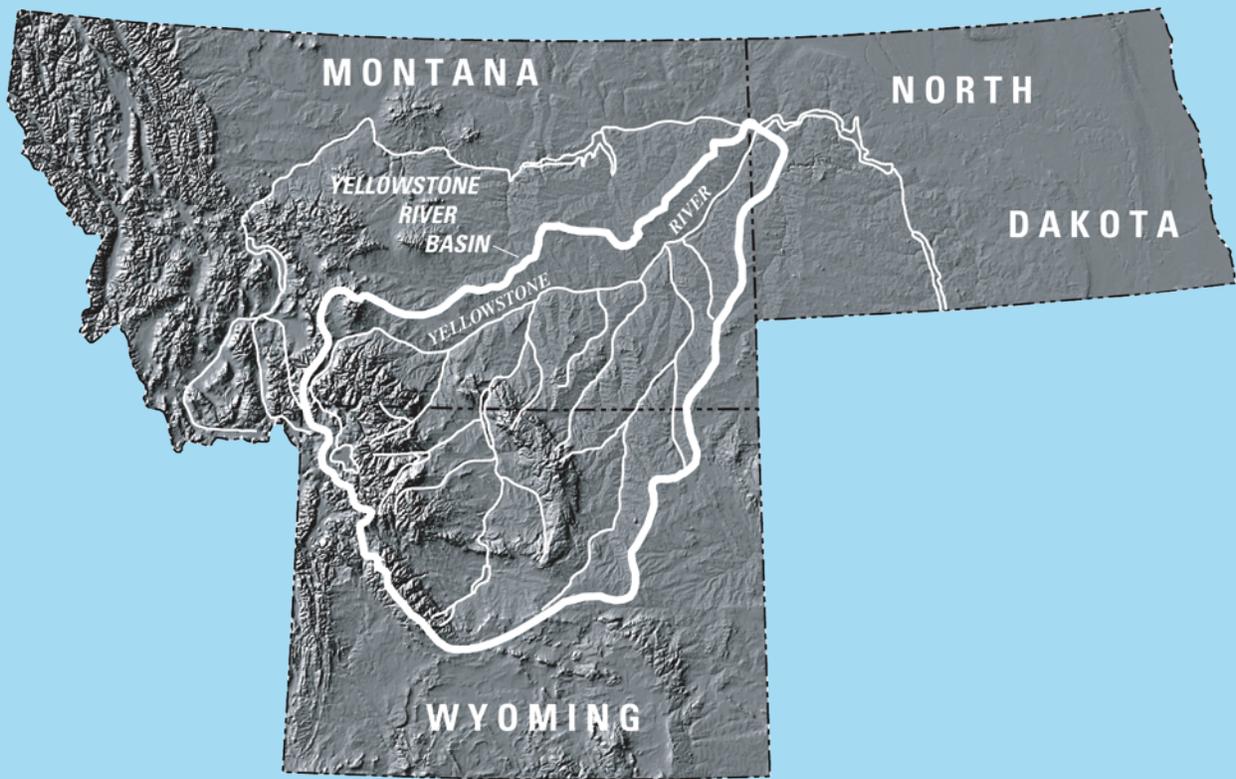


# YELLOWSTONE RIVER COMPACT COMMISSION

WYOMING

MONTANA

NORTH DAKOTA



Seventy-Third Annual Report  
2024



# **Yellowstone River Compact Commission**

## **Seventy-Third Annual Report**

**2024**



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## Conversion Factors

U.S. customary units to International System of Units

<b>Multiply</b>	<b>By</b>	<b>To obtain</b>
<b>Length</b>		
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
<b>Area</b>		
acre	4,047	square meter (m <sup>2</sup> )
acre	0.4047	hectare (ha) <sup>1</sup>
acre	0.4047	square hectometer (hm <sup>2</sup> )
acre	0.004047	square kilometer (km <sup>2</sup> )
square mile (mi <sup>2</sup> )	2.590	square kilometer (km <sup>2</sup> )
<b>Volume</b>		
cubic foot per second per day (ft <sup>3</sup> /s-day)	2,447	cubic meter (m <sup>3</sup> )
cubic foot per second per day (ft <sup>3</sup> /s-day)	0.0002447	cubic hectometer (hm <sup>3</sup> )
cubic foot (ft <sup>3</sup> )	0.02832	cubic meter (m <sup>3</sup> )
acre-foot (acre-ft)	1,233	cubic meter (m <sup>3</sup> )
acre-foot (acre-ft)	0.001233	cubic hectometer (hm <sup>3</sup> )
acre-foot (acre-ft)	0.000001233	cubic kilometer (km <sup>3</sup> )
<b>Flow rate</b>		
acre-foot per year (acre-ft/yr)	1,233	cubic meter per year (m <sup>3</sup> /yr)
acre-foot per year (acre-ft/yr)	0.001233	cubic hectometer per year (hm <sup>3</sup> /yr)
acre-foot per year (acre-ft/yr)	0.000001233	cubic kilometer per year (km <sup>3</sup> /yr)
cubic foot per second (ft <sup>3</sup> /s)	28.32	liter per second (L/s)
cubic foot per second (ft <sup>3</sup> /s)	28.32	cubic decimeter per second (dm <sup>3</sup> /s)
cubic foot per second (ft <sup>3</sup> /s)	0.02832	cubic meter per second (m <sup>3</sup> /s)
feet per year (ft/yr)	0.3048	meter per year
gallons per minute (gal/min)	0.06309	liter per second

<sup>1</sup>The unit hectare is used with the International System of Units (SI), which is in common everyday use throughout the world. See: Taylor, B.E., and Thompson, Ambler, eds., 2008, The International System of Units (SI): U.S. Department of Commerce, NIST Special Publication 330, 92 p., available online at <http://www.nist.gov/pml/pubs/sp330/>.



# YELLOWSTONE RIVER COMPACT COMMISSION

## WYOMING

BRANDON GEHBART  
STATE ENGINEER

Wyoming State Engineer's Office  
122 W 25th Street  
Herschler Building  
2nd Floor West  
Cheyenne, Wyoming 82002

## UNITED STATES

JOHN M. KILPATRICK  
CHAIRMAN

U. S. Geological Survey  
3162 Bozeman Avenue  
Helena, Montana 59601

## MONTANA

ANNA PAKENHAM STEVENSON  
ADMINISTRATOR

Water Resources Division  
Montana Dept. of Natural Resources  
and Conservation  
1424 9th Avenue, P.O. Box 201601  
Helena, Montana 59620-1601

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Honorable Mark Gordon  
Governor of the State of Wyoming  
Cheyenne, Wyoming 82002

Honorable Greg Gianforte  
Governor of the State of Montana  
Helena, Montana 59620

Honorable Kelly Armstrong  
Governor of the State of North Dakota  
Bismarck, North Dakota 58501

Dear Governors:

Pursuant to Article III of the Yellowstone River Compact, the Commission submits the following seventy-second annual report of activities for the period ending September 30, 2024

## Minutes of December 12, 2024

### 1. Introductions

Members of the Yellowstone River Compact Commission convened in-person and virtually on December 12, 2024. In attendance were Mr. John Kilpatrick, U.S. Geological Survey (USGS), Chairman and Federal Representative; Mr. Brandon Gebhart, Wyoming State Engineer's Office (SEO) and Commissioner for Wyoming; and Ms. Anna Pakenham Stevenson, Montana Department of Natural Resources and Conservation (DNRC) and Commissioner for Montana.

Also in attendance were Mr. Jack Morey, Ms. Michelle Hubbard, Mr. Joshua Fredrickson, and Mr. David Schroeder, SEO; Mr. Mark Elison, Ms. Christine Schweigert, Mr. John Lunzer, Mr. Todd Blythe, and Mr. Jacob Mohrmann, DNRC; Ms. Abigail Boudewyns and Mr. Chris Brown, Wyoming Attorney General's Office; Ms. Christy Meredith, Montana Department of Environmental Quality; Mr. Jason Whiteman, Northern Cheyenne Tribes; Mr. Bryce Klasen, North Dakota Department of Water Resources; Mr. Clayton Jordan, Mr. Nerea Belay, Mr. David Merrell, and Ms. Elizabeth Cresto, Bureau of Reclamation; Mr. Tony Anderson and Ms. Jane Fogleman, National Weather Service; Mr. Chris Morris, Bureau of Land Management; Ms. Madison May, Ms. Stacy Kinsey, Mr. Aroscott Whiteman, Mr. Aaron Fiaschetti, and Mr. Seth Davidson, USGS; and Mr. Mark Fix, Public.

### 2. Review and approval of the agenda (action)

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Mr. Kilpatrick led a review of the agenda. A request was made to rearrange some of the agenda items to align with coinciding commitments of Commissioner Gebhart. The following was proposed:

- Move “Yellowstone River Compact Commission [YRCC] Technical Advisory Committee [TAC] Report” to be agenda item 6.
- Move “Montana Tongue River diversions” to be agenda item 7.
- The agenda would continue as is starting with “Water year administration highlights for water year 2024” now being agenda item 8.

One additional request was made by Ms. Hubbard to add the following topic to the agenda: review of the 2020 YRCC resolution and water rights reporting requirements. This was added as agenda item 12.

A motion was made to approve the agenda as modified; the motion passed.

### 3. Action items from the 2023 meeting

- a. Monitoring of Montana Tongue River Diversions

Mr. Kilpatrick led a review of the action item from the 2023 meeting and noted the item will be completed under agenda item 7.

### 4. Annual budgets for the period July 2025 through June 2026

- a. Discussion of USGS streamgaging costs

Ms. May led a review of the costs to operate seven streamgages and produced the annual report for the 2025 water year. The overview included a breakout of the costs for the SEO, DNRC, and USGS.

Commissioner Gebhart asked what the cost increase was from last year. Ms. May replied that the increase was 4.5 percent.

- b. Approval of costs

A motion was made to approve the costs for 2025, and the motion passed.

### 5. Report on 2024 water year streamflow conditions and reservoir contents

Mr. Aroscott Whiteman led a presentation of streamflow conditions for the 2024 water year. Annual streamflow conditions were near average in the Bighorn, Little Bighorn, and Tongue River basins. Annual flows on the Clarks Fork and Powder River basins were approximately 85 percent of average.

Mr. Fiaschetti led a presentation of reservoir conditions for the 2024 water year. Overall, total reservoir contents in the Tongue, Powder, Clarks Fork, and Bighorn basins were approximately 300,000 acre-feet lower than at the end of the water year 2023. It was pointed out that even with average flows in the Bighorn Basin (the basin with typically the highest streamflow yields and storage), reservoir contents were more comparable to a below-average year.

Mr. Jordan indicated that 2024 was dry during the irrigation season, and additional storage water was used to meet irrigation demands.

## 6. YRCC TAC report

- a. Appointment of new members and review of current members to the TAC.

Ms. Hubbard led the discussion of current members and asked commissioners if any additions were needed. A discussion occurred, and it was noted that the TAC chairs needed to contact Mr. Anderson to discuss the appointment of a member from the National Weather Service.

Mr. Kilpatrick asked if any additional USGS members were needed. It was noted that Mr. Fiaschetti would replace Mr. Davidson on the TAC.

**Action:** Ms. Hubbard and Mr. Mohrmann will reach out to the National Weather Service to identify a TAC member.

- b. Summary of 2024 TAC activities
  - i. Montana call guide update

Mr. Lunzer led a presentation on how the Montana call guide (Excel spreadsheet) worked for 2024. Early in the spring (before runoff started) hydrologic and reservoir conditions had indicated that a call might be needed. However, Montana recognized that Tongue River Reservoir storage was generally above normal, and that substantial runoff in the Tongue Basin had not begun. They also communicated with Wyoming that a wait-and-see approach would be used to determine if conditions improved. Once runoff started, Montana made the decision not to call for water.

Ms. Hubbard asked how the guide is updated based on releases (of post-1950 contracts) out of Tongue River Reservoir. Mr. Lunzer stated the target fill volume is adjusted based on the water released for post-1950 contracts. The projections tab in the call guide was created to help people check in/out of the reservoir as the season progresses.

Commissioner Gebhart stated it was mentioned that 2024 was a one-off year (early conditions indicated a call, but a call was not needed)—how will you define those going forward? Mr. Lunzer replied the hydrologic conditions in 2024 made us think about reservoir contents and the gray area around when to call. Instead of calling, they used an approach of communication and watching the weather. They are learning the bounds of the spring conditions and the unpredictability of rain.

Mr. Schroeder expressed appreciation for Montana's consideration and thoughtfulness around the decision-making process in 2024. Wyoming reservoir owners had been more conservative with reservoir releases and carrying over more contents than in the past, expecting a call to be made. They appreciate the communication.

- ii. Forecasting improvement efforts
  - 1. Outline of future work

Ms. Hubbard led the discussion, indicating progress has been slow since the TAC only met in April this year. Ms. Hubbard and Mr. Mohrmann indicated they will work to determine how the TAC can continue to support forecast improvements. A summary document will be produced by the TAC outlining forecast improvement support.

Commissioner Gebhart indicated better forecasting is needed in the basin and offered encouragement to the TAC to continue its work. Mr. Kilpatrick agreed.

**Action:** TAC will produce a summary document describing how the TAC can continue supporting forecast improvements by the next YRCC Annual Meeting.

- iii. Provide support for the USGS 2100 project

Ms. Hubbard led the discussion concerning the project. The TAC will continue to support the project with any requested data, information, and technical support.

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Mr. Fix asked if there are any expected changes to flows after the big fire in the Bighorns this year? Mr. Schroeder replied they have been working with local municipalities and the National Weather Service to install additional sensors for precipitation and water quality. There is a concern that turbidity could impact municipal water supply intakes.

