

YELLOWSTONE RIVER COMPACT COMMISSION

408 Federal Building

Helena, Montana

December 20, 1955

His Excellency Milward L. Simpson
Governor of the State of Wyoming
Cheyenne, Wyoming

His Excellency J. Hugo Aronson
Governor of the State of Montana
Helena, Montana

His Excellency Norman Brunsdale
Governor of the State of North Dakota
Bismarck, North Dakota

Sirs:

Pursuant to Article III of the Yellowstone River Compact, the Commission created according to the terms of said Compact makes the following fourth annual report.

The Fourth Annual Meeting of the Yellowstone River Compact Commission was held at Billings, Montana on November 19, 1955. The duly constituted members were in attendance.

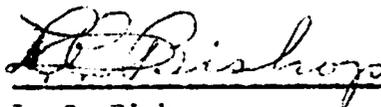
The administrative expenses of the Commission during the fiscal year ending June 30, 1955 were \$4,550, of which \$2,275 was borne by the federal government. The State of Montana bore \$775 and the State of Wyoming bore \$1,500. The expense borne by the respective States in the biennium ending June 30, 1955 and also since administration began has been equalized. A total budget of \$6,000 for the fiscal year ending June 30, 1956 was adopted.

Your Commissioners feel assured that water uses under the Compact were not exceeded by the upstream State or States during the report period ending September 30, 1955. No determinations of allocable use were considered necessary under the present conditions of water development. No questions on allocations of waters have come before the Commission.

The activities of the Commission have been directed to the collection of stream-flow data and the assembly of information on water-right filings and appropriations to actively administer the Compact when the need arises. Records of stream-flow at the designated points of measurement and storage in reservoirs are summarized in this report.

Pertinent data and records are available in the files of the Commission maintained in the office of the U. S. Geological Survey at Helena, Montana.

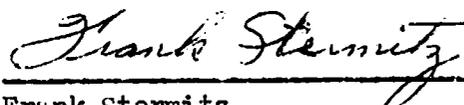
Respectfully submitted,



L. C. Bishop
Commissioner for Wyoming



Fred E. Buck
Commissioner for Montana



Frank Stermitz
Federal Representative

GENERAL REPORT

Cost:

The work of the Commission continues to be financed by cooperative arrangements between the State of Wyoming and Montana and the United States of America.

The expense of the Commission during the fiscal year ending June 30, 1955 is given:

	<u>Total Cost</u>	<u>Borne by United States</u>	<u>Borne by</u>	
			<u>Wyoming</u>	<u>Montana</u>
Gaging station operation	\$3000	\$1500	\$975	\$525
Improvement or installation of gaging stations	\$ 550	\$ 275	\$275	0
Collection and assembly of data and administration	<u>\$1000</u>	<u>\$ 500</u>	<u>\$250</u>	<u>\$250</u>
	\$4550	\$2275	\$1500	a/\$775

a/ Unequal expenditures to balance shares of prior fiscal year.

The budget for the current fiscal year ending June 30, 1956 is given:

	<u>Total Cost</u>	<u>Borne by United States</u>	<u>Borne by</u>	
			<u>Wyoming</u>	<u>Montana</u>
Gaging station operation	\$3500	\$1750	\$875	\$875
Improvement or installation of gaging stations	\$1500	\$ 750	\$375	\$375
Collection and assembly of data and administration	<u>\$1000</u>	<u>\$ 500</u>	<u>\$250</u>	<u>\$250</u>
	\$6000	\$3000	\$1500	\$1500

The above tabulation of incurred and contemplated cost do not include the salaries and necessary expenses of the State representatives which are borne by the respective states, nor the cost of collection of hydrologic data now being made available from other sources.

Gaging stations:

Records of stream-flow were collected at the designated points of measurements as described in the Compact or as near thereto as the Commissioners have deemed practical. To better understand the movements of waters in the Little Bighorn River Basin in the likely event of backwater conditions on the Little Bighorn River near Hardin, discharge records were collected on the Crow Agency Canal near the point of diversion. Such records used in conjunction with the records of the Little Bighorn River near Crow Agency might then be used to determine the flow of the Little Bighorn River at its mouth. Continued collection on this basis was approved for the next report period.

