

6181 (Addl. Work 1937)

(Also Addl. Work, 1937, On Two Other Surveys) { H6180 }
{ H6182 }

(Addl. Work, 1937)

6181

(Also Addl. Work, 1937, On Two Other Surveys)

Form 504
Rev. Dec. 1933
DEPARTMENT OF COMMERCE
U.S. COAST AND GEODETIC SURVEY
R. S. PATTON, DIRECTOR

DESCRIPTIVE REPORT
Topographic } (OW14, 014, OW15)
Hydrographic } Sheet No.

H6181
H6180
H6182

State Oregon-Washington

LOCALITY
Various (See original reports
of surveys involved)

1937

CHIEF OF PARTY
R. W. Knox

J.E.H.

NOV 20 1998

NCP

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.

OW14
O14

Field No. OW15

REGISTER NO. H-6181
H-6180 } Addl. Wk. 1937
H-6182 }

State Oregon - Washington

General locality Columbia River

Locality See Descriptive Report of the Sheet involved.

Scale 1 : 10,000 Date of survey Nov. 15 to 18, 1937

Vessel _____

Chief of Party R. W. Knox

Surveyed by R. W. Knox

Protracted by G. H. Everett

Soundings penciled by "

Soundings in fathoms feet

Plane of reference _____

Subdivision of wire dragged areas by _____

Inked by G. H. Everett

Verified by " "

Instructions dated _____, 19

Remarks: Cover & Title Sheet Executed in Office pending arrival of D. R. from field.

POST-OFFICE ADDRESS: Box 805, Astoria, Oregon.

TELEGRAPH ADDRESS:

EXPRESS ADDRESS:

20 chief SFC
2220P CKG
80-

1937 DEC 15 AM 11 55

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

December 7, 1937.
Ans. 12-17-37.

To: The Director,
U. S. Coast and Geodetic Survey,
Washington, D. C.

From: Lieut. Robert W. Knox,
U. S. Coast and Geodetic Survey.

Subject: Doubtful points arising during review of Columbia River surveys.

Further discussion of the doubtful points arising during the review of this party's hydrographic sheets, as discussed in the August 18th memorandum to the Chief, Section of Field Work, follows:

Paragraph 1. The 13 foot shoal off the docks at Astoria in latitude $46^{\circ} 11.6'$, longitude $123^{\circ} 48.9'$, was not verified, although a large number of 14's were obtained, mostly rocky bottom. It is recommended the original 13 foot sounding be retained.

Paragraph 2. Several lines were run in the vicinity of the shoal southward of Tongue Point. The U. S. Engineers' survey of August 3, 1937, ^{8p. 3/203} a copy of which is attached to the boat sheet, disproves the 11 and 14 foot depths shown on their December 13, 1935 survey, and agrees fairly well with the 1936 work on survey 6180. Differences up to 4 feet are noted between the present work and the latest Engineers' survey.

Paragraph 3. All the piles on Taylor Sands and vicinity have been located by sextant fixes, ^{but two} about 15 and 25 meters, respectively, north-northwest of the pile on position 4a. These are more or less obscured by the fish barn (@ Fish) and it is not believed necessary nor desirable to chart them. All but one of the above piles, that located by position 3a, have subsequently been located by triangulation, as has the downstream gable of the nearby fishhouse. These positions will be forwarded on form 567.

Paragraph 5. Considerable development was done on the shoal area to the westward of Pillar Rock Light, but none of the shoal U. S. Engineer soundings could be verified, although indications of all were found; in one instance within 1 foot and another, 2 feet. The writer was informed that the channel in this vicinity is dredged by hopper

dredges, and it is entirely possible that the changes in the lumpy bottom are due to erosion of the dredge dumpings. It is recommended this party's soundings supersede the Engineers'.

Paragraph 6. The description of Pillar Rock will be found on page 28 of the sounding volume. The distances given were measured with a 13-foot level rod.

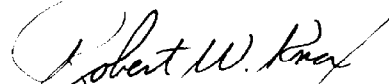
Paragraph 7. The survey of Blind Slough, as far as the proposed dike, and the hydrography of Grizzly Slough, have been accomplished.

Paragraph 9. The writer was informed by the Assistant Engineer in charge of the surveys of the lower Columbia River that the Puget Island channel lies but 100 feet west and 400 feet east of the Hunting Island range. This condition, of course, makes the 30 foot shoal in latitude $46^{\circ} 13.8'$, longitude $123^{\circ} 25.65'$ ^(87.3/205), crowd the range. Soundings of the most recent Engineers' survey, a copy of which is attached to the boat sheet, have been transferred to the boat sheet. Several lines were run to the westward of the channel, and one to the eastward.

Paragraph 10. The shoal soundings off the docks at Clifton were developed.

Paragraph 12. The shoal with least depth of 58 feet in latitude $46^{\circ} 16.4'$, longitude $123^{\circ} 29.65'$, was developed in order to determine its offshore limit.

Paragraph 14. The U. S. Engineers' survey of the Skamokawa Bar, dated August 31, 1937, ^(87.3/204) a copy of which is attached to boat sheet 6181, was not received until after the additional field work between the northwest end of Price Island and Price Island Light was accomplished; consequently soundings appearing on this latest survey have not been transferred to the boat sheet. A comparison of the tracing of the Engineers' survey of April 2, 1936, which likewise is attached to the boat sheet, and their recent survey shows decided differences in most of the areas of the several shoals this party recently investigated. For instance, (a) the most easterly of the green circled soundings, a 31 foot, falls on a 36, and the shoalest sounding in this vicinity is a $34\frac{1}{2}$. This party obtained a 33, which falls in about 37 feet of water, according to the recent Engineers' survey; ^(87.3/204) (b) there is now a $29\frac{1}{2}$ foot patch where the former survey showed 37 feet of water, and upon which this party recently obtained a 31. It is obvious that a system of 40 or 50 meter lines will not properly develop these shoals, but rather a 10 or 15 meter spacing would be required.



Robert W. Knox,
Chief of Party.

CKG
KTA
5

80-DRM

December 17, 1937.

To: Lieutenant Robert W. Knox,
U. S. Coast and Geodetic Survey,
Box 805,
Astoria, Oregon.

From: The Acting Director,
U. S. Coast and Geodetic Survey.

Subject: Doubtful points arising during review of Columbia River
surveys.

Your letter of December 7, 1937, furnishing detailed information on certain features in the Columbia River, is acknowledged with thanks.

This additional information will be of material value in charting the area.

Acting Director.

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

LANDMARKS FOR CHARTS

~~TO BE CHARTED~~ STRIKE OUT ONE

Astoria, Oregon

December 9, 1937

I recommend that the following objects which have ~~(been)~~ been inspected from seaward to determine their value as landmarks, be charted on ~~(the)~~ the charts indicated.
The positions given have been checked after listing.

Robert W. Knox,

Chief of Party.

GENERAL LOCALITY	NAME AND DESCRIPTION	POSITION		DATUM	METHOD OF LOCATION	DATE OF LOCATION	HARBOR CHART	INSHORE CHART	OFFSHORE CHART	CHARTS AFFECTED	
		LATITUDE	LONGITUDE								
		° ' "	° ' "								
Columbia River	triangulation name										
	FISH HO (U/s gable fishhouse No.1)	46 12	1054.8	123 51	662.1	MA'27	tr1	Dec. 1937	X	6151	
	FISH HO (D/s gable fishhouse No.2)	46 13	556.8	123 47	796.2	do	do	do	X	6151	
	PILE (Pile No. 1)	46 13	532.5	123 47	965.4	do	do	do	X	6151	
	PILE (Pile No. 2)	46 13	942.4	123 47	836.9	do	do	do	X	6151	
	PILE (appropriate position as shown from boat sheet; PILE (smooth sheet not available))	46 13	658	123 47	788	do	sextant	do	X	6151	
	PILE (Pile No. 4)	46 13	600.3	123 47	735.4	do	tr1	do	X	6151	
	PILE (Pile No. 5)	46 13	687.3	123 47	620.2	do	tr1	do	X	6151	
	note: there are 5 piles on line, and evenly spaced between pile No. 4 and pile No. 5										
	PILE (pile No. 6)	46 13	1360.3	123 46	1243.8	do	tr1	do	X	6151	
	PILE (Pile No. 7)	46 13	1342.9	123 46	936.5	do	tr1	do	X	6151	
	PILE (Pile No. 8)	46 13	1499.9	123 46	796.7	do	tr1	do	X	6151	
	*now charted										

This form shall be prepared in accordance with 1934 Field Memorandum, "LANDMARKS FOR CHARTS." The data should be considered for the charts of the area and not by individual field survey sheets. Information under each column heading should be given.

Field Records Section (Charts) H-6181 }
H-6180 } (Addl. Wk. 1937)
H-6182 }

HYDROGRAPHIC SHEET NO.

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

Number of positions on sheet	470
Number of positions checked	.....
Number of positions revised	.....
Number of soundings recorded	1113
Number of soundings revised	.....
Number of signals erroneously plotted or transferred	.....

Date:

Office Plotting by G.H. Everett

Verification by

Review by

S. Risegari
J. A. Mc Cormick
J. A. Mc Cormick

Time: 37 $\frac{1}{4}$ hrs

Time: 17 $\frac{1}{2}$ hrs (H-6182 Addl Wk 1937)

12 $\frac{1}{2}$ hrs (H-6181 Addl Wk 1937)

6 hrs (H-6180 Addl Wk 1937)

VERIFICATION REPORT ON H-6180-81-82 (Add'l. Work 1937)

The records conform to the general requirements.

The office work consisted of ~~the~~ checking the reduced soundings which were not checked in the field and the plotting of the work on the smooth sheets involved.

There is one sounding volume and one report for the three sheets.

Work on H-6182

Note - For work off Price Island, the B.S. plotting will appear different for some lines than the Sm. Sh. because \odot Lan is incorrectly plotted on the B.S.

Curves have been revised on this sheet where affected by the additional work.

Differences Listed Below.

A 1937 work (Pos.)	Soundings (feet)		Location	Soundings inked on sheet	Remarks
	1937 Work	1937 ⁶ Work			
60-61b	26	29	46°-15.58' 123°-27.38'	26	29 deleted to show 26 but was not on top of each other.
63-64b	28	36	-15.61' -27.34'	28'	1937 ⁶ work 30-36 feet 1937 - less than 30 feet
101-102b	28-30	34-36	-15.86 -27.6'	28-30	34-36 deleted
103b	29	34	-15.79' -27.6'	29'	34 deleted
6c	34	27	-15.64' -27.4'	27'	34 not plotted
		58'	-16.4' -29.65'		58 ft. shoal not detached but joined to main 60 ft. curve
27-28b	35	45	46°-15.5' 123°-27.0'	35	45 deleted

Work on H-6181

Curves revised where affected by additional work. Completion of this sheet waiting information from field ~~on~~ for work in Blind Slough.

4/7/38 Add'l work plotted in Blind Slough.
shore line, signals and piling from T-6573b (1937) plane table survey. Add'l Time 7 hrs.
JHE

Work on H-6180

The new location of Tongue Point Crossing Light 1937 was plotted from the triangulation data submitted. It was used as a signal in the additional work.

All new piles located except for the one located by 11a and the 5 piles between no. 4 and no. 5 have been plotted from the triangulation data. It was noted that considerable shrinkage has taken place in this sheet and allowance for the change in the projection was made in the plotting of these stations.

The down stream gable of the fish house at Lat. $46^{\circ}-13.3'$; Long. $123^{\circ}-47.6'$ was located by triangulation. The position as plotted checks well with the S.W. corner location and description as given in 1935 work (Pos. 10). The position (or orientation) of the fish house as inked on H-6180 had to be changed to agree with the additional information furnished. The gable was not inked as a triangulation station.

Lat. $46-13.1$; Long. $123-45.4$. The 1937 work (240-29a) shows greater depth. Apparently the 11 foot shoal (1935 work) no longer exists. Curves were not revised in this area since there appears to be changes since the 1935 work. Soundings in pencil are from the 1937 work.

Apr. 13, 1938 - Astoria Troller Basin plotted in insert, scale 1:5000
Refer to T-6573a (1937). Δ stations plotted from unadjusted values to conform with H-6180.

Add'l time - 12 hrs.

Submitted 2/3/38 JHE

H-6181 }
HYDROGRAPHIC SURVEY NO. H-6180 } (Addl. Wk. 1937)
H-6182 }

Smooth Sheet Originals

Boat Sheet Originals

Sounding Records One Vols. (Common to three survys)

Descriptive Report Cover & Title Sheet executed pending receipt of
of D. R. from the field

Title Sheet Do,

List of Signals _____

Landmarks for Charts (Form 567) None

Statistics _____

Approved by Chief of Party _____

Recoverable Station Cards (Form 524) None

Special Chart for Lighthouse Service None
(Circular Nov. 30, 1933)

Remarks _____

HYDROGRAPHY

Total Days 4

Last Date Nov. 18, 1937

MEMORANDUM

IMMEDIATE ATTENTION

SURVEY DESCRIPTIVE REPORT XXXXXXXXXX	}	No. XXXX	H-6181 H-6180 H-6182	} Addl. Wk. 1937	{ received Dec. 20, 1937 registered Dec. 23, 1937 verified reviewed approved
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This is forwarded in order that your attention may be directed to the matters as indicated below. Please initial in column 3 as an acknowledgement that your attention has been thus directed. The complete original records are available if desired. If you cannot give this your immediate attention, please initial, note, and forward to the next section marked, calling for the records at your convenience.

ROUTE		Initial	Attention called to
20			
22			
24			
25			
26			
30			
40			
62			
63			
82			
83			
88			
90			

RETURN TO

82	C. K. Green
----	-------------

✓

H:6181 (1937) add work

POST-OFFICE ADDRESS: Box 805, Astoria, Oregon.

TELEGRAPH ADDRESS:

EXPRESS ADDRESS:

DEPARTMENT OF COMMERCE

U. S. COAST AND GEODETIC SURVEY

February 9, 1938.

80
~~20~~
1938 FEB 14 AM 9:17

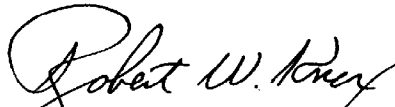
To: The Acting Director,
U. S. Coast and Geodetic Survey,
Washington, D. C.

From: Lieut. Robert W. Knox,
U. S. Coast and Geodetic Survey.

Subject: Hydrographic surveys H-6180 and H-6181.

With reference to the Acting Director's letter of February 4, 1938, regarding additional hydrography accomplished in Blind Slough and the Astoria troller basin, you are respectfully informed that the shore line and signals used in this work originate from plane table surveys which have not as yet been forwarded to the office. It is expected that this will be done in about two weeks.

The original structure of Tongue Point Crossing Light, which was relocated the latter part of 1937, has been entirely removed.



Robert W. Knox,
Chief of Party.

Disposed of - 7
May 12, 1938.
J. A. Mc Cormick

Rac

TIDE NOTE FOR HYDROGRAPHIC SHEET

January 10, 1938

Division of Hydrography and Topography:

✓ Division of Charts: Attention: Mr. E. P. Ellis

Plane of reference

Tide Reducers are approved in

1 volumes of sounding records for

HYDROGRAPHIC SHEET 6180-81-82 Additional work, 1937

Locality Columbia River

Chief of Party: Robert W. Knox in 1937

Plane of reference is Columbia River Datum, reading

1.3 ft. on tide staff at Clifton

20.1 ft. below B.M. 1

- 1.0 ft. on T.S. at Knappa

7.1 ft. below B.M. 1

2.5 ft. on T.S. at Astoria (Port Docks)

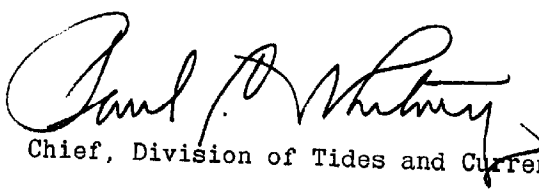
16.5 ft. below B.M. E 31

1.9 ft. on T.S. at Shamokawa

9.2 ft. below B.M. 1

Height of mean high water above plane of reference is 6.3 feet at Clifton; 7.1 feet at Knappa; 7.5 feet at Port Docks; and 6.5 feet at Shamokawa.

Condition of records satisfactory except as noted below:


Chief, Division of Tides and Currents.

Section of Field Records

REVIEW OF HYDROGRAPHIC SURVEY NO. 6181 Ad. Wk.(1937) FIELD NO. OW14

Elliott Point to Three Tree Point, Columbia River,
Oregon - Washington.

Surveyed in November 1937, Scale 1:10,000.

Instructions dated August 20, 1937 and October 8, 1937
(Letters to R. W. Knox).

Hand Lead Soundings.

3 Point fixes on shore signals.

Chief of Party - R. W. Knox.

Surveyed by - R. W. Knox.

Protracted by - G. H. Everett.

Soundings plotted by - G. H. Everett.

Verified and inked by - G. H. Everett.

1. Purpose of Survey.

The purpose of this survey was to accomplish additional work called for in paragraphs 10a, b and c of the review of H-6181 (1936).

2. Office Work.

The additional work was plotted on the boat sheet in the field but the smooth plotting was done in the office, the position numbers and day letters being indicated in green and the soundings in blue.

3. Results of Survey.

The Descriptive Report is a combined report covering the additional work on H-6180, H-6181 and H-6182. The report and sounding record for the three sheets have been filed under H-6181 Addl. Work. The various items of additional work on H-6181 are discussed below:

a. Reference par. 10a, review of H-6181.

Additional lines were run to develop the shoal area within the 30-foot curve in approximate lat. $46^{\circ} 15.5'$, long. $123^{\circ} 35.5'$ to the westward of Pillar Rock Light. Thirty feet was the least depth found in the vicinity of the 26-foot depth charted in lat. $46^{\circ} 15.55'$, long. $123^{\circ} 35.8'$ from U. S. Engineers' blueprint 27775 of June 1934. The least depth found on the shoal was 24 feet which is in fair agreement as to position with a 23 (not charted) on the blueprint. There is evidence of considerable change in this vicinity, the descriptive report stating that hopper dredges operate in the area and Engineers' surveys of Aug. 1934 (blueprint 27991) and May 1935 (blueprint 28705) showing a deepening where they overlap blueprint 27775 on

the edge of the channel. The combined development of the original and additional work on H-6181 is considered sufficient and being of a later date should supersede the Engineers' surveys in the common area.

b. Reference par. 10b, review of H-6181.

The shape and elevation above mean high water of Pillar Rock in lat. $46^{\circ} 15.5'$, long. $123^{\circ} 35.15'$ were determined. The elevation was noted on page 28 of the sounding record as 16 feet above the water but from other work on that day it was deduced in the office that the measurements were taken at the time of high water and the elevation of 16 feet has been accepted as being referred to the proper datum plane.

c. Reference par. 10c, review of H-6181.

The survey of Blind Slough was continued to the site of a proposed dike and the tributary, Grizzly Slough, as far as was practicable. Additional topographic signals and shoreline for this work originate with T-6573b (1937). There are no prior surveys by this Bureau in this area and no soundings charted.

