11771 THRU 11781

11771 THRU 11781

Form 504

U. S. DEPARTMENT OF COMMERCE

COAST AND GEODETIC SURVEY

DESCRIPTIVE REPORT

Type of Survey: Topographic

Field No.: Ph-40,000-895

Office No.: T-11771 thru T-11781

LOCALITY

State: Idaho

General locality: Clearwater and Nez Perce Counties

Locality: Orifino

19 59

CHIEF OF PARTY

L.G.Taylor, Chief of Field Party
W.Randall, Balto. Photo. Office

LIBRARY & ARCHIVES

DATE: August 1962

USCOMM-DC 5087

FORM 181
(4-23-54)

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

DESCRIPTIVE REPORT - DATA RECORD

Part 2

T-11771 thru T-11781

Project No. (II): 40000-895 Quadrangle Name (IV):

Field Office (II): Orifino, Idaho Chief of Party: Lorne Taylor

Photogrammetric Office (III): Baltimore, Md. Officer-in-Charge: William Randell

Instructions dated (II) (III): 20 August 1959 Supplement 1

Copy filed in Division of Photogrammetry (IV)

Method of Compilation (III): Kelsh

Manuscript Scale (III): 1:6000 Stereoscopic Plotting Instrument Scale (III): 1:6000

Scale Factor (III):

Date received in Washington Office (IV): Date reported to Nautical Chart Branch (IV):

Applied to Chart No. Date: Date registered (IV):

Publication Scale (IV): Publication date (IV):

Geographic Datum (III): Vertical Datum (III):

NA 1927

Mean sea level except as follows:
Elevations shown as (25) refer to mean high water
Elevations shown as (5) refer to sounding datum
i.e., mean low water or mean lower low water

Reference Station (III):

Lat.: Long.: Adjusted
Unadjusted

Plane Coordinates (IV): State: Zone:

Y= X=

Roman numerals indicate whether the item is to be entered by (II) Field Party, (III) Photogrammetric Office, or (IV) Washington Office.

When entering names of personnel on this record give the surname and initials, not initials only.

FORM C&GS-181b
(12-61)

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

DESCRIPTIVE REPORT - DATA RECORD

FIELD INSPECTION BY (II): Victor Serena	DATE: 1959
MEAN HIGH WATER LOCATION (III) (STATE DATE AND METHOD OF LOCATION): Kelsh	
PROJECTION AND GRIDS RULED BY (IV):	DATE
PROJECTION AND GRIDS CHECKED BY (IV):	DATE
CONTROL PLOTTED BY (III):	DATE
CONTROL CHECKED BY (III):	DATE
RADIAL PLOT OR STEREOSCOPIC CONTROL EXTENSION BY (III): Stereoplanigraph	DATE 1959, 1960
STEREOSCOPIC INSTRUMENT COMPILATION (III): PLANIMETRY Kelsh	DATE 1959, 1960
CONTOURS Kelsh	DATE 1959, 1960
MANUSCRIPT DELINEATED BY (III): Baltimore Field Office	DATE 1959, 1960
SCRIBING BY (III):	DATE
PHOTOGRAMMETRIC OFFICE REVIEW BY (III): Henry Eichert	DATE 1959, 1960
REMARKS:	

USCOMM-DC 16276B-P61

FORM C&GS-181c
(12-61)

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

DESCRIPTIVE REPORT - DATA RECORD

CAMERA (KIND OR SOURCE) (III):

C&GS "S" and US Engineers camera

PHOTOGRAPHS (III)

NUMBER	DATE	TIME	SCALE	STAGE OF TIDE
2508 thru 2522	Aug 1959		1:30,000	
2488 " 2503	"		1:30,000	
2340 " 2347	"		1:16,000	
2349 " 2353	"		"	
2359 " 2364	"		"	
2370 " 2381	"		"	
2386 " 2398	"		"	
2404 " 2414	"		"	
2420 " 2425	"		"	

TIDE (III)

	RATIO OF RANGES	MEAN RANGE	SPRING RANGE
REFERENCE STATION:			
SUBORDINATE STATION:			
SUBORDINATE STATION:			