The unsatisfactory condition resulting from silt deposits immediately below the Manning Dam on the Bighorn River near Custer prompted the relocation of that gaging station about 4 miles downstream, in sec. 33, T. 5 N., R. 34 E. The new site is just below U. S. Highway 10 and about a mile above the confluence with the Yellowstone River. The concrete pipe well and shelter installation was essentially completed, but not yet operative at the close of the report period. Manual gage readings at U. S. Highway 10 were used during the construction period and at various other times in the year.

The records of discharge collected at the points of measurement approved by the Commission are given in Appendix B. Supplementary records of the Little Bighorn River near Crow Agency and the Crow Agency Canal at Crow Agency, Montana are also tabulated therein.

Diversions:

Because of the major expense involved in the collection of quantitative diversion records, the Commission did not deem it necessary to require that information in this report period. The Commissioners for Wyoming and Montana were in full agreement that allocable uses under the Compact did not approach the pro rata share in either state. Available information on water-right filings and general knowledge of developments completed since January 1, 1950 provided the basis for the Commissioner's opinion.

The Commissioners agreed to catalog and keep the Commission informed of water-right filings in their respective states. The federal representative was instructed to keep reasonably current data on allocable water use on federal projects.

Storage:

In reservoirs completed after January 1, 1950:

Boysen Reservoir on the Bighorn River is the principal reservoir in this category, records for which are tabulated in Appendix C. The remaining reservoirs completed since January 1, 1950 are, in the aggregate, relatively small, therefore details of their operations have not been collected.

In reservoirs existing on January 1, 1950:

Compact allocations are affected by storage in these reservoirs only in so far as utilized for new developments. The extent of that use is known to be minor or relatively negligible. As a matter of information the quantities in storage on month-ends in the larger reservoirs in this category, namely Bull Lake, Pilot Butte, Buffalo Bill and Tongue River Reservoirs are tabulated in Appendix D.

RULES AND REGULATIONS FOR ADMINISTRATION OF
THE YELLOWSTONE RIVER COMPACT

A compact, known as the Yellowstone River Compact between the States of Wyoming, Montana and North Dakota, having become effective on October 30, 1951 upon approval of the Congress of the United States, which apportions the waters of certain interstate tributaries of the Yellowstone River which are available after the appropriative rights existing in the states of Wyoming and Montana on January 1, 1950 are supplied, and after appropriative rights to the use of necessary supplemental water are also supplied as specified in the Compact, the following rules and regulations are adopted subject to the provisions for amendment, revision or abrogation as provided herein.

Article I. Collection of Water Records.

- A. It shall be the joint and equal responsibility of the members of the states of Wyoming and Montana to collect, cause to be collected or otherwise furnish records of tributary stream flow at the points of measurement specified in Article V (B) of the Compact, or as near thereto as is physically or economically feasible or justified.

1. Clarks Fork

The gaging station known as Clarks Fork at Edgar, Montana and which is located in SW $\frac{1}{4}$ sec. 24, T. 4 S., R. 24 E., shall temporarily be the point of measurement for the Clarks Fork, subject to whatever mutually agreeable corrections to the stream-flow records at this point as may be deemed practical to meet the terms of the Compact.

2. Bighorn River (exclusive of Little Bighorn River)

The gaging station known as the Bighorn River near Custer, Montana and located near the center of sec. 10, T. 4 N., R. 34 E., shall temporarily be the designated point of measurement on that stream. The flow of the Little Bighorn River as measured at the gaging station near Hardin, Montana and located in S $\frac{1}{2}$, SE $\frac{1}{4}$ sec. 10, T. 1 S., R. 34 E., shall be considered the point of measurement for that stream, except that if or when satisfactory records are not available, the records for the nearest upstream station with practical corrections for intervening inflow or diversion shall be used.

3. Tongue River

The gaging station known as the Tongue River at Miles City, Montana and located in SE $\frac{1}{4}$ sec. 23, T. 7 N., R. 47 E., shall temporarily be the point of measurement for that stream.

