YELLOWSTONE RIVER COMPACT COMMISSION

WYOMING

MONTANA

NORTH DAKOTA



SIXTY-FOURTH ANNUAL REPORT 2015

Yellowstone River Compact Commission

Sixty-Fourth Annual Report

2015

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¹Wyoming disagrees with the term "Compact Reservoirs" as used throughout this annual report. Wyoming's acceptance of this annual report should not be construed as Wyoming's acceptance of the use of that term.

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Conversion Factors

Multiply	Ву	To obtain
	Length	
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
	Area	
acre	4,047	square meter (m ²)
acre	0.4047	hectare (ha) ¹
acre	0.4047	square hectometer (hm ²)
acre	0.004047	square kilometer (km ²)
square mile (mi ²)	2.590	square kilometer (km ²)
	Volume	
cubic foot per second per day (ft ³ /s-day)	2,447	cubic meter (m ³)
cubic foot per second per day (ft3/s-day)	0.0002447	cubic hectometer (hm ³)
cubic foot (ft ³)	0.02832	cubic meter (m ³)
acre-foot (acre-ft)	1,233	cubic meter (m ³)
acre-foot (acre-ft)	0.001233	cubic hectometer (hm ³)
acre-foot (acre-ft)	0.000001233	cubic kilometer (km ³)
	Flow rate	
acre-foot per year (acre-ft/yr)	1,233	cubic meter per year (m ³ /yr)
acre-foot per year (acre-ft/yr)	0.001233	cubic hectometer per year (hm ³ /yr)
acre-foot per year (acre-ft/yr)	0.000001233	cubic kilometer per year (km3/yr)
cubic foot per second (ft ³ /s)	28.32	liter per second (L/s)
cubic foot per second (ft ³ /s)	28.32	cubic decimeter per second (dm ³ /s)
cubic foot per second (ft ³ /s)	0.02832	cubic meter per second (m ³ /s)
feet per year (ft/yr)	0.3048	meter per year
gallons per minute (gal/min)	0.06309	liter per second

¹The 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 1608 MOUNTAIN VIEW ROAD RAPID CITY, SOUTH DAKOTA 57702

Honorable Matthew Mead Governor of the State of Wyoming Cheyenne, Wyoming 82002

Honorable Steve Bullock Governor of the State of Montana Helena, Montana 59620

Honorable Jack Dalrymple 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 sixty-fourth annual report of activities for the period ending September 30, 2015.

Minutes of December 3, 2015

Members of the Yellowstone River Compact Commission convened on December 3, 2015 at 8:30 am in the Sibley conference room of the Holiday Inn in Sheridan, WY. In attendance were Mr. Mark Anderson, U.S. Geological Survey (USGS), Chairman and Federal Representative; Ms. Sue Lowry, Wyoming State Engineer's Office (WSEO) and Commissioner for Wyoming; and Mr. Tim Davis, Montana Department of Natural Resources and Conservation (DNRC) and Commissioner for Montana (via phone). Also in attendance were Mr. Chris Brown, Wyoming Attorney General's Office (via phone); Mr. Loren Smith, Ms. Beth Ross, and Mr. Carmine LoGuidice, WSEO; Mr. Chuck Dalby, Mr. Kevin Peterson, Mr. Kevin Smith, Mr. Mark Elison, and Ms. Kim Overcast, DNRC; Ms. Amy Steinmetz, Montana Department of Environmental Quality (via phone); Mr. Jon Patch and Bill Schuh, North Dakota State Water Commission; Mr. Tim Felchle and Mr. Clayton Jordon, Bureau of Reclamation; Mr. Art Hayes, Jr., Tongue River Water Users Association: and Mr. Kirk Miller (via phone) and Mr. Wayne Berkas, USGS.

Mr. Anderson called the meeting to order and presented the agenda. He asked if there were any additions or corrections to the agenda. There were no additions.

Ms. Lowry made a motion to approve the agenda. It was seconded.

Mr. Berkas distributed a handout showing the operational cost for Fiscal Year (FY) 2016 and the estimated budgets for FY 2017 through 2019. The handout shows the cost for each streamgage in FY 2016 is \$15,960 and the cost to prepare the annual report is \$37,000. The total cost for FY 2016 is \$116,300. The breakout of this cost is: \$31,675 for WSEO, \$31,675 for DNRC, and

\$52,950 for USGS.

The contributions estimated for FY 2016 through FY 2018 by agency are as follows:

Year	WSE	DNRC	USGS	Total
FY 2017	\$32,900	\$32,900	\$54,540	\$120,340
FY 2018	\$33,890	\$33,890	\$56,180	\$123,960
FY 2019	\$34,910	\$34,910	\$57,865	\$127,685

The estimated cost increases from FY 2016 through FY 2019 assume an increase of 3 percent each year. The cost for each FY will not exceed those listed, but the cost might be less.

Ms. Lowry asked if the cost presented this year is different than the cost presented last year.

Mr. Berkas replied that the cost presented this year is less than the cost presented last year.

Ms. Lowry made a motion to approve the budget. It was seconded.

Mr. Anderson asked if the Commission could be updated on the legal proceedings of Montana v Wyoming and the Special Master report.

Mr. Peterson replied that the proceedings have a continuance until the end of December. Thus, there is nothing to report.

Mr. Brown added that the States need to make a status report to the Supreme Court on the progress they have made on resolving the dispute by December 31, 2015. Each State has filed one exception to the Special Master's second interim report, so those two questions are unresolved.

Ms. Lowry pointed out that the Special Master filed the second interim report after the last Yellowstone River Compact Commission meeting on December 4, 2014.

Mr. Anderson asked Mr. Berkas to present streamflow and reservoir conditions.

Mr. Berkas distributed a handout on streamflow and reservoir conditions through the 2015 water year. Streamflow was normal (normal is within 80 and 120 percent of average) at three gage sites and above normal at one gage site monitored by the Commission. Annual streamflow at Clarks Fork Yellowstone River at Edgar was 97 percent of average, and ranked 42nd lowest of 77 years. The annual streamflow at Bighorn River near Bighorn (adjusted for the flow of the Little Bighorn River and change of contents in Bighorn Lake) was 112 percent of average and ranked 36th lowest of 62 years. The annual streamflow at Tongue River at Miles City was 102 percent of average and ranked 43rd lowest of 72 years. The annual streamflow at Powder River near Locate was 130 percent of average and ranked 58th lowest of 77 years. Total adjusted streamflow of the four rivers in water year 2015 was 4,308,700 acre-ft, compared to 5,300,900 acre-ft in water year 2014, and 2,440,700 acre-ft in water year 2013.

Reservoir storage, historically monitored and reported for the Commission, decreased in all seven reservoirs (Bighorn Lake, Boysen Reservoir, Anchor Reservoir, Bull Lake, Pilot Butte Reservoir, Buffalo Bill Reservoir, and Tongue River Reservoir). The contents and the amounts of decrease are listed in the 2015 annual report. The total usable contents of these reservoirs at the end of water year 2015 was 2,097,000 acre-ft, compared to 2,324,000 acre-ft in water year 2014, and 1,993,000 acre-ft in water year 2013. Storage in other reservoirs in the four river basins at the end of water year 2015 was 348,900 acre-ft, compared to 392,800 acre-ft in water year 2014, and 364,300 acre-ft in water year 2013.

Mr. Berkas then presented flow duration hydrographs for 2014 and 2015 at selected sites in the Yellowstone River basin. Generally, streamflow remained in the normal range during the 2015 water year, mostly due to above normal rainfall in May and June. The exception is the Clarks Fork Yellowstone River, where streamflows after the peak streamflow in June became below normal for the summer and returned to normal in the fall. These hydrographs can be created using the utility at: *http://waterwatch.usgs.gov/index.php?id=sitedur*.

Ms. Lowry asked why flows in the Clarks Fork of the Yellowstone River near Belfry were below normal in June and July.

Mr. Loren Smith replied that the rain in May and June did not hit the east side of the Absaroka Mountains, drained by the Clarks Fork Yellowstone River, and the west side of the Bighorn Mountains, drained by the Bighorn River. Most of the high flows in the Bighorn River came from the Wind River Range.

Mr. Anderson asked Wyoming to address water-year administration.

Mr. LoGuidice replied that Montana Compact Commissioner Tim Davis made a call on Wyoming the second week of April, and this placed the entire Tongue River Basin into regulation that continued until May 21 when the rain increased flows in the streams in the basin. The main stem of the Tongue River did not go back into regulation after high flows in May. Little Goose Creek started regulation on July 15; Big Goose Creek started regulation on July 24; Wolf Creek started regulation on August 12; and Rapid Creek started regulation on July 2.

Mr. LoGuidice continued with the Powder River Basin. Clear Creek went into regulation on July 23; French Creek went into regulation on July 23; Rock Creek went into regulation on July 24; and Piney Creek went into regulation on August 3. The main stem of the Powder River never went into regulation.

Mr. Kevin Smith asked when do creeks in the Tongue and Powder River Basin usually go into regulation?

Mr. LoGuidice replied, usually after the second week of July, Rodeo week. The ranchers get back to work after a week of well-deserved fun and start making calls for water.

