7696

Diag. Cht. No. 6157 (Insert)

Form 504

U. S. COAST AND GEODETIC SURVEY

DEPARTMENT OF COMMERCE

DESCRIPTIVE REPORT

Type of Survey HYDROGRAPHIC

Field No. LR-11448 *Office No.* H-7696

LOCALITY

State Washington

General locality Franklin D. Roosevelt Lake

Locality Kettle River Arm

194 8

CHIEF OF PARTY

J.T.Jarman

LIBRARY & ARCHIVES

DATE 1 Feb. 1950

8-1870-1 (1)

7696

FEB 1 1950

Form 537
(Ed. June 1946)

REG. NO. H-7696

DEPARTMENT OF COMMERCE

U. S. COAST AND GEODETIC SURVEY

HYDROGRAPHIC TITLE SHEET

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

REGISTER No. H 7696

Field No. LR 11448

State Washington

General locality ~~Kettle River arm of Lake~~ Franklin D. Roosevelt Lake

Locality ~~Gorge Bridge to Napoleon Bridge.~~ Kettle River Arm

Scale 1/ 10 000 Date of survey Sept. & Oct. 1948

Instructions dated 20 June 1947

Vessel LCVP

Chief of party J.T.Jarman

Surveyed by Hal . Marchant & C. Lind

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

Fathograms scaled by L.E.Evart, Jr.

Fathograms checked by Henry Aanenson

Protracted by Thos. G. Taxelius

Soundings penciled by Thos. G. Taxelius

Soundings in ~~fathoms~~ feet at ~~MLW~~ ~~MLLW~~ a/ 1290 Ft. USBR 1937 independent datum, or 1288.575 MSL USC&GS

REMARKS:

a/ Soundings in feet at lake level datum of 1288.6 ft. above mean sea level (or 1290.0 ft USBR, 1937). Elevations are in feet above lake level datum.

U. S. GOVERNMENT PRINTING OFFICE 693019

DESCRIPTIVE REPORT
To Accompany

Hydrographic Survey H-7696, Field No. LR-11448

A. INSTRUCTIONS

1. The hydrographic survey of Franklin D. Roosevelt Lake has been designated Project CS-332. This is in accordance with original INSTRUCTIONS, No. 22/MEK FP-Jarman dated 20 June 1947.

B. SURVEY LIMITS AND DATES

1. This sheet is on the Kettle River Arm of Franklin D. Roosevelt Lake. It extends from the mouth of the Kettle River to Napoleon Bridge; work began on September 30, 1948 and the sheet was completed on October 7, 1948.

2. Some feeling over a shoal was accomplished with a leadline during the 1949 Season.

C. VESSELS AND EQUIPMENT

1. A navy type landing craft, vehicle and personnel, hereinafter referred to as launch LCVP was used for hydrographic surveying. It was leased with a boat operator furnished by the owner for $590.00 per month. The launch gave satisfactory results. The turning radius at sounding speed was approximately 25 meters. A squat and settlement test on the launch gave negligible results. This launch used an outboard fish set at 2 feet below the surface.

2. A gasoline powered sounding launch, designated launch No. 98, was furnished the party by the USC&GS Ship SURVEYOR. It used an inboard fish set at 1.5 feet below the surface; turning radius was 20 meters.

3. A large houseboat (camp barge type) which served as a base of operations, provided the necessary living accommodations and storage space for supplies, such as instruments and other necessary equipment. Fuel, generating equipment, and battery chargers were maintained on a small auxiliary barge. Signal building supplies and heavier items of such nature that would not be damaged by the weather, were stored on a large open barge which was generally kept ahead of the main operations.

4. An NK-7 type fathometer was used exclusively on this sheet; the launch LCVP accomplished the hydrography.

5. A lead line was used for feeling over shoals and obtaining least depths on submerged rocks.

6. A hand sounding machine and calibrated sheave mounted on the LCVP was used for comparisons in deep water and for obtaining deep water temperatures and salinities. The bulk of the temperatures and salinities

used on these two sheets were obtained by the LCVP. When possible, the launch 98 obtained supplemental temperature and salinity observations, using a leadline to support the apparatus. observations filed with H-7681

D. TIDE AND CURRENT STATIONS

1. Tidal note for this sheet is attached to this report. Paragraphs 1, 2, 3, 5, and 6 under this same heading, Descriptive Report to accompany sheets LR-10447 and LR-10247 apply to this sheet also.
H-7681 (1947) H-7682 (1947)

2. Soundings on the sheet were reduced by data from the Gorge Bridge staff. To supplement the data from the latter staff, refer to either the Kettle Falls Gage, or the Grand Coulee Dam Gage. The small amount of work accomplished in 1949 was reduced by data from the Kettle Falls staff.

3. While hydrography was in progress during the 1948 Season, the current noted was not appreciable. In May 1949, an estimated current of 4 knots was observed at the Gorge Bridge. It is believed that a current of 3 to 5 knots may be expected during the Spring flood stage.

E. SMOOTH SHEETS

1. The smooth sheets have not been plotted. It is expected that remarks under this heading will be inserted in the final descriptive report by the Processing Office. (See Proc. Off. Notes in this Desc. Rpt.)