Mr. Kilpatrick asked Mr. Schroeder if the SEO is installing flood warning streamgages? Mr. Schroeder replied there is already a flood warning network of streamgages in the basin operated by Sheridan County and their contractor. The National Weather Service is currently working to further precipitation instrumentation on these gages, and potentially some SEO gages. The flood warning gages are generally closer to Sheridan, whereas the SEO gages are at the mouths of the river canyons upstream.

Mr. Fix asked if the Tongue River Near Dayton, Wyoming, gage (former USGS site 06298000) was still operational? Mr. Schroeder replied the SEO took over operation of that streamgage in 2022. The data can be found on the SEO gaging website: <https://seoflow.wyo.gov>.

#### 7. Montana Tongue River diversions

- a. Summary of discussion between legal requirements of monitoring T&Y Canal and other diversions.

Commissioner Pakenham Stevenson gave a presentation covering:

##### T&Y Canal:

The T&Y Canal has a measurement device (a cantilever staff gage and rating curve) that is used by water users to determine flows. The DNRC has expressed interest in adding the T&Y Canal as a monitoring site to their real-time streamgage network. However, water users have not felt the need to have real-time data. Commissioner Pakenham Stevenson noted that the DNRC cannot legally require measurement on the T&Y Canal.

##### Reservoir accounting:

Releases for contract water out of Tongue River Reservoir are reported by the Tongue River Water Users Association. Any post-1950 water contracts are deducted from the reservoir fill target (in the Montana call guide).

##### Communication:

Montana will communicate the target fill volume and scheduled releases for Tongue River Reservoir each day via email. Contract deliveries are measured as releases from the Tongue River Reservoir, not at the headgate.

Mr. Schroeder (referencing the inability of the Montana DNRC to require measurement on the T&Y Canal) asked why does the DNRC Stream and Gage Explorer [STAGE] webpage have canals, and is there something different about those canals from the T&Y Canal? Mr. Lunzer replied most of the canals on the STAGE page are State-owned.

Mr. Kilpatrick asked if the T&Y Canal water users were willing to have real-time gage data and is it possible? Mr. Lunzer replied yes, they have a stilling well and cantilever staff gage that are both functional. The DNRC periodically takes measurements at the site to update the rating curve for water users.

Mr. Fredrickson asked if anyone has communicated to the T&Y Canal about how important that data would be? Mr. Lunzer replied yes.

Mr. Schroeder asked how much does the observed flow near the mouth (USGS gage: Tongue River at Miles City) play into operations for the T&Y Canal and the Tongue River Reservoir? Mr. Lunzer replied the distance (between the reservoir and the mouth) creates a situation where the reservoir operators cannot decrease releases (that is, for a rain event) because the lag time is so great that if the storm does not pan out, the time to get water back down to the mouth is too great. Mr. Fix indicated that

the decommissioned USGS gage (Tongue River above T&Y Diversion Dam near Miles City) was better for operations because it provided more accurate data for water levels near T&Y diversion dam. Mr. Kilpatrick indicated that the gage (operated from 2004 to 2011) was related to monitoring coal bed methane activities in the Tongue River Basin.

#### 8. Water year administration highlights for water year 2024

##### a. Wyoming

Mr. Schroeder noted the 2024 water year was a struggle; it started with high reservoir carryover and below-average snowpack in the Tongue and Powder River basins. Spring rain and snow brought the basin to near normal for water supplies. Major storage reservoirs filled and spilled, streamflow peaks were near normal, but flows dropped below normal into the summer months due to drought.

Administration was more than normal due to the lower flow conditions. Storage was heavily needed to supplement water supplies, resulting in a lower-than-normal fall reservoir carryover.

Mr. Fredrickson noted weather and snowpack in the Bighorn River were like the Tongue and Powder Rivers. Streamflow peaks were near/below normal with no flooding. All of Division 3 was classified as being in severe drought by the U.S. Drought Monitor by midsummer. Storage was heavily utilized to supplement water supplies in 2024, resulting in less than normal fall carryover storage.

Administration was similar to 2023 (a wetter year), which was surprising based on the dry conditions.

##### b. Montana

Mr. Elison noted Montana had no water commissioners or administration in the basin. No new surface-water permits, or water rights were issued in the lower Yellowstone River Basin. Treasure County Conservation District did use some of its streamflow reservation in 2024. The DNRC granted some exempt wells permits (less than 10 acre-feet per year), noting that applications for exempt wells had dropped compared to previous years. Three change authorizations were granted to change the point of diversion and place of use, or add stock tanks to an existing system.

Commissioner Gebhart asked was there legislation to hire water commissioners for the Tongue River? Commissioner Pakenham Stevenson replied approximately 5 years ago there was an unsuccessful pilot to hire State-based commissioners. Right now, the State is not contemplating having commissioners being State employees.

Mr. Schroeder asked were any of the change authorizations granted in the Tongue River Basin? Mr. Elison replied no.

A discussion amongst the Commissioners occurred about the order of the agenda, and for efficiency, the following action item arose.

**Action:** The agenda for the 2025 YRCC annual meeting will include water year streamflow conditions, administration, and adjudication combined into one agenda item. These will be covered by the SEO and DNRC. The USGS will continue to present on reservoir conditions.

##### c. Acknowledgement of 2024 water rights information changes by November 1

For the record, 2024 water rights were exchanged by Montana and Wyoming prior to November 1.

#### 9. State adjudications updates

##### a. Montana statewide adjudication

Mr. Elison noted adjudications are picking up and getting closer to final decree.

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### b. Wyoming board of control update on new adjudications

Mr. Schroeder stated Division 2 adjudication activities were mostly tabled with the busy stream administration year. Safety of dams inspections are required and continued in 2024, with 85 dams inspected. Most adjudications were concerned with dams or stock reservoirs. Currently, there are 18 petitions for surface-water changes and one for groundwater.

Mr. Fredrickson stated within Division 3, 19 surface-water and 4 groundwater adjudications were completed in 2024.

Mr. Elison asked how does Wyoming handle surface-water and groundwater connection for permits/administration? Mr. Schroeder replied it is usually left up to the local knowledge of the Superintendent, and whether the sources are interconnected so as to constitute as one source of supply. A request is then made to note the source is commingled in the tabulation of water rights. Ms. Hubbard noted that surface-water and groundwater permitting divisions are separate. Mr. Fredrickson noted that if there is an interference complaint related to a groundwater source, it goes to the groundwater division.

### 10. Update of Tongue River Future Forecasting Project

Mr. Blythe stated the project is future looking to understand changes in water supply out to the year 2100. They are using global climate models, hydrologic models, and river accounting models to determine future streamflow estimates. In 2024, the river accounting model is being created using RiverWare software and is being calibrated.

Commissioner Pakenham Stevenson asked at the end of this project how do you foresee the Commission utilizing this information and data (besides planning)? Mr. Blythe replied having the naturalized streamflow for all catchments will be helpful for streamflow forecasting, especially at the State line.

Mr. Kilpatrick asked how will the Northern Cheyenne Tribe use the information and data? Mr. Jason Whiteman replied the goal is to improve forecasting in the basin for water management. Mr. Whiteman updated the group that two snow monitoring stations will be installed as part of the 2100 Project in the Bighorn Mountains in 2025.

Mr. Anderson noted the forecasting agencies, including the National Weather Service and Natural Resources Conservation Service, should talk with the water management modelers. Mr. Jason Whiteman added that the Northern Cheyenne Tribe would like to be involved in that discussion.

**Action:** Mr. Barnhart of the USGS/Mr. Blythe will set up a call with the forecasting agencies and the Northern Cheyenne Tribe to discuss possibilities of integrating the project products with forecasting. A report out of this discussion will be added as a TAC agenda item in the spring.

### 11. Update on Wyoming Water Planning and Other Activities

Ms. Hubbard noted the installation of the U.S Army Corps of Engineers Upper Missouri River Basin Plains Snow and Soil Moisture Monitoring Network continues. The program has added a substantial amount of monitoring sites in 2023 and 2024.

Mr. Schroeder stated the Ten Reservoirs in Ten Years project has one site (Bull Creek) in Division 2 and two sites (enlarged Leavitt and Alkali) in Division 3. Currently, the potential construction cost remains prohibitive on the Bull Creek project, and it remains idle.

Commissioner Pakenham Stevenson noted that Montana is looking to propose large scale investment in storage, and they are using the Wyoming program as a model.

### 12. Review of the 2020 YRCC resolution and water rights reporting requirements

Ms. Hubbard led an overview of the resolution, noting that all surface-water rights in the basin are required to be shared in 2025, as opposed to only new permits or changes to existing permits. A discussion occurred and the following action item arose.

**Action:** Add sharing of water rights per the 2020 YRCC resolution for the 2025 meeting agenda.

### 13. YRCC annual report

- a. Asking for feedback on the current report format and if any additional information is needed.

Mr. Kilpatrick brought up that the report has been in the same format for many years and asked the commissioners if the report was still meeting the Commission's needs. A discussion among the commissioners occurred and they recommended that the TAC review the report format and make recommendations on how the report could be improved going forward.

Mr. Kilpatrick thanked Mr. Davidson for all his work on the YRCC as secretary and improvements to the report during his tenure.

**Action:** TAC to suggest a new format for the annual report for consideration at the 2025 commission meeting. The proposed changes would be for the 2025 report going forward.

### 14. Public comments

Mr. Jason Whiteman noted there is a joint funding agreement with USGS to monitor four alluvial groundwater wells near streamflow gages on the Tongue River. Hopefully the wells can be drilled in early 2025.

### 15. Agency updates

Mr. Schroeder stated the SEO is tracking a draft bill in front of the Wyoming Legislature that may extend the life of temporary water use agreements from 2 years to 5, with one extension allowed.

Mr. Kilpatrick noted USGS staffing changes: Aroscoff Whiteman is acting as the Branch Chief for Data, Stacy Kinsey is acting as the Data Operations Chief, and Madison May is helping with Data Program Management activities, including tracking funding agreements. Mr. Kilpatrick is no longer the Center Director and has transitioned to a long-term acting role working on international issues with Canada, although his role with the YRCC will not change.

### 16. Arrangements for next year's technical and annual meetings

Wyoming will be hosting the 2025 meetings. The group determined the following schedule:

- A virtual TAC meeting will be held 10–12 a.m. on Monday, April 14, 2025.
- Annual meeting will be held in the afternoon on Thursday, December 11, 2025.

**Action:** Wyoming to send save the dates for the spring TAC and Annual meetings.

Meeting adjourned.

Summary of Action Items:

- **Action:** Ms. Hubbard and Mr. Mohrmann to reach out to the National Weather Service to identify a TAC member.
- **Action:** TAC to produce a summary document describing how TAC can continue to support forecast improvements by the next YRCC Annual Meeting.

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- **Action:** The agenda for the 2025 annual meeting will include water year streamflow conditions, administration, and adjudication combined into one agenda item. These will be covered by the SEO and DNRC. The USGS will continue to present on reservoir conditions.
- **Action:** Mr. Barnhart/Mr. Blythe to set up a call with the forecasting agencies and the Northern Cheyenne Tribe to discuss possibilities of integration this work with forecasting. A report out of this discussion will be added as a TAC agenda item in the spring.
- **Action:** Add sharing of water rights per the 2020 YRCC resolution to the 2025 meeting agenda.
- **Action:** TAC to review and potentially suggest a new format for the annual report for consideration at the 2025 commission meeting. The proposed changes would be for the 2025 report and annual reports after that.
- **Action:** Wyoming to send save the dates for the spring TAC and Annual meetings.



Brandon Gebhart  
Commissioner for Wyoming



Anna Pakenham-Stevenson  
Commissioner for Montana



JOHN KILPATRICK  
2024.03.12  
10:49:12 -06'00'

John M. Kilpatrick  
Chairman and Federal Representative

## General Report

### Operation and Budget

Work funded by the Yellowstone River Compact Commission has been primarily concerned with the collection of required hydrologic data and funded through cooperative arrangements whereby Montana and Wyoming each bear an equal share of the cost, with the remaining cost borne by the United States. Salaries and necessary expenses of State and U.S. Geological Survey representatives to the Commission and the cost to other agencies of collecting hydrologic data are not considered as expenses of the Commission.

The expenses of the Commission during Federal fiscal year (FY) 2024 were \$153,300, in accordance with the budget adopted for the year.

The estimated budget for Federal FY2025 was approved, and proposed budgets for fiscal years 2026, 2027, 2028, and 2029 were tentatively adopted subject to availability of appropriations. Operational costs of Agency Canal and White Horse Canal, which are necessary to compute flows according to the Compact, are also included. The budgets for the 5 fiscal years are summarized as follows:

**Table 1.** Estimated operational budget for fiscal years 2025–28.

Fiscal year	Budget by agency			Total budget
	Wyoming State Engineer	Montana Department of Natural Resources and Conservation	U.S. Geological Survey	
2025	\$48,120	\$48,120	\$64,160	\$160,400
2026	\$50,530	\$50,530	\$64,160	\$165,220
2027	\$53,420	\$53,420	\$64,160	\$171,000
2028	\$56,840	\$56,840	\$64,160	\$177,840
2029	\$60,400	\$60,400	\$64,160	\$184,960

### Streamgauge Operation

Operation of five U.S. Geological Survey streamgages at the measuring sites specified in the Yellowstone River Compact continued in water year 2024. Each station produced satisfactory records. Streamgages, along with reservoir-content stations, are shown on a map of the Yellowstone River Basin at the end of this report.

