained (Pos. 112, Vol. 9). According to Item No.1 of the PRELIMINARY REVIEW for Project CS-241 rocks were reported in two places 135 meters apart. From the soundings obtained on this survey it appears to be one big rocky shoal. It is recommended that it be charted as a single rock awash as it has been in the past. Should be sunken rock or reef symbol. Depth is 3 feet MLLW

There is good agreement between the new survey and H-2216 with the exception of a few discrppancies.

(h) The 11½ fm. sounding (Lat. 48°-35'05", Long. 123°-11'-00") and the 20½ fm. sounding (Lat. 48°-34'-42", Long. 123°-~~09~~'-~~06~~") appear to be displaced slightly. These two soundings should be deleted from Chart. No.6379.

(i) The two charted rocks awash south of triangulation station OPEN 2 are not clearly shown on the old survey.

ø 48° 35'
λ 123° 10.8'

(j) The charted rock awash in the entrance to Mitchell Bay (Lat. 48°-34'-30", Long. 123°-10'-08") is not shown on H-2216.

M. COMPARISON WITH CHART:-

Chart No. 6379, scale 1:20000, print date 53 3/2 covers most of the survey area from the north end south to Lat. 48°-31'-20". Chart No. 6380, scale 1:80000, print date 52 - 7/14 covers the remainder of the area.

In general there is good agreement between the new survey and both charts but there are a few discrepancies in addition to those discussed previously in paragraph "L".

(a) The 47 fm. sounding in Lat. 48°-33'-20", Long. 123°-10'-27" is apparently displaced inshore and should be deleted from the chart. Review RPS

(b) The "PD" sunken rock charted in Lat. 48°-32.4', Long. 123°-09.7' (Item No. 2 of PRELIMINARY REVIEW - Project CS-241) has been disproved by the hydro party and should be deleted from chart. A sounding line was run between the rock's charted position and the beach, and no evidence of a rock was seen. Disproved Review RPC

(c) In Lat. 48°-32.0', Long. 123°-12.4' a portion of the 50 fm. curve and one or two soundings of less than 50 fms. should be charted to show the edge of 33 fm. shoal charted on 6380.

N. DANGERS AND SHOALS:-

A number of shoals and rocks previously uncharted were found by this survey but none are considered a serious danger to navigation. A tabulation of the more important ones follows:

(a) A rock was found in Lat. 48°-35'-00", Long. 123°-10'-54" bare ~~0.3~~ 3 ft. fm. at MLLW (Pos. 27k, Vol. 8). This should be charted as a rock awash.

(b) A sounding of 0.1 fm. was found in Lat. 48°-34'-48", Long. 123°-10'-50" (Pos. 20k, Vol. 8). Rock awash at MLLW from PA-A-54

(c) A shoal with a least depth of about 23 fms. was found in Lat. 48°-32'-48", Long. 123°-10'-15".

(d) A fathometer sounding of about ~~31~~ 29 fms. (Pos. 29-30C, Vol.13) was obtained in the vicinity of the charted 33 fm. shoal (Lat. 48°-32'-03", Long. 123°-12'-30"). This shoal was not completely developed because of the restriction laid down by PARAGRAPH 47 of the instructions for this project dated 11 March 1953 (Surveys were not to be carried past the boundary line between United States and Canadian Territorial Waters).

(e) A shoal with a least depth of about ~~30~~ 28 fms. was found in Lat. 48°-30'-44", Long. 123°-10'-~~30~~ 28".

(f) A shoal with a least depth by fathometer of 9.4 fms. (Pos. 24j-25j, Vol. 8) was found in Lat. 48°-30'-36", Long. 123°-08'-~~48~~ 45". This shoal was not verified by leadline.

(g) A shoal with a least depth by leadline of 4.4 fms. (Pos.15j, Vol.8) was found in Lat. 48°-30'-05", Long. 123°-08'-12".

All charted dangers, shoals, and bare rocks were found as charted, or shoaler depths were found except as listed in paragraphs "L", "M" & "N".

O. COAST PILOT INFORMATION:-

Coast Pilot information is included in a special report, "COAST PILOT NOTES - 1953", forwarded to the Washington Office 17 February 1954.

P. AIDS TO NAVIGATION:- (CL 172, 1954)

The positions of fixed aids to navigation shown on form No. 567 were forwarded to the Washington Office on 17 February 1954. There are two fixed aids in the area of this survey, Kellett Bluff Lt. and Lime Kiln L.H. Kellett Bluff Lt. was relocated by traverse by this party. Lime Kiln L.H. was used as a hydrographic signal but it's position was not otherwise verified.

There are no floating aids to navigation in the area of this survey.

Q. LANDMARKS FOR CHARTS:-

Form 567, Landmarks for Charts, was transmitted to the Washington Office 17 February 1954. There are no landmarks in this area recommended for charting.

R. GEOGRAPHIC NAMES:-

A special report on geographic names has not been made for this project and is not deemed necessary. No additions or changes in geographic names are recommended for this area.

Z. TABULATION OF APPLICABLE DATA:-

See paragraph "Z" of descriptive report for Survey H-8084 or H-8087 for tabulation of records previously transferred to the Washington Office and Seattle Processing Office.

Following is a list of records now on hand that will be transferred to the Seattle Processing Office in the near future:

1 each - Boat Sheet, Survey H-8086 (Field No. LJ-1353).
14 vols. - Sounding Records, " "
13 fathograms - Launch 92, " "
6 fathograms - Ship LESTER JONES, " "
1 cahier - Tidal Data, Hourly Heights, Curves, and Reducers for Kanaka Bay Tide Station.
1 each - Bromide Print, Hydrographic Survey H-4607.
1 sheet - Photostat in two sections of Hydrographic Survey H-6818.
1 sheet - " " " " " " " H-6746.

A list of hydrographic signals used is attached to page 1, Vol. 1 of the sounding records and is also attached to this report.