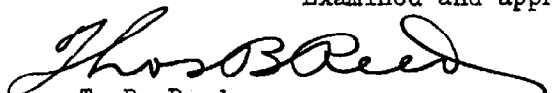
d. Aids to Navigation.

Positions determined on the additional work for can buoy "1" and lighted buoy "6" in lat. $46^{\circ} 15.5'$, long. $123^{\circ} 35.5'$, and lat. $46^{\circ} 15.4'$, long. $123^{\circ} 34.4'$ respectively are in substantial agreement with those charted. Lighted buoy "6" has been moved approximately 0.4 mile eastnortheast, however, subsequent to the date of the survey (Lighthouse Notice to Mariners 9 of 1938) to a location which more adequately marks the feature intended.

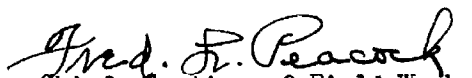
4. Reviewed by - J. A. McCormick, April 30, 1938.

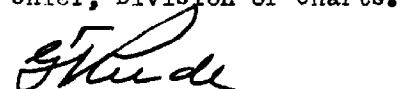
Inspected by - A. L. Shalowitz.

Examined and approved:


T. B. Reed,
Chief, Section of Field Records.


K.T. Adams
Chief, Division of Charts.


Fred. F. Peacock
Chief, Section of Field Work.


G. H. de
Chief, Division of H. & T.

affixed to drawing of 6152.

July 7, 1938

J. H. S.

6181

(See D.R. 6181 Addl. Wk. 1937)

U. S. COAST & GEODETIC SURVEY
LIBRARY AND ARCHIVES

1937

6181

(See D.R. 6181 Addl. Work 1937)

Form 504
Rev. Dec. 1933
DEPARTMENT OF COMMERCE
U.S. COAST AND GEODETIC SURVEY
R. S. PATTON, DIRECTOR

DESCRIPTIVE REPORT

Topographic } Sheet No. OW-14
Hydrographic }

State OREGON - WASHINGTON

LOCALITY

COLUMBIA RIVER

ELLIOTT
ELLIOTT POINT to

THREE TREE POINT ✓

1936

CHIEF OF PARTY

Robert W. Knox

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

U. S. COAST & GEODETIC SURVEY
LIBRARY AND ARCHIVES
APR 9 1936
REG. NO.

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.

Field No. OW-14

REGISTER NO. **H6181**

State OREGON-WASHINGTON

General locality COLUMBIA RIVER

Locality ELLIOTTPOINT TO THREE TREE POINT

Scale 1-10000 Date of survey June-July, 19 36

Vessel Chartered Launch 29N295

Chief of Party Robert W. Knox

Surveyed by Robert W. Knox

Protracted by C. R. Reed

Soundings penciled by C. J. Wagner

Soundings in ~~fathoms~~ feet

Plane of reference Low Water Plane (MLLW During Lowest River Stages)

Subdivision of wire dragged areas by

Inked by Leonard A. McGinn

Verified by Leonard A. McGinn

Instructions dated February 26, 1935

Remarks:

DESCRIPTIVE REPORT
TO ACCOMPANY HYDROGRAPHIC SHEET

OW-14

Scale 1-10000

1 Instructions Dated: Feb. 26, 1935 Robert W. Knox, Chief of Party

2 Area, Limits, etc. This sheet covers the area on the Columbia River from a line south of Elliott Point to a line south of Three Tree Point.

3 (1925) This survey joins Hydrographic Survey No. 5927 south of Elliott Point with satisfactory agreement. * See review par. 6 for exceptions.

4 (1935) This survey joins Hydrographic Survey No. 5928 south of Snag Island Jetty with satisfactory agreement. * See review par. 6 for exceptions.

5 This survey joins Hydrographic Sheet OW-15 on its eastern limits with satisfactory agreement. H-6182 (1936) (Field No)

6 SURVEY METHODS: Standard survey methods were used on this survey. Handlead soundings were taken with a 12 pound lead, using the usual bronze-centered mahogany tiller rope (Sampson Cordage Co.). The deep soundings were taken with a hand wire sounding machine, using stranded wire. The leadlines were checked frequently and corrections entered to the nearest half foot.

7 DANGERS: There are no dangers in the area covered by this survey. However, local knowledge is necessary to navigate any but the main ship channel.

8 Anchorage: There are no anchorages in the area covered by this survey.

9 COMPARISON WITH PREVIOUS SURVEYS: No copies of previous surveys were furnished the party, but a comparison with the surveys by the U. S. Engineers in May 1935 and December 1936 was made. The soundings of the two surveys agree satisfactorily. There is, however, such greater development on the present survey that a detailed comparison with previous surveys would serve no useful navigational purpose. * Not received in Office. 7/21/37 Date Dec. 11, 1936 on Boat Sheet

10 DISCREPANCIES: The soundings on the line from 78 to 81 d day appear too deep by from 2 to 3 ft. and it is recommended that the depths determined on the lines crossing these soundings be accepted. Lat 46° 15.2' Long 123° 24.5'

11 The soundings between pos. 10 and 11 e day appear to be a few seconds out in time and the depth curves drawn neglecting these sounding. Can't find any discrepancies here. corrected. Fair.

12 The sounding before pos. 20 b day appears to be a few seconds out in time, and should be disregarded when drawing depth curves. This is close to the edge of deep water and depths change rapidly. corrected. Fair.

25
CHANNELS: This survey covers the area of the main ship channel from Elliot Point to Three Tree Point, with minimum depth of about 33 ft.

This survey covers Woody Island Channel from Snag Island Jetty to Woody Island, with minimum depth of about 13 ft.

This survey covers the Prairie Channel from south of Carlson Island to Aldrich Point, with minimum depth to Knappa of about 13 ft. and about 6 ft. to Aldrich Point.

This survey covers Marsh Island Cr. with a minimum depth of about 2 ft.

The channel to the southwest of Woody Island has a Minimum depth of about 6 ft.

GEOGRAPHIC NAMES: Geographic Names for this area have been discussed in reports submitted with companion topographic sheets.

GENERAL: Leadline corrections are entered to the half-foot and tide reducers entered to the half-foot where necessary to enter leadline corrections, otherwise the tide reducers are entered to the foot.

Respectfully submitted,

Clifton J. Wagner
Clifton J. Wagner,
Jr. H. & G. E.

Approved and Forwarded:

Robert W. Knox
Robert W. Knox,
H. & G. E.,
Chief of Party.

STATISTICS

SHEET OW-14

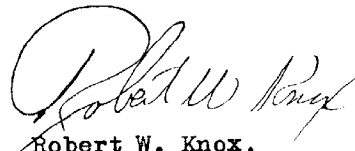
	Date 1936	Day letter	Volume	Number of soundings	Number of Positions	Statute miles of sounding	Boat
June	23	a	1	314	66	7.1	29N295
	25	b	1	515	130	16.4	
	26	c	1 & 2	657	142	21.6	
	29	d	2	660	127	21.1	
	30	e	2	865	174	24.6	
July	1	f	2 & 3	903	204	25.6	
	2	g	3	739	168	21.6	
	6	h	3	421	101	13.2	
	7	j	3 & 4	761	188	21.1	
	9	k	4	1 003	231	25.1	
	10	l	4 & 5	329	73	8.3	
	13	m	5	858	190	20.5	
	14	n	5	825	174	18.4	
	15	p	5 & 6	806	174	17.5	
	16	q	6	233	51	5.2	
	22	r	6	123	83	4.1	
	23	s	6	46	23	1.0	
				<hr/> 10,058	<hr/> 2,299	<hr/> 272.4	

Area in square statute miles = 9.0

APPROVAL BY CHIEF OF PARTY

Hydrographic Sheet OW-14 has been inspected by me and approved. The field and office work were done under my personal supervision.

No additional work is considered necessary.

A handwritten signature in cursive script, reading "Robert W. Knox". The signature is written in dark ink and is positioned above the typed name.

Robert W. Knox,
H. & G. E.,
Chief of Party.

Report on H-6181 (1936).

The records conform to the requirements of the General Instructions of the Hydrographic Manual except that the data called for on the cover labels has been entered in blue ink while the instructions specify black ink. (Cover label - pos. numbers + day letters shown here in color (red). Title page of pos. record - should have been in black.)

As it may be seen from an inspection of this survey, it is impossible to show all depth curves, due either to the steepness of the slope or the lack of sufficient soundings.

The section of sounding lines between 97-98j day (red) has not been shown. (Volume 4). Lat. $46^{\circ} 15' 75''$. Longitude. $123^{\circ} 33' 15''$. Position 98j is believed to be in error and is recommended for rejection. See Volume 4. This position is the end of the line and plots of j-lines.

The shorelines and signals for this hydrographic survey have been determined by plane table surveys of T-6385a, T-6385b (1935), T-6386 (1935) and T-6522(a) (1936).

The junction with H-6182 (1936) on the east is satisfactory. On the west there are two temporarily adjoining surveys, namely, H-5927 (1935) and H-5928 (1935). These surveys were made 12 months before H-6181 was made. Some shoaling and scouring has taken place since the time of H-5927 and H-5928. On this account satisfactory junctions could not be made with the latter surveys.

Junctions were made by means of the tracing paper method.

Leonard A. McGowan
June 12, 1937.

These changes were made in the office

Field Records Section (Charts)

HYDROGRAPHIC SHEET NO. **H6181**

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

Number of positions on sheet	.2299.
Number of positions checked	...89
Number of positions revised	...11.
Number of soundings recorded	10.058
Number of soundings revised	..70..
Number of signals erroneously plotted or transferred	.....

Date: *June 11, 1937*

Verification by *Leonard A. Kulsamer*

Time: *85 hours.*

Review by *A. Pisegari*

Time: *6 da. 6 hrs.*

HYDROGRAPHIC SURVEY NO. H6181

Smooth Sheet Yes

Boat Sheet Yes

Sounding Records 6 Vols. _____

Descriptive Report Yes

Title Sheet Yes

List of Signals Vol#1

Landmarks for Charts (Form 567) Yes

Statistics Yes

Approved by Chief of Party Yes

Recoverable Station Cards (Form 524) None

Special Chart for Lighthouse Service None
(Circular Nov. 30, 1933)

Remarks _____

HYDROGRAPHY

Total Days 17

Last Date July 23, 1936

Remarks

Decisions

	Remarks	Decisions
1	For Title	USGO decision
2		see T-6386
3		" "
4		see T-6386
5		" "
6		" "
7		" "
8		" "
9	For Title	USGO decision
10	For Title	
11		see T-6385
12		
13		see T-6385
14		" "
15		" "
16		" "
17	Retored to Field Party.	GNB (1937) see T-6386
18	Answer - See GNB (1937)	
19		
20		
21		
22		
23		
24		
25		
26		
27		
M 234		

GEOGRAPHIC NAMES

Survey No. **H6181**

Name on Survey	<div style="display: flex; justify-content: space-between; font-size: small;"> On Chart No. 6152 On previous survey No. On U. S. Quadrangle Maps From local information On local Maps P. O. Guide or Map Rand McNally Atlas U. S. Light List </div>										
	A	B	C	D	E	F	G	H	K		
<u>Washington</u> (state)	✓										1
X <u>Woody Island</u>	appd										2
X <u>Marsh Island Creek</u>	✓										3
X <u>Marsh Island</u>	appd										4
X <u>Prairie Channel</u>	appd										5
X <u>Long Island</u>	appd										6
^ <u>Blind Slough</u>	appd										7
X <u>Carlson Island</u>	appd		Carlson I *			USFRS		12-4-41			8
<u>Oregon</u>	✓										9
<u>Columbia River</u>	appd										10
X <u>Pillar Rock</u> LT	appd										11
X <u>Woody Island Chan</u>	appd										12
✓ <u>Jim Crow Pt</u>	appd										13
X <u>Brookfield</u>	appd										14
✓ <u>Three Tree Pt</u>	appd										15
X <u>Elliott Pt</u>	appd										16
✓ <u>Columbia Slough</u> WATSON SA	appd										17
											18
											19
											20
											21
											22
											23
											24
											25
											26
											27

Names underlined in red approved
by JHE on 4/17/37

200

TIDE NOTE FOR HYDROGRAPHIC SHEET

CS-5-5-37

May 6. 1937.

Division of Hydrography and Topography:

✓ Division of Charts: Attention Mr. E. P. Ellis

Tide Reducers are approved in
6 volumes of sounding records for

HYDROGRAPHIC SHEET 6181

Locality Pillar Rock - Three Tree Point, Columbia River.

Chief of Party: R. W. Knox in 1936
Plane of reference is Columbia River Datum (M LLW during lowest river stages),
1.7 ft. on tide staff at Knappa reading
7.1 ft. below B.M. 1
2.8 ft. on tide staff at Brookfield
12.5 ft. below B. M. 1
1.2 ft. on tide staff at Aldrich Pt.
13.8 ft. below B. M. 1

Height of mean high water above plane of reference is approximately 7 feet.

Condition of records satisfactory except as noted below:

Stam
Cooley Chief, Division of Tides and Currents.

MEMORANDUM

IMMEDIATE ATTENTION

SURVEY DESCRIPTIVE REPORT PHOTO STAT OF	}	No. H-6181 No. 6181	{ received April 9, 1937 registered April 16, 1937 verified reviewed approved
--	---	---------------------------------------	---

This is forwarded in order that your attention may be directed to the matters as indicated below. Please initial in column 3 as an acknowledgement that your attention has been thus directed. The complete original records are available if desired. If you cannot give this your immediate attention, please initial, note, and forward to the next section marked, calling for the records at your convenience.

ROUTE		Initial	Attention called to
20			
22			
24			
25			
26			
30			
40			
62			
63			
82			
83			
88			
90			

RETURN TO

82	C. K. Green
----	-------------

✓

POST-OFFICE ADDRESS: Box 805, Astoria, Oregon.

TELEGRAPH ADDRESS:

EXPRESS ADDRESS:

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

October 9, 1937.

To: The Director,
U. S. Coast and Geodetic Survey,
Washington, D. C.

From: Lieut. Robert W. Knox,
U. S. Coast and Geodetic Survey.

Subject: Hydrographic survey No. 6181.

Reference: The Director's letter of September 30th, 80-MCW

*the log raft probably
temporarily in that location -
perhaps being towed at the
time of hydrography -*

*80 C K G
13 M 12 U*

With reference to the notation "line is running along-
side log boom", appearing in the records in the vicinity of latitude
46° 11.5', longitude 123° 35.2', of the above mentioned survey,
you are respectfully advised that the notation should have been,
"running alongside of log raft". The dashed lines shown on the
survey represents the lines of piling used to secure log rafts
while in storage. In some instances the logs are not fatted, but
are surrounded by so-called "boom sticks", and it is probably one
of these referred to in the records.

As shown on the sheets, dolphins are spaced in the line
of piling at intervals of about 250 to 300 meters. It is not be-
lieved that the term "log boom" should be applied to these features,
as logs are seldom stores on the inshore side of the piling.

Robert W. Knox
Robert W. Knox,
Chief of Party.

*Notations made on H-6181 and T-6386
in accordance with above information.*

A. I. S.

25

25

CKG
R

80-MCW

September 30, 1937.

To: Lieutenant R. W. Knox,
U. S. Coast and Geodetic Survey,
P. O. Box 805,
Astoria, Oregon.

From: The Director,
U. S. Coast and Geodetic Survey.

Subject: Photostat of a section of Hydrographic Survey No. 6181
(1936) Field No. OW-14.

Enclosed herewith is a photostat of a section of Hydrographic
Survey No. 6181 (1936) Field No. OW-14.

The dashed line shown outside of the high water line was trans-
ferred to the smooth sheet, by the field party, from contemporary
Topographic Survey T-6386 (1935). This line is assumed to represent
the outer limits of log booms. The boat sheet shows numerous nota-
tions of "logs" outside of the dashed line. In the vicinity of lati-
tude 46°11.5', longitude 123°35.2' the sounding record notes that
"line is running alongside of log boom", although this sounding line
is 70 meters out in the channel from the dashed line.

In order that the log boom area may be properly charted, informa-
tion is desired as to the exact significance of the dashed line and
also whether or not there are obstructions in the channel outside of
the dashed line.

(Signed) J. H. Ellsworth

Enclosure.

Acting Director.

See reply attached.

Section of Field Records

REVIEW OF HYDROGRAPHIC SURVEY NO. 6181 (1936) FIELD NO. OW-14

Elliott Point to Three Tree Point,
Columbia River, Oregon - Washington.
Surveyed in June -July, 1936, scale 1:10,000.
Instructions dated February 26, 1935 (R. W. KNOX)

Hand Lead and Machine Soundings.

3 Point Fixes on shore signals.

Chief of Party - R. W. Knox
Surveyed by - R. W. Knox
Protracted by - C. R. Reed
Soundings plotted by - C. J. Wagner
Verified and inked by - L. A. McGann

1. Condition of Records.

The records are neat and legible and conform to the requirements of the Hydrographic Manual except as follows:

- a. Buoys that were located from sounding lines were not recorded in the index pages of respective volumes.
- b. Pillar Rock Channel F.R. 6 Beacon was plotted on the sheet by the field party. This was changed in the office to Buoy FLR6. The latter replaced the beacon on November 6, 1935 (LH N to M 45 of 1935), and was verified in Vol. 4, pos. 157J.
- c. The day letters on the cover label of the sounding records were not in their appropriate color and the data on the title pages was in pencil. The necessary changes were made in the office.
- d. The objects on which the topographic signals, falling outside the high water line, were not indicated on the smooth sheet. In most of these cases the information added on the sheet was obtained from a list of descriptions of topographic signals given in the descriptive report of T-6386 (1935). There are a number of other cases that are not listed which appear to be connecting points of the log boom area, assumed to be the heavy dashed line on the topographic sheet, and are probably dolphins. The other signals Tru (Lat. 46° -13.9', Long. 123° -34.9') and Sin (lat. 46° - 13.3', Long. 123° -33.2') the former falling inside the low water line and the latter just outside the high water line, are probably piles.

e. The descriptive report is faulty in the following respects:

- (1) The report makes no mention of Three Tree Bar Beacon which is no longer charted but which was used by the field party as a hydrographic signal. (see Par. 8b (2) this review).
- (2) A statement should have been included explaining why the main channel east of Jim Crow Point was surveyed but not the portion west of Jim Crow Point, when at the time of the present survey both portions were covered by the engineer's survey of 1935 (Blueprint 28,705). This might have accounted for the discrepancies noted in Par. 8a, (2) (c) this review.
- (3) Paragraph 9, page 1, states that "a comparison with the surveys by the U. S. Engineers in May, 1935 and December 1936 was made. The soundings of the two surveys agree satisfactorily." This statement cannot be reconciled with the office comparison of the 1935 survey and of the soundings from the 1936 survey as transferred to the boat sheet by the field party. Material differences were noted between the present survey and both engineers' surveys in a number of cases. A detailed discussion of these differences is contained in Par. 8a (2) (c) of this review. The field party has been requested to clarify the statement in the descriptive report.
- (4) Paragraph 10, page 1, states that "the soundings on the line from 78 to 81d day appear too deep by from 2 to 3 feet and it is recommended that the depths determined on the lines crossing these soundings be accepted." Neither the boat sheet nor the smooth sheet showed such conditions to exist on this line. Only one line crosses this stretch of d day and the two are in perfect agreement. It is quite possible that the error is a typographical one and that some other line was intended. It is most desirable that whenever a reference is made in the descriptive report to a feature on the smooth sheet, the latitude and longitude of the feature should be given and not merely the position number. Such practice not only facilitates work in the office, but serves as a check on the original reference.

