7700 7701 7702

7700 7701 7702

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-11848 LR-11948 LR-12048	*Office No.*	H-7700 H-7701 H-7702

LOCALITY

State Washington

General locality Spokane R. Arm of L. Roosevelt

Locality Spokane R. Mouth to Little Falls

1948-'49

CHIEF OF PARTY

J.T.Jarman

LIBRARY & ARCHIVES

DATE 6 FEB. 1950

B-1870-1 (1)

FEB. 1, 1950

Form 537
(Ed. June 1946)

REG. NO. H-7700

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-7700

Field No. LR-11848

State Washington

General locality Franklin D. Roosevelt Lake - Spokane River Arm

Locality Old Fort Spokane to Vicinity of Sand Creek

Scale 1:10,000 Date of survey November 1948 - June 1949

Instructions dated 20 June 1947

Vessel LCVP

Chief of party J.T.Jarman

Surveyed by J.T.Jarman, H.A.Marchant

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

Fathograms scaled by Floyd E. Gerken, Harry Lantzy

Fathograms checked by Henry Anenson

Protracted by Thomas G. Taxelius

Soundings penciled by Thomas C. Taxelius

Soundings in ~~fathoms~~ feet at ~~MEAN LOW WATER~~ [a] 1288.575 Ft. MSL USC&GS / 1290. Ft. USBR 1937

REMARKS:

a) Soundings in feet at lake level datum of 1288.6 ft. above mean sea level (or 1290 ft. USBR, 1937). Elevations are in feet above lake level datum.

U. S. GOVERNMENT PRINTING OFFICE 777032

FEB. 1, 1950

Form 537
(Ed. June 1946)

REG. NO. - H-7701

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-7701

Field No. LR-11948

State Washington

General locality Franklin D. Roosevelt Lake - Spokane River Arm

Locality Blue Creek to Heartline Canyon

Scale 1:10,000 Date of survey November 1948 - June 1949

Instructions dated 20 June 1947

Vessel LCVP (Field Party)

Chief of party J.T.Jarman

Surveyed by G.W.Moore & J.T.Jarman

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

Fathograms scaled by Floyd E. Gerken and Harry Lantzy

Fathograms checked by Harry Anenson

Protracted by Burnett Smith

Soundings penciled by Burnett Smith

Soundings in ~~fathoms~~ feet at ~~XXXXXXXXXXXX~~ a) 1288.575 feet above mean sea level

REMARKS:

a) Soundings in feet at lake level datum of 1288.6 ft. above mean sea level (or 1290 ft. USBR, 1937). Elevations are in feet above lake level datum.

U. S. GOVERNMENT PRINTING OFFICE 777032

NOV. 28, 1949

Form 537
(Ed. June 1946)

DEPARTMENT OF COMMERCE

U. S. COAST AND GEODETIC SURVEY

REG. NO. - H-7702

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-7702

Field No. LR-12048

State Washington

General locality Franklin D. Roosevelt Lake - Spokane River Arm

Locality Heartline Canyon to Little Falls

Scale 1:10,000 Date of survey November 1948

Instructions dated 20 June 1947

Vessel LCVP (Field Party)

Chief of party J.T.Jarman

Surveyed by G.W.Moore

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

Fathograms scaled by Floyd E. Gerken, Harry D. Lantzy

Fathograms checked by Henry Anenson

Protracted by T.G.Taxelius

Soundings penciled by T.G.Taxelius

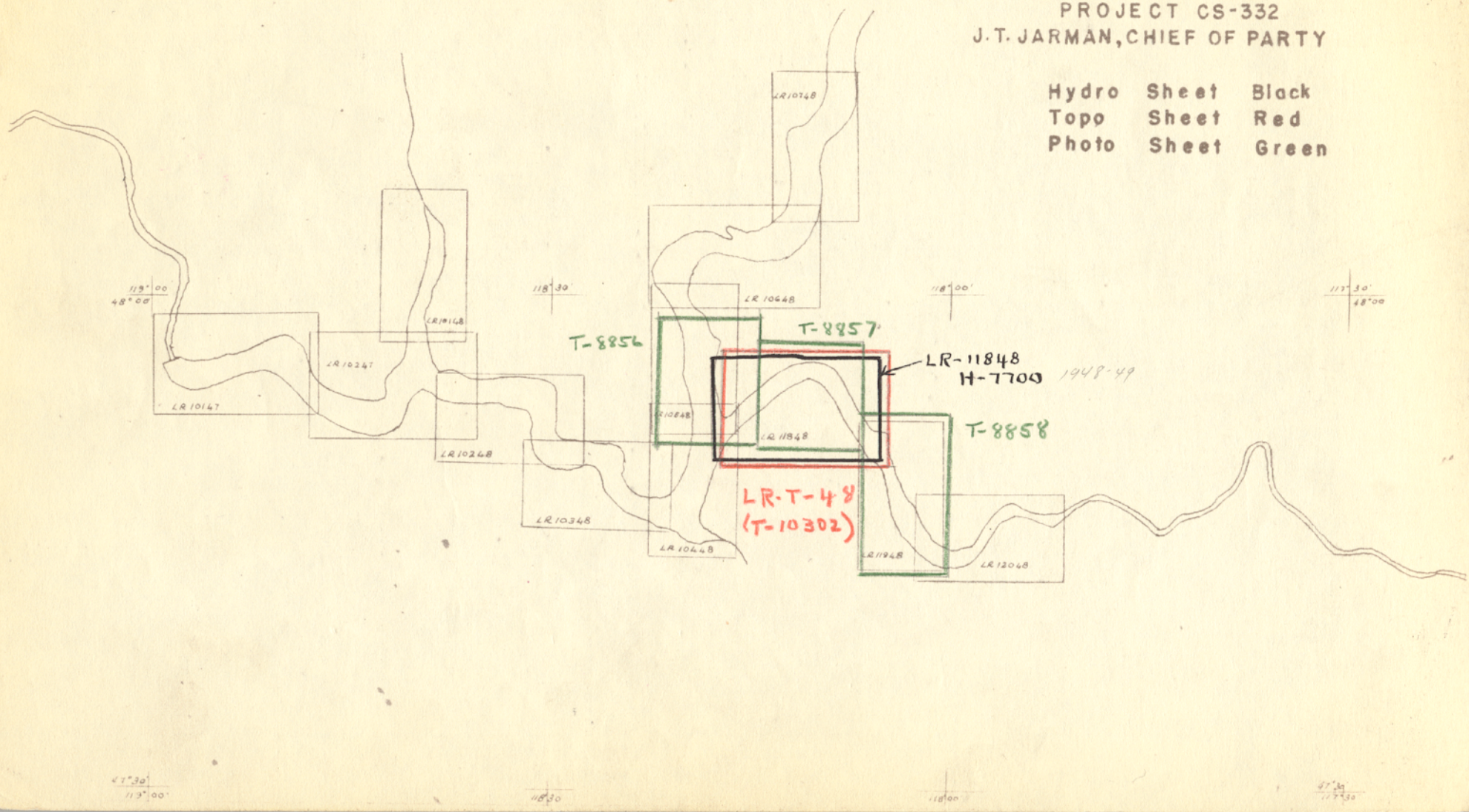
Soundings in ~~fathoms~~ feet at MLLW a) (a 1288.575' above MSL (USC&GS) (1290 USBR

REMARKS: Soundings in feet at lake level datum of 1288.6 ft. above mean sea level (Or 1290 ft. USBR, 1937). Elevations are in feet above lake level datum.

U. S. GOVERNMENT PRINTING OFFICE 777032

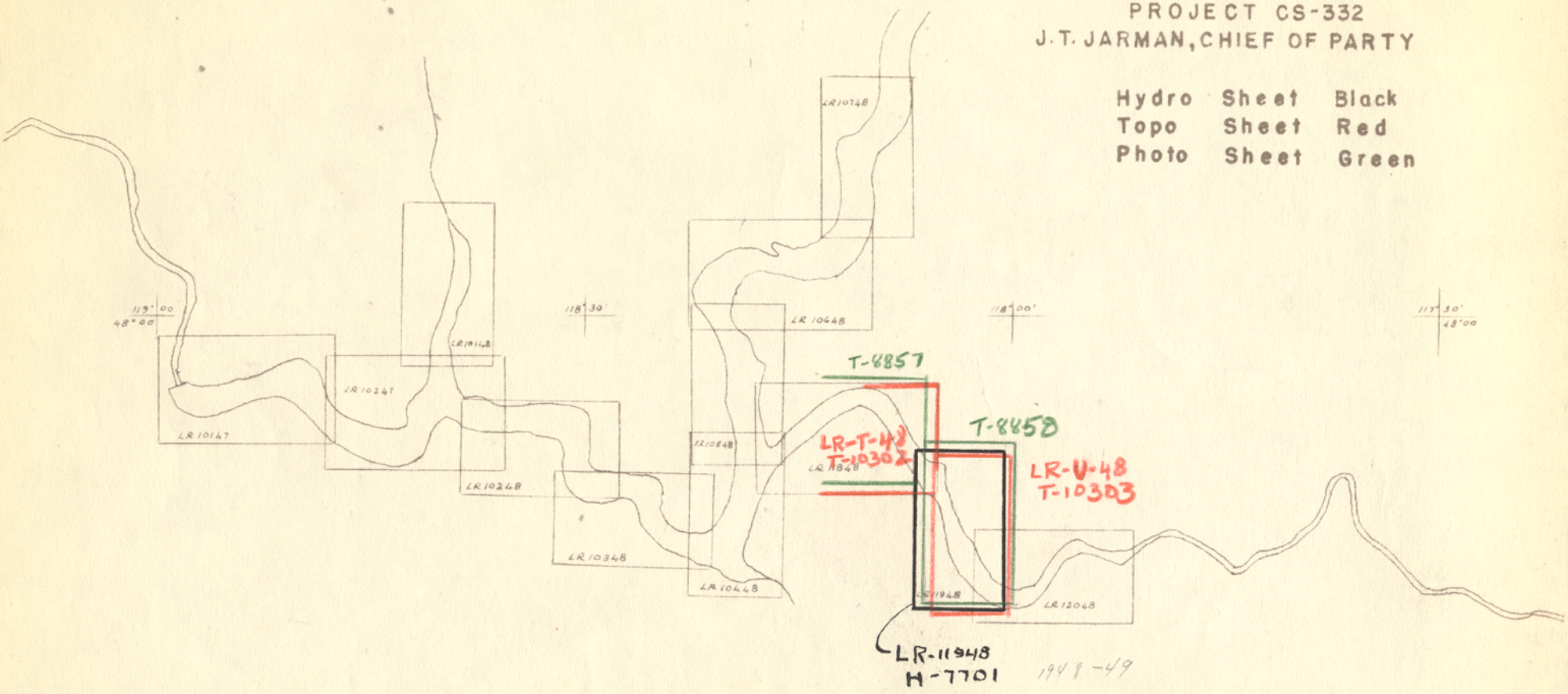
SHEET INDEX
FRANKLIN D. ROOSEVELT LAKE
PROJECT CS-332
J.T. JARMAN, CHIEF OF PARTY