Respectfully submitted,

Charles A. Schoene

Charles A. Schoene,
Commander, C&GS

Approved and Forwarded:

Curtis Le Fever

Curtis Le Fever,
Commander, C&GS
Comdg., Ship LESTER JONES

LIST OF SIGNALS - HYDROGRAPHIC SURVEY H-8086 (FIELD NO. LJ-1353)

TRIANGULATION STATIONS

NAME	YEAR	SIG.NAME
ANDREWS BAY R.M.	1909-1942	AND
BELLEVUE$_2$	1942	BELL
EDWARDS$_2$	1942	WAR
GRANITE	1894-1942	GRAN
HENRY$_2$	1942	HENRY
KELLETT BLUFF LT.	1953	KEL
KELP	1894-1942	KELP
KOPET	1894-1942	PET
LIME KILN L.H.	1942	LIME
LOW$_2$	1942	LOW
OPEN$_2$	1942	OPEN
QUEEN	1894-1942	QUEEN
ROUGH	1894-1942	ROUGH
SORREL	1894-1942	SOR

TOPOGRAPHIC STATIONS

AMY	IRR	QUO
ANT	IVY	QUI
ASK	JAP	RIG
BED	JAW	RIO
BOX	JOE	RIP
BUS	JOY	ROT
COD	JUG	SAP
CUE	KED	SHE
CUR	KEY	SIC
CUT	KID	SIR
DIF	LAD	TAP
DIP	LEO	TAX
DOG	LOP	TRY
DUD	LUG	TUT**
EAT	MAG	URN
EGG	MAL	USE
ELF	MAW	VAN
ERA	MID	VIA
FIG	NAT	VIM
FOG	NEW	WED
FOX	NIG	WEN
GAG	NIP	WHO
GAL	NUL	WIG
GAS	ODD*	YAK
GOB	OFF	YES
HAT	OIL	YET
HEM	OLD	ZAG
HIS	PAW	ZIG
HUM	PIE	ZOO
ICE	PIN	
IDA	PLY	

HYDROGRAPHIC STATIONS

ART
BOB
CAN
COW
DOT
ERG
FAT
FIX
GIG
HOE
KIM
QUM
SIS
YAM

MARKED TOPO STATIONS

BARK	1950
MIKE	1950

* Two signals with same name.

** This signal may not have been used.

TIDE NOTE

HYDROGRAPHIC SURVEYS H-8085 (FIELD NO. LJ-1253)
H-8086 (FIELD NO. LJ-1353)

A portable tide gage in Kanaka Bay on a ramshackle pier (Lat. 48°-29'-03", Long. 123°-04'-56") was used without time or range corrections for the reduction of all soundings on Surveys H-8085 and H-8086. Mean Lower Low Water corresponds to a reading of 4.7 feet on the tide staff at Kanaka Bay (reference Director's letter of 27 October 1953, addressed to Commanding Officer, LESTER JONES, Field No. 36, rjb).

Four days tidal records were lost on this gage during the period 13-17 September. Hourly heights for 14-17 September were furnished by the Washington Office based on observed tides at Friday Harbor (reference Director's Letter of 27 October 1953).

FATHOMETER CORRECTIONS

SURVEY H-8065 - - - - - (FIELD NO. LJ-1253)
SURVEY H-8066 - - - - - (FIELD NO. LJ-1353)

SOE FATHOMETERS NO. 75 & NO. 102

LAUNCH NO. 92 Fath #75

From	To	Corr. Fms.
0.0	5.0	+ 0.2
5.1	11.3	+ 0.3
11.4	19.5	+ 0.4
19.6	27.8	+ 0.5
27.9	36.4	+ 0.6
36.5	44.5	+ 0.7
44.6	52.9	+ 0.8
53.0	61.4	+ 0.9
61.5	69.7	+ 1.0
69.8	78.2	+ 1.1
78.3	86.5	+ 1.2
86.6	95.0	+ 1.3
95.1	113.2	+ 1.4
113.3	131.0	+ 1.6
131.1	148.8	+ 1.8
148.9	166.8	+ 2.0
166.9	- - -	+ 2.2

LESTER JONES Fath #102

From	To	Corr. Fms.
0.0	5.6	+ 0.3
5.7	14.0	+ 0.4
14.1	22.4	+ 0.5
22.5	30.8	+ 0.6
30.9	39.2	+ 0.7
39.3	47.4	+ 0.8
47.5	55.9	+ 0.9
56.0	64.0	+ 1.0
64.1	72.1	+ 1.1
72.2	81.0	+ 1.2
81.1	89.8	+ 1.3
89.9	107.5	+ 1.4
107.6	125.5	+ 1.6
125.6	143.0	+ 1.8
143.1	160.5	+ 2.0
160.6	172.0	+ 2.2

PHASE CORRECTIONS
Fathoms

FATHOMETER NO. 75

Scale	Corr.
"B"	± 0.0
"C"	+ 1.2
"D"	+ 2.2

FATHOMETER NO. 102

Scale	Corr.
"B"	(-) 2.6 -2.8
"C"	(-) 5.4
"D"	(-) 6.3

NOTE: One fathometer comparison was taken on this survey (Pages 62-63, Vol. 14) but it was not used for the correction of fathometer soundings. It was considered that one comparison and that in only one depth was not sufficient for the correction of soundings on the entire survey.

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CORRECTIONS TO WIRE SOUNDINGS

HYDROGRAPHIC SURVEY H-8086) - (FIELD NO. LJ-1353)

All wire soundings taken on this survey should be corrected for sheave factor. Sheave No. H-407 (used for all wire soundings) was tested 2 February 1954 and found to have an error of plus 0.5 fm. per 100 fms. A table of corrections follows:

FROM	TO	CORR. FMS.
0	20	+ 0.1
20	40	+ 0.2
40	60	+ 0.3
60	80	+ 0.4
80	100	+ 0.5
100	120	+ 0.6
120	140	+ 0.7
140	160	+ 0.8
160	180	+ 0.9

Copy ~ Cld.

STATISTICS

HYDROGRAPHIC SURVEY H-8086 (FIELD NO. LJ-1353)

DATE 1953	VOL.NO.	DAY LTR.	NUMBER POS.	STAT.MI.SNDGS.	L.L. SNDS.
			LAUNCH #92		
14 Sept.	1	a	85	12.7	- - -
15 Sept.	1&2	b	181	25.6	- - -
16 Sept.	2&3	c	108	14.2	5
17 Sept.	3	d	192	21.1	4
25 Sept.	4	e	211	21.9	9
26 Sept.	5&6	f	237	30.0	- - -
29 Sept.	6&7	g	227	22.7	5
1 Oct.	7	h	153	17.0	- - -
8 Oct.	8	j	62	5.4	3
9 Oct.	8	k	102	6.2	19
10 Oct.	8&9	l	154	11.4	15
11 Oct.	9&10	m	186	11.8	24
14 Oct.	10	n	25	- - -	18
Totals Launch			1923	200.0	102
			Ship LESTER JONES		WIRE SNDGS.
27 Sept.	11&12	A	217	52.7	
28 Sept.	12	B	176	38.6	
30 Sept.	13	C	174	35.1	8
8 Oct.	13	D	10	- - -	10
13 Oct.	14	E	183	30.7	7
14 Oct.	14	F	9	- - -	9
Totals Ship			769	157.1	34
Grand Totals			2692	357.1	136
Ship HODGSON			81	18.2	
			2773	375.3	

Total area of survey = 15.5 sq.stat.miles

PROCESSING OFFICE NOTES H-8086

SMOOTH SHEET

The smooth sheet was hand made in the Seattle Hydrographic Processing Unit using standard methods.

