

YELLOWSTONE RIVER

COMPACT COMMISSION

FIFTY-THIRD ANNUAL REPORT

2004

**YELLOWSTONE RIVER COMPACT COMMISSION
DENVER FEDERAL CENTER, BUILDING 53, ROOM F-1200
LAKEWOOD, COLORADO 80225**

Honorable David Freudenthal
Governor of the State of Wyoming
Cheyenne, Wyoming 82002

Honorable Brian Schweitzer
Governor of the State of Montana
Helena, Montana 59620

Honorable John Hoeven
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 fifty-third annual report of activities for the period ending September 30, 2004.

Members of the Yellowstone River Compact Commission convened the first of two meetings in 2004 on April 15 at 9:30 a.m. in Sheridan, Wyoming. In attendance were Mr. James Kircher, U.S. Geological Survey, Chairman and Federal Representative; Mr. Jack Stults, Administrator, Water Resources Division, Montana Department of Natural Resources and Conservation and Commissioner for Montana; and Mr. Patrick Tyrrell, Wyoming State Engineer and Commissioner for Wyoming. Also in attendance were Ms. Sue Lowry, Mr. Mike Whitaker, and Mr. Loren Smith, Wyoming State Engineer's Office; Mr. Keith Kerbel, Mr. Kevin Smith, and Mr. James Robinson, Montana Department of Natural Resources and Conservation; Mr. Todd Parfitt and Mr. Dan Hengel, Wyoming Department of Environmental Quality; Mr. Roy Kaiser, Natural Resources Conservation Service; Mr. Art Hayes, Jr., Tongue River Water Users Association; Mr. Wade Irion, HKM Engineering; and Mr. Wayne Berkas, Mr. Robert Swanson, and Mr. Robert Davis, U.S. Geological Survey.

Mr. Kircher called the meeting to order. All attendees introduced themselves.

Mr. Davis reported that costs for the program of streamflow-data collection and preparation of the annual report are \$70,000 for Federal fiscal year 2004 and are expected to be \$73,500 or less for fiscal year 2005.

Mr. Berkas reported that most of the streamflows in the Yellowstone River basin are less than average for mid-April. Streamflows at several sites throughout Montana were at a record daily low for April 15.

Ms. Lowry provided a summary of the April 14, 2004, meeting of the Technical Committee (minutes appended). Less-than-average runoff is forecast for 2004. Possible formats for reporting storage and other information for additional reservoirs in the annual report were discussed. Possible ways of making all hydrologic information relevant to the Compact readily available to all also were discussed. Mr. Kerbel reported that options were considered for developing a process or plan for managing and sharing water under the rules of the Compact, particularly for dry years. The Commissioners expressed the need to include some flexibility in order to meet existing obligations and agreed to continue to discuss options for administering the Compact and managing the available water. Mr. Hayes noted that flow in the Tongue River presently is less than the flow desired by Montana Fish, Wildlife and Parks. Mr. Stults stated that Montana tries to meet the desired instream flows in the Tongue River and other rivers but is obligated to meet the needs of the senior water-rights holders.

Mr. Kaiser reported that streamflow forecasts for water year 2003 were useful for planning even though many of the forecasts were less than the actual streamflow volumes. Refinements are being made to forecasting procedures for the Tongue River basin to try to improve accuracy of future forecasts. For water year 2004, the average snow-water equivalent in snowpack for measurement sites in the upper and lower Yellowstone River basin is less than the 1971-2000 average and less than for 2003. Maximum snowpack, which typically occurs in mid- to late-April, appears to have reached the maximum in March 2004 and is decreasing. Streamflow forecasts for water year 2004 for the upper and lower Yellowstone River basin indicate less-than-average streamflows, and peak streamflows from snowmelt are anticipated to occur about one month earlier in the year than average. Mr. Kerbel reported that precipitation in March 2004 in southeastern Montana was much less than average and drought conditions continue to prevail in many parts of Montana. Mr. Tyrrell discussed indications by researchers that very prolonged droughts have occurred in some areas of the western United States in the past. He also noted that much of the current need for water in this area was established during the early 1900's, which was a period of relatively abundant precipitation. Mr. Swanson noted that many of the streamflow stations in the Yellowstone River basin are operated on a seasonal basis that begins on April 1 of each year. If snowmelt-runoff peaks continue to occur earlier in the year than average, then cooperating agencies might want to consider support for full-year operation to avoid missing data collection for the peak periods. He also noted the importance of long-term streamflow information in preparing forecasts.

Ms. Lowry and others described the Technical Committee recommendations for reporting contents and other information for additional reservoirs in the annual Commission report. Mr. Davis and Mr. Berkas will consult with Ms. Lowry to prepare draft formats for reporting the reservoir information in future reports.

Mr. Tyrrell stated that semi-annual meetings of the Commission might be desirable, particularly during dry periods, and Mr. Stults and Mr. Kircher agreed. The Commissioners discussed the need to provide information from the spring Technical Committee and Commission meetings to the public in a timely manner. Mr. Kerbel, Ms. Lowry, and Mr. Davis agreed to try to develop a process for providing the information to the public.

Mr. Kircher asked for any other items recommended by the Technical Committee for consideration by the Commission for action. Ms. Lowry recommended consideration of preparing letters of support for snowpack and streamflow monitoring, along with a list of priority sites. Potential recipients of the letters include Congressional staff and officials of the U.S. Department of the Interior and the U.S. Department of Agriculture.

Mr. Stults stated his desire for the Commission to establish a process for developing some type of plan for water management in accordance with the Compact, on an annual basis or as needed. Mr. Tyrrell recommended sharing all pertinent administrative and technical information and defining specific issues that would need to be addressed in a plan. Mr. Stults concurred. The Commissioners agreed to continue discussions and asked for continued assistance from the Technical Committee.

Mr. Robinson thanked the Wyoming representatives for loaning the aerial photographs of Wyoming to Montana at the December 2003 meeting and returned them to the Wyoming representatives.

Mr. Stults reported that no new developments have occurred with Montana's water conservation programs and that the Montana Governor's Drought Advisory Committee continues to meet regularly. Mr. Tyrrell reported that the Wyoming Drought Task Force also continues to meet regularly due to drought conditions. Both Commissioners expressed concern about the persisting drought conditions.

Mr. Tyrrell introduced Mr. Parfitt of the Wyoming Department of Environmental Quality who described current water-quality aspects of coal-bed methane development in Wyoming. Development in the Powder and Tongue River drainage basins is increasing. A growing trend is for much of the produced water to be treated, if necessary, and discharged directly to perennial streams rather than to ephemeral or

intermittent tributary streams. Currently, Montana water-quality standards are being considered by Wyoming as part of the permitting process for coal-bed methane wells in Wyoming, particularly in the Tongue River basin. Wyoming is hiring additional field staff and inspectors and has obtained funds for additional streamflow and water-quality monitoring, beginning July 2004. The amount of produced water that reaches the Powder River is currently estimated to be about four cubic feet per second. Wyoming is working cooperatively with Montana in the process of determining TMDLs for the Tongue and Powder Rivers in Montana by sharing data and expertise. Mr. Parfitt reported that the main water-quality concerns for produced water and receiving streams are specific conductance and sodium adsorption ratio. Other concerns are iron and barium, though mostly on a local basis. Toxicity tests, developed by the U.S. Environmental Protection Agency, are being used to evaluate water for acute and chronic toxicity to biota. Future permitting in Wyoming will likely be based on a watershed concept and will utilize the results of the TMDL studies in Montana, as applicable, as part of the process. Mr. Parfitt was asked how water-quality standards were considered as part of Wyoming's permitting process. He replied that the current procedure is to consider the most stringent standard of either Wyoming or the downstream State and permit to that standard with respect to water quality at the State boundary. Mr. Parfitt added that information on permit applications is shared with the downstream State before approval. Mr. Hayes asked if the difference between the standard and the existing water quality would be shared among Montana, Wyoming, and other entities. Mr. Parfitt replied that current procedure is to permit to the standard but added that the standard would not likely be equaled or exceeded at the State boundary. When asked about treatment procedures for produced water, Mr. Parfitt replied that reverse osmosis seems to be the mostly widely used process at present, although ion exchange is also used. Mr. Hayes expressed concern about water stored in ponds and the changes in water quality that can occur as water from the ponds infiltrates into the subsurface. He encouraged the assessment and use of information from studies conducted in the 1970's and 1980's as well as new information. Mr. Tyrrell and Mr. Parfitt noted that ground water is being monitored at several pond sites in Wyoming.

Mr. Davis reported that a surface-water-quality monitoring network is being implemented in the Tongue River basin. The network consists of 11 sites—6 on the mainstem and 5 at the mouths of major tributaries. Information about the network and data for the 11 sites are available on the web at <http://TongueRiverMonitoring.cr.usgs.gov>.

Mr. Tyrrell provided an update on permitting in Wyoming. As of April 2, 2004, Wyoming has received a total of 2,661 applications for reservoirs to hold water produced from coal-bed methane activities, of which 255 were received in 2004. Of the total, 201 are in the Belle Fourche River basin, 113 are in the Cheyenne River basin, and 2,347 are in the Tongue and Powder River basins. The types of reservoirs include both on-channel reservoirs and off-channel pits. Additional funds have become available for field inspections of the reservoirs. The Wyoming State Engineer's Office permits off-channel pits only if a beneficial use of the water is specified. If no beneficial use is specified, then the permits are handled by the Wyoming Oil and Gas Conservation Commission. Permits with beneficial use are time limited. As of April 14, 2004, Wyoming has issued 24,271 active permits for coal-bed methane wells, of which 1,341 were issued in 2004. Mr. Tyrrell noted that not all permits result in active wells. Mr. Hayes asked if off-channel pits are reclaimed after the permit expires. Mr. Tyrrell replied that off-channel pits are not necessarily reclaimed because they are not considered to have a significant effect on the surface-water system. However, on-channel reservoirs do need to be breached when the permit expires. Mr. Tyrrell also noted that a suction-technology process is increasingly used in some mature methane-production areas. No water is involved in this process but methane yields are increased.

Mr. Kerbel reported that the Montana Department of Natural Resources and Conservation issues permits for discharge of coal-bed-methane produced water only when the water is put to beneficial use. To date, the only permits the Department has issued have been interim permits. Mr. Stults asked if land application of produced water is still being practiced in Wyoming. Mr. Whitaker replied that the practice is still being used. Mr. Tyrrell noted that the average water yield for coal-bed-methane production wells in Wyoming currently is about seven gallons per minute.

Ms. Lowry reported on water rights within the Bighorn Canyon National Recreation Area. A meeting is scheduled for April 30, 2004, to begin discussions on the final decree language and the disposition of active water rights and rights that are only utilized periodically. The total amount of water rights under consideration is about 10,000 acre-feet, mostly for irrigation. Wyoming will work with Montana, the Bureau of Reclamation, and other entities before making any final decisions.

Mr. Tyrrell noted that Mr. Swanson of the U.S. Geological Survey will be transferring from Wyoming to Nebraska and thanked him for his valuable service to the Commission and the State of Wyoming.

Mr. Swanson reported that the summary report for the Yellowstone River basin National Water-Quality Assessment (NAWQA) study is expected to be available in mid-May 2004. Mr. Stults and Mr. Hayes requested copies of the report when it is available.

The next meeting of the Commission is tentatively scheduled for Wednesday, December 1, 2004, in Montana. The next spring meeting is tentatively scheduled for Tuesday, April 12, 2005, in Wyoming. The Technical Committee will meet in the morning on those dates and the Commission will meet in the afternoon.

The meeting adjourned at 1:30 p.m.