WASHINGTON OFFICE REVIEW BY (IV): A. K. Heywood A.K. Heywood — DATE: 1960

~~PROOF EDIT BY~~ (IV): Final Drafting by: Scribing Section — DATE: 1960

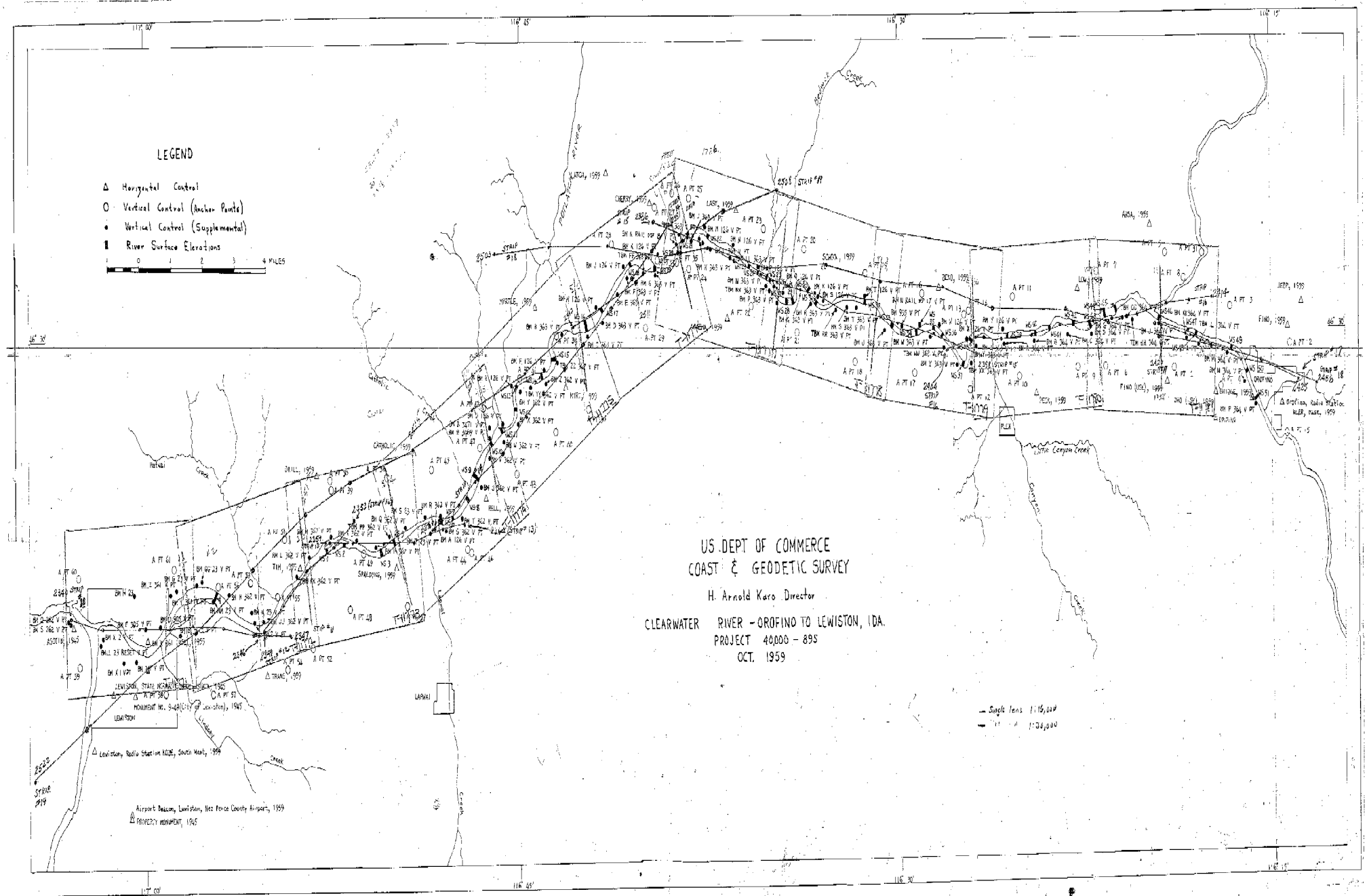
NUMBER OF TRIANGULATION STATIONS SEARCHED FOR (II):	RECOVERED:	IDENTIFIED:
NUMBER OF BM(S) SEARCHED FOR (II):	RECOVERED:	IDENTIFIED

NUMBER OF RECOVERABLE PHOTO STATIONS ESTABLISHED (III):

NUMBER OF TEMPORARY PHOTO HYDRO STATIONS ESTABLISHED (III):

REMARKS:

USCOMM-DC 16276C-P61


LEGEND
Horizontal Control
Vertical Control (Anchor Points)
Vertical Control (Supplemental)
River Surface Elevations
0 1 2 3 4 MILES
US DEPT OF COMMERCE
COAST & GEODETIC SURVEY
H. Arnold Karo Director
CLEARWATER RIVER - OROFINO TO LEWISTON, IDA.
PROJECT 40,000 - 895
OCT. 1959
Single lens 1:15,000
1:30,000
Lewiston, Radio Station KOZE, South Mast, 1959
Airport Beacon, Lewiston, Nez Perce County Airport, 1959
PROPERTY MONUMENT, 1945
Orofino, Radio Station KLER, mast, 1959
LAPWAI
LEWISTON
117° 00'
116° 45'
116° 30'
116° 15'
46° 30'

U. S. COAST & GEODETIC SURVEY

CLEARWATER RIVER - OROFINO TO LEWISTON, IDAHO

Project 40,000-895

Contents

Field Inspection Report

FIELD INSPECTION REPORT

CLEARWATER RIVER - OROFINO TO LEWISTON, IDAHO

Project 40,000-895

2. Areal Field Inspection

The Clearwater River is contained in a narrow canyon which broadens out appreciably as it nears its junction with the Snake River at Lewiston. The steep canyon walls are breached by deeply incised tributary drainage. An undulating prairie, composed of a thick mantle of rich topsoil overlaying the great Columbia River basalt beds, flank both sides of the river. Erosion has exposed columnar formations of the basalt beds all along the canyon walls. Talus is common to the base of rock formations; road and railway cuts bare occasional accumulations of unconsolidated sediments and colluvial deposits.

Excepting the Lewiston-Clarkston complex on the west and Ahsahka and Orofino on the east, there are no sizable communities or cultural developments along the river. Indeed, the stream is so closely confined there is little room for development. Moderate truck farms thrive near Spalding, small wheat farms are located on intermediate elevations in the canyon, while grain elevators are found along the railroad at Cherry Lane, Lenore, and Peck.

The famous Lolo Trail, travelled by the Lewis and Clark expedition, terminates near Orofino. In the fall of 1805, the expeditionary force pitched camp at the forks of the Clearwater River to build canoes for the final leg of their journey to the mouth of the Columbia.

Spalding has a place in American history as the site of an early mission and school. Marcus Whitman and Henry Spalding taught irrigated farming, brought in the Northwest's first printing press, and built saw and flour mills here. Slowly developing hostility induced Spalding

to leave after the massacre at Walla Walla in 1849.

The data record edge of all project photographs is indistinct. This defect caused little difficulty with horizontal control identification on the 1:30,000 scale photographs. However, the poorly defined area of the low altitude pictures was common with the control zone for vertical bridging. Where barren ridges coincided with poor quality, it was difficult to select vertical control points.