4. Powder River

The gaging station known as the Powder River near Locate, Montana and located in NE $\frac{1}{4}$ sec. 26, T. 8 N., R. 51 E., shall temporarily be the designated point of measurement for that stream.

- B. Records of total annual diversion in acre-feet above the points of measurement designated in the Compact for irrigation, municipal and industrial uses developed after January 1, 1950 shall be furnished by the members of the Commission for their respective states, at such time as the Commission deems necessary for interstate administration as provided by the terms of the Compact. Providing that if it be acceptable to the Commission, reasonable estimates thereof may be substituted.
- C. Annual records of the net change in storage in all reservoirs, not excluded under Article V (E) of the Compact, above the specified point of measurement specified in the Compact and completed after January 1, 1950, and the annual net change in reservoirs existing prior to January 1, 1950, which is used for irrigation, municipal and industrial purposes developed after January 1, 1950, shall be the primary responsibility of the member of the Commission in whose state such works are located; providing, such data is not furnished by federal agencies under the provisions of Article III (D) of the Compact, or, collected by the Commission.

Article II. Office and Officers.

- A. The office of the Commission shall be located, and be that of the United States Geological Survey in Helena, Montana.
- B. The Chairman of the Commission shall be the federal representative as provided in the Compact.
- C. The Secretary of the Commission shall be as provided for in Article III of these rules.
- D. The credentials of each member of the Commission shall be placed on file in the office of the Commission.

Article III. Secretary

- A. The Commission, subject to the approval of the Director of the United States Geological Survey to cooperative agreements for such purpose, shall employ the U. S. Geological Survey on a yearly basis to render such engineering and clerical aid as may reasonably be necessary for the administration of the Compact. Said agreement shall provide that the Geological Survey shall:
1. Maintain and operate gaging stations at or near the points of measurement specified in Article V (A) of the Compact.
 2. Assemble factual information on stream flow, diversion and reservoir storage for the preparation of an annual report to the Governors of the signatory states.
 3. Make such investigations and reports as may be requested by the Commission in aid of its administration of the Compact.
 4. Act as Secretary to the Commission.

Article IV. Budget.

- A. At the annual meeting of each even numbered year or prior thereto, the Commission shall adopt a budget for operation during the ensuing biennium beginning July first. Such budget shall set forth the total cost of construction, maintenance and operation of gaging stations, the cost of engineering and clerical aid, and other necessary expenses excepting the salaries and personal expenses of the Commissioners. On odd-numbered years revisions of the budget shall be considered.
- B. It shall be the obligation of the Commissioners of the States of Montana and Wyoming to endeavor to secure from the Legislature of their respective states sufficient funds with which to meet the obligations of this Compact, except insofar as provided by the federal government.

Article V. Meetings.

An annual meeting of the Commission shall be held on the third Tuesday of each November at some mutually agreeable point in the Yellowstone River Basin for consideration of the annual report for the water year ending the preceding September 30th, and for

MONTHLY SUMMARY OF DISCHARGE

Clarks Fork at Edgar, Montana

Location.--Lat $45^{\circ}28'$, long. $108^{\circ}51'$, in SW $\frac{1}{4}$ sec. 24, T. 4 S., R. 23 E., on right bank just downstream from highway bridge half a mile east of Edgar and 6 miles upstream from Rock Creek.

Records available.--July 1921 to September 1955.

Gage.--Water-stage recorder. Prior to Sept. 1, 1953, wire-weight gage read twice daily. Prior to Sept. 18, 1940, chain gage at same site and datum.

Average discharge.--22 years (1930-31, 1934-55), 1,017 cfs.

Extremes.--Maximum discharge during year, 5,300 cfs June 25 (gage height, 6.23 ft); minimum daily, 162 cfs Sept. 7; minimum gage height, 1.09 ft Mar. 24.

1921-55: Maximum discharge observed, 10,900 cfs June 2, 1936 (gage height, 8.62 ft); minimum observed, 41 cfs July 25, 1931; minimum gage height, that of Mar. 24, 1955.