Members of the Yellowstone River Compact Commission convened the second of two meetings in 2004 on December 6 at 1:00 p.m. in Billings, Montana. In attendance were Mr. James Kircher, U. S. Geological Survey, Chairman and Federal Representative; Mr. William Horak, U.S. Geological Survey and future Chairman; Mr. Jack Stults, Administrator, Water Resources Division, Montana Department of Natural Resources and Conservation and Commissioner for Montana; and Mr. Patrick Tyrrell, Wyoming State Engineer and Commissioner for Wyoming. Also in attendance were Ms. Sue Lowry, Mr. Mike Whitaker, and Mr. Loren Smith, Wyoming State Engineer's Office; Mr. Richard Moy, Mr. Kevin Smith, and Mr. Keith Kerbel, Montana Department of Natural Resources and Conservation; Ms. Sarah Bond, Montana Department of Justice; Mr. Art Compton, Montana Department of Environmental Quality; Mr. Art Hayes, Jr., Tongue River Water Users Association; Mr. Orrin Ferris, HKM Engineering; Mr. Richard Aro, Bureau of Indian Affairs, Northern Cheyenne Agency; Mr. Douglas Davis, Bureau of Indian Affairs; Mr. Lenny Duberstein, Bureau of Reclamation; and Mr. Kirk Miller, Mr. Wayne Berkas, and Mr. Robert Davis, U.S. Geological Survey.

Mr. Kircher called the meeting to order. All attendees introduced themselves.

Mr. Davis presented budget information for the program of streamflow data collection and preparation of the annual report. The program cost was \$70,000 for Federal fiscal year 2004 and will be \$71,900 for fiscal year 2005. One-fourth of the cost is provided by the State of Wyoming, one-fourth by the State of Montana, and one-half by the U.S. Geological Survey through the Cooperative Water Program. Estimates of costs for future years were presented based on an approximate 5-percent inflation factor per year. Mr. Davis stated that salaries and travel for data collection were the major expenses of the program. He also noted that estimates typically have been higher than the final program costs of the program for a given year. Mr. Stults moved to accept the budget for the program for fiscal year 2005. The motion was seconded by Mr. Tyrrell.

Mr. Berkas reported that streamflow during water year 2004 was 74 percent of average for the Clarks Fork Yellowstone River at Edgar, 38 percent of average for the Bighorn River near Bighorn (adjusted for flow in the Little Bighorn River and change in contents in Bighorn Lake), 20 percent of average for the Tongue River at Miles City, and 14 percent of average for the Powder River near Locate, which is a new record annual low. Total adjusted streamflow in the four rivers in water year 2004 was 1,621,000 acre-feet, compared to 2,174,000 acre-feet in water year 2003 and 1,685,000 acre-feet in water year 2002.

Reservoir storage increased during water year 2004 in Boysen Reservoir, Anchor Reservoir, Bull Lake, and Pilot Butte Reservoir. Reservoir storage decreased in Bighorn Lake, Buffalo Bill Reservoir, and Tongue River Reservoir. The contents and amounts of increases and decreases are listed in the report. The total usable contents of these reservoirs at the end of water year 2004 was 1,739,800 acre-feet, which is an increase of 88,000 acre-ft from the end of water year 2003.

The Commission had previously requested that additional reservoirs be included in the annual report. Total usable contents of these additional reservoirs of interest in the Yellowstone River basin at the end of water year 2004 was 215,300 acre-feet, a decrease of 7,900 acre-feet from the end of water year 2003. A new table listing the additional reservoirs and their contents has been added to the annual report.

Mr. Stults inquired as to the amount of snow pack in the four basins for water year 2004 as compared to average snow pack and water year 2003 snow pack. Mr. Berkas did not have that information available, and Mr. Roy Kaiser, who normally would have that information, was not at the meeting. Mr. Stults felt that this information would be interesting, and asked if the Technical Subcommittee might provide that information in the future. Mr. Moy asked if the annual flow information was available with exceedance probabilities in addition to percentages of average. Mr. Berkas did not have that information at present but would ensure that flow-exceedance probabilities and snow-pack information would be available at next year's meeting.

Mr. Stults reported on water conservation programs in Montana. Montana producers are experiencing serious cumulative effects from the last 6 years of drought. However, good reservoir management and sharing of shortages has been an important part of making the best of the situation. Montana continues to have successful examples of that on the Big Hole River, Blackfoot River, Jefferson River, and several others in the State, where a sophisticated approach to timing of diversions and sensitivity to return flows has helped make the best use of available water supplies. This approach to water conservation--which includes traditional approaches to water conservation in terms of on-field efficiency along with developing systems to better understand the interrelationship between water supply, timing of diversion, location of diversions and return flows--has helped to maximize use of the water supply in any particular drainage.

Ms. Lowry reported on activities of the Wyoming Drought Task Force. The Wyoming State Climatologist has attempted to present data into a more usable format for irrigators and water users across the State. In the Wyoming system, water supplies are administered solely by prior-appropriation doctrine and the needs of senior water-rights holders are satisfied first. Water supplies and availability in Wyoming are similar to last year, although perhaps lower in some instances.

Mr. Stults and Mr. Tyrrell each described the water-right regulation procedures used in their respective States. Although 'both States' water rights are based on prior-appropriation doctrine, the specific regulation procedures used in each State are different in some aspects.

Mr. Tyrrell reported on progress in developing a website for this Commission, and handed out sample web pages. Mr. Moy asked if the USGS would be the proper host for the website, which could have active links to Wyoming and Montana. Mr. Kircher stated that funding support and computer-security issues would likely need to be addressed with regard to USGS hosting the website, but offered to inquire further into these aspects and discuss his findings at the next meeting. Both Wyoming and Montana agreed with that process.

Mr. Tyrrell provided a handout from the Coalbed Natural Gas Interagency Work Group that lists the current hydrologic monitoring in the Tongue and Powder River basins. The work group was created last year as a result of the EIS process for Federal minerals in Wyoming.

Mr. Tyrrell discussed the policy Wyoming adopted in April 2003 regarding reservoirs constructed for use during coal-bed natural gas production. The Wyoming State Engineer's Office and Wyoming

Department of Environmental Quality (DEQ) are considering the bonding of reservoirs used in coal-bed natural gas production. Bonding will make money available to reclaim the reservoir sites when coal-bed natural gas production is completed. The Bureau of Land Management has a bonding process. Currently the Wyoming Oil and Gas Commission bonds backfilling and reclamation of off-channel pits, but does not bond reclamation of on-channel dams. The permits for reservoirs used in coal-bed natural gas production will require removal of reservoirs. One exception is if the land owner chooses to retain the reservoir for stock watering. The final reservoir has to be modified to store less than 15 acre-feet.

Mr. Tyrrell stated that bypassing of reservoirs is not required if there is no downstream irrigation. If there is downstream irrigation, the bypass is designed to handle the average annual peak flow. Wyoming will accept a bypass large enough to satisfy downstream rights, or an administrative plan that would satisfy downstream rights.

The Wyoming State Engineer's Office has processed approximately 32,000 coal-bed natural gas applications for wells (approved and not-approved) as of the first of December 2004. So far in 2004, Wyoming has processed more than 4,100 applications, averaging about 400 applications a month. As of December 1, 2004, 2,332 surface-water reservoir permit applications have been received. These applications comprise a total of about 30,000 acre-feet of storage. About 800 of the applications have advanced to permit status and the remaining are still in review.

Mr. Compton reported that Montana has gotten a belated start in coal-bed natural gas development. Currently, Montana has permitted about 250 wells. Three permits are currently in review. One permit is receiving public review, and the other two permits are receiving Departmental review. The total number of permits for wells in Montana, either operating or planned, is approximately 450 to 475.

Montana DEQ is developing water-quality models for the Tongue River, Powder River, and Rosebud Creek. The model for the Tongue River is calibrated and is working well. A stakeholder committee oversees the development of the models. The stakeholders include Montana and Wyoming producers, environmental groups, Tongue River water users, and Tribal representatives. The Wyoming DEQ and Montana DEQ are discussing acceptable water-quality standards that would be applicable at the border. The quality of Tongue River water is good and there is some assimilative capacity to divide between Wyoming and Montana. Montana water-quality standards are regularly exceeded in the Powder River. Also, water-quality standards are exceeded in Rosebud Creek, but not as often as in the Powder River.

Mr. Berkas updated the Commission on USGS monitoring activities in the Tongue River basin. Eleven sites are monitored in the Tongue River network. Three sites are in Wyoming and eight sites are in Montana. Daily discharge is computed at all sites. Water-quality samples are collected about 20 times per year at mainstem sites and about 12 times per year at tributary sites. Continuous specific-conductance data are collected at all sites from April 1 through September 30 of each year. However, some specific-conductance data for 2004 were not obtained due to equipment problems. Equipment problems have been corrected and the equipment in place is expected to provide acceptable record for the remainder of the monitoring project. Most of the funding for these activities is appropriated to the USGS by Congress, although funding from other Federal agencies, State agencies, and Tribal governments supplements the Congressional funding to provide for complete or nearly complete operation of the monitoring network.

Ms. Lowry stated that Wyoming is completing the description of the water rights that are within the high-water line at Bighorn Lake and the boundary of the Bighorn National Recreation Area which surrounds Bighorn Lake. The parties have agreed to the water rights and the priority dates. Bighorn Lake was given a Wyoming reservoir water right, even though the dam is located in Montana. A letter has been sent to the Montana Area Office, Bureau of Reclamation, requesting they sign the letter that describes the elevation of Bighorn Lake. Mr. Stults requested a copy of the letter. Mr. Tyrrell stated that Wyoming has abandoned a good portion of the water rights within the high-water line.

Mr. Kerbel reported on the Montana adjudication program. November 8, 2004 was the deadline for filing objections for people having temporary preliminary decree issues on the middle Yellowstone River. Those objections will be received by the Water Courts and the Water Courts will respond. Most of the claims in that particular area were for stock water. Montana has finished examining all the claims in the Little Bighorn and Bighorn River basins, and is beginning to examine claims in the Tongue River basin. The Montana Environmental Quality Council is submitting a bill to the State legislature to speed up adjudication in the State of Montana. If the bill passes, the Department of Natural Resources and Conservation will have 10 years to examine the remaining water-rights claims in the State.

Ms. Lowry reported that Wyoming has been organized into seven basins for water-planning purposes. Assessments of six of those basins are complete. Assessment of the final basin (Platte River) is approximately 80-percent complete.

Mr. Kerbel reported on the Montana/Crow Compact. The newly elected chair for the Crow Tribe wishes to draft Federal legislation to get the compact ratified with Congress. The State has ratified the Compact but the Compact still has to get Federal approval, and then Tribal approval. The Tribe is working with the Federal government to reach settlement on damage claims regarding water rights.

Mr. Miller reported on the USGS National Water-Quality Assessment (NAWQA) study of the Yellowstone River basin, which is currently in the low-intensity phase. Due to cuts in the NAWQA program, sampling will continue only at the Yellowstone River at Sidney site. The next high-intensity phase of the program is currently scheduled to begin in 2007 and probably will not involve fixed-site monitoring. However, due to projected budget cuts in the NAWQA program, the high-intensity phase might not start until 2010.

Mr. Stults stated that 2004 flows in the Tongue River in Montana were deficient such that water rights senior to 1950 were not filled. Due to the continuing drought in the basin and the likelihood that average runoff will not fill depleted reservoirs, Montana and Wyoming should discuss an equitable plan so that users in both States get a fair share of the water in 2005 according to Article V of the Yellowstone River Compact. Montana felt that water rights in both States senior to 1950 should be filled before water rights junior to 1950 are filled. Montana specifically requested that Wyoming release post-1950 stored water so that pre-1950 users in Montana could satisfy their water rights. Wyoming indicated that this call would not be heeded as Wyoming believes there is no legal basis for making such deliveries.