Hydro	Sheet	Black
Topo	Sheet	Red
Photo	Sheet	Green



SHEET INDEX
FRANKLIN D. ROOSEVELT LAKE
PROJECT CS-332
J. T. JARMAN, CHIEF OF PARTY

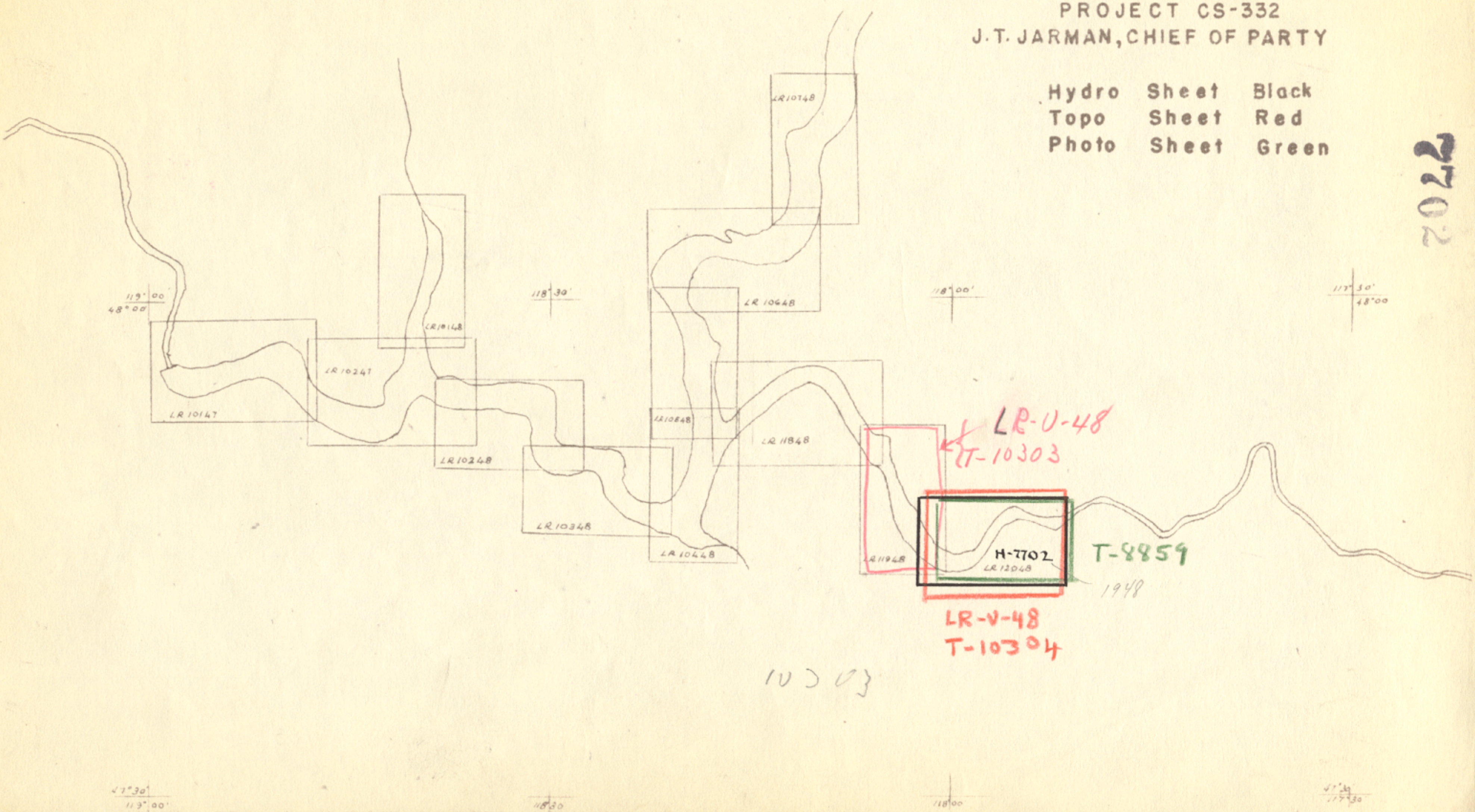
Hydro Sheet Black
Topo Sheet Red
Photo Sheet Green



SHEET INDEX
FRANKLIN D. ROOSEVELT LAKE
PROJECT CS-332
J. T. JARMAN, CHIEF OF PARTY

Hydro Sheet Black
Topo Sheet Red
Photo Sheet Green

7702



10303

DESCRIPTIVE REPORT
To Accompany
Hydrographic Survey H-7700, Field No. LR-11848 7700 -1948-49
Hydrographic Survey H-7701, Fiedl No. LR-11948 7701 -1948-49
Hydrographic Survey H-7702, Field No. LR-12048 7702 -1948

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. Sheet LR-11848 (H-7700, 1948-49) extends from the mouth of the Spokane River to Laughbon's landing; work began on the sheet on November 9, 1948 and ended November 22, 1948. The LCVP sounding launch was used exclusively on this sheet; approximately one-half day was spent in feeling and developing over shoal areas in June 1949. -1948-49

2. Sheet LR-11948 (H-7701, 1948-49) extends from Laughbon's Landing to ~~Squaw~~ Horseshoe Canyon Canyon; field work began on the sheet November 9, 1948 and ended November 22, 1948. Both the launch 98 and the LCVP sounding launch were used on the sheet. The LCVP sounding launch spent about 2 hours running splits and developing at the north end of the sheet in June 1949. -1948-49

3. Sheet LR-12048 (H-7702, 1948) extends from Squaw Canyon to Little Falls, Washington; field work began November 16, 1948 and ended November 22, 1948. The launch 98 was used exclusively on this sheet and no work was accomplished during the 1949 season. -7702 1948

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. Portable depth recorders of the NK-7 type recording in feet were used exclusively on all three sheets during the 1948 Season. An 808 type portable depth recorder recording in fathoms was used during the short 1949 season.

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 three sheets were obtained by the LCVP. When possible, the launch 98 obtained supplemental temperature and salinity observations, using a leadline to support the apparatus.

D. TIDE AND CURRENT STATIONS

1. Tidal notes for the three sheets under discussion are attached to this report. Paragraphs 1, 2, 3, 5 and 6 under this same heading, Descriptive Report to accompany sheet LR-10147 and LR-10247, apply to these sheets also. H 7681 H 7682

H 7700 - 1948-49

2. Soundings obtained in 1948 on sheet LR-11848 were reduced by data from Laughbon's Landing tide staff. Soundings obtained in 1949 were reduced by data from the USBR gage at Grand Coulee Dam. The latter gage was in constant operation throughout the duration of the project and served as a reference station for all areas of the lake where pool characteristics existed.

H 7701 1948-49

3. Soundings obtained by the launch 98 on sheet LR-11948 were reduced by data from the Crow tide staff. Soundings on this sheet obtained by the launch LCVP on November 19th and 22nd, 1948, were reduced by data from Laughbon's Landing tide staff. All soundings obtained by the LCVP during the 1949 season were reduced by data from the USBR gage at Grand Coulee Dam.

H 7702 - 1948

4. Soundings on sheet LR-12048 were reduced by data from the Mondivi tide staff; gaps, if any, were filled in by data from the USBR gage at Grand Coulee Dam. It should be noted that the lake was 2½ feet below normal level during the 1948 sounding operations on this sheet. Under such conditions, pool characteristics extend to topographic signal OAK at Lat. 47° 49.4', Long. 117° 56.1'. At the latter point, a current was noted, and it was found that the water surface was only 1.8 feet below the normal lake level at Little Falls. These observations indicated that a gradient began at signal OAK and extended to Little Falls; the water at Little Falls being 0.6 foot higher than the areas of the sheet where pool characteristics existed. With the lake at normal level, there will be no gradient in the Little Falls area. Since the gradient did exist when the hydrography was

accomplished and the datum plane is the normal lake level of 1288.575 above mean sea level, the reducers will vary in this particular area depending on the position of the sounding launch. No tide staff was established in the vicinity of signal OAK, the assumption being that the water surface was 2.4 feet below normal lake level, or at the same pool characteristic level of the remainder of the sheet to the westward. With this information, the tide reducers for the Little Falls area were obtained by constructing a graphic drawing to scale of the water surface and the datum plane; this drawing is shown on the boat sheet with an explanatory note.