<u>Month</u>	<u>Second-foot days</u>	<u>Maximum</u>	<u>Minimum</u>	<u>Mean</u>	<u>Runoff in Acre-feet</u>
October 1954	12,161	471	342	392	24,120
November	12,356	448	370	412	24,510
December	13,121	510	325	423	26,030
January 1955	12,935	435	400	417	25,660
February	11,410	450	350	408	22,630
March	12,519	600	200	404	24,830
April	13,923	826	260	464	27,620
May	34,299	2,720	309	1,106	68,030
June	99,660	4,730	1,590	3,322	197,700
July	45,970	2,180	772	1,483	91,180
August	11,822	704	190	381	23,450
September 1955	<u>7,086</u>	<u>399</u>	<u>162</u>	<u>236</u>	<u>14,050</u>
Water year 1954-55	287,262	4,730	162	787	569,800

MONTHLY SUMMARY OF DISCHARGE

Little Bighorn River near Crow Agency, Montana

Location.--Lat $45^{\circ}34'$, long. $107^{\circ}27'$, in $E\frac{1}{2}SE\frac{1}{4}$ sec. 13, T. 3 S., R. 34 E., on right bank at Chicago, Burlington, and Quincy Railroad bridge, 2 miles south of Crow Agency and 14 miles upstream from mouth.

Drainage area.--1,190 sq mi, approximately.

Records available.--April 1912 to September 1924, August 1928 to December 1932. April 1938 to September 1955 (few winter records in earlier years). March 1905 to June 1906 at site at Crow Agency, 2 miles downstream, records not equivalent because Crow Agency ditch diverts water between the two sites. October 1915 to September 1940, published as Little Horn near Crow Agency.

Gage.--Water-stage recorder. April 11, 1912 to Sept. 30, 1918, staff or chain gages; Oct. 1, 1918, to Sept. 30, 1924, Aug. 26, 1928, to Sept. 30, 1930, water-stage recorder; Oct. 1, 1931, to Dec. 5, 1932, Apr. 1, 1938 to May 6, 1947, wire-weight or chain gages; all at same site and datum.

Average discharge.--19 years (1928-29, 1931-32, 1938-55), 264 cfs.

Extremes.--Maximum discharge during year, 1,360 cfs Apr. 15 (gage height, 6.98 ft); minimum daily 40 cfs Aug. 7.
1912-24, 1928-32, 1938-55: Maximum discharge observed, about 8,200 cfs July 23, 1923 (gage height, 14.0 ft); no flow July 28 to Aug. 6, 1921.

<u>Month</u>	<u>Second-foot days</u>	<u>Maximum</u>	<u>Minimum</u>	<u>Mean</u>	<u>Runoff in Acre-feet</u>
October 1954	2,942	117	73	94.9	5,840
November	3,364	117	90	112	6,670
December	3,055	115	60	98.5	6,060
January 1955	2,580	100	70	83.2	5,120
February	2,375	110	70	84.8	4,710
March	3,570	200	80	115	7,080
April	18,488	1,200	130	616	36,670
May	14,617	820	271	472	28,990
June	16,560	740	445	552	32,850
July	6,674	372	143	215	13,240
August	2,897	138	40	93.5	5,750
September 1955	<u>2,249</u>	<u>114</u>	<u>58</u>	<u>75.0</u>	<u>4,460</u>
Water year 1954-55	79,371	1,200	40	217	157,400

MONTHLY SUMMARY OF DISCHARGE

Agency Canal at Crow Agency, Montana

Location.--Lat 45°35'55", long. 107°27'15", near center of sec. 1, T. 3 S., R. 34 E., on downstream right abutment of bridge at intersection of U. S. Highway No. 87 and the main street of Crow Agency, a third of a mile downstream from headgate.

Records available.--Fragmentary records for 1953-55.

Gage.--Staff gage read twice daily during canal operation. Some recorder record during 1953.

Extremes.--Maximum daily discharge during year, 117 cfs July 29; no flow Oct. 19 to May 18.

Remarks.--Canal operated Oct. 1-18 and May 19 to Sept. 30 for irrigation of about 3500 acres of land. Records poor due to operation of check gates downstream from gage.