2. Compliance with Instructions for the Project.

The plan, development, and extent of the survey satisfies the requirements of the instructions for the project except the following:

- a. A closer development of the more recently charted Engineer's shoal soundings which varied several feet shoaler than the

present survey depths would have been of material value in the disposition of several items discussed in paragraph 8a (2) (b) and (c) of this review.

- b. The 18 foot sounding in Lat. $46^{\circ} -16'$, Long. $123^{\circ} -31.9'$ should have been developed.
- c. The 12 foot sounding in Lat. $46^{\circ} -15.3'$, Long. $123^{\circ} -32.9'$ should have been developed.

3. Shoreline and Signals.

The shoreline and topographic signals originate with T -6385 a and b (1935), T-6386 (1935) and T-6522a (1936). The following hydrographic signals were located and are recorded in the index of Vol. 1 of the sounding volumes: Aug., Roy, Fra, Gon, X, Y, Z, N and M.

4. Sounding Line Crossings.

The agreement of depths on cross lines is satisfactory.

5. Depth Curves.

Within the limits of the survey the usual depth curves may be satisfactorily drawn, including portions of the low water, 6, 12 and 18 foot curves in the various sloughs.

6. Junctions with Contemporary Surveys.

The junction with the Engineers' survey of 1935 (Bp. 28705) in the main channel between Longs. $123^{\circ} - 34.2'$ and $123^{\circ} - 36.2'$ and the junction with H-6182 (1936) on the east are satisfactory.

The junctions with H-5927 (1935) and H-5928 (1935) on the west are satisfactory except in approximate Lat. $46^{\circ} -14.8'$ where on H-5927 (1935) two consecutive 5 and 6 foot soundings on line 82 and 83 u (red) are 2 feet shoaler, and on H-5928 (1935) between Lat. $46^{\circ} -13'$ and $46^{\circ} -14'$ where the soundings differ 2 to 5 feet in places, the 1935 depths being deeper in most cases. The fact that this is a changeable area and that the present survey depths were obtained about one year later probably accounts for these differences. The overlapping soundings from the 1935 surveys that are in disagreement have been omitted in the common areas on the present survey. For charting purposes, only the present survey information including that transferred from H-5927 (1935) and H-5928 (1935) should be used in the common areas.

7. Comparison with Prior Surveys

- a. H-1015 (1867-68) and H-1016 (1868).

These surveys, combined, cover the entire area of the present survey and are on a scale of 1:10,000. The former embraces the area north of and the latter south of approximate Lat. $46^{\circ} -13.3'$. Comparison shows that numerous changes have taken place, resulting from artificial and natural causes. In the Columbia

River main channel, between Elliott Pt. and Jim Crow Pt., the area has deepened considerably, while east of Jim Crow Pt. the area has generally shoaled. Outside the main channel in different sections of the survey the areas have undergone great and irregular changes. For example, shoals now exist where formerly considerably greater depths existed (Lat. $46^{\circ} - 15.1'$, Long. $123^{\circ} - 34'$; Lat. $46^{\circ} - 15.1'$, Long. $123^{\circ} - 36'$). The reverse is likewise true; shoals shown on the old surveys having been scoured away and now replaced by considerably greater depths (Lat. $46^{\circ} - 14.6'$, Long. $123^{\circ} - 35.3'$). Great changes have also occurred in Woody Island and Prairie Channels as well as in Marsh Creek and Blind Slough. Further details of the many changes noted since 1867 - 1868, would serve no useful cartographic purpose and are therefore omitted.

Because of the many changes that have occurred since the previous surveys, and the fact that the present survey is more detailed and closer developed, H-6181 (1936) should supersede the old surveys for charting purposes.

8. Comparison with Chart No. 6152 (New Print dated May 1, 1937).

a. Hydrography.

Within the area of the present survey the chart is based on portions of surveys discussed in the foregoing paragraphs and U. S. Engineers' Surveys which comprise Bps. 13107 (1890), 22021 (1928), 26617 (1932), 27295 (1933), 27775 (1934), 27963 (1934), 27971 (1934), and 28705 (1935).

(1) Bp. 13107 (1890) on a scale of 1:12,000, covers Prairie Channel and waterway around Carlson I; Bp. 22021 (1928) scale 1:10,000, a small adjacent area east of Woody I; and Bp. 26617 (1932) Scale 1:20,000, the area between Jim Crow Pt. and Elliott Pt., north of approximate Lat. $46^{\circ} - 14'$. Comparison with the charted depths shows considerable changes in detail on the shoal areas as well as in the channels. Among the more important changes noted are:

(a) The 18 foot sounding in Lat. $46^{\circ} - 14.55'$, Long. $123^{\circ} - 34.6'$ originating with Bp. 26617 (1932) falls on the present survey in general depths of 23 to 25 feet. This area has deepened generally and the 18 foot sounding should not be considered in future charting.

(b) The shoal area in Woody I. Channel, approximate Lat. $46^{\circ} - 14'.0'$ Long. $123^{\circ} - 35.6'$ (Bp. 26617 of 1932) has generally deepened although additional shoaling is noted in some spots.

(c) General deepenings and shoalings in places as well as changes in the axis of Prairie Channel (Bp. 13107 of 1890) has taken place. Because of the changeable character of the area, the time elapsed since the Engineer's Surveys were made and the fact that the present survey is more closely and adequately developed, H-6181 (1936) should

supersede the above surveys for charting purposes.

- (2) Bps. 27295 (1933), 27775 (1934), 27963 (1934), 27971 (1934) and 28705 (1935), on a scale of 1:10,000, cover portions of the Columbia River main channel, and areas contiguous thereto. Comparison of charted depths with the present survey shows a general good agreement except the following:
- (a) The shoal with least depth of 9 feet originating with Bp 27295 (1933) in Lat. $46^{\circ} -15.75'$, Long. $123^{\circ} -32.85'$ has shifted approximately 275 m. downstream and shoaled slightly, with the least depth of 7 feet being shown here on the present survey. The 15 and 16 foot depths charted just northeastward of the 9 fall in comparable depths on the present survey but the immediate vicinity of the charted 14 has deepened 5 to 13 feet. This charted shoal should be superseded by the present survey development in further charting.
- (b) The shoal area (defined by the 30 foot curve) west of Pillar Rock Light with least depth of 26 feet in Lat. $46^{\circ} -15.55'$, Long. $123^{\circ} -35.8'$ originates with the U. S. Engineer's survey of June, 1934 (Blue print 27775). A comparison with the present survey while indicating some deepening here brings out irregularities in the bottom, some of which have not been fully developed. An example of the latter is the 30 foot shoal about 100 meters eastward of the charted 26. For charting this particular area the engineer's survey of 1934 should be used to supplement the present survey except where the engineer's survey has been superseded on the charts by a later engineer's survey.
- (c) The 30 foot sounding in Lat. $46^{\circ} -15.55'$, Long. $123^{\circ} 32.7'$, the 36 foot sounding in Lat. $46^{\circ} -15.6'$, Long. $123^{\circ} -32.4'$ and the 24 foot sounding in Lat. $46^{\circ} -15.5'$ Long. $123^{\circ} - 33.2'$ all originate with Blueprint 28705 (1935) and fall in depths of $37\frac{1}{2}$ feet, 43 feet and 29 feet, respectively, on the present survey. A study of the surrounding depths on both surveys in these areas indicates several shoalings to have taken place but that generally the area has deepened. A comparison with the engineer's work of Dec. 1936, as transferred to the boat sheet by the field party, reveals further changes, some of the soundings agreeing with the present survey and others agreeing with the engineer's work of 1935 (Blueprint 28705). In connection with the latter, particular attention is called to the 34 foot depths on the 1935 Engineer's survey about 100 meters southwest of Buoy FLG "1" (Lat. $46^{\circ} -15.7'$, Long. $123^{\circ} -32.45'$) that are corroborated by 32 foot depths on the engineer's survey of Dec. 1936 and yet the present survey accomplished in June and July 1936, shows depths of about 38 feet. Also in the vicinity of Lat. $46^{\circ} -15.6'$, Long. $123^{\circ} - 32.65'$ depths of 33 feet on the 1935 engineer's survey are corroborated by similar depths on

the Dec. 1936 engineer's survey and yet the present survey shows 39 feet here. And again, in the vicinity of Lat. $46^{\circ} - 15.58'$, Long. $123^{\circ} - 33.36'$ the engineer's survey of 1935 shows depths of 32 to 34 feet that are corroborated by similar depths on the Dec. 1936 engineer's survey but the present survey shows 37 feet here. Whether these inconsistencies are the result of alternate deepenings and shoalings or whether the present survey failed to get the least depths in these areas is not known. The matter should have been given further consideration in the field.

Other depths on the engineer's survey of Dec. 1936 show distinct shoalings over the present depths. Examples of these are the 34 to 36 foot shoal in Lat. $46^{\circ} - 15.68'$, Long. $123^{\circ} - 32.35'$ where the present survey shows 46 to 49 feet; the 34 to 35 foot shoal in Lat. $46^{\circ} - 15.62'$, Long. $123^{\circ} - 32.4'$ where the present survey shows 40 to 44 feet; the 28 foot shoal in Lat. $46^{\circ} - 15.56'$, Long. $123^{\circ} - 32.68'$ where the present survey shows 37 feet and the 32 foot shoal in Lat. $46^{\circ} - 15.6'$, Long. $123^{\circ} - 33.5'$ where the present survey shows 41 to 45 feet. There are, however, but one or two depths on the present survey (due south of Three Tree Bar Beacon) that are shoaler than the engineer's survey of Dec. 1936.

In charting the main channel to the eastward of Jim Crow Point the present survey should be used only to supplement where necessary, the engineer's survey of Dec. 11, 1936. This survey is not in our files at the present time, but a request for a copy of same has been made. The above comparison having been made with soundings as transferred to the boat sheet by the field party, are subject to revision on direct comparison with the blue print.

*not received
office
11/26/37
SPJ*

To the westward of Jim Crow Point, the engineer's survey of 1935 (Blueprint 28,705) covers the main channel and this area was not resurveyed on the present survey but a satisfactory junction was made with it.

b. Aids to Navigation.

- (1) The charted fixed aids and Buoys C-1, FLG-1, and FIR-6, are in substantial agreement with the positions on the present survey and satisfactorily mark the features intended.
- (2) Some doubt exists regarding the present status of Three Tree Bar Beacon (Lat. $46^{\circ} - 15.7'$, Long. $123^{\circ} - 32.9'$). This beacon was removed from the chart on authority of L. H. N. to M. 23 of June 6, 1934, which states "Three Tree Bar Lighted Buoy No. 1, placed to temporarily mark the site of Three Tree Bar Light, will be maintained permanently. Three Tree Bar Beacon Light will not be rebuilt." No buoy was actually charted at the site of the beacon when the latter was removed, but lighted buoy No. 1 was placed about $1/3$ mile eastward of the position of the beacon and it is so shown on the present chart. However, the beacon was located by triangulation in 1935 and was so shown on the 1935 topographic sheet (T-6385^b)

and was used as a signal on the present hydrographic survey. It is also shown on the U. S. Engineer's survey of May, 1935 (Blueprint 28,705) as a located object, but not as a light. The beacon is no longer listed in the Light List.

It appears from the above that in all probability the lighted beacon was discontinued as an aid to navigation in 1934 but that the structure was never removed. That would account for its removal from the light list, and for it being observed on in 1935 and in the present survey. This matter has been referred to the field party (see Par. 10d) and the proper representation on the sheet will be deferred pending receipt of further information.

See marginal note,
par. 10d, this review.

9. Field Plotting.

Field protracting and plotting were well done and conformed to the requirements of the Hydrographic Manual.

10. Additional Field Work Recommended.

The following additional work is desirable in this area:

- a. A development of the shoal area (included within the 30 foot curve) to the westward of Pillar Rock Light and referred to in Par. 8a (2) (b) of this review. The latest U. S. Engineer's survey in this area is of June, 1934. Accomplished.
See par. 3a,
Review H-6181
Addl. Work (1937).
- b. The size, shape and elevation above mean high water of Pillar Rock (on which a light is now erected) in Lat. $46^{\circ} 15.5'$, Long. $123^{\circ} -35.15'$ should be determined. This feature is not shown on the modern topographic survey T-6385^a (1935) and the only information regarding it is what appears on the survey of 1870 (T-1235), but where no elevation is given. Accomplished.
See par. 3b
- Review H-6181
Addl. Work (1937)
- c. A continuation of the survey of Blind Slough and tributaries to the head of navigation. Accomplished.
See par. 3c,
Review H-6181
Addl. Work (1937)
- d. A check up on the present status of Three Tree Bar Beacon noted in Par. 8b (2) of this review. Structure only
remains. See
par. 8, Letter of
Sept. 30, 1937 by
Chief of Party
attached hereto.

Authority for this additional work is contained in a letter to the Chief of Party dated August 20, 1937. (Copy attached hereto)

11. Note to Compiler.

The compiler's attention is called to the following items:

- a. The statement in the descriptive report Par. 9, page 1, regarding a comparison with an engineer's survey of December, 1936. The survey covers the main channel east of Jim Crow Point, but is not on file in this Bureau. A request for a copy of same has been made.

b. Par. 8a and sub-paragraphs of this review regarding the superseding of certain charted depths and the use of certain U. S. Engineer's Surveys.

c. Par. 8b (2), this review, regarding the status of Three Tree Bar Beacon.

12. Superseding Old Surveys.

Within the area covered the present survey supersedes the following surveys for charting purposes:

H - 1015 (1867-68) in part

H - 1016 (1866) in part.

13. Reviewed by - G. Risegari and Harold W. Murray, July 21, 1937.

Inspected by - A. L. Shalowitz.

Examined and approved:

C. K. Green, *C. K. Green*
Chief, Section of Field Records.

K. T. Adams
Acting Chief, Division of Charts.

Fred L. Peacock
Chief, Section of Field Work.

G. H. Hude
Chief, Division of H. & T.

Mr. Shalowitz

(KAM)

JAP
4/11
YIP

22-AB
1990

Reply attached hereto.

August 20, 1957.

To: Lieutenant Robert W. Enex,
U. S. Coast and Geodetic Survey,
P.O. Box 805,
Astoria, Oregon.

From: The Director,
U. S. Coast and Geodetic Survey.

Subject: Doubtful points arising during review of Columbia River
surveys.

The survey of an area such as the Columbia River, where natural and man-made changes are constantly occurring, presents special difficulties, particularly in connection with the coordination of the new survey data with data from other sources such as the U. S. Engineers and the Bureau of Lighthouses. Therefore, this office has noted with satisfaction the general high quality of your Columbia River surveys as evidenced by the reviews.

There is furnished you herewith a copy of a memorandum from the Reviewing Section of the Chart Division to the Section of Field Work of the Division of Hydrography and Topography which calls attention to fourteen doubtful points which arose in the review of surveys Nos. H-6180, H-6181 and H-6182 (1956) which it is desirable to clarify in so far as practicable. It is believed that you are in a position to obtain the necessary information to clarify readily several of these points. Some others appear to require an amount of additional work which you may or may not be in a position to accomplish this field season. You will please give all these points careful consideration, furnish such clarifying information as you can readily obtain and make such recommendations as in your judgment are desirable with respect to clearing up the remainder of the doubtful points.

attached

Pending submission and approval of your definite recommendations, you are authorized to execute any additional work you deem desirable to clarify these points as you happen to be in that vicinity and can do conveniently. It is not desired, however, that you immediately disrupt your plans for the remainder of the season to do a large amount of additional work on these three sheets.

The best sheets of surveys Nos. 6180, 6181 and 6182 (1936), together with a bromide of survey No. 6182 and a bromide of a section of No. 6182 enlarged to a scale of 1:5000 are being furnished you under separate cover.

Acting Director.

August 18, 1937.

MEMORANDUM to Chief, Section of Field Work.

There have arisen in connection with the review of surveys H-6180, H-6181 and H-6182, in the Columbia River, a number of doubtful points that should be cleared up as soon as possible. They comprise the following items:

H-6180 (1936).

1. An examination of the shoal area off the docks at Astoria in lat. $46^{\circ}11.6'$ long. $123^{\circ}48.9'$ to determine the least depth on the shoal. The survey of 1868 (H-1018) shows a 15 foot depth here, rocky bottom. This has been carried forward to the present survey. Accomplished.
See par. 3b,
Review H-6180
Addl. Work (1937)
2. A development of the shoal to the southwestward of Tongue Point Crossing Light in the vicinity of lat. $46^{\circ}15.1'$ long. $123^{\circ}45.6'$. This shoal is merely indicated on the present survey. The soundings on the boat sheet that were transferred by the field party from the Engineers Survey of December 15, 1935 (not in our files) shows 11 and 14 foot depths between depths of 20 to 37 feet in the present survey. The later Engineers survey in the channel (December 15, 1936, Blueprint 30115) does not cover the area of the shoal. The present charted shoal of 8 and 9 feet was reported by the U. S. S. FOX on Oct. 25, 1935 (Chart Letter 907 of 1935). This area is highly changeable and sufficient development should be made to insure a harmonious junction with the work on H-6180. Accomplished.
See par. 3a,
Review H-6180,
Addl. Work (1937).
3. The charted piles on Taylor Sands in the general vicinity of lat. $46^{\circ}12.5'$ long. $123^{\circ}47.0'$ should be verified or disproved. These piles originate with the Engineers survey of 1928 (Sp. 22022). They were not located by the present survey nor are they referred to on any of the sounding lines in the immediate vicinity. They were transferred in red to the boat sheet by the field party and the only reference made by them is a pencil note on the boat sheet "Determine position of Piling". Accomplished.
See par. 3c,
Review H-6180,
Addl. Work (1937).

4. The status of the charted beacon in lat. $46^{\circ}15.9'$ long. $123^{\circ}45.6'$ should be determined. This beacon was originally charted as a light but on authority of Notice to Mariners 44 of 1914 and Chart Letter 465 of November 1914 it was changed to a day beacon and has been charted as such ever since. It was not located on H-6180 (1936) and falls outside the limits of the contemporary topographic sheet T-6521a (1936). The beacon was transferred in red to the boat sheet by the field party and a question mark placed after it. A sounding line runs right by it but no mention is made of its existence or non-existence. A pencil note on the boat sheet states "Ch. beacon north of Tongue Point crossing Range", but there is no evidence that this has been accomplished. The beacon is no longer listed in the light and buoy list nor is it shown on the latest Engineers survey in this area (Sp. 30113 of December 1936).
- Beacon non-existent.
See par. 4, Letter of Sept. 30, 1937 from Chief of Party attached to Des. Report H-6180

H-6181 (1936).