F. CONTROL STATIONS

1. Horizontal control for this project is second and third order triangulation executed by the USBR from 1934 to 1940. For a complete treatment of the main source of the horizontal control, refer to the "Special Report on Boundary Reservoir Control Points, Project Ph-2(45)", previously submitted to the Washington Office. Acc. No. G-7380

2. The foregoing control was supplemented by photo-hydro and topographic stations established by the Photogrammetric personnel. Project Ph-2(45). The registry numbers of the planimetric or shoreline survey sheet common to sheet LR-11448 is T-8867. (1946-47)
H-7696

3. Additional hydrographic stations were established by plane-table methods to replace several photogrammetric points which were marked doubtful, or could not be identified. In some instances, the photogrammetric points were so situated that they were not visible over a wide portion of the lake. Such stations were supplemented by establishing new stations. The locations of these new additional stations are shown on graphic control topographic sheets. The control sheet common to this sheet is LR-P-48, registry No. T-10299. LR-P-48 applied to H-7696 and used desig. [illegible]

4. An index map has been prepared for this sheet to show the limits and field numbers of contemporary planimetric shoreline surveys and control sheets; it is attached to this report.

5. The graphic control sheets which accompany the hydrography give the final accepted locations for the hydrographic control; where discrepancies exist, if any, the control sheet locations should be accepted. Location of photo-hydro stations from the shoreline survey sheets which were accepted have been shown on the graphic control sheet with green circles. Locations of additional signals plus the locations of photo-hydro stations found to be in error, have been shown with red circles. The majority of the photo-hydro stations used for hydrographic control were checked with a plane-table. Since the USBR third order control points are listed in plane coordinates, this sheet shows the Washington North State plane coordinate grid system.

Photo-Hydro stations in green are of same accuracy as red topo stations.

G. SHORELINE AND TOPOGRAPHY

T-8867(1946-47)

1. The planimetry shoreline was transferred to the boat sheets from ozalid prints of applicable shoreline survey sheets. Topographic stations were transferred to the boat sheets from applicable graphic control sheets. During the course of the hydrographic survey, some discrepancies were detected and corrected in the shoreline location. The corrected shoreline is shown in red ink on the control sheet (LR-P-48); the discussion of these discrepancies will be found in the Descriptive Report to Accompany Control sheet LR-P-48. (T-10299) D.R. attached to this descriptive report

H. SOUNDINGS

1. During the 1948 Season, an Nk-7 type fathometer operating in feet was used; a leadline was used during the short 1949 Season.

2. The general procedure was as follows: In the case of the LCVP, the oscillator depth was maintained at 2 feet. The initial of the fathometer was adjusted to read 2 feet when the fathometer was operating in feet. This initial adjustment was not changed when the machine was operating in fathoms, and under such conditions, the initial in fathoms was found to be 1.7 fathoms (average). The error in the initial reading in fathoms was absorbed in the velocity correction curve. Instructions were given to take three bar checks daily. The fathograms were scanned for variations from the standard initial of 2 feet in feet and 1.7 fathoms in fathoms, and such variations were applied in the record books as an index correction. The bar checks and vertical comparisons were used to obtain a check on the computed velocity corrections, but the computed velocity corrections were actually used for correcting the soundings.

3. During the winter months between the 1948 and the 1949 seasons, a study was made of the bar check data. It was found that a fairly constant residual existed after velocity corrections had been applied to the bar check soundings. Since the residuals were so nearly constant for the various depths of the bar check, it was indicated that it was an initial correction. When the above was discovered, the fathograms had already been scanned and initial corrections entered as described in Paragraph 2 above.

Therefore, the average residual for all of each days bar checks was determined and applied algebraically to the scanned initial. See "Cahier of Bar Check Residuals" to be submitted with the 1948 Season's data. Filed with H-7681

4. The boat sheet covered by this report has been plotted in feet since the majority of the soundings were obtained in that unit. The Washington Office has specified that the depth unit for smooth plotting will be in feet. The datum plane used on the boat sheet under discussion is the normal lake level of 1290 feet, USBR Independent Datum of Leveling, or 1288.575 feet above mean sea level. This is the datum which will be employed on the smooth plotted sheet.

I. CONTROL OF HYDROGRAPHY

1. The control of the sounding launch was entirely on board the sounding vessel using the standard three point fix method of position finding. A few exceptions occur in coves and bights where the method outlined in Paragraph 3352 of the Hydrographic Manual was used. The latter cases have been covered by notes in the position data column of the sounding records.

J. ADEQUACY OF SURVEY

1. It is believed that this sheet is complete. The boat sheet junction on the south appears to be satisfactory; no difficulty was experienced in drawing depth curves. (H-7695, 1948)

2. There is not much navigation on this arm of Lake Roosevelt except minor logging activity; the clearance on the Gorge Bridge and other bridges is limited (See T-8867); the main channel is winding and tortuous; therefore, not much time was spent on the sheet. (446-447)

K. CROSSLINES

Cross lines were obtained in the wide areas of the sheet; the number obtained are slightly under the 8% specified in the instructions. Those obtained check the normal system of development within the limits specified by the Hydrographic Manual.

L. COMPARISON WITH PRIOR SURVEYS

1. Prior surveys of this type do not exist in the area.

M. COMPARISON WITH CHART

1. There is no existing chart of Franklin D. Roosevelt Lake.

N. DANGERS AND SHOALS

1. The fixed Napoleon Bridge at Lat. 48° 44.8', Long. 118° 07.0', with a clearance of ~~approximately 12~~ 11' feet limits navigation beyond that point except for very small boats.

2. The channel is winding and tortuous; vessels drawing more than 10 feet should not venture beyond the fixed railroad bridge at Lat. 48° 42.4', Long. 118° 08.08' without local knowledge.

3. A list of the more important dangers on the sheet follows:

(a) Rocky pinnacle with least depth of 10 feet; Lat. 48° 40.61', Long. 118° 06.95'.