CONTROL STATIONS

As noted in the field report, the hydrographic signals were located by radial plot for the smooth sheet. These positions agree very well, in most cases, with the boat sheet positions.

Of the two signals KIM and COW, noted in the field report, KIM was located by radial plot and checked by sextant cuts. COW was located by sextant cuts. Radial-plot position of ⊙ COW deemed satisfactory; sextant cuts were not fully conclusive. No appreciable shift in hydrography involved.

SHORELINE AND TOPOGRAPHY

The shoreline was transferred from T-5590N and T-5590S (1954) except for the shoreline on the west shore of Henry Island, which was taken from a tracing furnished by Mr. Charles H. Bishop of the Portland Photogrammetric Office. The tracing is attached to this report. (Field Edit shoreline corrections have been applied to reviewed T-5590.)

The elevations of rocks along shore were taken from the hydrographic records and left in pencil.

ADEQUACY OF SURVEY and PA-A-54

This survey appears to be complete and adequate for charting.

The junction with H-8117 was checked and the agreement is good. Depth curves have been correlated.

The junction with H-8116 on the west side of Henry Island appears to be in agreement in depths less than 120 fathoms. In deeper depths there are some differences of 1 or 2 fathoms. Junction adequate.

CROSSLINES

Crossings in depth less than those on "D" scale appear to agree reasonably well. Soundings from "D" scale did not agree by several fathoms even with the same fathometer. It was requested that the Ship HODGSON run some additional crosslines as a check on the lines run by the LESTER JONES. Numerous differences were found which, it is believed, were caused by a loose range switch on the "D" scale. The variation of differences at the crossings seems to bear this out.

Review 7(A)

All crossings between the lines run by the Ship LESTER JONES and the Ship HODGSON were compared and the differences noted. It was felt that, inasmuch as the work by the HODGSON was all done on one day and can be checked easily as to phase correction and index and also soundings corrected to the HODGSON work agree better with the work of the PATTON in 1954, the work of the LESTER JONES should be corrected to the HODGSON work. This was done by tabulating all of the crossings between the HODGSON and the LESTER JONES and applying a correction to the LESTER JONES work. These corrections were applied at about the mid point between crossings.

COMPARISON WITH PRIOR SURVEYS

Checks or corrections under this heading have been made in ink on the field report.

COMPARISON WITH CHART

A 1 fathom sounding between positions 107 and 108 d at Lat. 48° 32'.25, Long. 123° 09'.70, is in the approximate location of the charted "PD" rock.

Review, PG

DANGERS AND SHOALS

Items under this heading checked or corrected in the field report.

Respectfully submitted,

William M. Martin

WILLIAM M. MARTIN
Supervisory Cartographer

APPROVED AND FORWARDED:

Curtis LeFever

CURTIS LE FEVER, CAPT., C&GS
SEATTLE DISTRICT OFFICER

GEOGRAPHIC NAMES PENCILED ON H-8086

ANDREWS BAY

BELLEVUE POINT

DEADMAN BAY

DELACOMBE POINT

HANBURY POINT

HARO STRAIT

HENRY ISLAND

KELLETT BLUFF

LOW ISLAND

MITCHELL BAY

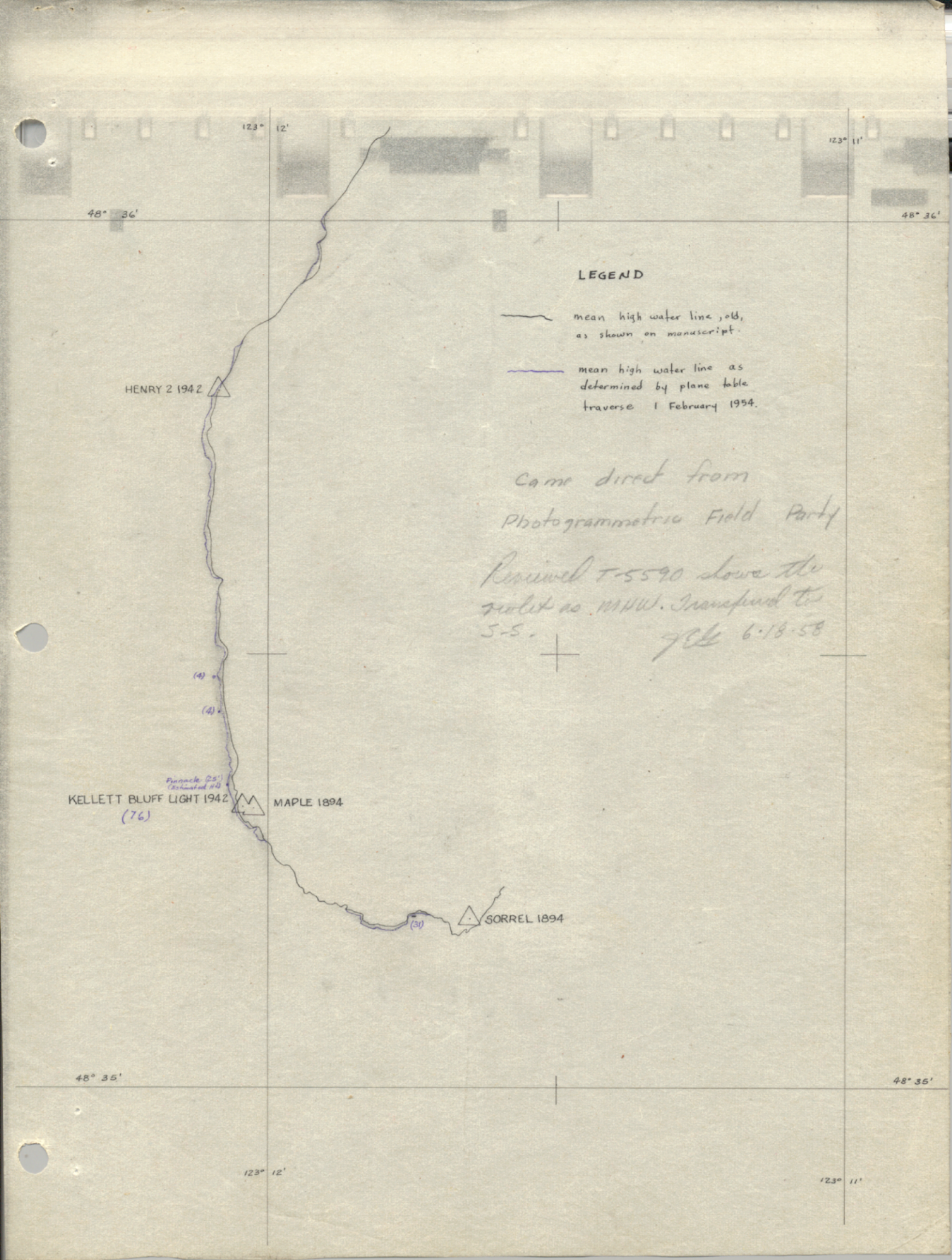
MOSQUITO PASS

OPEN BAY

SAN JUAN ISLAND

SMALLPOX BAY

SMUGGLERS COVE



Came direct from Photogrammetric Field Party

Reviewed T-5590 shore line plotted as MHW. Transferred to T-5. JCH 6-18-58

SUMMARY OF INITIAL, DRAFT & PHASE CORRECTION
IN FATHOMS. FATHOMETER NO. 62S, Ship HODGSON

Initial	Draft	A Scale	B Scale	C Scale	D Scale	
-1.00	+1.30	+0.03	+0.73	+1.93	+1.20	
		+0.33				A Scale
			+1.06			B Scale
				+2.99		C Scale
					+4.19	D Scale

SOUNDING CORRECTIONS

	Fathoms	
A Scale		+0.5
B Scale	31-100 fms.	+1.0
C Scale	31-100 fms.	+3.0
D Scale		+4.0

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form No. 717
Rev. Dec. 1938

SHEET NO. Serial No 4

RECORD OF TEMPERATURES, SALINITIES, AND THEORETICAL VELOCITIES

Ship or party USC&GSS HODGSON, Paul Taylor, Chief of party. 8 Sept (Thursday), 1955
Locality Haro Strait Project CS 1241 (Special) Survey No. H-8086

Date 1955	Time h. m. 120° Mer.	Latitude and longitude	* Depth	Temp. at Depth Obs. °C	Temp. at Depth Cor. °C	Specific Gravity Obs.	Specific Gravity Cor.	At Temp. Obs. °C	At Temp. Cor. °C	† Salinity	Salinity Velocity at temp.	Corrections Sal.	Corrections Pres.	Velocity (theoretical)	Therm. No.	Hydro. No.	Remarks (weather, bottom, etc.)
			Fathoms		Therm Corr.		Cor. of Sp. Gr.				M./Sec.	M./Sec.	M./Sec.	M./Sec.			
9/8	14 10	φ 48° 29.8 λ 123 09.6	0	10.0 *	10.1	1.0235	1.0228	10.3 *	10.4	30.8	30.5T			*	105144 # 9090	T 4785	* Surface # Deep Sea Bot #169
	14 04		2	9.8 #	9.8	1.0235	1.0228	10.3 *	10.4	30.8	30.5T						Bot #170
	13 59		5	9.6 #	9.6	1.0235	1.0228	10.3 *	10.4	30.8	30.6T						Bot #171
	13 54		10	9.5 #	9.5	1.0236	1.0228	9.9 *	10.0	30.8	30.8T						Bot #172
	13 50		20	9.2 #	9.2	1.0239	1.0231	9.8 *	9.9	31.2	31.0T						Bot #173
	13 45		30	9.0 #	9.0	1.0242	1.0234	9.8 *	9.9	31.6	31.2T						Bot #174
	13 39		50	8.5 #	8.5	1.0245	1.0237	9.8 *	9.9	32.0	31.4T						Bot #175
	13 33		75	8.3 #	8.3	1.0246	1.0238	9.6 *	9.7	32.1	31.7T						Bot #176
	13 28		100	8.2 #	8.2	1.0248	1.0239	10.0 *	10.1	32.3	31.7T						Bot #177
	13 03		125	8.0 #	8.0	1.0249	1.0241	10.0 *	10.1	32.5	31.9T						Bot #178
	12 52		150	7.9 #	7.9	1.0250	1.0242	10.3 *	10.4	32.7	31.8T						Bot #179
	12 40		169.5 B	7.8 #	7.8	1.0250	1.0243	10.5 *	10.6	32.8	31.7T						Bot #180
							** Cor. to 15°C										Weather: Overcast. Calm seas. Barometer rising.
												Spec. cup No H 132					Sheave #405
																	~~File~~
																	Bottom: Gravel

* If depth recorded is bottom indicate thus: 965 B
† Express in parts /1000. If by titration indicate thus: 34.15 T

U. S. GOVERNMENT PRINTING OFFICE 11—11506

LAYER ABSTRACT OF TEMPERATURES & SALINITIES

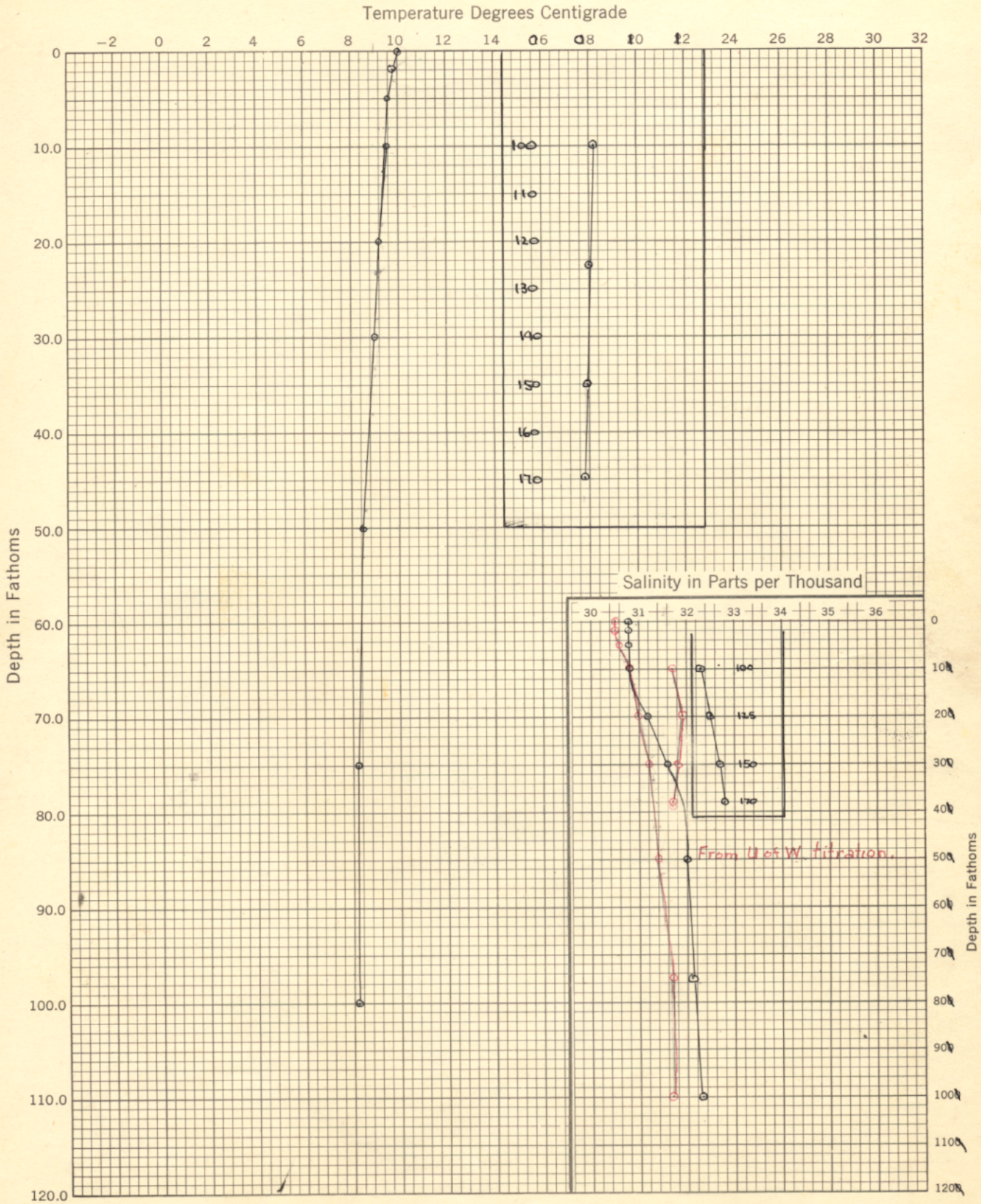
DEPTH Fms.	TEMP °C	SALINITY 0/00
* 8	9.3	31.0
18	9.2	31.0
38	8.8	31.3
58	8.4	31.5
78	8.2	31.7
98	8.2	31.7
118	8.1	31.9
138	8.0	31.8
158	7.9	31.8