Mr. Loren Smith stated that the Wind River and Bighorn River basins were looking dry in early May, but rain and snow during May greatly helped the soil moisture. Eight streams went into regulation in the basin. In the Clarks Fork of the Yellowstone River, Bennett Creek went into regulation in April before the annual snow-melt runoff replenished the streams. This typically occurs every year. Regulation stops when the runoff begins, and regulation does not come back later in the year. Greybull River had a call on April 27 for the delivery of storage water. Regulation was relaxed during the runoff period, but continued on July 6 when the river flows receded. Gooseberry Creek went into regulation on April 1, was relaxed, and restarted on August 6. Medicine Lodge and Paint Rock Creeks went into regulation on July 15. Water became scarce in those two creeks, and the depth of regulation approached territorial right dates. The Middle Popo Agie River water users continue to regulate themselves. Little Popo Agie River went into regulation on August 3 for storage water delivery. Little Popo Agie River water users took storage water from Christina Lake. Storage water from Christina Lake is rarely used because it is difficult to get to the reservoir and release the water.

Mr. Dalby asked how water users would become self-regulating.

Mr. Loren Smith replied that water users have the opportunity under free river conditions to manage their systems however they want. WSEO monitors what they are using, but until someone makes a formal request (call), WSEO does not regulate water use.

Mr. Anderson asked Montana to address water-year administration.

Mr. Kevin Smith replied that snowpack and water-supply conditions looked bleak going into runoff and in April, Montana placed a call to Wyoming on post-1950 storage water in the Tongue River. Rain occurred in May, and Montana lifted the call in mid-May before the Tongue River Reservoir spilled. The reservoir continued to spill into July. Commissioners were placed on the river prior to the call on Wyoming and kept on through the summer to officially deliver decreed and contract water.

Mr. Anderson asked Wyoming to brief the Commission on the Technical Committee meeting in April, 2015.

Ms. Lowry said that many experts from State and Federal agencies gave presentations on streamflow, snow pack, potential runoff, and climatological predictions for the spring and runoff period. Of concern to the Committee members was the inability to accurately predict snowmelt runoff in the Tongue River Basin. As follow up to this concern, Technical Committee members from Montana and Wyoming contacted experts in the Natural Resources Conservation Service (NRCS) and the National Weather Service (NWS) and asked them about the models they use, and what additional information do they need to increase the accuracy of their predictions. NRCS responded favorably and are interested in improving their predictive capabilities. NWS has not responded in writing but the River Forecast Center in Kansas City is willing and interested. The Technical Committee will continue to communicate and work with NRCS and NWS to improve their predictive capabilities.

Mr. Dalby asked if other States are using remote sensing to measure snow pack and sensing stations to measure climatic conditions and soil moisture to help forecast runoff.

Ms. Lowry replied that Colorado is doing some work in the Colorado River Basin. California, particularly the area draining into the San Francisco Bay, is using daily information to update the forecasts. Most of their efforts require weekly flights to get a better resolution of the snow pack. There also is research with satellites to measure snow water equivalent (SWE) in snow pack. And there has been some research using LIDAR to get a better estimate of snow depth. The University of Wyoming received a grant to look at the fate of snow. They will attempt to determine where the water goes during snowmelt; what part runs off to the streams and what part infiltrates into the ground.

Mr. Dalby requested that one of the researchers from the University of Wyoming give a presentation to the Technical Committee.

Mr. LoGuidice mentioned that more locations in Wyoming are being considered for weather modification.

Mr. Kevin Smith asked if Wyoming could update the Technical Committee at the next meeting on weather modification in Wyoming.

Mr. Anderson asked Wyoming to address coal bed methane development.

Ms. Ross distributed handouts and said that statewide, the total number of groundwater permits related to coal bed methane (CBM) development in Wyoming decreased from 76 in 2014 to 42 in 2015. The number of surface water

temporary filings and permits in the Tongue, Little Powder, and Powder River Basins in 2014 decreased from seven surface water temporary filings and 2081 permits to four temporary filings and 2031 permits in 2015 as of this meeting. Most of the reductions occurred in the Powder River Basin.

Mr. LoGuidice added that some of the CBM wells are being converted to a stock watering use. There are many miles of buried pipe on the landscape attached to wells that don't produce much water. Some land owners are using this system of pipes to provide water to watering tanks spread over the grazing range. If the landowners do this conversion, they assume the liability. There is a lot of cost to modify the well before the Wyoming Oil and Gas Conservation Commission and the Wyoming Department of Environmental Quality will allow the land owner to assume the well. Also, some land owners are interested in converting a CBM reservoir to a stock watering reservoir. Before the Wyoming State Engineer's Office (WSEO) issues a permit, the reservoir has to be reduced to a size that Mother Nature can fill or a maximum of 20 acre-feet. Plus, downstream water rights have to be considered. So the reservoir may have to be fitted with a control structure so water can be released if there is a call for water. It may seem like a good idea to keep these CBM structures until you consider your obligation to modify the structure and the need to get a permit.

Mr. Kevin Smith asked if the Wyoming State Engineer's Office has a good count on all of the CBM reservoirs and who is converting the reservoirs to stock reservoirs.

Mr. LoGuidice replied that in 2001, when CBM production increased, personnel from WSEO started inspecting and permitting all of the reservoirs intended to hold CBM production water. During that process, if they discovered unpermitted stock reservoirs, they also permitted those. So, they have a good list of all the reservoirs, whether they are CBM or stock reservoirs. The CBM reservoirs have a "drop dead" date, so when that date is reached, the inspector visits the reservoir to see if it is being used for CBM production water. If it is not or the company wants to abandon the reservoir, the reservoir has to be removed or given to another owner. If another owner takes over the reservoir and converts it to stock watering, the reservoir has to be modified (reduce size and outlet structure) before it is re-permitted as stock watering. Because there are older water rights in the basin, the reservoir has to be outfitted with an outlet structure in case there is a call for regulation in the drainage.

Mr. Anderson asked Montana to address CBM development.

Ms. Steinmetz replied that no CBM production water discharged into Montana streams in 2015.

Mr. Kevin Smith noted that CBM production is decreasing and asked if this topic could be dropped from future Yellowstone River Compact Commission meeting discussions? Ms. Lowry said that Wyoming was fine with dropping this topic from future full Commission meeting discussions.

Mr. Anderson proposed that CBM development be removed from next year's agenda, with the option that it could be added in future years should CBM development increase again. The other Commissioners agreed.

Mr. Anderson asked Montana to address statewide adjudication progress.

Ms. Overcast handed out a map showing the status of adjudication in Montana. She stated that Montana does a general adjudication where they look at all of the water rights that are pre-July 1, 1973. Of interest to the Commission is they were able to get an enforceable decree to pre-1950, however, the Montana Water Court is attempting to include all per-1973 rights in the decree.

Montana received adequate funding from the legislature to get final decrees out for the whole State by 2028.

There has been only one new permit application on the Powder River. The Montana Department of Natural Resources preliminarily granted the permit, but there was an objection. Now the permit application is in the hearing process. The objection dealt with water availability.

Mr. Schuh replied that as he understands the process, Montana has water rights that were either implied or authorized by local authorities, and Montana is bringing them all together for a final authorization through Montana's Water Court.

Ms. Overcast said correct. Montana's Water Use Act was formulized in 1973. One of the requirements of the act was to do a general adjudication of Montana's water rights. Water right owners had to file their water right between 1979 and 1982. There were more than 200,000 claims. DNRC was assigned to process and examine all of those claims in 85 water basins. DNRC is applying the Supreme Court Rules to the examination of those claims in order to have a decree that can be enforced.

Mr. Anderson asked Wyoming to address new adjudications.

Mr. LoGuidice replied that the Board of Control adjudicated 37 reservoirs in the Tongue and Powder River Basins. There were 103 reservoir endorsements (a water right owner has the option to have a stock reservoir adjudicated or endorsed). There were 24 pump and/or pipeline adjudications, two ditch enlargements, and 34 groundwater adjudications. There were 17 surface water and two groundwater petitions granted or acted on and finalized. One of the petitions was on the Prairie Dog Creek drainage and one on the main stem of the Tongue River. Both are finalized and post-1950 rights can be shut off it there is a pre-1950 call.

Mr. Loren Smith added that in the Bighorn River Basin, the general adjudication is finally complete. All appeals have been disposed. Fifty-one surface water permits were adjudicated, 30 reservoirs were inspected and adjudicated and one stock reservoir was endorsed. There were 31 ground water proofs, with some of those being enlargements of use. The Board of Control finalized 19 surface water petitions and six groundwater petition changes. There are about 65 inspections remaining to be address, and about 20 of those are instream flow permits. It can take about 3-5 years for those to be adjudicated.

Mr. Kevin Smith asked what is meant by enlargement of the groundwater use?

Mr. Loren Smith replied that when the inspector visits a site, they might note that the well is irrigating more acres than originally noted in the permit, but the water volume is the same. The map of irrigated acres comes at the end of the application process, so irrigated acres might not match up with the listed acreage in the permit.

Ms. Overcast asked what was involved with bringing the instream flow permits to adjudication?

Mr. Loren Smith replied that the applicant may have some flow data to base the permit on, but WSEO has to verify that the water they are requesting actually exists. That means gaging the stream and making measurements. The Water Development Commission files the permit application with the WSEO based upon studies conducted by the Wyoming Game and Fish Department. The water right is held by the State.

Mr. Anderson asked Montana to update the Commission on the Montana/Crow Compact.