(b) Three rocks at Lat. 48° 43.81', Long. 118° 07.05' with least depths of 0.3 ft., 2.0 ft. and 2.0 ft. respectively.

4. There is no gradient on the Kettle River at the Napoleon Bridge when the lake is at its normal level of 1288.6 feet above mean sea level. During draw-down periods, the upper reaches of the river will be subject to a gradient, the extent and amount depending on the extent of the draw-down.

5. The following notes which were submitted by the hydrographer in charge of the sheet are listed for information:

(a) Dangers and shoals are numerous within the limits of the survey. The entire area should be navigated with extreme caution. The adjoining topography gives little indication of the underwater contours. The main channel is narrow and many abrupt course changes are necessary to safely navigate the area. The depth curves are abrupt in many places between the main channel and the shoal areas. In the upper reaches, there are numerous logs and debris piles deposited by the Spring floods.

(b) Shoal at Lat. 48° 41.01', Long. 118° 08.9'; least depth 18 feet; bottom sandy; position 38c and 39c.

(c) A cove at Lat. 48° 42.45', Long. 118° 07.2'; the entrance is blocked by numerous rocks as described on positions 145a through 147a.

(d) A rock at Lat. 48° 43.58', Long. 118° 07.58'; bares 2 feet; position 45b.

(e) A shoal, Lat. 48° 44.05', Long. 118° 07.05'; least depth 4 feet; bottom, sandy; positions 60b through 64b.

(f) Numerous areas on the sheet have been labelled too shoal to sound; depths in such areas range from 6 inches to 3 feet. The majority of the sounding lines continued until the launch was aground.

(g) The presence of weeds and marine growth throughout the area give no accurate indication of shoal areas. The marine growth exists regardless of any certain depth.

O. COAST PILOT INFORMATION

1. For a complete discussion of Coast Pilot information refer

Bridge Clearances per T 8867 -6- 10/10/47

Napoleon Br. Vert. Clear. 11.4
RR Br. " " 27.4
GN RR Br. " " 37.9
Gorge Hwy. " " 33.0

to "Coast Pilot Report, Franklin D. Roosevelt Lake, Project Ph-2(45)" previously submitted to the Washington Office. (Filed in Coast Pilot Sect.)

The water surface at Cooler Dam was about 0.3 ft below normal pool level of 1290 ft 9/10/47 - VM.

2. Navigation on this arm of Lake Roosevelt is limited by the clearance of three fixed bridges, the clearances being submitted by field units of Project Ph-2(45). These clearances were verified by the hydrographic party. It is noted on shoreline survey sheet, T-8867, (1946-47) that the clearances have not been reduced to the plane of reference datum. The water surface elevations for the 1947 Season for correcting these clearances have been submitted to the Seattle Processing office.

Bridge clearances as noted on T-8867 are based on pool level 0.3 ft. below 1290.0 ft (USBR). (See Proc. Off. notes)

3. It is recommended that deep draft vessels not enter the Kettle River without local knowledge.

Clearances noted on Survey sheet
GS 11.1 ft
27.1 "
37.6 "
327 " ?

4. The large bight at Lat. 48° 40.8', Long. 118° 06.8' furnishes excellent protection and good holding ground for an anchorage.

P. AIDS TO NAVIGATION

1. There are no aids to navigation within the area.

Q. LANDMARKS FOR CHARTS

1. There are no landmarks for charts within the area.

R. GEOGRAPHIC NAMES

1. For a complete treatment of Geographic Names, refer to "Special Report, Geographic Names, sheets 8849 to 8859, Project Ph-2(45)" previously submitted to the Washington Office. No additional information was obtained by the topographic and hydrographic units, Project CS-332.

Filed in Geographic Name Section.

S. SILTED AREAS

1. No silted areas were detected from an inspection of the fathograms.

T. BY-PRODUCT INFORMATION

1. In addition to providing a basic hydrographic survey of Franklin D. Roosevelt Lake, this party has attempted to obtain sufficient information by hydrographic methods from which the Bureau of Reclamation can delineate 10 foot bottom contours. Therefore, the survey is somewhat more detailed than would ordinarily be the case.

U. MISCELLANEOUS

1. This report is compiled from notes submitted by Hal A. Marchant.

V. REFERENCES

1. The following listed reports will be of help and interest in connection with this survey:

Descriptive Report to Accompany Hydrographic Survey Nos. H-7681 (1947) and H-7682 (1947), Field Nos. LR-10147 and LR-10247.
Coast Pilot Report, Franklin D. Roosevelt Lake, Project Ph-2(45). (Filed in Coast Pilot Sect.)
Special Report, Investigation of Geographic Names, Sheets 8849 to 8859, Project Ph-2(45). (Filed in Geographic Name Sect.)
Special Report on Reservoir Boundary Control Points, Project Ph-2(45). (Acc. No. G-7380)
Field Inspection Report, Area of the Third Radial Plot, Project Ph-2(45). (Div. of Photo.)
Water Surface Elevations (Tides), Season 1948, Project CS-332. (Filed in Div. of Tides.
Water Surface Elevations (Tides), Season 1949, Project CS-332. (Filed in Div. of Tides.
Cahier "Copies of Correspondence and Related Information Applicable to Project CS-332, Lake Roosevelt". (Acc. No. S-2722
Cahier "Bar Check Residual Study" (Filed with H-7681)
Report of Preliminary Investigation of Lake Roosevelt by John C. Ellerbe dated 27 September 1945. (Filed in Library under J.C. Ellerbee)