(*Index = +0.22 fms.)

"A" scale comparison at mean depth of 8 fms.
T. & S. corrections assumed to be zero at this depth.

GRAPH OF TEMPERATURES AND SALINITIES

U.S. COAST AND GEODETIC SURVEY



Ship USC&GSS Hodgson

Paul Taylor Com'd'g.

Date 9/8/55

Locality Haro Strait

Deep Sea #90901
Surface #105144

Thermometer (Makers) No.

Hydrometer No. T 4785

Serial No. 4

Position: Lat. 48 ° 29.8 ,

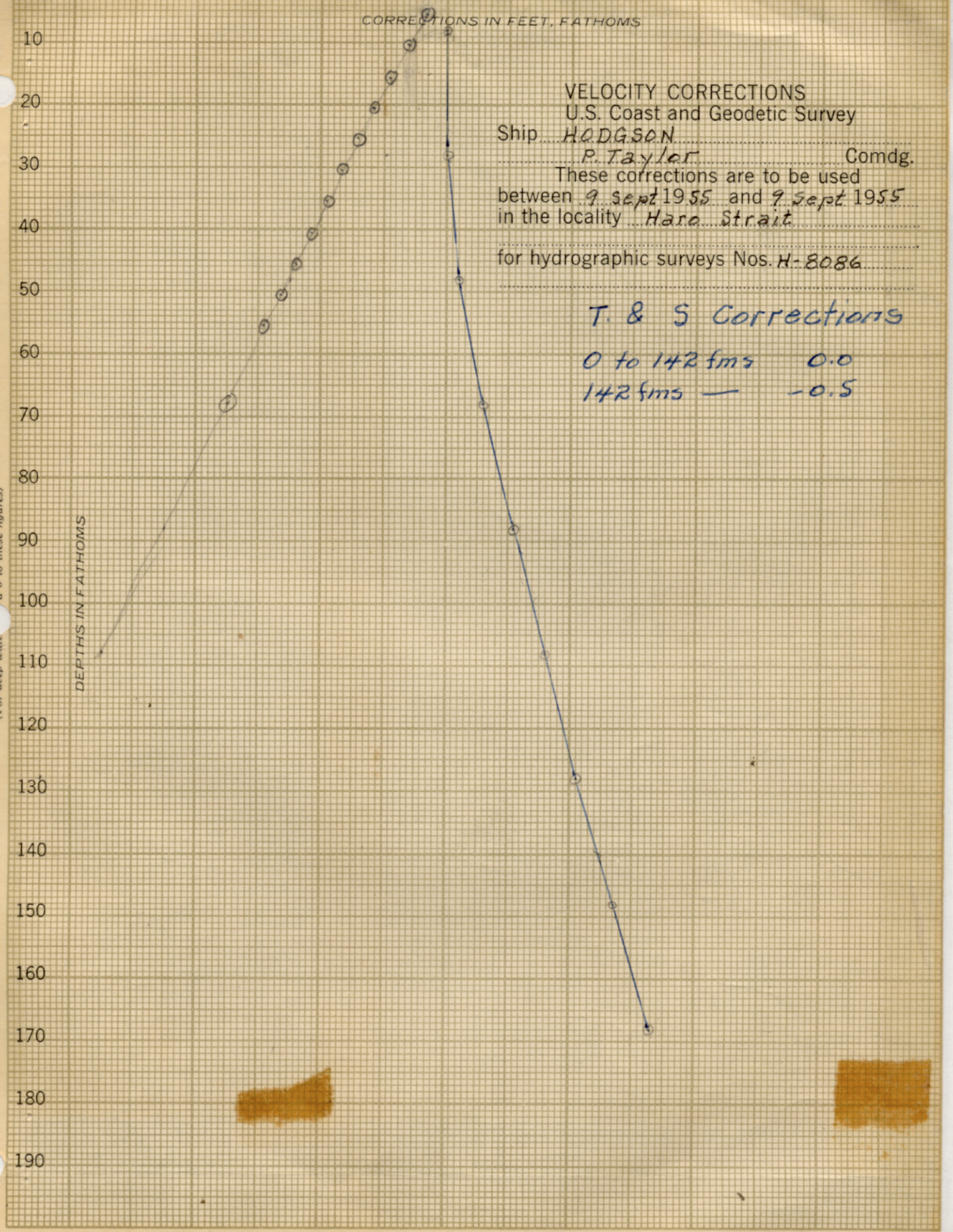
Long. 123 ° 09.6 ,

Salinities by

M-2327-5

Form No J-100-5 +6 +0.4 +0.2 0 -0.2 -0.4

(Let 1 inch equal 4 fathoms for deep water and 1 inch equal 0.4 fathom for shoal.)



VELOCITY CORRECTIONS
U.S. Coast and Geodetic Survey

Ship HODGSON
P. Taylor Comdg.