Ms. Overcast replied that the Montana Water Court approved the Compact in May 2015. The Compact has been appealed to the Montana Supreme Court and no decision has been rendered.

Mr. Anderson asked the Bureau of Reclamation to discuss Bighorn Lake.

Mr. Jordan replied the snowpack in the Bighorn River Basin was below average. The Bureau of Reclamation operated the dam based on the predicted runoff from the snow pack and did not see a need to evacuate storage for flood control. But, above average precipitation occurred in May and average inflows in June reached 15,000 cfs. As a result, releases from Yellowtail Dam increased to about 14,000 cfs for a few weeks in June.

Mr. Anderson asked if the Bureau of Reclamation was thinking of raising the flood pool elevation in Bighorn Lake.

Mr. Jordan replied that there was some talk of reallocating space in the reservoir. After the floods in 2011, it became obvious that all of the space designated for flood control was needed.

Ms. Lowry suggested that the Bureau of Reclamation did not need to update the Commission in the future; rather the updates were better suited for the Technical Committee meeting in the spring. The other Commissioners agreed.

Mr. Anderson reminded the Commissioners that last year there was discussion about preparing a letter to the U.S. Army Corps of Engineers (USACE) as a result of the 2014 WRRDA bill. A letter was drafted, but it was not sent. Mr. Anderson met with Mr. Steven Stockton with USACE in Washington, DC, and asked him about the WRRDA bill. His response was that little would be done until money was appropriated. Mr. Anderson said it probably would be a good idea to send our suggestions and concerns about a monitoring network to be incorporated in USACE's planning should the money be appropriated. Commissioners Lowry and Davis (proxy by Mr. Kevin Smith) agreed that the letter should be updated and sent.

Mr. Dalby asked if the WRRDA bill was limited to the Yellowstone River Basin?

Mr. Anderson replied the bill is for the entire Missouri River Basin.

Mr. Schuh asked if the letter addressed the need for monitoring to better define the contributions from the tributaries to the Missouri River?

Ms. Lowry replied yes. There is a section in the WRRDA bill that references a report that evaluated USACE operations during the 2011 flood on the Missouri River. The main negative comment suggested the USACE could have had a better sense of plains snow pack. They could not have foreseen the rains that came in April and May, so they ran out of flood space in their reservoirs. A white paper suggested more SNOTEL sites, soil moisture monitoring, and plains snow pack monitoring was needed. Basically, the WRRDA bill deals with collecting more information so the USACE can better manage their reservoirs.

Mr. Anderson asked Wyoming to update the Commission on the Wyoming Governor's Water Strategy.

Ms. Lowry reported that at the beginning of the 2014 legislative session, the Governor announced a Water Strategy. There are about 10 strategic initiatives, and one of those initiatives dealt with water storage projects. The project is called "Ten in Ten", based on the goal to permit 10 new water storage projects in 10 years. The project will be handled by the Water Development Commission. Each proposed water storage project goes through three levels. The first level is reconnaissance, the second level is feasibility, and the third level is construction. Within level 2 (feasibility), there are three phases; general setting, geology, and compliance and permitting. So far, only two projects have reached phase three of level 2 (compliance and permitting). One is on Alkali Creek Reservoir, a tributary to Paint Rock Creek and Nowood River in the Bighorn River Basin. The other is Upper Leavitt Reservoir on Beaver Creek, a tributary to Shell Creek and Bighorn River.

Mr. Dalby said he thought there was talk of putting a storage reservoir on Clear Creek.

Mr. LoGuidice asked if he meant Bull Creek Reservoir. They are still in phase one, trying to find a suitable site. It has a planned storage of 14,000 acre-ft.

Mr. Anderson announced that this will be Mr. Carmine LoGuidice's last Yellowstone River Compact Commission meeting, and on behalf of the Commission thanked Mr. LoGuidice for his service.

The Commissioners agreed to hold the next Yellowstone River Compact Commission meeting on December 1, 2016 in Montana.

The meeting adjourned at 10:30 am.

Sue Lowry Commisioner for Wyoming

Timothy K. Davis Commissioner for Montana

Mark T. Anderson Chairman and Federal Representative

General Report

Operation and Budget

Work funded by the Yellowstone River Compact Commission, that to date has been primarily concerned with the collection of required hydrologic data, has been financed through cooperative arrangements whereby Montana and Wyoming each bear an equal share of the cost, and the remaining cost is borne by the United States. Salaries and necessary expenses of the 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 2015 were \$114,000, in accordance with the budget adopted for the year.

Estimated budgets for Federal fiscal years 2016, 2017, 2018, and 2019 were tentatively adopted subject to the availability of appropriations. The budgets for the four fiscal years are summarized as follows:

Year	Wyoming State Engineer	Montana Department of Natural Resources and Conservation	U.S. Geological Survey	Total
FY 2016	\$31,675	\$31,675	\$52,950	\$116,300
FY 2017	\$32,900	\$32,900	\$54,540	\$120,340
FY 2018	\$33,890	\$33,890	\$56,180	\$123,960
FY 2019	\$34,910	\$34,910	\$57,865	\$127,685

Gaging Station and Operation

Operation of five streamflow-gaging stations at the measuring sites specified in the Yellowstone River Compact continued in water year 2015 with satisfactory records collected at each station. Locations of streamflow-gaging stations, 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. Even though the Little Bighorn River is not covered by the Yellowstone River Compact, the compact covers the water in the Bighorn River minus the Little Bighorn River. Thus, the streamflow from the Little Bighorn River is subtracted from the streamflow of the Bighorn River. In addition, the Bighorn River streamflow is adjusted monthly with change in storage of Bighorn Lake. During water year 2015, annual streamflow was normal² at three of the four streamflow-gaging stations and above normal at the other streamflow-gaging station. The rank of the annual streamflow, with the lowest annual streamflow having a rank of 1, is displayed in the following table:

		Percent of	Rank of annu	al streamflow	Year of lowest	Number of years of annual record	
Station number	Streamflow-gaging station	average stream- flow for water year 2015 ¹	2015 water year	2014 water year	annual streamflow (rank equals 1)		
06208500	Clarks Fork Yellowstone River at Edgar, Mont., minus diversions to White Horse Canal	97	42	75	2001	77	
06294500	Bighorn River above Tullock Creek, near Bighorn, Mont., minus Little Bighorn River near Hardin, Mont. (06294000), adjusted for change in contents in Bighorn Lake	81	36	49	2002	62	
06308500	Tongue River at Miles City, Mont.	102	43	66	1961	72	
06326500	Powder River near Locate, Mont.	130	58	62	2004	77	

¹Average is based on period of record at each station.

²The "normal" range defined in this report is 80 to 120 percent of average.

Tabulation of streamflow records for water year 2015 (tables 1–5) and graphical comparisons of statistical distribution of monthly and annual streamflow, and annual departures from mean annual streamflow (figures 1–4) are provided in the section "Summary of Discharge for Yellowstone River Compact Streamflow-Gaging Stations." The tabulated streamflow records do not account for depletions for irrigation and other uses unless otherwise noted.

Diversions

No diversions were regulated by the Commission during water year 2015.

Reservoir Contents

Reservoirs Completed After January 1, 1950

As a matter of record and general information, month-end usable contents data (tables 6–8) and descriptions of these reservoirs are given in the section "Month-end Contents for Yellowstone River Compact Reservoirs Completed after January 1, 1950." Boysen Reservoir, located on the Wind River and operated by the Bureau of Reclamation, began the water year with 626,700 acre-ft in usable contents and ended the water year with 591,000 acre-ft. Anchor Reservoir, located on South Fork Owl Creek and operated by the Bureau of Reclamation, began the water year with an estimated 498 acre-ft in usable contents and ended the water year with 395 acre-ft. Bighorn Lake, a Bureau of Reclamation storage project on the Bighorn River that is the largest in the Yellowstone River Basin, contained 1,004,000 acre-ft of usable contents at the beginning of the water year and 951,800 acre-ft at the end of the water year.

Reservoirs Existing on January 1, 1950

As a matter of record and general information, month-end usable contents data for the four reservoirs in existence on January 1, 1950, upstream from the points of measurement, are given in table 9 in the section "Month-End Contents for Yellowstone River Compact Reservoirs Existing on January 1, 1950." The reservoirs are 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 current (2015) and previous water years for the 7 reservoirs listed above plus 38 additional reservoirs that have usable contents greater than 1,000 acre-ft was compiled at the request of the Commission. The information is provided in table 10 in the section "Water-Year-End Contents for Yellowstone River Compact Reservoirs or Lakes."

Summary of Discharge for Yellowstone River Compact Streamflow-Gaging Stations

06208500 Clarks Fork Yellowstone River at Edgar, Mont.

LOCATION.—Lat 45°27'57", long 108°50'39" referenced to North American Datum of 1927, in SE ¹/₄ SE ¹/₄ SE ¹/₄ 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 mi².

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 Geodetic Vertical Datum of 1929. Prior to August 31, 1953, nonrecording gage located at same site and elevation.

REMARKS.—10-01-2014 to 09-30-2015: records are good, except estimated records are poor.

Diversions for irrigation include about 41,500 acres, of which about 840 acres lie downstream from the station. In addition, about 6,300 acres of land upstream from the station are irrigated by diversions from the adjoining Rock Creek Basin. **Discharge values and summary statistics given herein have the diversions to White Horse Canal subtracted.** **Table 1.**Daily mean discharge for Clarks Fork Yellowstone River at Edgar, Mont. (06208500), minus diversions to White Horse Canal,
October 2014 through September 2015.