5. During the course of the hydrography, no current was noted on sheets LR-11848 and LR-11948. No current was noted west of signal OAK on sheet LR-12048, Lat. 47° 49.4', Long 117° 56.0'. It was estimated that the current at the latter point was ½ knot at noon on November 19, 1948. At signal SOL near the Little Falls Dam, the current was estimated to be 2½ knots. It is believed that these currents would have been greatly reduced in strength had the lake been at its normal level.

6. During the Spring flood season, it is believed that currents of 1 to 3 knots may be expected on all three of these sheets, the strength diminishing as the distance from the Little Falls Dam increases.

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. Smooth sheets plotted in Seattle P.O. See P.O. notes in 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. 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 sheets common to sheet LR-11848 are T-8856 and T-8857; that common to LR-11948 is T-8858; that common to LR-12048 is T-8859.

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 LR-11848 is LR-T-48; the control sheet common to LR-11948 is LR-U-48; and the control sheet common to LR-12048 is LR-V-48.

Graphic control sheets LR-T-48 (T-10302), LR-U-48 (T-10303) and LR-V-48 (T-10304) were applied to Hydro. Sheets and then were destroyed

4. An index map has been prepared for each sheet to show the limits and field numbers of contemporary planimetric shoreline surveys and control sheets; they are 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 planetable. Since the USBR third order control points are listed in plane coordinates, all three sheets show 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

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 sheets, T 0302 (LR-T-48); the discussion of these discrepancies will be found in the Descriptive Report to Accompany Control sheets LR-T-48, LR-U-48 and LR-V-48.
T 0302 T 0303 T 0304

See FP F3 H/S Desc Rpt.

H. SOUNDINGS

1. Except for a short period in 1949 when an 808 type portable depth recorder was used, all soundings on these sheets were obtained with NK-7 type fathometers operating in feet.

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. In the case of the launch 98, the initial was adjusted to read 1.5 feet when the machine was operating in feet; otherwise, the procedure was the same for this launch as the LCVP. The average fathom initial on launch 98 was 0.81 fathoms.

3. Procedure during the short 1949 Season was varied from that discussed in the foregoing paragraph. In general, the procedure outlined in

H-7682 H-7681, 1947

Paragraph 2, sub-head "H" of Descriptive Report for sheets LR-10147 and LR-10247 was followed. Since all soundings obtained during this period were in fathoms, the initial was set in fathoms to a known bar check depth. It was expected that this procedure would eliminate the "Bar Check Residual" discussed in the next paragraph.

4. 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.

Ε filed with H-7681

5. The boats sheets covered by this report have 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 feet. The datum plane used on boat sheet LR-11848 is approximately 2½ to 3 feet below the normal lake level; the datum planes used on boat sheets LR-11948 and LR-12048 is the approximate normal lake level of 1290 feet, U.S.B.R. 1937 Independent datum, or 1288,575 feet above mean sea level. The datum plane for the smooth sheets will be the same as that used on boat sheets LR-11948 and LR-12048.

H7700 1948-49 H7701 1948-49 H7702, 1948

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.

2. It should be noted that the records of the launch 98 contain a large number of recorded sounds at the ends of lines with the abbreviation "TC" opposite them. (TC means time and course.) These soundings should be saved and plotted, using the established time and spacing on the line to forward plot them; otherwise, there will be a gap between the end of the line and the beach. The launch 98 is a low powered, V-bottom boat which could not safely run lines at full speed all the way into the beach. Therefore, the fix was obtained at a safe distance from the shore, but the vessel continued on course without slackening speed and sheered off from the beach at the last possible moment. The LCVP used this procedure in only a few instances.

J. ADEQUACY OF SURVEY

1. It is believed that all three of these sheets are complete. Boat sheet junctions between these sheets and contemporary sheets appear to be satisfactory; depth curves can be completely drawn.

Records OK C.H.F.

2. There is a 39 foot sounding, Lat. 47° 54.95', Long. 118° 17.9' between positions 65e and 66e on sheet LR-11848 which appears to be slightly out of position. It was intended to investigate this sounding during the 1949 season, but it was overlooked. Although it is possible that the sounding exists in its present position, it is probable that it has been misread from the fathogram. The fathograms cannot be checked at this writing since they have already been transmitted to the Seattle Processing Office. sounding correctly recorded and plotted.

3. At the time hydrography was in progress on sheets LR-11948 and LR-12048 the lake level was 2½ feet below normal level. This condition prevented the launch from covering certain shoal areas which are listed below.

(a) Sheet LR-11948, Lat. 47° 50.2', Long. 118° 08.0' adjacent to the east shore; this area was covered by approximately 3 feet of water which would be approximately 5 feet at normal lake level, or the adopted datum plane.

(b) Sheet LR-11948, Lat. 47° 49.4', Long. 118° 05.8' adjacent to the east shore; this area was covered by approximately 3 feet of water which would be approximately 5 feet at normal lake level, or the adopted datum plane.

(c) Sheet LR-12048, Lat. 47° 47.6', Long. 118° 03.75' adjacent to the south shore; this area covered by approximately 1½ feet of water which would be 3 to 4 feet at normal lake level, or the adopted datum plane.

(d) Sheet LR-12048, Lat. 47° 48.3', Long. 118° 01.0' adjacent to the north shore; this area covered by approximately 1½ feet of water which would be 3 to 4 feet at normal lake level, or the adopted datum plane.

4. It should be noted that the hydrographic party places the submerged rock, Lat. 47° 49.57', Long. 117° 55.40' about 20 meters up-stream in a northeasterly direction from the location shown on the shoreline survey sheet T-8859. The hydrographic location is correct. S/S plotting of rock in substantial agreement with typo. location.

K. CROSSLINES

1. Crosslines obtained on these sheets exceed the minimum 8% specified in the instructions. The crosslines 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. Sheet LR-11848; There are no mid-channel dangers on this sheet. Inshore dangers are listed below.

(a) Rock baring ½ foot, Lat. 47° 54.45', Long. 118° 18.92; 10 meters of the beach. (pos. 446)

(b) Submerged rock, Lat. 47° 54.75', Long. 118° 18.58'; least depth 2½ feet, positions 47b, ~~48b and 49b.~~

(c) Submerged sand spit, Lat. 47° 55.47', Long. 118° 16.95'; covered with 1 to 2 feet of water.

(d) Submerged sand hillock, Lat. 47° 55.90', Long. 118° 16.52; least depth 16 feet, positions 34f to 40f.

(e) Submerged sand hillock, Lat. 47° 55.68', Long. 118° 16.23'; least depth ~~18~~ 11 feet, position ~~21~~ 18c.

H 7701 1948-49

2. Sheet ~~LR-11948~~; In general, mid-channel courses may be steered on this sheet provided the dangers listed below are avoided.

(a) A ridge of coarse yellow sand and gravel at Lat. 47° 50.05', Long. 118° 07.10' which extends in a northwesterly and southeasterly direction, approximately 100 meters long and only a few meters wide; least depth is 8 feet at the southern end, position 106c day; consumed 20 minutes time searching for least depth.

(b) A rock bench extends out half way across the lake from the east shore, Lat. 47° 49.38', Long. 118° 05.85'; the least depth at the western tip of the bench is 7 feet, position 87c; spent 20 minutes searching the area with lead line.

H 7702 1947

3. Sheet ~~LR-12048~~: Numerous dangers exist within the area covered by this sheet, and it should be navigated with caution. A list of the dangers follows:

(a) At longitude 118° 02.85', a sand ridge makes out from the north shore and extends to within 100 meters of the south shore. The average depth over the ridge at the ~~1250~~ datum plane is approximately 3 feet. Slightly north of the midpoint of the ridge there is a sandy, grass covered island which bares 4 feet above the datum plane. The sides of the ridge are quite steep. When the hydrography was accomplished, the lake level was 2½ feet below normal, and numerous dead trees and snags were exposed to view on the ridge. The main channel lies between the south tip of the ridge and the south shore. However, there is a very narrow channel close to the north shore at the north end of the ridge through which 6 feet can be taken with local knowledge.

(b) Submerged rock, Lat. 47° 49.57', Long. 117° 55.40; least depth ~~1½~~ (2) feet, position 46d day. This rock is almost in mid-channel and is a large boulder about 5 meters in diameter.

(c) Rocky shoal about 50 meters off the beach, Lat. 47° 47.85', Long. 118° 04.31'; the shoal is about 10 meters in diameter with least depth of 3 feet, position 23c.

(d) There is a shoal bench which extends 1/3 way across the lake from the south shore between Long. 118° 03.4' and Long. 118° ~~04.0~~ 03.95'. A least depth of 3 feet was found on this bench at Lat. 47° 47.68', Long. 118° 03.47'.

(e) A mud bank extends northward from the south shore at Lat. 47° 47.6', Long. 118°, 02.3' to about the center of the lake; the bank is covered with an average depth of 16 feet. 9ft φ 47 47.72 λ 118° 02.256

(d) A small gravel bank with a least depth of ~~16~~ 17 feet was found at Lat. 47° 48.08', Long. 118° 02.05', position 47e day.