5. The shoal area (included within the 30 foot curve) to the westward of Pillar Rock Light should be developed. The charted depths in this area originate with the U. S. Engineers survey of June 1934 and a comparison with the present survey while indicating some deepening brings out irregularities in the bottom, some of which have not been fully developed on the present survey.
- Accomplished.
See par. 3a,
Review H-6181
Addl. Work (1937)
6. The size, shape and elevation above mean high water of Pillar Rock (on which a light is now erected) in lat. $46^{\circ}15.5'$ long. $123^{\circ}35.15'$ should be determined. This feature is not shown on the latest topographic survey T-6385a (1935), a triangulation station being shown instead, and the only information regarding it is what appears on the survey of 1870 (T-1255), but where no elevation is given.
- Accomplished.
See par. 3b,
Review H-6181
Addl. Work (1937)
7. The survey should be continued in Blind Slough and its tributaries to the head of navigation.
- Accomplished.
See par. 3c,
Review H-6181
Addl. Work (1937)
8. The present status of Three Tree Bar Beacon (lat. $46^{\circ}15.7'$ long. $123^{\circ}32.9'$) should be determined. This beacon was removed from the charts on authority of L.H.N. to M. of June 6, 1934. The beacon, however, was located by triangulation in 1935 and so shown on the 1935 topographic survey (T-6385b) and was used as a signal on the present hydrographic survey (H-6181). It is also shown on the U. S. Engineers survey of May 1935 as a located object but not as a light. The beacon is no longer listed in the light list. It is possible that the structure still remains and if so, should be verified.
- Structure only remains. See par. 8, Letter of Sept. 30, 1937 by Chief of Party attached to Des. Report H-6181 (1936)

H-6182 (1936).

9. Additional lines should be run in the Puget Island Bar Channel particularly in the vicinity of the 30 foot shoal in lat.

45°12.3' long. 123°25.65' unless a recent Engineers survey covers this channel. The latest Engineers surveys on file in this office and on which the present chart is based are surveys of April and July 1934 and an Engineers report of conditions of December 10, 1935. The 30 foot shoaling is close to the range line through this channel. The boat sheet contains transferred soundings in this area that do not agree with those on the above Engineers surveys and it would appear that a later survey was made by them in this area although the D. R. notes a comparison having been made with an April 1934 survey.

Accomplished.
See par. 3b of
Review H-6182
Addl. Wk. (1937).

10. In Clifton Channel in the approach to the docks at Clifton, split lines should be run in the vicinity of the 7 and 8 foot soundings lat. 45°12.75' long. 123°27.65'.

Accomplished.
See par. 3c of
Review H-6182
Addl. Wk. (1937).

11. The doubtful 17 foot sounding in lat. 46°12.05' long. 123°23.5' should be investigated unless already covered in the 1937 work. This sounding is noted in the D. R. for investigation during 1937.

17 in error.
Removed from sheet,
See letter of Sept. 30, 1937
by Chief of Party in
Descriptive Report
H-6182.

12. The shoal area with least depth of 58 feet in the main ship channel in lat. 46°16.4' long. 123°29.65' should be developed to determine its offshore extent.

Accomplished.
See par. 3d of
Review H-6182
Addl. Wk. (1937)

13. The existence or non-existence of the 2 charted lights (single pile) in lat. 46°14.4' long. 123°26.5' at the entrance to Klobowin Slough in lat. 46°13.9' long. 123°25.4' on Hunting Island should be determined. These lights are not shown on the present survey and were not located on the contemporary planetable survey, T-6522b, covering this area, although other similar features have been located thereon with great detail. No statement appears in either the topographic D. R. or the hydrographic D. R. that these lights no longer exist. The Pacific Coast Light List as of January 1, 1937, still lists them as maintained lights.

Lights non-existent.
See letter of Sept. 30, 1937
by Chief of Party in
Des. Rept. H-6182

14. In the main channel between the northwest end of Price Island and Price Island Light, the U. S. Engineers survey of April 1936 shows a number of shoal soundings (some of which are charted) that were not verified by the present survey (H-6182) made about 3 months later, although indications are noted in some cases. (See photostatic enlargement of H-6182 and tracing of shoals from Engineers survey). While the bottom is somewhat irregular in this area there is, nevertheless, evidence of some change having taken place since the Engineers survey was made (compare soundings shown in pencil on tracing with those on our survey). It is possible that dredging was done here between the time of the Engineers survey and our survey, or that some work has been done here subsequent to our survey, the result of which has not yet been furnished this office. The field party should be requested to determine from the District

Accomplished.
See par. 3a, of
Review H-6182
Addl. Wk. (1937).

Engineers office what has actually been accomplished in this area and to do such additional work as in its opinion is necessary for a correct representation of present conditions. If Engineers surveys later than April 1936 are available, the field party should submit copies of same.

The above items are indicated on the several boat sheets and are numbered to correspond with the numbers in this memorandum. The field party should be requested to use similar numbering.

A. L. Shalowitz,
In Charge Reviewing Section.

COPY

Reply to this letter
filed under Instructions
in Reviewing Section

Post Office Address: Box 808, Astoria, Oregon.

R. W. Knox - Oct. 8, 1937.
Also Nov. 1, 1937.

DEPARTMENT OF COMMERCE
U. S. Coast and Geodetic Survey

September 30, 1937.

To: The Director,
U. S. Coast and Geodetic Survey,
Washington, D. C.

From: Lieut. Robert W. Knox,
U. S. Coast and Geodetic Survey.

Subject: Doubtful points arising during review of Columbia River
surveys.

Reference: Director's letter of August 20th and Memorandum to Chief,
Section of Field Records, of August 18th.

Attached
herewith

In accordance with paragraph 3 of the first mentioned reference,
the following recommendations are made relative to the doubtful points
listed in the second reference:

H-6180

1. Recommended.

2. Recommended, provided any survey made by the U. S. Engineers
does not adequately cover the area of the shoal.

3. The charted piles were verified as to existence, and an attempt
was made, in January or February when the small amount of additional
work was done, to verify their position. These piles, along with other
landmarks in the estuary, recently constructed, will be located at the end
of the present field season.

4. Beacon no longer in existence.

H-6181

5. Recommended. Refers to Par. 10^a of Review.

6. Recommended. Refers to Par. 10^b of Review.

7. Blind Slough and its tributary, Grizzly Slough, are used for
log raft storage and navigation is limited to such tows. At the present
time there is a proposed flood control project in this area, the completion
of which would dike off this slough somewhere between the end of the present
survey and its northern entrance at Brownmead. Refers to Par. 10^c of

Review.

Last winter, in discussing the advisability of continuing the surveys through the slough with the U. S. Engineers at Portland, it was suggested that no additional work be done until the outcome of the proposed diking was known.

In the opinion of the writer, this is an excellent example of a navigable slough that should be surveyed in order to complete the chart, but would involve a great deal of time and labor and the navigational value resulting therefrom would be questionable. Navigation here, as is the case throughout the entire river with tugs and river boats, is entirely by local knowledge, few tugs even carrying a chart. However, it is recommended such surveys be made, provided the diking plans have been settled upon.

8. In 1935 the Lighthouse Department informed the writer that Three Tree Bar Beacon had been discontinued, but as the light was still burning it was so described in the triangulation records. At the present time the light is non-existent, but the structure still stands.

Refers to
Par. 10 d of
Review.

H-6182
9. The writer was informed by the Assistant Engineer in charge of the survey launch Robert Gray that a survey of all bars upstream from Skamokawa was soon to be made, and discussion of the advisability of further work on this bar (Puget Island) is withheld until examination of the forthcoming survey.

It has been found that one of the most difficult parts of the hydrographic surveys of this River is deciding how much work should be done in and adjacent to the areas covered by the U. S. Engineers. They have found from long experience that the several bars require surveys at intervals ranging from four times a year to every three or four years. In the former cases it is evident that a rigid agreement between surveys even a month or two apart is not to be expected. Yet, if the bars were to be thoroughly surveyed, such work would be obsolete before the smooth sheets were plotted, let alone verified and the soundings charted.

In sounding in the dredged channels, particularly along the edges, it has repeatedly been noticed that adjacent soundings vary as much as a fathom, sometimes more. With such lumpy bottom, a sounding-for-sounding agreement between any surveys could not be expected.

A note on the Columbia River charts states that the project depth is 35 feet and that a 30-foot channel below Portland is usually practicable. From this it would seem that an intensive development or investigation of depths or differences, much greater than the project depth and in changeable areas, is not an economical practice.

For such reasons it has been the policy of the writer, more so this year than before, to space the sounding lines close together, about 35 or 40 meters, along the junction with the U. S. Engineers channel lines, overlapping the latter at least one line. As these critical area lines are run only under favorable conditions and with all possible care, it is believed any failure to make a proper junction with the Engineers work can rightfully be laid to changeable or lumpy bottom. Generally, such differences are not investigated; likewise shoal Engineer soundings in or near the middle of the channels are not investigated.

10. Recommended.

11. This area investigated during current season and 17-foot sounding found to be in error.

12. With a project depth of 35 feet, it is believed an investigation of the 58-foot shoal is not warranted, particularly as the depths range as follows: 29, 52, 58, 67, 85 and 100 feet.

13. These lights are non-existent.

14. As stated in paragraph 9, this bar is to be surveyed by the U. S. Engineers within a short time; the recommendation concerning the shoal soundings is therefore withheld until receipt of this survey.

(Signed) Robert W. Knox,
Chief of Party.

Applied to drawing of Chart 6152 - no. 26, 1937 - J.W.

6180

(And Addl. Work, 1937,
For Which See
6181, Addl. Work, 1937)

U. S. COAST & GEODETIC SURVEY
LIBRARY AND ARCHIVES
MAR 15 1937
Acc. No. _____

6180

(And Addl. Work, 1937,
For Which See
6181 Addl. Work, 1937)

Form 504
Rev. April 1935
DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

DESCRIPTIVE REPORT

~~Topographic~~ } Sheet No. 0 - 11
~~Hydrographic~~ }

State OREGON

LOCALITY
Columbia River

Vicinity of Astoria

1936

CHIEF OF PARTY
Robert W. Knox

20

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

REG. NO.

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.

Field No. 0-11

REGISTER NO.

H6180

State Oregon

General locality Columbia River

Locality Vicinity of Astoria

Scale 1:10,000 Date of survey Sept 21 - Oct. 17, 1936

Vessel chartered launch 29N295

Chief of Party Robert W. Knox

Surveyed by M. E. Wennermark

Protracted by M. E. W. and C. J. W.

Soundings penciled by R. W. K.

Soundings in ~~fathoms~~ feet

Plane of reference mean lower low water

Subdivision of wire dragged areas by

Inked by C. F. Mc Kenney

Verified by G. C. Mc Blorson

Instructions dated February 26, 1935, 19

Remarks:

DESCRIPTIVE REPORT

TO ACCOMPANY HYDROGRAPHIC SHEET

H-6180
NO. 0-14

Scale 1:10,000

COLUMBIA RIVER

OREGON

VICINITY OF ASTORIA

1936

Instructions dated Feb. 26, 1935

Surveyed by M. E. WENNERMARK

AREA, LIMITS, ETC.

The hydrography of sheet ^{H-6180} 0-14 covers the area from Smith Point to Tongue Point, and from the Oregon shore to approximately the middle of the river. ✓

(1935) The western limits of the survey joins survey No. 5975; the northern, sheet ^{H-6180} W-12 of the current field season; the northeastern, survey No. 5927; and the southeastern limits, survey No. 5928. A comparison of the soundings at these junctions indicates that such are satisfactory. *
See Review par. 6 regarding junctions.

The main ship channel, in the vicinity of Astoria, was last surveyed by the U. S. Engineers on May 16, 1935, blue-print B-15-10, ^{H-28703} scale 1:10,000. The soundings along the limits of the two surveys agree within a foot, generally, although there are several instances where the apparent discrepancies are as much as three feet. Part of this difference is undoubtedly due to the difficulties of satisfactorily transferring the soundings from the badly and unevenly distorted blueprints to the current sheets. The sheets join closely to the edges of the dredged channel, and it is entirely possible that the majority of discrepancies are due to an uneven bottom. *in some cases add to small changes in depths in others.*

North of the Port of Astoria docks, in the southwest corner of the sheet, junction was made with the U. S. Engineer survey ^{H-36708} B-4-37/21, of February 19, 1936, scale 1:10,000. The agreement is considered very satisfactory. *
See Review par. 6 regarding junction.

From a point about a half-mile ^{WNW} south by west of Tongue point to the Tongue Point Channel Rear Range, the survey makes a junction with the Engineers survey B-4-35/30, December 13, 1935, scale 1:10,000. Unfortunately, there is very little overlapping between the surveys and the fact that the junction is near the edges of the dredged channel makes a comparison of adjacent lines more or less worthless. ✓
** Not in office files Aug. 1937*

SURVEY METHODS: Standard survey methods were used. All soundings were taken with a 12-pound handlead. The usual type bronze centered mahogany tiller rope (Samson Cordage Company) was used. The lines were carefully prepared, and were re-marked when errors threatened to become of such magnitude as to require corrections to the recorded soundings.

DANGERS: The only danger to navigation in the area covered by this sheet is a rock, uncovering at a -1 foot tide, in latitude $46^{\circ} 11'$ 1697 meters, longitude $123^{\circ} 47'$ 720 meters. The general depth in this vicinity is 10 feet. The position of the wreck of the Sylvania de Grace - lost in the sixties - was transferred from topographic sheet No. 1123 to the present boat sheet, and an intensive development of the area made. The wreck plots immediately northwest of the above mentioned rock, and several soundings of 6 and 7 feet were obtained on it.

Local knowledge is necessary to navigate all but the main ship channel.

ANCHORAGES: The quarantine anchorage is opposite buoy 2, where the depths range from 30 to 20 feet, hard sand bottom.

Fog bound vessels, or those whose owners do not permit navigation of the river at night, often anchor in the area north and west of Tongue Point where the depths vary from 60 to 20 feet, hard sand bottom.

COMPARISON WITH PREVIOUS SURVEYS: No copies of previous surveys were furnished the party, but a composite tracing of the soundings from the latest chart, and from the U. S. Engineers survey of June 30, 1935, of the Astoria Ferry Channel - scale 1:20,000 - which also includes a system of quarter mile lines extending to about one and one-half miles from the river bank, was made. The soundings agree reasonably well, considering the time elapsed between surveys, etc. There is, however, such a much greater development on the present survey than on the former that a detailed discussion of the differences would serve no useful navigational purpose. As an example: the present survey shows a distinct trough in latitude $46^{\circ} 13.6'$, longitude $123^{\circ} 47.5'$ to $48.3'$, with depths as great as 30 feet; the greatest depth shown on the chart is 14 feet; in latitude $46^{\circ} 13.0'$, longitude $123^{\circ} 47.6'$, there is a considerable area of shoal water, with a minimum depth of 1 foot; the Engineer survey, with widely spaced lines, merely indicates this shoal with one $4\frac{1}{2}$ foot and several 5 foot soundings.

CHANNELS: 1) Main ship channel: except for two small areas, one immediately north of the west part of Astoria and the other about a half mile northwest of the Tongue Point Lighthouse Reservation wharfs, where the depths are considerable in excess of the controlling channel depths, the main ship channel was not sounded.

2) Astoria Ferry Channel: the least depth in the channel leading from the ferry landing in Astoria to Point Ellice is 18 feet. This channel is surveyed every two or three years by the U. S. Engineers, generally on a scale of 1:20,000.

DISCREPANCIES: In the plotting and reviewing of this sheet several discrepancies were noted, the more important of which are:

- a) The sounding on position 6m is 23^{*} feet; but that between 124 and 125 h, in practically the same position is 26 feet. ** Appears correct. Probably a slight spot.*
- b) The middle sounding between 5 and 6 m is a 27^{*}, crossed by a 30^{*} on the sounding immediately before 141 n. *The 27 ft. sounding accepted. The 30 appears erroneous.*
- c) The sounding on position 57 j is 46 feet, crossed by the one after 7 p, a 43^{*}. *Lat. 46° 12.7' Long. 123° 48.35'*
** This 43 appears to be correct. The bottom is irregular.*
- d) The line between 7 o and 8 c was forced inshore slightly to better the crossing with the soundings between 60 and 61 q. *Lat. 46° 11.5' Long. 123° 51.3'*
- e) The soundings between 86 and 87 g day are about 2 to 4 feet deeper than those between 162 and 163 q; probably due to the fact that they are on the edge of the dredged channel. *Lat. 46° 12.1' Long. 123° 48.3'*
- f) The 4^{*} foot sounding between 118 and 119 e day was rejected, consequent work proving this sounding either read or recorded in error. *This sdg. not plotted. Evidently is erroneous shown by development.*

BOTTOM: The majority of the bottom specimens were either hard sand or hard mud.

LANDMARKS FOR CHARTS: Landmarks for charts were submitted following the 1935 season. ✓

GEOGRAPHIC NAMES: Geographic names are correct and complete as appearing on the published charts.

Respectfully submitted:

Robert W. Knox,
H. & G. Eng'r.

STATISTICS

SHEET 0 - 14

Date	Day letter	Volume	No. of soundings	No. of positions	St. miles of soundings	Boat
1936						
Sept 24	a	1	495	86	15.4	29N295
25	b	1	98	21	3.2	
28	c	1	117	20	4.2	
29	d	1	267	51	8.0	
30	e	1	770	187	25.8	
Oct 2	f	2	740	171	25.5	
3	g	2	354	87	12.1	
5	h	2	686	161	23.7	
6	j	2 & 3	728	159	25.2	
7	k	3	717	172	22.8	
9	l	3	357	71	11.0	
15	n	4	532	177	16.22	
16	o	4	457	172	20.8	
17	q	4	665	183	20.4	
1937						
Feb 26	r	1	156	46	2.3	skiff
27	s	5	109	37	2.3	skiff
totals			7,178	1,801	238.9	

Area in square state miles = 15.7


APPROVAL OF CHIEF OF PARTY

Hydrographic sheet O-11, and accompanying records have been inspected and approved by me. The field work was done under my occasional supervision; the office work under my direct supervision.

Deep-draft shipping in Astoria is confined to the Port of Astoria and the Standard and Union Oil Company docks. Of the many other piers, a few are used in the fishing industry, by tenders, trollers, etc. In the majority of cases it is impossible to sound between the piers because of arrangements for mooring small gill netting boats, or because the area is foul with ruins of old piers, etc.

It would require a detailed survey on a scale of 1:5,000 to thoroughly survey this waterfront, and for the reasons stated in the preceding paragraph, it is not believed economically feasible to do so.

No additional work is therefore considered necessary.