Further discussion continued between the two States regarding terms of the Compact and interstate regulation of water rights. Montana posed the question concerning how water rights with priority dates prior to March 1945 were administered in Wyoming. Wyoming indicated that those rights were allowed to divert more than the one cubic foot per second per 70 acres during times of runoff events. Under a free river system, Wyoming appropriators are allowed to take more water when the system is full and no one is making a valid call for water. Wyoming streams are only administered when valid complaints are received and regulation is requested by an affected Wyoming appropriator. Mr. Stults and Mr. Tyrrell agreed to assign staff members (Mr. Moy and Ms. Lowry) to meet at a later date to discuss possible solutions for both States and report back to the Commission at the April 2005 meeting.

Montana asked if Wyoming had appointed a water commissioner for the mainstem of the Tongue River as requested at the June 2004 teleconference between Montana and Wyoming. Mr. Whitaker responded by saying that Wyoming does have two commissioners appointed to the Tongue River. However, Wyoming did not receive a valid call for regulation from a Wyoming appropriator on the mainstem Tongue River and therefore no one has been administering the Tongue River. Montana asked if a survey has been completed of the water rights on the mainstem of the Tongue River. Montana stated that it had appointed two commissioners for its portion of the mainstem Tongue River.

Discussion ensued regarding releases from Tongue River Reservoir. In summary, water is released sufficient to maintain water in the downstream river system to satisfy stock needs. Additional factors

include maintaining flow during periods of icing conditions and conveyance losses. Trying to support these needs, while simultaneously trying to store water during non-runoff periods (late summer, fall, and winter) when Wyoming is not diverting and storing water, has been impossible during the recent drought years. Montana feels the solution is to allocate the early season runoff according to their interpretation of the Compact to ensure that pre-1950 water rights on both sides of the border are satisfied. Wyoming questioned the accounting of Tongue River Reservoir releases toward the filling of the reservoir. The point was made that in Wyoming, if an appropriator chooses to release water from a reservoir during the normal storage period, that amount of water is accounted against the fill of that reservoir.

The Commissioners decided that April 7-8, 2005 would be the primary target for the next meeting, with April 25-26 as an alternate target. The meeting will be held in Sheridan, Wyoming and the Wyoming State Engineer's Office will make arrangements for the meeting.

Mr. Kircher advised this would be his last meeting as Chairman. Mr. Horak will be the new Chairman. The Commissioners expressed their appreciation to Mr. Kircher for his service to the Commission.

Mr. Kircher called for items that could be removed from the agenda. The committee agreed to remove Yellowtail Claims, Wyoming Water Planning Program, and NAWQA from future agendas.

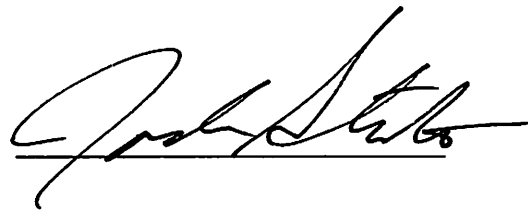
The committee agreed to add 'Post-1950 Water Rights Issues' to the next agenda.

Mr. Davis announced Mr. Berkas will assume most of his duties at future meetings.

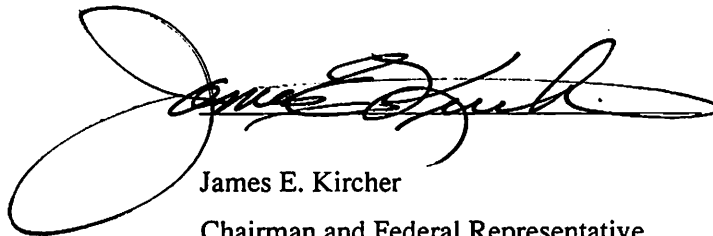
Mr. Tyrrell moved to adjourn the meeting. Mr. Stults seconded. The meeting adjourned at 4:30 p.m.



Patrick T. Tyrrell
Commissioner for Wyoming



Jack Stults
Commissioner for Montana



James E. Kircher
Chairman and Federal Representative

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GENERAL REPORT

Cost of operation and budget

The work funded by the Yellowstone River Compact Commission, which to date has been primarily concerned with the collection of required hydrologic data, has been financed through cooperative arrangements whereby Montana and Wyoming each bear one-fourth of the cost, and the remaining one-half is borne by the United States. The salaries and necessary expenses of the State and 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 expense of the Commission during fiscal year 2004 was \$70,000, in accordance with the budget adopted for the year.

The estimated budgets for Federal fiscal years 2005, 2006, 2007, and 2008, based on an approximate 5-percent increase per year, were tentatively adopted subject to the availability of appropriations. The budgets for the four fiscal years are summarized as follows:

<u>October 1, 2004, to September 30, 2005 (fiscal year 2005):</u>	
Estimate for continuation of existing streamflow-gaging programs	\$71,900
<u>October 1, 2005, to September 30, 2006 (fiscal year 2006):</u>	
Estimate for continuation of existing streamflow-gaging programs	\$76,000
<u>October 1, 2006, to September 30, 2007 (fiscal year 2007):</u>	
Estimate for continuation of existing streamflow-gaging programs	\$80,000
<u>October 1, 2007, to September 30, 2008 (fiscal year 2008):</u>	
Estimate for continuation of existing streamflow-gaging programs	\$84,000

Streamflow-gaging station operation

Streamflow-gaging stations at the measuring sites specified in the Yellowstone River Compact were continued in operation, and satisfactory records were 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.

For measurement sites, horizontal coordinate information (latitude and longitude) is referenced to the North American Datum of 1927 (NAD 27). The gage datums and elevations listed in this report are referenced to the National Geodetic Vertical Datum of 1929 (NGVD 29).

During water year 2004, annual streamflow was below normal¹ at all reporting Yellowstone River Compact gaging stations.

<u>Station number</u>	<u>Streamflow-gaging station</u>	<u>Percent of average streamflow²</u>
06208500	Clarks Fork Yellowstone River at Edgar, Mont., minus diversions to White Horse Canal	74
06294500	Bighorn River above Tullock Creek, near Bighorn, Mont., minus Little Bighorn River near Hardin, Mont. Adjusted for change in contents in Bighorn Lake	38
06308500	Tongue River at Miles City, Mont.	20
06326500	Powder River near Locate, Mont.	14

¹The "normal" range is 80 to 120 percent of average.

²Average is based on period of record at station.

Tabulation of water-discharge records for water year 2004 and graphical comparisons of discharge during water year 2004 with discharge during water year 2003 and with 10-year and 30-year average discharges are provided in the section "Summary of discharge for Yellowstone River Compact Commission streamflow-gaging stations."

Diversions

No diversions were regulated by the Commission during water year 2004.

Reservoir contents

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 311,900 acre-feet in storage and ended the water year with 475,100 acre-feet. Anchor Reservoir began the water year with 345 acre-feet in storage and ended the water year with 429 acre-feet. Bighorn Lake, a Bureau of Reclamation storage project on the Bighorn River that is the largest in the basin, contained 769,900 acre-feet at the beginning of the water year and 694,300 acre-feet at the end of the water year. Daily contents ranged from 634,300 acre-feet on May 8, 2004 to 799,100 acre-feet on November 13, 2003. Month-end and year-end contents and a description of these reservoirs are given in the section "Monthly summary of contents for Yellowstone River Compact reservoirs completed after January 1, 1950."

Reservoirs existing on January 1, 1950

As a matter of record and general information, month-end contents data are given later in the report for four reservoirs in existence upstream from the points of measurement on January 1, 1950. The reservoirs are Bull Lake, Pilot Butte Reservoir, Buffalo Bill Reservoir, and Tongue River Reservoir. These data are pertinent to allocation under Article V, Section C, Item 3 of the Compact.

The storage capacity of Buffalo Bill Reservoir was increased in 1992 from 456,600 acre-feet to 644,540 acre-feet (listed as 646,565 acre-feet by Bureau of Reclamation). The storage capacity of Tongue River Reservoir was increased in 1999 from 68,000 acre-feet to 79,070 acre-feet.

Annual summary of reservoir contents

Information on reservoir contents at the end of the current and previous water years for the 7 reservoirs listed above plus 23 additional reservoirs was compiled at the request of the Commission. The information is provided in the section "Annual summary of contents for Yellowstone River Compact reservoirs or lakes."

SUMMARY OF DISCHARGE FOR YELLOWSTONE RIVER COMPACT COMMISSION STREAMFLOW-GAGING STATIONS

06208500 Clarks Fork Yellowstone River at Edgar, Mont.

LOCATION.--Lat 45°27'58", long 108°50'35" (NAD 27), in SE¹/₄SE¹/₄SE¹/₄ 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.--2,022 mi².

PERIOD OF RECORD.--July 1921 to September 1969, October 1986 to current year.

REVISED RECORDS.--WSP 1509: 1924, 1932(M). WSP 1729: Drainage area. WDR MT-04-1: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 3,460 ft (NGVD 29). Prior to Aug. 31, 1953, nonrecording gage at same site and elevation.

REMARKS.--Records good except those for the estimated daily discharges, which are poor. Diversions for irrigation of about 41,500 acres, of which about 840 acres lies 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. U.S. Geological Survey satellite telemeter at station. Discharge values given herein have the diversion of White Horse Canal subtracted.

**DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES**

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	266	619	556	e310	e340	322	425	192	940	3,040	486	463
2	289	577	514	e290	e340	310	536	146	769	3,080	456	408
3	289	589	493	e270	e340	302	586	170	793	2,880	430	437
4	283	597	488	e250	e340	301	504	377	1,120	2,650	792	605
5	276	633	480	e240	e330	298	477	864	1,860	3,050	569	660
6	268	624	e420	e260	e340	297	547	1,440	2,710	2,680	539	572
7	263	613	e480	e310	e340	287	664	1,820	3,700	2,340	540	485
8	273	598	473	e350	e350	283	725	2,010	4,200	2,220	482	418
9	278	567	456	e340	e340	299	783	1,960	3,920	2,120	427	370
10	306	586	437	e340	e340	317	746	1,680	4,520	1,950	353	342
11	375	614	e380	e340	e310	320	651	1,490	6,360	1,800	311	339
12	404	589	e370	e340	e300	313	636	1,500	4,440	1,670	269	342
13	400	565	e420	e340	e320	320	612	1,300	3,420	1,540	225	362
14	417	557	454	e350	e330	328	659	1,080	2,790	1,430	191	377
15	458	561	472	e350	e400	329	736	831	2,500	1,310	156	456
16	462	558	e420	e350	e500	321	713	631	2,360	1,260	133	567
17	462	552	e370	e350	e600	315	642	560	2,230	1,200	127	556
18	456	539	e370	e340	e700	308	569	502	1,980	1,110	128	658
19	456	533	e380	e350	489	316	568	468	1,820	1,020	148	673
20	459	549	e390	e350	371	334	487	598	1,750	1,060	153	720
21	457	e540	e450	e350	346	382	374	569	1,770	1,040	148	861
22	436	e470	445	e350	320	369	308	939	1,720	1,040	183	909
23	438	e400	e410	e350	311	385	241	1,010	1,900	1,140	205	865
24	430	e520	e380	e360	318	440	162	1,030	2,390	1,050	220	813
25	435	539	e380	e330	325	526	100	923	2,760	914	243	806
26	450	551	e430	e300	324	552	76	796	3,120	805	420	791
27	445	553	e410	e280	320	495	49	677	3,220	702	1,180	764
28	482	563	e400	e280	323	425	43	656	3,110	680	951	769
29	539	538	e330	e300	338	385	246	931	2,900	662	814	738
30	619	569	e320	e330	---	350	298	1,200	2,840	594	699	707
31	727	---	e330	e350	---	355	---	1,080	---	550	553	---
TOTAL	12,598	16,863	13,108	10,000	10,645	10,884	14,163	29,430	79,912	48,587	12,531	17,833
MEAN	406	562	423	323	367	351	472	949	2,664	1,567	404	594
MAX	727	633	556	360	700	552	783	2,010	6,360	3,080	1,180	909
MIN	263	400	320	240	300	283	43	146	769	550	127	339
AC-FT	24,990	33,450	26,000	19,840	21,110	21,590	28,090	58,370	158,500	96,370	24,860	35,370