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	923	667	e540	e520	e450	454	731	1,790	5,440	1,360	352	178
2	1,030	670	e620	e600	e500	469	869	2,020	6,370	1,300	312	157
3	973	698	e680	e600	e450	438	728	2,200	6,520	1,190	275	155
4	932	701	e690	e540	e450	409	657	2,250	6,080	1,060	258	163
5	898	679	e690	e590	e460	461	624	2,320	6,010	958	263	173
(820	(((-(90	-(00	420	490	(11	2 400	5.040	0(2	214	101
0	839	000	6080	6600	428	480	502	2,400	5,940	962	222	191
/	/91	696	e6/0	e590	444	422	593	2,600	5,790	1,010	332	206
8	744	/41	e640	e570	460	406	554	2,390	5,/10	862	339	195
9	/20	722	e630	e530	45/	395	545	1,990	6,220	854	342	188
10	699	//9	e620	e540	446	393	522	1,680	6,500	850	428	189
11	703	801	e610	e540	446	393	516	1,390	6,600	951	395	183
12	698	641	617	e550	443	389	511	1,160	5,950	1,000	362	177
13	709	578	606	e560	433	397	524	1,190	5,510	958	341	179
14	706	566	598	e540	433	397	502	1,310	5,290	841	306	182
15	684	491	597	e530	437	401	548	1,580	4,500	721	266	173
16	691	596	592	2560	440	421	700	2 450	1 260	669	280	177
10	677	-500	542	2550	449	431 540	/00 650	2,430	4,300	661	209	1//
17	670	e390	561	e550	441	556	630	2,990	4,820	624	525 227	195
10	619	2660	560	e560	404	530	027	2,030	4,230	024 502	227	212
19	(25	2000	509	e500	410	507	027	2,500	3,020	592	212	250
20	035	6000	308	6550	430	507	937	2,200	3,330	580	312	270
21	613	e670	554	e530	443	504	860	2,050	2,960	498	287	290
22	600	e680	549	e510	414	540	966	1,980	2,550	485	257	252
23	597	e640	547	e530	432	559	1,120	2,270	2,180	451	247	241
24	602	e650	522	e560	430	547	1,250	2,660	1,920	418	250	226
25	592	e650	531	e540	426	536	1,200	2,830	1,770	448	227	215
26	598	e660	580	e550	437	508	1 240	2 940	1 660	447	192	225
20	607	e700	515	e550	42.0	481	1 110	3 190	1 620	414	172	223
28	673	e740	495	e560	451	475	954	3 400	1 550	419	178	235
29	654	e700	389	e550		547	1 040	3 770	1 520	450	186	230
30	657	e430	342	e500		635	1 480	3 580	1 400	426	207	230
31	657		e290	e470		626		4.130		394	196	
								.,				
Total	22,220	19,740	17,620	17,030	12,340	14,820	23,940	73,660	127,900	22,850	8,870	6,145
Mean	717	658	569	549	441	478	798	2,376	4,264	737	286	205
Max	1,030	801	690	600	550	635	1,480	4,130	6,600	1,360	428	290
Min	592	430	290	470	404	389	502	1,160	1,400	394	173	155
Acre-ft	44,070	39,160	34,960	33,780	24,470	29,390	47,490	146,100	253,699	45,330	17,590	12,190

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

SUMMARY STATISTICS								
	Water Year 2015	Water Years 1921–2015*						
Annual total	367,200							
Annual mean	1,006	1,031						
Annual runoff (acre-ft)	728,300	746,400						

*During periods of operation (water years 1921-69, 1987 to current year).



Figure 1. Streamflow data for Clarks Fork Yellowstone River at Edgar, Mont. (06208500), minus diversions to White Horse Canal, water years 1921–2015. *A*, Statistical distribution of monthly and annual streamflow. *B*, Annual departure from the mean annual streamflow.

06294000 Little Bighorn River near Hardin, Mont.

LOCATION.—Lat 45°44′09″, long 107°33′27″ referenced to North American Datum of 1983, in SE ¼ NE ¼ NE ¼ 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 mi².

PERIOD OF RECORD.—June 1953 to present.

REVISED RECORDS.—Water Data Report MT-86-1: 1978.

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.—10-01-2014 to 09-30-2015: records are fair, except estimated records are poor.

Streamflow partly regulated by Willow Creek Reservoir (also known as Lodge Grass Reservoir, capacity 22,900 acre-ft). Diversions for irrigation include 20,980 acres upstream from station. **Discharge values and summary statistics given herein include the streamflow of terminal wasteway of Agency Canal.**

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Мау	Jun	Jul	Aug	Sep
1	195	169	e140	e130	e200	e210	208	221	1,830	289	147	114
2	195	170	e150	e140	e220	e210	201	232	1,690	248	137	114
3	195	170	e160	e150	e210	e210	201	232	1,630	249	127	119
4	193	169	e150	e140	e210	214	200	241	1,610	242	123	124
5	193	168	e150	e160	e210	224	199	250	1,410	229	137	128
6	191	167	e150	e170	e210	241	201	273	1,250	221	151	144
7	193	167	e150	e170	e220	253	200	295	1,130	228	141	154
8	193	166	e150	e180	e230	261	198	344	1,060	239	139	157
9	184	167	e150	e180	e230	257	194	356	935	211	135	158
10	182	175	e150	e170	e220	268	191	340	856	198	137	157
11	179	176	e150	e190	e210	276	192	332	849	186	134	155
12	185	173	e150	e180	e210	276	194	298	1,000	171	129	151
13	185	139	e150	e180	e210	270	193	270	891	161	126	147
14	189	e140	e150	e180	e210	264	185	241	793	149	121	147
15	192	e140	e150	e190	e210	264	192	244	732	142	118	153
16	186	e150	e140	e200	e210	251	206	271	691	141	111	152
17	183	e160	e140	e210	e210	241	229	371	684	158	113	141
18	180	e160	e150	e210	e210	241	241	511	674	174	122	148
19	180	e170	e150	e210	e210	239	244	518	633	165	127	156
20	178	e180	e150	e210	e210	235	248	491	597	156	128	161
21	176	e190	e150	e210	e210	228	224	445	536	150	129	155
22	175	e180	e150	e210	e200	221	198	417	485	142	102	155
23	174	e180	e150	e200	e190	217	187	405	465	129	115	150
24	173	e170	e150	e200	e200	215	185	409	438	122	117	131
25	174	e170	e150	e200	e210	215	200	444	410	130	118	125
26	174	e170	e150	e200	e220	219	214	632	380	130	118	121
27	172	e160	e140	e210	e210	217	219	970	368	129	116	120
28	169	e160	e130	e200	e200	213	222	1,060	345	135	115	117
29	170	e160	e130	e200		210	226	1,050	327	139	123	116
30	168	e160	e120	e200		206	236	1,320	310	153	120	118
31	169		e120	e200		206		1,860		151	119	
Total	5,645	4,976	4,520	5,780	5,900	7,272	6,228	15,340	25,010	5,467	3,895	4,188
Mean	182	166	146	186	211	235	208	495	834	176	126	140
Max	195	190	160	210	230	276	248	1,860	1,830	289	151	161
Min	168	139	120	130	190	206	185	221	310	122	102	114
Acre-ft	11,200	9,870	8,965	11,460	11,700	14,420	12,350	30,430	49,600	10,840	7,725	8,307

 Table 2.
 Daily mean discharge for Little Bighorn River near Hardin, Mont. (06294000), October 2014 through September 2015.

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

SUMMARY STATISTICS									
	Water Year 2015	Water Years 1954–2015							
Annual total	94,220								
Annual mean	258	276							
Annual runoff (ac-ft)	186,900	199,70							

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

LOCATION.—Lat 46°07′28″, long 107°28′08″ referenced to North American Datum of 1983, in SE ¼ SE ¼ NE ¼ 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 mi². Area at site used October 7, 1955 to September 30, 1981, 22,885 mi².

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. Elevation of gage is 2,700 ft, referenced to the North American Vertical Datum of 1988. 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.—10-01-2014 to 09-30-2015: records are good, except estimated records are poor.

After November 1965, streamflow has been regulated by Bighorn Lake (usable contents, 1,312,000 acre-ft). Major regulation prior to November 1965 occurred from 14 reservoirs in Wyoming and 1 in Montana with combined usable contents of about 1,400,000 acre-ft. Diversion for irrigation of about 445,200 acres occurs upstream from the station.

Table 3.Daily mean discharge for Bighorn River above Tullock Creek, near Bighorn, Mont. (06294500), October 2014 through
September 2015.