(e) A soft grey mud shoal was found at Lat. 47° 47.95', Long. 118° 01.89' with a least depth of ~~18~~ feet. 19ft. Smooth Sheet.

(f) A ~~narrow pointed~~ ridge extends northwesterly from the south shore at Longitude 118° 01.6' to about half way across the lake; ~~least~~ depth ~~at tip~~ is 19 feet, ~~Lat. 47° 48.3'~~, Long. 118° 01.75'

(g) A bench extends halfway across the lake from the north shore between Longitudes 118° 01.0' and 118° 01.6'; the outer edge of the bench is covered by approximately 17 ~~18~~ feet of water.

O. COAST PILOT INFORMATION

1. For a complete discussion of Coast Pilot information refer to "Coast Pilot Report, Franklin D. Roosevelt Lake, Project Ph-2(45)" previously submitted to the Washington office. Filed in Coast Pilot Sect.

2. Mid-channel courses may be safely steered on sheet LR-11848. H 7700 1948-49 It is possible to safely anchor at any point where good holding ground exists. A list of the best anchorages follows:

(a) Behind sand island, Lat. 47° 55.85', Long. 118° 16.07'; depth 35 feet; bottom, sand.

(b) Bight, Lat. 47° 55.85', Long. 118° 15.85', depth 50 feet; bottom, mud.

(c) Bight, Lat. 47° 56.2', Long. 118° 15.05'; depth, 45 feet; bottom, mud.

The numerous coves and small bights offer the best protection and holding ground for small vessels.

3. Mid-channel courses may be safely steered on sheet LR-11948 H 7701 1948-49 provided precautions are taken to avoid the dangers listed at Lat. 47° 50.05', Long. 118° 07.16' and at Lat. 47° 49.35', Long. 118° 05.86'. It is possible to safely anchor at any point provided good holding ground exists. The best anchorages on the sheet are listed below:

(a) Cove, Lat. 47° 53.35', Long. 118° 08.5'; depths, 40 feet; bottom, sand and mud.

(b) Bight, Lat. 47° 52.75', Long. 118° 09.~~1~~05'; depths, 30 feet; bottom, mud.

(c) Bight, Lat. 47° 50.~~1~~15', Long. 118° 07.4'; depths 40 feet; bottom, mud.

(d) Bight, Lat. 47° 47.9', Long. 118° 04.~~8~~65'; depths ~~45~~ 3 feet; bottom, mud.

4. Sheet ~~LR-12048~~ H 7702 (1948): Navigators proceeding upstream from the westward can safely steer mid-channel courses on this sheet except in the wide portion at Lat. 47° 47.75', Long. 118° 02.~~9~~8 where courses must be laid out to avoid the submerged sand ridge extending north and south almost across the lake, and the submerged benches extending out from the shoreline which were mentioned under the heading "Dangers and Shoals". The submerged rock near the Little Falls Dam at Lat. 47° 49.57', Long. 117° 55.40 can be passed on either side; its location will be marked by current rips. The lake is so narrow within the limits of this sheet that almost any point with good holding ground can be used as an anchorage. The best anchorages are listed below:

(a) Lat. 47° 47.7', Long. 118° 03.1'; depth, 26 feet; bottom, mud.

(b) Lat. 47° 47.8~~5~~, Long. 118° 01.8'; depth, 23 feet; bottom, mud.

P. AIDS TO NAVIGATION

1. There are no aids to navigation within the limits of these sheets.

Q. LANDMARKS FOR CHARTS

1. Data relative to landmarks for charts are shown on form 567 which was submitted with Project Ph-2(45). A copy of the form is attached to this report.

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 Geo. Name Sect.

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. These three sheets were surveyed in November 1948 with winter fast approaching. Snow began to fall on November 15th. After the latter date the work continued until November 22nd, under considerable handicap when the 1948 season was terminated. At this time the sheets were about complete although several more days of attention to details would have been desirable. In the Spring of 1949, splits, development, and attention to details was executed on sheet LR-11848 (H-7708) 1948-49 and west and north half of sheet LR-11948 (H-7709) 1948-49. The remainder of the area was not considered of sufficient importance to spend any more time on it.

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 C.P. Sect.
Special Report, Investigation of Geographic Names, Sheets T-8849 to T-8859, Project Ph-2(45). Filed in Geo. Name Sect.
Special Report on Reservoir Boundary Control Points, Project Ph-2(45). G-7380
Field Inspection Report, Area of the Third Radial Plot, Project Ph-2(45) Photogrammetry Div.
Water Surface Elevations (Tides), Season 1948, Project CS-332. Filed in Div. of Tides.
Water Surface Elevations (Tides), Season 1949, Project CS-332.
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 John C. Ellerbe, 1945
Temp. & Salinity measurements filed with H-7681.

X. TABULATION OF APPLICABLE DATA

1. The following data is being submitted for sheet LR-11848: H-7708 (1948-49)

Sounding Volumes (Form 275)	6 vol.
Fathograms	6 rolls
Boat Sheet LR-11848 (H-7708) 1948-49	1 ea.
Control Sheet LR-T-48	1 ea.
Descriptive Report (combined for 3 sheets)	

2. The following data is being submitted for sheet LR-11948: H-7709 (1948-49)

Sounding Volumes (Form 275)	4 vol.
Fathograms	4 rolls
Boat Sheet LR-11948 (H-7709) 1948-49	1 ea.
Control Sheet LR-U-48	1 ea.
Descriptive Report (Combined for 3 sheets)	

3. The following data is being submitted for sheet LR-12048: H-7702, 1948

Sounding Volumes (Form 275)	2 vol.
Fathograms	3 rolls
Boat Sheet LR-12048 (H-7702)	1 ea.
Control Sheet LR-V-48	1 ea.
Descriptive Report (Combined for 3 sheets)	

4. The following data is applicable to all sheets covered by this report:

Velocity Corrections 16 Aug. to 22 Nov., 1948	1 cahier Filed with H-7681
Velocity Corrections, 1949 Season	1 cahier Filed with H-7681
Water Surface Elevations (Tides), 1948 Season	1 cahier Filed in Div. of Tides.
Water Surface Elevations (Tides), 1949 Season	1 cahier Filed in Div. of Tides.
Cahier of Bar Check Residuals	1 cahier Filed with H-7681
Tide data and marigrams for all gages	Filed in Div of Tides
Level Records for all tide stations	
Recovery Notes, triangulation	
Bench Mark Descriptions and Recovery Notes	

5. The following work has been accomplished on the records and data of these sheets:

All fathograms have been scaled and checked.
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 in Vol. 1 through Vol. 5, Sheet LR-11848. (H-7700)

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

H-7700 1948-49
Sheet LR-11848: Check reduced soundings Vol. 1 through Vol. 5; reduce and check soundings Vol. 6; smooth plot sheet.

H-7701 1948-49
Sheet LR-11948: Reduce and check all soundings; smooth plot sheet

H-7702 1948
Sheet LR-12048: Reduce and check all soundings; smooth plot sheet.

REMARKS

1. This report has been compiled from notes submitted by Lt. Comdr. Moore and Mr. Hal A. Marchant.

Respectfully submitted

J. T. Jarman

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

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

POST-OFFICE ADDRESS:

TELEGRAPH ADDRESS:

EXPRESS ADDRESS:

February 9, 1949

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

(H-7700, 1948-49)

Subject: Approval of hydrographic sheets, LR-11848, LR-11948, and LR-12048. (H-7702) 1948 (H-7701, 1948-49)

The records and data applicable to the following hydrographic sheets has been inspected and is approved:

H-7700, Field No. LR-11848 1948-49
H-7701, Field No. LR-11948 1948-49
H-7702, Field No. LR-12048 1948

J.T. Jarman
Chief of Party

Form 567
Rev. March 1935

DEPARTMENT OF COMMERCE
U. S. COAST A GEODETIC SURVEY

LANDMARKS FOR CHARTS

TO BE CHARTED } STRIKE OUT ONE
~~TO BE DELETED~~ }

Coulee Dam, Wash. October 1947, 193

I recommend that the following objects which have (*have not*) been inspected from seaward to determine their value as landmarks, be charted on (~~have not been inspected from seaward~~) the charts indicated.

The positions given have been checked after listing. J.E. Deal

J.T. Jarman
Chief of Party.

GENERAL LOCALITY State of Washington
Spokane River

NAME AND DESCRIPTION	POSITION					METHOD OF LOCATION	DATE OF LOCATION	HARBOR CHART	INSHORE CHART	OFFSHORE CHART	CHARTS AFFECTED
	LATITUDE		LONGITUDE		DATUM						
	° ′	D. M. METERS	° ′	D. P. METERS							
T-8857 CHURCH, west gable (H-7700)	47 56	(1338.7) 514.5	118 11	(912.8) 332.3	NA 1927	Radial Plot	1947		not		Area Charted
T-8859 STACK (H-7702)	47 49	(410.5) 1442.6	117 55	(1147.7) 100.4	"	"	"				"

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.