These corrections are to be used between 9 Sept 1955 and 9 Sept 1955 in the locality Haro Strait

for hydrographic surveys Nos. H-8086

T. & S Corrections

0 to 142 fms	0.0
142 fms —	-0.5

B-1736-5

Appears to be in error. Recomputed by Seattle processing Office

Form No J-100-5

0 +0.2 .4 .6 .8 1.0 1.2 1.4 1.6 1.8 2.0

(Let 1 inch equal 4 fathoms for deep water and 1 inch equal 0.4 fathom for shoal.)

CORRECTIONS IN FEET, FATHOMS

DEPTHS IN FATHOMS

(For deep ... add a 0 to these figures)

10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190

VELOCITY CORRECTIONS
U.S. Coast and Geodetic Survey

Ship HODGSON
Paul Taylor Comdg.

These corrections are to be used
between Sept 9, 1955 and Sept 9 1955
in the locality
HARO STRAIT
for hydrographic surveys Nos. H-8086

0 – 22.0 = 0
22.1 – 68.5 = +0.5
68.6 – 114.0 = +1.0
114.1 – 158.0 = +1.5
158.1 —— = +2.0

B-1736-5

Mid-depth	TEMP	SAL.	VELOCITY @ TEMP.	SALINITY CORR'N @ TEMP	PRESSURE CORR'N	Layer VEL	Corr'n Factor	LAYER corrn	DEPTH CORRN	APP DEPTH
3	9.8	30.5	1486.0	− 5.4	+ 0.1	1480.7	+ .01218	+ .0605	+ .0605	5.5
8	9.5	30.7	84.8	− 5.2	+ 0.3	89.9	.01155	.0578	.1183	10.5
13	9.5	30.8	84.8	− 5.1	+ 0.4	80.1	.01169	.0584	.1767	15.5
18	9.2	31.0	83.7	− 4.8	+ 0.6	79.5	.01128	.0564	.2331	20.5
23	9.1	31.0	83.4	− 4.8	+ 0.7	79.3	.01114	.0557	.2888	25.5
28	9.0	31.2	83.0	− 4.6	+ 0.9	79.3	.01114	.0557	.3445	30.5
33	8.9	31.2	82.6	− 4.6	+ 1.0	79.0	.01101	.0550	.3995	35.5
38	8.8	31.3	82.2	− 4.5	+ 1.2	78.9	.01097	.0548	.4543	40.5
43	8.6	31.4	81.5	− 4.3	+ 1.3	78.9	.01066	.0533	.5076	45.5
48	8.5	31.4	81.1	− 4.2	+ 1.5	78.8	.01046	.0523	.5599	50.5
53	8.4	31.4	81.1	− 4.1	+ 1.7	78.8	.01053	.0526	.6125	55.5
58	8.4	31.5	1481.1	− 4.3	+ 1.9	78.8	.01057	.0528	.6653	60.5
63	8.4	31.5	1480.7	− 4.2	+ 2.0	78.5	.01060	.0530	.7183	65.5
68	8.3	31.6	80.3	− 4.2	+ 2.2	78.3	.01046	.0523	.7696	70.5
73	8.3	31.7	80.3	− 4.0	+ 2.4	78.7	.01073	.0536	.8232	75.5
78	8.3	31.7	80.3	− 4.0	+ 2.6	78.9	.01085	.0544	.8776	80.5
83	8.2	31.7	80.0	− 4.0	+ 2.7	78.7	.01073	.0536	.9312	85.5
88	8.2	31.7	80.0	− 4.0	+ 2.9	78.9	.01087	.0544	.9856	90.5
93	8.2	31.8	80.0	− 4.0	+ 3.0	79.0	.01094	.0547	1.0403	95.5
98	8.2	31.8	80.0	− 4.0	+ 3.2	79.2	.01108	.0554	1.0957	100.5
103	8.2	31.8	80.0	− 4.0	+ 3.4	79.4	.01121	.0560	1.1517	105.5
108	8.2	31.8	80.0	− 3.9	+ 3.6	79.7	.01142	.0571	1.2088	110.5
113	8.1	31.8	79.6	− 3.9	+ 3.87	79.5	.01128	.0564	1.2652	115.5
118	8.1	31.8	79.6	− 3.9	+ 3.9	79.6	.01135	.0568	1.3220	120.5
123	8.0	31.8	79.2	− 3.8	+ 4.1	79.5	.01128	.0564	1.3784	125.5
128	8.0	31.8	79.2	− 3.8	+ 4.2	79.6	.01135	.0568	1.4352	130.5
133	8.0	31.9	79.2	− 3.8	+ 4.4	79.8	.01144	.0572	1.4924	135.5
138	7.9	31.8	78.8	− 3.9	+ 4.6	79.5	.01128	.0564	1.5488	140.5
143	7.9	31.8	78.8	− 3.9	+ 4.87	79.6	.01135	.0568	1.6056	145.5
148	7.9	31.8	78.8	− 3.9	+ 5.0	79.8	.01155	.0578	1.6634	150.5
153	7.9	31.8	78.8	− 3.9	+ 5.1	80.0	.01165	.0584	1.7206	155.5
158	7.9	31.8	78.8	− 3.9	+ 5.3	80.2	.01176	.0588	1.7794	160.5
163	7.8	31.9	78.4	− 4.0	+ 5.4	79.8	.01144	.0572	1.8366	165.5
168	7.8	31.9	78.4	− 4.0	+ 5.6	80.0	.01162	.0581	1.8947	170.5
173	7.8	31.9	78.4	−4.0	+ 5.87	80.1	.01176	.0588	1.9535	175.5

GEOGRAPHIC NAMES

Survey No. H - 8086

Name on Survey	A On Chart No.	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	
Washington			(for title)						BGN	1
San Juan Islands			"							2
Haro Strait									BGN	3
San Juan Island										4
Deadman Bay										5
Bellevue Point										6
Smallpox Bay										7
Low Island										8
Andrews Bay										9
Smugglers Cove										10
Mitchell Bay										11
Hanbury Point										12
Delacombe Point										13
Mosquito Pass										14
Open Bay										15
Kellett Bluff										16
Henry Island										17
			Names approved 11-13-57							18
			H. Heck.							19
Tide Station off sheet:			All names except No. 5 on chart 6379.							20
Kanaka Bay										21
										22
										23
										24
										25
										26
										27

M 234

Hydrographic Surveys (Chart Division)

HYDROGRAPHIC SURVEY NO. ..8086...

Records accompanying survey:

Boat sheets 1....; sounding vols. 15...; wire drag vols. .....;

bomb vols. .....; graphic recorder rolls 5-Envelopes

special reports, etc. .1-Smooth sheet and 1-Descriptive report.