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1921 - 2004, BY WATER YEAR (WY)*

	530	501	409	351	350	365	558	2,092	4,053	2,017	608	476
MEAN	530	501	409	351	350	365	558	2,092	4,053	2,017	608	476
MAX	1,010	777	593	512	584	554	1,398	5,578	7,256	4,771	1,541	1,395
(WY)	(1942)	(1928)	(1996)	(1997)	(1963)	(1943)	(1943)	(1928)	(1996)	(1943)	(1951)	(1941)
MIN	298	310	217	200	180	220	123	757	1,768	290	49.5	156
(WY)	(1956)	(1936)	(1937)	(1922)	(1922)	(1924)	(1961)	(1968)	(1987)	(1988)	(1988)	(1988)

SUMMARY STATISTICS

FOR 2003 CALENDAR YEAR

FOR 2004 WATER YEAR

WATER YEARS 1921 - 2004*

ANNUAL TOTAL	352,592	279,426	
ANNUAL MEAN	966	763	1,027
HIGHEST ANNUAL MEAN			1,623
LOWEST ANNUAL MEAN			644
HIGHEST DAILY MEAN	8,760	Jun 1	6,390
LOWEST DAILY MEAN	116	Aug 28	43
ANNUAL SEVEN-DAY MINIMUM	125	Aug 23	144
MAXIMUM PEAK FLOW			6,950
MAXIMUM PEAK STAGE			7.59
INSTANTANEOUS LOW FLOW			9.30
ANNUAL RUNOFF (AC-FT)	699,400	554,200	744,000
10 PERCENT EXCEEDS	2,500	1,820	2,820
50 PERCENT EXCEEDS	450	472	469
90 PERCENT EXCEEDS	259	282	271

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

e--Estimated.

06208500 CLARKS FORK YELLOWSTONE RIVER AT EDGAR, MONT.
 (Minus diversions to White Horse Canal)

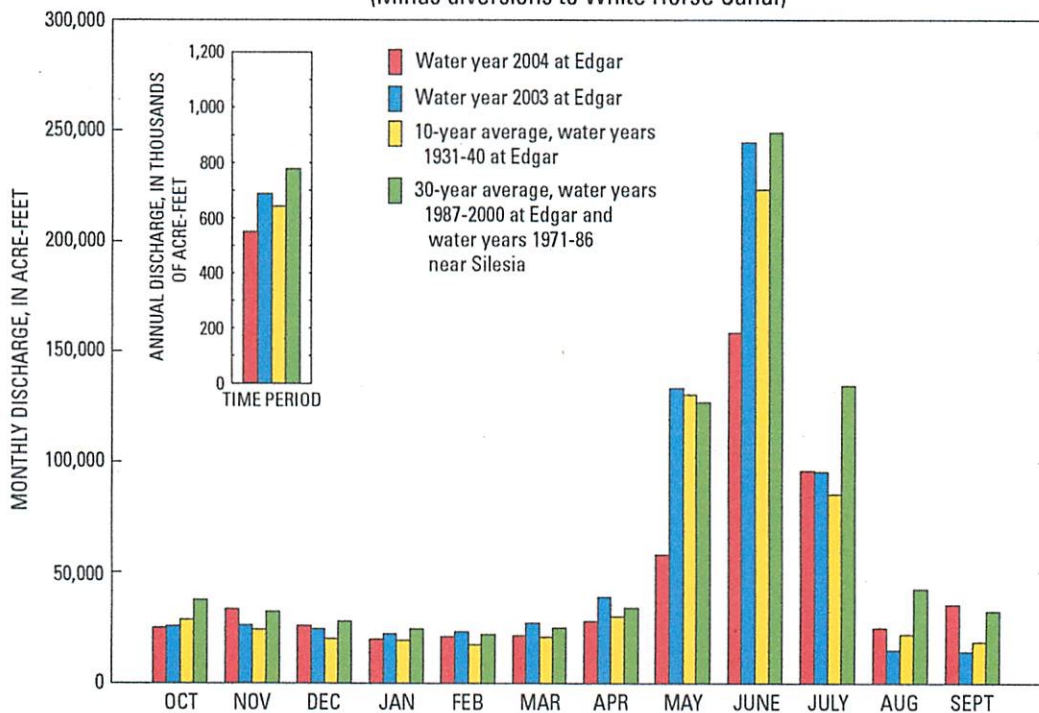


Figure 1. Comparison of discharge of the Clarks Fork Yellowstone River during water year 2004 with discharge during water year 2003 and with 10-year and 30-year average discharges.

06294000 Little Bighorn River near Hardin, Mont.

LOCATION.--Lat 45°44'09", long 107°33'24" (NAD 27), in SE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.19, T.1 S., R.34 E., Big Horn County, Hydrologic Unit 10080016, on left bank 50 ft downstream from bridge on Sarpy Road, 0.2 mi upstream from terminal wasteway of Agency Canal, 0.6 mi upstream from mouth, and 2.3 mi east of Hardin.

DRAINAGE AREA.--1,294 mi².

PERIOD OF RECORD.--June 1953 to current year.

REVISED RECORDS.--WDR MT-86-1: 1978.

GAGE.--Water-stage recorder. Elevation of gage is 2,882.29 ft (NGVD 29) (levels by U.S. Army Corps of Engineers). Prior to Oct. 7, 1953, nonrecording gage at site 0.4 mi downstream. Oct. 7, 1953 to May 6, 1963, water-stage recorder at site 0.3 mi downstream. May 6, 1963 to Nov. 6, 1963, nonrecording gage at site 0.4 mi downstream. All at different elevations. Nov. 7, 1963 to Aug. 15, 1976, water-stage recorder at site 35 ft downstream at present elevation. Aug. 15, 1976 to Sept. 30, 1979, water-stage recorders were located on each bank downstream from Sarpy Road bridge and were used depending on control conditions.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Flow partly regulated by Willow Creek Reservoir (capacity 23,000 acre-ft). Diversions for irrigation of 20,980 acres upstream from station. Discharge values given herein include flow of terminal wasteway of Agency Canal. U. S. Geological Survey satellite telemeter at station. Unpublished records of instantaneous water temperature and specific conductance available in files of the District office.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	77	e100	e130	e100	e100	289	108	37	109	79	59	51
2	87	e100	e140	e90	e100	266	107	43	109	70	51	49
3	84	e95	e140	e80	e110	214	108	43	82	64	48	51
4	88	e95	e130	e80	e120	191	110	36	66	69	55	56
5	90	e90	e110	e70	e120	183	110	34	59	80	51	53
6	92	e100	e130	e60	e120	169	109	33	67	149	61	67
7	98	e100	e130	e70	e120	174	109	30	78	177	60	76
8	100	e100	e130	e100	e130	189	110	49	76	162	62	77
9	97	e110	e120	e90	e120	168	113	79	86	125	57	68
10	97	e120	e110	e90	e110	191	114	108	90	98	53	69
11	98	e130	e100	e90	e100	197	117	126	154	83	52	71
12	93	e130	e100	e90	e110	198	112	130	195	67	53	69
13	97	e120	e120	e90	e120	185	110	146	238	56	52	68
14	97	e120	e130	e90	e130	170	109	149	220	42	52	71
15	113	e120	e110	e90	e140	161	108	136	228	37	49	77
16	108	e130	e110	e90	e140	160	107	119	211	28	43	82
17	107	e130	e110	e100	e140	150	107	109	190	30	34	84
18	108	136	e110	e100	e140	149	105	86	176	48	40	83
19	107	132	e110	e100	e140	153	96	90	174	52	49	80
20	107	e130	e110	e100	e150	160	91	84	168	40	46	99
21	104	e110	e110	e100	e170	e150	95	100	164	34	49	122
22	103	e90	e110	e110	e200	152	99	101	165	32	41	140
23	105	e80	e120	e120	e250	134	94	155	161	26	42	142
24	105	e90	e120	e130	e300	126	89	136	138	25	42	125
25	101	e100	e120	e100	e350	122	83	124	118	49	43	105
26	103	e110	e120	e90	403	122	74	118	121	61	40	87
27	108	e120	e110	e80	395	123	67	114	117	44	40	80
28	111	e130	e100	e80	387	120	67	106	105	39	50	74
29	123	e150	e100	e90	342	119	69	95	88	41	50	69
30	e120	e130	e100	e100	---	116	38	95	77	46	55	75
31	e100	---	e100	e100	---	112	---	104	---	58	56	---
TOTAL	3,128	3,398	3,590	2,870	5,257	5,113	2,935	2,915	4,030	2,011	1,535	2,420
MEAN	101	113	116	92.6	181	165	97.8	94.0	134	64.9	49.5	80.7
MAX	123	150	140	130	403	289	117	155	238	177	62	142
MIN	77	80	100	60	100	112	38	30	59	25	34	49
AC-FT	6,200	6,740	7,120	5,690	10,430	10,140	5,820	5,780	7,990	3,990	3,040	4,800

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1954 - 2004, BY WATER YEAR (WY)

MEAN	153	152	134	139	200	309	309	601	807	260	117	126
MAX	276	248	223	366	610	987	748	2,852	1,981	1,333	382	267
(WY)	(1979)	(1979)	(1979)	(1975)	(1971)	(1972)	(1965)	(1978)	(1968)	(1975)	(1975)	(1978)
MIN	60.7	82.6	65.6	71.6	70.3	71.1	54.8	71.9	117	8.50	2.46	19.1
(WY)	(2002)	(2002)	(2002)	(1988)	(1989)	(2002)	(1961)	(1961)	(1961)	(1961)	(1961)	(1960)

06294000 Little Bighorn River near Hardin, Mont.--Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1954 - 2004	
ANNUAL TOTAL	67,087		39,202		275	
ANNUAL MEAN	184		107		676	1975
HIGHEST ANNUAL MEAN					70.4	1961
LOWEST ANNUAL MEAN						
HIGHEST DAILY MEAN	1,220	Jun 1	403	Feb 26	15,800	May 20, 1978
LOWEST DAILY MEAN	29	Jul 31	a25	Jul 24	0.30	Aug 5, 1961
ANNUAL SEVEN-DAY MINIMUM	32	Jul 29	37	May 1	0.40	Aug 3, 1961
MAXIMUM PEAK FLOW			b427	Feb 26	d22,600	May 19, 1978
MAXIMUM PEAK STAGE			c4.86	Jan 19	f11.78	Mar 20, 1960
INSTANTANEOUS LOW FLOW					g0.20	Aug 7, 1961
ANNUAL RUNOFF (AC-FT)	133,100		77,760		199,500	
10 PERCENT EXCEEDS	391		161		598	
50 PERCENT EXCEEDS	108		100		160	
90 PERCENT EXCEEDS	70		49		74	

a--Includes Agency Canal.
 b--Gage height, 3.30 ft.
 c--Backwater from ice.
 d--Gage height, 11.20 ft.
 e--Estimated.
 f--Site and elevation then in use.
 g--Result of discharge measurement.

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

SUMMARY STATISTICS	WATER YEARS 1946 - 1961 *		WATER YEARS 1967 - 2004**	
ANNUAL MEAN	3,358		3,745	
HIGHEST ANNUAL MEAN	5,501	1947	5,594	1997
LOWEST ANNUAL MEAN	1,623	1961	1,474	2003
HIGHEST DAILY MEAN	25,700	Jun 23, 1947	50,000	May 20, 1978
LOWEST DAILY MEAN	462	May 12, 1961	400	Apr 4, 1967
ANNUAL SEVEN-DAY MINIMUM	528	May 6, 1961	843	Nov 18, 1977
MAXIMUM PEAK FLOW	g26,200	Jun 24, 1947	d59,200	May 20, 1978
MAXIMUM PEAK STAGE	10.65	May 20, 1947	14.15	May 20, 1978
INSTANTANEOUS LOW FLOW	f275	Nov 15, 1959		
ANNUAL RUNOFF (AC-FT)	2,578,000		2,713,000	
10 PERCENT EXCEEDS	6,200		6,170	
50 PERCENT EXCEEDS	2,810		3,320	
90 PERCENT EXCEEDS	1,500		1,710	

*Prior to construction of Yellowtail Dam.