U. S. GOVERNMENT PRINTING OFFICE 69678

Data related to sheet H-7700, Field No. LR-11848

1948-49

7700

Season 1948

7-186
(July 1935)

Tabulated Tide Reducers, Hydrographic Sheet H-7700
Field No. LR-11848

Date	Feet		Fms.
Nov. 9	+ 2.2		+ 0.3
	+ 2.4	to noon	
10	+ 2.6	after 12:00	+ 0.4
12	+ 2.6		+ 0.4
13	+ 2.6		+ 0.4
14	+ 2.6		+ 0.4
	+ 2.6	to noon	
15	+ 2.4	after 12:00	+ 0.4
	+ 2.4	to noon	
16	+ 2.6	after 12:00	+ 0.4
17	+ 2.4		+ 0.4
18	+ 2.4		+ 0.4
22	+ 2.2		+ 0.3

Referred to staff at Laughbon's Landing with USBR gage at Grand Coulee Dam as Reference station.

7700 - 1948-49

Season 1949, Tide Reducers

Sheet LR 11848

	Feet	Fms.
June 18	+ 0.2 All day	0.0 fms. all day
June 19	+ 0.2 " "	0.0 fms. all day

Refer to Coulee Dam Gage

7700 -1949-49

Sheet LR-11848

Bar Check Residuals

(To be applied algebraically to scanned Index Corrections)

7-186
(July 1935)

Date	Bar Check Residuals Feet	Fms.	Fath.	Launch	Remarks
Nov. 9	-0.5	0.0	86	LCVP	To 08:45
9	0.2	0.0	172	"	After 08:45
10	-0.1	0.0	86	"	
12	-0.1	0.0	172	"	
13	0.1	0.0	172	"	
14	-0.5	0.0	172	"	
15	-0.3	0.0	172	"	
16	-0.1	0.0	172	"	
17	-0.2	0.0	172	"	
18	0.0	0.0	172	"	To 09:15
18	-0.5	0.0	86	"	After 09:15
22	0.4	0.0	172	"	

Data applicable to sheet H-7701, Field No. LR-11948

1948-49

7701

Season 1948

7-186
(July 1935)

Tabulated tide Reducers- H-7701
Field No. LR-11948

Date	Feet	Fms.
Nov. 9	∔ 2.4	∔ 0.4
10	∔ 2.6	∔ 0.4
15	∔ 2.6	∔ 0.4
19	∔ 2.4	∔ 0.4
22	∔ 2.4	∔ 0.4

November 9, 10, and 15 are referred to Crow staff.
November 19 and 22 are referred to Laughbon's Landing Staff.
Reference station is USBR gage at Grand Coulee Dam.

7701

Season 1949, Tide Reducers

Sheet LR 11948

Refer to Coulee Dam Gage			Fms.
	Feet		
June 18	+ 0.2	All day	0.0 fms. all day

7701 1948-49

Sheet LR-11948
Bar Check Residuals
(To be applied algebraically to scanned Index Corrections)

7-186
(July 1935)

Date	Bar Check Residuals Feet	Fms.	Fath.	Launch	Remarks
Nov.					
9	-0.1	0.0	163	98	
10	0.4	0.0	163	98	
15	0.1	0.0	163	98	
19	0.2	0.0	172	LCVB	

7701

List of Hydrographic Signals
Sheet LR-1948 H-7701 1948-49

Abe	T-10303
Ace	T-10303
Add	T-10303
Ado	T-10303
Aha	T-10303
Aim	T-10303
Alp	T-10303
Ann	T-10303
Art	T-10303
Axe	" *
Bag	T-8858
Bah	T-8858
Bar	T-10303
Bat	T-8858
Bed	T-8858
Ben	T-10303
Bib	T-8858
Big	T-8858
Boa	T-8858
Bob	T-8858
Box	T-8858
Bum	T-8858
Bus	T-8858
But	T-8858
Cab	T-8858
Cam	T-8858
Can	T-8858
Cap	T-8858
Car	T-8858
Cat	T-8857
Cob	T-8858
Cow	T-8858
Cry	T-8858
Cut	T-8858
Daw	T-8857
Deb	T-8857
Deer	Triangulation
Dif	T-8857
Ego	T-10302
Few	T-10302
Gal	T-10302
Gig	T-10303
Gum	T-10303
Gus	T-10303
Hat	T-10303
Her	T-10303
Hid	T-10303
Hop	T-10303
Hub	T-8858
Ida	T-8858
Irk	T-8858
Ivy	T-8858
Key	T-8858
Kim	T-8858
How	T-10303
Jon	T-8858
Lit	T-8858
Log	T-8858
Lux	T-8858
Maw	T-8858
Mum	T-8858
Nay	T-8858
Nig	T-8858
Nip	T-8858
Oak	T-8858
Off	T-8858
Oil	T-8858
Oid	T-8858
Out	T-8858
Pie	T-10303
Pot	T-10303
Rag	T-8858
Ram	T-8858
Rat	T-8858
Red	T-8858
Rep	T-8858
Rev	T-8858
Rim	T-8858
Roc	T-10303
Sue	T-8858
BON	T-8858

* There are two signals with the name "Axe" on control sheet T-10303.

7702

Data applicable to sheet H-7702, Field No. LR-12048

1948

Season 1948 H-7702

Velocity Correction List
Hydrographic Sheet
No. LR-12048
Launch 98

16 Nov. to 22 Nov.

Fathometer No. NK-7 163
Curve No. 25

To Depth Feet	Corr. Feet
6.9	0.0
17.3	-0.2
27.6	-0.4
38.5	-0.6
49.2	-0.8
59.9	-1.0
70.0	-1.2
80.5	-1.4
Below 80.5	-1.6

To Depth Fms.	Corr. Fms.
6.0	-0.6
11.2	-0.7
17.3	-0.8
Below 17.3	-0.9

Computed by JTJ
Checked by
Copy Checked

7702

VELOCITY CORRECTIONS
Season 1949-Lake Roosevelt
Project CS-382

Sheet LR 11848
Sheet LR 11948

June 18, 1949
808-1228 Fathometer
All soundings in fathoms
Curve No. 9

Reducers in Fathoms

0.0 to 3.0 Fms.
+0.1 to 9.7 "
+0.2 to 30.0 "
+0.3 after 30 fms.

7702

Sheet LR-12048

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
Nov. 16	0.3	0.0	163	98	
17	0.1	0.0	163	98	
18	0.1	0.0	163	98	
19	0.2	0.0	163	98	
22	0.2	0.0	163	98	

7702
1948 Season

7-186
(July 1935)

Tabulated Tide Reducers- H-7702
Field No. LR-12048

Date	Feet		Fms.
Nov. 16	∠ 2.6 ∠ 2.4	to 14:00 after 14:00	∠ 0.4
17	∠ 2.6		∠ 0.4
18	∠ 2.4		∠ 0.4
19	∠ 2.4		∠ 0.4
	∠ 2.2	to 15:00	∠ 0.3
22	∠ 2.4	after 15:00	∠ 0.4

Referred to Mondovi staff with Reference station at USBR gage, Grand Coulee Dam.

The foregoing reducers apply to all areas of the sheet except the last mile (see explanation in descriptive report for sheet). In the latter area a gradient existed when the sounding was accomplished and the reducers were determined graphically by a curve. See the boat sheet for the graphic determination.

7702 1948

List of Hydrographic Signals
Sheet LR-12048

Abe	T-10304	Gum	T-8859	Rat	T-8859
Ace	"	Hat	T-10304	Red	"
Add	"	Her	T-8859	Rep	T-8858
Ado	"	Hid	T-10303	Rev.	T-8859
Aha	T-8859	His	T-8859	Rim	T-8859
Aim	"	Hop	T-10303	Sis	T-10304
Alp	"	How	"	Sol	"
Ann	"	Hub	T-8859	Sue	"
Art	"	Ida	"	Tom	T-8859
Axe	"	Irk	"	War	T-8859
Bag	"	Ivy	"	Wed	T-10304
Boa	T-10304	Joy	T-10304	Wee	T-8859
Bus	"	Key	T-8859		
Cab	T-8859	Kim	T-10304		
Cam	T-10304	Log	"		
Can	T-8859	Lux	T-8858		
Cap	T-10304	Maw	"		
Car	"	Mum	"		
Cat	T-8859	Nay	"		
Cod	"	Nig	"		
Cry	"	Nil	T-8859		
Cut	"	Nip	T-8858		
Day	T-10304	Nor	T-8859		
Deer	Triangulation	Nut	T-10304		
Doc	T-8859	Oak	"		
Eat	"	Off	"		
Egg	T-10304	Oil	T-8859		
Ego	"	old	"		
Eva	"	Out	T-10304		
From	"	Pie	"		
Few	"	Pot	T-8859		
Gal	T-8859	Quo	T-10304		
Gas	T-10304	Rag	T-8859		
Gig	"	Ram	"		

Form No. 742
DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Ed. May 1935

GEODETIC POSITIONS FROM LAMBERT COORDINATES

STATE WASHINGTON N STATION CPSRS 29 1935

x	2,679 429.45	R_b+A	19205 863.43
C	2,000,000.	y	302 517.19
x' $(=x-C)$	679 429.45	R_b+A-y	18 903 346.24
log $(x-C)$	5.832 14437	$\frac{\theta}{2}$ (in secs.)	3705.22
log (R_b+A-y)	7.276 53874	log $\frac{\theta}{2}$	3.568 81400
log tan θ	8.555 60563 -10	log S	4.685 55151
θ	2° 01' 30".44 = 7410".44	log sin $\frac{\theta}{2}$	8.254 36551
log θ (θ in secs.)	3.869 84399	log sin$^2\frac{\theta}{2}$	6.508 73102
log l	9.871 87656	log 2	0.301 03000
log $\frac{\theta}{l}$	3.997 96743	log R*	7.276 53874
$\Delta\lambda$ $(=\frac{\theta}{l})$	9953.308	log y''	4.086 49976
		y''	12,198.31* (12,206.18)
λ (central mer.)	120° 50' 00"	R_b+A-y	18 903 346.24
$-\Delta\lambda$	2 45 53.31	y''	+ 12 198.31
λ	118 04 06.69	R	18 915 544.55
	139.2 (1109.5)		
		y	302 517.19
		y''	− 12 206.18
		y'	290 311.01
		ϕ (by interpolation)	47° − 47' − 45.16 1394.7 (458.4)

$\tan\theta=\frac{x-C}{R_b+A-y}$

$\Delta\lambda=\frac{\theta}{l}$

$\lambda=\lambda$ (central mer.)$-\Delta\lambda$

1248.7
624.3
139.2
485.1

$y''=2R\sin^2\frac{\theta}{2}$

$y'=y-y''$

C is constant added to x' in computation of coordinates

R_b is map radius of lowest parallel

A is value of y' for R_b; in most cases it is zero

ϕ is interpolated from table of y'

* Use (R_b+A-y) as an approximate value of R and later correct this value when R is obtained below.

