# YELLOWSTONE RIVER

# COMPACT COMMISSION

## THIRTY-FIFTH ANNUAL REPORT

## 1986

YELLOWSTONE RIVER COMPACT COMMISSION

821 East Interstate Avenue
Bismarck, North Dakota

Honorable Mike Sullivan
Governor of the State of Wyoming
Cheyenne, Wyoming

Honorable Ted Schwinden
Governor of the State of Montana
Helena, Montana

Honorable George Sinner
Governor of the State of North Dakota
Bismarck, North Dakota

Dear Sirs:

Pursuant to Article III of the Yellowstone River Compact (YRC), the Commission submits the following thirty-fifth annual report of activities for the period ending September 30, 1986.

The Commission held its annual meeting by conference call December 16, 1986, beginning at 9:00 a.m. Mr. George L. Christopulos, Wyoming State Engineer; and Mr. Gary Fritz, Administrator, Water Resources Division, Montana Department of Natural Resources and Conservation; the designated representatives of their respective states; and Mr. L. Grady Moore, the designated Federal representative and chairman were present.

Others present included:

Joe Moreland, U.S. Geological Survey, Water Resources Division, Helena, Mont.;
Richard Moy, Montana Department of Natural Resources and Conservation, Helena, Mont.;
Chuck Dalby, Montana Department of Natural Resources and Conservation, Helena, Mont.;
Jeff Fasset, Wyoming State Engineer's Office, Cheyenne, Wyo.;
Craig Cooper, Wyoming State Engineer's Office, Riverton, Wyo.;
John Shields, Wyoming State Engineer's Office, Cheyenne, Wyo.; and
Francis Carr, Wyoming Board of Control.

1. ANNUAL REPORT BY USGS:

Mr. Moreland reported that streamflow in the interstate tributaries was about normal in 1986 but considerably greater than in 1985. The annual flow of the Tongue River was 96 percent of the long-term average; the annual flow of the Powder River was 81 percent, the annual flow of the Bighorn River was 112 percent, and the annual flow of the Clark Fork of the Yellowstone River was 95 percent.

Mr. Moreland stated that the first paragraph under the Rules and Regulations is an incomplete sentence and suggested appropriate corrections. Mr. Fritz suggested that Montana representative would review the paragraph and recommend other changes. Mr. Fritz stated that suggested changes would be submitted to Mr. Christopulos for approval before being sent to Mr. Moore.

Mr. Moreland reported that the annual operating budget for U.S. Geological Survey (USGS) activities associated with the Yellowstone River Compact for 1988 would remain at the 1987 level of $33,200 per year. The program probably would increase 3 percent to 4 percent in 1989 because of inflation. Mr. Moreland also indicated that a replacement observer will be needed to measure the Tongue River Reservoir elevation. He reported that the streamflow gage on the Clark Fork has been relocated from Silesia to Edgar, Mont.

2. WATER-QUALITY TREND ANALYSES ON THE POWDER RIVER:

Mr. Moreland noted that the Montana District Office of the USGS and the Montana Department of Natural Resources and Conservation had entered into a cooperative agreement in the late summer of 1986 to perform a water-quality trend analysis of the Powder River. He summarized the work of Dr. Larry Cary of the USGS. Dr. Cary analyzed selected constituents for possible trends at gaging stations on the Powder River located near Sussex, Wyo. and Locate, Mont.

Data from the Locate, Mont. gage were analyzed for two periods, 1951-62 and 1974-85, for the following constituents: specific conductance, pH, bicarbonate, hardness, noncarbonate hardness, sodium, sulfate, dissolved solids, and sodium-adsorption ratio. Statistically significant trends were found for pH, sodium, and sodium-adsorption ratio for 1951-62. The above constituents plus calcium, magnesium, potassium, and chloride were analyzed for trends during the later period. The results showed statistically significant trends for specific conductance, sodium, chloride, and sodium-adsorption ratio.

Trend analyses also were performed on specific conductance, sodium, chloride, sulfate, dissolved-solids, and sodium-adsorption ratio data from the Sussex, Wyo. gage for the periods 1967-68 and 1976-85. Statistically significant trends are indicated by the preliminary results for sodium, chloride, sulfate, and sodium-adsorption ratio. Discharge at Locate, Mont. showed a significant decreasing trend for the period 1974-85 of 13 cubic feet per second ($ft^3/s$) per year.

Mr. Christopulos asked if Wyoming representatives had been consulted about the study. He indicated that the water-quality issue on the Powder River is a sensitive area between the states of Montana and Wyoming. Mr. Moore indicated that the study was discussed at previous annual meetings of the Yellowstone River Compact Commission, but that the Powder River trend-analysis study was originally designed to include all four interstate tributaries. Because the U.S. Geological Survey was unable to obtain Federal funding and because of the state of Montana's interest in examining Powder River water quality, the study was limited to the Powder River and funded through the U.S. Geological Survey's Federal-State cooperative program. Mr. Fritz indicated that information has been exchanged between himself and Mr. Purcell of the Wyoming Water Development Commission regarding the analysis. Mr. Moreland offered his apology to Mr. Christopulos for not informing him of the status of the study.

3. INTERSTATE DITCHES:

Chairman Moore thanked Mr. Shields for his excellent report on the Commission's past activities toward adjudicating the interstate ditches. Mr. Fritz also thought the report was a good summary of the Commission's activities regarding the interstate ditch issue but requested that a number of other items be added to the letter. Mr. Shields agreed to incorporate these omissions into the report. Mr. Moore suggested, and the two commissioners agreed, that a fully documented report on the Commission's efforts to provide and adjudicate water rights for the interstate ditches should be included in a future annual report to provide an official record of the Commission's actions in this matter.

The Commission discussed the status of the Sirrine, Doctor, and Interstate ditches where the point of diversion is in Wyoming and the users are in Montana and Wyoming. Mr. Cooper indicated that he and Mr. Bill Hergett, the agent for the Doctor and Interstate ditchs, have agreed on Mr. Hergett's water-right claims on these two ditches and that the maps delineating the irrigated acres are now being reviewed by Mr. Christopulos, as are the map and claim for the Sirrine Ditch. Mr. Cooper and Mr. Dalby will meet with Mr. Hergett on January 8 and 9, 1987, to finalize the maps. Mr. Christopulos felt that the Wyoming Board of Control will be able to review and incorporate these water rights into the Board's records in early May. The Commission could meet in late

May or early June to adjudicate these water rights as well as to discuss the proposals for administrative procedures developed by the states of Montana and Wyoming for physically apportioning the flows of the interstate tributaries as provided for in Article V of the Compact.

Mr. Christopulos stated that there apparently are problems with the water rights on the Britton ditch. The water is diverted in Montana and used in Wyoming. Mr. Dalby and Mr. Christopulos will review the existing water-rights and the claim on this ditch and will coordinate on their findings by the end of March. The Commission agreed that it would be appropriate to adjudicate the water rights on this interstate ditch concurrently with the other three but recognized that it may be difficult because of the perceived problems with the Britton ditch. Mr. Christopulos requested, and Mr. Fritz concurred, that Mr. Shields and Mr. Dalby double check whether any other interstate ditches need to be considered by the Commission.

4. CLARK FORK STREAM FORECASTING:

Mr. Moore thanked Mr. Shields for sending him a copy of the report prepared by the Soil Conservation Service in Portland, Oreg. Mr. Fritz and Mr. Moreland had not received the report and were unable to offer comments. Mr. Fritz requested that two original copies be sent directly to Montana. Mr. Moreland requested one original copy.