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	5,140	3,350	e3,300	e3,100	3,090	3,080	3,660	2,580	9,680	7,930	2,510	2,270
2	5,160	3,390	3,330	e3,100	3,040	3,100	3,540	2,520	10,700	7,390	2,460	2,450
3	5,180	3,430	3,230	e3,100	3,030	3,240	3,270	2,510	12,400	7,120	2,360	2,480
4	5,200	3,460	3,120	e3,100	3,020	3,290	3,120	2,500	13,800	7,080	2,320	2,530
5	5,230	3,500	2,980	e3,100	3,020	3,290	3,110	2,420	14,200	7,050	2,480	2,580
6	5 2 5 0	3 520	2,990	e3 100	3 020	3 340	3 110	2 370	13 900	7 050	2 570	2.640
7	4 900	3 260	3 010	e3 100	3 060	3 380	3 110	2,480	14 200	6 750	2,520	2,590
8	4.560	2.850	3.020	e3.100	3.090	3,400	3.030	2.550	14.300	6.580	2.450	2,570
9	4.250	2,870	3.030	e3.100	3.120	3.420	2,820	2,670	13.800	6.350	2.460	2,560
10	3.940	2.950	3.040	e3.100	3.120	3.420	2.710	2,700	14.500	5.780	2.350	2.570
11	2.0(0	0.040	2.0.40	2 100	2 000	2,400	0.500	0 (70	15.000	5.050	2 2 1 0	2 (20
11	3,960	2,940	3,040	e3,100	3,080	3,480	2,580	2,670	15,200	5,050	2,310	2,620
12	4,030	2,900	3,050	e3,100	3,050	3,540	2,580	2,550	15,100	4,980	2,460	2,600
13	4,040	2,870	3,060	e3,100	3,050	3,520	2,530	2,480	15,400	4,880	2,540	2,580
14	4,070	2,870	3,070	e3,100	3,050	3,510	2,470	2,400	15,100	4,//0	2,450	2,560
15	4,120	2,960	3,100	3,200	3,040	3,500	2,400	2,460	14,800	4,680	2,410	2,610
16	4,000	2,990	3,060	3,220	3,020	3,500	2,460	2,660	14,600	4,460	2,370	2,710
17	3,720	3,010	3,060	3,240	3,020	3,620	2,460	2,920	14,600	4,380	2,300	2,710
18	3,550	3,060	3,060	3,250	3,010	3,780	2,510	3,090	14,800	4,380	2,390	2,720
19	3,580	3,100	3,050	3,300	3,000	3,790	2,500	3,170	14,900	4,350	2,510	2,710
20	3,600	3,130	3,070	3,370	3,090	3,760	2,470	3,070	14,800	4,320	2,470	2,720
21	3,620	3,110	3,090	3,240	3,180	3,740	2,420	2,960	14,700	3,940	2,400	2,720
22	3,650	3,090	3,130	3,070	3,160	3,730	2,340	2,880	14,500	3,710	2,330	2,710
23	3,490	3,150	3,140	3,060	3,160	3,720	2,310	2,820	14,400	3,610	2,270	2,740
24	3,260	3,170	3,140	3,090	3,120	3,710	2,270	2,800	14,200	3,530	2,220	2,710
25	3,280	3,210	3,170	3,180	3,180	3,720	2,390	2,840	13,900	3,230	2,230	2,720
26	3.320	3.260	3.130	3.290	3.180	3.720	2,660	2.820	13.000	2,720	2.370	2,740
27	3,350	3,250	3,110	3,360	3,170	3,720	2,720	3,510	11,900	2,460	2,340	2,780
28	3,390	3,280	3,110	3,340	3,120	3,710	2,690	5,060	10,900	2,470	2,340	2,810
29	3,410	3,330	3,100	3,310		3,690	2,650	6,870	9,840	2,460	2,350	2,830
30	3,380	3,300	e3,100	3,210		3,680	2,580	8,150	8,710	2,600	2,300	2,810
31	3,320		e3,100	3,160		3,670		9,380		2,570	2,240	
Tetel	125.000	04.5(0	05.000	00.200	96 200	100.000	01 470	102 000	406 000	149 (00	74.000	70.250
Iotai	125,000	94,560	95,990	98,290	80,290	109,800	81,470	102,900	406,800	148,000	/4,080	79,330
Mar	4,031	3,152	3,096	3,1/1	3,081	3,541	2,/10	5,518	15,500	4,795	2,390	2,045
Miax	5,250	3,520	2,220	3,370	3,180	3,/90	3,000	9,380	15,400	7,930	2,570	2,830
Iviin	3,200	2,850	2,980	3,060	3,000	3,080	2,270	2,370	ð,/10	2,460	2,220	2,270
Acre-It	247,800	187,600	190,400	195,000	1/1,200	217,700	101,600	204,000	806,900	294,800	146,900	157,400

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

SUMMARY STATISTICS							
	Water Year 2015	Water Years 1945–2015					
Annual total	1,503,000						
Annual mean	4,118	3,680					
Annual runoff (ac-ft)	2,981,000	2,664,000					



Figure 2. Streamflow data for Bighorn River above Tullock Creek, near Bighorn, Mont. (06294500), minus Little Bighorn River near Hardin, Mont. (06294000); adjusted for change in contents in Bighorn Lake, water years 1954–2015. *A*, Statistical distribution of monthly and annual streamflow. *B*, Annual departure from the mean annual streamflow.

06308500 Tongue River at Miles City, Mont.

LOCATION.—Lat 46°23′05″, long 105°50′44″ referenced to North American Datum of 1983, in SE ¼ SE ¼ SE ¼ SE ¼ 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.—5,397 mi². Area at site used prior to October 4, 1995, 5,379 mi².

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.

GAGE.—Water-stage recorder. Elevation of gage is 2,360 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.—10-01-2014 to 09-30-2015: records are fair, except estimated records are poor.

Streamflow is regulated by Tongue River Reservoir (station 06307000) with usable contents of 79,070 acre-ft, and many small reservoirs in Wyoming with combined capacity about 15,000 acre-ft. Diversions for irrigation include about 100,800 acres upstream from station.

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	391	332	e230	e210	e290	e290	195	42	2,480	665	147	185
2	385	329	e210	e220	e280	e300	187	41	2,770	583	141	184
3	352	325	e220	e230	e270	e300	185	26	2,770	543	139	177
4	363	316	e220	e230	e270	e280	183	21	2,730	472	156	155
5	380	314	e210	e230	e260	e300	182	18	2,780	448	146	175
(202	200	-240	-220	- 290	-220	100	17	2.050	126	145	200
6	393	309	e240	e230	e280	e320	180	1/	3,050	436	145	209
/	381 201	200	e240	e230	e510	e380	180	20	3,190 2,170	390 259	140	205
8	391	296	e240	e230	e350	e400	180	57	3,170	358	124	215
9	363	296	e240	e220	e400	e420	183	4/	2,910	314	128	208
10	367	308	e250	e220	e380	e450	179	58	2,940	280	130	198
11	374	e200	e250	e220	e350	e410	167	70	2,880	276	154	168
12	410	e140	e250	e220	e330	317	162	67	2,550	299	136	184
13	419	e120	e250	e220	e320	288	159	58	2,440	280	129	182
14	423	e160	e250	e220	e320	280	155	49	2,560	270	122	170
15	426	e180	e250	e220	e310	277	150	50	2,800	259	107	159
16	428	e200	e250	e230	e300	273	149	70	2,480	252	111	166
17	430	e230	e250	e230	e290	262	150	110	2,140	249	122	176
18	428	e250	e250	e230	e290	256	149	121	2,090	247	152	163
19	375	e260	e260	e230	e260	255	147	119	2,050	236	192	163
20	351	e300	e260	e230	e280	252	145	107	2,090	232	217	178
21	346	e300	e260	e230	e280	248	128	101	2,220	221	240	195
22	341	e300	e260	e230	e280	242	122	123	1,860	218	194	194
23	334	e310	e250	e240	e280	231	120	141	1,700	201	192	203
24	333	e300	e250	e250	e280	225	119	180	1,480	173	187	215
25	332	319	e250	e260	e300	223	116	193	1,330	163	171	172
26	325	314	e240	e280	e270	220	120	206	1,180	155	169	162
27	307	312	e230	e310	e260	213	130	259	1,060	171	130	168
28	316	313	e230	e370	e280	209	127	1,000	926	244	138	133
29	323	e290	e220	e400		208	108	2,090	843	285	152	146
30	330	e270	e200	e350		203	33	2,550	752	252	167	159
31	321		e190	e300		200		2,530		180	191	
Total	11,440	8,193	7,400	7,720	8,400	8,732	4,490	10,550	66,220	9,352	4,769	5,367
Mean	369	273	239	249	300	282	150	340	2,207	302	154	179
Max	430	332	260	400	400	450	195	2,550	3,190	665	240	215
Min	307	120	190	210	260	200	33	17	752	155	107	133
Acre-ft	22,690	16,250	14,680	15,310	16,660	17,320	8,906	20,920	131,300	18,550	9,459	10,650

Table 4. Daily mean discharge for Tongue River at Miles City, Mont. (06308500), October 2014 through September 2015.

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

SUMMARY STATISTICS								
	Water Year 2015	Water Years 1938–2015*						
Annual total	152,600							
Annual mean	418	408						
Annual runoff (acre-ft)	302,700	295,500						

*During periods of operation (April 1938 to April 1942, April 1946 to water year 2014).

Figure 3. Streamflow data for Tongue River at Miles City, Mont. (06308500), water years 1938–2015. *A*, Statistical distribution of monthly and annual streamflow. *B*, Annual departure from the mean annual streamflow.

06326500 Powder River near Locate, Mont.

LOCATION.—Lat 46°25′46″, long 105°18′37″ referenced to North American Datum of 1983, in SW ¼ SW ¼ SE ¼ 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, and 25 mi east of Miles City, and at river mile 29.4.