**--After completion of Yellowtail Dam.

a--Gage height, 1.92 ft.

b--Backwater from ice.

c--Gage height, 0.12 ft.

d--Gage height, 14.50 ft, at different site and datum.

e--Estimated.

f--About, result of freezeup.

g--Gage height, 8.79 ft, at different site and datum.

06294500 BIGHORN RIVER ABOVE TULLOCK CREEK, NEAR BIGHORN, MONT.

(Minus
06294000 Little Bighorn River near Hardin, Mont.;
adjusted for change in contents in Bighorn Lake)

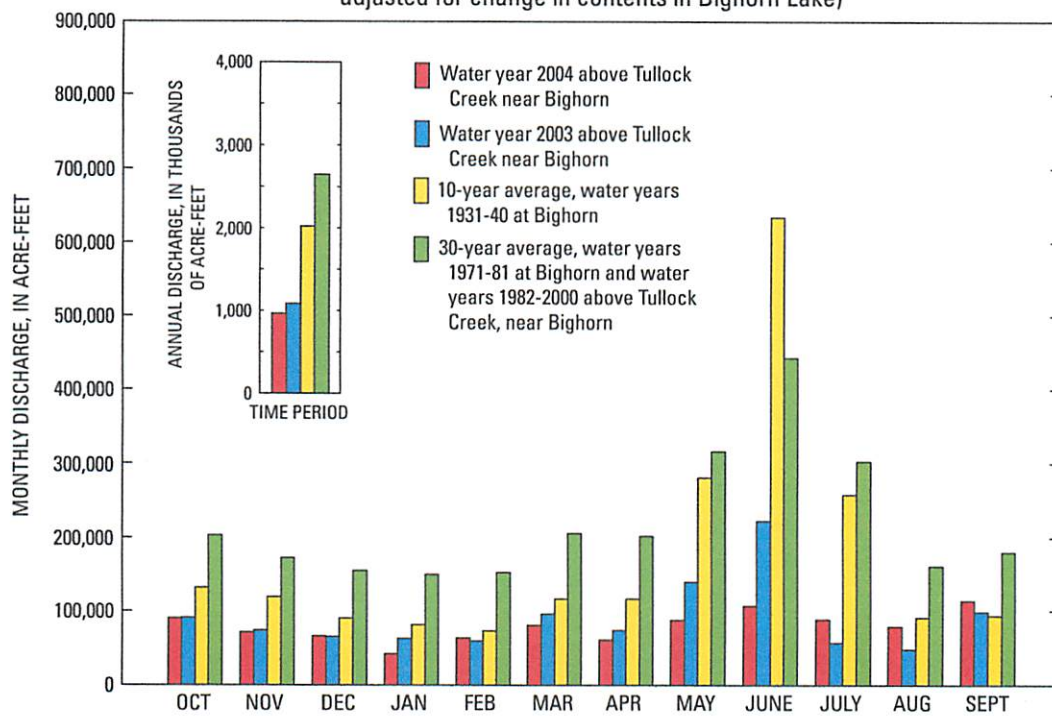


Figure 2. Comparison of discharge of the Bighorn River during water year 2004 with discharge during water year 2003 and with 10-year and 30-year average discharges.

06308500 Tongue River at Miles City, Mont.

LOCATION.--Lat 46°23'05", long 105°50'41" (NAD 27), in SE¹/₄SE¹/₄SE¹/₄ 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 Oct. 4, 1995, 5,379 mi².

PERIOD OF RECORD.--April 1938 to April 1942, April 1946 to current year. Published as "near Miles City" April 1938 to April 1942. Not equivalent to records published as "near Miles City" May 1929 to October 1932. April 1946 to Oct. 4, 1995, at site 2.5 mi upstream from present site. Flows at present site are equivalent with flows at site operated from 1946. Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS.--WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 2,360 ft (NGVD 29). April 1938 to April 1942, nonrecording gage at site 8 mi upstream from present site at different elevation. April 1946 to Sept. 30, 1963, at elevation 1.00 ft higher than present site. Oct. 4, 1995, gage was moved 2.5 miles downstream.

REMARKS.--Water-discharge records good except those for estimated daily discharges, which are poor. Flow regulation by Tongue River Reservoir (station 0630700) with capacity of 79,100 acre-feet, and many small reservoirs in Wyoming with combined capacity about 15,000 acre-ft. Diversions for irrigation of about 100,800 acres upstream from station. U. S. Army Corps of Engineers satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	58	e70	e110	e90	e70	e100	221	11	112	53	50	17
2	63	e70	e120	e80	e70	e90	200	11	97	32	49	16
3	53	e60	e120	e70	e70	e90	188	8.5	91	21	55	18
4	48	e50	e120	e60	e70	e100	208	8.7	65	24	36	18
5	44	e40	e120	e50	e70	e100	226	8.9	39	34	33	18
6	39	e50	e120	e60	e70	e110	227	8.3	23	213	27	17
7	37	e60	e120	e70	e70	e150	221	8.3	19	120	25	15
8	39	e60	e120	e80	e80	e200	208	7.6	16	76	49	16
9	43	e70	e110	e90	e70	e250	180	9.1	16	49	54	15
10	43	e80	e100	e100	e70	e500	162	10	15	36	39	14
11	48	e80	e110	e100	e70	e300	162	12	122	23	29	14
12	51	e80	e110	e100	e70	e250	153	10	246	19	27	15
13	46	e80	e110	e100	e70	225	152	9.7	120	18	27	19
14	43	e80	e100	e90	e65	176	134	8.4	106	24	26	40
15	47	e80	e90	e90	e60	168	117	8.0	108	26	23	54
16	54	e80	e90	e90	e70	166	113	9.5	88	22	20	49
17	69	e80	e100	e100	e80	161	109	13	90	16	26	49
18	71	e90	e100	e100	e90	166	113	14	83	13	29	48
19	71	e90	e100	e100	e90	170	119	20	92	13	29	51
20	71	e70	e100	e100	e100	151	120	40	103	14	23	56
21	74	e50	e100	e100	e100	138	130	47	103	16	21	57
22	72	e30	e100	e100	e90	143	135	50	97	19	21	72
23	69	e35	e100	e110	e90	176	125	71	99	20	21	80
24	60	e40	e90	e100	e90	207	109	298	98	16	23	79
25	51	e50	e100	e90	e100	210	89	232	53	13	27	79
26	69	e60	e100	e70	e100	213	64	165	33	14	26	74
27	80	e70	e110	e60	e100	207	18	140	21	35	24	74
28	e90	e80	e110	e60	e100	199	10	109	18	50	22	75
29	e100	e90	e100	e60	e100	193	9.4	92	21	49	21	77
30	e80	e100	e100	e60	---	197	11	90	34	50	19	75
31	e70	---	e100	e70	---	216	---	97	---	52	18	---
TOTAL	1,853	2,025	3,280	2,600	2,345	5,722	4,033.4	1,627.0	2,228	1,180	919	1,301
MEAN	59.8	67.5	106	83.9	80.9	185	134	52.5	74.3	38.1	29.6	43.4
MAX	100	100	120	110	100	500	227	298	246	213	55	80
MIN	37	30	90	50	60	90	9.4	7.6	15	13	18	14
AC-FT	3,680	4,020	6,510	5,160	4,650	11,350	8,000	3,230	4,420	2,340	1,820	2,580

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1938 - 2004, BY WATER YEAR (WY)*

	241	251	189	193	275	528	432	677	1,244	457	178	196
MEAN	694	585	423	529	1,794	1,783	1,693	2,983	3,825	2,207	700	599
(WY)	(1972)	(1942)	(1950)	(1999)	(1971)	(1971)	(1965)	(1978)	(1978)	(1975)	(1975)	(1968)
MIN	10.3	60.9	68.0	76.9	74.5	74.5	12.5	29.2	41.9	12.6	6.08	2.40
(WY)	(1961)	(1989)	(1990)	(2002)	(2003)	(2002)	(1961)	(1961)	(2002)	(1960)	(1949)	(1938)

06308500 Tongue River at Miles City, Mont.--Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1938 - 2004*	
ANNUAL TOTAL	95,263		29,113.4			
ANNUAL MEAN	261		79.5		402	
HIGHEST ANNUAL MEAN					986	1978
LOWEST ANNUAL MEAN					57.2	1961
HIGHEST DAILY MEAN	4,000	Mar 15	500	Mar 10	9,290	Jun 15, 1962
LOWEST DAILY MEAN	30	Nov 22	7.6	May 8	0.00	Jul 9, 1940
ANNUAL SEVEN-DAY MINIMUM	42	Oct 4	8.5	May 3	0.00	Jul 9, 1940
MAXIMUM PEAK FLOW			unknown		b13,300	Jun 15, 1962
MAXIMUM PEAK STAGE			a5.07	Mar 10	b13.27	Mar 19, 1960
INSTANTANEOUS LOW FLOW					0.00	Jul 9, 1940
ANNUAL RUNOFF (AC-FT)	189,000		57,750		291,000	
10 PERCENT EXCEEDS	711		161		900	
50 PERCENT EXCEEDS	110		70		220	
90 PERCENT EXCEEDS	69		16		65	

*--During period of record (April 1938 to April 1942, April 1946 to current year).

a--About, backwater from ice.

b--At previous site and elevation.

e--Estimated.

06308500 TONGUE RIVER AT MILES CITY, MONT.

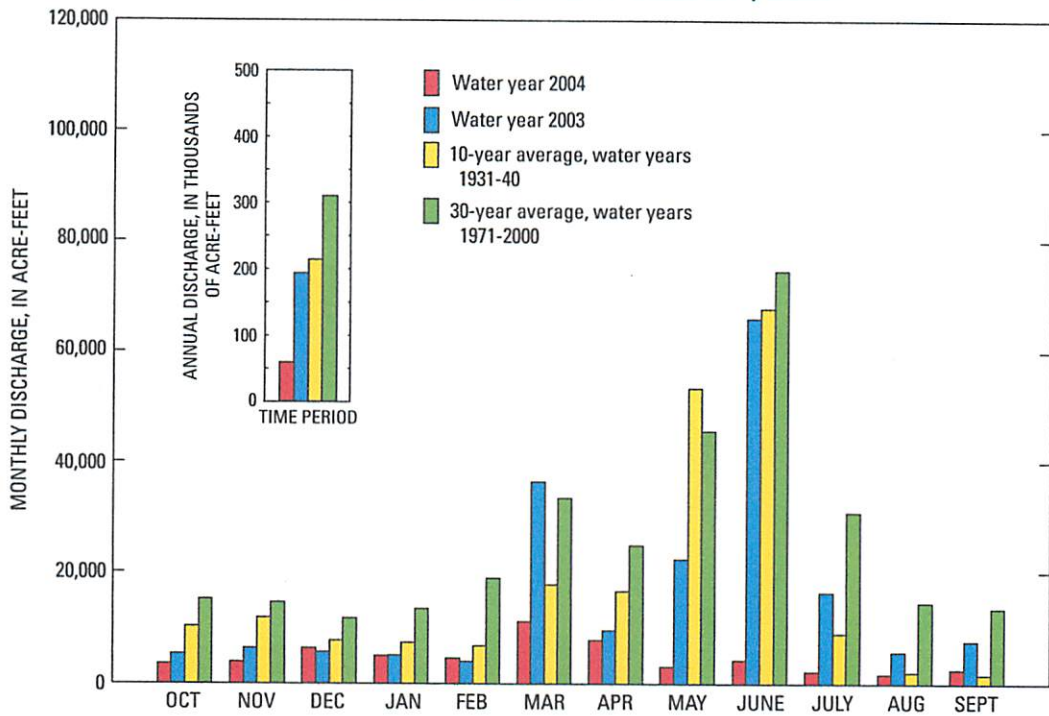


Figure 3. Comparison of discharge of the Tongue River during water year 2004 with discharge during water year 2003 and with 10-year and 30-year average discharges.