Robert W. Knox,
Chief of Party

Field Records Section (Charts)

HYDROGRAPHIC SHEET NO. **H6180**

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

Number of positions on sheet	1801
Number of positions checked	23
Number of positions revised	0
Number of soundings recorded	7178
Number of soundings revised	83
Number of signals erroneously plotted or transferred	0

Date: 17 May, 1937
Verification by *E. C. McBliss*
checked by C. F. McKenney
Review by *G. Pisigani*

Time: 4 days 5 hours
5 days 2 1/2 hours
Time: 9 " 5 "

HYDROGRAPHIC SURVEY NO. H6180

Smooth Sheet Yes

Boat Sheet Yes

Sounding Records 5 Vols. _____

Descriptive Report Yes

Title Sheet Yes

List of Signals Vol.#1

Landmarks for Charts (Form 567) None

Statistics Yes

Approved by Chief of Party Yes

Recoverable Station Cards (Form 524) None

Special Chart for Lighthouse Service None
(Circular Nov. 30, 1933)

Remarks _____

HYDROGRAPHY
Total Days 17
Feb. 27, 1937

Remarks

Decisions

	Remarks	Decisions
1	<i>For Title</i>	<i>USGB decision</i>
2	<i>For Title</i>	
3		<i>See T-6481</i>
4		<i>" "</i>
5		<i>" "</i>
6		<i>See H-5975</i>
7		
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GEOGRAPHIC NAMES

Survey No. **H6180**

Name on Survey	<div style="display: flex; justify-content: space-between; font-size: small;"> On Chart No. 6151 On previous survey No. On U. S. Quadrangle Maps From local information On local Maps P. O. Guide or Map Rand McNally Atlas U. S. Light List </div>									
	A	B	C	D	E	F	G	H	K	
<u>Oregon</u> (state)	✓ appd									1
<u>Columbia River</u>	✓ appd									2
<u>Astoria</u>	✓ appd									3
<u>Smith Pt</u>	✓ appd									4
<u>Tongue Pt</u>	✓ appd									5
<u>Desdemona Sands</u>	✓ appd									6
										7
<u>Taylor Sands</u>	✓			D.R. Pg 3				✓		8
<u>Tongue Pt Bar</u>	✓			D.R. Pg 3						9
										10
										11
										12
										13
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										26
										27

Names under lined in red approved
by Life on 4/7/37

42.C

TIDE NOTE FOR HYDROGRAPHIC SHEET

Division of Hydrography and Topography:

Division of Charts: Attention: Mr. E. P. Ellis.

Tide Reducers are approved in
5 volumes of sounding records for

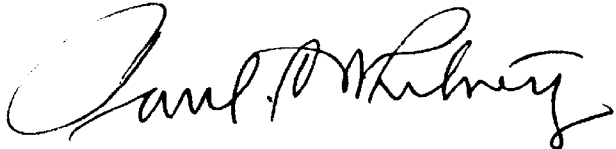
HYDROGRAPHIC SHEET 6180

Locality Vicinity of Astoria, Columbia River.

Chief of Party: R. W. Knox in 1936-1937.
Plane of reference is mean lower low water, reading
2.5 ft. on tide staff at Tongue Point
19.5 ft. below B.M. 1
2.5 ft. on tide staff at Port Docks
16.5 ft. below B. M. E 31

Height of mean high water above plane of reference is 7.5 feet.

Condition of records satisfactory except as noted below:

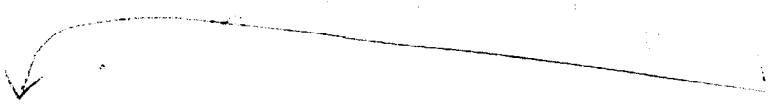


Chief, Division of Tides and Currents.

17 May, 1937.

Report on H 6180
Verifying and Inking

1. The records conform to the requirements of the General Instructions.
2. The usual depth curves can be completely drawn within the limits of the sheet.
3. The field plotting was completed to the extent prescribed in the Hydrographic Manual.
4. The office draftsman did not have to do over any part of drafting done by the field party except as noted on the statistic sheet.
5. The junctions with the contemporary adjacent sheets were fair in view of the fact that this bottom is rapidly changing. See lat.



be the result of dredging operations.
Verified by a 25 and 28 foot depth on Bp. 30113
(Dec. 15, 1936) falling close by. H.V.M.

9. $46^{\circ}13.95'$ long $123^{\circ}43.5'$, There
is a 24 ft. sounding on position
 74^p
 24^p which might be questioned.

The adjoining sheet shows
33 feet in this location. This
sounding is close to the
channel and it was left

for final disposition by the
receiver. Inasmuch as the sdg. may appear
erroneous there is no evidence in the records
that can dispense its correctness. The 24 can
6. In lat. $46^{\circ}13.5'$, long. $123^{\circ}47.2'$.

There are a number of piles*
shown on the boat sheet
in red pencil. These piles
are not located on the
smooth sheet and they should
be disposed of by higher
authority. *The sheet be retained on
the charts until disposed of.

7. In lat $46^{\circ}13.85'$, long. $123^{\circ}45.56'$.

There is a black beacon shown
on the boat sheet with a
question mark after it. This
beacon was removed in
October, 1914 and it was
reported as such in "Notice
to Mariners".

8. In lat. $46^{\circ}11.9'$ long $123^{\circ}47.5'$

The Chief of Party states in the
Descriptive Report ^{page 2} that the
wreck of the Sylvia de Groen ^{from}
plots immediately northwest of
the sunken rock in this area.
The verifier can find no
location of this wreck in
the records consequently it
was not plotted on the
smooth sheet. <sup>No wreck symbol necessary
since the area is well sound
& near the 14 rock</sup>

9. In lat. $46^{\circ} 13.6'$, long. $123^{\circ} 45.4'$
Volume 1, page 56. A 4 foot
sounding[†] is recorded. This
area was later developed and
no indication of the above
sounding was found. Therefore
it was rejected or recommended
by the Chief of Party. <sup>Evidently an error
& is not plotted</sup>

10. The signals and shoreline
were taken from the aluminum
mounted topographic sheet
T 6521 a (1936).

This aids to navigation
were located by triangulation
and by three point hydrographic

pages and no discrepancies were
noted.

Respectfully submitted,

G. C. McGlendon

MEMORANDUM

IMMEDIATE ATTENTION

SURVEY
 DESCRIPTIVE REPORT
~~PHOTOSTATIC OF~~

No. H-6180

~~No. 1~~

received Mar. 17, 1937
 registered April 7, 1937
 verified
 reviewed
 approved

This is forwarded in order that your attention may be directed to the matters as indicated below. Please initial in column 3 as an acknowledgement that your attention has been thus directed. The complete original records are available if desired. If you cannot give this your immediate attention, please initial, note, and forward to the next section marked, calling for the records at your convenience.

ROUTE		Initial	Attention called to
20			
22			
24			
✓ 25			<i>page 3</i>
26			
30			
40			
62			
63			
82			
83			
88			
90			

RETURN TO

82	C. K. Green
----	-------------

Section of Field Records

REVIEW OF HYDROGRAPHIC SURVEY NO. 6180 (1936) FIELD NO. O-14

Vicinity of Astoria, Columbia River, Oregon
Surveyed in Sept-Oct. 1936, Scale 1:10,000
Instructions dated Feb. 26, 1935 (R. W.Knox).

Hand Lead Soundings.

3 Point fixes on shore signals.

Chief of Party - R. W. Knox.
Surveyed by - M. E. Wennermark.
Protracted by - M. E. Wennermark, C. J. Wagner.
Soundings penciled by - R. W. K.
Verified and inked by - C. F. McKenney, G. C. McGlosson.

1. Condition of Records.

The records are neat and legible and conform to the requirements of the Hydrographic Manual except as follows:

- a. Information on the title pages of the sounding records was in pencil instead of ink. (par. 138).
- b. Important information, such as buoys locations, was not indexed on the second page of each respective volume. (par. 60).
- c. The duplicate of the chart forwarded to the Lighthouse Bureau containing objects for locating Aids to Navigation was not received by this office.

The Descriptive Report is clear and satisfactorily covers all items of importance except that the report makes no mention of the existence or non-existence of the beacon charted in lat. $46^{\circ}13.9'$ long. $123^{\circ}45.6'$ and the piles charted in the vicinity of lat. $46^{\circ}13.4'$ long. $123^{\circ}47.5'$. These features are discussed in par. 8c(1) and 8a(1) this review.

2. Compliance with Instructions for the Project.

The plan, development, and extent of the survey satisfies the instructions for the project except as follows:

- a. A closer development should have been made of the adjoining shoal area below Tongue Point Crossing Lt. in lat. $46^{\circ}13.1'$ long. $123^{\circ}45.6'$ discussed in par. 6e, this review.
- b. Uncertainty exists as to the present status of the piles and beacon discussed in pars. 8a(1) and 8c(1), this review.

- c. The 24 foot sounding in lat. $46^{\circ}13.95'$ long. $123^{\circ}43.58'$ is the first sounding on line (pos. 74p, red) falling in depths of 33 feet. It appears to be 1 fathom too shoal and should have been investigated. Its importance is minimized, however, by a shoal area with slightly deeper depths shown close by and nearer to the channel limits on a subsequent U. S. Engineer's survey of Dec. 15, 1936 (Bp. 30113) and therefore no additional work is being requested here.

3. Shoreline and Signals.

The shoreline and topographic signals originate with T-6521a (1936). Hydrographic signal Fish originates with this survey and is recorded in Sounding Volume No. 4. The fish house on Desdemona Sands was determined on H-5975 (1935) and was transferred to the present hydrographic sheet.

4. Sounding Line Crossings.

The agreement of depths on crosslines is in general satisfactory.

5. Depth Curves.

Within the area of the present survey, the usual depth curves may be satisfactorily drawn except in the unsurveyed areas in the main channel which are covered by the U. S. Engineer's surveys.

6. Junction with Contemporary Surveys.

- a. The junction with H-6179 (1935-36) on the north is satisfactory.

- b. The junction with H-5927 (1935) on the north and east, H-5928 (1935) on the east, and H-5975 (1935) on the west is satisfactory except as follows:

- (1). H-5927 (1935) in the vicinity of lat. $46^{\circ}14.5'$ between longs. $123^{\circ}44.3'$ and $123^{\circ}45'$ shows a line of soundings (positions 14 to 19cc, red) that are 1 to 4 feet deeper in places and 2 feet shoaler in others than the present survey depths. Also in the vicinity of lat. $46^{\circ}14.35'$ long. $123^{\circ}43.2'$ a number of soundings are 2 to 5 feet deeper than the present survey depth.
- (2). H-5928 (1935) in the vicinity of lat. $46^{\circ}13.25'$ long. $123^{\circ}45.1'$ shows soundings (line 81 to 82 g, red) 6 to 12 feet shoaler than the present survey depths.

- (3). H-5975 (1935) in the vicinities of lat. $46^{\circ}15'$ long. $123^{\circ}51.2'$ and lat. $46^{\circ}12.4'$ long. $123^{\circ}50.4'$ shows depths varying 2 to 4 feet shoaler than the present survey depths.

The above differences are due to natural changes in bottom subsequent to the 1935 surveys. Since the later present survey should control for charting, only these soundings from the 1935 work that were in general agreement with the present survey were transferred in the overlapping area. The present survey including the soundings transferred, should supersede the 1935 work in the common areas.

- c. A satisfactory junction is made on the southwest, with the U. S. Engineer's survey, Bp. 30706 (Feb. 19, 1936).
- d. A satisfactory junction is made with the Engineer's survey Bp. 28703 (May 16, 1935) in the main channel between Tongue Pt. and Astoria. (See D. R., page 1 for further details.) A later survey of June 18, 1937 (Bp. 30729) covers the same area, is subsequent to the present survey and is not as yet applied to the chart except as noted in par. 8a(5), this review. The depths that fall within the limits of the present survey show good agreement except in a few spots where differences of 1 to 3 feet are noted.
- e. The D. R. (page 1) discusses a junction made from a point about a half-mile WNW of Tongue Point to the Tongue Point Channel Rear Range with the Engineer's survey of Dec. 13, 1935 (B-4-35/30).^{* Filed as Bp. 31035} This survey is not on file in this office but a request for it has been made. Most of the area covered, however, is superseded by Bp. 30113 (Dec. 15, 1936). Agreement with this later survey (applied to chart) is generally satisfactory except at the western limits where a few depths are slightly shoaler than the present survey.

A number of soundings transferred to the boatsheet in color apparently originate with the Dec. 13, 1935 engineer's survey. In lat. $46^{\circ}13.1'$ long $123^{\circ}45.65'$, an 11 and 14 foot sounding shown in color on the boat sheet (successive soundings on line) fall outside the limits of the Engineer's 1936 survey but in depths of 20 to 37 feet and between sounding lines spaced 100 m. apart on the present survey. The U.S.S. FOX on Oct. 23, 1935 (Chart Letter 907, 1935) reported an 8 and 9 foot depth in this vicinity (applied to chart Feb. 3, 1936), the 8 falling very close to the above 11 foot sounding. Other depths in the present survey including the overlapping soundings from H-5928 (1935) show a general shoal area here but indicate that its character is a changeable one. Additional field work is required in this area (see par. 10a). Pending receipt of this work, the 8 and 9 foot depths should be retained on the chart.

7. Comparison with Prior Surveys.

a. H-250 (1851), H-273 (1851).

These surveys on a scale of 1:20,000, are in the nature of reconnaissances showing both topography and hydrography. They contain no information that has not been adequately covered by later surveys and they need not be considered in future charting.

b. H-1017 (1868), H-1018 (1868), H-1725 (1885), and H-1930 (1889).

These surveys on a scale of 1:10,000 except H-1017 (1868), scale 1:20,000 cover portions of the area of the present survey. The area covered is in general of a very changeable character and has been entirely superseded by later U. S. Engineer's surveys discussed in paragraph 8a, this review and except for the 13 foot sounding in the following paragraph a comparison of changes noted would serve no useful cartographic purpose and is omitted.

The 13 foot sounding, rocky bottom (not charted) on H-1018 (1868) in lat. 46°11.6' long. 123°48.9' falls in depths of about 17 feet and between sounding lines spaced 80 m. apart on the present survey. The 13 could not be verified in the original sounding volume due to illegibility of position numbers on the smooth sheet. It does, however, fall close to an undeveloped 14 foot shoal on the present survey and a 14 foot depth on H-4733 (1927) which survey is discussed in paragraph 7c, this review. The 13 is therefore being carried forward and should be used in future charting pending a further examination. (See par. 10b, this review).

Because of the changeable character of the area, the time elapsed between the earlier surveys and the present survey and because of the close development of the present work, H-6180 (1936) should supersede the above surveys for charting purposes except as indicated above.

c. H-4733 (1927).

This 1 to 10,000 scale sheet falls entirely within the limits of the present survey. It covers in general a strip about 1/3 to 1/2 mile wide extending along the entire dock front of Astoria. The character of this survey is below the usual standard and as noted in the approval note on the sheet is not suitable for charting purposes and has therefore never been applied to the chart. Consideration in this review is to insure that the present survey development adequately disposes of any critical depths or suggested shoaling shown on the old survey.

- (1). The 6 foot sounding in lat. $46^{\circ}11.8'$ long. $123^{\circ}48.1'$; the 17 foot sounding (lat. $46^{\circ}11.55'$ long. $123^{\circ}49.0'$) and the 11 (lat. $46^{\circ}11.5'$ long. $123^{\circ}49.4'$) fall in deeper depths on the present survey. Investigation in the sounding records including control and other soundings on line shows a weak fix in the case of the 6 and that the other two soundings were obtained near a turn. All three soundings are probably further inshore than as plotted and in better agreement with the present survey.
- (2). The group of 19 foot soundings in lat. $46^{\circ}12.0'$ long. $123^{\circ}47.6'$ fall in depths of 24 to 28 feet on the present survey. Surrounding depths on the present survey especially to the northward show a general deepening of 4 to 7 feet in this area.

The present survey adequately covers and completely supersedes this 1927 survey.

8. Comparison with Chart 6151 (June 14, 1937).

a. Hydrography.

Within the area covered by the present survey the chart is based on U. S. Engineers surveys Bps. 18073 (1922), 22022 (1928), 22499 (1929), 26617 (1932), 27484 (1934), 27772 (1934), 28816 (1935), and 30729 (1937) and Chart Letter 907 (1935). These are discussed in the following paragraphs:

- (1). A few charted soundings close inshore originate with Bps. 18073 (1922), 22022 (1928) and 22499 (1929). In general the depths are in fair agreement with those on the present survey.

Eight piles (charted) in the vicinity of lat. $46^{\circ}13.4'$ long. $123^{\circ}47.5'$ originating with Bp. 22022 (1928) were not located by the present survey and no reference note pertaining to them could be found in the sounding records. They were transferred in red to the boat sheet by the field party and the only reference made to them is a pencil note on the boat sheet, "determine position of piling". In view of the uncertainty of their present status, the piles should be retained on the chart pending additional information from the field party. (See par. 10c, this review).
- (2). Blueprints 26617 (1932) and 28816 (1935) embrace the northeastern and the southwestern halves, respectively, of the present survey. In general, the depths on Bp. 28816 (1935) show a fair agreement with the present depths except in Astoria Ferry Channel where a general deepening of as much as 2 feet has taken place.

Comparison of depths on Bp. 26617 (1932) shows that changes in the shoals as well as in the deeps have taken place. For example, the shoal areas in the vicinity of Taylor Sands have increased in size and the channel area, vicinity of lat. $46^{\circ}13.6'$ long. $123^{\circ}47.5'$ has deepened from 4 to 8 feet in places. Special attention is called to the following:

- (a). The 18 foot sounding (charted) in lat. $46^{\circ}12'$ long. $123^{\circ}49.6'$ originating with Bp. 28816 (1935) falls close to depths of 22 feet on the present survey but between sounding lines spaced 110 m. apart. The 18 (actually $18\frac{1}{2}$) is one of several $18\frac{1}{2}$ to $20\frac{1}{2}$ foot soundings on line. Soundings to the eastward vary 4 feet shoaler than the present survey depths. The 18 also falls about 190 m. SE of a shoal spot on the present survey with two least depths of 16 feet and where the Engineer's survey shows 20 feet. It is evident that general changes in bottom have taken place here and that the 18 should be disregarded in future chartings.
- (b). The 18 foot sounding in lat. $46^{\circ}11.8'$ long. $123^{\circ}50.1'$ originating with Bp. 26617 (1932) falls practically on a 23 foot sounding on the present survey. A study of the common area shows a deepening has taken place. The 18 foot sounding should be disregarded in future charting.
- (3). A few charted soundings from Bp. 27484 (1934) and Bp. 27772 (1934) fall just within the limits of the present survey in lat. $46^{\circ}11.5'$ long. $123^{\circ}51.6'$ and are in good agreement.
- (4). The charted 8 and 9 foot soundings in lat. $46^{\circ}13.2'$ long. $123^{\circ}45.6'$ originating with Chart Letter 907 (1935) are discussed in par. 6e, this review.
- (5). The hand corrected 28 and 29 foot soundings in approximate lat. $46^{\circ}11.7'$ long. $123^{\circ}49.4'$ originate with the U. S. Engineer's survey of June 18, 1937 (Bp. 30729). These soundings fall in the main channel and are outside the limits of the present survey. (See par. 6d, this review, for further discussion of this Bp.)

Except as noted above, the present survey within the area covered supersedes the above information in future charting.

b. Controlling Depths in Channels.