<u>Month</u>	<u>Second-foot days</u>	<u>Maximum</u>	<u>Minimum</u>	<u>Mean</u>	<u>Runoff in Acre-feet</u>
October 1954	572	36	-	18.5	1,130
May 1955	323	37	-	10.4	641
June	955	64	25	31.8	1,890
July	2,852	117	66	92.0	5,660
August	2,533	115	52	81.7	5,020
September	<u>1,725</u>	<u>69</u>	<u>53</u>	<u>57.5</u>	<u>3,420</u>
Water year 1954-55	8,960	117	0	24.5	17,760

MONTHLY SUMMARY OF DISCHARGE

Little Bighorn River near Hardin, Montana

Location.--Lat $45^{\circ}44'20''$, long. $107^{\circ}33'20''$, on line between $S\frac{1}{2}$ $SE\frac{1}{2}$ sec. 18 and $NE\frac{1}{4}$ sec. 19, T. 1 S., R. 34 E., on right bank 425 ft upstream from county road bridge, about a quarter of a mile upstream from mouth and 2.4 miles east of Hardin.

Records available.--June 1953 to September 1955.

Gage.--Water-stage recorder. June 4, 1953, to October 6, 1953, wire-weight gage on bridge 425 ft downstream at different datum.

Extremes.--Maximum discharge during year, 1,320 cfs April 20 (gage height, 6.21 ft); minimum daily, 18 cfs August 8.
1953-55: Maximum discharge, 1,320 cfs June 17, 1953, April 20, 1955; maximum gage height, 6.81 ft March 3, 1954 (backwater from ice); minimum daily discharge, that of August 8, 1955.

<u>Month</u>	<u>Second- Foot days</u>	<u>Maximum</u>	<u>Minimum</u>	<u>Mean</u>	<u>Runoff in Acre-feet</u>
October 1954	2,827	111	71	91.2	5,610
November	3,374	117	75	112	6,690
December	2,855	110	55	92.1	5,660
January 1955	2,575	100	65	83.1	5,110
February	2,420	100	70	86.4	4,800
March	3,450	180	70	111	6,840
April	17,814	1,250	110	594	35,330
May	17,438	950	328	563	34,590
June	17,745	735	470	592	35,200
July	4,854	390	79	157	9,630
August	1,945	103	18	62.7	3,860
September 1955	1,839	92	34	61.3	3,650
Water year 1954-55	79,136	1,250	18	217	156,970

MONTHLY SUMMARY OF DISCHARGE

Bighorn River near Custer, Montana

Location.--Lat $46^{\circ}07'$, long. $107^{\circ}28'$, near center of sec. 10, T. 4 N., R. 34 E., on left bank just downstream from Manning diversion dam, 3 miles upstream from Tullock Creek, 4 miles southeast of Custer and $4\frac{1}{2}$ miles upstream from mouth.

Records available.--May 1945 to September 1955.

Gage.--Water-stage recorder. Prior to December 7, 1945, wire-weight gage at same datum. Auxiliary wire-weight gage on highway bridge 4 miles downstream at different datum.

Average discharge.--9 years, 3,838 cfs.

Extremes.--Maximum discharge during year, 8,900 cfs June 19 (gage height, 5.18 ft); maximum gage height, 7.67 ft March 31 (backwater from ice); minimum daily, 852 cfs July 22; minimum gage height, 1.27 ft March 4 (backwater from ice).

1945-55: Maximum discharge, 26,200 cfs June 24, 1947 (gage height, 8.79 ft), from rating curve extended above 12,500 cfs by logarithmic plotting; maximum gage height recorded, 10.65 ft March 20, 1947 (ice jam); minimum discharge, 756 cfs December 13, 1949 (gage height, 0.89 ft).

Remarks.--Discharge records based on observed readings of auxiliary gage October 1 to November 26, and August 26 to September 30 when recording gage record was not available.