....

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

Number of positions on sheet		......	2773
Number of positions checked		......	160
Number of positions revised		......	1
Number of soundings revised (refers to depth only)		......	357 *
Number of soundings erroneously spaced		......	——
Number of signals erroneously plotted or transferred		......	——
Topographic details	Time	......	16 hrs.
Junctions	Time	......	16 hrs.
Verification of soundings from graphic record	Time	......	16 hrs.

Verification by J. E. Gearhart ....Total time 340. Date 6-24-59

Reviewed by ..A. L. Evans.......... Time 62... Date 7/29/59

* 262 due to incorrect tide reducer

M-2232-1

DIVISION OF CHARTS

REVIEW SECTION - NAUTICAL CHART BRANCH

Review of Hydrographic Survey — Registry No. H-8086

Washington, San Juan Islands, Haro Strait — Field No. LJ-1353

Surveyed - Sept. 1953-Sept.1955 — Scale: 1:10,000

Project No. CS-241

Soundings: 808 depth recorder, hand lead, wire — Control: sextant fixes on shore signals

Chief of Party: K. S. Ulm & Paul Taylor
Surveyed by : K. S. Ulm, Paul Taylor, C. A. Schoene, J. E. Guth
Protracted by : W. M. Martin (Seattle P.O.)
Soundings plotted by: W. M. Martin
Verified and inked by : J. E. Gearhart
Reviewed by: L. V. Evans III 7/29/59
Inspected by : R. H. Carstens

1. Shoreline and Control

The shoreline originates with reviewed photogrammetric survey T-5590 (1954). Several rocks awash in the vicinity of lat. 48°34.8' long. 123°10.9' originate with planetable sheet PA-A-54 (to be destroyed after completion of H-8117); rock information from the planetable survey was confirmed by the hydrography ~~hence~~ PA-A-54 is deemed adequate to supersede T-5590 for the rock data in this vicinity.

The sources of control are given in the Descriptive Report.

2. Sounding Line Crossings

The final soundings have been brought into adequate agreement at crossings (see 7A).

3. Depth Curves and Bottom Configuration

The depth curves are adequately defined by the hydrography.

The bottom slopes precipitously from the shoreline of Henry and San Juan Islands to the deep water (130-160 fms.) of Haro Strait where the bottom is generally smooth with gentle slopes.

4. Junctions with Contemporary Surveys

Adequate junctions were effected with H-8116 (1954) to the north and with H-6818 (1942-43) and H-8085 (1953-54) to the south. The junction with H-8117 (1954-59) will be considered in the review of that survey.

On the west, where the present survey extends to the project limits at the Canadian boundary, depths on this survey are in adequate harmony with charted hydrography.

5. Comparison with Prior Surveys

A. H-333 (1852) 1:214,240 Reconnaissance
H-433 (1854) 1:100,000 "
H-1629 (1884) 1:80,000

These earliest surveys show too few soundings in the present area to afford a worthwhile comparison and are entirely superseded by the present survey.

B. H-2211 (1894) 1:40,000 H-4607 (1926) 1:20,000
H-2216 (1894) 1:10,000

These prior surveys covered the present area with handlead and wire-sounding methods. In the inshore areas there are no important differences between present and prior depths. Along the steep slopes and in the deep water of Haro Strait (100-160 fms.) the prior depths are consistently deeper than present depths by as much as 34 fms. These differences are attributed to combinations of the following factors:

(1) Difficulty on the prior surveys in holding the vessel vertically over the sounding lead in this area of considerable current action, tending to give soundings greater than true depths.

(2) Effect of the steep slopes on the echo soundings of the present survey, giving returns less than the true depth directly under the vessel.

(3) Effect of the steep slopes giving marked differences in depth with relatively little horizontal displacement.

Specific attention is called to the following:

(1) The 14 fm. sounding charted in lat. 48°31.99', long. 123°09.83' from H-4607 is considered to be displaced and should be disregarded. The present closely spaced hydrography adequately discredits this sounding in its charted position in depths of about 36 fms.

(2) The 23 and 14-fm. soundings charted in approximately lat. 48°33.1' long. 123°10.2' are from a line plotted incorrectly on H-4607 and should be disregarded. After correct plotting these soundings are in harmony with the present hydrography.

(3) The 20-fm. sounding charted in lat. 38°34.75' long. 123°11.1' is actually 29½ fms. from H-2216 as verified in the sounding record and is in harmony with the present depths.

With the addition of a number of bottom characteristics carried forward from H-4607 the present survey is considered adequate to supersede the prior surveys within the common area.

6. Comparison with Chart 6379 (print of 11/18/57
Chart 6380 " " 10/13/58

A. Hydrography

The charted hydrography originates mainly with the previously discussed prior surveys, supplemented by some advance data from the present survey.

It is recommended that the sunken rock charted (from Cl 648-1947) in lat. 48°32.4' long. 123°09.7' be moved to the position of the 1-fm. sounding on this survey in lat. 48°32.35' long. 123°09.7' and the "PD" omitted. Although the least depth was not conclusively developed the survey position is considered the probable location of the reported feature.

With the exception noted in the preceding paragraph the present survey is adequate to supersede the charted hydrography within its limits.

B. Aids to Navigation

Lights at Kellett Bluff and Lime Kiln are the only aids to navigation charted in the area of this survey. They are charted in substantial agreement with their survey positions.

7. Condition of Survey

A. The field records are complete except that there was insufficient information for determining phase corrections for the LESTER JONES 808 fathometer. Additional crosslines run by the HODGSON were held and used to derive empirical corrections to correct the soundings by the LESTER JONES.

Corrections ranging from -1.8 to +3.4 fms. applied by the smooth plotter brought soundings by the LESTER JONES into agreement with its own crosslines, with the launch hydrography and with adjoining surveys.

B. The smooth plotting was well done.

8. Compliance with Project Instructions

Except as noted in 7 (A) this survey adequately complies with the project instructions.

9. Additional Field Work Recommended

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

Examined and Approved:

for Wallace A. Bruder
Max G. Ricketts, Chief
Nautical Chart Branch

Ernest B. Lewey
Ernest B. Lewey, Chief
Chart Division

Lorin F. Woodcock
Lorin F. Woodcock, Chief
Hydrography Branch

D. B. Grenell
by J. Bowie
Samuel B. Grenell, Chief
Coastal Surveys Division

Form 712
(11-30-55)

U. S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

TIDE NOTE FOR HYDROGRAPHIC SHEET

Chart Division: R. H. Carstens 25 November 1957

Plane of reference approved in
15 volumes of sounding records for

HYDROGRAPHIC SHEET 8086

Locality Haro Strait, Washington

Chief of Party: K. S. Ulm & P. Taylor in 1953-1955

Plane of reference is mean lower low water, reading

4.8 ft. on tide staff at Kanaka Bay

13.3 ft. below B.M. 1 (1926)

Height of mean high water above plane of reference is 6.6 feet.