The Commission is primarily interested in the streamflow near the mouths of the Clarks Fork Yellowstone River, Bighorn River, Tongue River, and Powder River. Although the Little Bighorn River is excluded from the Yellowstone River Compact, its inclusion is necessary to compute streamflows of the Bighorn River in accordance with the Compact whereby the streamflow of the Little Bighorn River (including streamflow from Agency Canal) is subtracted from the streamflow of the Bighorn River. Additionally, the Bighorn River streamflow is adjusted monthly with the change in contents of Bighorn Lake.

During water year 2024, annual streamflow was normal (normal is defined in this report as 80 to 120 percent of average) at all streamgages. Information and statistics about the 2024 and 2023 annual streamflows at compact streamgages are displayed in [table 2](#).

Tabulation of streamflow records for water year 2024 ([tables 3–7](#)) and graphical comparisons of the statistical distribution of monthly streamflow, annual streamflow, and annual departures from mean annual streamflow ([figs. 1–4](#)) are provided in the “Summary of Discharge for Yellowstone River Compact Streamgages” section. Tabulated streamflow records do not account for depletions from irrigation and other uses unless otherwise noted.

### Diversions

No diversions were regulated by the Commission during water year 2024.

## Reservoir Contents

### Reservoirs Completed after January 1, 1950

As a matter of record and general information, month-end contents data (tables 8–10) and descriptions of these reservoirs are given in the “Month-End Contents for Yellowstone River Compact Reservoirs Completed after January 1, 1950” section of this report. Boysen Reservoir, located on the Wind River and operated by the Bureau of Reclamation, began the water year with 672,770 acre-feet (acre-ft) in contents and ended the water year with 573,120 acre-ft. Anchor Reservoir, located on South Fork Owl Creek and operated by the Bureau of Reclamation, began the water year with 1,768 acre-ft in contents and ended the water year with 475 acre-ft. Bighorn Lake, located on the Bighorn River and operated by the Bureau of Reclamation, is the largest reservoir in the Yellowstone River Basin and began the water year with 988,258 acre-ft in contents and ended the water year with 924,206 acre-ft.

### Reservoirs Existing on January 1, 1950

As a matter of record and general information, month-end contents data for the four reservoirs in existence on January 1, 1950, upstream from the points of measurement, are given in table 11 in the “Month-End Contents for Yellowstone River Compact Reservoirs Existing on January 1, 1950” section of this report. These reservoirs include Bull Lake, Pilot Butte Reservoir, and Buffalo Bill Reservoir operated by the Bureau of Reclamation; and Tongue River Reservoir, operated under the supervision of the Water Resources Division of the Montana Department of Natural Resources and Conservation. These data are pertinent to allocation under Article V, Section C, Item 3 of the Compact.

## Annual Contents of Reservoirs

Information on reservoir contents at the end of the 2024 and the previous water year for the 7 reservoirs listed above, in addition to 38 additional reservoirs with storage capacity greater than 1,000 acre-ft, was compiled at the request of the Commission. This information is provided in table 12 in the “Water-Year-End Contents for Yellowstone River Compact Reservoirs or Lakes” section.

**Table 2.** Annual streamflow statistics at Yellowstone River compact streamgages.

Station number	Streamgage	Percentage of average streamflow for water year 2024 <sup>1</sup>	Rank of annual streamflow by water year <sup>2</sup>		Year of lowest annual streamflow (rank equals 1)	Number of years of annual record
			2024	2023		
06208500	Clarks Fork Yellowstone River at Edgar, Montana, minus diversions to White Horse Canal	86	30	54	2001	86
06294500	Bighorn River above Tullock Creek, near Bighorn, Montana, minus Little Bighorn River near Hardin, Montana. (06294000), including Agency Canal Tailwaste near Hardin, Montana; and adjusted for change in contents in Bighorn Lake	99	34	59	2002	71
06308500	Tongue River at Miles City, Montana	96	40	64	1961	81
06326500	Powder River near Locate, Montana	85	41	67	2004	86

<sup>1</sup>Average is based on period of record at each station.

<sup>2</sup>The lowest annual streamflow is a rank of 1.

## Summary of Discharge for Yellowstone River Compact Streamgages

### 06208500 Clarks Fork Yellowstone River at Edgar, Montana

LOCATION.—Lat 45°27'56.57", long 108°50'38.78" referenced to North American Datum of 1983, in SE¼SE¼SE¼ sec. 23, T. 4 S., R. 23 E., Carbon County, Hydrologic Unit 10070006, on right bank 400 ft downstream from county bridge, 0.5 mi east of Edgar, 6 mi upstream from Rock Creek, and at river mile 22.1.

DRAINAGE AREA.—2,034 mi<sup>2</sup>.

PERIOD OF RECORD.—July 1921 to September 1969, October 1986 to present.

REVISED RECORDS.—Water Supply Paper (WSP) 1509: 1924; 1932, maximum discharge. WSP 1729: Drainage area. Water Data Report MT-04-1: Drainage area.

GAGE.—Water-stage recorder. Elevation of gage is 3,460 ft, referenced to the National American Vertical Datum of 1988. Prior to August 31, 1953, nonrecording gage located at same site and elevation.

REMARKS.—Diversions for irrigation occur downstream from the station. In addition, lands upstream from the station are irrigated by diversions from the adjoining Rock Creek Basin. Discharge values and summary statistics prior to October 2016 have the diversions of daily mean discharge to White Horse Canal subtracted. Daily values with White Horse Canal subtracted continue to be available in the [Adjusted for White Horse Canal] parameter.

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**Table 3.** Daily mean discharge for Clarks Fork Yellowstone River at Edgar, Montana (06208500), minus diversions to White Horse Canal near Silesia, Mont. (06208790), October 2023 through September 2024.

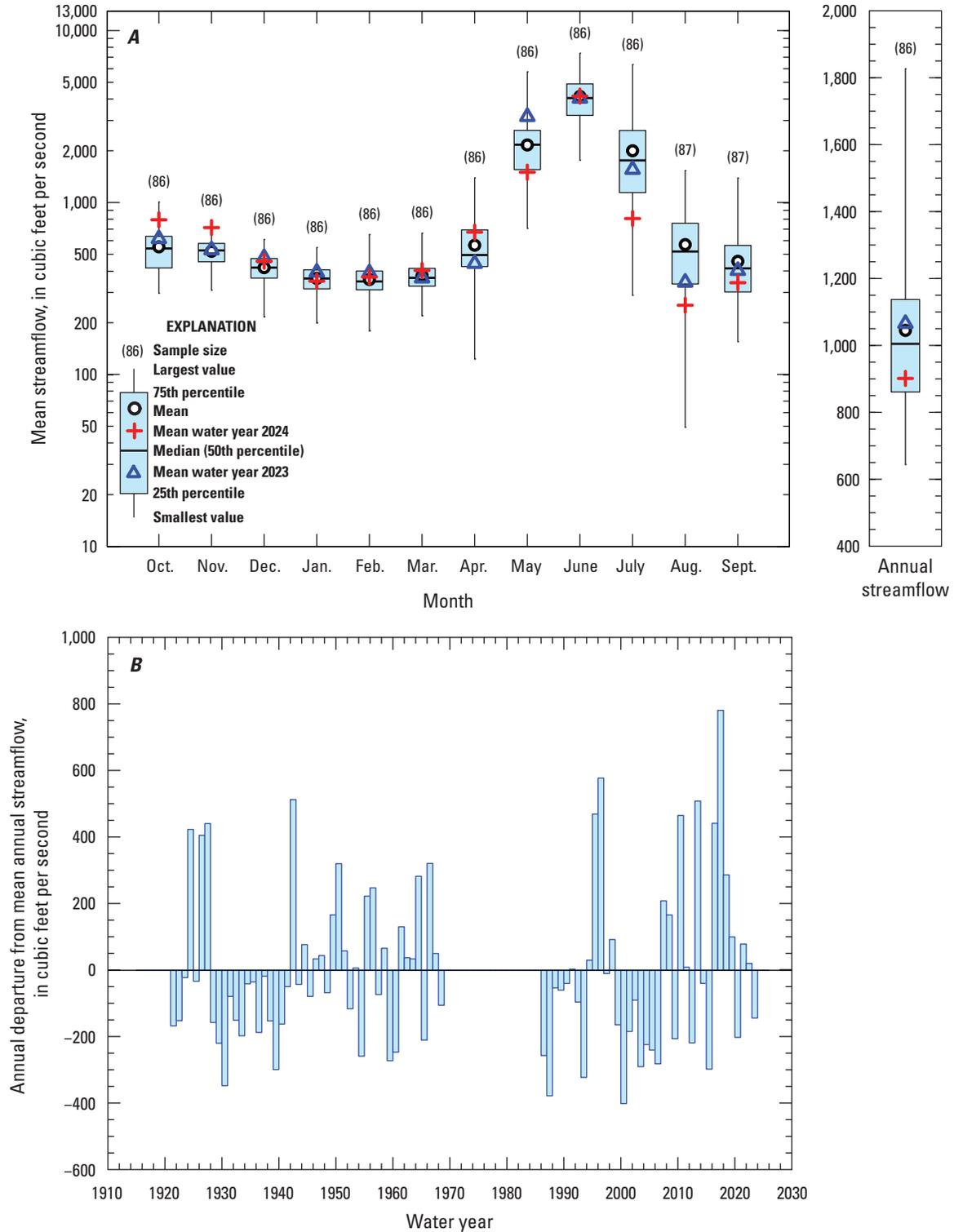
[Discharge is in cubic feet per second. Abbreviations: acre-ft, acre-feet; e, estimated; Max, maximum; Min, minimum. Symbol: --, no data]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	597	850	e494	e389	e393	396	408	908	2,170	1,710	345	147
2	596	859	e511	e384	e386	398	400	818	2,410	1,710	281	143
3	607	856	e517	e366	e393	393	397	722	2,610	1,750	247	137
4	609	853	e530	e345	e405	e362	429	659	3,870	1,630	237	136
5	619	840	575	e344	e427	e323	537	605	5,040	1,400	253	133
6	621	870	586	e355	422	e304	621	678	6,430	1,150	255	132
7	616	919	579	e347	410	e314	664	758	7,100	1,030	295	128
8	606	900	561	e261	402	e320	547	753	7,180	914	332	128
9	590	861	552	e315	397	e335	494	936	7,070	816	344	131
10	568	814	e494	e311	396	e374	e470	838	7,340	778	353	132
11	593	763	e434	e285	390	402	e464	779	8,050	793	375	140
12	810	777	e475	e284	e373	407	e451	1,020	7,140	828	363	165
13	1,200	763	e458	e319	e340	414	e469	1,430	6,490	847	337	181
14	990	728	e434	e372	e314	411	e586	1,880	5,880	855	287	191
15	906	724	e400	e365	e300	396	e772	2,070	5,630	821	308	212
16	849	712	e441	e339	e273	382	e947	2,050	5,100	806	292	198
17	915	697	e458	e342	e260	387	e839	2,340	4,200	705	260	197
18	946	689	e458	e352	e332	400	e776	2,680	3,210	635	261	255
19	900	674	e459	e356	e356	408	e653	2,440	2,480	614	242	540
20	888	671	e496	e360	e384	442	e663	2,230	1,950	593	220	962
21	859	660	493	e360	e381	475	e612	2,010	1,650	594	215	808
22	857	628	489	e358	e402	541	e611	1,800	1,670	545	204	727
23	844	613	e459	e336	398	519	e682	1,890	1,990	483	205	693
24	879	654	e426	e362	388	475	e728	2,180	2,590	426	196	666
25	925	e589	e357	e370	386	460	e811	1,640	3,070	405	185	606
26	922	e538	e302	e352	e388	431	e1,090	1,470	2,940	389	179	549
27	914	e481	e297	e377	e361	420	e1,100	1,450	2,790	399	171	496
28	914	e507	e327	e375	e341	418	e1,050	1,390	2,770	388	156	469
29	899	e521	e354	e389	e351	409	e1,010	1,720	2,450	375	152	464
30	833	e516	e373	e393	--	407	e982	2,260	1,980	361	162	429
31	823	--	e397	e395	--	409	--	2,320	--	366	153	--
<b>Total</b>	<b>24,700</b>	<b>21,530</b>	<b>14,190</b>	<b>10,860</b>	<b>10,750</b>	<b>12,530</b>	<b>20,260</b>	<b>46,720</b>	<b>125,300</b>	<b>25,119</b>	<b>7,865</b>	<b>10,290</b>
<b>Mean</b>	<b>797</b>	<b>718</b>	<b>458</b>	<b>350</b>	<b>371</b>	<b>404</b>	<b>675</b>	<b>1,507</b>	<b>4,175</b>	<b>810</b>	<b>254</b>	<b>343</b>
<b>Max</b>	<b>1,200</b>	<b>919</b>	<b>586</b>	<b>395</b>	<b>427</b>	<b>541</b>	<b>1,100</b>	<b>2,680</b>	<b>8,050</b>	<b>1,750</b>	<b>375</b>	<b>962</b>
<b>Min</b>	<b>568</b>	<b>481</b>	<b>297</b>	<b>261</b>	<b>260</b>	<b>304</b>	<b>397</b>	<b>605</b>	<b>1,650</b>	<b>361</b>	<b>152</b>	<b>128</b>
<b>Acre-ft</b>	<b>48,980</b>	<b>42,700</b>	<b>28,140</b>	<b>21,540</b>	<b>21,230</b>	<b>24,860</b>	<b>40,190</b>	<b>92,680</b>	<b>248,400</b>	<b>49,820</b>	<b>15,600</b>	<b>20,420</b>

### Summary statistics

	Water year 2024	Water years 1921–2024*
<b>Annual total</b>	330,100	--
<b>Annual mean</b>	902	1,045
<b>Annual runoff (acre-ft)</b>	655,100	757,300

\*During periods of operation (water years 1921–69, 1987 to current year [2024]).