5. AUTHORITY OF THE FEDERAL CHAIRMAN:

Mr. Fritz requested that Chairman Moore respond to his January 20, 1986, letter and earlier brief regarding the authority of the Chairman of the Yellowstone River Compact Commission to cast a deciding vote when Montana and Wyoming are unable to agree upon matters critical to administering the Compact. Mr. Moore stated that the U.S. Geological Survey was uncomfortable breaking a tie when the two states are in disagreement regarding the interpretation of the Compact. Mr. Fritz reviewed Article III.F of the Compact and indicated that he feels that the Chairman is required to break a tie. Mr. Fritz further stated that Mr. Moore's response is now different than it was 6 months earlier and different from the legal position developed by Mr. Aldrich, U.S. Department of the Interior, Field Solicitor, Billings, Mont. Mr. Fritz stated that this is a very important decision and that it should be based upon sound legal principles and appropriate case law. He did not understand how Mr. Phil Cohen, Chief Hydrologist, Water Resources Division, U.S. Geological Survey, in Reston, Va., could make such a decision based upon political reasons and without knowledge of the history of the Compact or the issue before the Commission. Mr. Christopulos stated that he had not seen the Montana letter of January 20, 1986, and therefore was unable to respond to its contents but emphasized that he felt the USGS should have the authority

to break a tie if the issue involves the administration but not the interpretation of the Compact. Mr. Fritz stated that the Commission cannot administer the Compact until it agrees on the interpretation of the Compact; Mr. Fritz gave examples of areas of disagreement. He further indicated that the Commission was no better prepared to administer the Compact today than the original signators were 36 years ago. The basic disagreements on the interpretation of the Compact are still present. Mr. Fritz emphasized that the state of Montana is at a disadvantage because it is unable to determine if the state of Wyoming is abiding by the Compact in water-short years. He further stated that the state of Montana has spent an enormous amount of time trying to make the Compact work but feels they have been frustrated by, in his view, the state of Wyoming's lack of cooperation. Mr. Christopulos agreed that the two states must work together and feels that progress has been made. He indicated that Dr. Lou Allen spent the better part of six months reviewing the state of Montana's proposed methodology and that he has completed an extensive analysis of it. Dr. Allen has also developed an alternative proposal for Compact administration. Mr. Christopulos indicated, however, that he has not had time to review Dr. Allen's report. He further questioned whether the state of Montana has actually been shortchanged in the past. He could only remember once when pre-1950 water rights may not have been satisfied in Montana. Mr. Moore agreed to send a copy of the January 20, 1986, letter to Mr. Christopulos. Mr. Fritz indicated that he plans to talk with the Montana Attorney General and the Department of Natural Resources and Conservation attorney before taking further action. Chairman Moore stated that the states of Montana and Wyoming would have to take whatever action they felt necessary to resolve this issue.

The conference call meeting was adjourned at 11:00 a.m. No date or time were set for the next meeting.

Respectfully submitted,

George L. Christopulos
Commissioner for Wyoming

Gary Fritz
Commissioner for Montana

L. Grady Moore
Federal Representative

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ILLUSTRATIONS

# GENERAL REPORT

## Cost of operation and budget

The work funded by the Commission, which to date has been primarily concerned with the collection of required hydrologic data, has been financed through cooperative arrangements whereby Montana and Wyoming each bear one-fourth of the cost and the remaining one-half is borne by the United States. The salaries and necessary expenses of the State and Federal representatives, and hydrologic data made available by other agencies, are not evaluated or considered as expenses of the Commission.

The expense of the Commission during fiscal year 1986 was $32,000, in accordance with the budget adopted for the year.

The budgets for fiscal years 1987 and 1988 were tentatively adopted subject to the availability of appropriations.

The budgets for the three fiscal years are summarized as follows:

| | |
|---|---|
| October 1, 1985, to September 30, 1986 (fiscal year 1986): | |
| Continuation of existing stream-gaging programs | $32,000 |
| October 1, 1986, to September 30, 1987 (fiscal year 1987): | |
| Continuation of existing stream-gaging programs | $33,200 |
| October 1, 1987, to September 30, 1988 (fiscal year 1988): | |
| Estimate of continuation of existing stream-gaging programs | $33,200 |

## Stream-gaging-station operation

Gaging stations at the measuring sites specified in the Compact were continued in operation and satisfactory discharge records collected at each. The streamflow station on the Clarks Fork Yellowstone River near Silesia, Montana was threatened by bank erosion during the 1986 water year. After approval by the Commission, the station was relocated December 4, 1986 5.8 miles upstream to the previous gaging site at Edgar, Montana. Diversions to the Whitehorse Canal between the two sites will be estimated to allow adjustment of the record. Locations of gaging and reservoir stations are shown on a map of the Yellowstone River Basin at the end of the report.

During the water year ending September 30, 1986, annual streamflow was average in all four tributaries of the Yellowstone River as given in the following table:

| Measurement point | Percent of average |
|---|---|
| Clarks Fork Yellowstone River near Silesia, Mont. | 95 |
| Bighorn River above Tullock Creek, near Bighorn, minus Little Bighorn River near Hardin, Mont. Adjusted for change in contents in Bighorn Lake | 112 |
| Tongue River at Miles City, Mont. | 96 |
| Powder River near Locate, Mont. | 81 |

Details of streamflow for the 1986 water year and bar graphs showing comparisons with average flows during selected base periods and with the preceding year are given in the section "Monthly summary of discharge for Compact stream-gaging stations."

## Diversions

No incidents during the year required administration of the water in accordance with the provisions of the Compact. At the present level of water-resources development, the Commission believes that a program of intensive water-use regulations is not necessary.

## Storage in reservoirs

### Reservoirs completed after January 1, 1950

Bighorn Lake, a U.S. Bureau of Reclamation project on the Bighorn River, and the largest storage project in the basin, contained 820,200 acre-feet at the beginning of the year and 1,025,000 acre-feet at the close. It fluctuated from a minimum of 669,800 acre-feet on April 25, 1986, to a maximum of 1,064,000 acre-feet on July 22, 1986. Boysen Reservoir, located on the Wind River and operated by the U.S. Bureau of Reclamation, began the year with 540,200 acre-feet in storage and ended with 671,900 acre-feet. Details regarding these reservoirs are given in the section "Monthly summary of contents for Compact reservoirs completed after January 1, 1950." The Commission is cognizant of other reservoirs in this general group and considers their aggregate effect to be insufficient to warrant the collection of storage data at this time.

## Reservoirs existing on January 1, 1950

As a matter of record and general information, month-end storage data are given later in the report for reservoirs in existence upstream from the points of measurement on January 1, 1950. These data are pertinent to allocation under Article V, Section C, Item 3 of the Compact.

## 06208800 Clarks Fork Yellowstone River near Silesia, Mont.

LOCATION.--Lat 45°30'48", long 108°49'42", in NW1/4 SE1/4 sec. 1, T. 4 S., R. 23 E., Carbon County, Hydrologic Unit 10070006, on left bank 0.5 mi downstream from Whitehorse Canal intake, 1 mi upstream from Rock Creek, 3 mi south of Silesia, and at mile 16.3.

DRAINAGE AREA.--2,093 $mi^2$.

PERIOD OF RECORD.--October 1969 to current year. Records for July 1921 to September 1969 (published as Clarks Fork Yellowstone River at Edgar) at site 5.8 mi upstream not equivalent owing to diversion in Whitehorse Canal during irrigation season. Records since January 1950 available in annual reports of Yellowstone River Compact Commission.

GAGE.--Water-stage recorder. Datum of gage is 3,405.79 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers).

REMARKS.--Estimated daily discharges: Nov. 9 to Jan. 27, Feb. 7-25, May 29 to June 25. Records good except those for Nov. 9 to Jan. 27, Feb. 7-25, which are poor, and those for May 29 to June 25, which are fair. Diversion for irrigation of about 45,900 acres, of which 2,180 acres are downstream from station. In addition, about 56,200 acres of land upstream from station are irrigated by diversions from the adjoining Rock Creek basin.

AVERAGE DISCHARGE.--17 years, 1,142 $ft^3/s$, 827,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,500 $ft^3/s$ June 10, 1981, gage height, 8.36 ft; minimum, 56 $ft^3/s$ Apr. 25, 1981, gage height, 0.53 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 5,300 $ft^3/s$ and maximums(*):

| Date | Time | Discharge $ft^3/s$ | Gage height |
|---|---|---|---|
| June 4 | unknown | *8,780 | *7.20 |
| June 16 | unknown | unknown | unknown |

Minimum daily discharge, 210 $ft^3/s$ Dec. 1.

| Month | Second-foot days | Mean | Maximum | Minimum | Runoff, in acre-feet |
|---|---|---|---|---|---|
| October 1985 | 19,614 | 633 | 708 | 565 | 38,900 |
| November | 12,492 | 416 | 587 | 240 | 24,780 |
| December | 12,310 | 397 | 540 | 210 | 24,420 |
| January 1986 | 13,865 | 447 | 540 | 310 | 27,500 |
| February | 12,677 | 453 | 800 | 250 | 25,140 |
| March | 14,008 | 452 | 639 | 380 | 27,780 |
| April | 21,305 | 710 | 1,130 | 494 | 42,260 |
| May | 45,617 | 1,472 | 5,800 | 587 | 90,480 |
| June | 158,790 | 5,293 | 8,400 | 3,000 | 315,000 |
| July | 48,379 | 1,561 | 2,850 | 919 | 95,960 |
| August | 17,317 | 559 | 984 | 301 | 34,350 |
| September 1986 | 22,377 | 746 | 1,000 | 513 | 44,380 |
| 1986 water year | 398,751 | 1,092 | 8,400 | 210 | 790,900 |