For the portion of the main ship channel covered by the present survey the charted channel depth note does not conflict with the depths of the present survey.

c. Aids to Navigation.

- (1). The charted beacon^{*} in lat. 46°13.9' long 123°45.6' was originally charted as a light but on authority of L.H.N. to M. 44 of 1914 and Chart Letter, 465 of 1914 it was changed to a day beacon and has been charted as such ever since. It was not located on the present survey and falls outside the limits of the contemporary topographic sheet T-6521a (1936). The beacon was transferred in red to the boat sheet by the field party and a question mark placed after it. A sounding line runs right by it but no mention is made of its existence or non-existence. A pencil note on the boat sheet states "Ck. beacon north of Tongue Pt. crossing Range" but there is no evidence that this has been accomplished. The beacon is no longer listed in the light and buoy list nor is it shown on the latest Engineer's survey in this area (Bp. 30113 of Dec. 1936). The field party has been requested to ascertain the present status of this aid (see par. 10d, this review). Pending this information the beacon should remain as charted.
- * See marginal note opposite par. 10d, this review.
- (2). The remaining buoys and beacons located on the present survey are in substantially the same positions as charted and satisfactorily mark the features intended.

9. Field Plotting.

Field plotting and protracting were satisfactory and conform to the requirements of the Hydrographic Manual.

10. Additional Field Work Recommended.

The survey is generally satisfactory. The following additional field work, however, is essential for completion of the area covered:

- a. A development of the shoal area southwestward of Tongue Point Crossing Light in lat. 46°13.1' long. 123°45.6' discussed in par. 6e, this review. (Authorized by Instructions (R.W.Knox) Nov. 1, 1937)

Accomplished.
See par. 3a,
Review H-6180
Addl. Work (1937)

- b. An examination of the shoal area off the docks at Astoria in lat. 46°11.6' long. 123°48.9' discussed in paragraph 7b, this review. Accomplished.
See par. 3b,
Review H-6180
Addl. Work (1937).
- c. The charted piles on Taylor Sands noted in par. 8a(1) of this review should be verified or disproved. Accomplished.
See par. 3c,
Review H-6180,
Addl. Work (1937).
- d. The present status of the charted beacon* noted in par. 8c(1), this review, should be determined. * Beacon non-existent. See par. 4,
Letter of Sept. 30, 1937,
by Chief of Party attached to Des. Rept. H-6181

Authority for the above additional work is contained in a letter to the Chief of Party dated August 20, 1937. (Copy attached to Des. Report, H-6181)

11. Note to Compiler.

The compiler's attention is called to the following:

- a. Par. 6e, 8a(1) and 8c(1) of this review relative to information that should be retained on the chart.
- b. Par. 6d and 8a(5) of this review relative to Bp. 30729 (1937) which is subsequent to the present survey and has been applied to the chart in part only.
- c. Par. 6e, of this review, relative to Bp. 30113 (Dec. 15, 1936) which is subsequent to the survey and has been applied to the chart.

12. Superseded Old Surveys.

Within the area covered, the present survey supersedes the following surveys for charting purposes:

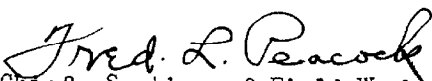
H-250	(1851)	in part.
H-273	(1851)	" "
H-1017	(1868)	" "
H-1018	(1868)	" "
H-1725	(1885)	" "
H-1930	(1889)	" "
H-4733	(1927)	entirely.

13. Reviewed by G. Risegari and Harold W. Murray, Aug. 10, 1937.
Inspected by A. L. Shalowitz.

Examined and approved:


C. K. Green,
Chief, Section of Field Records.


L. O. Lobbut,
Chief, Division of Charts.


Fred. L. Peacock,
Chief, Section of Field Work.


G. Stude,
Chief, Division of H. & T.

COPY

Post Office Address: Box 805, Astoria, Oregon.

DEPARTMENT OF COMMERCE
U. S. Coast and Geodetic Survey

Reply to this letter
filed under Instructions
in Reviewing Section.
R. W. Knox - Oct. 8, 1937
Also Letter of Nov. 1, 1937.

September 30, 1937.

To: The Director,
U. S. Coast and Geodetic Survey,
Washington, D. C.

From: Lieut. Robert W. Knox,
U. S. Coast and Geodetic Survey.

Subject: Doubtful points arising during review of Columbia River
surveys.

Reference: Director's letter of August 20th and Memorandum to Chief,
Section of Field Records, of August 18th. (Filed in Descriptive
Report H-6181)

In accordance with paragraph 3 of the first mentioned reference,
the following recommendations are made relative to the doubtful points
listed in the second reference: Following paragraph numbers refer
to paragraphs in above memorandum.

H-6180
1. Recommended. - Refers to par. 10^b of Review.

2. Recommended, provided any survey made by the U. S. Engineers
does not adequately cover the area of the shoal. Refers to Par. 10^a of Review.

3. The charted piles were verified as to existence, and an attempt
was made, in January or February when the small amount of additional
work was done, to verify their position. These piles, along with other
landmarks in the estuary, recently constructed, will be located at the end
of the present field season. Refers to Par. 10^c of Review.

4. Beacon no longer in existence. Refers to Par. 8 c(1) and 10 d of
H-6181 Review

5. Recommended.

6. Recommended.

7. Blind Slough and its tributary, Grizzly Slough, are used for
log raft storage and navigation is limited to such tows. At the present
time there is a proposed flood control project in this area, the completion
of which would dike off this slough somewhere between the end of the present
survey and its northern entrance at Brownsmead.

Last winter, in discussing the advisability of continuing the surveys through the slough with the U. S. Engineers at Portland, it was suggested that no additional work be done until the outcome of the proposed diking was known.

In the opinion of the writer, this is an excellent example of a navigable slough that should be surveyed in order to complete the chart, but would involve a great deal of time and labor and the navigational value resulting therefrom would be questionable. Navigation here, as is the case throughout the entire river with tugs and river boats, is entirely by local knowledge, few tugs even carrying a chart. However, it is recommended such surveys be made, provided the diking plans have been settled upon.

8. In 1935 the Lighthouse Department informed the writer that Three Tree Bar Beacon had been discontinued, but as the light was still burning it was so described in the triangulation records. At the present time the light is non-existent, but the structure still stands.

H-6182

9. The writer was informed by the Assistant Engineer in charge of the survey launch Robert Gray that a survey of all bars upstream from Skamokawa was soon to be made, and discussion of the advisability of further work on this bar (Puget Island) is withheld until examination of the forthcoming survey.

It has been found that one of the most difficult parts of the hydrographic surveys of this River is deciding how much work should be done in and adjacent to the areas covered by the U. S. Engineers. They have found from long experience that the several bars require surveys at intervals ranging from four times a year to every three or four years. In the former cases it is evident that a rigid agreement between surveys even a month or two apart is not to be expected. Yet, if the bars were to be thoroughly surveyed, such work would be obsolete before the smooth sheets were plotted, let alone verified and the soundings charted.

In sounding in the dredged channels, particularly along the edges, it has repeatedly been noticed that adjacent soundings vary as much as a fathom, sometimes more. With such lumpy bottom, a sounding-for-sounding agreement between any surveys could not be expected.

A note on the Columbia River charts states that the project depth is 35 feet and that a 30-foot channel below Portland is usually practicable. From this it would seem that an intensive development or investigation of depths or differences, much greater than the project depth and in changeable areas, is not an economical practice.

For such reasons it has been the policy of the writer, more so this year than before, to space the sounding lines close together, about 35 or 40 meters, along the junction with the U. S. Engineers channel lines, overlapping the latter at least one line. As these critical area lines are run only under favorable conditions and with all possible care, it is believed any failure to make a proper junction with the Engineers work can rightfully be laid to changeable or lumpy bottom. Generally, such differences are not investigated; likewise shoal Engineer soundings in or near the middle of the channels are not investigated.

10. Recommended.

11. This area investigated during current season and 17-foot sounding found to be in error.

12. With a project depth of 35 feet, it is believed an investigation of the 58-foot shoal is not warranted, particularly as the depths range as follows: 29, 52, 58, 67, 85 and 100 feet.

13. These lights are non-existent.

14. As stated in paragraph 9, this bar is to be surveyed by the U. S. Engineers within a short time; the recommendation concerning the shoal soundings is therefore withheld until receipt of this survey.

(Signed) Robert W. Knox,
Chief of Party.

Section of Field Records

REVIEW OF HYDROGRAPHIC SURVEY NO. 6180 Add'l. Wk. FIELD NO. 0 14

Vicinity of Astoria, Columbia River, Oregon
Surveyed in November 1937, Scale 1:10,000
Instructions dated August 20, 1937; October 8, 1937 and Nov. 1, 1937
(Letters to R. W. Knox)

Hand Lead and Machine Soundings.

3 Point fixes on shore signals.

Chief of Party - R. W. Knox.
Surveyed by - R. W. Knox.
Protracted by - G. H. Everett.
Soundings plotted by - G. H. Everett.
Verified and inked by - G. H. Everett.

1. Purpose of Survey.

The purpose of this survey was to accomplish additional work called for in paragraphs 10a, b and c of the review of H-6180 (1936).

2. Office Work.

The additional work was plotted on the boat sheet in the field but the smooth plotting and inking was done in the office, the position numbers and day letters being indicated in green and the soundings in blue.

3. Results of Survey.

The Descriptive Report is a combined report covering the additional work on H-6180, H-6181 and H-6182. The report and sounding record are filed under H-6181, Add'l. Work. The various items of additional work on H-6180 are discussed below:

a. Reference par. 10a, review of H-6180.

Four lines were run in the vicinity of lat. 46° 13.1', long. 123° 45.6', to develop the shoal to the southwest of Tongue Point Crossing Light. Depths on the additional work indicate a general deepening of the shoal area, no depths of less than 17 feet being obtained where the original work and H-5928 (1935) show depths of 10 and 11 feet. The additional lines, however, are spaced approximately 100 meters apart and the additional work as a whole has not been extended far enough to obtain satisfactory agreement with the original. Under these circumstances the shoaler depths on the original work cannot be considered as non-existent and the area should be charted from the characteristic soundings on all surveys discussed above and from U. S. Engineers' blueprint 31203 of August, 1937 (surveyed 3 months prior to additional work) which overlaps this Bureau's surveys but does not cover the shoaler portion of the area.

No indications were obtained of the 8 and 9 foot depths (charted on the western tip of the shoal) reported by the U.S.S. FOX on Oct. 23, 1935 (Chart Letter 907 of 1935). The 8 falls in depths of 29 to 31 feet on the additional work, 21 to 31 feet on the original work and approximately 50 meters inshore from a 27 foot depth at the inshore limits of the 1937 Engineers' survey. The combined evidence of these three surveys is considered sufficient to indicate the present non-existence of the 8 and 9 foot depths in the positions reported. It is possible that they exist farther to the eastward but in view of the changeable nature of the area and the retention of the 10 and 11 foot depths on H-6180 and H-5928 (1935) they are not considered of any importance and should be disregarded in future charting.

b. Reference par. 10b review of H-6180.

The 13 foot sounding, rocky bottom, from H-1018 (1868) in lat. $46^{\circ} 11.6'$, long. $123^{\circ} 48.9'$ off the docks at Astoria, was investigated and the least depth found was 14 feet. The development is good, but there is a possibility that the 13 may exist and it has been retained.

c. Reference par. 10c, review of H-6180.

Piles charted on Taylor Sands in the vicinity of lat. $46^{\circ} 13.4'$ long. $123^{\circ} 47.5'$ from blueprint 22022 of 1928, were investigated and new positions determined for those in existence. The additional work should supersede the information derived from the blueprint.

d. Astoria Troller Basin.

Although not called for in the instructions for the additional work, additional soundings were obtained in the Astoria Troller Basin in approximate lat. $46^{\circ} 11.4'$, long. $123^{\circ} 51.3'$. Topographic signals and revised shoreline originate with T-6573a (1937). The additional work was carried to a satisfactory junction with H-6180.

e. Aids to Navigation.

Tongue Point Crossing Light in lat. $46^{\circ} 13.2'$, long. $123^{\circ} 45.3'$ was relocated by triangulation for use in the control of the additional work and falls 80 meters to the south of the charted position originating with Lighthouse Notice to Mariners 23 of 1937. The triangulation position is undoubtedly the more accurate and should supersede for charting.

4. Reviewed by - J. A. McCormick, April 29, 1938.

Inspected by - A. L. Shalowitz.

Examined and approved:



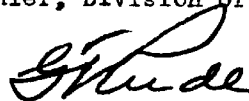
T. B. Reed,
Chief, Section of Field Records.



Chief, Division of Charts.



Chief, Section of Field Work.



Chief, Division of H. & T.

Applied to Chart 6151 - Sept 20, 1937 - L.M.Z.
Applied to Chart correction 6151 Sept 2, 1938 H.E. MacEwen

6182

(And Addl. Work, 1937, For which
See 6181, Addl. Work 1937)

U. S. COAST & GEODETIC SURVEY
LIBRARY AND ARCHIVES
APR 9 1937
Acc. No.

6182

6182

(And Addl. Work, 1937,
For which See
6181, Addl. Work 1937)

Form 504
Rev. Dec. 1933
DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
R. S. PATTON, DIRECTOR

DESCRIPTIVE REPORT

~~Hydrographic~~ } Sheet No. OW-15
Hydrographic

State Oregon-Washington

LOCALITY

Columbia River

Three Tree Point to

~~Army Landing and to~~ Cathlamet

193 6

CHIEF OF PARTY

Robert W. Knox.

10P

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

U. S. COAST & GEODETIC SURVEY
LIBRARY AND ARCHIVES
APR 9 1937
REG. NO.
Acc. No.

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.

Field No. OW 15

REGISTER NO. **H6182**

State OREGON-WASHINGTON

General locality COLUMBIA RIVER

Locality THREE TREE POINT ^{TO} ~~ANNEKE LANDING~~ CATHLAMET

Scale 1=10000 Date of survey July-Aug.-Oct., 1936

Vessel Chartered Launch 29N295

Chief of Party R. W. Knox

Surveyed by R. W. Knox

Protracted by C. J. Wagner

Soundings penciled by C. J. Wagner

Soundings in 4444 feet

Plane of reference Low Water Plane (MLLW During Lowest River Stages)

Subdivision of wire dragged areas by ///

Inked by E. C. McGlerson

Verified by E. C. McGlerson

Instructions dated February 26, 1935

Remarks:

DESCRIPTIVE REPORT
TO ACCOMPANY HYDROGRAPHIC SHEET

OW-15

Scale 1-10000

COLUMBIA RIVER

OREGON-WASHINGTON

1936

INSTRUCTIONS DATED: February 26, 1935 Robert W. Knox, Chief of Party

AREA, LIMITS, etc. The hydrography of sheet OW-15 covers the area from a line south of Three Tree Point to Ankeny Landing on the Main Ship Channel and to Cathlamet on the Cathlamet Channel.

The survey joins sheet OW-14 on a line south of Three Tree Point with satisfactory agreement.

SURVEY METHODS: Standard survey methods were used. The sounding was done with a 12 pound lead on a handlead line or a hand wire machine using stranded wire. The usual type bronze centered mahogany tiller rope (Sampson Cordage Co.) was used. The lead lines were checked frequently and re-marked when the errors threatened to be of such magnitude as to require corrections to the recorded soundings.

DANGERS: There are no dangers in the area covered by this survey.

ANCHORAGES: There are no anchorages in the area covered by the survey.

COMPARISON WITH PREVIOUS SURVEYS: Chart 6152, pub. Aug. 1935; There is an area bare at low water, 420 meters North by East of Aldrich Point that is not shown on the chart.

The low water line in the vicinity of lat. $46^{\circ} 16'$ and long. $123^{\circ} 30'$ shows changes from the line as charted.

In the area in the vicinity of lat. $46^{\circ} 16'$ and long. $123^{\circ} 28.5'$ there is a spot bare at low water instead of $\frac{1}{2}$ ft. as charted.

The southwest entrance to MULTNOMAH SLOUGH was found to be bare at low water.

The $\frac{1}{2}$ ft. sounding charted in lat. $46^{\circ} 12.6'$ and long. $123^{\circ} 24.2'$ was not verified, minimum depth of 7 ft. being obtained in this area.

In the vicinity of the charted 4 ft. in lat. $46^{\circ} 12.3'$ and long. $123^{\circ} 23.6'$ a minimum depth of 6 ft. was obtained.

Surveys by the U. S. Engineers; This survey agrees with the U. S. E. survey B-5-32/2* except for a few of the soundings in the deep water off Three Tree Point where greater depths were obtained than are shown on the U. S. E. survey. In the depths under 60 ft. the agreement is satisfactory.

* This blueprint not in Office Files. G. R.

(3p. 29451)

U. S. E. B-5-31/16, April 2, 1936.

The 30 ft. sounding shown on the U. S. E. survey, lat. $46^{\circ} 15.9$ and long. $123^{\circ} 27.6$ was not verified. A minimum depth of 35 ft. was obtained in this area. See Review par. 8a(5)

The $31\frac{1}{2}$ ft. sounding shown 410 meters NNW of Price Id. Lt. was not verified, a sounding of 39 ft. being obtained near this position. See Review par. 8a(5)

The two surveys generally agree within 2 ft. with the exceptions noted above.

The agreement between this survey and the U. S. E. survey B-12-60, Apr. 1934, is satisfactory. * This probably refers to Engrs. Survey, Puget Id. Bar (Ap. 27466)

The agreement between this survey and the U. S. E. survey of Cathlamet Channel is satisfactory.

The agreement between this survey and the U. S. E. surveys of Skamokawa Cr. and Elokomín Slough is satisfactory.

GEOGRAPHIC NAMES: Geographic names have been discussed in reports submitted with companion topographic sheets.

DISCREPANCIES: The following apparent discrepancies are noted;

The 14^* ft. sounding on 11h day appears to be one fathom too deep, and recommend it be rejected. * This area is covered by much shallower depths. Rejection of the 14' by Field party is concurred in. G.R.

The 17^* ft. sounding in lat. $46^{\circ} 12.05$ and long. $123^{\circ} 23.5$ looks erroneous and will be investigated when a junction is made to this sheet during the 1937 season. * See Review par. 10d

The 14 ft. soundings on and after 2s day are crossed by 21-22u day with 22 ft. * The 22 ft. sds. has been plotted. The bottom is very irregular in this area. G.R.

GENERAL: All depth curves are not drawn on the sheet along the bank of the river where the depth changes so rapidly that the curves would almost coincide, nor in the sloughs where they might detract from the legibility of the soundings.

CHANNELS: This survey covers the main ship channel from Three Tree Point to Ankeny Landing with minimum depths of about 33 ft. * 32 ft. in lat. $46^{\circ} 15.6$ Long. $123^{\circ} 27.2$ G.R.

The west end of Cathlamet Channel with minimum depths of ^{5 s.R.} about 6 ft.

The Clifton Channel with a minimum depth of about 6 ft.

The main ship channel is surveyed infrequently by the U. S. Engineers in the regions of deep water, but about once a year in the vicinity of Skamokawa and Puget Id. Bars.