**Figure 1.** Streamflow data for Clarks Fork Yellowstone River at Edgar, Montana (06208500), minus diversions to White Horse Canal near Silesia, Mont. (06208790), water years 1921–2024. *A*, Boxplots showing statistical distribution of monthly and annual streamflow. *B*, Annual departure from the mean annual streamflow.

## 06294000 Little Bighorn River near Hardin, Montana

LOCATION.—Lat 45°44′08.47", long 107°33′26.89" referenced to North American Datum of 1983, in SE¼ NE¼NE¼ 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<sup>2</sup>.

PERIOD OF RECORD.—June 1953 to present.

REVISIONS HISTORY.—Water Data Report MT-86-1: 1978. Gage height and discharge data for the period Apr. 28 to June 19, 2017, were revised on Dec. 12, 2019, based on reanalysis of reference readings.

GAGE.—Water-stage recorder. Elevation of gage is 2,882.29 ft, referenced to the National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to October 7, 1953, nonrecording gage located at site 0.4 mi downstream. October 7, 1953, to May 6, 1963, water-stage recorder located at site 0.3 mi downstream. May 6, 1963, to November 6, 1963, nonrecording gage located at site 0.4 mi downstream. All locations had different elevations. November 7, 1963, to August 15, 1976, water-stage recorder located at site 35 ft downstream at present elevation. August 15, 1976, to September 30, 1979, water-stage recorders were located on each bank downstream from Sarpy Road Bridge and were used depending on control conditions.

REMARKS.—Flow partly regulated by Willow Creek Reservoir (capacity 23,000 acre-ft). Numerous diversions for irrigation occur upstream from station. Discharge values and summary statistics prior to October 2016 have the diversions of daily mean discharge to Agency Canal included. Daily values with Agency Canal included continue to be available in the [Adjusted for Agency Canal] parameter.

**Table 4.** Daily mean discharge for Little Bighorn River near Hardin, Montana (06294000), including diversions to Agency Canal, October 2023 through September 2024.

[Discharge is in cubic feet per second. Abbreviations: acre-ft, acre-feet; e, estimated; Max, maximum; Min, minimum. Symbol: --, no data]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	184	265	e205	e169	e171	e172	202	273	993	324	125	107
2	187	267	e214	e169	e169	e172	200	289	928	312	114	104
3	194	273	e235	e166	e171	e171	206	286	931	334	113	99
4	205	276	e223	e165	e170	e173	209	279	988	325	109	94
5	224	279	223	e167	e170	e173	205	269	1,050	318	110	92
6	217	272	219	e161	e170	e175	254	316	1,100	310	117	82
7	212	263	217	e159	e171	e175	e324	452	1,150	297	131	85
8	205	252	219	e151	e170	e178	e410	971	1,150	277	127	85
9	200	250	217	e150	e170	e178	e584	1,230	1,130	264	137	85
10	211	246	213	e153	e170	e184	587	1,630	1,130	242	144	93
11	203	239	209	e138	e170	192	580	1,220	1,120	220	152	94
12	216	237	e202	e103	e171	197	520	886	1,100	207	150	94
13	299	237	e200	e94.6	e171	202	404	746	1,000	209	146	105
14	557	235	185	e98.7	e171	204	346	729	918	202	149	101
15	406	232	184	e110	e169	208	338	809	843	188	146	105
16	327	229	e174	e124	e159	208	341	882	782	168	138	104
17	291	227	e191	e130	e156	201	336	883	733	169	132	112
18	273	226	e189	e127	e159	197	345	896	692	179	126	126
19	268	226	e195	e128	e162	193	355	958	674	180	129	130
20	268	223	e195	e138	e166	191	335	891	625	183	123	125
21	263	223	e195	e156	e169	195	318	824	570	171	117	132
22	260	222	e189	e167	e171	198	305	888	542	166	109	127
23	265	218	e195	e166	e173	196	298	1,040	518	165	109	115
24	268	222	e185	e165	e174	201	301	1,240	466	173	109	109
25	e269	227	e165	e164	e174	198	284	1,380	415	160	107	111
26	286	e206	e159	e164	e172	195	279	1,150	385	148	114	110
27	288	e185	e146	e165	e160	190	289	926	370	147	119	101
28	e241	e202	e162	e168	e156	180	298	834	356	142	133	100
29	e239	e192	e168	e171	e167	194	294	791	346	141	142	96
30	e233	e191	e170	e172	--	207	290	881	332	142	138	92
31	252	--	e169	e173	--	220	--	993	--	135	120	--
<b>Total</b>	<b>8,011</b>	<b>7,042</b>	<b>6,012</b>	<b>4,632</b>	<b>4,872</b>	<b>5,918</b>	<b>10,040</b>	<b>25,840</b>	<b>23,340</b>	<b>6,598</b>	<b>3,935</b>	<b>3,116</b>
<b>Mean</b>	<b>258</b>	<b>235</b>	<b>194</b>	<b>149</b>	<b>168</b>	<b>191</b>	<b>335</b>	<b>834</b>	<b>778</b>	<b>213</b>	<b>127</b>	<b>104</b>
<b>Max</b>	<b>557</b>	<b>279</b>	<b>235</b>	<b>173</b>	<b>174</b>	<b>220</b>	<b>587</b>	<b>1,630</b>	<b>1,150</b>	<b>334</b>	<b>152</b>	<b>132</b>
<b>Min</b>	<b>184</b>	<b>185</b>	<b>146</b>	<b>94.6</b>	<b>156</b>	<b>171</b>	<b>200</b>	<b>269</b>	<b>332</b>	<b>135</b>	<b>107</b>	<b>82</b>
<b>Acre-ft</b>	<b>15,890</b>	<b>13,969</b>	<b>11,920</b>	<b>9,188</b>	<b>9,663</b>	<b>11,740</b>	<b>19,910</b>	<b>51,259</b>	<b>46,290</b>	<b>13,089</b>	<b>7,805</b>	<b>6,180</b>
<b>Summary statistics</b>												
							<b>Water year 2024</b>			<b>Water years 1954–2024</b>		
<b>Annual total</b>							109,400			--		
<b>Annual mean</b>							299			278		
<b>Annual runoff (acre-ft)</b>							216,300			201,000		

## 06294500 Bighorn River above Tullock Creek, near Bighorn, Montana

LOCATION.—Lat 46°07'28.10", long 107°28'07.65" referenced to North American Datum of 1983, in SE¼SE¼NE¼ sec. 3, T. 4 N., R. 34 E., Treasure County, Hydrologic Unit 10080015, on right bank 1.9 mi upstream from Tullock Creek, 3.6 mi southwest of Bighorn, 4.5 mi southeast of Custer, and at river mile 3.0.

DRAINAGE AREA.—22,419 mi<sup>2</sup>. Area at site used October 7, 1955, to September 30, 1981, 22,885 mi<sup>2</sup>.

PERIOD OF RECORD.—October 1981 to present. Previously published as "06294700 Bighorn River at Bighorn, MT" from 1956–81, and as "06294700 Bighorn River near Custer" from 1945–55. Streamflows are equivalent at all sites.

GAGE.—Water-stage recorder. Datum of gage is 2,702.36 ft, referenced to the North American Vertical Datum of 1988 (NAVD88), from GNSS survey. Prior to 1/29/2025, the elevation of gage was reported as 2,700 ft above NAVD88.. May 11, 1945, to December 6, 1945, nonrecording gage, and December 7, 1945, to October 6, 1955, water-stage recorder located 1.7 mi upstream at different elevation. October 7, 1955, to September 30, 1981, located at site 2.3 mi downstream at different elevation.

REMARKS.—Streamflow has been regulated by Bighorn Lake since November 1965, with Yellowtail Dam being completed in 1967. Major regulation prior to November 1965 occurred from 14 reservoirs in Wyoming and 1 in Montana. Diversion for irrigation occurs upstream from the station.

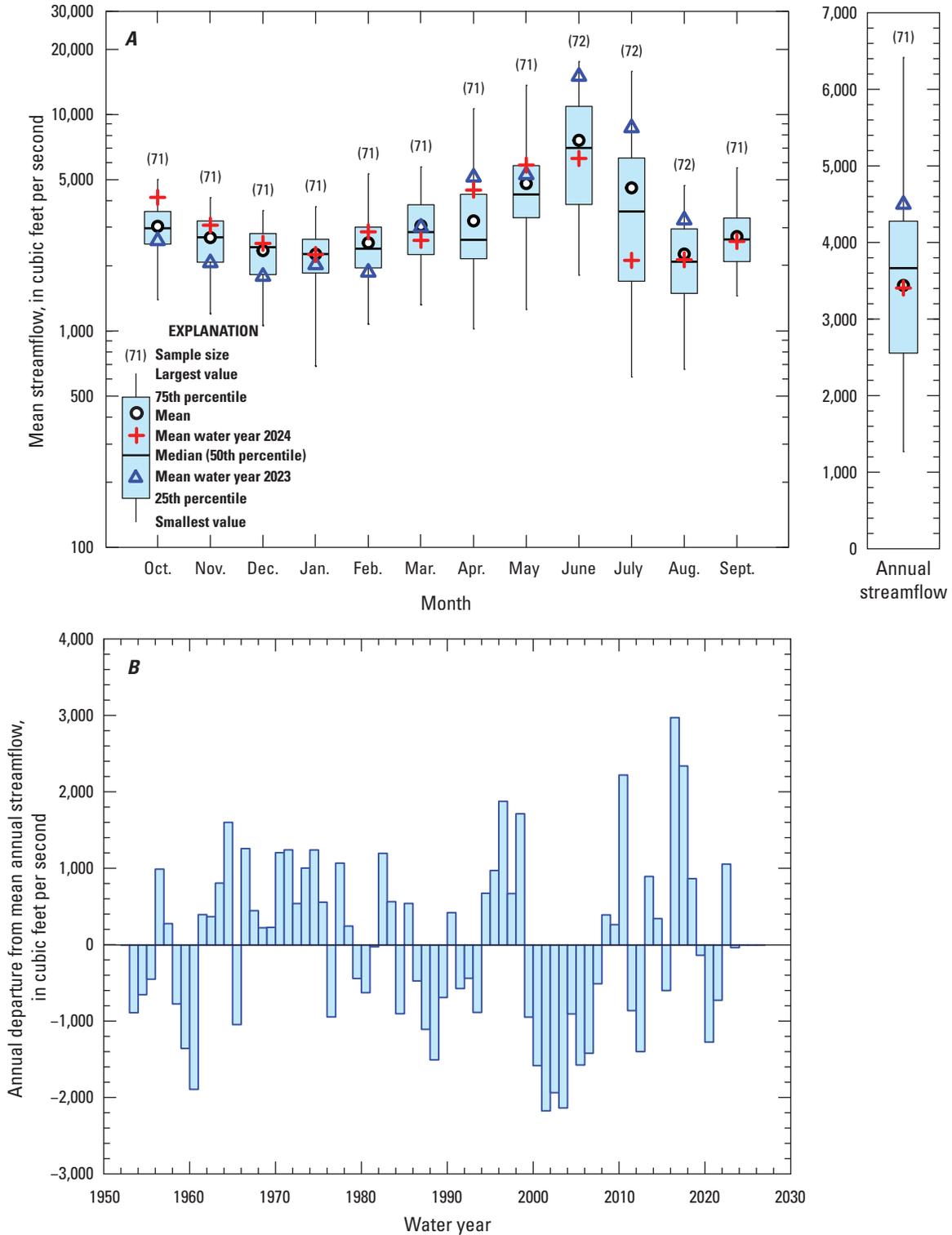
**Table 5.** Daily mean discharge for the Bighorn River above Tullock Creek near Bighorn, Montana (06294500), October 2023 through September 2024.