X. TABULATION OF APPLICABLE DATA

1. The following data is being submitted for this sheet:

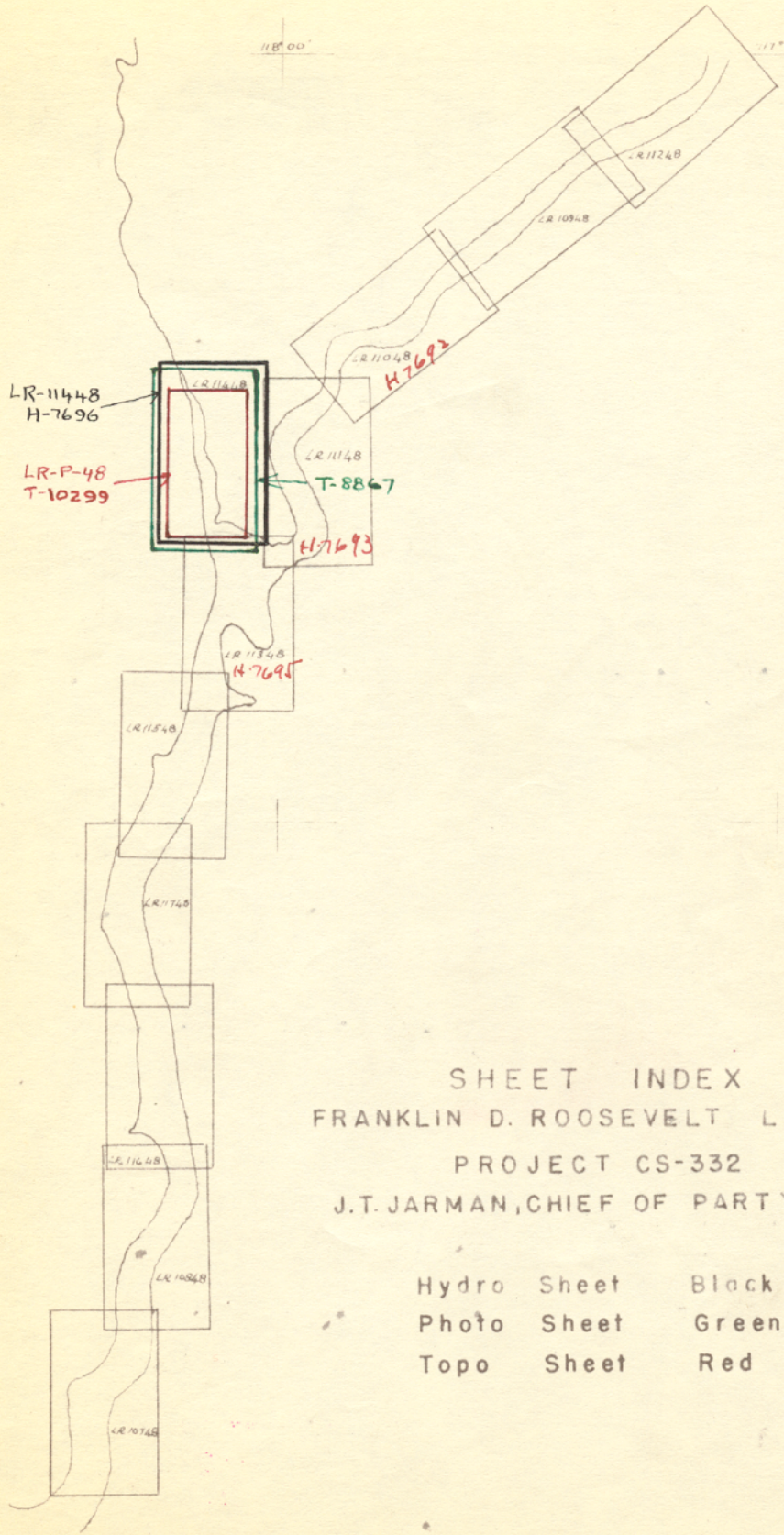
Sounding volumes (Form 275)	2 vol.
Fathograms	1 roll
Boat Sheet (LR-11448) H-7696	1 ea.
Control Sheet (LR-P-48) (T-10299)	1 ea.
Descriptive Report	

2. The following data is applicable to all sheets in the immediate vicinity:

Velocity corrections, 4 June 1948 to 13 August 1948	1 cahier	Filed with H7681 (Acc. No. S-2722)
Velocity corrections, 1949 Season	1 "	
Water Surface Elevations, 1948 Season	1 "	
Water Surface Elevations, 1949 Season	1 "	
Bar Check Residuals	1 "	
Tide data and marigrams for all gages		Filed in Div. of Tides & Currents
Level records for all gages		
Recovery notes, triangulation		
Bench mark descriptions and recovery notes		

3. The following work has been accomplished on the records and data of this sheet: (By field party)

All fathograms have been checked and scaled.
Velocity corrections have been entered and checked.
Tide reducers have been entered and checked.
Fathogram index corrections have been entered and checked.
Soundings have been reduced but not checked.



SHEET INDEX

FRANKLIN D. ROOSEVELT LAKE

PROJECT CS-332

J.T. JARMAN, CHIEF OF PARTY

Hydro	Sheet	Black
Photo	Sheet	Green
Topo	Sheet	Red

4. There remains to be accomplished the following work on the records and data of these sheets:

Check the reduction of the soundings; plot smooth sheet

Respectfully submitted,

J. T. Jarman
Chief of Party

Encl.