Condition of records satisfactory except as noted below:

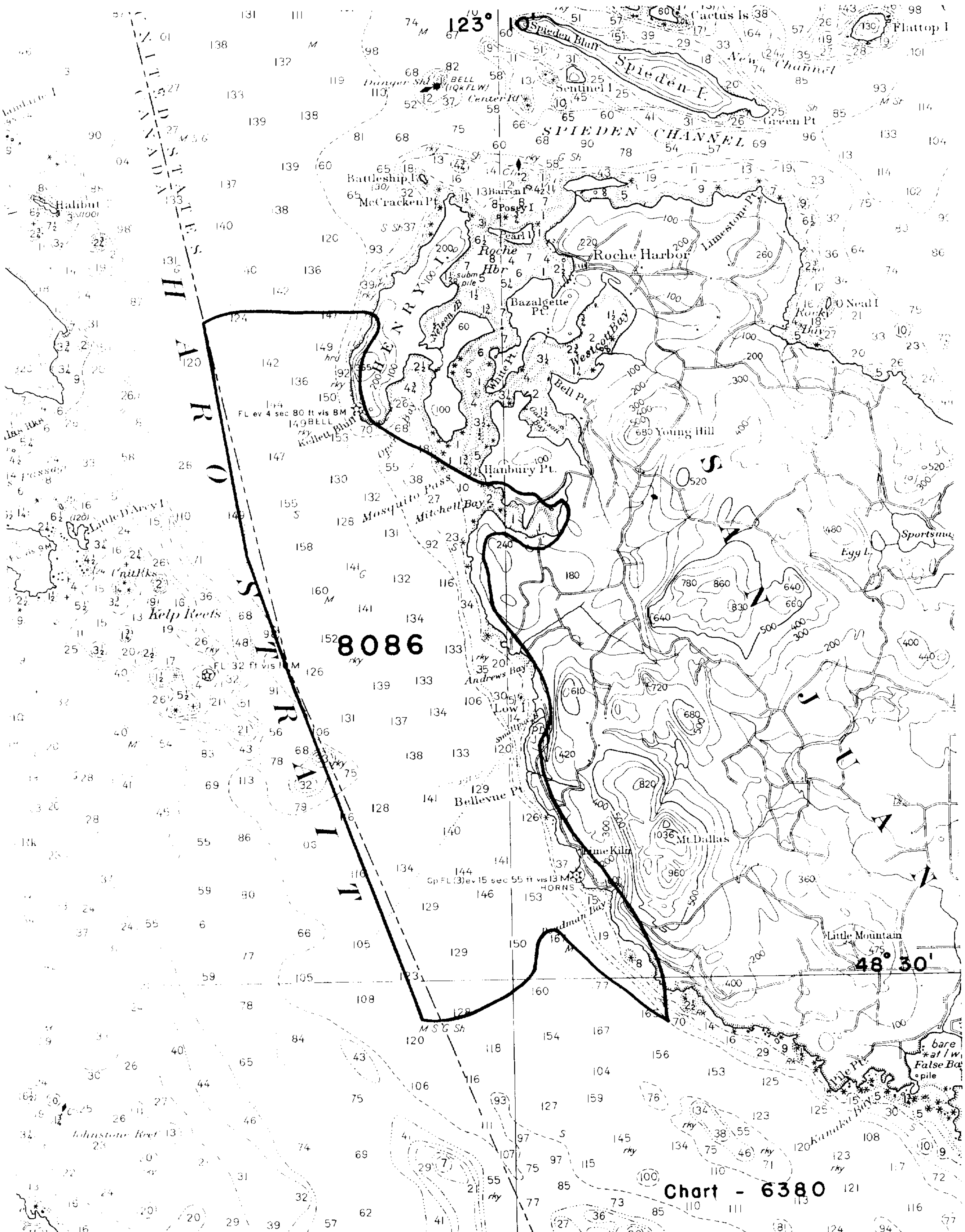
NOTE: Tide reducers for the positions listed below have been revised in red and verified.

Vol.	Positions
6	3g - 126g
12	31B - 132B

William Shupe
Signature

Chief, Tides Branch

Comm-DC 34330


123° 10'
Spieden I.
Spieden Bluff
Cactus Is
Flattop I
New Channel
Sentinel I
Green Pt
SPIEDEN CHANNEL
Danger Sh
Center Rf
Battleship I
McCracken Pt
Barren I
Posey I
Pearl I
Roche Hbr
Roche Harbor
Limestone Pt
HENRY I.
Bazalgette Pt.
Westcott Bay
Nelson B
White Pt
Bell Pt
O Neal I
Rocky Bay
Halibut I
Young Hill
Kellett Bluff
FL ev 4 sec 80 ft vis 8 M
BELL
Hanbury Pt.
Mosquito Pass
Mitchell Bay
Little D'Arcy I
Unit Rks
Kelp Reefs
FL 32 ft vis 10 M
UNITED STATES
CANADA
HARO STRAIT
SAN JUAN
8086
Andrews Bay
Low I
Smallpox Pt
Bellevue Pt
Mt. Dallas
Lime Kiln
Gp FL (3) ev 15 sec 55 ft vis 13 M
HORNS
Deadman Bay
Little Mountain
48° 30'
Egg L
Sportsman
Pile Pt
False Bay
Kanaka Bay
Johnstone Reef
Chart - 6380

NAUTICAL CHARTS BRANCH

SURVEY NO. H-8086

Record of Application to Charts

DATE	CHART	CARTOGRAPHER	REMARKS
9 Dec. '57	6379	H. ElliacEwen	Before [redacted] Verification and Review Partially. Verified by JFW during review - Partially applied JFW 7/21/59
12/1/57	6300	HEM - JFW	Before ~~After~~ Verification and Review Partially
22 Jan '58	6380	H. ElliacEwen	Before [redacted] Verification and Review Partially. SMA
4/8/58	6382	JFW	Before ~~After~~ Verification and Review Examined - not applied
10-31-60	6379	M. Rogers	Before ~~After~~ Fully appld Verification and Review SMA
12-14-60	6380	M. Rogers	Fully appld thru chart 6379 in common area Before After Verification and Review
12-14-60	6382	M. Rogers	Fully appld Before After Verification and Review thru chart 6380
12-15-60	6300	M. Rogers	Fully appld Before After Verification and Review thru chart 6380
5-29-79	18488	Stephen Hall 6-15-79 ROS	Fully applied Before After Verification and Review
			Before After Verification and Review

M-2168-1

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