[Discharge is in cubic feet per second. Abbreviations: acre-ft, acre-feet; e, estimated; Max, maximum; Min, minimum. Symbol: --, no data]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	3,270	4,300	3,360	3,400	3,620	3,310	3,620	6,370	5,870	3,520	2,690	2,540
2	3,330	4,350	3,390	3,390	3,620	3,310	3,620	6,420	5,760	3,500	2,660	2,570
3	3,410	4,330	3,420	3,370	3,620	3,340	3,630	6,420	5,700	3,460	2,640	2,490
4	3,430	4,300	3,450	3,360	3,630	3,310	3,730	6,410	5,620	3,330	2,610	2,480
5	3,480	4,360	3,460	3,370	3,610	3,310	3,960	6,400	5,520	3,140	2,690	2,440
6	3,510	4,390	3,450	3,380	3,600	3,280	4,140	6,610	5,470	3,090	2,630	2,510
7	3,530	4,290	3,380	3,380	3,610	3,240	4,370	6,620	5,200	3,090	2,800	2,700
8	3,560	4,150	3,320	3,370	3,600	3,220	4,660	6,580	5,050	3,050	2,710	2,690
9	3,490	4,060	3,320	3,350	3,480	3,210	4,970	6,820	4,980	2,990	2,610	2,690
10	3,480	3,960	3,320	3,340	3,340	3,210	5,100	7,190	4,980	2,940	2,620	2,720
11	3,510	3,990	3,330	e3,340	3,320	3,200	5,100	6,810	4,980	2,820	2,660	2,750
12	3,680	4,010	3,340	e3,380	3,330	3,200	5,130	5,810	5,160	2,800	2,600	2,750
13	4,100	4,030	3,340	e3,500	3,320	3,200	4,960	5,420	5,570	2,790	2,490	2,730
14	4,760	3,970	3,320	e3,470	3,310	3,200	4,840	5,180	5,450	2,790	2,570	2,690
15	4,660	3,880	3,310	e3,470	3,310	3,190	4,790	5,000	5,390	2,860	2,660	2,650
16	4,560	3,850	3,290	e3,470	3,280	3,190	4,780	4,940	5,320	2,810	2,620	2,610
17	4,460	3,800	3,360	e3,480	e3,250	3,180	5,030	4,930	5,340	2,780	2,570	2,650
18	4,390	3,810	3,330	e3,480	3,230	3,170	5,250	4,870	5,280	2,810	2,540	2,830
19	4,420	3,830	3,390	e3,480	3,220	3,170	5,680	4,880	5,030	2,850	2,480	2,860
20	4,460	3,840	3,380	e3,480	3,250	3,160	6,130	4,890	4,830	2,870	2,480	2,720
21	4,510	3,660	3,370	e3,480	3,310	3,170	6,130	4,790	4,650	2,830	2,570	2,680
22	4,590	3,420	3,370	e3,490	3,320	3,180	6,130	4,890	4,350	2,850	2,530	2,650
23	4,690	3,420	3,380	e3,500	3,320	3,170	6,090	5,450	4,190	2,850	2,500	2,600
24	4,520	3,430	3,380	e3,480	3,320	3,210	6,050	6,770	4,190	2,850	2,500	2,610
25	4,500	3,450	3,310	e3,500	3,340	3,190	5,930	7,600	4,010	2,820	2,480	2,630
26	4,610	3,450	3,300	e3,540	3,330	3,160	6,240	6,770	3,650	2,830	2,520	2,560
27	4,500	3,450	3,280	3,560	3,330	3,160	6,450	6,110	3,480	2,820	2,560	2,510
28	4,410	3,470	3,320	3,570	3,240	3,240	6,420	5,850	3,510	2,820	2,600	2,490
29	4,440	3,400	3,350	3,590	3,290	3,460	6,400	5,730	3,500	2,800	2,560	2,470
30	4,510	3,330	3,380	3,590	--	3,590	6,360	5,750	3,510	2,750	2,580	2,430
31	4,400	--	3,400	3,610	--	3,600	--	5,810	--	2,730	2,570	--
<b>Total</b>	<b>127,200</b>	<b>116,000</b>	<b>104,100</b>	<b>107,200</b>	<b>98,350</b>	<b>100,700</b>	<b>155,700</b>	<b>184,100</b>	<b>145,500</b>	<b>91,240</b>	<b>80,300</b>	<b>78,700</b>
<b>Mean</b>	<b>4,102</b>	<b>3,866</b>	<b>3,358</b>	<b>3,457</b>	<b>3,391</b>	<b>3,249</b>	<b>5,190</b>	<b>5,938</b>	<b>4,851</b>	<b>2,943</b>	<b>2,590</b>	<b>2,623</b>
<b>Max</b>	<b>4,760</b>	<b>4,390</b>	<b>3,460</b>	<b>3,610</b>	<b>3,630</b>	<b>3,600</b>	<b>6,450</b>	<b>7,600</b>	<b>5,870</b>	<b>3,520</b>	<b>2,800</b>	<b>2,860</b>
<b>Min</b>	<b>3,270</b>	<b>3,330</b>	<b>3,280</b>	<b>3,340</b>	<b>3,220</b>	<b>3,160</b>	<b>3,620</b>	<b>4,790</b>	<b>3,480</b>	<b>2,730</b>	<b>2,480</b>	<b>2,430</b>
<b>Acre-ft</b>	<b>252,199</b>	<b>230,000</b>	<b>206,500</b>	<b>212,600</b>	<b>195,100</b>	<b>199,800</b>	<b>308,800</b>	<b>365,100</b>	<b>288,700</b>	<b>181,000</b>	<b>159,300</b>	<b>156,100</b>

Summary statistics

	Water year 2024	Water years 1967–2024
Annual total	1,389,000	--
Annual mean	3,795	3,767
Annual runoff (acre-ft)	2,747,500	2,728,700



**Figure 2.** Adjusted streamflow data for Bighorn River above Tullock Creek, near Bighorn, Montana (06294500); minus Little Bighorn River near Hardin, Mont. (06294000) including Agency Canal; and adjusted for change in contents in Bighorn Lake, water years 1954–2024. *A*, Boxplots showing statistical distribution of monthly and annual streamflow. *B*, Annual departure from the mean annual streamflow.

**06308500 Tongue River at Miles City, Montana**

LOCATION.—Lat 46°23'04.54", long 105°50'43.88" referenced to North American Datum of 1983, in SE¼SE¼SE¼ sec. 4, T. 7 N., R. 47 E., Custer County, Hydrologic Unit 10090102, on right bank 1.5 mi south of Miles City and at river mile 2.3.

DRAINAGE AREA.—5,404 mi<sup>2</sup>. Area at site used before October 4, 1995, 5,379 mi<sup>2</sup>.

PERIOD OF RECORD.—April 1938 to April 1942, April 1946 to present. Published as "near Miles City" April 1938 to April 1942. Not equivalent to records published as "near Miles City" May 1929 to October 1932. April 1946 to October 4, 1995, at site 2.5 mi upstream from present site. Streamflows at present site are equivalent with streamflows at site operated from 1946. Monthly discharge only for some periods, published in Water Supply Paper (WSP) 1309.

REVISED RECORDS.—WSP 1729: Drainage area. 2011: Extremes for period of daily record, specific conductance: maximum daily value.

GAGE.—Water-stage recorder. Elevation of gage is 2,351.40 ft, referenced to the North American Vertical Datum of 1988. April 1938 to April 1942, nonrecording gage located at site 8 mi upstream from present site at different elevation. April 1946 to September 30, 1963, located at elevation 1.00 ft higher than present site. October 4, 1995, gage was moved 2.5 mi downstream.

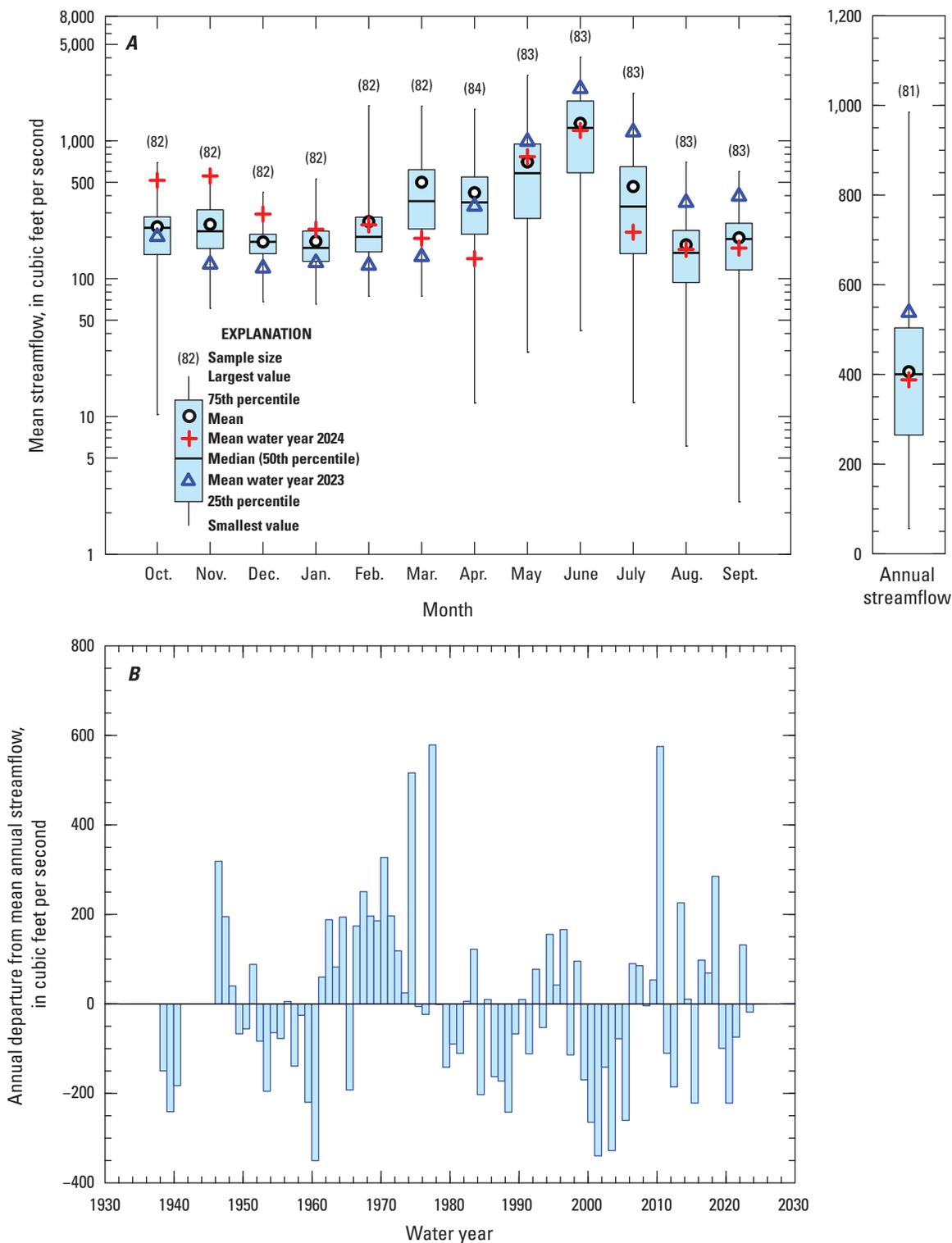
REMARKS.—Streamflow is regulated by Tongue River Reservoir (station 06307000) and many small reservoirs in Wyoming. Diversions for irrigation also occur upstream from the station.

**Table 6.** Daily mean discharge for Tongue River at Miles City, Montana (06308500), October 2023 through September 2024.

[Discharge is in cubic feet per second. Abbreviations: acre-ft, acre-feet; e, estimated; Max, maximum; Min, minimum. Symbol: --, no data]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	417	e590	e382	e199	e301	e259	137	174	1,010	519	95	181
2	450	e600	417	e204	e296	e285	138	183	1,070	484	105	169
3	518	645	e385	e205	e293	e279	137	193	1,110	448	109	163
4	626	689	e375	e205	e288	e270	134	202	1,090	405	94	151
5	527	647	e387	e206	e282	e259	129	226	1,070	360	117	153
6	439	617	e383	e206	e276	e247	126	288	1,050	304	116	149
7	448	609	378	e210	e268	e240	136	796	1,070	306	132	142
8	456	604	380	e204	e262	e239	169	2,490	1,140	319	132	131
9	461	609	375	e198	e258	e236	200	1,100	1,250	290	136	135
10	468	620	366	e190	e251	e231	170	648	1,430	250	130	139
11	475	622	362	e173	e242	e229	157	524	1,640	203	134	132
12	498	622	e372	e160	e237	224	149	479	1,750	180	154	133
13	513	622	e358	e156	e225	216	141	474	1,850	166	157	133
14	523	624	e328	e158	e210	206	133	488	1,920	321	162	143
15	527	624	e265	e175	e200	199	128	530	1,890	338	147	151
16	517	624	e277	e217	e193	189	125	581	1,750	213	165	163
17	518	617	e303	e244	e193	179	121	619	1,580	163	159	165
18	517	611	e277	e234	e201	171	117	683	1,430	157	150	173
19	512	598	e285	e232	e239	164	115	728	1,320	143	149	214
20	511	567	e309	e240	e254	154	116	778	1,210	131	136	217
21	518	523	e317	e247	e256	150	119	806	1,080	136	156	211
22	530	484	e342	e258	e260	150	127	815	1,160	122	184	194
23	536	448	e339	e265	e268	150	122	846	1,020	117	213	187
24	543	e429	e289	e272	e265	e148	128	1,210	889	111	209	189
25	546	e406	e226	e275	e266	e147	137	1,360	754	99	175	183
26	557	e397	e182	e280	e253	e146	139	1,140	664	75	189	175
27	e556	e400	e53.7	e282	e204	e146	148	1,110	630	57	252	169
28	e565	e409	e36.6	e288	e188	146	151	1,110	694	72	290	174
29	e580	e416	e69.8	e292	e189	142	172	1,090	587	82	270	186
30	e579	e388	e123	e296	--	139	171	1,070	544	77	232	190
31	e575	--	e171	e301	--	137	--	1,020	--	88	199	--
<b>Total</b>	<b>16,010</b>	<b>16,660</b>	<b>9,113</b>	<b>7,072</b>	<b>7,118</b>	<b>6,077</b>	<b>4,192</b>	<b>23,760</b>	<b>35,650</b>	<b>6,734</b>	<b>5,048</b>	<b>4,995</b>
<b>Mean</b>	<b>516</b>	<b>555</b>	<b>294</b>	<b>228</b>	<b>245</b>	<b>196</b>	<b>140</b>	<b>766</b>	<b>1,188</b>	<b>217</b>	<b>163</b>	<b>167</b>
<b>Max</b>	<b>626</b>	<b>689</b>	<b>417</b>	<b>301</b>	<b>301</b>	<b>285</b>	<b>200</b>	<b>2,490</b>	<b>1,920</b>	<b>519</b>	<b>290</b>	<b>217</b>
<b>Min</b>	<b>417</b>	<b>388</b>	<b>36.6</b>	<b>156</b>	<b>188</b>	<b>137</b>	<b>115</b>	<b>174</b>	<b>544</b>	<b>56.5</b>	<b>94.4</b>	<b>131</b>
<b>Acre-ft</b>	<b>31,750</b>	<b>33,050</b>	<b>18,080</b>	<b>14,030</b>	<b>14,120</b>	<b>12,050</b>	<b>8,315</b>	<b>47,130</b>	<b>70,710</b>	<b>13,360</b>	<b>10,010</b>	<b>9,907</b>
<b>Summary statistics</b>												
							<b>Water year 2024</b>			<b>Water years 1938–2024*</b>		
<b>Annual total</b>							142,400			--		
<b>Annual mean</b>							389			407		
<b>Annual runoff (acre-ft)</b>							281,800			295,100		

\*During periods of operation (water years 1938 to April 1942, April 1946 to current year [2024]).