3. Horizontal Control

All stations were panelled prior to photography. Excepting three stations (MYRTLE, FINO, LATCH) the marking consisted of 12 foot on a side, L-shaped, white cloth panels placed so that the station was at the apex of the L. At field print scales, many of the resultant station images were hardly recognizable as to form.

It is recommended that three panels be used for future premarking. These panels should be distributed symetrically around the station. Cloth spacing should be such that separate forms may be distinguished. Black rather than white cloth may be preferrable in some cases and its use should be explored.

a) In two areas the 1:30,000 scale photographs failed to blanket the 1:16,000 coverage. Observations were made for the position determination of two anchor points (A PT 46 and 60) which fell outside the limits of horizontal control.

b) No datum adjustments were made by the field party.

c) All control excepting; ORO USE, 1958 and FINO USE, 1958 were established by or connected to the Bureau triangulation station net. The USE stations are not necessary for the horizontal bridge.

d) All station were positively identified.

e) A search was made for all Bureau marks in the area.

f) The quality of the identification of horizontal control needs no amplification other than that entered on individual CSI cards.

4. Vertical Control

The vertical angle elevation of the triangulation stations in the net spanning the Clearwater River provided the basis for the control of the major part of the vertical bridge. The elevation of the remaining control points were derived from Corps of Engineers or Coast & Geodetic Survey bench marks. The Corps of Engineers level line started and closed on Bureau level lines.

The elevation of most anchor points must be computed using photogrammetrically determined distances. All reciprocal vertical angles involved in the elevation of control points were checked for accuracy using T-O and curvature and refraction corrections based on distances scaled from the field photographs.

The elevation of other anchor points were determined by checked tellurometer distances or by direct, closed-loop trigonometric leveling from Bureau or Corps of Engineers bench marks.

The gradient of the Clearwater River can be determined from trigonometric connections made by the field party while waiting for the delivery of photography. The field elevations should be reduced to the level of the water at the time of photography by reference to river gage readings made by the Washington Water Power Company at Spalding and at Kamiah. A list of water level connections and a record of gage readings are contained in the Index to Field Work.

5. Contours and Drainage

No planetable contouring was done in the field.

The Clearwater drainage system is free of the mapping complications caused by low gradients and dense timber. Sediments are predominately boulders. Many short stretches of sand and bed rock are found all along the river.

Though canyons containing tributary drainage are deep and well developed, streams, as judged by stream-flow, are small and contribute little to the total run-off. Of the tributaries between Lewiston and Orofino, the North Fork alone is navigable. Because of numerous rapids, neither the North Fork or the Clearwater is navigable except to small boats operated by experienced river boatmen.

No aids to navigation are located in the project area. The clearance of bridges and cables over the Clearwater River were not measured. The location of the crossings as well as the overland routes of all trunk, power transmission lines were indicated on field photographs.

6. Woodland Cover

Stands of timber are confined to the canyon and are not very dense. Proceeding west from Orofino, the timber thins and finally disappears altogether. Isolated patches of low brush are too small to cause trouble in contouring.

7,8. Alongshore and Offshore Features

Not applicable to this project.

9. Landmarks

The Triangulation Party submitted a list of landmarks for the area in 1959.

10. Boundaries, Monuments, and Lines

The location of these features were not required.

11. Other Control

Not applicable to this project.

12. Other Interior Features

The city of Orofino is at the east end of the project. It is the seat of Clearwater County and the center of logging operations that radiate out into the great forests to the north. The unincorporated community of Ahsahka is located four miles downstream. The people of both communities earn their livelihood chiefly in the timber industry. Unscheduled air service to the locality is provided by the Orofino Municipal Airport.

Lewiston is located at the junction of the Snake and Clearwater Rivers. A great pulp and wood products plant is located at the Washington Water Power Dam at the east edge of town. The Lewis and Clark Normal College has its campus here. Air access to the twin city area of Lewiston and Clarkston is by way of the Lewiston Municipal and the Asotin County Airports.

The Camas Prairie Railroad stays alongside the Clearwater River for the length of the project. Spur lines at Spalding and Orofino terminate in Grangeville and Headquarters. A branch line leaves the river at Arrow Junction and goes through Juliaetta and Moscow.

U.S. Highway 95 proceeds along the north bank of the river to Spalding and then turns south and leaves the project area. State Highway 9 links Spalding with Orofino. Important connections to routes 95 and 9 are made at Lewiston, Spalding, Peck, and Orofino.

13. Geographic Names

A separate report is being submitted on the subject of geographic names.

14. Supplemental Data

a) One set of USGS maps of the plan and profile of the Clearwater River is being submitted with field records.

b) One set of city maps of Clarkston, Lewiston, and Orofino.

Approved and forwarded:

Lorne G. Taylor
LCDR, C&GS

Respectfully submitted:

Victor E. Serena
C&GS

INDEX TO FIELD WORK

Horizontal Control..... 34 Stations

Station	Photo. No., Ag 100-
AGATHA	2498
AHSA	2491
Airport Beacon, Lewiston Nez Perce County Airport	2520
ASOTIN, 1945	2521
BELL	2371, 2514
BEND	2495
BM X 361 (USE)	2519
BRIDGE	2489
CATHOLIC	2515
CHERRY	2500
DISH	2493
DRILL (USGS)	2516
FINO	2488
FINO USE, 1958	2491
JEEP (USE)	2488
LAST	2498, 2508
LATCH	2501
Lewiston, Radio Station KOZE, Mast	2520
Lewiston, State Normal School, Stack, 1945	2520
LOW	2408, 2493
Monument No. 9 (City of Lewiston), 1945	2520
MYRT	2512
MYRTLE (USGS)	2512, 2502
ORO USE, 1958	2422
OROFINO, 1933	2490

Horizontal Control (cont.)