<u>Month</u>	<u>Second-foot days</u>	<u>Maximum</u>	<u>Minimum</u>	<u>Mean</u>	<u>Runoff in Acre-feet</u>
October 1954	82,140	3,100	2,220	2,650	162,900
November	84,660	3,160	2,520	2,822	167,900
December	88,910	3,210	1,900	2,868	176,400
January 1955	72,850	2,800	2,000	2,350	144,500
February	58,700	2,500	1,800	2,096	116,400
March	89,900	5,800	2,000	2,900	178,300
April	156,800	7,890	3,630	5,227	311,000
May	139,520	7,150	2,800	4,501	276,700
June	166,690	8,350	3,670	5,556	330,600
July	62,923	4,480	852	2,030	124,800
August	45,070	2,160	1,080	1,454	89,400
September 1955	49,760	2,920	1,210	1,659	98,700
Water year 1954-55	1,097,923	8,350	852	3,008	2,177,600

MONTHLY SUMMARY OF DISCHARGE

Tongue River at Miles City, Montana

Location.--Lat $46^{\circ}21'$, long. $105^{\circ}48'$, in SE $\frac{1}{4}$ sec. 23, T. 7 N., R. 47 E., on right bank 4 miles south of Miles City and 3 miles upstream from mouth.

Records available.--April 1938 to April 1942, April 1946 to September 1955. Published as "near Miles City" April 1938 to April 1942. Not equivalent to records published as "near Miles City" May 1929 to September 1932.

Gage.--Water-stage recorder. April 1938 to April 1942, wire-weight gage at site 3 miles upstream at different datum.

Average discharge.--11 years (1939, 1941, 1946-55), 393 cfs.

Extremes.--Maximum discharge during year, 3,310 cfs May 4 (gage height, 5.53 ft); minimum daily, 5.0 cfs Sept. 27, 28. 1938-42, 1946-55: maximum discharge, 12,000 cfs Mar. 6, 1949 (gage height, 10.6 ft), (float measurements), maximum gage height, 11.80 ft Mar. 6, 1949 (ice jam); no flow July 9-19, Aug. 13, 14, Sept. 28, 1940.

<u>Month</u>	<u>Second-foot days</u>	<u>Maximum</u>	<u>Minimum</u>	<u>Mean</u>	<u>Runoff in Acre-feet</u>
October 1954	2,441	204	38	78.7	4,840
November	6,378	213	200	213	12,650
December	6,455	235	190	208	12,800
January 1955	4,730	205	95	153	9,380
February	2,942	115	90	105	5,840
March	8,039	1,400	115	259	15,950
April	13,738	351	150	458	27,250
May	26,335	2,400	135	850	52,230
June	38,119	2,070	273	1,271	75,610
July	13,588	1,840	80	438	26,950
August	2,151	94	29	69.4	4,270
September 1955	<u>365.4</u>	<u>31</u>	<u>5.0</u>	<u>12.2</u>	<u>725</u>
Water year 1954-55	125,281.4	2,400	5.0	343	248,500

MONTHLY SUMMARY OF DISCHARGE

Powder River near Locate, Montana

Location.--Lat $46^{\circ}26'$, long. $105^{\circ}18'$, in NE $\frac{1}{4}$ sec. 26, T. 8 N., R. 51 E., on right bank 50 ft downstream from bridge on U. S. Highway 12, 3 miles upstream from Locate Creek, 5 miles west of former site of Locate, and 25 miles east of Miles City.

Records available.--March 1930 to September 1955.

Gage.--Water-stage recorder. Prior to July 11, 1947, wire-weight gage at bridge 50 ft upstream at same datum, which served as auxiliary gage thereafter.

Average discharge.--17 years, 657 cfs.

Extremes.--Maximum discharge during year, 5,000 cfs Apr. 2, (gage height, 5.64 ft, from graph based on gage readings); minimum daily, 4.7 cfs Sept. 21, 24, 25, 27.

1938-55: maximum discharge observed, 31,000 cfs Feb. 19, 1943 (gage height, 11.23 ft), from rating curve extended above 14,000 cfs; no flow Jan. 16 to Feb. 12, Feb. 22-24, 1950.

Remarks.--Once-daily readings of wire-weight gage were graphed for numerous periods when recorder inlets were inoperative due to silt deposits.