Statistics
Hydrographic Title Sheets
List of Hydrographic Signals
Landmarks for Charts
Index Sheets
Abstract of Velocity Corrections
Abstract of Tide Reducers
Approval Sheet

Season 1948
Tabulated Tide Reducers, Sheet LR-11448

7-186
(July 1935)

Date	Feet	Fms.
Sept. 30	∠ 0.4	∠ 0.1
Oct. 1	∠ 0.4	∠ 0.1
Oct. 7	∠ 0.2	0.0

Refer to Gorge Bridge Staff with omissions, if any, from either Kettle Falls gage, or Grand Coulee Dam, gage.

Season 1949-Tide Reducers

Sheet LR 11448

Refer to Kettle Falls Staff

May 10	∠ 5.0	ft.	all day
May 11	∠ 5.0	"	" "
May 12	∠ 5.0	"	" "
May 13	∠ 4.8	"	" "
May 19	∠ 1.0	"	" "
May 20	∠ 0.8	"	" "
May 21	∠ 0.4	"	" "

Sheet LR-11448

Bar Check Residuals

(To be applied algebraically to the scanned Index Corrections)

7-186
(July 1935)

Date	Bar Check Residuals Feet	Fms.	Fath.	Launch	Remarks
Sept. 30	-0.6	0.0	NK-7 86	LCVP	
Oct. 1	-0.2	0.0	86	LCVP	
7	-0.1	0.0	86	LCVP	

7696

VELOCITY CORRECTIONS
U.S. Coast and Geodetic Survey
Ship --- LCVP
J.T.Jarman Comdg.
These corrections are to be used between 27 Sept. 1948 and 21 Oct. 1948 in the locality Gifford to Canadian Boundary,Lake Roosevelt. for hydrographic surveys LR-11148 to LR-11748 incl.

Corrections for NK-7 No.86

Corrections for feet

To depth		Corr.	
21.0	ft. ----	0.0	ft.
59.5	" ----	-0.2	"
91.0	" ----	-0.4	"
122.0	" ----	-0.6	"
152.0	" ----	-0.8	"
182.0	" ----	-1.0	"
Below 182.0	" ----	-1.2	"

Corrections for fathoms

To depth		Corr.	
15.4	fm. -----	-1.4	fm.
30.5	" -----	-1.5	"
Below 30.5	" ------	-1.6	"

H 7696
LR 11448
Lake Roosevelt, Washington.
Kettle River

Processing Office Notes.

Smooth sheet.

The projection and grid were ruled on the machine (1946-47) in Washington. Shoreline and signals are from T 8867 and T 10299. Triangulation was plotted from the photo control data for sheet T 8867. T-10299 applied to H-7696 and then was destroyed.

Bridge Clearances.

As the water surface of the pool at Coulee Dam was 0.3 feet below the sounding datum (1290 Ft. USBR) on the afternoon of 10/10/47 when the chearances were measured this correction has been subtracted from the vertical clearances of the four Kettle River bridges as shown on T 8867. See Page 6 of this report. The water level at the dam was rising slowly at that time.

Fathometer speed.

All fathograms were checked for speed at random intervals thruout each days work and found satisfactory. Templates suitably devided for the calibration of the fathometer used were available for this test.

Other subjects have been covered by the report of the field party.

Edgar G. Smith

Edgar G. Smith
Cart. Engr.
Seattle Proc.Off. 1/30/50

7696

STATISTICS
Sheet LR-11448- H-7696

Vol. No.	Day Letter	Date	HL Wire	Positions	Statute Miles
		Season 1948 (LCVP)			
1	a (blue)	9/30	5	169	16.9
1	b "	10/1	16	157	9.8
2	c "	10/7	8	68	3.7
		Season 1949 (LCVP)			
2	d "	5/13	4	4	--
	Totals		33	398	30.4

Area Square Statute Miles-- 1.9

7696

Form 712
DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY
Rev. June 1937

TIDE NOTE FOR HYDROGRAPHIC SHEET

Division of Hydrography and Topography:

Division of Charts:

Plane of reference approved in
volumes of sounding records for

HYDROGRAPHIC SHEET H-7696

Locality Kettle River Arm of Lake Roosevelt

Chief of Party: J.T. Jarman
Plane of reference is 1288.575 feet above mean sea level
2.238 ft. on tide staff at Gorge Bridge
42.351 ft. below B. M. M-23-1

Both the Kettle Falls gage and the Grand Coulee Dam gage are applicable to this sheet in case of omissions in the Gorge Bridge staff record.

Refer to "Special Report, Water Surface Elevations (Tides), Season 1948, Lake Roosevelt".

Condition of records satisfactory except as noted below:

Chief, Division of Tides and Currents.

U. S. GOVERNMENT PRINTING OFFICE 756675

H 7696
LR 11448

Lake Roosevelt, Washington
Kettle River

List of geographic names penciled on smooth sheet.

Washington

Stevens County

Ferry

Franklin County

*Franklin D. Roosevelt Lake

*Kettle River

* This estuary is called Kettle River by local residents.