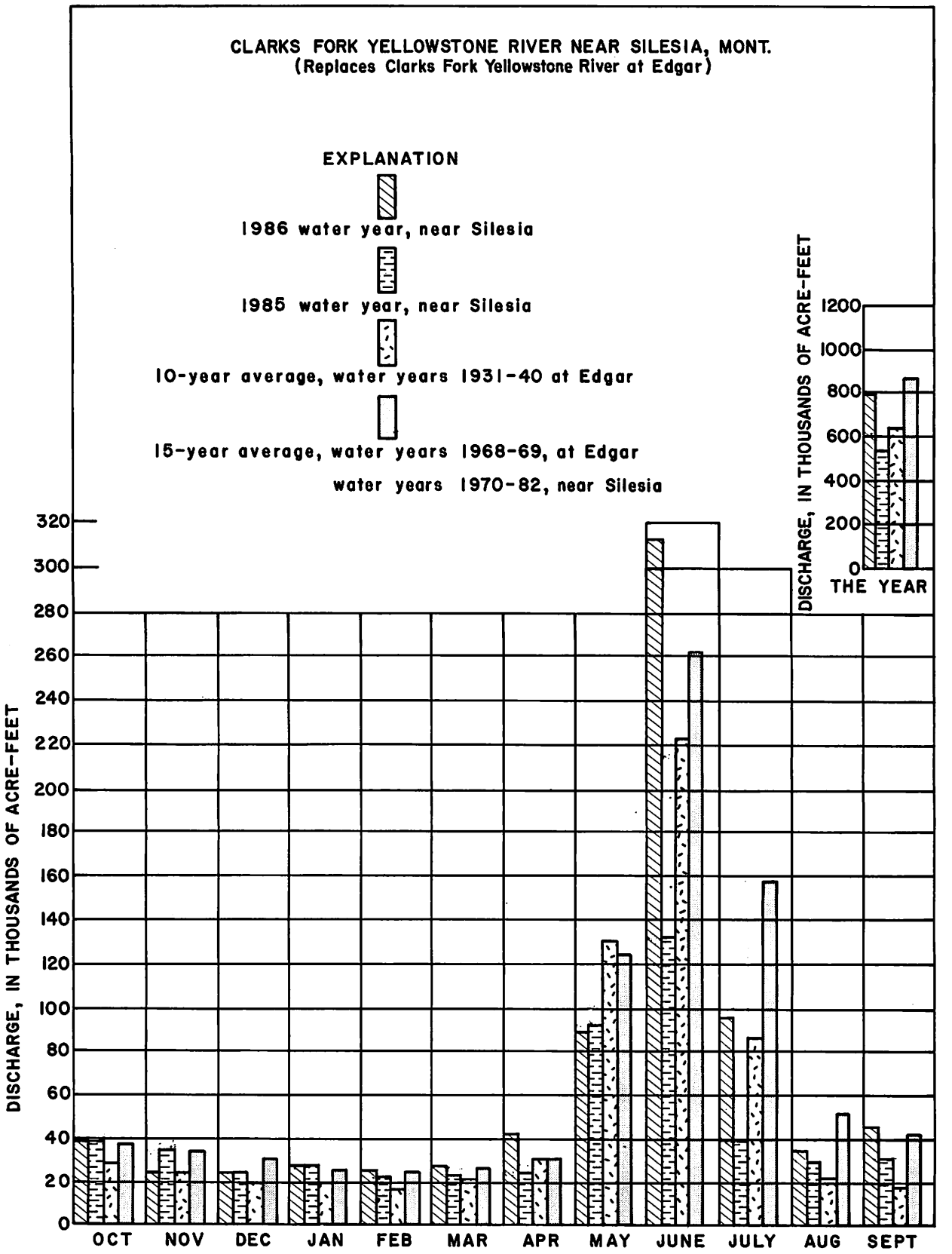


Figure 1.--Comparison of discharge for 1986 water year with 1985 water year of Clarks Fork Yellowstone River near Silesia and with average discharge for water years 1931-40 at Edgar and for water years 1968-69 at Edgar and 1970-82 near Silesia.

## 06294000 Little Bighorn River near Hardin, Mont.

LOCATION.--Lat 45°44'09", long 107°33'24", in SE1/4 NE1/4 NE1/4 sec. 19, T. 1 S., R. 34 E., Big Horn County, Hydrologic Unit 10080016, on left bank 50 ft downstream from bridge on Sarpy Road, 0.2 mi upstream from terminal wasteway of Agency Canal, 0.6 mi upstream from mouth, and 2.3 mi east of Hardin.

DRAINAGE AREA.--1,294 $mi^2$.

PERIOD OF RECORD.--June 1953 to current year. Records since June 1953 available in annual reports of Yellowstone River Compact Commission.

GAGE.--Water-stage recorder. Datum of gage is 2,882.29 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Oct. 7, 1953, nonrecording gage at site 0.4 mi downstream. Oct. 7, 1953, to May 6, 1963, water-stage recorder at site 0.3 mi downstream. May 6, 1963, to Nov. 6, 1963, nonrecording gage at site 0.4 mi downstream. All at different datums. Nov. 7, 1963, to Aug. 15, 1976, water-stage recorder at site 35 ft downstream at present datum. Aug. 15, 1976, to Sept. 30, 1979, water-stage recorders located on each bank downstream of Sarpy Road bridge and were used depending on control conditions.

REMARKS.--Estimated daily discharges: Nov. 9 to Mar. 1. Records good except those for period of estimated record, which are poor. Flow partly regulated by Willow Creek Reservoir (capacity 23,000 acre-ft). Diversions for irrigation of 20,980 acres upstream from station. Figures of discharge given herein include flow of terminal wasteway of Agency Canal.

AVERAGE DISCHARGE.--33 years, 310 $ft^3/s$, 224,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,600 $ft^3/s$, May 19, 1978, gage height, 11.20 ft, used gage height as obtained at bridge on Sarpy Road; maximum gage height, 11.78 ft Mar. 20, 1960, site and datum then in use (backwater from ice); minimum discharge observed, 0.20 $ft^3/s$ Aug. 7, 1961, result of discharge measurement.

EXTREMES FOR CURRENT YEAR--Peak discharges greater than base discharge of 1,000 $ft^3/s$ and maximums(*):

| Date | Time | Discharge $ft^3/s$ | Gage height |
|---|---|---|---|
| Feb. 27 | 0830 | ice jam | *6.71 |
| May 11 | 0930 | 1,270 | 3.95 |
| June 6 | 0430 | *2,450 | 4.99 |

Minimum daily discharge, 40 $ft^3/s$ Dec. 2.

| Month | Second-foot days | Mean | Maximum | Minimum | Runoff, in acre-feet |
|---|---|---|---|---|---|
| October 1985 | 4,283 | 138 | 167 | 125 | 8,500 |
| November | 2,539 | 84.6 | 136 | 45 | 5,040 |
| December | 3,219 | 104 | 160 | 40 | 6,380 |
| January 1986 | 3,708 | 120 | 160 | 74 | 7,350 |
| February | 6,129 | 219 | 954 | 60 | 12,160 |
| March | 9,754 | 315 | 904 | 186 | 19,350 |
| April | 6,930 | 231 | 337 | 179 | 13,750 |
| May | 17,361 | 560 | 1,150 | 251 | 34,440 |
| June | 32,709 | 1,090 | 2,420 | 296 | 64,880 |
| July | 4,905 | 158 | 272 | 109 | 9,730 |
| August | 2,591 | 83.6 | 139 | 50 | 5,140 |
| September 1986 | 4,834 | 161 | 218 | 140 | 9,590 |
| 1986 water year | 98,962 | 271 | 2,420 | 40 | 196,300 |

## 06294500 Bighorn River above Tullock Creek, near Bighorn, Mont.

LOCATION.--Lat 46°07'29", long 107°28'06", in SE1/4 SE1/4 NE1/4 sec. 3, T. 4 N., R. 34 E., Treasure County, Hydrologic Unit 10080015, on right bank, 1.9 mi upstream from Tullock Creek, 3.0 mi upstream from mouth, 3.6 mi southwest of Bighorn, and 4.5 mi southeast of Custer.

DRAINAGE AREA.--22,414 $mi^2$. Area at site used Oct. 7, 1955, to Sept. 30, 1981, 22,885 $mi^2$.

PERIOD OF RECORD.--Oct. 1, 1981, to current year. Records since January 1950 available in annual reports of the Yellowstone River Compact Commission. Previously, published as "06294700 Bighorn River at Bighorn, MT," 1956-81, and as "near Custer," 1945-55. Flows are equivalent at all sites.

GAGE.--Water-stage recorder. Elevation of gage is 2,700 ft above National Geodetic Vertical Datum of 1929, from topographic map. May 11 to Dec. 6, 1945, nonrecording gage, and Dec. 7, 1945, to Oct. 6, 1955, water-stage recorder at different datum. Oct. 7, 1955, to Sept. 30, 1981, at site 2.3 mi downstream at different datum.