H 7700 1948-49
LR 11848

Lake Roosevelt, Washington
Spokane River

Processing Office Notes.

Smooth Sheet.

The projection and grid were ruled on the machine at of 1946-47 Washington. Shoreline is from T 8856 and T 8857. Signals are from graphic control sheet T 10302 and from photo-topo compilations T 8856 and T 8857.

T-10302 was applied to H-7700 and then destroyed.

The sheet was plotted under the supervision of the C O P in the Seattle Proc. Off. The report of the field party covers all necessary subjects. Fathometer speed was checked on the profiles at random intervals throughout each days work. Templates suitable to the calibration of the fathometers were used.

Edgar E. Smith

Edgar E. Smith
Cart.Engr.
Seattle Proc. Off. 1/20/50

H 7701
Lr 11948 1948-49

Lake Roosevelt, Washington.
Spokane River

Processing Office Notes.

Smooth sheet.

The projection and grid were ruled on the machine in Washington. Shoreline is from T 8857 and T 8858. Signals are from these sheets and from T 10303 LR-U-48.

Fathogram speed.

The speed of the profiles have been tested at random intervals thruout each days work using templates suitable to the calibration of the fathometer in use.

The plotting of the sheet has proceeded under the supervision of the C O P. The report of the field party covers other subjects.

Edgar E. Smith

Edgar E. Smith
Cart. Engr.
Seattle Proc Off. 1/20/50

H 7702
LR 12048 1949

Lake Roosevelt, Washington.
Spokane River Arm.

Processing Office Notes.

Smooth Sheet.

The projection and grid were ruled on the machine in Washington. The grid is Washington State North, Lambert. The brand of the paper was not marked on the sheet.

Fathpgrams.

The profiles have been checked for speed using a template marked for a paper feed of 1.079 inches per minute. The NK-7 fathometers were equipped with salt water tachometers with reed frequency of 67.1.

General.

Certain changes have been noted in the report which were due to the usual differences between boatsheet and corrected soundings. The finished smooth sheet has been seen by the chief of party. There are no further remarks to add to the report.

Edgar E. Smith
Cart. Engr. 11/17/49

7700

STATISTICS

Sheet H-7700, Field No. LR-11848

1948-49

Date	Vol. No.	HL Smd.	Positions	Statute Miles	Day Letter	
1948						
Nov. 9	1	0	140	30.0	a	(blue)
10	2	0	143	30.5	b	"
12	2	0	52	6.7	c	"
13	2	0	69	13.3	d	"
14	2	0	113	14.5	e	"
15	3	7	184	29.6	f	"
16	4	0	138	17.8	g	"
17	4	0	156	25.6	h	"
18	4	0	126	15.7	j	"
22	5	2	44	5.7	k	"
1949						
June 18	6	4	55	8.1	l	"
Totals		13	1220	197.5		

Area square statute miles---5.5

7701

STATISTICS 1948-49

Sheet H-7701, Field No. LR-11948

Date	Vol. No.	Day Letter	HL Smd.	Positions	Statute Miles
1948 (Launch 98)					
Nov. 9	1	a (red)	0	131	20.8
10	1	b "	0	184	31.5
15	2	c "	11	137	18.0
1948 (LCVP)					
19	3	a (blue)	1	134	19.5
22	3	b "	1	4	0.6
1949 (LCVP)					
June 18	4	c "	0	28	3.2
	Totals		13	618	93.6

Area square statute miles— 2.4

7702 1948

Statistics

Sheet H-7702, Field No. LR-12048

Date	Vol. No.	Day Letter	HL Smd.	Positions	Statute Miles
1948					
Nov. 16	1	a (red)	0	121	14.0
17	1	b "	0	131	17.8
18	2	c "	1	132	18.6
19	2	d "	6	79	9.0
22	2	e "	6	75	6.9
	Totals		13	538	66.3

Area square statute miles--- 1.7

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

7700

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-7700 (Field No. LR-11848)
1948-49

Locality Spokane River Arm of Lake Roosevelt
Mouth of Spokane River to Laughbon's Landing

Chief of Party: J.T. Jarman
Plane of reference is 1288.575 feet above mean sea level
4.436 } ft. on tide staff at { No. 1 at Laughbon's Landing (to noon 11/14/48)
7.405 } ft. below B. M. H-52 { No. 2 at Laughbon's Landing (after 12:00, 11/14/48)
207.557

Plane of Reference -- Same
10 ft. on staff at Grand Coulee Dam
21.8 ft. below B.M. Section 8 (USBR)

Condition of records satisfactory except as noted below:

Chief, Division of Tides and Currents.

U. S. GOVERNMENT PRINTING OFFICE 756675

CHC

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

TIDE NOTE FOR HYDROGRAPHIC SHEET

~~Division of Hydrography and Topography~~ 7 March 1950

Division of Charts: R. H. Carstens

Plane of reference approved in
6 volumes of sounding records for

HYDROGRAPHIC SHEET 7700 1948-49

Locality Lower Spokane River, Lake Roosevelt, Washington

Chief of Party: J. T. Jarman in 1948-49
Plane of reference is
~~at mean tide staff~~ 1290 feet (USBR 1937 Datum of Leveling)
~~at or below Bench~~ or 1288.6 feet (Sea-level datum of 1929)

4.4 ft. on tide staff No. 1 at Laughbons Landing
7.4 ft. on tide staff No. 2 at " "
207.5 ft. below B. M. H-52

-1.4 ft. on tide staff Coulee Dam
166.2 ft. above B. M. OSBORNE 2

Condition of records satisfactory except as noted below:

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

U. S. GOVERNMENT PRINTING OFFICE 756675

7701

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-7701 (Field No. LR-11948)
1948-49

Locality Spokane River Arm of Lake Roosevelt
Laughbon's Landing to Squaw Canyon.

Chief of Party: J.T. Jarman
Plane of reference is 1288.575 feet above mean sea level
6.736 ft. on tide staff at Crow (staff)
153.408 ft. below B. M. CP 23

Plane of Reference- Same
7.405 ft. on tide staff at Laughbon'sx Landing (staff No. 2)
207.557 ft. below B.M. H-52

Condition of records satisfactory except as noted below:

Chief, Division of Tides and Currents.

U. S. GOVERNMENT PRINTING OFFICE 756675

RHC

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

TIDE NOTE FOR HYDROGRAPHIC SHEET

~~Division of Hydrography and Topography~~ 7 March 1950

Division of Charts: R. H. Carstens

Plane of reference approved in
4 volumes of sounding records for

HYDROGRAPHIC SHEET 7701 1948-49

Locality Middle Spokane River, Lake Roosevelt, Washington

Chief of Party: J. T. Jarman in 1948-49
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)

6.7 ft. on tide staff at Crow
153.4 ft. below B. M. CP-23

-1.4 ft. on tide staff at Coulee Dam
166.2 ft. above B. M. OSBORNE 2

Condition of records satisfactory except as noted below:

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

U. S. GOVERNMENT PRINTING OFFICE 756675

7702

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-7702 (Field No. LR-12048)
1948

Locality Spokane River Arm of Lake Roosevelt
Squaw Canyon to Little Falls Dam

Chief of Party: J.T. Jarman
Plane of reference is 1288.575 feet above mean sea level
8.631 ft. on tide staff at Mondovi
34.105 ft. below B. M. CP-31

Plane of Reference- Same
12.448 ft. on staff at Little Falls
9.479 ft. below B.M. LF-4 (USBR)

Plane of Reference- Same
1290.461 ft. on staff at Washington Water Power Co.
0.479 ft. below B.M. LF-4 (USBR)

These last two references are needed to reduce the last mile of the sheet where a gradient existed when the hydrography was accomplished. See descriptive report.

Condition of records satisfactory except as noted below:

Chief, Division of Tides and Currents.

U. S. GOVERNMENT PRINTING OFFICE 756675

439

RHC

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

TIDE NOTE FOR HYDROGRAPHIC SHEET

12 December 1949

~~Division of Hydrography and Topography:~~

Division of Charts: R. H. Carstens

Plane of reference approved in
2 volumes of sounding records for

HYDROGRAPHIC SHEET 7702 1948

Locality Lake Roosevelt (Upper Spokane River), Washington

Chief of Party: J. T. Jarman in 1948
Plane of reference is 1290 feet (USBR Datum of Leveling)
~~ft. on tide staff at~~ or 1288.57 feet (Sea Level Datum of 1929)
~~ft. below B.M.~~ or 34.1 feet below B. M. CP31
or 8.6 feet above zero of Mondovi tide staff.