**Figure 3.** Streamflow data for Tongue River at Miles City, Montana (06308500), water years 1938–2024. *A*, Boxplots showing statistical distribution of monthly and annual streamflow. *B*, Annual departure from the mean annual streamflow.

## 06326500 Powder River near Locate, Montana

LOCATION.—Lat 46°25'45.97", long 105°18'37.19" referenced to North American Datum of 1983, in SW¼SW¼SE¼ sec. 23, T. 8 N., R. 51 E., Custer County, Hydrologic Unit 10090209, on left bank at downstream side of bridge on U.S. Highway 12, 0.1 mi west of Locate, 25 mi east of Miles City, and at river mile 29.4.

DRAINAGE AREA.—13,060 mi<sup>2</sup>.

PERIOD OF RECORD.—March 1938 to present.

REVISED RECORDS.—Water Supply Paper (WSP) 926: 1939. WSP 1309: 1938–39, maximum discharge. WSP 1729: Drainage area. Water Data Report MT–04–1: Drainage area.

GAGE.—Water-stage recorder. Elevation of gage is 2,384.79 ft, referenced to the National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to July 11, 1947, nonrecording gage located at bridge 1.5 mi upstream, and July 11, 1947, to September 30, 1965, water-stage recorder located at site near upstream bridge at different elevation. October 1, 1965, to October 4, 1966, nonrecording gage, and October 5, 1966, to March 21, 1978, water-stage recorder located at present site and elevation. March 22, 1978, to April 23, 1981, water-stage recorder located 1.5 mi upstream at different elevation, April 24 to August 20, 1981, water-stage recorder located at present site and elevation, and August 21, 1981, to September 30, 1981, water-stage recorder located 1.5 mi upstream at different elevation. October 1, 1981, to April 5, 1995, water-stage recorder located at site 1.5 mi downstream at different elevation. April 7, 1995, to present, water-stage recorders located on each bank and each used depending on control conditions.

REMARKS.—Some regulation occurs by three reservoirs in Wyoming. Diversions for irrigation occur upstream from station.

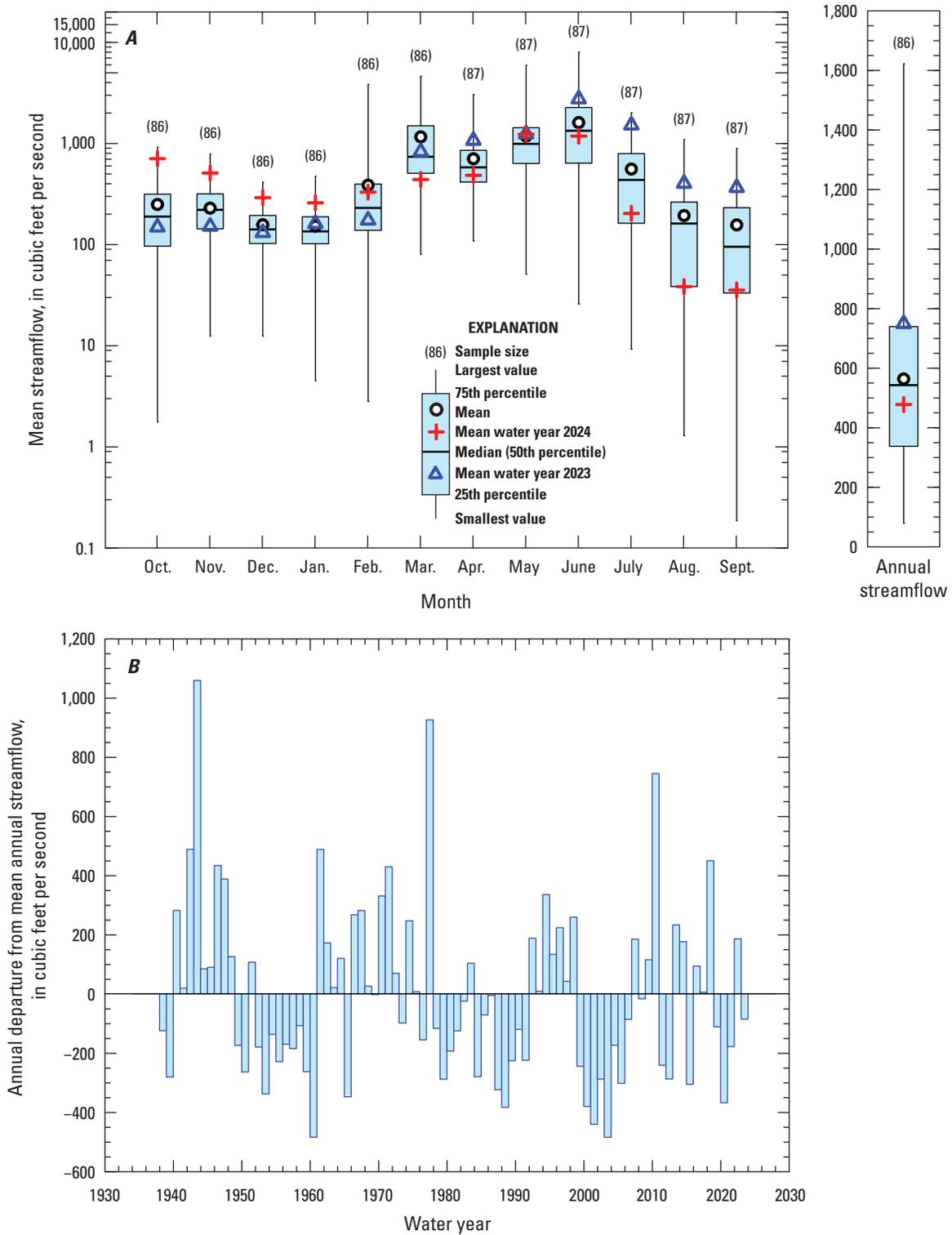
**Table 7.** Daily mean discharge for Powder River near Locate, Montana (06326500), October 2023 through September 2024.

[Discharge is in cubic feet per second. Abbreviations: acre-ft, acre-feet; e, estimated; Max, maximum; Min, minimum. Symbol: --, no data]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	572	580	321	e231	e272	e444	421	394	1,360	e611	e25.5	45
2	552	534	317	e239	e278	e464	419	447	1,340	e569	e30.2	39
3	539	605	303	e252	e285	e460	418	e443	1,340	513	e30.6	e35.4
4	542	611	302	e267	e290	e451	e414	587	e1220	e501	e27.6	e29.9
5	507	600	295	e275	e299	e450	412	575	e1160	e442	e28.9	e26.6
6	513	599	291	e266	e311	e460	e401	610	1,110	e385	e30.5	e31.2
7	497	e574	e306	e259	e329	e478	e399	2,390	1,080	e345	28	38
8	483	e575	e285	e257	e351	e506	414	2,860	1,100	324	24	34
9	486	e563	e283	e254	e367	e525	455	1,390	1,120	e296	21	e21.7
10	490	557	e281	e254	e379	e528	499	1,090	1,590	264	18	e18.3
11	487	551	e281	e254	e384	e502	571	1,170	1,590	221	24	16
12	480	543	e281	e254	e386	e463	559	1,190	1,680	184	132	e13.8
13	470	538	e281	e251	e381	e425	561	1,080	1,730	e168	68	e14.4
14	468	524	e282	e243	e377	399	626	943	1,750	278	e38.3	13
15	470	512	e281	e233	e368	e411	577	915	1,570	200	e36.5	11
16	610	e511	e283	e230	e360	e422	516	911	1,370	140	e39.4	e15.8
17	1,600	503	e294	e239	e351	e412	481	898	1,340	e117	e34.4	27
18	1,560	493	e309	e249	e338	e403	471	902	1,190	111	28	e37.1
19	1,140	484	e335	e256	e325	e404	503	1,060	1,150	e110	42	e44.9
20	1,050	e482	351	e261	e316	e404	516	1,210	1,120	99	64	e60.8
21	984	477	e327	e268	e304	e404	532	1,400	1,020	87	44	e47
22	941	e467	e313	e277	e294	e405	546	1,370	1,320	68	43	e46.1
23	899	462	e306	e283	e290	e412	582	1,460	997	54	49	e49
24	803	463	e297	e282	e289	e424	555	2,850	918	39	e33.7	e52.5
25	755	443	e284	e281	e295	e430	e552	2,010	797	32	e33.6	50
26	729	422	e288	e278	e310	446	e527	1,640	756	30	e36.9	e46.7
27	740	447	e286	e276	e331	440	463	1,500	e834	e33.4	e34.8	e46.9
28	702	466	e269	e274	e363	e425	417	1,310	e749	31	e32.9	e51.1
29	700	424	e254	e272	e403	e423	397	1,220	683	26	e37	e56.6
30	662	358	e242	e271	--	439	e378	1,230	e633	e22.7	e33	e51.7
31	604	--	e232	e271	--	431	--	1,310	--	e23.9	e46.6	--
<b>Total</b>	<b>22,030</b>	<b>15,370</b>	<b>9,060</b>	<b>8,057</b>	<b>9,626</b>	<b>13,690</b>	<b>14,580</b>	<b>38,360</b>	<b>35,620</b>	<b>6,324</b>	<b>1,194</b>	<b>1,069</b>
<b>Mean</b>	<b>711</b>	<b>512</b>	<b>292</b>	<b>260</b>	<b>332</b>	<b>442</b>	<b>486</b>	<b>1,238</b>	<b>1,187</b>	<b>204</b>	<b>38.5</b>	<b>35.6</b>
<b>Max</b>	<b>1,600</b>	<b>611</b>	<b>351</b>	<b>283</b>	<b>403</b>	<b>528</b>	<b>626</b>	<b>2,860</b>	<b>1,750</b>	<b>611</b>	<b>132</b>	<b>60.8</b>
<b>Min</b>	<b>468</b>	<b>358</b>	<b>232</b>	<b>230</b>	<b>272</b>	<b>399</b>	<b>378</b>	<b>394</b>	<b>633</b>	<b>22.7</b>	<b>18.3</b>	<b>11.2</b>
<b>Acre-ft</b>	<b>43,710</b>	<b>30,480</b>	<b>17,970</b>	<b>15,980</b>	<b>19,090</b>	<b>27,150</b>	<b>28,920</b>	<b>76,100</b>	<b>70,650</b>	<b>12,550</b>	<b>2,369</b>	<b>2,121</b>

**Summary statistics**

	Water year 2024	Water years 1939–2024
<b>Annual total</b>	175,000	--
<b>Annual mean</b>	478	564
<b>Annual runoff (acre-ft)</b>	346,100	408,600



**Figure 4.** Streamflow data for Powder River near Locate, Montana (06326500), water years 1939–2024. *A*, Boxplots showing statistical distribution of monthly and annual streamflow. *B*, Annual departure from the mean annual streamflow.

## Month-End Contents for Yellowstone River Compact Reservoirs Completed after January 1, 1950

### Boysen Reservoir, Wyoming, Bureau of Reclamation

LOCATION.—Lat 43°25'00", long 108°10'37" referenced to North American Datum of 1927, in NW¼NW¼ 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<sup>2</sup>.

PERIOD OF RECORD.—October 1952 to present.

GAGE.—Water-stage recorder. Datum of gage is reported by the Bureau of Reclamation based on local construction elevation datum unless reported otherwise.

RESERVOIR INFORMATION.—Reservoir is formed by rock-fill dam completed in October 1951. Storage began October 11, 1951. The elevation at the top of dead pool (outlet and penstock invert pipe) is 4,657.00 ft and contents of 40,080 acre-ft. The elevation at the top of inactive contents is 4,685.00 ft and contents 219,200 acre-ft. The elevation of the top of the joint-use pool (top of spillway gate) is 4,725.00 ft and contents of 741,594 acre-ft. Top of exclusive flood control is 4,732.20 ft and contents of 892,226 acre-ft. Top of crest of dam is at elevation 4,758.00 ft.

DATA.—Available from the Bureau of Reclamation at [https://www.usbr.gov/gp-bin/arcweb\\_boyr.pl](https://www.usbr.gov/gp-bin/arcweb_boyr.pl).

**Table 8.** Month-end contents for Boysen Reservoir, Wyoming.

[Data provided by the Bureau of Reclamation. Symbol: --, no data]

Date	Water-surface elevation, in feet	Contents, in acre-feet	Change in contents, in acre-feet
September 30, 2023	4,721.36	672,770	--
October 31	4,721.67	678,435	5,665
November 30	4,721.03	666,779	-11,656
December 31	4,720.38	655,106	-11,673
January 31, 2024	4,718.96	630,207	-24,899
February 29	4,718.48	621,999	-8,208
March 31	4,718.72	626,094	4,095
April 30	4,714.95	564,921	-61,173
May 31	4,712.56	529,096	-35,825
June 30	4,721.77	680,271	151,175
July 31	4,719.90	646,588	-33,683
August 31	4,717.56	606,568	-40,020
September 30, 2024	4,715.48	573,120	-33,448
2024 water year	--	--	-99,650

## Anchor Reservoir, Wyoming, Bureau of Reclamation

LOCATION.—Lat 43°39'50", long 108°49'27" referenced to North American Datum of 1927, 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, Wyoming.

DRAINAGE AREA.—131 mi<sup>2</sup>.

PERIOD OF RECORD.—November 1960 to present.