REMARKS.--Estimated daily discharges: Oct. 19 to Dec. 18 and Feb. 12 to Mar. 2. Records good except those for estimated daily discharges, which are poor. Flow regulated by Bighorn Lake beginning November 1965 (usable capacity, 1,356,000 acre-ft). Major regulation prior to November 1965 by 14 reservoirs in Wyoming and 1 in Montana with combined usable capacity of about 1,400,000 acre-ft; see sections "Monthly summary of contents for Compact reservoirs." Diversions for irrigation of about 445,200 acres upstream from station.

AVERAGE DISCHARGE.--41 years (water years 1946-81, 1982-86), 3,929 $ft^3/s$ 2,847,000 acre-ft/yr, unadjusted.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge, 59,200 $ft^3/s$ May 20, 1978, gage height, 14.15 ft; maximum gage height recorded, 14.21 ft Apr. 2, 1965 (ice jam); minimum discharge, about 275 $ft^3/s$ Nov. 15, 1959, result of freezeup; minimum daily, 400 $ft^3/s$ Apr. 4, 1967.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,700 $ft^3/s$ July 4, 1983, gage height, 5.66 ft; maximum gage height, 8.52 ft Jan. 14, 1982 (ice jam); minimum daily discharge, 1,220 $ft^3/s$ Oct. 18, 1985.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 9,470 $ft^3/s$ June 12, gage height, 5.07 ft; maximum gage height, 7.84 ft Feb. 25, backwater from ice; minimum daily discharge, 1,220 $ft^3/s$ Oct. 18.

| Month | Second-foot days | Mean | Maximum | Minimum | Runoff, in acre-feet | Adjusted runoff, in acre-feet* |
|---|---|---|---|---|---|---|
| October 1985 | 67,300 | 2,171 | 2,330 | 1,220 | 133,500 | 133,700 |
| November | 73,200 | 2,440 | 3,000 | 2,200 | 145,200 | 94,800 |
| December | 93,160 | 3,005 | 3,050 | 2,940 | 184,800 | 121,200 |
| January 1986 | 85,390 | 2,755 | 2,990 | 2,530 | 169,400 | 129,200 |
| February | 79,590 | 2,843 | 2,960 | 2,620 | 157,900 | 148,000 |
| March | 135,970 | 4,386 | 5,320 | 3,500 | 269,700 | 229,000 |
| April | 134,920 | 4,497 | 5,390 | 3,860 | 267,600 | 253,400 |
| May | 158,020 | 5,097 | 6,390 | 4,220 | 313,400 | 345,300 |
| June | 223,840 | 7,461 | 9,050 | 4,980 | 444,000 | 676,700 |
| July | 204,200 | 6,587 | 6,980 | 5,900 | 405,000 | 401,300 |
| August | 100,560 | 3,244 | 5,720 | 2,900 | 199,500 | 175,400 |
| September 1986 | 112,990 | 3,766 | 4,240 | 3,240 | 224,100 | 214,500 |
| 1986 water year | 1,469,140 | 4,025 | 9,050 | 1,220 | 2,914,000 | 2,922,500 |

*Adjusted for change in contents in Bighorn Lake minus Little Bighorn River near Hardin.

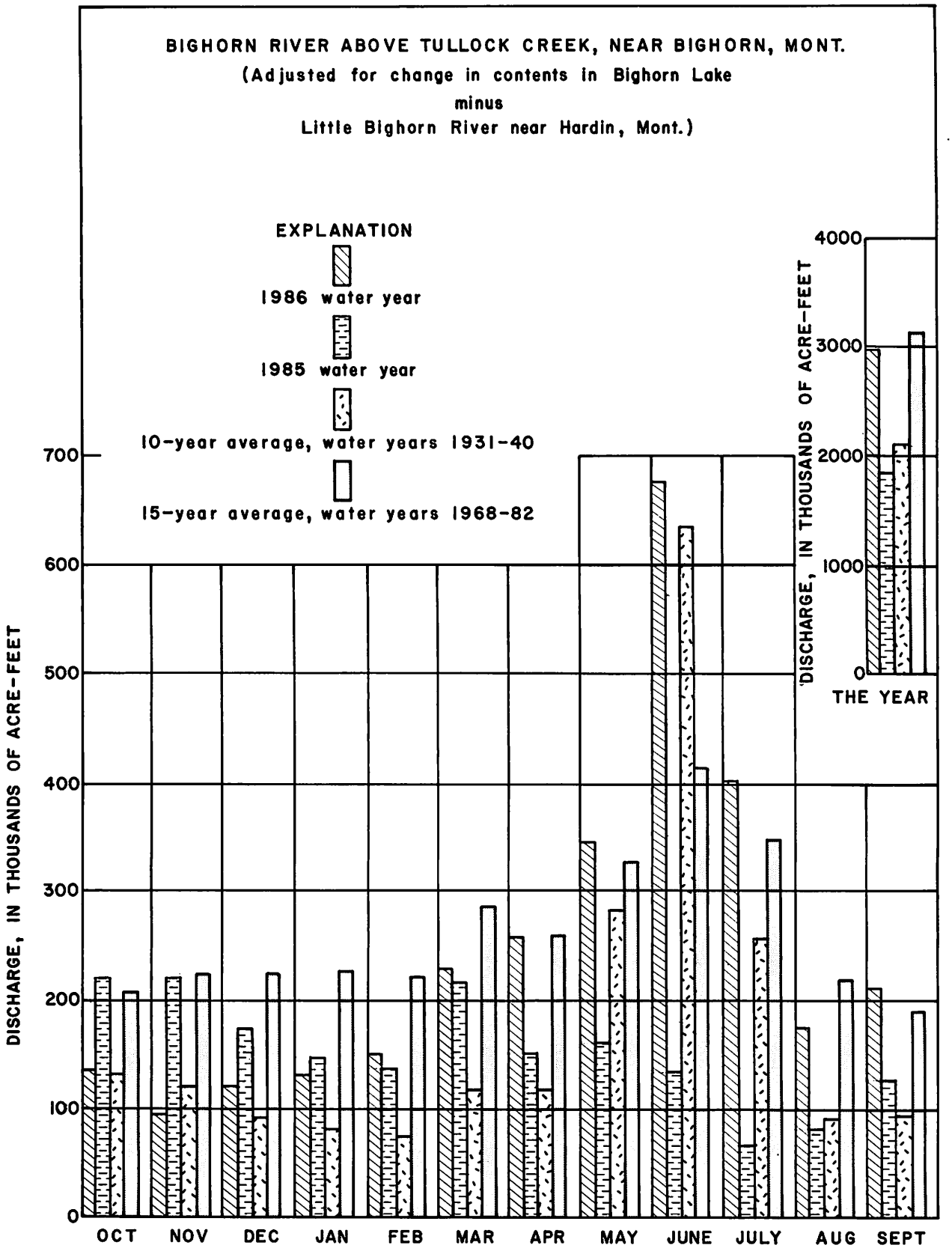


Figure 2.--Comparison of discharge for 1986 water year with 1985 water year of Bighorn River above Tullock Creek, near Bighorn and with average discharge for water years 1931-40 and 1968-82.

## 06308500 Tongue River at Miles City, Mont.

LOCATION.--Lat 46°20'44", long 105°48'10", in NE1/4 NE1/4 SE1/4 sec. 23, T. 7 N., R. 47 E., Custer County, Hydrologic Unit 10090102, on right bank 4 mi south of Miles City and at mile 8.1.

DRAINAGE AREA.--5,379 $mi^2$.

PERIOD OF RECORD.--April 1938 to April 1942, April 1946 to current year. Published as "near Miles City" April 1938 to April 1942. Not equivalent to records published as "near Miles City" May 1929 to October 1932. Monthly discharges only for some periods, published in WSP 1309. Records since January 1950 available in annual reports of Yellowstone River Compact Commission.

GAGE.--Water-stage recorder. Datum of gage is 2,375.76 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). April 1938 to April 1942, nonrecording gage at site 8 mi upstream at different datum. April 1946 to Sept. 30, 1963, at datum 1.00 ft higher.

REMARKS.--Estimated daily discharges: Oct. 23 to Feb. 27. Records good except those for estimated daily discharges, which are poor. Flow regulation by Tongue River Reservoir (see section "Monthly summary of contents for Compact reservoirs existing on January 1, 1950") and many small reservoirs in Wyoming (combined capacity, about 15,000 acre-ft). Diversions for irrigation of about 100,800 acres upstream from station.