06326500 Powder River near Locate, Mont.

LOCATION.--Lat 46°25'48", long 105°18'34" (NAD 27), in SW¹/₄SW¹/₄SE¹/₄ 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.--13,068 mi².

PERIOD OF RECORD.--March 1938 to current year.

REVISED RECORDS.--WSP 926: 1939. WSP 1309: 1938-39 (M). WSP 1729: Drainage area. WDR MT-04-1: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 2,384.79 ft (NGVD 29) (levels by U.S. Army Corps of Engineers). Prior to July 11, 1947, nonrecording gage at bridge 1.5 mi upstream, and July 11, 1947 to Sept. 30, 1965, water-stage recorder at site near upstream bridge at different elevation. Oct. 1, 1965 to Oct. 4, 1966, nonrecording gage, and Oct. 5, 1966 to Mar. 21, 1978, water-stage recorder at present site and elevation. Mar. 22, 1978 to Apr. 23, 1981, water-stage recorder 1.5 mi upstream at different elevation. Apr. 24 to Aug. 20, 1981, water-stage recorder at present site and elevation, and Aug. 21, 1981 to Sept. 30, 1981, water-stage recorder 1.5 mi upstream at different elevation. Oct. 1, 1981 to Apr. 5, 1995 water-stage recorder at site 1.5 miles downstream at different elevation. Apr. 7, 1995 to present, water-stage recorders located on each bank and used depending on control conditions.

REMARKS.--Water-discharge records fair except those for estimated daily discharges, which are poor. Some regulation by three reservoirs in Wyoming with combined usable capacity of 36,800 acre-ft. Diversions for irrigation of about 101,800 acres upstream from station. U.S. Army Corps of Engineers satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	76	81	e80	e80	e60	e70	262	59	65	20	48	2.4
2	75	87	e90	e70	e60	e70	240	63	64	14	66	2.0
3	75	79	e100	e60	e60	e70	271	51	55	10	43	2.8
4	76	67	e90	e50	e60	e75	267	51	42	9.7	218	3.4
5	75	e40	e80	e40	e55	e80	259	34	39	10	229	3.2
6	75	e45	e100	e45	e55	e80	247	30	26	11	133	2.7
7	71	e45	e110	e50	e55	e80	233	29	24	11	86	2.4
8	64	e50	e120	e60	e55	e80	234	27	28	19	69	2.4
9	61	e55	e120	e70	e60	e80	204	20	25	23	69	2.7
10	60	e60	e110	e70	e70	e90	183	17	24	20	58	2.4
11	49	e60	e100	e70	e65	e100	173	18	35	20	39	2.4
12	47	e60	e110	e70	e65	e200	182	17	50	19	28	4.7
13	46	e60	e120	e70	e60	e300	193	21	42	17	21	12
14	47	e60	e120	e70	e65	469	184	20	31	16	14	33
15	47	e55	e110	e70	e65	605	168	18	23	11	8.3	53
16	48	e60	e100	e70	e70	704	158	20	17	8.1	5.3	45
17	48	e65	e110	e70	e70	597	145	37	22	6.6	4.2	29
18	53	e70	e100	e70	e75	529	154	48	12	5.2	3.4	22
19	51	e70	e100	e70	e75	e500	156	57	14	4.1	2.7	19
20	47	e65	e100	e70	e80	e500	139	67	16	4.2	2.5	19
21	47	e60	e100	e70	e75	e450	107	104	15	3.5	3.2	20
22	49	e50	e100	e70	e75	e450	102	70	15	2.8	4.2	17
23	44	e45	e100	e80	e70	e400	96	64	13	2.6	4.5	15
24	37	e50	e100	e75	e75	354	82	118	13	2.6	4.2	14
25	44	e60	e100	e70	e75	350	75	152	13	2.3	3.3	14
26	42	e70	e100	e60	e80	323	98	76	12	2.1	3.1	16
27	38	e80	e100	e50	e80	289	95	78	12	2.0	2.9	e17
28	45	e90	e90	e50	e80	263	77	70	10	3.5	2.7	e17
29	88	e100	e80	e50	e75	271	78	56	9.6	3.1	2.4	e13
30	87	e90	e80	e60	---	285	65	51	11	3.3	2.5	e30
31	71	---	e80	e60	---	277	---	43	---	2.9	2.7	---
TOTAL	1,783	1,929	3,100	1,990	1,965	8,991	4,927	1,586	777.6	289.6	1,183.1	438.5
MEAN	57.5	64.3	100	64.2	67.8	290	164	51.2	25.9	9.34	38.2	14.6
MAX	88	100	120	80	80	704	271	152	65	23	229	53
MIN	37	40	80	40	55	70	65	17	9.6	2.0	2.4	2.0
AC-FT	3,540	3,830	6,150	3,950	3,900	17,830	9,770	3,150	1,540	574	2,350	870

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1939 - 2004, BY WATER YEAR (WY)

	248	217	149	142	425	1,215	732	1,126	1,577	556	210	167
MEAN	248	217	149	142	425	1,215	732	1,126	1,577	556	210	167
MAX	921	790	417	476	3,850	4,627	3,062	5,970	8,045	2,015	1,096	898
(WY)	(1941)	(1999)	(1942)	(1981)	(1943)	(1972)	(1965)	(1978)	(1944)	(1993)	(1941)	(1941)
MIN	1.77	12.5	12.5	4.53	2.82	80.2	109	51.2	25.9	9.34	1.30	0.19
(WY)	(1961)	(1961)	(1961)	(1950)	(1950)	(1950)	(1961)	(2004)	(2004)	(2004)	(1988)	(1960)

06326500 Powder River near Locate, Mont.--Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1939 - 2004	
ANNUAL TOTAL	93,584.09		28,959.8			
ANNUAL MEAN	256		79.1		564	
HIGHEST ANNUAL MEAN					1,622	1944
LOWEST ANNUAL MEAN					79.1	2004
HIGHEST DAILY MEAN	2,000	Mar 18	704	Mar 16	26,000	Feb 19, 1943
LOWEST DAILY MEAN	0.10	Sep 8	2.0	Jul 27	0.00	Jan 16, 1950
ANNUAL SEVEN-DAY MINIMUM	0.17	Sep 2	2.5	Aug 28	0.00	Jan 16, 1950
MAXIMUM PEAK FLOW			a875	Mar 15	31,000	Feb 19, 1943
MAXIMUM PEAK STAGE			b4.14	Mar 8	b12.20	Mar 16, 1978
INSTANTANEOUS LOW FLOW					c0.00	Many days
ANNUAL RUNOFF (AC-FT)	185,600		57,440		408,300	
10 PERCENT EXCEEDS	694		170		1,310	
50 PERCENT EXCEEDS	130		60		230	
90 PERCENT EXCEEDS	8.7		4.2		39	

a--Gage height, 2.63 ft.
b--Backwater from ice.
c--On many days in 1950, 1960-61, and 1998.
e--Estimated.

06326500 POWDER RIVER NEAR LOCATE, MONT.

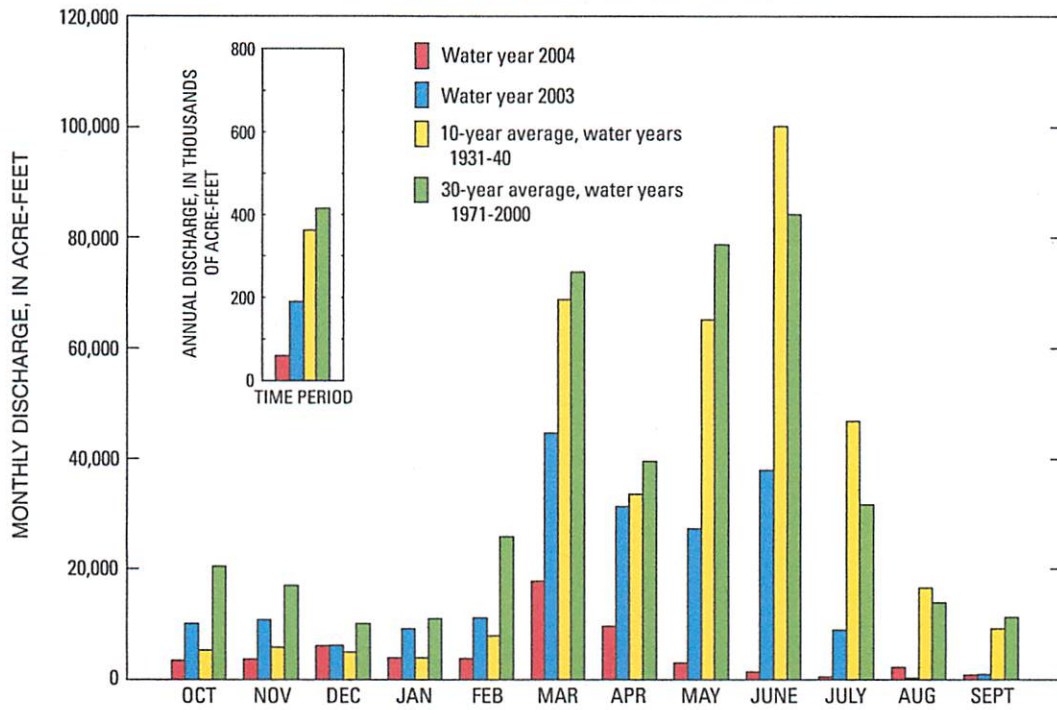


Figure 4. Comparison of discharge of the Powder River during water year 2004 with discharge during water year 2003 and with 10-year and 30-year average discharges.

**MONTHLY SUMMARY OF CONTENTS FOR YELLOWSTONE RIVER COMPACT
RESERVOIRS COMPLETED AFTER JANUARY 1, 1950**

06258900 Boysen Reservoir, Wyo.

LOCATION.--Lat 43°25'00", long 108°10'37" (NAD 27), in NW¹/₄NW¹/₄ sec. 16, T.5 N., R.6 E., Fremont County, Hydrologic Unit 10080005, at dam on Wind River and 13 mi north of Shoshoni, Wyoming.

DRAINAGE AREA.--7,700 mi².

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

GAGE.--Water-stage recorder. Datum of gage is NGVD of 1929 (levels by Bureau of Reclamation).

REMARKS.--Reservoir is formed by rock-fill dam completed in October 1951. Storage began Oct. 11, 1951. Usable capacity, 701,500 acre-ft between elevation 4,657.00 ft, invert of penstock pipe, and 4,725.00 ft, top of spillway gate. Dead storage, 40,080 acre-ft below elevation 4,657.00 ft. Prior to Jan. 1, 1966, usable capacity was 757,800 acre-ft and dead storage was 62,000 acre-ft at same elevations. Between January 1966 and October 1996, usable capacity was 742,100 acre-ft and dead storage was 59,880 acre-ft, at same elevations. Crest of dam is at elevation 4,758.00 ft. Water used for irrigation, flood control, and power generation.

COOPERATION.--Elevations and capacity 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, Mar. 18, 19, 1956, elevation, 4,684.18 ft, capacity table then in use.

EXTREMES FOR CURRENT YEAR.--Maximum daily contents, 496,800 acre-ft, July 14, 15, elevation, 4,713.09 ft; minimum daily contents, 312,500 acre-ft, Oct. 1, elevation, 4,698.59 ft.