DRAINAGE AREA.-13,060 mi².

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, and August 21, 1981 to September 30, 1981, water-stage recorder located at site near elevation. October 1, 1981 to April 5, 1995 water-stage recorder located at site at different elevation. October 1, 1981 to April 5, 1995 water-stage recorder located at site near upstream at different elevation. April 7, 1995 to present, water-stage recorders located on each bank and used depending on control conditions.

REMARKS.—06-27-2015 to 09-30-2015: records are fair. 10-01-2014 to 06-26-2015: records are good, except estimated records are poor.

Some regulation occurs by three reservoirs in Wyoming with combined usable contents of 36,800 acre-ft. Diversions for irrigation include about 101,800 acres upstream from station.

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Мау	Jun	Jul	Aug	Sep
1	240	326	e260	e270	e290	e290	413	280	5,300	1,510	237	139
2	240	323	e260	e270	e300	e290	388	287	5,770	1,410	191	127
3	228	315	e270	e260	e310	e290	384	273	5,020	1,310	166	111
4	259	321	e270	e260	e290	e290	383	286	4,340	1,260	160	107
5	279	312	e280	e250	e300	e300	371	358	4,240	1,170	163	106
6	300	330	e280	e240	e300	e320	380	358	5,970	1,140	189	114
7	303	316	e300	e240	e310	e370	427	348	8,550	1,080	173	107
8	322	338	e300	e230	e330	e500	445	363	8,270	1,040	175	101
9	342	351	e310	e230	e340	e600	464	364	7,340	988	174	104
10	444	e360	e310	e220	e320	e800	477	363	5,370	944	163	95
11	414	e280	e330	e220	e300	657	460	402	5,010	957	149	93
12	391	e220	e350	e210	e290	627	422	405	4,230	877	130	89
13	394	e200	e380	e210	e300	813	430	414	3,950	805	134	78
14	373	e180	e370	e200	e310	719	419	408	4,920	805	142	77
15	360	e210	e360	e210	e330	707	370	447	5,040	877	131	75
16	340	e230	e360	e220	e340	689	370	507	4,070	799	134	82
17	360	e250	e350	e230	e300	648	376	508	3,680	757	147	85
18	356	e280	e350	e230	e310	603	365	592	3,520	696	165	88
19	356	e300	e350	e240	e320	564	345	546	3,650	576	171	96
20	362	e310	e350	e240	e330	562	348	635	3,600	559	170	99
21	357	e330	e350	e240	e330	557	345	855	4,060	492	158	94
22	348	e350	e350	e240	e320	532	337	1,090	3,870	450	142	91
23	360	e360	e340	e250	e320	520	318	1,090	2,840	399	166	100
24	347	e350	e340	e260	e330	488	291	1,010	2,320	346	181	121
25	346	e350	e330	e270	e320	490	290	1,410	2,080	346	171	131
26	327	e340	e330	e290	e300	495	287	1,370	1,870	330	154	137
27	310	e350	e320	e310	e280	479	317	1,740	1,800	343	147	141
28	322	e360	e320	e320	e280	467	307	4,570	1,750	392	172	151
29	331	e330	e300	e310		465	286	5,720	1,630	261	176	154
30	333	e300	e270	e310		452	272	6,600	1,540	225	161	156
31	324		e260	e300		454		6,090		225	150	
Total	10,370	9,172	9,900	7,780	8,700	16,039	11,090	39,690	125,599	23,370	5,042	3,249
Mean	334	306	319	251	311	517	370	1,280	4,187	754	163	108
Max	444	360	380	320	340	813	477	6,600	8,550	1,510	237	156
Min	228	180	260	200	280	290	272	273	1,540	225	130	75
	00 5 (0	10 100	10 6 4 0	15 420	17 260	21.010	21.000	70 720	240 100	46.250	10.000	6 4 4 4

 Table 5.
 Daily mean discharge for Powder River near Locate, Mont. (06326500), October 2014 through September 2015.

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

SUMMARY STATISTICS								
Water Year 2015	Water Years 1939–2015							
270,000								
740	568							
535,500	411,300							
	SUMMARY STATISTICS Water Year 2015 270,000 740 535,500							

Figure 4. Streamflow data for Powder River near Locate, Mont. (06326500), water years 1939–2015. *A*, Statistical distribution of monthly and annual streamflow. *B*, Annual departure from the mean annual streamflow.

Month-End Contents for Yellowstone River Compact Reservoirs¹ Completed after January 1, 1950

06258900 Boysen Reservoir, Wyo.

LOCATION.—Lat 43°25′00″, long 108°10′37″ referenced to North American Datum of 1927, in NW ¼ NW ¼ sec. 16, T.5 N., R.6 E., Fremont County, Hydrologic Unit 10080005, at dam on Wind River and 13 mi north of Shoshoni, Wyo.

DRAINAGE AREA.—7,700 mi².

PERIOD OF RECORD.—October 1951 to present (month-end contents only).

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

REMARKS.—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 4,657.0 ft. and contents of 40,080 acre-ft. The elevation of the top of the joint use pool (top of spillway gate) is 4,725.0 ft. and contents of 741,600 acre-ft. Crest of dam is at elevation 4,758.00 ft. Water used for irrigation, flood control, and power generation.

COOPERATION.-Elevations and contents table furnished by Bureau of Reclamation.

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

Date	Water-surface elevation, in feet	Usable contents, in acre-feet	Change in usable contents, in acre-feet
September 30, 2014	4,721.03	626,700	
October 31	4,722.57	655,000	28,300
November 30	4,722.28	646,600	-5,400
December 31	4,721.88	642,200	-7,400
January 31, 2015	4,721.27	631,100	-11,200
February 28	4,721.05	627,100	-4,000
March 31	4,720.64	619,700	-7,400
April 30	4,719.95	607,400	-12,300
May 31	4,723.95	681,100	73,800
June 30	4,725.36	708,600	27,400
July 31	4,722.80	659,300	-49,300
August 31	4,720.65	619,900	-39,400
September 30, 2015	4,719.01	591,000	-28,900
2015 water year			-35,700

Table 6. Month-end contents for Boysen Reservoir, Wyo.

[Symbol: --, no data]

¹Wyoming disagrees with the term "Compact Reservoirs" as used throughout this annual report. Wyoming's acceptance of this annual report should not be construed as Wyoming's acceptance of the use of that term.

06260300 Anchor Reservoir, Wyo.

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, Wyo.

DRAINAGE AREA.-131 mi².

PERIOD OF RECORD.—November 1960 to present (month-end contents only).

GAGE.—Water-stage recorder. Datum of gage is referenced to the National Geodetic Vertical Datum of 1929 (Bureau of Reclamation bench mark).

REMARKS.—Reservoir is formed by concrete-arch dam completed in 1960. The elevation of the dead pool (invert of river outlet) is 6343.75 ft. and contents of 66 acre-ft. The top of the active conservation pool is 6441.0 ft. and contents of 17,230 acre-ft. Water is used for irrigation of land in Owl Creek Basin.

COOPERATION.-Elevations and contents table furnished by Bureau of Reclamation.

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

 Table 7.
 Month-end contents for Anchor Reservoir, Wyo.

Date	Water-surface elevation, in feet	Usable contents, in acre-feet	Change in usable contents, in acre-feet
September 30, 2014	6,363.64	498	
October 31	6,368.50	754	256
November 30	6,366.00	613	-141
December 31	6,366.00	613	0
January 31, 2015	6,366.70	651	38
February 28	6,367.00	667	16
March 31	6,367.26	682	15
April 30	6,363.04	471	-211
May 31	6,382.91	1,950	1,479
June 30	6,412.44	7,420	5,470
July 31	6,406.32	5,630	-1,790
August 31	6,365.27	576	-5,054
September 30, 2015	6,361.23	395	-181
2015 water year			-103

[Symbol: --, no data]

06286400 Bighorn Lake near St. Xavier, Mont.

LOCATION.—Lat 45°18′27″, long 107°57′26″ referenced to North American Datum of 1927, in SW ¼ SE ¼ 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 mi².

PERIOD OF RECORD.—November 1965 to present (month-end contents only). Prior to October 1969, published as "Yellowtail Reservoir." Records of daily elevations and contents on file at the U.S. Geological Survey, Wyoming-Montana Water Science Center in Helena, Mont.

GAGE.—Water-stage recorder located in powerhouse control room. Elevation of gage is 3,296.5 ft, referenced to the National Geodetic Vertical Datum of 1929 (levels by Bureau of Reclamation).

COOPERATION.-Elevations and contents table furnished by Bureau of Reclamation.

REMARKS.—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 3296.50 ft., contents of 17,720 acre ft. The top of the inactive conservation pool is 3547.00 ft., contents of 469,900 acre-ft. The elevation of spillway crest is 3,593.00 ft. The top of the exclusive flood pool (top of gates) is 3657.00 ft., contents of 1,279,000 acre-ft. The top of the surcharge pool is 3660.00 ft., contents of 1,332,000 acre-ft. All elevations are referenced to the National Geodetic Vertical Datum of 1929. Water is used for power production, flood control, irrigation, and recreation.

EXTREMES FOR PERIOD OF RECORD.—Maximum contents, 1,346,000 acre-ft, July 6, 1967, elevation, 3,656.43 ft; minimum since first filling, 519,400 acre-ft, March 11, 2003, elevation 3,572.81 ft.