GAGE.—Water-stage recorder. Datum of gage is reported by the Bureau of Reclamation based on local construction elevation datum unless reported otherwise.

RESERVOIR INFORMATION.—Reservoir is formed by concrete-arch dam completed in 1960. The elevation of the dead/inactive pool (invert of river outlet) is 6,343.75 ft and contents of 66 acre-ft. The top of the active conservation pool is 6,441.0 ft and contents of 17,228 acre-ft. Anchor Reservoir was built to have contents of 17,228 acre-ft, but sinkholes within the area contained by the dam prevent filling the reservoir to the designed volume. A dike constructed within the reservoir prevents water from entering the sinkholes and operationally limits storage to 7,369 acre-ft.

DATA.—Available from the Bureau of Reclamation at [https://www.usbr.gov/gp-bin/arcweb\\_ancr.pl](https://www.usbr.gov/gp-bin/arcweb_ancr.pl).

**Table 9.** Month-end contents for Anchor Reservoir, Wyoming.

[Data provided by the Bureau of Reclamation. Symbol: --, no data]

Date	Water-surface elevation, in feet	Contents, in acre-feet	Change in contents, in acre-feet
September 30, 2023	6,380.47	1,767.61	--
October 31	6,375.76	1,342.54	-425.07
November 30	6,372.59	1,096.06	-246.48
December 31	6,366.46	703.84	-392.22
January 31, 2024	6,364.50	604.00	-99.84
February 29	6,364.13	586.23	-17.77
March 31	6,371.11	989.80	403.57
April 30	6,378.31	1,563.91	574.11
May 31	6,394.38	3,519.64	1,955.73
June 30	6,411.25	6,877.75	3,358.11
July 31	6,388.18	2,636.60	-4,241.15
August 31	6,362.39	508.78	-2,127.82
September 30, 2024	6,361.58	475.20	-33.58
2024 water year	--	--	-1,292.41

### Bighorn Lake near St. Xavier, Montana, Bureau of Reclamation

LOCATION.—Lat 45°18'27", long 107°57'26" referenced to North American Datum of 1927, in SW¼SE¼ sec. 18, T. 6 S., R. 30 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 southwest of St. Xavier, and at river mile 86.6.

DRAINAGE AREA.—19,626 mi<sup>2</sup>.

PERIOD OF RECORD.—November 1966 to present.

GAGE.—Water-stage recorder. Datum of gage is reported by the Bureau of Reclamation based on local construction elevation datum unless reported otherwise.

RESERVOIR INFORMATION.—Reservoir is formed by thin concrete-arch dam; construction began in 1961 and was completed in 1967. Storage began November 3, 1965. The elevation of the dead pool is 3,296.50 ft and contents of 18,355 acre-ft. The top of the inactive conservation pool is 3,547.00 ft and contents of 467,473 acre-ft. The elevation active conservation is 3,614.00 ft and contents of 778,317 acre-ft. The top of the joint use pool is 3,640.00 ft and contents of 1,011,052 acre-ft. The top of the exclusive flood pool (top of gates) is 3,657.00 ft and contents of 1,263,682 acre-ft.

DATA.—Available from the Bureau of Reclamation at [https://www.usbr.gov/gp-bin/arcweb\\_bhr.pl](https://www.usbr.gov/gp-bin/arcweb_bhr.pl).

**Table 10.** Month-end contents for Bighorn Lake, Montana.

[Data provided by the Bureau of Reclamation. Symbol: --, no data]

Date	Water-surface elevation, in feet	Contents, in acre-feet	Change in contents, in acre-feet
September 30, 2023	3,638.28	988,258	--
October 31	3,639.68	1,006,713	18,455
November 30	3,637.15	973,984	-32,729
December 31	3,633.86	935,591	-38,393
January 31, 2024	3,627.14	870,920	-64,671
February 29	3,624.66	850,724	-20,196
March 31	3,621.05	823,922	-26,802
April 30	3,617.71	801,412	-22,510
May 31	3,624.18	847,000	45,588
June 30	3,637.45	977,719	130,719
July 31	3,634.27	940,121	-37,598
August 31	3,632.38	919,825	-20,296
September 30, 2024	3,632.80	924,206	4,381
2024 water year	--	--	-64,052

## Month-End Contents for Yellowstone River Compact Reservoirs Existing on January 1, 1950

The extent, if any, to which the use of reservoirs in this section 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 in [table 11](#). Three of the reservoirs (Bull Lake, Pilot Butte Reservoir, and Buffalo Bill Reservoir) are in the Bighorn River Basin, Wyoming, with contents data available from the Bureau of Reclamation. The height of the Buffalo Bill Dam was increased for power operations in 1992, which increased storage of the reservoir from 456,600 to 644,500 acre-ft (listed as 646,565 acre-ft by the 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, who provides the water-level data and the reservoir-contents data. The spillway of Tongue River Dam was raised in 1999 which increased storage of Tongue River Reservoir from 68,040 to 79,071 acre-ft.

**Table 11.** Month-end contents for Yellowstone River Compact reservoirs existing on January 1, 1950.

Date	Contents, in acre-feet <sup>1,2</sup>			
	06224500 Bull Lake	Pilot Butte Reservoir	06281500 Buffalo Bill Reservoir	06307000 Tongue River Reservoir
September 30, 2023	82,146.07	27,400.00	453,100.00	60,743.00
October 31	72,457.13	28,293.00	452,748.00	56,388.00
November 30	72,286.98	28,085.00	475,151.00	49,658.00
December 31	72,311.79	27,449.00	478,491.00	49,111.00
January 31, 2024	71,924.21	27,391.00	476,889.00	47,869.00
February 29	71,972.66	27,416.00	477,605.00	50,223.00
March 31	72,238.53	27,911.00	484,361.00	56,434.00
April 30	77,470.30	28,309.00	465,673.00	68,563.00
May 31	92,808.56	22,038.00	480,993.00	80,076.00
June 30	147,189.48	20,424.00	610,140.00	78,544.00
July 31	121,340.20	21,242.00	567,602.00	69,946.00
August 31	72,940.42	20,153.00	476,345.00	54,004.00
September 30, 2024	32,292.30	11,754.00	400,840.00	44,851.00
Change in contents during water year 2024	-49,853.77	-15,646.00	-52,260.00	-15,892.00

<sup>1</sup>Contents data provided by Bureau of Reclamation and Montana Department of Natural Resources and Conservation.

<sup>2</sup>Pre-compact water rights and post-compact water rights for these reservoirs are presented in [table 12](#) (“Water-year-end contents for Yellowstone River Compact reservoirs or lakes.”)

## Water-Year-End Contents for Yellowstone River Compact Reservoirs or Lakes

Water-year-end contents for additional reservoirs of interest to the Yellowstone River Compact are listed in [table 12](#).

**Table 12.** Water-year-end contents for Yellowstone River Compact reservoirs or lakes.

[Contents are in acre-feet. Reservoirs or lakes are listed in alphabetical order by drainage basin. Symbol: --, no data or not available]

Reservoir or lake name	Pre-compact 1950 water right	Post-compact 1950 water right	Total permitted water right	Contents on Sept. 30, 2024	Contents on Sept. 30, 2023	Change in contents <sup>1</sup>
Clarks Fork Yellowstone River Basin						
Cooney Reservoir <sup>2</sup>	28,230	0	28,230	18,631	20,546	-1,915
Glacier Lake <sup>2</sup>	4,200	0	4,200	942	--	--
Bighorn River Basin						
(Lake) Adelaide Reservoir <sup>3</sup>	1,449	3,315	4,764	849	950	-101
Anchor Reservoir <sup>4,5</sup>	0	9,252	9,252	475	1,768	-1,293
Bighorn Lake <sup>5</sup>	0	1,116,000	1,116,000	924,206	988,258	-64,052
Boysen Reservoir <sup>5</sup>	757,851	0	757,851	573,120	672,770	-99,650
Buffalo Bill Reservoir <sup>5</sup>	456,640	187,940	644,580	400,840	453,100	-52,260
Bull Lake <sup>5</sup>	151,951	0	151,951	32,292	82,146	-49,854
Christina Reservoir <sup>3</sup>	3,860	0	3,860	0	3,860	-3,860
Corral Reservoir <sup>3</sup>	0	1,027	1,027	354	746	-392
Diamond Creek Dike Reservoir <sup>3</sup>	0	18,378	18,378	1,800	18,378	-16,578
Enterprise Reservoir <sup>3</sup>	1,494	204	1,698	35	275	-240
Fairview Extension Reservoir <sup>3</sup>	791	620	1,411	1,090	1,411	-321
Greybull Valley Reservoir <sup>3</sup>	0	33,169	33,169	4,327	28,590	-24,263
Harrington Reservoir <sup>3</sup>	315	887	1,202	900	1,202	-302
Lake Cameahwait Reservoir <sup>3</sup>	0	6,683	6,683	6,683	6,683	0
Lake Creek Reservoir <sup>3</sup>	1,373	0	1,373	220	1,091	-871
Lodge Grass Reservoir <sup>6</sup>	22,900	0	22,900	12,450	19,000	-6,550
Lower Sunshine Reservoir <sup>3</sup>	0	58,748	58,748	30,571	53,147	-22,576
Newton Reservoir <sup>3</sup>	4,525	0	4,525	4,200	4,073	127
Perkins and Kinney Reservoir <sup>3</sup>	1,202	0	1,202	715	715	0
Pilot Butte Reservoir <sup>5</sup>	34,600	0	34,600	11,754	27,400	-15,646
Sage Creek Reservoir <sup>3</sup>	440	2,345	2,785	2,400	2,507	-107
Shell Reservoir <sup>3</sup>	1,949	0	1,949	493	195	298
Shoshone Lake Reservoir <sup>3</sup>	4,560	5,181	9,741	6,060	4,700	1,360
Upper Sunshine Reservoir <sup>3</sup>	52,988	0	52,988	29,233	5,138	24,095
Teapot Reservoir <sup>3</sup>	1,578	0	1,578	0	0	0
Ten Sleep Reservoir <sup>3</sup>	3,509	0	3,509	3,509	4,048	-539
Wiley Reservoir <sup>3</sup>	689	331	1,020	1,000	970	30
Worthen Meadow Reservoir	0	1,504	1,504	1,230	1,422	-192

**Table 12.** Water-year-end contents for Yellowstone River Compact reservoirs or lakes.—Continued

[Contents are in acre-feet. Reservoirs or lakes are listed in alphabetical order by drainage basin. Symbol: --, no data or not available]

Reservoir or lake name	Pre-compact 1950 water right	Post-compact 1950 water right	Total permitted water right	Contents on Sept. 30, 2024	Contents on Sept. 30, 2023	Change in contents <sup>1</sup>
Powder River Basin						
Cloud Peak Reservoir <sup>3</sup>	3,398	173	3,571	340	3,571	-3,231
Dull Knife Reservoir <sup>3</sup>	0	4,345	4,345	986	1,546	-560
Healy Reservoir <sup>3,7</sup>	0	5,140	5,140	3,156	4,676	-1,520
Kearney Lake Reservoir <sup>3</sup>	1,854	4,470	6,324	322	1,399	-1,077
Lake DeSmet <sup>3,8</sup>	37,515	197,472	234,987	196,387	204,598	-8,211
Muddy Guard Reservoirs <sup>3,9</sup>	0	2,336	2,336	1,109	2,286	-1,177
Posy No. 1 Reservoir <sup>3</sup>	0	1,537	1,537	811	1,322	-511
Tie Hack Reservoir	1,647	788	2,435	1,758	2,435	-677
Willow Park Reservoir <sup>3</sup>	4,457	0	4,457	1,166	581	585
Tongue River Basin						
Big Horn Reservoir <sup>3</sup>	2,749	1,969	4,781	698	1,667	-969
Dome Reservoirs <sup>3,10</sup>	1,843	188	2,031	979	1,418	-439
Park Reservoir <sup>3</sup>	7,347	3,015	10,362	3,238	5,007	-1,769
Sawmill Lakes Reservoir <sup>3</sup>	0	1,275	1,275	769	796	-27
Tongue River Reservoir <sup>2</sup>	72,500	6,571	79,071	44,851	60,743	-15,892
Twin Lakes Reservoir <sup>11</sup>	1,180	2,232	3,412	2,345	2,466	-121

<sup>1</sup>Change in contents is derived from subtracting the previous water year's contents from the current water year's contents.<sup>2</sup>Reservoir managed and contents provided by the State of Montana.<sup>3</sup>Private reservoir. Contents provided by the State of Wyoming.<sup>4</sup>Anchor Reservoir was built to have a usable content of 17,410 acre-feet, but sinkholes and constructed dikes within the area contained by the dam prevent filling the reservoir to the designed volume. At present, only 9,252 acre-feet has been adjudicated with the remaining capacity having been eliminated from the permit.<sup>5</sup>Reservoir managed and contents provided by the Bureau of Reclamation.<sup>6</sup>Lodge Grass Reservoir (Willow Creek Dam) managed and contents provided by Bureau of Indian Affairs.<sup>7</sup>Reservoir managed and contents provided by the State of Wyoming.<sup>8</sup>Reservoir managed by Johnson County, Wyoming and the State of Wyoming. Contents provided by the State of Wyoming.<sup>9</sup>Data are combined contents of Muddy Guard No. 1 and Muddy Guard No. 2 Reservoirs.<sup>10</sup>Data are combined contents of Dome Lake and Dome Lake No. 1 Reservoir.<sup>11</sup>Data are combined contents of Twin Lakes No. 1 and Twin Lakes No. 2 Reservoirs.

## Appendix 1. 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 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.