AVERAGE DISCHARGE.--43 years (1938-41, 1946-86), 436 $ft^3/s$, 315,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,300 $ft^3/s$ June 15, 1962, gage height, 12.33 ft, present datum, from rating curve extended above 8,220 $ft^3/s$ on basis of float measurement; maximum gage height, 13.27 ft, Mar. 19, 1960, Feb. 15, 1971 (ice jam), present datum; no flow July 9-19, Aug. 13, 14, Sept. 28, 1940.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,620 $ft^3/s$ Sept. 25, gage height, 6.57 ft; maximum gage height, 9.74 ft Feb. 26 (ice jam); minimum daily discharge, 99 $ft^3/s$ Oct. 16.

| Month | Second-foot days | Mean | Maximum | Minimum | Runoff, in acre-feet |
|---|---|---|---|---|---|
| October 1985 | 5,196 | 168 | 310 | 99 | 10,310 |
| November | 6,490 | 216 | 320 | 160 | 12,870 |
| December | 6,380 | 206 | 240 | 170 | 12,650 |
| January 1986 | 5,810 | 187 | 210 | 150 | 11,520 |
| February | 12,040 | 430 | 2,500 | 140 | 23,880 |
| March | 17,810 | 575 | 2,120 | 352 | 35,330 |
| April | 11,927 | 398 | 428 | 360 | 23,660 |
| May | 17,656 | 570 | 2,670 | 260 | 35,020 |
| June | 38,715 | 1,291 | 2,470 | 221 | 76,790 |
| July | 9,841 | 317 | 658 | 224 | 19,520 |
| August | 6,618 | 213 | 257 | 181 | 13,130 |
| September 1986 | 13,824 | 461 | 1,910 | 220 | 27,420 |
| 1986 water year | 152,307 | 417 | 2,670 | 99 | 302,100 |

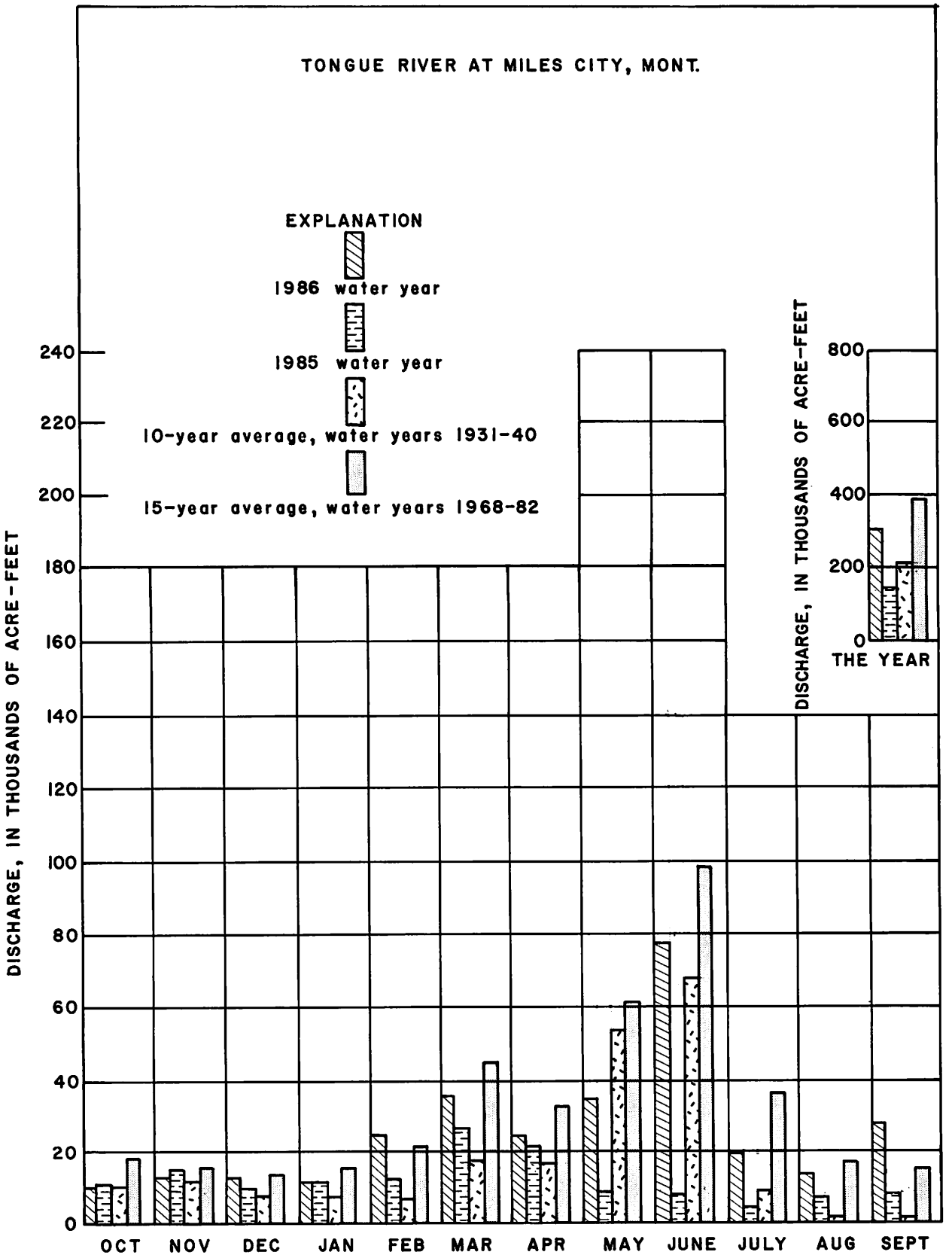


Figure 3.--Comparison of discharge for 1986 water with 1985 water year of Tongue River at Miles City and with average discharge for water years 1931-40 and 1968-82.

## 06326500 Powder River near Locate, Mont.

LOCATION.--Lat 46°26'56", long 105°18'44", in NW1/4 SW1/4 sec. 14, T. 8 N., R. 51 E., Custer County, Hydrologic Unit 10090209, on left bank 1.5 mi downstream from bridge on old U.S. Highway 12 at present site of Locate, 1.5 mi upstream from Locate Creek, 5 mi west of former site of Locate, 25 mi east of Miles City, and at mile 27.9.

DRAINAGE AREA.--13,194 $mi^2$. Drainage area at site 1.5 mi upstream, 13,189 $mi^2$.

PERIOD OF RECORD.--March 1938 to current year. Records since January 1950 available in annual reports of Yellowstone River Compact Commission.

REVISED RECORDS.--WSP 926: 1939. WSP 1309: 1938-39 (M). WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 2,384.79 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to July 11, 1947, nonrecording gage at bridge 1.5 mi upstream, and July 11, 1947, to Sept. 30, 1965, water-stage recorder at site near upstream bridge at different datum. Oct. 1, 1965, to Oct. 4, 1966, nonrecording gage, and Oct. 5, 1966, to Mar. 21, 1978, water-stage recorder at present site and datum. Mar. 22, 1978, to Apr. 23, 1981, water-stage recorder 1.5 mi upstream at different datum, Apr. 24 to Aug. 20, 1981, water-stage recorder at present site and datum, and Aug. 21, 1981, to Sept. 30, 1981, water-stage recorder 1.5 mi upstream at different datum. Effective Oct. 1, 1981, recording and nonrecording gages will be maintained at both the upstream and present gage locations and each site will be employed depending on the water-stage control conditions and for the capability of recording useful gage-height data.

REMARKS.--Estimated daily discharges: Nov. 8 to Mar. 2. Records fair except those for estimated daily discharges, which are poor. Some regulation by three reservoirs in Wyoming with combined usable capacity of 36,800 acre-ft. Diversions for irrigation of about 101,800 acres upstream from station.

AVERAGE DISCHARGE.--48 years, 604 $ft^3/s$, 437,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 31,000 $ft^3/s$ Feb. 19, 1943, maximum gage height, 12.27 ft Mar. 16, 1978 (backwater from ice); no flow Jan. 16 to Feb. 12, Feb. 22-24, 1950, July 27, Sept. 21-27, Oct. 1, 1960, Sept. 4-8, 1961.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 5,000 $ft^3/s$ and maximums(*):

| Date | Time | Discharge $ft^3/s$ | Gage height (ft) |
|---|---|---|---|
| Feb. 26 | unknown | (a) | (b)*6.76 |
| May 9 | 1745 | *4,830 | (b) 6.24 |

(a) backwater from ice
(b) observed

Minimum discharge, 29 $ft^3/s$ Aug. 17.

| Month | Second-foot days | Mean | Maximum | Minimum | Runoff, in acre-feet |
|---|---|---|---|---|---|
| October 1985 | 7,634 | 246 | 303 | 174 | 15,140 |
| November | 4,005 | 134 | 221 | 70 | 7,940 |
| December | 3,935 | 127 | 170 | 60 | 7,810 |
| January 1986 | 4,900 | 158 | 240 | 120 | 9,720 |
| February | 12,490 | 446 | 3,000 | 110 | 24,770 |
| March | 33,805 | 1,090 | 4,510 | 418 | 67,050 |
| April | 14,886 | 496 | 907 | 364 | 29,530 |
| May | 30,627 | 988 | 3,670 | 348 | 60,750 |
| June | 37,651 | 1,255 | 3,200 | 343 | 74,680 |
| July | 5,136 | 166 | 401 | 42 | 10,190 |
| August | 1,845 | 59.5 | 120 | 30 | 3,660 |
| September 1986 | 22,873 | 762 | 3,080 | 301 | 45,370 |
| 1986 water year | 179,787 | 493 | 4,510 | 30 | 356,600 |