Station	Photo. No., Ag 100-
Orofino, Radio Station KLER, Mast	2488
PECK (USGS)	2492
Property Monument, 1945	2520
SCHOOL	2497
SPALDING	2515
TIM	2351, 2517
TRANS	2518
*A PT 46	2364
*A PT 60	2340

*Established for control of 1:16,000 scale planimetry and vertical control.

Vertical Control (Anchor Points)..... 61 Stations

Station	1:16,000 Scale Photo. No., Ag 100-	1:30,000 Scale Photo. No., Ag 100-
A PT 1	2420	2491
2	2425	2489
3	2423	2489
4	2423	2490
5	2411	2491
6	2409	2492
7	2409	2492
8	2421	2491
9	2409	2492
10	2406	2493

Vertical Control (cont.)

Station	1:16,000 Scale Photo. No. Ag 100-	1:30,000 Scale Photo. No. Ag 100-
A PT 11	2406	2493
12	2404	2495
13	2404	2494
14	2404	2494
15	2425	2488
16	2395	2496
17	2395	2496
18	2394	2496
19	2393	2496
20	2391	2497
21	2392	2497
22	2390	2498
23	2390	2498
24	2388	2499
25	2388	2499
26	2386	2499
27	2381	2500
28	2378	2501
29	2378	2501
30	2376	2512
31	2414	2491
32	2413	2490
33	2386	2500
34	2376	2512
35	2380	2500
36	2408	2493
37	2362	2516
38	2362	2515
39	2360	2516
40	2375	2513

2406
2404
2404
2404

2493
2495
2494

Vertical Control (cont.)

Station	1:16,000 Scale Photo. No., Ag 100-	1:30,000 Scale Photo. No., Ag 100-
A PT 41	2374	2513
42	2373	2513
43	2373	2513
44	2364	2514
45	2371	2514
46	2364	-
47	2363	2514
48	2360	2517
49	2353	2516
50	2353	2517
51	2351	2518
52	2351	2517
53	2349	2518
54	2347	2518
55	2349	2518
56	2344	2518
57	2345	2518
58	2343	2519
59	2340	2521
60	2340	-
61	2342	2519

Vertical Control (Supplemental) 115 Stations

Station	1:16,000 Scale Photo. No., Ag 100-
H 23	2342
LL 23 Reset	2341
MM 23 (PP & L)	2344
N 23	2349
S 23	2362

Vertical Control (Supplemental) cont.

Station	1:16,000 Scale Photo. No., Ag 100-
T 23	2362
A 126	2371
B 126	2363
D 126	2372
E 126	2374
F 126	2375
G 126	2376
H 126	2377
J 126	2378
K 126	2381
M 126	2387
N 126	2389
P 126	2389
Q 126	2390
R 126	2391
S 126	2391
T 126	2393
W 126	2396
X 126	2397
Y 126	2406
Q 262	2340
S 262	2340
D 305	2343
F 305 (L.S.H.D.)	2343
G 352	2513
X 361 USE	2342
XX 361 USE	2343
Y 361 USE	2343
Z 361 USE	2343
G 362 USE	2343

Vertical Control (Supplemental) cont.

Station	1:16,000 Scale Photo. No., Ag 100-
GG 362 USE	2345
H 362 USE	2345
J 362 USE	2349
L 362 USE	2352
M 362 USE	2352
N 362 USE	2360
P 362 USE	2361
TBM PP 362 USE	2361
Q 362 USE	2362
R 362 USE	2370
S 362 USE	2371
T 362 USE	2371
U 362 USE	2372
V 362 USE	2373
W 362 USE	2374
X 362 USE	2373
Y 362 USE	2374
TBM YY 362 USE	2374
Z 362 USE	2375
TBM ZZ 362 USE	2376
B 363 USE	2376
C 363 USE	2378
D 363 USE	2377
E 363 USE	2378
F 363 USE	2379
TBM FF 363 USE	2379
G 363 USE	2381
H 363 USE	2387
J 363 USE	2387
K 363 USE	2388

Vertical Control (Supplemental) cont.

Station	1:16,000 Scale Photo. No., Ag 100-
L 363 USE	2389
TBM LL 363 USE	2389
N 363 USE	2390
TBM NN 363 USE	2391
P 363 USE	2390
Q 363 USE	2391
R 363 USE	2392
TBM RR 363 USE	2392
S 363 USE	2393
T 363 USE	2393
U 363 USE	2394
W 363 USE	2397
TBM WW 363 USE	2396
X 363 USE	2397
TBM XX 363 USE	2397
Y 363 USE	2398
Z 363 USE	2398
A 364 USE	2406
B 364 USE	2406
C 364 USE	2408
D 364 USE	2409
G 364 USE	2411
TBM GG 364 USE	2420
TBM HH 364 USE	2420
J 364 USE	2420
TBM KK 364 USE	2420
L 364 USE	2421
M 364 USE	2422
N 364 USE	2423
P 364 USE	2423

Vertical Control (Supplemental) cont.

Station	1:16,000 Scale Photo. No., Ag 100-
B 3415 (I.G.S.)	2343
B 3429 (I.G.S.)	2345
B 3465 (I.G.S.)	2363
B 3469 (I.G.S.)	2372
B 3471 (I.G.S.)	2373
X 1 (USGS)	2342
X 2 (USGS)	2340
741 (USGS)	2342
935	2395
N Rail Milepost 8	2386
N Rail Milepost 16	2394
N Rail Milepost 17	2395
Intersection of centerlines 5th and Fair Streets	2340
Intersection of centerlines Riverside Street and U.S. Hwy. 410	2340
Center of triangle formed by Y intersection of U.S. Hwy. 95 and U.S. Hwy. 410	2342
Highway surface at center of Y intersection of a gravel road leading southwest.	2342
BELL	2372
BEND	2396
DRILL (USGS)	2517
TIM	2351

Vertical Control (Water Surface) 51 Control Pts.