<u>Month</u>	<u>Second-foot days</u>	<u>Maximum</u>	<u>Minimum</u>	<u>Mean</u>	<u>Runoff in Acre-feet</u>
October 1954	292.6	16	6.4	9.44	580
November	1,847	99	16	61.6	3,660
December	2,660	110	55	65.8	5,280
January 1955	1,950	65	25	62.9	3,870
February	2,145	90	50	76.6	4,250
March	18,115	2,000	75	584	35,930
April	45,895	5,210	442	1,530	91,030
May	27,535	2,020	369	388	54,610
June	33,371	3,740	376	1,112	66,190
July	15,253	1,680	109	492	30,250
August	6,560	1,070	19	212	13,010
September 1955	<u>249.4</u>	<u>16</u>	<u>4.7</u>	<u>6.31</u>	<u>495</u>
Water year 1954-55	155,873.0	5,210	4.7	427	309,200

RESERVOIRS COMPLETED AFTER JANUARY 1, 1950

BOYSEN RESERVOIR

Water-stage recorder at dam on Bighorn River, about 21 miles south of Thermopolis, Wyoming. Reservoir formed by earth-fill dam, construction of which began in 1947. Storage began on October 11, 1951. Dead storage, 62,000 acre-feet at elevation 4657.0. Usable contents, 758,000 acre-feet at elevation 4725.0 (top of gates). Crest of dam at elevation 4758.

Records given herein represent usable contents. Water is used for irrigation and power development. Allocation for flood control provided. Data collected by U. S. Bureau of Reclamation and furnished by Corps of Engineer, U. S. Army.

Extremes.--Maximum usable contents during year, 689,200 acre-feet October 1, 1954; minimum, 401,100 acre-feet May 20, 1953-55; Maximum usable contents, 761,700 acre-feet July 20-23, 1954; minimum, that of May 20, 1955.

<u>Month</u>	<u>Water-Surface elevation in feet</u>	<u>*Contents in Acre-feet</u>	<u>Change in contents during month in acre-feet</u>
September 30, 1954	4721.43	689,700	
October 31	4721.15	684,600	- 5,100
November 30	4718.85	643,200	-41,400
December 31	4715.60	587,400	-55,800
January 31, 1955	4712.54	537,600	-49,800
February 28	4711.00	513,400	-24,200
March 31	4707.91	466,700	-46,700
April 30	4704.25	411,100	-52,600
May 31	4703.94	409,800	- 4,300
June 30	4709.30	487,500	77,700
July 31	4709.30	487,500	0
August 31	4706.55	446,800	-40,700
September 30, 1955	4704.14	412,600	-34,200
Water year 1954-55			-277,100

* Does not include dead storage of 62,000 acre-feet.

RESERVOIRS IN EXISTENCE ON JANUARY 1, 1950

The extent, if any, of the use of reservoirs in this category which may be subject to Compact allocations was not determined. As a matter of hydrologic interest, the month-end contents in acre-feet of four reservoirs are given. The first three reservoirs are in the Bighorn River Basin in Wyoming and data on contents was furnished by the U. S. Bureau of Reclamation. Tongue River Reservoir in Montana is operated under the supervision of the Montana State Water Conservation Board which agency furnished operating data.

Contents in Acre-feet

	<u>Bull Lake</u>	<u>Pilot Butte Reservoir</u>	<u>Buffalo Bill Reservoir</u>	<u>Tongue River a/ Reservoir</u>
September 30, 1954	94,000	5,800	289,200	15,400
October 31	85,900	2,700	242,100	11,500
November 30	83,800	5,000	230,800	10,100
December 31	78,000	7,400	220,300	9,100
January 31, 1955	66,300	9,200	205,300	7,000
February 28	63,100	14,700	199,200	8,600
March 31	62,200	26,400	193,300	10,800
April 30	61,100	29,400	178,800	28,200
May 31	71,800	23,800	168,400	36,000
June 30	117,500	27,200	331,000	41,200
July 31	124,700	19,000	343,200	32,000
August 31	110,000	10,000	273,200	20,900
September 30, 1955	93,300	5,000	221,900	13,400

a/ Contents based upon sedimentation surveys of October, 1948.