Month	Water-surface elevation, in feet	Usable contents, in acre-feet	Change in usable contents, in acre-feet
September 30, 2003	4,698.53	311,900	---
October 31	4,699.16	318,800	+6,900
November 30	4,700.61	335,100	+16,300
December 31	4,701.95	350,500	+15,400
January 31, 2004	4,702.84	361,000	+10,500
February 29	4,703.87	373,400	+12,400
March 31	4,706.18	402,000	+28,600
April 30	4,706.57	406,900	+4,900
May 31	4,707.07	413,400	+6,500
June 30	4,709.79	449,700	+36,300
July 31	4,712.84	493,100	+43,400
August 31	4,711.45	473,000	-20,100
September 30, 2004	4,711.60	475,100	+2,100
2004 water year			+163,200

06260300 Anchor Reservoir, Wyo.

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

DRAINAGE AREA.--131 mi².

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

GAGE.--Water-stage recorder. Datum of gage is NGVD of 1929 (Bureau of Reclamation benchmark).

REMARKS.--Reservoir is formed by concrete arch dam completed in 1960. Usable capacity, 17,410 acre-ft (revised) between elevation 6,343.75 ft, invert of river outlet, and 6,441.00 ft, spillway crest, including 68 acre-ft below elevation 6,343.75 ft. Prior to Oct. 1, 1971, usable capacity was 17,280 acre-ft, including 149 acre-ft below the invert. Water is used for irrigation of land in Owl Creek basin.

COOPERATION.--Elevations and capacity 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.

EXTREMES FOR CURRENT YEAR.--Maximum daily contents, 540 acre-ft, Mar. 30, elevation, 6,363.10 ft; minimum daily contents, 254 acre-ft, many days, elevation, 6,355.00 ft.

Month	Water-surface elevation, in feet	Usable contents, in acre-feet	Change in usable contents, in acre-feet
September 30, 2003	6,358.11	345	---
October 31	6,357.00	314	-31
November 30	6,355.00	254	-60
December 31	6,355.00	254	0
January 31, 2004	6,355.60	271	+17
February 29	6,355.00	254	-17
March 31	6,363.00	535	+281
April 30	6,355.00	254	-281
May 31	6,358.30	355	+101
June 30	6,358.30	355	0
July 31	6,360.40	429	+74
August 31	6,360.40	429	0
September 30, 2004	6,360.40	429	0
2004 water year			+84

06286400 Bighorn Lake near St. Xavier, Mont.

LOCATION.--Lat 45°18'27", long 107°57'26" (NAD 27), in SW¹/₄SE¹/₄ 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 current year (month-end contents only). Prior to October 1969, published as "Yellowtail Reservoir." Records of daily elevations and contents on file at the USGS office in Helena, Mont.

GAGE.--Water-stage recorder in powerhouse control room. Datum of gage is 3,296.5 feet (levels by Bureau of Reclamation).

REMARKS.--Reservoir is formed from thin concrete-arch dam; construction began in 1961; completed in 1967. Storage began Nov. 3, 1965. Usable capacity, 1,312,000 acre-ft, between elevation 3,296.50 ft, river outlet invert, and 3,657.00 ft, top of flood control. Elevation of spillway crest, 3,593.00 ft. Normal maximum operating level, 1,097,000 acre-ft, elevation, 3,640.00 ft. Minimum operating level, 483,400 acre-ft, elevation, 3,547.00 ft. Dead storage, 16,010 acre-ft, below elevation 3,296.50 ft. Water is used for power production, flood control, irrigation, and recreation.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 1,346,000 acre-ft, July 6, 1967, elevation, 3,656.43 ft; minimum contents since first filling, 591,400 acre-ft, Mar. 11, 2003, elevation, 3,572.81 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 799,100 acre-ft, Nov. 13, elevation, 3,611.84 ft; minimum contents, 634,300 acre-ft, May 8, elevation, 3,581.76 ft.

Month	Water-surface elevation, in feet	Usable contents, in acre-feet	Change in usable contents, in acre-feet
September 30, 2003	3,607.20	769,900	---
October 31	3,611.40	796,200	+26,300
November 30	3,610.52	790,500	-5,700
December 31	3,605.13	757,600	-32,900
January 31, 2004	3,594.58	699,300	-58,300
February 29	3,591.51	683,300	-16,000
March 31	3,588.22	666,500	-16,800
April 30	3,582.94	640,100	-26,400
May 31	3,584.12	646,000	+5,900
June 30	3,586.80	659,300	+13,300
July 31	3,587.29	661,800	+2,500
August 31	3,586.40	657,300	-4,500
September 30, 2004	3,593.63	694,300	+37,000
2004 water year			-75,600

**MONTHLY SUMMARY OF CONTENTS FOR YELLOWSTONE RIVER COMPACT
RESERVOIRS EXISTING ON JANUARY 1, 1950**

The extent, if any, to which the use of reservoirs in this section may be subject to Compact allocations was not determined. As a matter of hydrologic interest, the month-end usable contents in acre-feet of four reservoirs are given. The first three reservoirs are in the Bighorn River basin, Wyoming, and data on contents were furnished by the Bureau of Reclamation. The Tongue River Reservoir in Montana is operated under the supervision of the Water Resources Division of the Montana Department of Natural Resources and Conservation, which furnished the water-level data and the reservoir-capacity table.

Month	Usable contents, in acre-feet ¹			
	06224500 Bull Lake	Pilot Butte Reservoir	06281500 Buffalo Bill Reservoir	06307000 Tongue River Reservoir
September 30, 2003.....	55,620	9,290	465,700	39,050
October 31	56,800	24,990	444,700	41,160
November 30.....	56,890	24,670	450,500	43,240
December 31	56,930	24,560	458,000	45,070
January 31, 2004	57,290	24,460	463,700	45,070
February 29	57,380	24,580	468,600	46,110
March 31	57,380	24,430	483,600	48,710
April 30	60,920	27,880	473,900	48,970
May 31	60,370	15,200	442,400	45,580
June 30	99,190	24,020	519,300	42,200
July 31	137,400	17,510	521,400	35,500
August 31	107,300	19,630	463,700	26,620
September 30, 2004.....	88,940	15,630	438,800	26,620
Change in contents during water year.....	+33,320	+6,340	-26,900	-12,430

¹Pre-Compact water rights and post-Compact water rights for these reservoirs are presented in the table, "Annual summary of contents for Yellowstone River Compact Commission reservoirs or lakes."

ANNUAL SUMMARY OF CONTENTS FOR YELLOWSTONE RIVER COMPACT RESERVOIRS OR LAKES

[Contents are in acre feet. Reservoirs or lakes are listed in alphabetical order by drainage basin. Symbol: --, data not applicable or not available]

Reservoir or lake name	Pre- Compact 1950 water right	Post- Compact 1950 water right	Usable capacity	Usable contents on Sept. 30, 2004	Usable contents on Sept. 30, 2003	Change in contents
Bighorn River basin						
(Lake) Adelaide Reservoir ¹	1,450	4,760	6,210	800	--	---
Anchor Reservoir ²	17,410	0	17,410	429	345	84
Bighorn Lake ²	--	1,312,000	1,312,000	694,300	769,900	-75,600
Boysen Reservoir ²	701,500	0	701,500	475,100	311,900	163,200
Buffalo Bill Reservoir ²	456,600	190,000	646,600	438,800	465,700	-26,900
Bull Lake ²	152,000	0	152,000	88,940	55,620	33,320
Greybull Valley Reservoir ¹	0	33,170	33,170	1,100	1,480	-380
Pilot Butte Reservoir ²	34,600	0	34,600	15,630	9,290	6,340
Sunshine Reservoir ¹	52,990	0	52,990	6,600	1,800	4,800
Lower Sunshine Reservoir ¹	42,640	42,300	84,940	1,010	1,490	-480
Powder River basin						
Cloud Peak Reservoir ¹	3,400	172	3,570	0	0	0
Dull Knife Reservoir ¹	--	4,320	4,320	504	987	-483
Healy Reservoir ¹	--	5,140	5,140	2,620	3,080	-460
Kearney Reservoir ¹	1,850	4,470	6,320	2,500	2,710	-210
Lake DeSmet ¹	37,520	197,500	235,000	185,600	197,600	-12,000
Muddy Guard Reservoir ¹	--	2,340	2,340	0	492	-492
Tie Hack Reservoir ¹	1,650	2,440	2,440	2,440	2,440	0
Willow Park Reservoir ¹	4,460	--	4,460	2,230	1,320	910
Tongue River basin						
Bighorn Reservoir ¹	2,750	1,880	4,630	794	1,030	-236
Cross Creek Reservoir ¹	--	798	798	0	324	-324
Dome Reservoir ^{1,3}	1,840	188	2,030	1,180	1,480	-300
Granger Reservoir ¹	146	--	146	0	0	0
Last Chance Reservoir ¹	90	--	90	0	0	0
Martin Reservoir ¹	561	--	561	0	0	0
Park Reservoir ¹	7,350	3,020	10,360	4,160	4,150	10
Sawmill Lakes Reservoir ¹	--	1,280	1,280	703	0	703
Tongue River Reservoir ⁴	68,000	11,070	79,070	26,620	39,050	-12,430
Twin Lakes Reservoir ^{1,5}	1,180	2,220	3,400	3,100	2,820	280
Weston Reservoir ¹	370	--	370	0	0	0
Willits Reservoir ¹	79	--	79	0	0	0

¹Reservoirs managed by the State of Wyoming

²Reservoirs managed by Bureau of Reclamation.

³Data are combined contents of Dome Lake and Dome Lake Reservoir.

⁴Reservoir managed by the State of Montana.

⁵Data 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:

1. Maintain and operate gaging stations at or near the points of measurement specified in Article V (A) of the Compact.
 2. Assemble factual information on stream flow, diversion, and reservoir storage for the preparation of an annual report to the Governors of the signatory States.
 3. Make such investigations and reports as may be requested by the Commission in aid of its administration of the Compact.
- B. The Geological Survey shall act as Secretary to the Commission.

Article IV. Budget

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

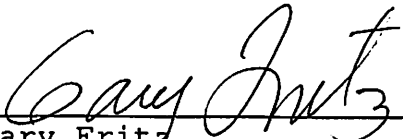
Article V. Meetings

An annual meeting of the Commission shall be held each November at some mutually agreeable point in the Yellowstone River Basin for consideration of the annual report for the water year ending the preceding September 30th, and for the transaction of such other business consistent with its authority; provided that by unanimous consent of the Commission the date and place of the annual meeting may be changed. Other meetings as may be deemed necessary shall be held at a time and place set by mutual agreement, for the transaction of any business consistent with its authority.


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

Article VI. Amendments, Revisions and Abrogations.

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




Gary Fritz
Commissioner for Montana



George L. Christopoulos
Commissioner for Wyoming

ATTESTED:



L. Grady Moore
Federal Representative

Adopted November 17, 1953
Amended December 16, 1986

**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

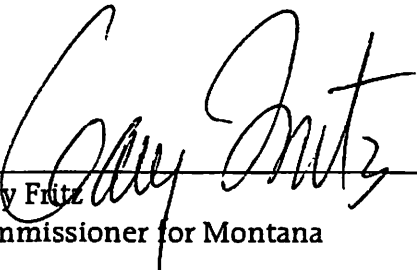
A. The USGS will pay one-half and the states of Montana and Wyoming shall each pay one-quarter of the expenses of the facilitator, which shall not exceed \$10,000, unless agreed to by both states and the USGS.

Section VIII. Amendments

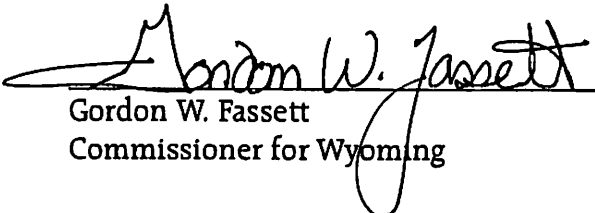
A. These rules may be amended or revised by a unanimous vote of the Commission.

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.