Water gage data for the adjustment of river ties follow list of water surfaces.

Station	Unadjusted Field Elevation feet	Date of Observation 1959	1:16,000 Photo. No. Ag 100-
WS 1	762.7	28 Aug.	2352
2	765.8	28 Aug.	2352
3	768.4	28 Aug.	2361
4	762.3	28 Aug.	2345
5	773.5	31 Aug.	2361
6	773.8	31 Aug.	2363
7	781.8	1 Sept.	2363
8	782.8	1 Sept.	2363
9	790.6	1 Sept.	2372
10	791.9	1 Sept.	2373
11	799.2	1 Sept.	2373
12	799.6	1 Sept.	2373
13	802.6	1 Sept.	2375
14	810.9	1 Sept.	2375
15	812.5	1 Sept.	2375
16	827.9	1 Sept.	2377
17	832.8	2 Sept.	2377
18	833.9	1 Sept.	2379
19	846.0	2 Sept.	2379
20	846.7	2 Sept.	2387
21	852.9	2 Sept.	2387
22	860.2	2 Sept.	2388
23	862.4	2 Sept.	2389
24	867.0	18 Sept.	2389
25	866.9	4 Sept.	2389

Vertical Control (Water Surface) cont.

Station	Unadjusted Field Elevation feet	Date of Observation 1959	1:16,000 Photo. No. Ag 100-
WS 26	866.97	4 Sept.	2391
27	870.98	4 Sept.	2391
28	872.15	4 Sept.	2391
29	872.55	4 Sept.	2391
30	886.41	3 Sept.	2392
31	886.54	3 Sept.	2393
32	890.39	3 Sept.	2393
33	900.98	3 Sept.	2393
34	901.68	3 Sept.	2396
35	907.73	3 Sept.	2397
36	908.42	3 Sept.	2397
37	918.3	3 Sept.	2397
38	926.1	3 Sept.	2397
39	928.0	3 Sept.	2407
40	933.2	3 Sept.	2407
41	937.7	2 Sept.	2407
42	941.4	3 Sept.	2409
43	950.0	2 Sept.	2409
44	950.05	2 Sept.	2409
45	952.84	2 Sept.	2409
46	966.5	2 Sept.	2411
47	968.9	2 Sept.	2421
48	975.5	2 Sept.	2421
49	982.8	2 Sept.	2423
50	987.8	2 Sept.	2423
51	994.4	2 Sept.	2423

Below are listed river stage levels as measured by gages at Spalding and Kamiah. The gages are maintained by the Washington Water Power Company of Clarkston, Idaho,

Date	Spalding gage		Kamiah gage	
21 Aug.	1.52 ft.		3.94 ft.	
22	1.92		-	
23	1.83		-	
24	1.62		-	
25	1.46	(photography)	3.71	
26	1.35		3.67	
27	1.29		3.62	
28	1.36	-.10	3.65	-0.6
29	1.25	-.31	-	
30	1.40	-.00	-	
31	1.28	-.28	-	
1 Sept.	1.32	-.14	3.71	0.00
2	1.85	+.39	3.92	+.21
3	1.60	+.14	3.76	+.05
4	1.39	-.07	3.61	-.10
5	1.32		-	
6	2.41		-	
7	4.22		-	
8	3.25		4.64	
9	2.59		4.27	
10	2.26		4.11	
11	1.95		3.91	
12	1.74		-	
13	1.58		-	
14	1.51		3.77	
15	1.72		4.23	
16	2.43		4.36	
17	2.19		4.21	
18	1.98	+.48	4.19	+.48

The Kamiah automatic gage did not give readings on dates left blank.

Bench Marks identified for position only

Bench Mark	1:16,000 Scale Photo. No., Ag 100-
X 5 (PP & L)	2341
L 23 Reset	2341
M 23	2343
Y 37 (PP & L)	2340
U 45	2340
RP 78 (USGS)	2413
R 262	2340
T 262	2340
B 305	2342
JJ 362 (USE)	2350
KK 362 (USE)	2351
A 363 (USE)	2376
M 363 (USE)	2390
V 363 (USE)	2396
E 364 (USE)	2410
F 364 (USE)	2410
K 264 (USE)	2420
H 364 (USE)	2420
820 (USGS)	2342
959.0 (USGS)	2406
990.5 (USGS)	2410
B 3457 (IGS)	2362

PHOTOGRAMMETRIC PLOT REPORT
CLEARWATER RIVER (Lewiston to Ahsahka), IDAHO
Project 40,000-895, Part II
May 1960

21. AREA COVERED:

The Clearwater River from its junction with the Snake River at Lewiston eastward (or upstream) to the junction with the North Fork Clearwater River at Ahsahka is covered by Topographic Manuscripts T-11771 through T-11781 at 1:6,000. This report discusses the photogrammetric bridging incidental to furnishing horizontal and vertical control for Kelsh compilation.

22. METHOD:

(See Project Index for layout of photographs, control and T-sheets). The area was photographed at 1:30,000 and 1:16,000 scales. The 1:30,000 scale photography (strips 18 and 19) was bridged to establish supplemental horizontal control for the 1:16,000 scale photography. The 1:16,000 scale photography was then bridged to establish horizontal and vertical control points to be used in Kelsh planimetric and topographic compilation.