Condition of records satisfactory except as noted below:

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

U. S. GOVERNMENT PRINTING OFFICE 756675

H 7700 1948-49
Lr 11848

Lake Roosevelt, Washington.
Spokane River.

List of geographic names penciled on smooth sheet.

Washington

* Franklin D. Roosevelt Lake

* Spokane River

Marble Flats

Stevens County

Lincoln County

Fort Spokane

* The waters of this sheet are at pool level as regulated by the height of water at Coulee Dam. Local residents speak of this estuary as Spokane River.

H 7701 1948 '49
LR 11948

Lake Roosevelt, Washington.
Spokane River

List of geographic names
penciled on smooth sheet.

Washington

* Franklin D. Roosevelt Lake

* Spokane River

Stevens County

Spokane Indian Reservation

* This arm of Lake Roosevelt is at pool level as regulated at Coulee Dam. People living in this district speak of this as Spokane River.

H 7702 1949
LR 12048

Lake Roosevelt, Washington.

Geographic names
penciled on smooth sheet.

Lake Roosevelt

Spokane River

Washington

Lincoln County

Stevens County

Squaw Canyon

Little Falls

Wynecoop Flats

It is suggested that the report on geographic names for Proj. Ph 2(45) be consulted for other appropriate names. The processing office does not have a copy of this report.

C
O
P
Y

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 grephic 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. Ventura 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

FEB 15 1950

FORM 537a (9-24-47) DEPARTMENT OF COMMERCE COAST AND GEODETIC SURVEY

REGISTER NO. T - 10302

TOPOGRAPHIC TITLE SHEET

FIELD NO. LR-T-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
Lake Roosevelt, Spokane River Arm

LOCALITY
Mouth Spokane River to Laughbon's Landing

SCALE
1:10,000

DATE OF SURVEY November, 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~~ OR 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 Independent Datum of Leveling, or 1288.575 feet above mean sea level. Heights of rocks and islands are referred to the normal lake level, i.e., the height of the feature above the normal lake level is given.

Corrections to shoreline and topo. signals shown on T-10302 were applied to H-7700 (1948-49); T-10302 was then destroyed.

The magnetic declination at ΔCP SEN 14 A, 1935-47, (USBR) 18 June, 1949, at 1730 was 21° 30' E

12136

FEB 15 1950

FORM 537a (9-24-47)

DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

REGISTER NO. T - 10303

TOPOGRAPHIC TITLE SHEET

FIELD NO. LR-U-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
Lake Roosevelt, Spokane River Arm

LOCALITY
Laughbon's Landing to Squaw Canyon

SCALE
1: 10,000

DATE OF SURVEY Nov., 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 Independent Datum of Leveling, or 1288.575 feet above mean sea level. Heights of rocks and islands are referred to the normal lake level, i.e., the height of the feature above the normal lake level is given.

Hydrographic signals shown on T-10303 were applied to surveys H-7700-7701 & 7702, after which T-10303 was destroyed.

The magnetic declination at △ CP SRN 22, 1935-47, (USBR) ~~was~~ 18 June, 1949, at 1600 was 21°45' E.

12136

FEB 15 1950

FORM 537a (9-24-47) DEPARTMENT OF COMMERCE COAST AND GEODETIC SURVEY

REGISTER NO. T-10304

TOPOGRAPHIC TITLE SHEET

FIELD NO. LR-V-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: Lake Roosevelt, Spokane River Arm

LOCALITY: Squaw Canyon to Little Falls Dam

SCALE: 1: 10,000

DATE OF SURVEY: Nov., 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 Independent Datum of Leveling, or 1288.575 feet above mean sea level. Heights of rocks and islands are referred to the normal lake level, i.e., the height of the feature above the normal lake level is given.

Hydrographic Signals shown on Graphic Control survey T-10304 were applied to H-7702 after which T-10304 was destroyed.

Magnetic declination at Δ CP SES 33, 1935-47 (USBR) 18 June, 1949, at 1230 was 21° 52' E.

12136

DESCRIPTIVE REPORT
To Accompany
Topographic Control Survey T-10302, Field No. LR-T-48
Topographic Control Survey T-10303, Field No. LR-U-48
Topographic Control Survey T-10304, Field No. LR-V-48

These surveys are a by-product of Projects Ph-2(45) and CS-332. Project Ph-2(45) furnished shoreline and photo-hydro locations for the 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 location 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. These surveys are on the Spokane River extending from its mouth to the Little Falls Dam. They were executed during the months of October and November 1948.

T-10302
LR-T-48 extends from the mouth of the Spokane River to Laughbon's Landing; began work on the sheet October 26, 1948 and it was completed November 7, 1948.

T-10303
LR-U-48 extends from Laughbon's Landing to Squaw Canyon; began work November 7, 1948 and completed the sheet on November 13, 1948.

T-10304
LR-V-48 extends from Squaw Canyon to the Little Falls Dam; work began on November 14, 1948 and the sheet was completed on November 20, 1948.

CONTROL

1. Horizontal control for these surveys 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)" H-7380 previously submitted to the Washington office. Refer also to Descriptive Report accompanying Hydrographic Sheets H-7681 and H-7682, side heading "F".
1947 1947

2. The USBR third order triangulation within this area is listed in plane coordinates based on the Washington North State Grid system.

Therefore, these survey sheets contain 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 being the maximum height to which the water rises in the lake. This plane is the 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.

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 were 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 location should be accepted.

SHORELINE AND TOPOGRAPHY

1. The shoreline shown of 1946-47 in pencil on these sheets came from shoreline survey sheets T-8857 through T-8859 inclusive. The following checks, or shoreline changes were ascertained by planetable methods:

(a) Change in rocky shoreline of small bight, Lat. 47° 55.2' (15'), Long. 118° 18.0'; new shoreline sketched with aid of sextant fixes by hydrographer; believed to be compilers error.

(b) Change in shoreline between signals AXE and BOA, Lat. 47° 55.3', Long. 118° 16.9'; new shoreline sketched with aid of sextant fixes by the hydrographer; believed to be a compilers error.

(c) Shoreline between signals OAK and CP SRS 9, Lat. 47° 56.3', Long. 118° 15.2' to Lat. 47° 56.2', Long. 118° 14.5', was suspected and checked; no change was obtained and the original shoreline was correctly shown.

(d) Change in shoreline of cove, Lat. 47° 54.6', Long. 118° 11.0' (10'); believed to be compilers error.

T-10302 Applied to H-7700 (1948-49)

7-18-382

(e) All of the foregoing appear on sheet LR-T-48. The corrected, or checked shoreline has been shown on the control sheet with red ink. No errors were detected on sheets LR-U-48 and LR-V-48.

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 sheets H-7700, H-7701 and H-7702. 1948-49 (1948)

2. The water of the Spokane arm of Lake Roosevelt is not potable because of sewage and industrial waste from the City of Spokane. At the present time, the City of Spokane is constructing a sewage disposal plant, and the National Park Service is attempting to prevent industrial waste from being dumped into the river.

AIDS TO NAVIGATION

1. There are no aids to navigation within the limits of these sheets.

LANDMARKS FOR CHARTS

1. Data relative to landmarks for charts are shown on Form 567, a copy of which is attached. These are the same objects submitted by personnel of Project Ph-2-(45), and are at the same locations.

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. Filed in Geographic Name Sect.

2. No additional information was obtained by the topographic and hydrographic units, 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 endeavor to provide suitable names for the large number of unnamed features on the lake. This information is not yet available.

Respectfully submitted,

J. T. Jarman
Chief of Party

GEOGRAPHIC NAMES

Survey No. H-7700

1948-49

Name on Survey	On Chart No. A	On previous survey No. B	On U. S. quadrangle Maps C	From local information D	On local Maps E	P. O. Guide or Map F	Rand McNally Atlas G	U. S. Light List H	K	
Washington										1
Stevens County										2
Lincoln County										3
Spokane River Arm										4
Spokane River Bridge										5
Marble Flats										6
Twin Buttes										7
Spokane Indian Reservation					(area north of Spokane River Arm)					8
Old Fort Spokane										9
Ferguson Creek										10
Sand Creek										11
										12
										13
					Names underlined in red are approved. 2-10-50 L. Heck					14
										15
										16
										17
										18
										19
										20
										21
										22
										23
										24
										25
										26
										27

M 234

GEOGRAPHIC NAMES

Survey No. H-7701 1948-49

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

M 234

GEOGRAPHIC NAMES

Survey No. H-7702 1948

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									USHB	1
Stevens County										2
Lincoln County										3
Franklin D. Roosevelt Lake									USHB	4
Spokane River Arm										5
Synaw Canyon										6
Spokane Indian Reservation					(area north of Spokane River Arm)					7
Wynecoop Flats										8
Little Falls			(town)							9
Heartline Canyon (q.v.)										10
										11
					Names underlined in red are approved 2-10-50 L. Heck					12
										13
										14
Mondovi Tide Sta.										15
										16
										17
										18
										19
										20
										21
										22
										23
										24
										25
										26
										27

Hydrographic Surveys (Chart Division)

HYDROGRAPHIC SURVEY NO. H-7700 1948-49

Records accompanying survey:

Boat sheets 1; sounding vols. 6; wire drag vols. .....;
bomb vols. .....; graphic recorder rolls 5 envel.;
special reports, etc. .....
.....

