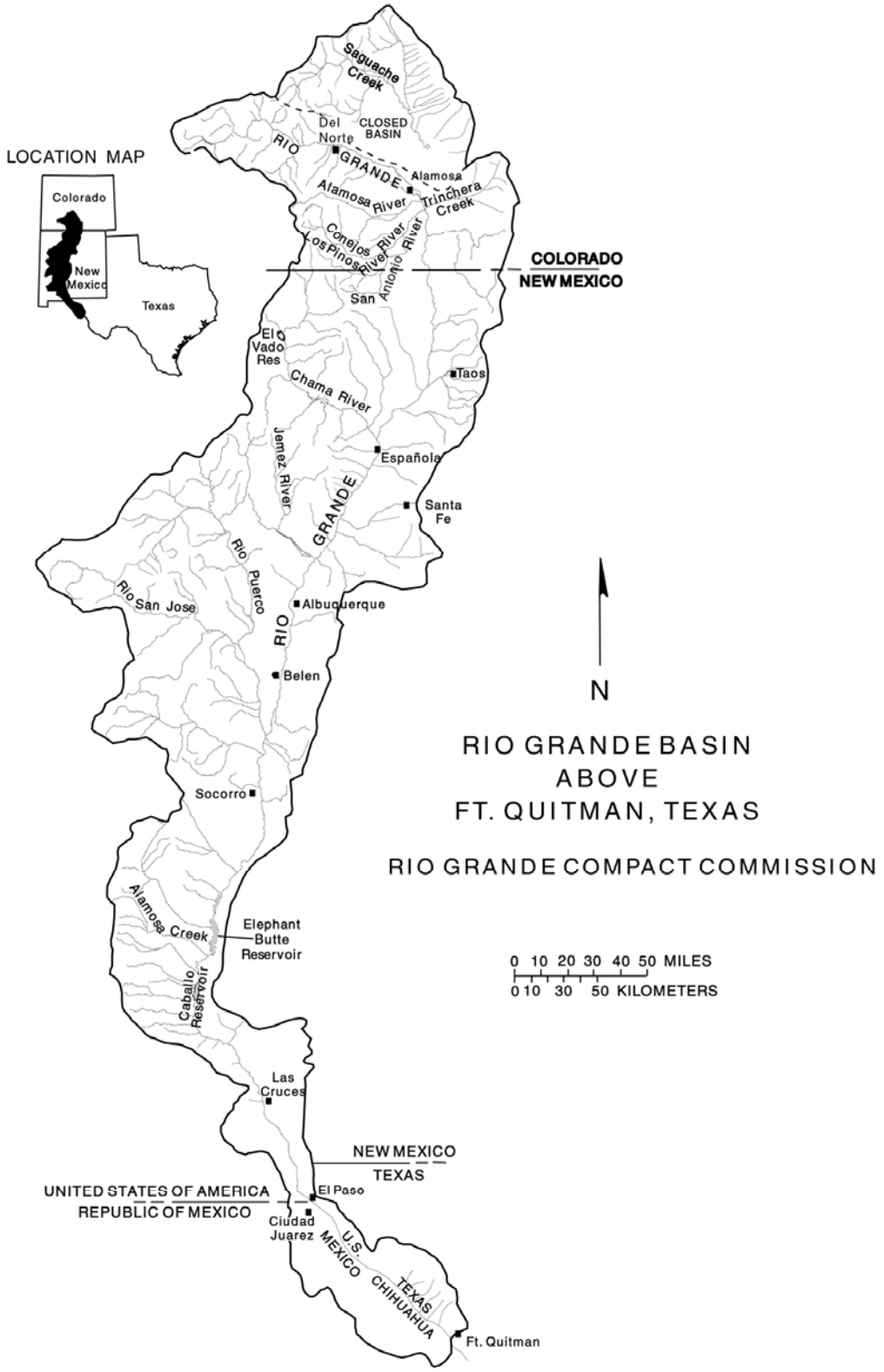
REPORT

of the

RIO GRANDE COMPACT COMMISSION

2019

TO THE GOVERNORS OF
Colorado, New Mexico and Texas


LOCATION MAP
Colorado
New Mexico
Texas
Saguache Creek
Del Norte
CLOSED BASIN
RIO GRANDE
Alamosa
Alamosa River
Trinchera Creek
Conejos River
Los Pinos River
San Antonio River
COLORADO
NEW MEXICO
El Vado Res
Chama River
Taos
Jemez River
Española
RIO GRANDE
Santa Fe
Rio Puerco
Rio San Jose
Albuquerque
RIO
Belen
N
RIO GRANDE BASIN
ABOVE
FT. QUITMAN, TEXAS
RIO GRANDE COMPACT COMMISSION
Socorro
Alamosa Creek
Elephant Butte Reservoir
Caballo Reservoir
0 10 20 30 40 50 MILES
0 10 30 50 KILOMETERS
Las Cruces
NEW MEXICO
TEXAS
UNITED STATES OF AMERICA
REPUBLIC OF MEXICO
El Paso
Ciudad Juarez
U.S.
MEXICO
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CHIHUAHUA
Ft. Quitman

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RIO GRANDE COMPACT COMMISSION
COLORADO NEW MEXICO TEXAS

November 12, 2020

The Honorable Michelle Lujan Grisham
Governor of the State of New Mexico
Santa Fe, New Mexico

The Honorable Greg Abbott
Governor of the State of Texas
Austin, Texas

The Honorable Jared Polis
Governor of the State of Colorado
Denver, Colorado

Honorable Governors:

The 81st Annual Meeting of the Rio Grande Compact Commission was broadcast via webinar on November 12, 2020. The webinar replaced the in-person meeting that was canceled in April 2020 due to the global health crisis. The meeting was held via webinar to discuss Rio Grande Compact issues such as compact accounting and administration.

The Commission reviewed the cost of operation and found that the expenses for the administration of the Rio Grande Compact were $200,403 in the fiscal year ending June 30, 2019. The United States bore $51,594 of this total; the balance of $148,809 was borne equally by the three States party to the Compact.

Upon printing, the 2019 Report of the Rio Grande Compact Commission will be provided under separate cover.

Respectfully,

John R. D'Antonio, Jr., P.E., Commissioner for New Mexico

Patrick R. Gordon, Commissioner for Texas

Kevin G. Rein, P.E., Commissioner for Colorado

REPORT OF THE ENGINEER ADVISERS