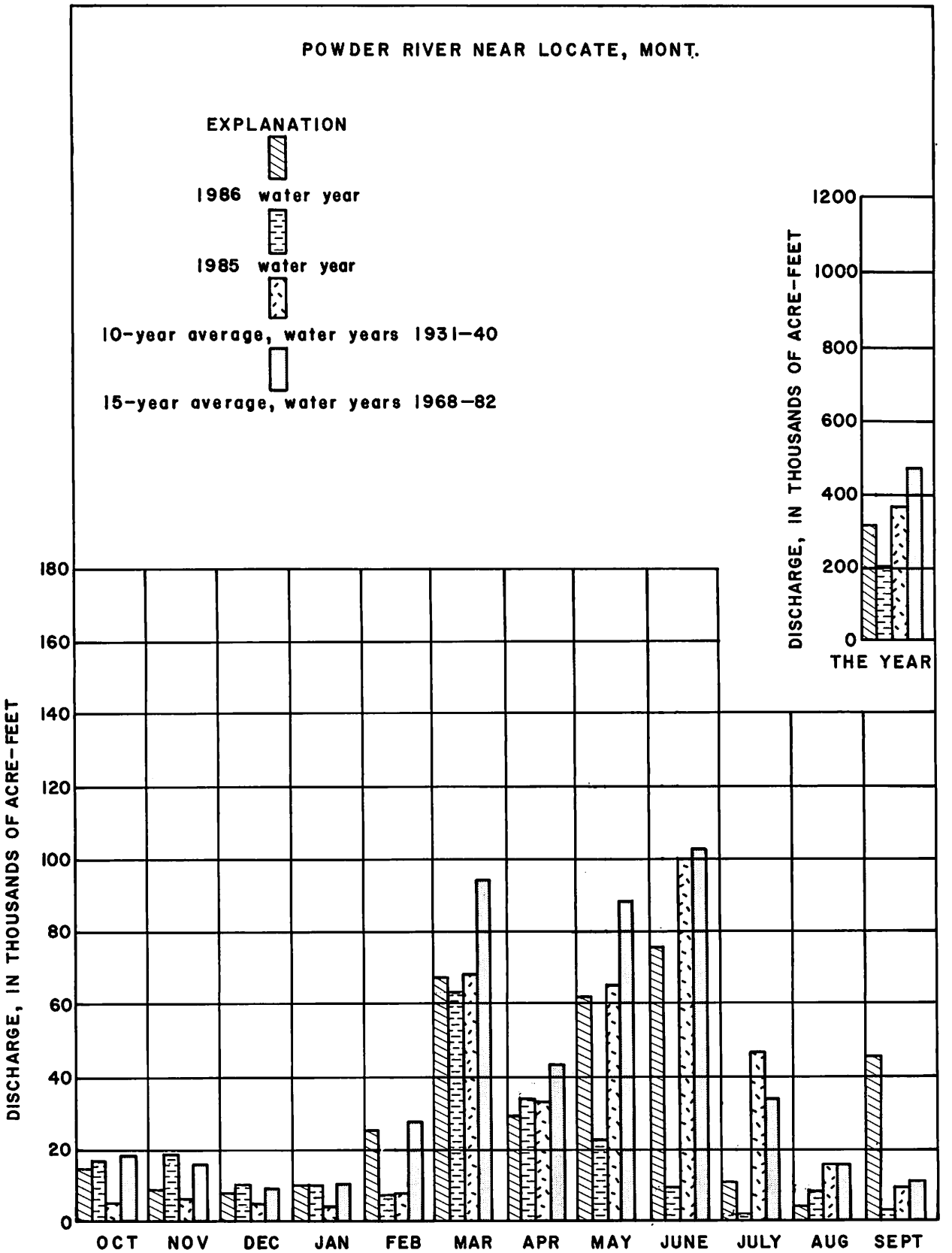


Figure 4.--Comparison of discharge for 1986 water year with 1985 water year of Powder River near Locate and with average discharge for water years 1931-40 and 1968-82.

## 06258900 Boysen Reservoir, Wyo.

LOCATION.--Lat 43°25'00", long 108°10'37", in NW1/4 NW1/4 sec. 16, T. 5 N., R. 6 E., Fremont County, Hydrologic Unit 10080005, at dam on Wind River and 13 mi north of Shoshoni, Wyoming.

DRAINAGE AREA.--7,700 $mi^2$.

PERIOD OF RECORD.--October 1951 to current year (monthend contents only).

GAGE.--Water-stage recorder. Datum of gage is referenced to National Geodetic Vertical Datum of 1929 (levels by U.S. Bureau of Reclamation).

REMARKS.--Reservoir is formed by rock-fill dam completed in October 1951. Storage began Oct. 11, 1951. Usable capacity, 742,100 acre-ft between elevation 4,657.00 ft, invert of penstock pipe, and 4,725.00 ft, top of spillway gate. Dead storage, 59,880 acre-ft below elevation 4,657.00 ft. Prior to Jan. 1, 1966, usable capacity was 757,800 acre-ft and dead storage was 62,000 acre-ft at same elevations. Crest of dam is at elevation 4,758 ft. Figures given herein represent usable contents. Water used for irrigation, flood control, and power development.

COOPERATION.--Records furnished by U.S. Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum usable daily contents, 862,500 acre-ft July 6, 7, 1967, elevation, 4,730.83 ft; minimum usable daily since normal use of water started, 191,900 acre-ft Mar. 18, 19, 1956, elevation, 4,684.18 ft, capacity table then in use.

EXTREMES FOR CURRENT YEAR.--Maximum usable contents, 754,800 acre-ft July 7, elevation, 4,725.64 ft; minimum usable, 415,800 acre-ft May 21, elevation, 4,705.18 ft.

| Month | Water-surface elevation, in feet | Usable contents, in acre-feet | Change in contents, in acre-feet |
|---|---|---|---|
| September 30, 1985 | 4,713.60 | 540,200 | |
| October 31 | 4,715.00 | 562,600 | +22,400 |
| November 30 | 4,714.84 | 560,100 | -2,500 |
| December 31 | 4,714.34 | 552,000 | -8,100 |
| January 31, 1986 | 4,713.43 | 537,500 | -14,500 |
| February 28 | 4,713.73 | 542,200 | +4,700 |
| March 31 | 4,710.56 | 493,300 | -48,900 |
| April 30 | 4,706.96 | 440,600 | -52,700 |
| May 31 | 4,707.87 | 453,600 | +13,000 |
| June 30 | 4,724.98 | 741,700 | +288,100 |
| July 31 | 4,722.73 | 698,600 | -43,100 |
| August 31 | 4,722.15 | 687,700 | -10,900 |
| September 30, 1986 | 4,721.29 | 671,900 | -15,800 |
| 1986 water year | | | +131,700 |

## 06260300 Anchor Reservoir, Wyo.

LOCATION.--Lat 43°39'50", long 108°49'27", in sec. 26, T. 43 N., R. 100 W., Hot Springs County, Hydrologic Unit 10080007, at dam on South Fork Owl Creek, 2 mi downstream from Middle Fork, 3 mi southeast of Anchor, and 32 mi west of Thermopolis.

DRAINAGE AREA.--131 $mi^2$.

PERIOD OF RECORD.--November 1960 to current year (monthend contents only).

GAGE.--Water-stage recorder. Datum of gage is referenced to National Geodetic Vertical Datum of 1929 (U.S. Bureau of Reclamation benchmark).

REMARKS.--Reservoir is formed by concrete arch dam completed in 1960. Usable capacity, 17,170 acre-ft between elevation 6,343.75 ft, invert of river outlet, and 6,441.00 ft, spillway crest, not including 68 acre-ft below elevation 6,343.75 ft. Prior to Oct. 1, 1971, usable capacity was 17,280 acre-ft not including 149 acre-ft below the invert. Figures given herein represent usable contents. Water is used for irrigation of land in Owl Creek basin.

COOPERATION.--Records furnished by U.S. Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum usable daily contents, 9,250 acre-ft July 4, 1967, elevation, 6,418.52 ft; no storage on many days each year.