Difficulty was experienced in holding some of the bridge points from model to model. In many of the models additional bridging points were selected to facilitate the tie between models. Thus, bridge points which could not be held within the allowable error were eliminated, the remaining bridge points providing sufficient control to assure a good tie between models. That error remaining was evenly distributed about the model. Since there was at least one horizontal control point and one vertical control point per model the error after adjustment was within the allowable limits. The exact cause of the above error was not determined, but it could be related to the out-of-focus characteristic of the 1:16,000 scale photography. (See note under Paragraph 25 Photography)

Although adjustment of some strips indicated rather large discrepancies, the overall adjustment of each should assure sufficient accuracy in compilation.

23. ADEQUACY OF CONTROL:

Horizontal control stations were premarked and complied with project instructions.

24. SUPPLEMENTAL DATA:

Bridge points 4510, 4511 and 4612 were established during the extension of horizontal and vertical control strip 3 - Bruce's Eddy Dam Site Project. These bridge points were used in the adjustment of strip 16-Clearwater River Project, therein serving as the junction between these two projects.

25. PHOTOGRAPHY:

The Pacific Air Surveys (under contract to the U. S. Army Corps of Engineers) photographed the area at 1:16,000 and 1:30,000 scales. The Wild RC-8 Camera (focal length 152.62 mm) was used and the identification designation assigned this photography was "AG-100".

Approximately one quarter of each 1:16,000 scale exposure appears to be out of focus, also, this area is in the same location on every exposure. It is believed this was caused by the airplane's exhaust passing between the camera lens and the ground. This stream of hot air distorted the ground images causing a general lack of sharply defined images on the film. The stereo-models were "soft" and accurate ground elevations were difficult to obtain. Generally, several readings were made of each point to assure as accurate a reading as possible.

26. DISCUSSION OF EACH STRIP ADJUSTMENT:

Tabulated on the following page are the adjustments of each strip:

HORIZONTAL BRIDGING

Strip No.	Models	Control pts in Adjstmnt	Control pts to Check Adjstmnt	Maximum Error(ft)	Average Error(ft)
11	7	6	6	7	4.4
12	3	3	5	7	3.4
13	5	5	9	5.7	2.2
14	11	7	14	7.1	3.3
15	12	6	19	8.4	3.8
16	9	5	6	15.5	6.8

(Strip 17 covered the area from Ahsahka to Orofino or eastward from the junction of the Clearwater and the North Fork Clearwater Rivers - and was not bridged.)

18	15	7	4	8	4.5
19	14	9	8	8	5.2

(Maximum allowable error 0.3mm at 1:6,000 scale = 6 feet.)

VERTICAL BRIDGING

Strip No.	Control pts in Adjstmnt	Control Pts to Check Adjstmnt	Maximum Error(ft)	Average Error(ft)
11	8	24	6.0	2.0
12	6	10	4.6	1.5
13	7	28	8.4	2.8
14	17	37	9.2	4.4
15	20	71	8.1	3.2
16	13	36	9.5	3.5

17 Not bridged.

18 and 19 Not Bridged for Vertical Control Extension.

Strips 18 and 19 were bridged first to establish supplemental horisontal control to adjust strips 11 through 17.

STRIP 18 (photos AG-100-2484 through 2503, 1:30,000 scale)

Four points (AGATHA 1959, BEND 1959, S.S.BEND, S.S.SCHOOL 1959) exceeded the maximum allowable error, therefore were omitted from the bridge adjustment. The images of the four points were not well defined in the stereo-models. The error could be caused by not being able to observe the exact image of the point selected in the field.

STRIP 19 (photos AG-100-2508 through 2522, 1:30,000 scale)

Three points (ASOTIN 1945, AIRPORT BCN-LEWISTON NEZ PERCE CO AIRPORT 1959, PROPERTY MONUMENT 1945) exceeded the maximum allowable error and were therefore omitted from the final bridge adjustment. These points were located outside the area of good adjustment. This does not indicate any discrepancy in the field work--only an error created by the location of these points relative to the control points used in the adjustment of the entire strip of photography.

STRIP 11 (photos AG-100-2340 through 2347, 1:16,000 scale)

One point (ASOTIN 1945) exceeded the maximum allowable error and was therefore omitted from the final adjustment of this strip. The reason for this error has been discussed, see STRIP 19.

STRIP 12 (photos AG-100-2349 through 2352, 1:16,000 scale)

All bridge points held in final adjustment. One point (TIM 1959) exceeded the maximum allowable error by one foot. As this station was in the area of poor definition as described in paragraph 25 "Photography", the error was not regarded as excessive.

STRIP 13 (photos AG-100-2359 through 2364, 1:16,000 scale)

All points held within limits.

STRIP 14 (photos AG-100-2370 through 2381, 1:16,000 scale)

The maximum error exceeded the allowable error by one (1) foot.

STRIP 15 (photos AG-100-2386 through 2398, 1:16,000 scale)

Three points (CHERRY, LAST, S.S.SCHOOL) exceed the maximum allowable error and therefore were omitted from the final adjustment of this strip. All three of these points appeared in that part of the photography that was out-of-focus.

STRIP 16 (photos AG-100-2404 through 2413, 1:16,000 scale)

Three types of horizontal control points (field-identified, tie-points from Strip 18 and tie-points from Strip 3) were used in the adjustment of this strip. The tie-points from Strip 3 served to make a satisfactory junction between Part I (1:24,000 manuscript scale and Part II (1:6,000 manuscript scale).

Submitted by:

Willard A. Kuncis 9-11-66

Approved:

Everett H. Ramey, Chief
Stereoscopic Mapping Unit

SCOPE

This report summarizes the activities of the C&GS on reimbursable Project 40,000-895, Clearwater River, Idaho.

For convenience of reporting, the project is divided into two parts. Part I is designated as the area east of Orofino in the vicinity of the Bruces Eddy Dam site along the North Fork Clearwater River. Part II encompasses that area from Lewiston along the Clearwater River to Ahsahka, Idaho.