RHC

Form 712
DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY
Rev. June 1937

TIDE NOTE FOR HYDROGRAPHIC SHEET

~~Division of Hydrography and Topography~~ 17 February 1950

Division of Charts: R. H. Carstens

Plane of reference approved in
2 volumes of sounding records for

HYDROGRAPHIC SHEET 7696

Locality Kettle River, Roosevelt Lake, Washington

Chief of Party: J. T. Jarman in 1948
Plane of reference is
~~ft. on tide staff at~~ 1290 feet (USBR 1937 Datum of Leveling)
~~ft. below B. M.~~ or 1288.6 feet (Sea-level datum of 1929)

2.2 ft. on tide staff at Gorge Bridge
42.3 ft. below B. M. M-23-1 Reset

2.7 ft. on tide staff at Napoleon Bridge
35.4 ft. below B. M. Z 76

3.2 ft. on tide staff at Kettle Falls
81.7 ft. below B. M. A 281

Condition of records satisfactory except as noted below:

E. C. McKay
Chief, ~~Division~~ Section of Tides ~~and Currents.~~

U. S. GOVERNMENT PRINTING OFFICE 756675

GEOGRAPHIC NAMES

Survey No. H-7696

Name on Survey	A On Chart No.	B On previous survey No.	C On U. S. quadrangle Maps	D From local information	E On local Maps	F P. O. Guide or Map	G Rand McNally Atlas	H U. S. Light List	K	
Washington									USGB	1
Stevens County										2
Ferry County										3
Franklin D. Roosevelt Lake									USGB	4
Kettle River Arm										5
Gorge Bridge			(location of tide gage)							6
Napoleon Bridge										7
Boyds										8
Napoleon										9
										10
										11
					Names underlined in red are approved 2-9-50 L. Heck					12
										13
										14
										15
										16
										17
										18
										19
										20
										21
										22
										23
										24
										25
										26
										27

M 234

Hydrographic Surveys (Chart Division)

H-7696
HYDROGRAPHIC SURVEY NO. .....

Records accompanying survey:

Boat sheets 1; sounding vols. 2; wire drag vols. .....;
bomb vols. .....; graphic recorder rolls 1 envel.;
special reports, etc. .....
.....

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

Number of positions on sheet		398
Number of positions checked		26
Number of positions revised		4
Number of soundings revised (refers to depth only)		1
Number of soundings erroneously spaced		11
Number of signals erroneously plotted or transferred		0
Topographic details	Time	1
Junctions	Time	0
Verification of soundings from graphic record	Time	8

Verification by Robert C. Richard Total time 48 Date 3/10/50

Reviewed by [signature] Time 19 Date 4/17/50

M-2232-1

FEB 15 1950

FORM 537a (9-24-47)

DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

REGISTER NO. T - 10299

TOPOGRAPHIC TITLE SHEET

FIELD NO. LR-P-48

Each Planetable and Graphic Control Sheet should be accompanied by this form, completed so far as practicable, when forwarded to the Washington Office.

STATE
Washington

GENERAL LOCALITY
Kettle River Arm of Lake Roosevelt

LOCALITY
Gorge Bridge to Napoleon Bridge

SCALE
1: 10,000

DATE OF SURVEY
Sept. & Oct., 1948

VESSEL
Field Party

CHIEF OF PARTY
J.T. Jarman

SURVEYED BY
George N. Lathrop

INKED BY
Hal A. Marchant

HEIGHTS IN FEET ABOVE ~~MEAN~~ 1288.575 ft. M.S.L. ☐ TO GROUND ☐ TO TOPS OF TREES

CONTOUR APPROXIMATE CONTOUR FORM LINE INTERVAL _____ FEET

PROJECT NUMBER
CS-332

REMARKS

The normal lake level is 1290 feet, USBR 1937 Independent Datum, or 1288.575 feet above mean sea level. Heights of rocks and islands are referred to the normal lake level, i.e., the heights of the features above normal lake level are given.

Magnetic variation 21°50'E at CPKT 3, 1100 May 12, 1949

LR-P-48 applied to H-7696 (1948) and then was destroyed.

12136

DESCRIPTIVE REPORT
To Accompany

Topographic Survey T-10299, Field No. LR-P-48

These surveys are a by-product of Projects Ph-2(45) and CS-332. Project Ph-2(45) furnished the shoreline and photo-hydro station locations for a hydrographic survey of Franklin D. Roosevelt Lake. Project CS-332 is the hydrographic survey of the lake. The graphic control sheets were used to locate additional hydrographic stations by planetable methods, as well as to verify, in several instances, the compilation of the shoreline, and the locations of some of the photo-hydro stations.

INSTRUCTIONS

1. These surveys are not covered by specific instructions. In general, instructions for Project CS-332 cover the surveys. The latter instructions suggest that additional hydrographic stations be located by sextant cuts plotted on the boat sheets. Due to the large number of additional stations necessary plus the desirability of having some check on the photo-hydro locations, the suggestion was not practical, and separate graphic control sheets were adopted.

SURVEY LIMITS AND DATES

1. This survey is on the Kettle River Arm of ~~Lake~~ Franklin D. Roosevelt Lake. It extends from the mouth of the Kettle River to Napoleon Bridge; work began on September 26, 1948 and the sheet was completed on October 1, 1948. It is contemporary to shoreline survey sheet T-8867; it is also contemporary to hydrographic survey H-7696. (1948) (1946-47)

CONTROL

1. Horizontal control for this survey is second and third order triangulation executed by the Bureau of Reclamation from 1934 to 1940. For a complete treatment of the main source of the horizontal control refer to the "Special Report on Reservoir Boundary Control Points, Project Ph-2(45)" previously submitted to the Washington Office. (Acc. No G-7380)

2. The USBR third order triangulation within this area is listed in plane coordinates based on the Washington North State Grid system. Therefore, this control sheet contains the latter grid system as well as the geographic system.

METHODS

1. Standard planetable methods were used throughout the survey. In a few instances, the planetable method was supplemented by theodolite cuts which were protracted.

2. Elevations of rocks and islands are referred to the 1290 foot Datum Plane which is based on the 1937 USBR Independent Datum of Leveling.