EXTREMES FOR CURRENT YEAR.--Maximum usable contents, 1,980 acre-ft June 19, elevation, 6,383.22 ft; no usable storage most of year.

| Month | Water-surface elevation, in feet | Usable contents, in acre-feet | Change in contents, in acre-feet |
|---|---|---|---|
| September 30, 1985 | 6,304.30 | 0 | 0 |
| October 31 | 6,304.30 | 0 | 0 |
| November 30 | 6,304.00 | 0 | 0 |
| December 31 | 6,304.30 | 0 | 0 |
| January 31, 1986 | 6,304.30 | 0 | 0 |
| February 28 | 6,304.30 | 0 | 0 |
| March 31 | 6,304.30 | 0 | 0 |
| April 30 | 6,340.00 | 0 | 0 |
| May 31 | 6,363.00 | 467 | +467 |
| June 30 | 6,363.85 | 505 | +38 |
| July 31 | 6,340.00 | 0 | -505 |
| August 31 | 6,340.00 | 0 | 0 |
| September 30, 1986 | 6,304.30 | 0 | 0 |
| 1986 water year | | | 0 |

## 06286400 Bighorn Lake near St. Xavier, Mont.

LOCATION.--Lat 45°18'27", long 107°57'26", in SW1/4 SE1/4 sec. 18, T. 6 S., R. 31 E., Big Horn County, Hydrologic Unit 10080010, in block 13 of Yellowtail Dam on Bighorn River, 1.3 mi upstream from Grapevine Creek, 15.5 mi southeast of St. Xavier, and at mile 86.6.

DRAINAGE AREA.--19,626 $mi^2$.

PERIOD OF RECORD.--November 1965 to current year (monthend contents only). Prior to October 1969, published as "Yellowtail Reservoir."

GAGE.--Water-stage recorder in powerhouse control room. Datum of gage is referenced to National Geodetic Vertical Datum of 1929 (levels by U.S. Bureau of Reclamation).

REMARKS.--Reservoir is formed by thin concrete-arch dam; construction began in 1961; completed in 1967. Storage began Nov. 3, 1965. Usable capacity, 1,356,000 acre-ft between elevation 3,296.50 ft, river outlet invert, and 3,657.00 ft, top of flood control. Elevation of spillway crest, 3,593.00 ft. Normal maximum operating level, 1,097,000 acre-ft, elevation, 3,640.00 ft. Minimum operating level, 483,400 acre-ft, elevation 3,547.00 ft. Dead storage, 16,010 acre-ft, revised, below elevation 3,296.50 ft. Figures given herein represent usable contents. Water is used for power production, flood control, irrigation, and recreation.

COOPERATION.--Elevations and capacity table furnished by U.S. Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily contents, 1,346,000 acre-ft July 6, 1967, elevation, 3,656.43 ft; minimum since first filling, 660,700 acre-ft Mar. 11, 1970, elevation, 3,584.45 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 1,064,000 acre-ft July 22, elevation, 3,640.77 ft; minimum, 669,800 acre-ft Apr. 25, elevation, 3,588.87 ft.

| Month | Water-surface elevation, in feet | Usable contents,* in acre-feet | Change in contents, in acre-feet |
|---|---|---|---|
| September 30, 1985 | 3,614.94 | 820,200 | |
| October 31 | 3,616.16 | 828,900 | +8,700 |
| November 30 | 3,609.41 | 783,500 | -45,400 |
| December 31 | 3,599.59 | 726,300 | -57,200 |
| January 31, 1986 | 3,593.48 | 693,500 | -32,800 |
| February 28 | 3,593.90 | 695,800 | +2,300 |
| March 31 | 3,589.81 | 674,500 | -21,300 |
| April 30 | 3,589.72 | 674,100 | -400 |
| May 31 | 3,602.12 | 740,400 | +66,300 |
| June 30 | 3,638.74 | 1,038,000 | +297,600 |
| July 31 | 3,639.19 | 1,044,000 | +6,000 |
| August 31 | 3,637.61 | 1,025,000 | -19,000 |
| September 30, 1986 | 3,637.60 | 1,025,000 | 0 |
| 1986 water year | | | +204,800 |

*From revised capacity table dated Feb. 18, 1986.

## MONTHLY SUMMARY OF CONTENTS FOR COMPACT RESERVOIRS EXISTING 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 monthend contents in acre-feet of four reservoirs are given. The first three reservoirs are in the Bighorn River basin, Wyoming, and data on contents were furnished by the U.S. Bureau of Reclamation. The Tongue River Reservoir in Montana is operated under the supervision of the Water Resources Division of the Montana Department of Natural Resources and Conservation, which furnished the operating data.

Contents, in acre-feet

| Month | 06224500 [a]/Bull Lake | [b]/Pilot Butte Reservoir | 06281500 [c]/Buffalo Bill Reservoir | 06307000 [d]/Tongue River Reservoir |
|---|---|---|---|---|
| September 30, 1985. . . | 31,890 | 15,610 | 239,500 | 12,500 |
| October 31. . . . . | 34,570 | 19,820 | 246,600 | 16,100 |
| November 30 . . . . . | 36,610 | 19,740 | 262,400 | 18,260 |
| December 31 . . . . . | 39,700 | 19,660 | 272,200 | 14,530 |
| January 31, 1986. . . . | 41,250 | 19,660 | 271,400 | 12,400 |
| February 28 . . . . . | 42,980 | 19,660 | 275,200 | 24,580 |
| March 31. . . . . | 45,160 | 19,580 | 296,100 | 30,180 |
| April 30. . . . . | 51,140 | 19,820 | 293,700 | 28,250 |
| May 31. . . . . | 74,440 | 11,040 | 293,100 | 42,020 |
| June 30 . . . . . | 143,400 | 15,540 | 449,500 | 55,800 |
| July 31 . . . . . | 143,000 | 24,840 | 378,500 | 35,800 |
| August 31 . . . . . | 122,700 | 24,570 | 293,100 | 13,900 |
| September 30, 1986. . . | 90,640 | 20,780 | 260,400 | 16,100 |
| Change in contents during water year. . | +58,750 | +5,170 | +20,900 | +3,600 |

[a]/ Usable contents, from revised capacity table effective October 1, 1965. Dead storage is 722 acre-ft.

[b]/ Usable contents. Dead storage is 5,360 acre-ft.

[c]/ Usable contents, from revised capacity table based on survey of 1959. Contents prior to October 1960 based on survey of 1941. Dead storage is negligible.

[d]/ Usable contents. Dead storage is 1,400 acre-ft. Contents based upon sedimentation surveys of October 1948.

# 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, is administered under the following rules and regulations 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 streamflow 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 near Silesia, Montana and located in NW1/4 SE1/4 sec. 1, T. 4 S., R. 23 E., shall be the point of measurement for the Clarks Fork.

2. Bighorn River (exclusive of Little Bighorn River)

   The gaging station known as the Bighorn River above Tullock Creek, near Bighorn, Montana, and located in SE1/4 SE1/4 NE1/4 sec. 3, 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 SE1/4 NE1/4 NE1/4 sec. 19, 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 NE1/4 NE1/4 SE1/4 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 NW1/4 SW1/4 sec. 14, 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 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 are 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 at the office of the Chairman of the Commission.

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, shall enter into cooperative agreements with the U.S. Geological Survey for such engineering and clerical services as may reasonably be necessary for the administration of the Compact. Said agreements 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.

B. The Geological Survey shall 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 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 the transaction of such other business consistent with its authority; provided that by unanimous consent of the Commission the date and place of the annual meeting may be changed. Other meetings as may be deemed necessary shall be held at a time and place set by mutual agreement, for the transaction of any business consistent with its authority.

No action of the Commission shall be effective until approval by the Commissioners for the States of Wyoming and Montana.

Article VI. Amendments, Revisions and Abrogations.

The Rules and Regulations of the Commission may be amended or revised by a unanimous vote at any meeting of the Commission.

Gary Fritz
Commissioner for Montana

George L. Christopulos
Commissioner for Wyoming

ATTESTED:

L. Grady Moore
Federal Representative

Adopted November 17, 1953
Amended December 16, 1986

# RULES FOR ADJUDICATING WATER RIGHTS ON INTERSTATE DITCHES

## Article I. Purpose

The purpose of this rule is to determine and adjudicate, in accordance with the laws of Montana and Wyoming, those pre-Compact (January 1, 1950) water rights for diverting from the Powder, Tongue, Bighorn and Clarks Fork Rivers and their tributaries where the point of diversion is in one State and the place of use is in the other State.

## Article II. Authority

In accordance with the Yellowstone River Compact, the State of Montana and the State of Wyoming, being moved by consideration of interstate comity, desire to remove all causes of present and future controversy between the States and between persons in one State and persons in another State with respect to these interstate ditches. Article III (E) of the Compact provides the Yellowstone River Compact Commission with the authority "....to formulate rules and regulations and to perform any act which they may find necessary to carry out the provisions of this Compact...."

## Article III. Definitions

The terms defined in the Yellowstone River Compact apply as well as the following definitions:

1. "Acre-feet" means the volume of water that would cover 1 acre of land to a depth of 1 foot.