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

Number of positions on sheet		1220
Number of positions checked		98
Number of positions revised		8
Number of soundings revised (refers to depth only)		133
Number of soundings erroneously spaced		34
Number of signals erroneously plotted or transferred		—
Topographic details	Time	3 hrs
Junctions	Time	None
Verification of soundings from graphic record	Time	24 hrs

Verification by Earl W. Bragonje Total time 198 Date 4-28-50

Reviewed by O. W. Zeskind Time 25 Date 6-1-50

M-2232-1

Hydrographic Surveys (Chart Division)

HYDROGRAPHIC SURVEY NO. H-7701 1948 49

Records accompanying survey:

Boat sheets 1; sounding vols. 4; wire drag vols. .....;

bomb vols. .....; graphic recorder rolls 2 envel.;

special reports, etc. .....

.....

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

Number of positions on sheet		618
Number of positions checked		39
Number of positions revised		17
Number of soundings revised (refers to depth only)		91
Number of soundings erroneously spaced		84
Number of signals erroneously plotted or transferred		—
Topographic details	Time	3
Junctions	Time	9
Verification of soundings from graphic record	Time	21

Verification by Earl M. Briggs Total time 88 Date 5-11-50

Reviewed by Lee Gesteland Time 16 Date 6-6-50

M-2232-1

Hydrographic Surveys (Chart Division)

HYDROGRAPHIC SURVEY NO. H-7702 1948

Records accompanying survey:

Boat sheets ..1..; sounding vols. 2....; wire drag vols. .....;

bomb vols. .....; graphic recorder rolls 3 envel.;

special reports, etc. ....

....

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

Number of positions on sheet		538
Number of positions checked		45
Number of positions revised		6
Number of soundings revised (refers to depth only)		17
Number of soundings erroneously spaced		5
Number of signals erroneously plotted or transferred		—
Topographic details	Time	2 hrs.
Junctions (none)	Time	—
Verification of soundings from graphic record	Time	3 hrs.

E. M Brogoyie add'l Total 5 hrs

Verification by D. A. Buzzell ....Total time 63 hrs Date 2-6-50

Reviewed by C. W. Jeskind .... Time 20 Date June 13, 1950

M-2232-1

DIVISION OF CHARTS

REVIEW SECTION - NAUTICAL CHART BRANCH

REVIEW OF HYDROGRAPHIC SURVEY — REGISTRY NO. H-7700

FIELD NO. LR-11848

Washington, Franklin D. Roosevelt Lake-Spokane River Arm,
Old Fort Spokane to vicinity of Sand Creek
Surveyed in Nov. 1948-June 1949 Scale 1:10,000
Project No. CS-332

Soundings:

NK-7 Fathometer
808 Fathometer

Control:

Sextant fixes on shore signals

Chief of Party - J. T. Jarman
Surveyed by - J. T. Jarman and H. A. Marchant
Protracted by - T. G. Taxelius
Soundings plotted by - T. G. Taxelius
Verified and inked by - E. M. Bragonje
Reviewed by - I. M. Zeskind, 1 June 1950
Inspected by - R. H. Carstens

1. Shoreline and Control

The shoreline of this survey originates with air-photographic surveys T-8856 and T-8857 of 1946-47. Shoreline revisions in red are from graphic control survey Field No. LR-T-48 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

Depth curves were adequately delineated.

This is a survey of that portion of the Spokane River Arm of the Franklin D. Roosevelt Lake which lies immediately east of the mouth of the Spokane River. This arm is formed by the impoundment of water upstream from the Grand Coulee Dam. The bottom is generally smooth.

It drops abruptly at the shore to depths of about 60 ft. and from here, slopes gradually to a deeper channel where depths range from 120 to 200 ft. Several submerged rocks and sandy shoals are found close inshore in the western portion of the survey.

4. Junctions with Contemporary Surveys

The present survey makes an adequate junction with H-7701 (1948-49) on the east. The junction with H-7686 (1948) will be discussed 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

There are no charts of the area by this Bureau.

7. Condition of Survey

a. The sounding records and Descriptive Report 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

DIVISION OF CHARTS

REVIEW SECTION - NAUTICAL CHART BRANCH

REVIEW OF HYDROGRAPHIC SURVEY REGISTRY NO. H-7701

FIELD NO. LR-11948

Washington, Franklin D. Roosevelt Lake-Spokane River Arm,
Blue Creek to Heartline Canyon
Surveyed in Nov. 1948-June 1949 Scale 1:10,000
Project No. CS-332

Soundings:

NK-7 Fathometer
808 Fathometer

Control:

Sextant fixes on shore signals

Chief of Party - J. T. Jarman
Surveyed by - J. T. Jarman and G. W. Moore
Protracted by - B. Smith
Soundings plotted by - B. Smith
Verified and inked by - E. M. Bragonje
Reviewed by - I. M. Zeskind, 6 June 1950
Inspected by - R. H. Carstens

1. Shoreline and Control

The shoreline of this survey originates with air-photographic surveys T-8857 and T-8858 of 1946-47.

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 are adequately delineated.

This is a survey of that portion of the Spokane River Arm of Franklin D. Roosevelt Lake which lies southeastward from Laughbons Landing. This arm is formed by the impoundment of water upstream from the Grand Coulee Dam. Except for some inshore irregularities and several dangers to navigation (as noted on page 7, paragraph 2, in the Descriptive Report), the bottom is generally smooth. Depths along the axis of the natural channel range from 55 ft. in lat. 47°

47.98', long. 118° 04.50', to 130 ft. in lat. 47° 53.56', long. 118° 09.67'.

4. Junctions with Contemporary Surveys

The present survey makes adequate junctions with H-7700 (1948-49) on the north and H-7702 (1948) on the south.

5. Comparison with Prior Surveys

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

6. Comparison with Charts

There are no charts of the area by this Bureau.

7. Condition of Survey

a. The sounding records and Descriptive Report 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.

Examined and approved:

H. R. Edmonston
Chief, Nautical Chart Branch

R. W. Knox
Chief, Division of Charts

L. S. Hubbard
Chief, Section of Hydrography

W. M. Scaife
Chief, Division of Coastal Surveys

DIVISION OF CHARTS

REVIEW SECTION - NAUTICAL CHART BRANCH

REVIEW OF HYDROGRAPHIC SURVEY REGISTRY NO. H-7702

FIELD NO. LR-12048

Washington, Franklin D. Roosevelt Lake-Spokane River Arm,
Heartline Canyon to Little Falls
Surveyed in Nov., 1948 Scale 1:10,000
Project No. CS-332

Soundings: Control:

NK-7 Fathometer Sextant fixes on shore signals

Chief of Party - J. T. Jarman
Surveyed by - G. W. Moore
Protracted by - T. G. Taxelius
Soundings plotted by - T. G. Taxelius
Verified and inked by - D. A. Buzzell
Reviewed by - I. M. Zeskind, 13 June 1950
Inspected by - R. H. Carstens

1. Shoreline and Control

The shoreline of this survey originates with air-photographic surveys T-8858 and T-8859 of 1946-47.

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

2. Sounding Line Crossings

Depth at crossings are in adequate agreement.

3. Depth Curves and Bottom Configuration

The usual depth curves are adequately delineated.

This is a survey of that portion of the Spokane River Arm of Franklin D. Roosevelt Lake which lies east of Heartline Canyon. This arm is formed by the impoundment of water upstream from the Grand Coulee Dam. The bottom is irregular, and in the narrow portion of the river, slopes sharply downward to the natural channel. In the broad portion of the river in the western part of the survey, several shoal areas extend off from shore.

An unusual shoal ridge in lat. 47° 47.8', long. 118° 02.8', extends from the north shore of the river to within 100 meters of the south shore, almost completely blocking the course of the river. Depths along the axis of the natural channel range from 12 ft. at lat. 47° 49.52', long. 117° 55.49', to 71 ft. at lat. 47° 47.54', long. 118° 02.75'.

4. Junctions with Contemporary Surveys

An adequate junction was effected with H-7701 (1948-49) on the west. The present survey extends to the limits of the Project on the east where no other hydrographic surveys by this Bureau have been made.

5. Comparison with Prior Surveys

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

6. Comparison with Charts

There are no charts of the area by this Bureau.

7. Condition of Survey

a. The sounding records and Descriptive Report 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 adequate basic survey and no additional field work is recommended.

Examined and approved:

H. R. Edmonston
Chief, Nautical Chart Branch

R. W. Knox
Chief, Division of Charts

L. S. Hubbard
Chief, Section of Hydrography

W. M. Scaife
Chief, Division of Coastal Survey

NAUTICAL CHARTS BRANCH

SURVEY NO. H-7700 1948-49

Record of Application to Charts

DATE	CHART	CARTOGRAPHER	REMARKS
9/15/51	6168	Everett	~~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.

NAUTICAL CHARTS BRANCH

SURVEY NO. H-7701 1948-49

Record of Application to Charts

DATE	CHART	CARTOGRAPHER	REMARKS
9-15-57	6168	GHE	~~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.

NAUTICAL CHARTS BRANCH

SURVEY NO. H-7702 1948

Record of Application to Charts

DATE	CHART	CARTOGRAPHER	REMARKS
9-15-51	6168	GHE	~~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.