The "1290 Foot Plane" is the normal lake level; it being the maximum height to which the water rises in the lake. This plane is equivalent to 1288.575 feet above mean sea level. For additional treatment of this subject refer to Descriptive Report to accompany Hydrographic sheets H-7681 and H-7682, side heading "D".

3. Recovery notes are being submitted for all triangulation stations visited during the course of the survey. In some instances, USBR second order triangulation stations were used for orientation purposes, but the stations were not visited. The original tripod placed by the USBR when the triangulation was executed was still standing, and was used for the sighting point.

4. Locations of photo-hydro stations which were accepted from the shoreline survey sheets have been shown on the graphic control sheets with green circles. Locations of additional stations plus the locations of those photo-hydro stations found to be in error have been shown with red circles. Most of the photo-hydro stations accepted have been checked with the planetable.

5. These control sheets contain the final accepted location for all hydrographic control, and where discrepancies exist, if any, the control sheet locations should be accepted.

SHORELINE AND TOPOGRAPHY

1. The shoreline shown in pencil on this sheet came from shoreline survey sheet T-8867 (1946-47). An error was detected and corrected in the shoreline at Lat. 48° 42.5', Long. 118° 07.1'; the corrected shoreline is shown on the control sheet in red ink. This error is believed to be a compiler's error since no slides or evidence of erosion were present.

COAST PILOT INFORMATION

1. For a complete discussion of Coast Pilot information refer to "Coast Pilot Information, Franklin D. Roosevelt Lake, Project Ph-2(45)" previously submitted to the Washington Office. Also refer to Descriptive Report to accompany Hydrographic sheet H-7696, side headings "N" and "O". (1948)

See D.R. H-7696.

AIDS TO NAVIGATION

1. There are no aids to navigation within the limits of this sheet.

LANDMARKS FOR CHARTS

1. There are no landmarks for charts within the limits of this sheet.

GEOGRAPHIC NAMES

1. For a complete treatment of Geographic Names, refer to "Special Report, Geographic Names, Sheets 8849 to 8859 inclusive, Project

Filed in Geo. Name Sect.

Ph-2(45) previously submitted to the Washington Office.

2. No additional information was obtained by the topographic unit, Project CS-332.

3. It is known that the National Park Service is contacting the Bureau of Reclamation, the Indian Service and various residents along the lake shore in an effort to provide suitable names for the large number of unnamed features on the lake. This information is not yet available.

REMARKS

1. This report is compiled from notes submitted by the topographer.

Respectfully submitted,

J. T. Jarman
Chief of Party

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DEPARTMENT OF COMMERCE

U. S. Coast and Geodetic Survey

1500 Westlake Ave., North
Seattle, Wash.

March 9, 1950

To: Chief, Division of Coastal Surveys
U. S. Coast and Geodetic Survey
Washington, D. C.

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

Subject: Comments, Project CS-332, Lake Roosevelt

In view of the fact that the Lake Roosevelt Hydrographic sheets are about plotted and will soon be ready for verification, the following comments are considered appropriate. Some of the remarks that follow have been included in the descriptive report, but it is believed that this letter should be made a part of all the descriptive reports for a better understanding of the problems confronting the party.

CONTROL

1. The control which was already in place was executed by the Bureau of Reclamation from 1934 to 1942. The second order scheme placed on the higher elevations on either side of the lake is apparently good triangulation. It is listed in both geographic coordinates and plane coordinates.

2. The USBR third order control was listed in plane coordinates only. A local plane coordinate system with triangulation station ALPHA as origin was used from Grand Coulee Dam to the mouth of the Spokane river. On the Spokane river and north of its mouth, the Washington North State Grid coordinates were used. The third order control consists of intersection stations, three point fixes observed on second-order stations with a fourth object observed as a check, and three point fixes with a azimuth check observed from one of the stations in the fix. The third order points used by the party were called CPs by the USBR, and furnished most of the control for graphic signal location. In the opinion of the Chief of Party, the latter control was not absolutely relative.

Comments, Project CS-332, Lake Roosevelt
J. T. Jarman, Chief of Party

When using an aluminum backed topographic sheet, the plotted positions of all visible CPs could not always be checked exactly with the alidade from a planetable setup with the board oriented on another CP. However, the error was generally very small and we were able to obtain intersection of cuts by keeping the orientation in the general direction of the cuts. In some areas, the error was not noticeable, and in others, it could be detected. The USBR stated that some of the difficulty might be due to slides and shifting of earth masses adjacent to the lake which is possible. It was also determined that it was common USBR practice to observe a three point fix from a "near point" which was tied to the monument by a distance and direction. The "near point" was not marked except by stake and the distance was sometimes as much as 200 yards. Apparently, the term, "near point", means an eccentric observation for the three point fix. It is just possible that the eccentric distance and direction in such cases was carelessly measured. It is also my understanding that the CP stations in certain areas were not marked until well after the observations had been completed which may have produced errors in station location. The foregoing facts are enumerated as a possible explanation for the discrepancies noted; in the opinion of the Chief of Party the third order triangulation is adequate as it now exists for the control of hydrography on the lake.

3. The map manuscripts produced by Project Ph-2(45) used both second order stations and third order CPs as control. The results obtained on shoreline location and photo-hydro station location were excellent. In general, the graphic control party made a practice of checking the locations of the photo-hydro stations as furnished by Project Ph-2(45). Approximately 75% of those checked were exact in location; about 20% of those checked were located within the limits of the photogrammetric specifications which stated that no point on the map manuscript was to be out of position more than 0.5 millimeter. This would be a maximum error of 5 meters on a scale of 1:10,000, and some of the stations approaching the maximum error were relocated by the graphic control party and shown with red circles on the control sheets. The remaining 5% of the photo-hydro stations checked by the graphic control party were relocated and shown with red circles on the control sheets.