2. "Cubic foot per second" means a flow of water equivalent to a volume of 1 cubic foot that passes a point in 1 second of time and is equal to 40 miners inches in Montana.

3. "Interstate Ditches" shall include ditches and canals which convey waters of the Bighorn, Tongue, Powder, and Clarks Fork Rivers and their tributaries across the Wyoming-Montana State line where the water is diverted in one State and the place of use is in the other State.

4. "Department of Natural Resources and Conservation," hereafter called the "Department," means the administrative agency and Department of the Executive Branch of the Government of Montana created under Title II, Chapter 15, MCA which has the responsibility for water administration in that State.

5. "Water Court" means a Montana District Court presided over by a water judge, as provided for in Title III, Chapter 7, MCA.

6. "State Engineer" shall be the current holder of the position created by the Wyoming Constitution as Chief Water Administration Official for the State of Wyoming.

7. "Board of Control," hereinafter called the "Board," is defined as the constitutionally created water management agency in Wyoming composed of the four Water Division Superintendents and the State Engineer.

8. "Superintendent" is the member of the Board who is the water administration official for the Water Division where the interstate ditch is located. (The two Water Divisions in the Yellowstone River drainage are Water Division Numbers Two and Three.)

9. "Date of Priority" shall mean the earliest date of actual beneficial use of water, unless evidence and circumstances pertaining to a particular claim establish an earlier date.

10. "Point of Diversion" is defined to be the legal land description by legal subdivision, section, township, and range of the location of the diversion structure for an interstate ditch from a natural stream channel.

11. "Place of Use" is defined to be the legal land description (legal subdivision, section, township, and range) of the lands irrigated by an interstate ditch.

12. "Person" is defined as an individual, a partnership, a corporation, a municipality or any other legal entity, public or private.

13. "Claimant" is defined as any person claiming the use of water from an interstate ditch as herein defined.

Article IV. Procedures

The procedures for determining and adjudicating water rights associated with interstate ditches shall be categorized as follows: (A) Where the point of diversion is in Wyoming and place of use in Montana, and (B) Where the point of diversion is in Montana and place of use in Wyoming.

A. Wyoming Procedure

1. The Yellowstone River Compact Commission will provide a claim form to be completed by the claimant that will describe the location and point of diversion and land being irrigated, the priority date claimed, method of irrigation and such other information required to describe the claim.

2. The Yellowstone River Compact Commission will send the claim form to water users on the interstate ditches.

3. Water users will complete the claim form and file it with the Yellowstone Compact Commission, which, when found to be correct and complete, will be forwarded to the Board for verification.

4. Upon receipt of the form, the Board shall forward it to the appropriate Superintendent, who in cooperation with the Department, will validate the information including the use that has been made of the water, the number of acres and location of lands being irrigated, the priority date, and all other relevant information. The Superintendent and the Department will utilize aerial photography and other information to have prepared a reproducible map showing the location of the ditch system, lands irrigated, point of diversion, etc., of the claim.

5. After the validation procedure, the Superintendent will hold a hearing, after appropriate notice and advertisement, at which time the claimant shall describe, in detail, the use that has been made of the water and the lands that are being irrigated, establish a priority date, etc. Costs incurred in advertising shall be paid by the claimant. If a single hearing is held to consider several claims, the costs of advertising shall be shared equally among the claimants. Anyone who opposes the claim shall appear and state the reasons, if any, for opposition to the claim. If there is no opposition to the claim, cost incurred in holding the hearing shall be paid by the claimant. If protestants do appear and oppose the claim, hearing costs will be paid 50 percent by the claimant and 50 percent by the protestant, or if there is more than one protestant, the remaining 50 percent shall be shared equally among the protestants.

6. At the conclusion of the hearing, the Superintendent shall forward the record to the Yellowstone River Compact Commission with findings and recommendations. The Yellowstone River Compact Commission will make the

determination of the amount of the right, the location, and the priority date, and then send the record to the Board.

7. The Board shall review the record and integrate it into its water rights system. Upon entry of the record by the Board, the information shall be forwarded to the Department and the Chairman of the Yellowstone River Compact Commission.

8. Upon the entry of the right into the Board's records, it would have the following attributes:

   a. The right will be a Wyoming water right with a priority date as established by this procedure.

   b. The amount of the right will be determined as provided by Wyoming law, i.e., 1 cubic foot per second per 70 acres, with an additional 1 cubic foot per second if the right has priority earlier than March 1, 1945, under the Wyoming Surplus Water Law, 41-4-318 and 41-4-319, W.S. 1977.

B. Montana Procedure

1. The Yellowstone River Compact Commission will provide a claim form to be completed by the claimant that will describe the location and point of diversion and land being irrigated, the priority date claimed, method of irrigation and such other information required to describe the claim.

2. The Commission will send the claim form to water users on the interstate ditches.

3. Water users will complete the claim form and file it with the Yellowstone River Compact Commission, which, when found to be correct and complete, will be forwarded to the Department for verification.

4. Upon receipt of the form, the Department, in cooperation with the Wyoming State Engineer's Office, will validate the information, including the use that has been made of the water, the number of acres and location of lands being irrigated, the priority date, and all other relevant information. The appropriate Superintendent and the Department will utilize aerial photographs and other information to have prepared a reproducible map showing the location of the ditch system, land irrigated, point of diversion, etc., of the claim.

5. The Department would then forward the record to the Yellowstone River Compact Commission with its findings and recommendations. Upon approval by the Commission, the record shall be submitted to the Montana Water Court for adjudication. A duplicate record will be forwarded to the Wyoming State Engineer's Office, the Board, and the Chairman of the Yellowstone River Compact Commission upon adjudication.

6. Upon adjudication of the right by the Montana Water Court, it would have the following attributes:

   a) The right will be a Montana water right with a priority date as established by this procedure.

   b) The amount of the right will be determined as provided by Montana law.

Article V. Exclusions

A. These rules recognize the limitation in Article VI of the Yellowstone River Compact regarding Indian water rights.

B. These rules shall not be construed to determine or interpret the rights of the States of Wyoming and Montana to the waters of the Little Bighorn River.

Article VI. Claim Form Submission Period

All claims must be submitted to the Yellowstone River Compact Commission, c/o L. Grady Moore, United States Geological Survey, 821 E. Interstate, Bismarck, ND 58501 no later than December 31, 1984.

Gary Fritz
Commissioner for Montana

George L. Christopulos
Commissioner for Wyoming

ATTESTED:

L. Grady Moore
Federal Representative

Adopted September 20, 1984

## METRIC CONVERSION TABLE

The following factors may be used to convert the inch-pound units published herein to the International System (SI) of metric units. Subsequent reports will contain both the inch-pound and SI unit equivalents in the station manuscript descriptions until such time that all data will be published in SI units.

| Multiply inch-pound units | By | To obtain SI units |
|---|---|---|
| | **Length** | |
| feet (ft) | .3048 | meters (m) |
| miles (mi) | 1.609 | kilometers (km) |
| | **Area** | |
| acres | 4047 | square meters ($m^2$) |
| | .4047 | *hectares (ha) |
| | .4047 | square hectometer ($hm^2$) |
| | .004047 | square kilometers ($km^2$) |
| square miles ($mi^2$) | 2.590 | square kilometers ($km^2$) |
| | **Volume** | |
| cfs-day ($ft^3/s$-day) | 2447 | cubic meters ($m^3$) |
| | .002447 | cubic hectometers ($hm^3$) |
| acre-feet (acre-ft) | 1233 | cubic meters ($m^3$) |
| | .001233 | cubic hectometers ($hm^3$) |
| | .000001233 | cubic kilometers ($km^3$) |
| | **Flow** | |
| cubic feet per second ($ft^3/s$) | 28.32 | liters per second (L/s) |
| | 28.32 | cubic decimeters per second ($dm^3/s$) |
| | .02832 | cubic meters per second ($m^3/s$) |
| acre-feet per year (acre-ft/yr) | 1233 | cubic meters per year ($m^3/yr$) |
| | .001233 | cubic hectometers per year ($hm^3/yr$) |
| | .000001233 | cubic kilometers per year ($km^3/yr$) |

*The unit hectare is approved for use with the International System (SI) for a limited time. See NBS Special Bulletin 330, p. 15, 1972 edition.


LOCATION MAP

YELLOWSTONE RIVER COMPACT COMMISSION

# YELLOWSTONE RIVER BASIN

EXPLANATION

▲ COMPACT STREAM-GAGING STATIONS
◧ RESERVOIR-CONTENT STATIONS

10 0 10 20 30 40 MILES
10 5 0 10 20 30 40 50 60 KILOMETERS

MAP SHOWING LOCATIONS OF COMPACT STREAM-GAGING AND RESERVOIR-CONTENT STATIONS