Date	Water-surface elevation, in feet	Usable contents, in acre-feet	Change in usable contents, in acre-feet
September 30, 2014	3,640.08	1,004,000	
October 31	3,637.47	972,000	-32,000
November 30	3,634.98	943,700	-28,300
December 31	3,632.03	912,900	-30,800
January 31, 2015	3,628.20	877,500	-35,400
February 28	3,629.34	887,600	10,100
March 31	3,624.83	849,000	-38,600
April 30	3,621.85	825,400	-23,600
May 31	3,635.57	950,200	124,800
June 30	3,645.25	1,074,000	123,800
July 31	3,639.87	1,001,000	-73,000
August 31	3,638.15	980,100	-20,900
September 30, 2015	3,6435.71	951,800	-28,300
2015 water year			-52,200

Table 8.	Month-end	contents for	Bighorn	Lake, Mont
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[Symbol: --, no data]

Month-End Contents for Yellowstone River Compact Reservoirs¹ 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 usable contents in acre-ft of four reservoirs are given in table 9. Three of the reservoirs (Bull Lake, Pilot Butte Reservoir, and Buffalo Bill Reservoir) are in the Bighorn River Basin, Wyoming, and data on contents were furnished by the Bureau of Reclamation. The usable contents of Buffalo Bill Reservoir were increased in 1992 from 456,600 acre-ft to 644,500 acre-ft (listed as 646,565 acre-ft by 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 furnished the water-level data and the reservoir-contents table. The usable contents of Tongue River Reservoir increased from 68,040 acre-ft to 78,360 acre-ft in 1999.

_		Usable conten	ts, in acre-feet²	
Date	06224500 Bull Lake	Pilot Butte Reservoir	06281500 Buffalo Bill Reservoir	06307000 Tongue River Reservoir
September 30, 2014	104,000	22,400	510,200	54,980
October 31	103,700	24,610	464,000	48,840
November 30	104,000	24,360	463,100	49,320
December 31	105,100	24,330	464,300	50,440
January 31, 2015	105,200	24,260	463,500	50,270
February 28	105,200	24,250	462,300	51,400
March 31	105,100	24,090	478,200	55,380
April 30	108,600	27,450	497,400	65,830
May 31	134,200	27,680	566,900	82,700
June 30	149,800	27,160	631,100	79,770
July 31	144,800	18,460	584,400	70,730
August 31	100,200	13,480	499,700	56,790
September 30, 2015	62,960	12,740	430,800	46,910
Change in contents During water year	-41,040	-9,660	-79,400	-8,070

Table 9. Month-end contents for Yellowstone River Compact reservoirs¹ existing on January 1, 1950.

¹Wyoming disagrees with the term "Compact Reservoirs" as used throughout this annual report. Wyoming's acceptance of this annual report should not be construed as Wyoming's acceptance of the use of that term.

² Pre-Compact water rights and post-compact water rights for these reservoirs are presented in the table, "Water-year-end contents for Yellowstone River Compact reservoirs or lakes."

Water-Year-End Contents for Yellowstone River Compact Reservoirs¹ or Lakes

Month-end usable contents for additional reservoirs of interest to the Yellowstone River Compact is listed in table 10. Anchor Reservoir was built to have a usable contents of 17,410 acre-ft., but sinkholes within the area contained by the dam prevent filling the reservoir to the designed volume, and at present, only 9,252 acre-ft. has been adjudicated with an extension to December 31, 2013, for the remaining 8,158 acre-ft.

 Table 10.
 Water-year-end contents for Yellowstone River Compact reservoirs¹ or lakes.

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

Reservoir or lake name	Pre- compact 1950 water right	Post- compact 1950 water right	Total permitted water right	Total contents ²	Usable contents ³ on Sept. 30, 2015	Usable contents ³ on Sept. 30, 2014	Change in usable contents ⁴
		Clarks Fork Ye	ellowstone Rive	er Basin			
Cooney Reservoir ^{5,6}	28,230	0	28,230	28,230	18,380	16,520	1,860
Glacier Lake ^{5,6}	4,200	0	4,200	4,200			
		Bigho	orn River Basin				
(Lake) Adelaide Reservoir ^{7,9}	1,449	3,315	4,764	4,760	675	3,480	-2,805
Anchor Reservoir ^{8,9,10}	0	9,252	17,412	1117,230	395	498	-103
Bighorn Lake ^{8,9,10}	0	1,116,000	1,116,000	121,021,000	951,800	1,004,000	-52,200
Boysen Reservoir ^{8,9,10}	757,851	0	757,851	11741,600	591,000	626,700	-35,700
Buffalo Bill Reservoir ^{8,9,10}	456,640	187,940	644,580	11646,600	430,800	510,200	-79,400
Bull Lake ^{8,9,10}	151,951	0	151,951	11152,500	62,960	104,000	-41,040
Christina Reservoir ^{9,13}	3,860	0	3,860	3,860	55	3,860	-3,805
Corral Reservoir ^{9,13}	0	1,027	1,027	1,030	676	764	-88
Diamond Creek Dike Reservoir ^{9,13}	0	18,378	18,378	18,380	388	345	43
Enterprise Reservoir ^{9,13}	1,494	204	1,698	1,700	12	352	-340
Fairview Extension Reservoir ^{9,13}	791	620	1,411	1,410	1,200	1,320	-120
Greybull Valley Reservoir ^{9,13}	0	33,169	33,169	33,170	9,030	17,490	-8,460
Harrington Reservoir ^{9,13}	315	887	1,202	1,200	800	800	0
Lake Cameahwait Reservoir ^{9,13}	0	6,683	6,683	6,680	6,680	6,680	0
Lake Creek Reservoir ^{9,13}	1,373	0	1,373	1,370	655	655	0
Lodge Grass Reservoir ^{14,15}	22,900	0	22,900	22,900	15,320	15,940	-620
Lower Sunshine Reservoir ^{9,13}	0	58,748	58,748	58,750	36,720	48,520	-11,800
Newton Reservoir ^{9,13}	4,525	0	4,525	4,520	305	347	-42
Perkins and Kinney Reservoir9,13	1,202	0	1,202	1,200	1,040	1,200	-160
Pilot Butte Reservoir ^{8,9}	34,600	0	34,600	1133,720	15,390	21,910	-6,520
Sage Creek Reservoir ^{9,13}	440	2,345	2,785	2,780	2,680	2,780	-100
Shell Reservoir ^{9,13}	1,949	0	1,949	1,950	112	640	-528
Shoshone Lake Reservoir ^{9,13}	4,559	5,181	9,740	9,740	0	1,500	-1,500
Upper Sunshine Reservoir ^{9,13}	52,988	0	52,988	52,990	38,010	46,550	-8,540
Teapot Reservoir ^{9,13}	1,578	0	1,578	1,580	0	0	0
Ten Sleep Reservoir ^{9,13}	3,509	0	3,509	3,510	3,240	3,510	-270
Wiley Reservoir ^{9,13}	689	331	1,020	1,020	1,020	1,020	0
Worthen Meadow Reservoir ^{9,13}	0	1,504	1,504	1,500	1,190	1,230	-40

Table 10. Water-year-end contents for Yellowstone River Compact reservoirs¹ or lakes.—Continued

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

Reservoir or lake name	Pre- compact 1950 water right	Post- compact 1950 water right	Total permitted water right	Total contents ²	Usable contents ³ on Sept. 30, 2015	Usable contents ³ on Sept. 30, 2014	Change in usable contents ⁴
		Powd	er River Basin				
Cloud Peak Reservoir ^{13,16}	3,398	173	3,571	4,620	0	3,570	-3,570
Dull Knife Reservoir ^{13,16}	0	4,345	4,345	5,000	1,430	1,240	190
Healy Reservoir ^{13,16}	0	5,140	5,140	6,500	3,920	4,920	-1,000
Kearney Reservoir ^{13,16}	1,854	4,470	6,324	7,500	2,120	1,300	820
Lake DeSmet ^{13,16}	37,515	202,612	240,127	235,000	201,900	206,600	-4,700
Muddy Guard Reservoir ^{13,16}	0	2,335	2,335	2,340	1,170	1,240	-70
Posy No. 1 Reservoir ^{13,16}	0	1,537	1,537	1,540	1,190	962	228
Tie Hack Reservoir ^{13,16}	1,647	788	2,435	2,440	2,330	2,440	-110
Willow Park Reservoir ^{13,16}	4,457	0	4,457	4,460	1,670	646	1,020
		Tongı	ue River Basin				
Bighorn Reservoir ^{13,16}	2,749	1,875	4,624	4,620	643	1,440	-797
Dome Reservoir ^{6,16,17}	1,843	188	2,031	2,090	441	1,320	-879
Park Reservoir9,16	7,347	2,143	9,490	10,360	4,390	4,570	-180
Sawmill Lakes Reservoir ^{13,16}	0	1,258	1,258	1,280	749	645	104
Tongue River Reservoir ^{5,6}	79,070	0	79,070	79,070	46,910	54,980	-8,070
Twin Lakes Reservoir ^{13,18}	1,180	2,217	3,397	3,400	2,470	2,280	190

¹Wyoming disagrees with the term "Compact Reservoirs" as used throughout this annual report. Wyoming's acceptance of this annual report should not be construed as Wyoming's acceptance of the use of that term.