PERSONNEL

1. With the exception of the commissioned officers, the personnel employed during the project were inexperienced. A number of Filipino Cadets were assigned to the party for training. These men all had an engineering background and some of them were familiar with C&GS methods. They were a decided assistance in the completion of the project, but with the exception of Messers. Venture and Abroger, they should

not have been placed in charge of a hydrographic launch without an experienced officer being aboard. However, exigencies encountered caused some of these Cadets to be placed in charge of a hydrographic launch for limited periods. We also had a bright young man on the party by the name of Charles Lind who was rated an hydrographer observer by Lt. Comdr. Moore. Late in the 1948 Season, sickness among key personnel caused Lt. Comdr. Moore to place Mr. Lind in charge of a hydrographic launch before he had acquired a full rounded experience.

2. Sheets LR-10648 and LR-11148 were plotted at Coulee Dam, Washington by Filipino Cadets. These men were relatively inexperienced and several errors were detected and corrected when the sheets were inspected. It is believed that the sheets are now acceptable, but it is suggested that the verifier give them a close scrutiny.

3. The foregoing facts are mentioned for the benefit of the verifier; it is believed that any discrepancies which resulted have been eliminated during the smooth plot.

SEASON OF 1949

1. During the 1948 Season, the project area was covered by hydrography, but there were a number of unfinished details when weather terminated the season sooner than expected. These details including a few poorly located signals, a number of undeveloped areas, and a failure to feel over some shoals with the leadline were undertaken during the short 1949 season. Sheets between the Little Dalles and Gifford, Washington received detailed attention; other 1948 sheets received minor attention.

2. Several draftsman in the Seattle Processing Office have pointed out that leadline soundings obtained in 1949 are sometimes slightly deeper than the corresponding fathometer sounding. The LCVP was the launch used for feeling operations in 1949. The fathometer fish was located amidships, and it was necessary to obtain leadline soundings from the bow of the launch, a distance of approximately 15 feet from the fathometer fish. The general procedure was to use the fathometer to find the shoal, and after the launch was approximately over it, both fathometer and leadline soundings were obtained. Because the shoals were generally of limited extent with a very irregular bottom and both time and money were short in 1949, no attempt was made to verify fathometer soundings which were no more than 1 foot shoaler than the corresponding leadline sounding, the policy being to show the shoaler of the two soundings obtained.

Respectfully submitted,

/s/ J. T. Jarman
Chief of Party

DIVISION OF CHARTS

REVIEW SECTION - NAUTICAL CHART BRANCH

REVIEW OF HYDROGRAPHIC SURVEY — REGISTRY NO. H-7696

FIELD NO. LR-11448

Washington, Franklin D. Roosevelt Lake, Kettle River Arm
Surveyed in Sept. - Oct., 1948 — Scale 1:10,000
Project No. CS-332

Soundings:

Fathometer
Handlead

Control:

Sextant fixes on shore signals

Chief of Party - J. T. Jarman
Surveyed by - R. A. Marchant and C. Lind
Protracted by - T. G. Taxelius
Soundings plotted by - T. G. Taxelius
Verified and inked by - R. C. Richard
Reviewed by - I. M. Zeskind, 17 April 1950
Inspected by - R. H. Carstens

1. Shoreline and Control

The shoreline and the limits of inshore shoal areas for this survey originate with air-photographic survey T-8867 (1946-47). Shoreline revisions in red are from graphic control survey LR-P-48 (field number) which was subsequently destroyed.

The origin of the control is adequately described in the Descriptive Report.

2. Sounding Line Crossings

Depths at crossings are in adequate agreement.

3. Depth Curves and Bottom Configuration

The usual depth curves were adequately delineated. Portions of the inshore depth curves are not shown because of their proximity to the high-water line.

This is a survey of that portion of the Franklin D. Roosevelt Lake which is located in the Kettle River Arm between the Napoleon and Gorge Bridges. It was formed by the

impoundment of water upstream from the Grand Coulee Dam. The bottom is irregular and contains a number of rocky pinnacles. Shoal areas, some of which were too shoal to sound, extend offshore at several places. The natural channel is narrow and ranges in depth from 19 to 68 ft.

4. Junctions with Contemporary Surveys

The junction of the present survey with H-7695 (1948-49) on the south will be considered in the review of that survey.

5. Comparison with Prior Surveys

No prior surveys of the area have been made by this Bureau.

6. Comparison with Charts

A. Hydrography

There are no charts of the area by this Bureau.

B. Aids to Navigation

There are no aids to navigation within the limits of the survey.

7. Condition of Survey

a. The sounding records and Descriptive Reports are complete and comprehensive.

b. The field plotting was accurately done.

8. Compliance with Project Instructions

The survey adequately complies with the Project Instructions.

9. Additional Field Work Recommended

This is an excellent basic survey and no additional field work is recommended.

H. R. Edmonston
Chief, Nautical Chart Branch

Examined and approved:
R. W. Knox
Chief, Division of Charts

L. S. Hubbard
Chief, Section of Hydrography

W. M. Scaife
Chief, Division of Coastal Surveys

NAUTICAL CHARTS BRANCH

SURVEY NO. H-7696

Record of Application to Charts

DATE	CHART	CARTOGRAPHER	REMARKS
8/11/54	6169	S.G. McGann	~~Before~~ After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review

M-2168-1

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