Multnomaw Slough has a minimum of about 5 ft. ✓

Steamboat Slough has a minimum depth of about ✓
15 ft. via a tortuous channel.

Eplokomin Slough has a minimum depth to the ✓
Crown Willamette Mill from Cathlamet of about 4 ft., but only about
1 ft. through the entire slough.

The west entrances to the slough north of Welsh ✓
Id. are bare at low water.

The slough dividing the Hunting Islands has a ✓
minimum depth of about 1 ft.

The slough north of Puget Island has a minimum ✓
depth of about 7 ft.

LANDMARKS FOR CHARTS: Landmarks for charts were submitted following ✓
the 1936 field season.

Clifton J. Wagner
Clifton J. Wagner,
Jr. H. & G. E.

Approved and forwarded:

Robert W. Knox

Robert W. Knox,
H. & G. E.,
Chief of Party.

STATISTICS

SHEET O W-15

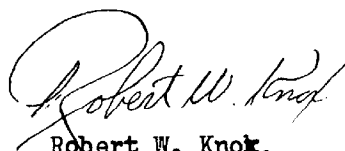
Date 1936	Day letter	Volume	Number of soundings	Number of Positions	Statute miles of sounding	Boat	
July	20	a	1	872	170	21.7	29N295
	21	b	1	315	67	8.3	do
	22	c	1	630	128	16.1	do
	23	d	1 & 2	718	171	22.1	do
	24	e	2	721	218	19.9	do
	27	f	2 & 3	598	168	18.1	do
	28	g	3	600	131	16.8	do
	29	h	3	747	187	18.0	do
	30	j	3 & 4	920	213	23.1	do
	31	k	4	574	123	14.5	do
Aug.	6	l	4	877	187	25.1	do
	7	m	5	929	195	25.8	do
	12	n	5	819	179	23.6	do
	13	p	5 & 6	853	188	20.7	do
	14	q	6	771	185	21.4	do
	18	r	6	581	172	21.4	do
	19	s	7	826	176	22.6	do
	20	t	7	848	196	22.8	do
	21	u	7 & 8	414	104	9.6	do
Oct.	12	v	8	681	168	21.9	do
	13	w	8	647	184	22.4	do
Totals				<u>4941</u>	<u>3510</u>	<u>415.9</u>	

Area in square statute miles = 13

APPROVAL BY CHIEF OF PARTY

Hydrographic sheet OW-15 has been inspected and approved by me. The field and office work were done under my immediate supervision.

No additional work is considered necessary except the investigation of a 17 ft. sounding as noted under DISCREPANCIES.

A handwritten signature in cursive script, reading "Robert W. Knok".

Robert W. Knok,
H. & G. E.
Chief of Party

Field Records Section (Charts)

H6182
HYDROGRAPHIC SHEET NO.

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

Number of positions on sheet	.....	3510
Number of positions checked	.....	30
Number of positions revised	.....	0
Number of soundings recorded	.....	14,941
Number of soundings revised	.....	14.3
Number of signals erroneously plotted or transferred	.....	0

Date: 11 June, 1937

Verification by *B.C. McGlown*

Review by *S. Risegari*

Time: 9 days 6 1/4 hours.

Time: 7 " 5 "

HYDROGRAPHIC SURVEY NO. **H6182**

Smooth Sheet **Yes** _____

Boat Sheet **Yes** _____

Sounding Records **8** Vols. _____

Descriptive Report **Yes** _____

Title Sheet **Yes** _____

List of Signals **Vol.#1** _____

Landmarks for Charts (Form 567) **Yes** _____

Statistics **Yes** _____

Approved by Chief of Party **Yes** _____

Recoverable Station Cards (Form 524) **None** _____

Special Chart for Lighthouse Service **None**
(Circular Nov. 30, 1933) _____

Remarks _____

HYDROGRAPHY
Total Days **21**
Last Date **Oct. 13, 1936.**

Remarks.

Decisions

	Remarks.	Decisions
1	<i>For Title</i>	<i>USGB decision</i>
2		<i>see T-6385</i>
3		" "
4		" "
5		<i>USGB decision</i>
6		<i>USGB decision</i>
7		
8		
9		
10		<i>USGB decision</i>
11		
12	<i>For Title</i>	<i>USGB decision</i>
13		
14		
15		
16		
17		<i>USGB decision</i>
18		<i>see T-6523</i>
19		<i>USGB decision</i>
20		
21		
22	<i>For Title</i>	<i>USGB decision</i>
23		<i>see T-6386</i>
24		
25		
26		
27		

GEOGRAPHIC NAMES

Survey No. **H6182**

Name on Survey	Source										
	A	B	C	D	E	F	G	H	K		
<u>Washington</u>	✓ app'd										1
✓ <u>Three Tree Point</u>	✓ app'd										2
✓ <u>Skamokawa Creek</u>	✓ app'd										3
✓ <u>Steamboat Slough</u>	✓ app'd										4
✓ <u>Price Island</u>	✓ app'd										5
✓ <u>Welch Island</u>	✓ app'd										6
✓ <u>Red Slough</u> Multnomah Slough	✓ Multi-nomah slough	✓		<u>RED SLOUGH</u>			see T-6522c				7
✓ <u>Elokomin Slough</u>	✓										8
✓ <u>Hunting Islands</u>	✓ app'd										9
✓ <u>Tenasillahe Island</u>	✓ app'd										10
✓ <u>Clifton Channel</u>	✓ app'd										11
<u>Oregon</u>	✓										12
✓ <u>Clifton</u>	✓ app'd										13
✓ <u>Cathlamet</u>	✓ app'd										14
✓ <u>Puget Island</u>	✓ app'd										15
✓ <u>Hunts Mill Point</u>	✓ app'd										16
✓ <u>Bugby Hole</u>	✓										17
✓ <u>Ankeny Landing</u>	✓ app'd										18
<u>Puget I. Bar</u>	✓ app'd										19
<u>Cathlamet Chan</u>	✓ app'd										20
<u>Wauna Chan</u>	✓ app'd										21
<u>Columbia River</u>	✓										22
✓ <u>Aldrich Pt</u>	✓ app'd										23
											24
											25
											26
											27

Names underlined in red approved
by GJE on 4/17/37

Puget Island light is shown on H 6182 as a Δ station and on T 6523a as a topographic station. Note added to T-6523a Puget I. Lt. is also a triangulation station. Ris.

5. The junctions with contemporary adjacent sheets will be made when they have been verified and inked in this office.
6. The signals and shore line were taken from T 6523a, ~~1936~~ (1936), T 6522 a & b (1936), and T 6385b (1936).
7. The aids to navigation on the smooth sheet were located by triangulation, intersection, and three point fixes.
8. In volume 2, page 7, there is recorded a 19 ft sounding. ^{pro (78-79) d.} This sounding plots in bat $46^{\circ} 15.7'$ long $123^{\circ} 27.4'$. In view of the fact that ^{this} area was later developed and as the Chief of Party recommends rejection of this sounding, it was left off the smooth sheet, as it was probably recorded in error. ^{This area was drift soundings. No shore depth was found. The party's recommendation rejecting the 19 ft is concurred in.}
9. In volume 4, page 17. The hydrographer states that the

line is broken, to investigate
sunk or scow. ^{Lat. 46°-13.56' Long. 123°-28.75'} The verifier can
find no record of this investigation
nor can the wreck be
~~found~~ found on the boat sheet
nor smooth sheet.

10. In volume 4, page 48, lat
46°13.15', long 123°28.5'. The
hydrographer states "rock about 11m"
This rock is shown as a wreck
on the boat sheet, consequently
it was shown on the smooth
sheet as such.

11. In lat. 46°13.2', long 123°28.5',
there is a rock wreck
shown on the boat sheet, there
seems to be no authority
for this rock in the records.
However it was shown on
the smooth sheet as outlined
on the boat sheet.

Respectfully submitted,
Ed. M. Blosson.

line is broken, to investigate
sunk in scow. ^{Lat. 46°-13.56' Long. 123°-28.75'} The verifier can
find no record of this investigation
nor can the wreck be
~~found~~ found on the boat sheet
nor smooth sheet.

10. In volume 4, page 48. Lat
46°-13.15', Long 123°-28.5'. The
hydrographer states "rock abn 11m"
This rock is shown as a rock
on the boat sheet, consequently
it was shown on the smooth
sheet as such.

11. In Lat. 46°-13.2', Long 123°-28.5',
there is a rock a rock
shown on the boat sheet, there
seems to be no authority
for this rock in the records.
However it was shown on
the smooth sheet as outlined
on the boat sheet.

Respectfully submitted,
Ed. McBlown.

MEMORANDUM

IMMEDIATE ATTENTION

SURVEY }
 DESCRIPTIVE REPORT } No. H -6182
 PHOTOSTAT OF } ~~No. H -6182~~

{ received April 9, 1937
 { registered April 16, 1937
 { verified
 { reviewed
 { approved

This is forwarded in order that your attention may be directed to the matters as indicated below. Please initial in column 3 as an acknowledgement that your attention has been thus directed. The complete original records are available if desired. If you cannot give this your immediate attention, please initial, note, and forward to the next section marked, calling for the records at your convenience.

ROUTE		Initial	Attention called to
20			
22			
24			
25			
26			
30			
40			
62			
63			
82			
83			
88			
90			

RETURN TO

82	C. K. Green
----	-------------



TIDE NOTE FOR HYDROGRAPHIC SHEET

Division of Hydrography and Topography:

✓ Division of Charts: Attention Mr. E. P. Ellis

Tide Reducers are approved in
8 volumes of sounding records for

HYDROGRAPHIC SHEET 6182

Locality Three Tree Point to Cathlamet, Columbia River

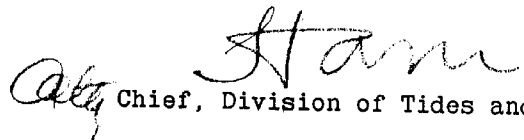
Chief of Party: Robert W. Knox in 1936

Plane of reference is Columbia River Datum, reading

- 0.0 ft. on tide staff at Cathlamet
- 34.5 ft. below B.M. 1
- 2.3 ft. on tide staff at Bugby Hole
- 7.3 ft. below B.M. 1
- 1.3 ft. on tide staff at Clifton
- 20.1 ft. below B. M. 1
- 1.9 ft. on tide staff at Shamokawa
- 9.2 ft. below B.M.1
- 1.2 ft. on tide staff at Aldrich Point
- 13.8 ft. below B.M. 1
- 0.0 ft. on tide staff at Puget Island
- 11.7 ft. below B. M. 1

~~Condition of records satisfactory except as noted below:~~

Height of mean high water above plane of reference is approximately
7 feet.


Chief, Division of Tides and Currents.

Section of Field Records

REVIEW OF HYDROGRAPHIC SURVEY NO. 6182 (1936) FIELD NO. OW 15

Three Tree Point to Cathlamet, Columbia River, Oregon-Washington.
Surveyed in 1936, Scale 1:10,000
Instructions dated Feb. 26, 1935 (R.W.Knox)

Hand Lead and Machine Soundings. 3 Point fixes on shore signals.

Chief of Party - R. W. Knox.
Surveyed by - R. W. Knox.
Protracted by - C. J. Wagner.
Soundings plotted by - C. J. Wagner.
Verified and inked by - G. C. McGlasson.

1. Condition of Records.

The records are neat and legible and conform to the requirements of the Hydrographic Manual except as follows:

- a. The name "Fin" was used three times for different signals on the sheet (Hydrographic Manual, par. 12).
- b. Reference is made in sounding Vol. 4, page 17, to an investigation of a sunken scow, the position of which would appear to fall close inshore near a 19 foot sounding in lat. $46^{\circ}13.55'$ long. $123^{\circ}28.75'$. It is assumed that since no other information was noted in the records, descriptive report, or on the boat sheet that the scow is considered non-existent.
- c. No definite information is given in the records as to what stage of the tide the two rocks in approximate lat. $46^{\circ}13.15'$ long. $123^{\circ}28.45'$ are awash. (Hyd. Manual, par. 160 C). The upper of the two rocks was transferred in the office from the boat sheet and is not mentioned in any of the records.

The Descriptive Report is satisfactory as to essential details and satisfactorily covers all items of importance except no reference was made as to the result of the investigation of the sunken scow discussed in par. 1b, this review and no mention is made of the failure to locate the two charted lights in the vicinity of lat. $46^{\circ}14'$ long. $123^{\circ}25.5'$ (see par. 8b (2), this review).

2. Compliance with Instructions for the Project.

This survey in general is very satisfactory and adequately complies with the instructions for the project. However, greater attention should have been paid to the following items:

- a. A number of important shoal spots are shown on the U. S. Engineers survey of April 1936 (Bp. 29451) in the main channel off Price Island that were not verified by the present

survey made about 3 months later (see par. 8a(6), this review). Par. 8 of the instructions calls for a detailed explanation of all junctions made with surveys of the U.S. Engineers. The descriptive report points out 2 soundings (only 1 of which is charted) on the Engineers survey that were not verified by the present survey (not as a result of investigation but merely of comparison), although other similar cases exist.

While the instructions provide for omitting the surveying of an area covered by recent adequate surveys of the Engineers, it is felt that if for any reason the surveyor goes into such an area for purposes other than to make the required junctions, then the survey should be a complete one, particularly with reference to existing shoals, and where differences cannot be reconciled a recommendation should be included in the descriptive report regarding the future charting of such shoals. Otherwise no advantage accrues from the resurvey of such areas.

- b. A more detailed survey should have been made of the Puget Island Bar Channel between lat. $46^{\circ}12'$ and lat. $46^{\circ}13'$. The latest engineer's surveys (on file in this office) in this channel on which the present chart is based are surveys of April and July 1934 (Bp. 27466 and 27785, respectively) and an engineer's report of conditions (see par. 8a(8), this review). The present survey shows a 30 foot shoaling in lat. $46^{\circ}12.3'$ long. $123^{\circ}25.65'$ close to the range line through this channel. The boat sheet contains transferred soundings in this area that do not agree with those on the above Engineer's blueprints and it would appear that a later survey was made by them in this area, although the descriptive report notes a comparison having been made with an April 1934 Engineer's survey. This matter has been referred to the field party (see par. 10b, this review).

3. Shoreline and Signals.

The shoreline and topographic signals originate with T-6522a&b (1936), T-6523a (1936), and T-6385b (1936).

Triangulation stations Oak, Pine and C, shown with blue triangles between Puget Island Light and Hunts Mill Point, are from the U.S. Engineer's triangulation reduced to the N. A. 1927 Datum through a line common to U.S.C. & G. Survey and Engineers' schemes. (See D. R. T-6522 (1936) page, 1, last paragraph.)

4. Sounding Line Crossings.

The agreement of depths on cross lines is satisfactory.

5. Depth Curves.

Within the area of the present survey the usual depth curves can be satisfactorily drawn including portions of the low water line.

6. Junction with Contemporary Surveys.

The junction with H-6181 (1936) on the west will be discussed in the review of that sheet.

The survey joining on the southeast has not yet been received in the office. The junction will be discussed in the review of that sheet.

7. Comparison with Prior Surveys.

a. H-1015 (1867-68), H-1335 (1875-76).

These surveys on a scale 1:10,000, cover the area of the present survey east and west of approximate long. $123^{\circ}29'$ respectively.

Comparison shows that numerous changes have taken place over most of the common area some of which are of considerable extent involving shoreline changes and depths. The more important of these are as follows:

- (1). The main ship channel, between Three Tree Point and long. $123^{\circ}28'$ has generally deepened and in some places by as much as 35 feet; off Price and Hunting Islands, the area has generally shoaled by about 20 feet in places; off Puget Island, the agreement is generally fair.
- (2). In Cathlamet Channel there is practically no agreement with the present depths, some areas having deepened and others shoaled. The greatest change in depths occurs off the north side of the channel in the upper portion where the present depths are generally deeper by 20 to 30 feet. An island now exists in this channel (approx. lat. $46^{\circ}12.5'$ long. $123^{\circ}25.0'$) where depths ranging from 3 to 25 ft. are shown on H-1335 (1875-76).
- (3). The depths west of Welch Island between Clifton Channel and the main ship channel has completely changed as well as adjacent shoreline. The depths in general are considerably shallower.
- (4). Welch Island has extended northwest of the old position approximately 1800 meters.

Further detailed discussion of the numerous changes that have taken place have been omitted since it would serve no useful navigational purpose. Because of the many changes that have taken place in this area and because the present survey has adequately covered the area, H-6182 (1936) should supersede the old surveys for charting purposes.

8. Comparison with Chart 6152 (New Print dated May 1, 1937).a. Hydrography.

Within the area covered by the present survey the chart is based on surveys discussed in the foregoing paragraphs, and the Engineers' surveys and reports, comprising Bps. 13108 (1890), 18831 (1924), 21941 (1928), 22021 (1928), 22299 (1928), 27466 (1934), 27785 (1934), 29383 (1936), 29451 (1936), Report on Conditions of Dec. 10, 1935, and Chart Letter 523 (1936).

- (1). The charted soundings in Clifton Channel between approximate lat. $46^{\circ}12'$ and lat. $46^{\circ}15'$ originate with the Engineers Survey of 1890 (Bp. 13108). An examination of the area shows deepenings as well as shoalings have occurred in places, particularly north of lat. $46^{\circ}13'$, whereas, south of lat. $46^{\circ}13'$, the channel has shoaled in general.

The charted sand spot in lat. $46^{\circ}12.3'$ long. $123^{\circ}26.8'$ originating with the Engineers survey falls on the present survey in depths of 11 to 14 feet. While the comparison of the surrounding depths with the present depths show general good agreement, nevertheless, the present survey ran a line of soundings close by the spot at practically low water but no such feature was noted. The spot is believed no longer to exist.

Because of the changes noted and the time elapsed, H-6182 (1936) should supersede Bp. 13108 (1890) for charting purposes.

- (2). Blueprint 18831 (1924) and blueprint 22299 (1928) on a scale 1:5,000 together cover Cathlamet Channel between Cathlamet and the north entrance.

In the northern portion of the main channel the agreement of the depths on Bp. 18831 (1924) with those on the present survey are generally good but in the adjacent areas south of this portion of the channel some deepening as well as shoaling in places has taken place. The channel entrance to Elokomin Slough (Bp. 18831) has generally deepened, and the area adjacent to Puget Island in lat. $46^{\circ}11.8'$ long. $123^{\circ}24'$ an extensive shoaling has taken place.

The $\frac{1}{2}$ foot sounding charted in approximate lat. $46^{\circ}12.55'$ long. $123^{\circ}24.2'$ originates with Bp. 18831 (1924) and falls practically on a 7 foot sounding on the present survey. Comparison of the depths surrounding the shoal sounding with the present ones shows that considerable changes have taken place. The adjacent soundings north of the $\frac{1}{2}$ foot sounding fall on the channel area and are now much shoaler

than those on the 1924 survey, while in the other areas, outside the channel, the present depths are deeper. Because this area is subject to considerable changes, it is believed that the $\frac{1}{2}$ foot sounding no longer exists and should be disregarded in future charting.