A project layout accompanies this report and may be referred to for these areas.

For clarity, each phase of the project is discussed under separate heading.

T-11771

Clarkston
Clearwater River
Clearwater River Memorial Bridge
Lewiston
Lindsay Creek
Snake River

T-11772

Clearwater River
Hatwai Creek
Lindsay Creek

T-11773

*Beardy Gulch Creek
Cole Canyon Creek
Clearwater River
Coyote Gulch Creek
Hog Island

T-11774

Catholic Creek
Clearwater River
Coyote Gulch Creek
Lapwai Creek
Lewis & Clark Hwy.
Spalding
Spalding Memorial State Park

T-11775

Arrow
Clearwater River
Lewis & Clark Hwy.
Lower Cottonwood Island
Myrtle
Potlatch River

T-11776

Cherrylane Station
Clearwater River
Fir Island
Lewis & Clark Hwy.
Lower Cottonwood Island
Upper Cottonwood Island

T-11777

Ahsahka
Clearwater River
Lewis & Clark Hwy.
North Fork Clearwater River

Fihal Name Sheets PH 40000-895

T-11778

Agatha
Big Eddy
Clearwater River
Jack Creek
Lenore
Lewis & Clark Hwy.

T-11779

Clearwater River
Harpers Bend
Lewis & Clark Hwy.

T-11780

*Big Canyon Creek
Clearwater River
Lewis & Clark Hwy,
Snells Island
Peck Junction
Peck Station
Saddlebag Rapids
Snells Island

* BGN decision

Geographic Names Section

PROJECT 40,000-895
TOPOGRAPHIC MAPPING
Clearwater River, Idaho

General

On January 9, 1959, negotiations were initiated between Admiral Pierce of the C&GS and Mr. C. W. Waggoner of the Corps of Engineers, Walla Walla District. General specifications were outlined at that time. On January 27, 1959, Mr. Waggoner visited the Washington Office to discuss details of the project.

Negotiations were continued by an exchange of correspondence which resulted in the acceptance of the project on a reimbursable basis to be completed in the spring of 1960.

Purpose

The Army Engineers propose to build one of the world's larger dams located on the North Fork of the Clearwater River near Orofino, Idaho, designated as Bruces Eddy Dam Site.

Existing map coverage was limited to the 1:250,000 series. The dam site area (Part I) required the mapping of nine 1:24,000 surveys and eleven (Part II) 1:6,000 surveys.

The 1:24,000 series were to provide the Engineers with reconnai ance maps for preliminary planning. Field work was to provide monumented horizontal and vertical control for future larger scale mapping anddevelopment of the reservoir site.

Photography

The photography on Part I was flown by Photo Mission 702 of the C&GS. A flight map with five carefully oriented lines giving the most advantageous placement for stereoscopic bridging was furnished. Excellent adherence to these flight lines by the Photo Mission was obtained. Photography was of good quality taken with the 6" Wild Aviogon camera at 1:36,000 scale on August 25, 1959.

The photography on Part II was taken by Pacific Aerial Surveys under contract to the Corps of Engineers. Specifications as to altitude, endlap and camera were set by C&GS.

Photography continued

The first film was received and examined in August 1959. Some strips were rejected and subsequently rephotographed. The photography was of poor quality in one quadrant due to exhaust of aircraft. Tests proved that parallax could be cleared using this photography. Difficulty was encountered during the vertical bridging operations tying models together. (See side heading "Map Accuracy").

Project Diagram

Soil conservation photography taken 1954 at 1:60,000 scale was used to lay an uncontrolled mosaic for use as a project diagram. Nine sheets were laid out to conform to the drainage area. They do not conform to the standard 1:24,000 topographic series. Copies of this diagram were forwarded to Mr. Waggoner for approval.

Sheet Size

Manuscript dimensions on Part I were restricted to 21" x 25½" overall for use in a bound brochure to be assembled by Corps of Engineers. The scale was 1:24,000 and contained both polyconic and state grid.

Overall size on Part II was 29" x 42", the format taken from samples furnished by the Engineers. Grid ticks at 2500' intervals were scribed. No polyconic projection was shown. The sheets were skewed so that the Clearwater River tended to bisect each sheet.

Field Operations

During operational planning of this project, it became evident that field operations would be difficult due to dense woods (Part I), mountainous terrain (Parts I and II) and lack of access roads (Part I).

The use of helicopters was proposed to overcome these difficulties and later proved to be worthwhile.

Any interior areas serviced by roads were many times inaccessible during the initial phase of field operation, due to ruts and washouts caused by spring thaws or deadfalls caused by storms. Later, Forest Service personnel arrived to clear fire lanes permitting survey parties to enter some station sites.

Horizontal Control (Parts I and II)

All previously established stations within the project area were recovered by the reconnaisance party. Additional control needed for aero-triangulation was established by conventional triangulation methods. A sketch of the triangulation scheme is included with this report.

Control recovered or stations selected by the reconnaisance party prior to aerial photography were premarked whenever possible.

58 stations were identified by direct or substitute station methods in Part I and 34 in Part II.

Vertical Control (Part I)

Bureau bench marks of second-order accuracy were established along the river to form the basis for control leveling in the project area. Elevations were extended from these lines and carried through the triangulation net by reciprocal vertical angle observations. Additional elevations were achieved using tellurometer derived distances and vertical angles. Closed trigonometric theodolite and short hand level loops were employed to make final connections to vertical control points.

Vertical control points were identified in pairs normal to the flight line and spaced every third model. In addition, the elevation of any identifiable features existing along level lines which could be readily cut in from triangulation stations was also given.