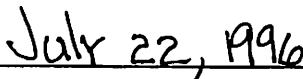
Gary Fritz
Commissioner for Montana



Gordon W. Fassett
Commissioner for Wyoming



William F. Horak
Federal Representative



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.
2. "Cfs" means a flow of water equivalent to a volume of 1 cubic foot that passes a point in 1 second of time and is equal to 40 miners inches in Montana.
3. "Interstate Ditches" shall include ditches and canals which convey waters of the Bighorn, Tongue, Powder, and Clarks Fork Rivers and their tributaries across the Wyoming-Montana State line where the water is diverted in one State and the place of use is in the other State.
4. "Department of Natural Resources and Conservation," hereafter called the "Department," means the administrative agency and Department of the Executive Branch of the Government of Montana created under Title II, Chapter 15, MCA which has the responsibility for water administration in that State.

5. "Water Court" means a Montana District Court presided over by a water judge, as provided for in Title III, Chapter 7, MCA.
6. "State Engineer" shall be the current holder of the position created by the Wyoming Constitution as Chief Water Administration Official for the State of Wyoming.
7. "Board of Control," hereinafter called the "Board," is defined as the constitutionally created water management agency in Wyoming composed of the four Water Division Superintendents and the State Engineer.
8. "Superintendent" is the member of the Board who is the water administration official for the 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.
5. After the validation procedure, the Superintendent will hold a hearing, after appropriate notice and advertisement, at which time the claimant shall describe, in detail, the use that has been made of the water and the lands that are being irrigated, establish a priority date, etc. Costs incurred in advertising shall be paid by the claimant. If a single hearing is held to consider several claims, the costs of advertising shall be shared equally among the claimants. Anyone who opposes the claim shall appear and state the reasons, if any, for opposition to the claim. If there is no opposition to the claim, cost incurred in holding the hearing shall be paid by the claimant. If protestants do appear and oppose the claim, hearing costs will be paid 50 percent by the claimant and 50 percent by the protestant, or if there is more than one protestant, the remaining 50 percent shall be shared equally among the protestants.
6. At the conclusion of the hearing, the Superintendent shall forward the record to the Yellowstone River Compact Commission with his findings and recommendations. The Yellowstone River Compact Commission will make the

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

7. The Board shall review the record and integrate it into its water rights system. Upon entry of the record by the Board, the information shall be forwarded to the Department and the Chairman of the Yellowstone River Compact Commission.
8. Upon the entry of the right into the Board's records, it will have the following attributes:
 - a. The right will be a Wyoming water right with a priority date as established by this procedure.
 - b. The amount of the right will be determined as provided by Wyoming law.

B. Montana Procedure

1. The Yellowstone River Compact Commission will provide a claim form to be completed by the claimant that will describe the location and point of diversion and land being irrigated, the priority date claimed, method of irrigation and such other information required to describe the claim.
2. The Commission will send the claim form to water users on the interstate ditches.
3. Water users will complete the claim form and file it with the Yellowstone River Compact Commission, which, when found to be correct and complete, will be forwarded to the Department for verification.
4. Upon receipt of the form, the Department, in cooperation with the Wyoming State Engineer's Office, will validate the information, including the use that has been made of the water, the number of acres and location of lands being irrigated, the priority date, and all other relevant information. The appropriate Superintendent and the Department will utilize aerial photographs and other information to have prepared a reproducible map showing the location of the ditch system, land irrigated, point of diversion, etc., of the claim.

5. The Department will then forward the record to the Yellowstone River Compact Commission with its findings and recommendations. Upon approval by the Commission, the record shall be submitted to the Montana Water Court for adjudication. A duplicate record will be forwarded to the Wyoming State Engineer's Office, the Board, and the Chairman of the Yellowstone River Compact Commission upon adjudication.
6. Upon adjudication of the right by the Montana Water Court, it will have the following attributes:
 - a) The right will be a Montana water right with a priority date as established by this procedure.
 - b) The amount of the right will be determined as provided by Montana law.

Article V. Exclusions

- A. These rules recognize the limitation in Article VI of the Yellowstone River Compact regarding Indian water rights.
- B. These rules shall not be construed to determine or interpret the rights of the States of Wyoming and Montana to the waters of the Little Bighorn River.

Article VI. Claim Form Submission Period

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

YELLOWSTONE RIVER COMPACT COMMISSION

WYOMING

GORDON W. FASSETT
STATE ENGINEER
HERSCHLER BUILDING
4TH FLOOR EAST
CHEYENNE, WYOMING 82002
(307) 777-354

UNITED STATES

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

MONTANA

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

YELLOWSTONE RIVER COMPACT COMMISSION

CLAIM FORM FOR INTERSTATE DITCHES

1. Name of ditch or canal: _____
2. Source of water supply: _____
Tributary of _____
3. Name of claimant: _____
Address _____
City _____ State _____ Zip Code _____
Home Phone No. _____ Business Phone No. _____
4. Person completing form: _____
Address _____
City _____ State _____ Zip Code _____
Home Phone No. _____ Business Phone No. _____
5. Method of irrigation: _____
6. Point of diversion: County _____ State _____
Headgate located in the ___ $\frac{1}{4}$ ___ ___ $\frac{1}{4}$ ___, Section _____, T. ___ R. ___

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

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.
11. Has irrigation water been diverted onto all lands shown in the above tabulation each year since completion of works?___
If not, state exceptions and reasons therefore: _____

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. _____

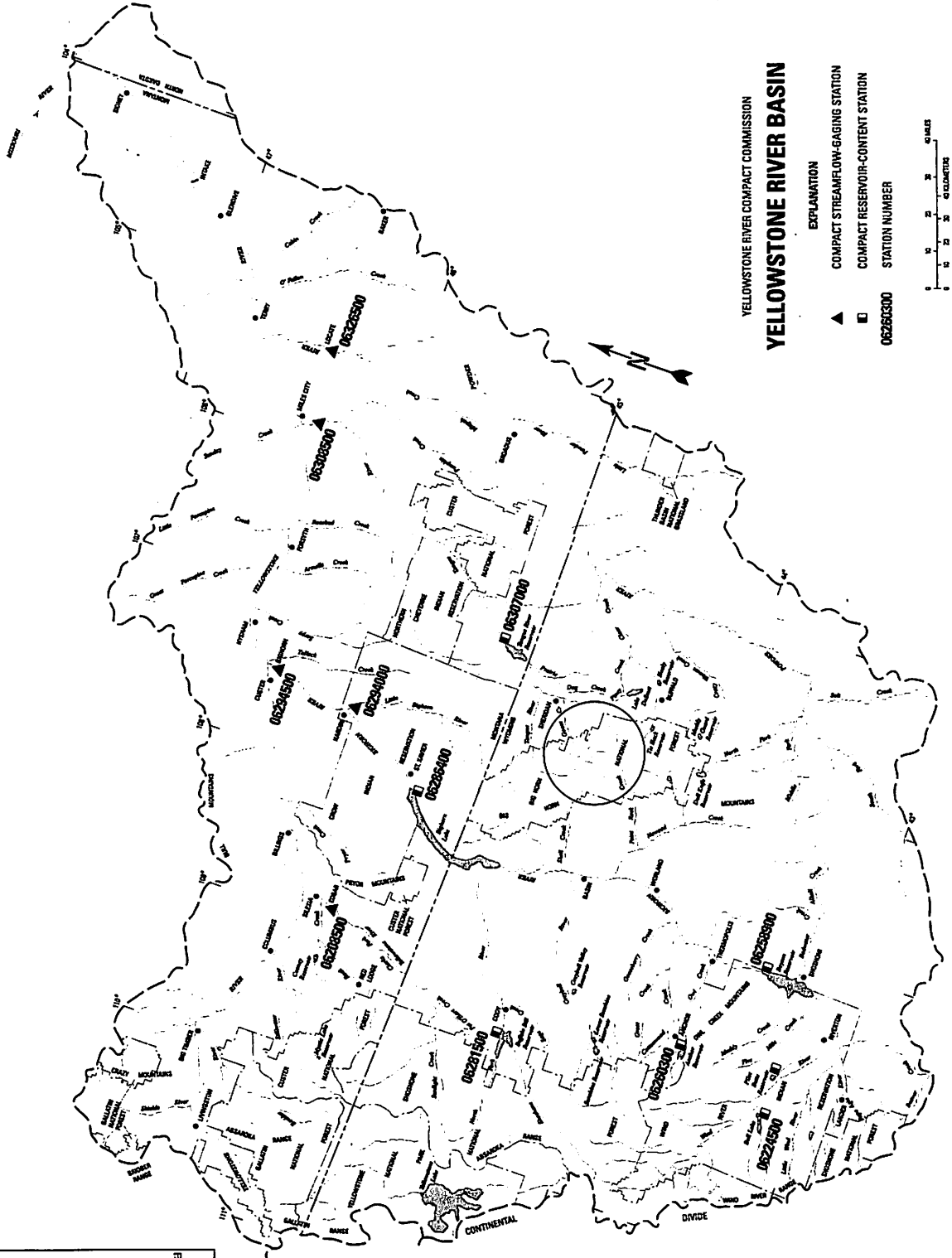
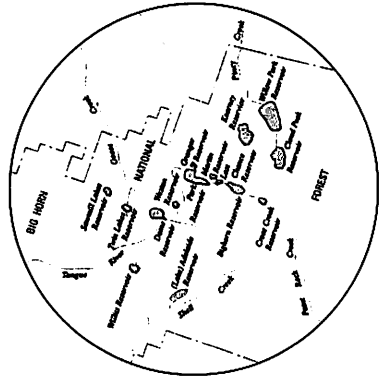
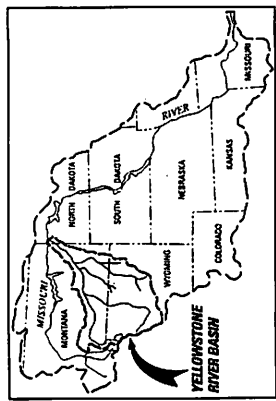
13. What permit or claim numbers have been assigned to known records filed with either the Wyoming State Engineer's Office or the Montana Department (DNRC) for irrigating the above lands? _____

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: _____

CONVERSION TABLE

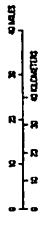
<u>Multiply inch-pound units</u>	<u>By</u>	<u>To obtain SI units</u>
	<i>Length</i>	
feet (ft)	0.3048	meters (m)
miles (mi)	1.609	kilometers (km)
	<i>Area</i>	
acres	4,047	square meters (m ²)
	0.4047	*hectares (ha)
	0.4047	square hectometer (hm ²)
	0.004047	square kilometers (km ²)
square miles (mi ²)	2.590	square kilometers (km ²)
	<i>Volume</i>	
cfs-day or second-foot day (ft ³ /s-day)	2,447	cubic meters (m ³)
	0.002447	cubic hectometers (hm ³)
cubic feet	0.02832	cubic meters
acre-feet (acre-ft)	1,233	cubic meters (m ³)
	0.001233	cubic hectometers (hm ³)
	0.000001233	cubic kilometers (km ³)
	<i>Flow</i>	
cubic feet per second (ft ³ /s)	28.32	liters per second (L/s)
	28.32	cubic decimeters per second (dm ³ /s)
	0.02832	cubic meters per second (m ³ /s)
acre-feet per year (acre-ft/yr)	1,233	cubic meters per year (m ³ /yr)
	0.001233	cubic hectometers per year (hm ³ /yr)
	0.000001233	cubic kilometers per year (km ³ /yr)

*The unit hectare is approved for use with the International System (SI) for a limited time. See National Bureau of Standards Special Bulletin 330, p. 12, 1977 edition.



YELLOWSTONE RIVER COMPACT COMMISSION
YELLOWSTONE RIVER BASIN

- EXPLANATION
- ▲ COMPACT STREAMFLOW-GAGING STATION
 - COMPACT RESERVOIR-CONTENT STATION
- 06266300 STATION NUMBER



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