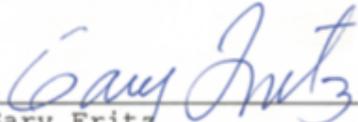
## Article V. Meetings

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. Christopoulos  
Commissioner for Wyoming

ATTESTED:

  
\_\_\_\_\_  
L. Grady Moore  
Federal Representative

Adopted November 17, 1953  
Amended December 16, 1986

## Appendix 2. Rules for the Resolution of Disputes over the Administration of the Yellowstone River Compact

December 19, 1995

### Section I. General Framework

According to Article III(F) of the Yellowstone River Compact.

“In case of the failure of the representatives of Wyoming and Montana to unanimously agree on any matter necessary to the proper administration of this compact, then the member selected by the director of the United States Geological Survey shall have the right to vote upon the matters in disagreement and such points of disagreement shall then be decided by a majority vote of the representatives of the states of Wyoming and Montana and said member selected by the director of the United States geological survey, each being entitled to one vote.”

### Section II. Purpose and Goal

- A. The purpose of these rules is to clarify and more fully develop the dispute resolution process outlined in Section I.
- B. The goal of the dispute resolution process outlined in these rules is to encourage joint problem solving and consensus building. It consists of three phases -- unassisted negotiation, facilitation, and voting.
- C. Any agreement reached through this process is binding on Montana, Wyoming, and the United States Geological Survey (USGS).
- D. Either state can initiate the dispute resolution process defined in Sections IV, V, and VI, and the other state is obligated to participate in good faith. The states agree that the issues pursued under this dispute resolution process shall be both substantive and require timely resolution.

### Section III. Consensus

- A. In the process of administering the Yellowstone River Compact, the representatives from Montana and Wyoming agree to seek consensus.
- B. For purposes of this rule, consensus is defined as an agreement that is reached by identifying the interests of Montana and Wyoming and then building an integrative solution that maximizes the satisfaction of as many of the interests as possible. The process of seeking consensus does not involve voting, but a synthesis and blending of alternative solutions.

### Section IV. Unassisted Negotiation

- A. In all situations, the representatives from Montana and Wyoming shall first attempt to seek consensus through unassisted negotiation. The federal representative will not serve as chairperson in the unassisted negotiation process.
- B. During a negotiation process, the representatives from Montana and Wyoming shall identify issues about which they differ, educate each other about their needs and interests, generate possible resolution options, and collaboratively seek a mutually acceptable solution.
- C. To help facilitate negotiations, the representatives from Montana and Wyoming in cooperation with the USGS agree to share technical information and develop joint databases. Other data sources may also be used.
- D. The USGS shall serve as technical advisor in the two-state negotiations.

## Section V. Facilitation

- A. If the representatives from Montana and Wyoming are not able to reach consensus through unassisted negotiation, they shall each identify, articulate, and exchange, in writing, the unresolved Issues.
- B. The representatives from Montana and Wyoming shall then jointly appoint a facilitator to assist in resolving the outstanding dispute. If the representatives from Montana and Wyoming cannot identify a mutually acceptable facilitator, the representative appointed by the USGS shall appoint a Facilitator.
- C. A facilitator, for purposes of this rule, is defined as a neutral third party that shall help the representatives from Montana and Wyoming communicate, negotiate, and reach agreements voluntarily. The facilitator is not empowered to vote or render a decision.
- D. The facilitator shall assist the representatives from Montana and Wyoming in developing appropriate ground rules for each facilitated session including establishing a deadline for completion of the facilitation process, setting an appropriate agenda, identifying issues, collecting and analyzing technical information, developing options, packaging agreements, and preparing a written agreement. The facilitator reserves the right to meet privately with each representative during the facilitation process.

## Section VI. Voting

- A. If, and only if, the representatives from Montana and Wyoming are unable to reach consensus with the assistance of a facilitator, then a dispute may be settled by voting.
- B. The representatives from Montana and Wyoming, along with the representative appointed by the director of the USGS, are each entitled to one vote.
- C. If the USGS representative does not vote in accordance with Article III, then the director of the USGS will select, with concurrence from Wyoming and Montana, a neutral third party to vote.
- D. If the representative appointed by the director of the USGS is not involved in the steps outlined in Sections IV and V, each state shall have the opportunity to present appropriate information to that representative. This information may be presented through both oral presentations and written documents. All information will be shared with the other state. The representative of the USGS may also consult the facilitator referenced in Section V in an attempt to resolve any disputes.
- E. The USGS shall pay the expenses of the representative appointed by the director of the USGS.
- F. Points of disagreement shall be resolved by a majority vote.

## Section VII. Funding

- A. The USGS will pay one-half and the states of Montana and Wyoming shall each pay one-quarter of the expenses of the facilitator, which shall not exceed \$10,000, unless agreed to by both states and the USGS.

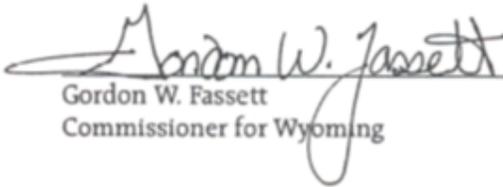
## Section VIII. Amendments

- A. These rules may be amended or revised by a unanimous vote of the Commission.

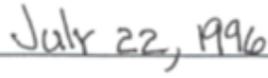
## Section IX. Execution

These rules for the resolution of disputes over the administration of the Yellowstone River Compact are hereby executed on the date indicated below.

  
\_\_\_\_\_  
Gary Fritz  
Commissioner for Montana

  
\_\_\_\_\_  
Gordon W. Fassett  
Commissioner for Wyoming

  
\_\_\_\_\_  
William F. Horak  
Federal Representative

  
\_\_\_\_\_  
Date

## Appendix 3. 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 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 which have not yet been adjudicated.

### 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. "Cfs" 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 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 l and 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. (A sample form for this purpose is attached.)
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 his 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 will 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.

### 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 will 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 will 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 District Chief, United States Geological Survey, 821 E. Interstate, Bismarck, ND 58501, within 90 calendar days after the claimant has received the claim form from the Commission. The blank claim form will be sent certified mail to the water user and the submission period of 90 calendar days will begin with the next day following receipt of the form, as evidenced by the certified mail receipt card. For good cause shown in writing, an extension of time beyond the 90 days for submittal may be obtained from the Commission.

## Appendix 4. Claim Form for Interstate Ditches

### YELLOWSTONE RIVER COMPACT COMMISSION

**WYOMING**

GORDON W. FASSETT  
STATE ENGINEER

HERSCHLER BUILDING  
4<sup>th</sup> FLOOR EAST  
CHEYENNE, WYOMING 82002  
(307) 777-7354

**UNITED STATES**

WILLIAM F. HORAK  
CHAIRMAN

U. S. GEOLOGICAL SURVEY  
821 E. INTERSTATE AVENUE  
BISMARCK, NORTH DAKOTA 58501  
(701) 250-4601

**MONTANA**

GARY FRITZ  
ADMINISTRATOR, WATER RESOURCES  
DIVISION

DEPT. OF NATURAL RESOURCES &  
CONSERVATION  
1520 EAST SIXTH AVENUE  
HELENA, MONTANA 59620  
(406) 444-6603

## YELLOWSTONE RIVER COMPACT COMMISSION CLAIM FORM FOR INTERSTATE DITCHES

1. Name of ditch or canal: \_\_\_\_\_

2. Source of water supply: \_\_\_\_\_

Tributary of \_\_\_\_\_

3. Name of claimant: \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

Home Phone No. \_\_\_\_\_ Business Phone No. \_\_\_\_\_

4. Person completing form: \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

Home Phone No. \_\_\_\_\_ Business Phone No. \_\_\_\_\_

5. Method of irrigation: \_\_\_\_\_

6. Point of diversion: County \_\_\_\_\_ State \_\_\_\_\_

Headgate located in the \_\_\_ 1/4 \_\_\_ 1/4, Section \_\_\_, T. \_\_\_ R. \_\_\_

(a) Description of headgate: (Briefly describe the materials and general features, date constructed or last known work, general condition.) \_\_\_\_\_

\_\_\_\_\_

(b) Describe water measuring device: \_\_\_\_\_

\_\_\_\_\_

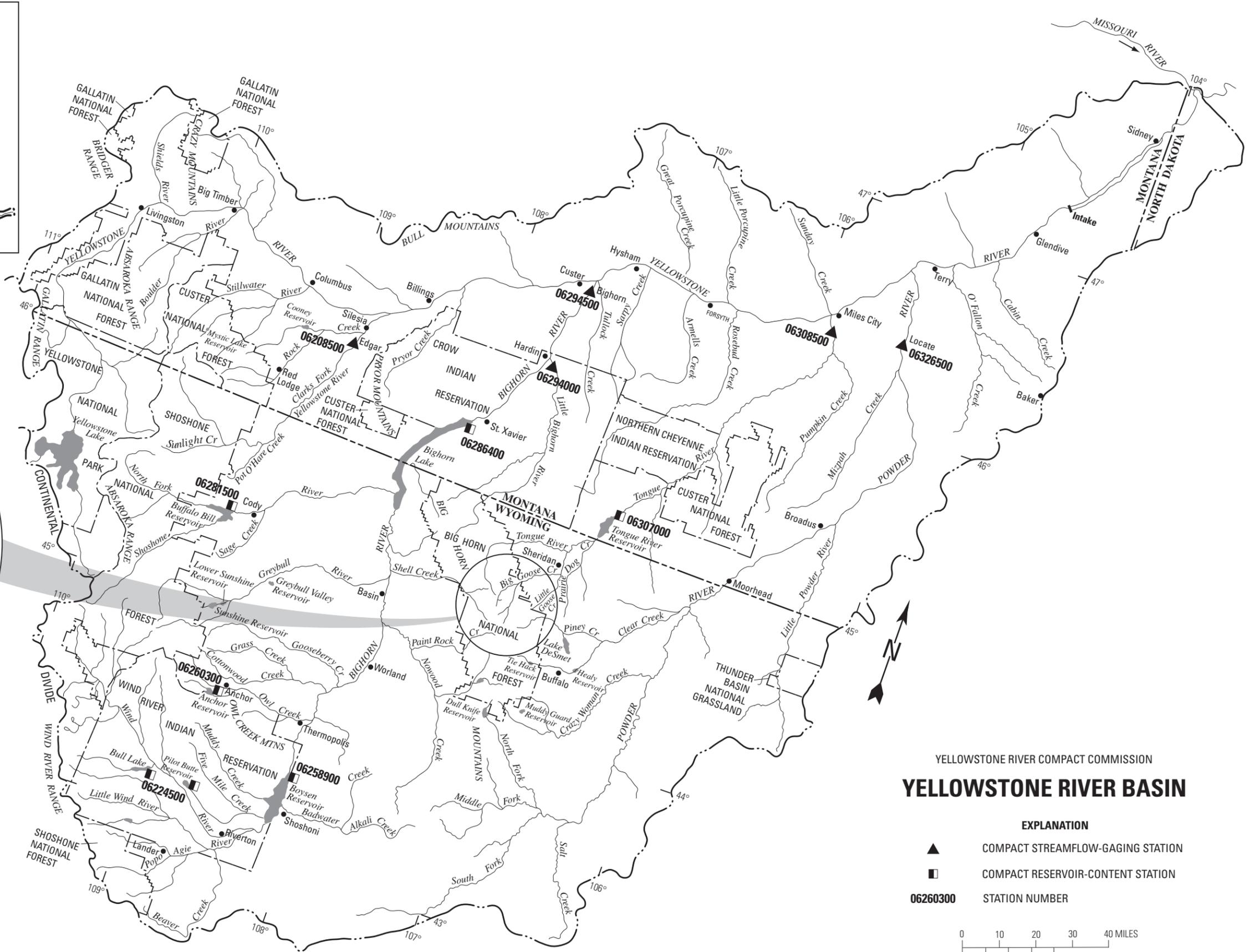
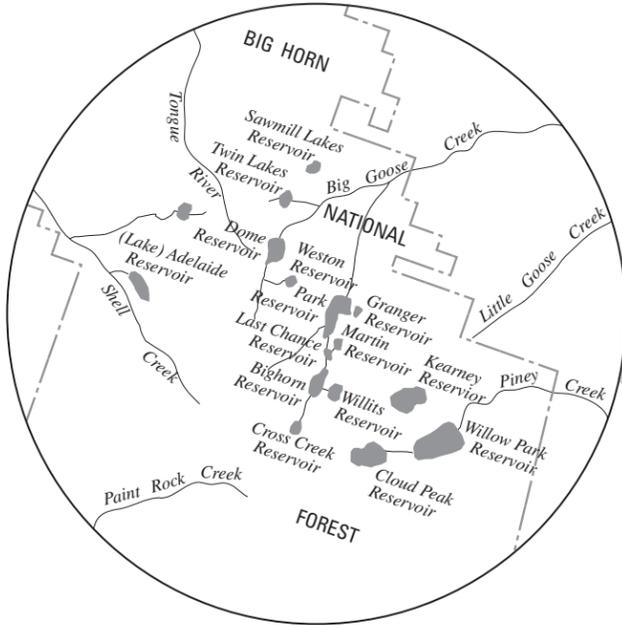
\_\_\_\_\_





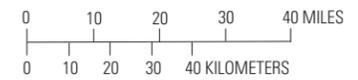


LOCATION MAP



YELLOWSTONE RIVER COMPACT COMMISSION  
**YELLOWSTONE RIVER BASIN**

- EXPLANATION**
- ▲ COMPACT STREAMFLOW-GAGING STATION
  - COMPACT RESERVOIR-CONTENT STATION
  - 06260300 STATION NUMBER



**LOCATIONS OF YELLOWSTONE RIVER COMPACT STREAMFLOW-GAGING AND RESERVOIR-CONTENT STATIONS**