Comparison with Bp. 22299 (1928) shows a fair agreement in depths with the present survey in the vicinity of lat. $26^{\circ}12.6'$ but south of this area except in a few places the depths are generally deeper.

Because of the changeable character of Cathlamet Channel, the time elapsed since the above Engineers' surveys were made and because the present survey is more closely and adequately developed, H-6182 (1936) should supersede Bps. 18831 (1924) and 22299 (1928) for charting purposes.

- (3). Bps. 21941 (1928) and 22021 (1928) are on scales of 1:5000 and 1:10,000, respectively, the former covering Steamboat Slough and Skamokawa Bar and the latter the channel area between Skamokawa Creek and the western limit of the present survey. The depths on Bp. 21941 (1928) are in general good agreement with those on the present survey. The comparison with Bp. 22021 (1928) shows the channel locations and the depths therein are in fair agreement with the present survey, but the shoals as well as shoal areas have changed greatly.

Because of the age of the above engineers surveys and the close development of the present survey the latter should supersede Bp. 21941 (1928) and Bp. 22021 (1928) for charting purposes.

- (4). Bp. 27466 (1934) and 27785 (1934) are on a scale of 1:5000, the former embracing the main channel area between approximate lat. $46^{\circ}11'$ and lat. $46^{\circ}14'$ and the latter, a small narrow section in the vicinity of Puget Island Bar. The depths are in general agreement with the present survey, except for the 30 foot shoaling on the present survey in lat. $46^{\circ}12.3'$ long. $123^{\circ}25.65'$. Additional work is being requested here unless the area has been covered by a late engineers survey.
- (5). Bp. 29383 (Feb. 1936) covers the main channel area on the present survey from its southern limit to Bugby Hole Light (approx. lat. $46^{\circ}11'$). The depths are in general good agreement. The only sounding of importance on the engineers survey that is not shown on the present survey is a 6 foot "RK" sounding (charted) in lat. $46^{\circ}10.6'$ long. $123^{\circ}25.7'$. However, it falls close to an undeveloped indication on the present survey and should be retained on the chart. This sounding has been carried forward to the present survey.

- (6). Blueprint 29451 (April 1936) is on a scale of 1:5000 and covers the main channel from the northwest end of Hunting Islands to approximate long. $123^{\circ}29'$. Some ~~minor~~ shoalings have occurred in the vicinity of lat. $46^{\circ}15.8'$ long. $123^{\circ}28.2'$, but generally the agreement in depths between the two surveys is good. In the channel proper the engineers survey shows a number of shoal soundings (some of which are charted) between the northwest end of Price Island and Price Island Light that were not verified by the present survey although indications are noted in some cases. While the bottom is somewhat irregular in this area there is nevertheless evidence of some change having taken place since the engineers survey was made (compare area in lat. $46^{\circ}15.5'$ long. $123^{\circ}27.1'$). A request is being made for further information regarding this area and pending its receipt the shoal soundings should be continued on the charts. (See par. 10a, this review.)
- (7). The charted 7 foot sounding in Skamokawa Creek, between Brooks and Steamboat Sloughs giving the controlling depth in this portion of the creek originates with Chart Letter 523 of 1936, which gives only a general location for the 7. When transferred to the present survey the 7 actually falls in a low water area. However, the controlling depth on the present survey is in agreement with the charted depth.
- (8). The two 32 foot soundings on the Puget Island Bar range in approximate lat. $46^{\circ}12.3'$ long. $123^{\circ}25.6'$ originate with an Engineers Report of Conditions of Dec. 10, 1935. This report cannot be traced. The upper 32 falls on the present survey in an open area while the lower falls near a 34, both of which are on a hard sand bottom. This area is not considered sufficiently developed on the present survey to disprove the existence of these 32 foot soundings and they should be retained on the chart.
- (9). Bp. 30536 (1937) scale 1:5000 covers the main channel from the southern limit of the present survey to Puget Island Light with a few widely spaced lines. This survey is subsequent to the present survey but the two are in general good agreement. This blueprint has not yet been applied to the chart.

b. Aids to Navigation.

The charted aids to navigation are in agreement with the positions shown on the present survey except as follows:

- (1). Lights F 2 and F 4 in approximate lat. $46^{\circ}12.3'$ long. $123^{\circ}24.5'$ and Bugby Hole Light in lat. $46^{\circ}11'$ long. $123^{\circ}26'$, originating with H. O. N. to M. 12 (1935),

L.H.N. to M. 1 (1935), and L.H.N. to M. 42 (1926), were located by the present survey about 60, 120 and 70 meters respectively, southward of their charted positions. The lights were plotted on the chart from bearings and distances given in the Notices. The locations on the present survey are plane table determinations and should supersede the charted locations.

- (2). The light* (single pile) in lat. $46^{\circ}14.4'$, long. $123^{\circ}25.5'$ at the entrance to Elokomin Slough and the light* (single pile) in lat. $46^{\circ}13.9'$, long. $123^{\circ}25.4'$ on Hunting Island are not shown on the present survey. They were not located on the contemporary plane table survey T-6522b covering this area, although other similar features have been located thereon with great detail. No statement appears in either the topographic descriptive report or the report of the present survey that these lights no longer exist. The Pacific Coast Light List as of Jan. 1, 1937, still lists them as maintained lights. This matter has been referred to the field party (see par. 10 of this review). * See margin at note par. 10 of this review.
- (3). Buoy S1, at the northern tip of Puget Island, charted from L. H. N. to M. 2 (1921), was located by the present survey approximately 70 meters north of the charted position.

9. Field Plotting.

The field plotting was very satisfactory.

10. Additional Field Work Recommended.

To make this survey complete the following additional work should be accomplished:

- a. Pars. 2a and 8a(6) of this review call attention to certain charted shoal spots from the U. S. Engineers' survey of Apr. 1936 that were not verified by the present survey. Since this is an area where periodic surveys are made by the engineers a separate memorandum has been sent to the field party regarding further information in this area. (Memo. included in letter of Aug. 20, 1937 to Chief of Party - See end of Par. 10, this review). Accomplished. See par. 3a of Review H-6182 Addl. Wk. (1937).
- b. Additional lines in the Puget Island Bar Channel particularly in the vicinity of the 30 foot shoal in lat. $46^{\circ}12.3'$ long. $123^{\circ}25.65'$ unless a recent Engineers survey covers this channel. (see par. 2b, this review). Accomplished. See par. 3b of Review H-6182 Addl. Wk. (1937).
- c. In Clifton Channel in the approach to the docks at Clifton split lines should be run in the vicinity of the 7 and 8 foot soundings in lat. $46^{\circ}12.75'$, long. $123^{\circ}27.65'$. Accomplished. See par. 3c of Review H-6182 Addl. Wk. (1937).

- d. An investigation of a doubtful 17^{*} foot sounding in lat. 46°12.05, long. 123°23.5'. This is noted in the D. R. for investigation when the work is extended up the river in 1937. * 17 in error. Removed from sheet. See par. 11, Letter of Sept. 30, 1937, by Chief of Party attached to Des. Rept.
- e. A development of the 58 foot sounding in the main ship channel in lat. 46° 16.4', long. 123°29.65. The indicated shoaling may be building up around an obstruction on which a lesser depth exists. Accomplished See par. 3d of Review H-6182 Addl. Wk. (1937)
- f. A check up on the existence or non-existence of the two charted lights^{*} noted in Par. 8b(2) of this review. * Lights non-existent. See par. 13, Letter of Sept. 30, 1937, by Chief of Party, attached to Des. Rept. Also Letter Oct. 25, 1937 from L.H. Bureau attached.

Authority for the above additional work is contained in a letter to the Chief of Party dated Aug. 20, 1937. (Copy attached to Des. Report, H-6181)

11. Note to Compiler.

The compiler's attention is called to the following items:

- a. The statement at the bottom of page 1 of the D. R. regarding the comparison between the present survey and the U. S. Engineers survey B-5-32/2. The date of this survey is uncertain, but is believed to be of 1936. However, it may be the source of the soundings transferred to the boat sheet by the field party in the vicinity of Three Tree Point and eastward and noted thereon as originating with the Engineers survey of March 26, 1935. Since neither of these surveys are on file in this office, a request has been made for both.
- b. Paragraph 8b(2) this review, regarding two charted lights which are not shown on the present survey.
- c. Par. 8a(6) this review, regarding the charting of certain shoal spots in the main channel.

12. Superseding Old Surveys.

Within the area covered the present survey supersedes the following surveys for charting purposes:

H-1015 (1867-68) in part.
H-1335 (1875-76) in part.

13. Reviewed by G. Risegari, June 28, 1937.
Inspected by A. L. Shalowitz.

Examined and approved:

C. K. Green, *C. K. Green*
Chief, Section of Field Records.

Fred. L. Peacock
Chief, Section of Field Work.

L. O. Lobbert
Chief, Division of Charts.

G. Heide
Chief, Division of H. & T.

COPY

Post Office Address: Box 805, Astoria, Oregon.

DEPARTMENT OF COMMERCE
U. S. Coast and Geodetic Survey

Reply to this letter filed
under instructions in
Reviewing Section
R.W.Knox - Oct. 8, 1937
Also letter of Nov. 1, 1937

September 30, 1937.

To: The Director,
U. S. Coast and Geodetic Survey,
Washington, D. C.

From: Lieut. Robert W. Knox,
U. S. Coast and Geodetic Survey.

Subject: Doubtful points arising during review of Columbia River
surveys.

Reference: Director's letter of August 20th and Memorandum to Chief,
Section of Field Records, of August 18th. (Filed in Descriptive
Report H-6181)

In accordance with paragraph 3 of the first mentioned reference,
the following recommendations are made relative to the doubtful points
listed in the second reference: H-6180 Following paragraph numbers refer
to paragraphs in above memorandum.

1. Recommended.
2. Recommended, provided any survey made by the U. S. Engineers
does not adequately cover the area of the shoal.
3. The charted piles were verified as to existence, and an attempt
was made, in January or February when the small amount of additional
work was done, to verify their position. These piles, along with other
landmarks in the estuary, recently constructed, will be located at the end
of the present field season.
4. Beacon no longer in existence.
- H-6181
5. Recommended.
6. Recommended.
7. Blind Slough and its tributary, Grizzly Slough, are used for
log raft storage and navigation is limited to such tows. At the present
time there is a proposed flood control project in this area, the completion
of which would dike off this slough somewhere between the end of the present
survey and its northern entrance at Brownsmead.

Last winter, in discussing the advisability of continuing the surveys through the slough with the U. S. Engineers at Portland, it was suggested that no additional work be done until the outcome of the proposed diking was known.

In the opinion of the writer, this is an excellent example of a navigable slough that should be surveyed in order to complete the chart, but would involve a great deal of time and labor and the navigational value resulting therefrom would be questionable. Navigation here, as is the case throughout the entire river with tugs and river boats, is entirely by local knowledge, few tugs even carrying a chart. However, it is recommended such surveys be made, provided the diking plans have been settled upon.

8. In 1935 the Lighthouse Department informed the writer that Three-Tree Bar Beacon had been discontinued, but as the light was still burning it was so described in the triangulation records. At the present time the light is non-existent, but the structure still stands.

H-6182

9. The writer was informed by the Assistant Engineer in charge of the survey launch Robert Gray that a survey of all bars upstream from Skamokawa was soon to be made, and discussion of the advisability of further work on this bar (Puget Island) is withheld until examination of the forthcoming survey.

It has been found that one of the most difficult parts of the hydrographic surveys of this River is deciding how much work should be done in and adjacent to the areas covered by the U. S. Engineers. They have found from long experience that the several bars require surveys at intervals ranging from four times a year to every three or four years. In the former cases it is evident that a rigid agreement between surveys even a month or two apart is not to be expected. Yet, if the bars were to be thoroughly surveyed, such work would be obsolete before the smooth sheets were plotted, let alone verified and the soundings charted.

In sounding in the dredged channels, particularly along the edges, it has repeatedly been noticed that adjacent soundings vary as much as a fathom, sometimes more. With such lumpy bottom, a sounding-for-sounding agreement between any surveys could not be expected.

A note on the Columbia River charts states that the project depth is 35 feet and that a 30-foot channel below Portland is usually practicable. From this it would seem that an intensive development or investigation of depths or differences, much greater than the project depth and in changeable areas, is not an economical practice.

For such reasons it has been the policy of the writer, more so this year than before, to space the sounding lines close together, about 35 or 40 meters, along the junction with the U. S. Engineers channel lines, overlapping the latter at least one line. As these critical area lines are run only under favorable conditions and with all possible care, it is believed any failure to make a proper junction with the Engineers work can rightfully be laid to changeable or lumpy bottom. Generally, such differences are not investigated; likewise shoal Engineer soundings in or near the middle of the channels are not investigated.

25
Refers
to
Par.
10^b
of
Review

10. Recommended. - Refers to Par. 10 of Review
11. This area investigated during current season and 17-foot sounding found to be in error. Refers to Par. 10 of Review
12. With a project depth of 35 feet, it is believed an investigation of the 58-foot shoal is not warranted, particularly as the depths range as follows: 29, 52, 58, 67, 85 and 100 feet. Refers to Par. 10 of Review
13. These lights are non-existent. - Par. 10 of Review
14. As stated in paragraph 9, this bar is to be surveyed by the U. S. Engineers within a short time; the recommendation concerning the shoal soundings is therefore withheld until receipt of this survey. Par. 10 of Review

(Signed) Robert W. Knox,
Chief of Party.

✓

80-DRM

October 18, 1937.

Commissioner of Lighthouses,
Department of Commerce,
Washington, D. C.

On page 112 of the 1937 Pacific Coast Light List two lights on single piles are listed at the bottom of the page (items Nos. 789 and 790) as maintained from May 1 to August 1. In July to October of 1936 our field party operating in this locality failed to locate these lights. In response to a specific inquiry the Chief of Party under letter of September 30, 1937 reported these lights to be non-existent.

Please advise whether it is the intention to re-establish these lights or whether they are to be permanently discontinued.

(Faint signature)

Director.

IN REPLYING ADDRESS
COMMISSIONER OF LIGHTHOUSES
AND REFER TO DATE OF THIS LETTER
AND FILE NO.

1533.

80 ekg

DEPARTMENT OF COMMERCE
BUREAU OF LIGHTHOUSES
WASHINGTON

1937 NOV 2 AM 11 48
October 30, 1937

The Director,
U. S. Coast and Geodetic Survey,
Washington, D. C.

Referring to your letter of October 18th in regard to two lights shown on the Pacific Coast list, page 112, which are no longer being maintained, the circumstances surrounding the discontinuance of these lights, which is permanent, are indicated in copy of letter of October 25th from the Superintendent of Lighthouses at Portland, Oregon, which is herewith for your information.

Chas A Park
C. A. PARK,
Acting Commissioner.

CAP:HS
Incl.

EWL:A

LIGHTHOUSES
OCT 29 3 35 PM '37

1537
October 25, 1937

Commissioner of Lighthouses:

1. Reference is made to your letter of October 21, 1937, concerning Elokomin Slough Light and Hunting Island Fishing Light, which were reported as not existing by the U. S. Coast & Geodetic Survey.

2. These lights were permanently discontinued on August 1, 1937, as published in Local Notice No. 80 of August 12, 1937, and Department of Commerce Notice No. 33 of August 18, 1937. These lights were private aids maintained by the Union Fishing Drift No.1, and as they had been very poorly maintained they were discontinued by the Union Drift No.1, at request of this office. No requests have been received by this office for the re-establishment of these lights.

E. C. Merrill
Superintendent of Lighthouses

Information noted a.l.s.

Section of Field Records

REVIEW OF HYDROGRAPHIC SURVEY NO. 6182 Addl. Wk.(1937) FIELD NO. OW15

Three Tree Point to Cathlamet, Columbia River, Oregon - Washington

Surveyed in November 1937, Scale 1:10,000

Instructions dated Aug. 20, 1937 (Letter to R. W. Knox)

Oct. 8, 1937 (" " R. W. Knox)

Hand Lead and Machine Soundings.

3 Point fixes on shore signals.

Chief of Party - R. W. Knox.

Surveyed by - R. W. Knox.

Protracted by - G. H. Everett.

Soundings plotted by - G. H. Everett.

Verified and inked by - G. H. Everett.

1. Purpose of Survey.

The purpose of this survey was to accomplish additional work called for in paragraphs 10a, b, c, and e of the review of H-6182 (1936).

2. Office Work.

The additional work was plotted on the boat sheet in the field but the smooth plotting and inking was done in the office, the position number and day letters being indicated in green and the soundings in blue.

3. Results of Survey.

The Descriptive Report for the additional work is a combined report covering additional work on H-6180, 6181 and 6182. The report and sounding record for the three sheets have been filed under H-6181 Addl. Work. The following paragraphs refer to paragraph numbers in the review of the original survey (H-6182).

a. Reference Par. 10a.

The additional work in the main channel off Price Island was done two months subsequent to a survey by the U. S. Engineers (Blueprint 31,204). A study of these two surveys together with the engineers survey made in April 1936 (blueprint 29,451) and the work by this Bureau in October 1936 (H-6182) reveals the area to be very broken and humpy. ✓ In some cases previously determined shoals were verified by the engineer's work of 1937 (blueprint 31,204) while in others they were verified by the additional work of 1937, but no two of the surveys were found to be in complete agreement with each other. Because of the nature of the

bottom the shoals not verified could not be considered as non-existent. As suggested in the descriptive report for the additional work (par. 14), it would require 10 to 15 meter lines for a single survey to completely develop these shoals.

In the absence of information that dredging has been done in this area, the chart should be compiled from the characteristic soundings of all the surveys discussed above.

b. Reference par. 10b.

The additional lines in the Puget Island Bar Channel developed the extent of the 30 foot shoal in lat. $46^{\circ} 12.3'$, long. $123^{\circ} 25.65'$. The two charted 32 feet soundings on the range, (discussed in par. 8a(3) of the original review) were also verified and 31 feet found in both cases.

The area of the additional work has been covered by a recent engineer's survey (blueprint 31,205 of Sept. 1, 1937). The two surveys are in good agreement and should supplement each other for charting.

c. Reference Par. 10c.

The split lines run off the docks at Clifton revealed several additional shoal depths, but nothing shoaler than was previously found.

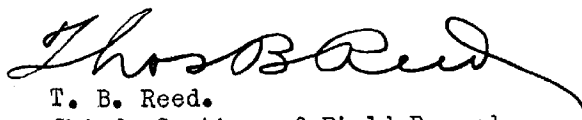
d. Reference Par. 10e.


A development of the 58 foot depth in the vicinity of lat. $46^{\circ} 16.4'$, long. $123^{\circ} 29.65'$ revealed no lesser depths.


4. Reviewed by - G. Risegari, Feb. 24, 1938.


Inspected by - A. L. Shalowitz.

Examined and approved:


T. B. Reed.
Chief, Section of Field Records.


K.T. Adams
Chief, Div. of Charts.


Fred. L. Peacock
Chief, Section of Field Work.


G. H. de
Chief, Div. of H. & T.

Applied to drawing of Chart 6152 - Dec. 3, 1937 - J.W.

Additional work applied to drawing chart 6152 7/7-38 G.H.S.