In Part I, the elevations of 183 vertical control stations were determined and in Part II, 61 such stations were recorded. In addition, the heights of all triangulation stations within the project area were determined.

All vertical control was marked by the field party with copper weld or 1" iron pipe suitably stamped.

Field Inspection

Field inspection was complete within the limits of photography on Part I and within the limits of the 1:16,000 scale photography on Part II. This included classification of roads, buildings, vegetation and drainage. Also included was the identification of all bench marks whether or not they were to be used as control for model points.

Office Operations

Part I

Alternate strips were bridged horizontally and vertically by the stereoplanigraph and adjusted analytically by IBM programming.

The density of horizontal control averages four to six stations per strip and sufficient vertical control was furnished by pairs of elevations normal to the flight line every third model.

Additional horizontal and vertical control was established during the aerotriangulation to enable each model to be delineated by Kelsh methods.

Original requests by the Army Engineers for a 50' interval was modified at the urging of the Geological Survey to 40'. These surveys could then be utilized by them for standard 7½' quadrangles.

Part II

The 1:30,000 scale photography was bridged by stereoplanigraph methods to establish supplemental horizontal control points sufficient in density to fix the position of each 1:16,000 scale photograph.

The 1:16,000 scale photographs were then bridged both horizontally and vertically providing enough control for individual models to be compiled by the Kelsh Plotter.

These Kelsh models were compiled on 1:6,000 scale work sheets with a contour interval of 10'. All data with the exception of a woods overlay was delineated on these work sheets.

Instructions limited the extent of contouring to approximately 400' above the river elevation.

Drafting and Edit

All work sheets were reviewed prior to scribing by the Review Section. The work sheets were then paneled into manuscripts and scribed after which the manuscript was edited prior to reproduction.

Map Accuracy

Every attempt was made throughout the project to maintain the standards of National Map Accuracy.

Field parties charged with the responsibility of selecting vertical control points were instructed to choose a site varying less than one foot in a fifteen foot radius. This in itself required diligent searching.

Instrument operators selecting additional vertical control whose elevations were to be determined by IBM adjustment chose as well defined points as possible. Six such elevations were furnished each Kelsh model, four near the outer edges and two near the physical centers, to insure that absolute orientation would be in the same plane.

Tree heights were determined by helicopter as an aid to the operator delineating contours.

Horizontal control was plentiful. A minimum of six stations appeared in each bridged strip of the 1:36,000 and 1:30,000 scale photography. Supplemental points established by stereoplanigraph to control the 1:16,000 scale photography was further refined by adjusting each strip by IBM methods.

Conclusions

Part I

In areas free of woods and in partially wooded areas (less than 50%) standard accuracy may be expected. In areas of dense woods, expressions may be weak with smoother contours as compared with open areas.

Using tree heights as guides, attempts were made to "dig in" with the floating mark utilizing the occasional openings in the trees to check the placement of the contour interval. These areas may be less than standard accuracy and cannot be verified except by extensive field edit.

Part II

The 1:16,000 scale photography as noted in a previous side heading was of generally poor quality. Approximately one-quarter of each exposure appeared to be out of focus and was apparent in the same quadrant on each photograph.

This inhibited the adjustment of the vertical bridging technique since the stereoscopy in these areas was "soft" the instrument elevations of selected images were hard to determine. Averages of many readings were used. When these instrument elevations were later adjusted in the IBM, the effect of the "softness" contributed to errors in the determined elevations.

In general, contours should be found to be of standard accuracy with isolated random areas in error of more than ½ contour interval.

Transmitted Data (Part I)

Field photographs (1:40,000):

59-W-5590 thru 59-W-5614
59-W-5561 thru 59-W-5588
59-W-5520 thru 59-W-5549
59-W-5490 thru 59-W-5518
59-W-5459 thru 59-W-5488

426 control station identification cards
4 Wye level books
6 Sketch books
3 IBM lists (showing instrument horizontal and vertical control, positions and elevations)
1 List bench mark positions by Kelsh Plotter Methods
5 Pages substitute station positions (Form 164)
1 Geographic Names report
1 Field Inspection report
1 Triangulation sketch (Phase 1 - 1959)
1 Triangulation sketch (Phase 2 - 1959)
1 Project diagram
Triangulation descriptions (1959 stations)
74 Pages adjusted horizontal control data (1959)
Descriptions and elevations vertical control data
Air photo index
1 Each cronar film positive (sheets 1 thru 8)
3 Each Ozalid prints (double weight) (sheets 1 thru 8)

Transmitted Data (Part II)

Field Photographs (1:30,000)

AG 100 2488 thru 2503
AG 100 2508 thru 2522
AG 100 2340 thru 2353

Transmitted Data (Part II) cont.

AG 100 2359 thru 2364
AG 100 2370 thru 2381
AG 100 2385 thru 2398
AG 100 2403 thru 2414
AG 100 2420 thru 2425

2 Each Cronar film positives (sheets 1 thru 11)
3 Each ozalid prints, double weight (sheets 1 thru 11)

Project Extension

On June 20, 1960, Mr. Waggoner telephoned requesting additional compilation of small areas in the vicinity of Elk Creek and Breakfast Creek, designated as sheets 5A* and 7A respectively ([redacted]) These sheets were compiled in like manner and forwarded August 19, 1960.

Respectfully Submitted:

A. K. Heywood

Approved:

Charles Theurer
Chief, Cartographic Branch

10/31/62

L. W. Swanson
Chief, Photogrammetry Division

* T-10958A, T-10963A

NAUTICAL CHARTS BRANCH

SURVEY NO. T-11771 thru 11781

Record of Application to Charts

DATE	CHART	CARTOGRAPHER	REMARKS
			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
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			Before After Verification and Review

M-2168-I

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.