²Includes dead storage.

³Excludes dead storage.

⁴Change in usable contents is derived from subtracting the 2014 usable contents from the 2015 usable contents.

⁵ Reservoir managed by the State of Montana.

⁶Usable contents by year are provided by Montana Department of Natural Resources.

⁷Usable contents by year are provided by Wyoming State Engineer's Office.

⁸Reservoirs managed by Bureau of Reclamation.

⁹Permitted capacity and total contents data from http://waterplan.state.wy.us/plan/bighorn/2010/techmemos/Task3F.pdf.

¹⁰Usable contents by year are provided by Bureau of Reclamation.

¹¹Top of active conservation pool.

¹²Top of joint use pool.

¹³Private reservoirs permitted and accounted by the State of Wyoming.

14Lodge Grass Reservoir (Willow Creek Dam), Managed by Bureau of Indian Affairs

¹⁵Usable contents by year are provided by Bureau of Indian Affairs.

¹⁶Permitted capacity and total contents data from http://waterplan.state.wy.us/plan/powder/2002/techmemos/storage.

¹⁷Data are combined contents of Dome Lake and Dome Lake Reservoir.

¹⁸Data are combined contents of Twin Lakes Number 1 and Twin Lakes Number 2.

RULES AND REGULATIONS FOR ADMINISTRATION OF THE YELLOWSTONE RIVER COMPACT

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

Article I. Collection of Water Records

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

The gaging station known as Clarks Fork near Silesia, Montana and located in NW1/4 SE1/4 sec. 1, T. 4 S., R. 23 E., shall be the point of measurement for the Clarks Fork.

2. Bighorn River (exclusive of Little Bighorn River)

The gaging station known as the Bighorn River above Tullock Creek, near Bighorn, Montana, and located in SE1/4 SE1/4 NE1/4 sec. 3, T. 4 N., R. 34 E., shall temporarily be the designated point of measurement on that stream. The flow of the Little Bighorn River as measured at the gaging station near Hardin, Montana, and located in SE1/4 NE1/4 NE1/4 sec. 19, T. 1 S., R. 34 E., shall be considered the point of measurement for that stream, except that if or when satisfactory records are not available, the records for the nearest upstream station with practical corrections for intervening inflow or diversion shall be used.

3. Tongue River

The gaging station known as the Tongue River at Miles City, Montana, and located in NE1/4 NE1/4 SE1/4 sec. 23, T. 7 N., R. 47 E., shall temporarily be the point of measurement for that stream. 4. Powder River

The gaging station known as the Powder River near Locate, Montana, and located in NW1/4 SW1/4 sec. 14, T. 8 N., R. 51 E., shall temporarily be the designated point of measurement for that stream.

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

Article II. Office and Officers

- A. The office of the Commission shall be located at the office of the Chairman of the Commission.
- B. The Chairman of the Commission shall be the Federal representative as provided in the Compact.
- C. The Secretary of the Commission shall be as provided for in Article III of these rules.
- D. The credentials of each member of the Commission shall be placed on file in the office of the Commission.

Article III. Secretary

A. The Commission, subject to the approval of the Director of the United States Geological Survey, shall enter into cooperative agreements with the U.S. Geological Survey for such engineering and clerical services as may reasonably be necessary for the administration of the Compact. Said agreements shall provide that the Geological Survey shall:

- Maintain and operate gaging stations at or near the points of measurement specified in Article V (A) of the Compact.
- 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 authorrity; 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

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George L. Christopulos Commissioner for Wyoming

ATTESTED:

L. Grady Moore

Federal Representative

Adopted November 17, 1953 Amended December 16, 1986

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 data bases. 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.

Commissioner for Montana

Gordon W. Fassett

Commissioner for Wyoming

William F. Horak Federal Representative

July 22, 1996 Date

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.
- "Cfs" means a flow of water equivalent to a volume of l cubic foot that passes a point in l second of time and is equal to 40 miners inches in Montana.
- 3. "Interstate Ditches" shall include ditches and canals which convey waters of the Bighorn, Tongue, Powder, and Clarks Fork Rivers and their tributaries across the Wyoming-Montana State line where the water is diverted in one State and the place of use is in the other State.
- 4. "Department of Natural Resources and Conservation," hereafter called the "Department," means the administrative agency and Department of the Executive Branch of the Government of Montana created under Title II, Chapter 15, MCA which has the responsibility for water administration in that State.

- 5. "Water Court" means a Montana District Court presided over by a water judge, as provided for in Title III, Chapter 7, MCA.
- 6. "State Engineer" shall be the current holder of the position created by the Wyoming Constitution as Chief Water Administration Official for the State of Wyoming.
- 7. "Board of Control," hereinafter called the "Board," is defined as the constitutionally created water management agency in Wyoming composed of the four Water Division Superintendents and the State Engineer.
- 8. "Superintendent" is the member of the Board who is the water administration official for the Water Division where the interstate ditch is located. (The two Water Divisions in the Yellowstone River drainage are Water Division Numbers Two and Three.)
- 9. "Date of Priority" shall mean the earliest date of actual beneficial use of water, unless evidence and circumstances pertaining to a particular claim establish an earlier date.
- 10. "Point of Diversion" is defined to be the legal land description by legal subdivision, section, township, and range of the location of the diversion structure for an interstate ditch from a natural stream channel.
- 11. "Place of Use" is defined to be the legal land description (legal subdivision, section, township, and range) of the lands irrigated by an interstate ditch.
- 12. "Person" is defined as an individual, a partnership, a corporation, a municipality or any other legal entity, public or private.
- 13. "Claimant" is defined as any person claiming the use of water from an interstate ditch as herein defined.

Article IV. Procedures

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

A. Wyoming Procedure

- 1. The Yellowstone River Compact Commission will provide a claim form to be completed by the claimant that will describe the location and point of diversion and land being irrigated, the priority date claimed, method of irrigation and such other information required to describe the claim. (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.
- After the validation procedure, the Superintendent 5. 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.

YELLOWSTONE RIVER COMPACT COMMISSION

WYOMING

GORDON W. FASSETT STATE ENGINEER HERSCHLER BUILDING 4TH FLOOR EAST CHEYENNE, WYOMING 82002 (307) 77773354

UNITED STATES

WILLIAM F. HORAK CHAIRMAN U.S. GEOLOGICAL SURVEY 821 E. INTERSTATE AVENUE BISMARCK, NORTH DAKOTA 58501

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

MONTANA

YELLOWSTONE RIVER COMPACT COMMISSION

(701) 250-4601

CLAIM FORM FOR INTERSTATE DITCHES

1.	Name of ditch or canal:									
2.	Source of water supply:									
	Tributary of									
3.	Name of claimant:									
	Address									
	City StateZip Code									
	Home Phone No Business Phone No									
4.	Person completing form:									
	Address									
	City StateZip 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 $1/4$, T. R.									
	(a) Description of headgate: (Briefly describe the materials									
	and general features, date constructed or last kn									
	work, general condition.)									

(b) Describe	water	measuring	device:
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(c) If the point of diversion is in Montana:

1. What flow rate has been claimed?

_____ **D** cubic feet per second

gallons per minute

miner's inches

2. What volume of water has been claimed?

acre-feet

7. Dimensions of ditch at headgate: Width at top (at waterline) ______ feet; width at bottom ______ feet; side slopes (vertical:horizontal) _____; depth of water _____ feet; grade _____ feet per mile.

8. Place of use and acres irrigated: County_____ State _____ Give legal subdivisions of land owned by you on which water is being used (acres claimed): An example field is shown in the first line.

т.	R.	SE	EC.			NE ¹ ₄				NW¼			5	SW			SF		TC	DTAL
				NE¼	NW	SW	SE	NE	MW	SW	SE	NE	NW	SW	SE¼	NEI	NW	SW	SEI	
501	lac		0			151										1				202
130	175	~	18			012.1											10.2			32.3
	-																			
																		1		
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- 9. Describe any additional uses of water claimed from the ditch:
- 10. Date of first beneficial use of water (priority date) on lands described above for ______ Ditch is ______ (mo/day/yr) and shall be the same for all lands claimed on this form.
- 12. Attach documentary evidence or affidavits showing your ownership or control of the above lands, as well as the historic use of water on these lands.
- 13. What permit or claim numbers have been assigned to known records filed with either the Wyoming State Engineer's Office or the Montana Department (DNRC) for irrigating the above lands?
- 14. Have personnel in the Wyoming State Engineer's Office or the Montana Department (DNRC) been contacted to obtain the information given in No. 13? () Yes () No
- 15. Describe any flumes or pipelines in the ditch conveyance system:_____

16. Describe ordinary annual period of use: ______ to _____ (mo/day) (mo/day)

17. Attach copies of aerial photographs, U. S. Geological Survey maps or other such documents showing the ditch and lands irrigated that give evidence to this claim and may be useful to the Commission.

* * * * * * * * * *

State of _____) SS State of _____)

I, ______, having been duly sworn, depose and say that I, being of legal age and being the claimant of this claim for a water right, and the person whose name is signed to it as the claimant, know the contents of this claim and the matters and things stated there are correct.

Subscribed and sworn before me, this _____day of _____, 19___.

Notary Public

Residing at:		
My commission exr	nires.	
my commission exp	JII CD.	