TO THE RIO GRANDE COMPACT COMMISSION
March 6, 2020

The Engineer Advisers to the Rio Grande Compact Commission met in Albuquerque, New Mexico on February 7, 2020 and between March 2 and March 6, 2020 to:

- Receive reports;
- Prepare the 2019 Rio Grande Compact (Compact) water accounting;
- Discuss continuing and new issues in preparation for the 2020 annual meeting of the Rio Grande Compact Commission (Commission); and
- Prepare the Engineer Advisers' report.

The Engineer Advisers received the participation of the U.S. Geological Survey (USGS), the U.S. Bureau of Reclamation (Reclamation), the U.S. Army Corps of Engineers (Corps), the U.S. Bureau of Indian Affairs (BIA), the International Boundary and Water Commission (IBWC), and the U.S. Fish and Wildlife Service (Service) at the meetings. The agencies each presented information about their specific water-related activities in the basin during the previous calendar year.

COMPACT ACCOUNTING

The Engineer Advisers reviewed the streamflow and reservoir storage records and other pertinent data for the Upper Rio Grande Basin during calendar year 2019 and are again unable to reach a consensus on the accounting. The lack of consensus arises from a disagreement that began in 2011 amongst the Texas Engineer Adviser and the New Mexico and Colorado Engineer Advisers on the release of credit water by Reclamation from Elephant Butte Reservoir in late summer 2011. As a result, the Engineer Advisers have not reached consensus on how to finalize the 2011 through 2019 Compact Delivery Tables for Colorado and New Mexico and the Release and Spill from Project Storage Table. For 2019, as in previous years, each of the Engineer Advisers developed accounting methods described in the addenda to this report. At its 2019 meeting, the Commission did not approve any of the proposed accounting methods. In 2020, the

Engineer Advisers used the accounting methods they individually prepared to carry forward Compact accounting for the 2019 calendar year. As described in the New Mexico Engineer Adviser's addenda in previous years, the use of accounting methods 1 and 2 had an impact on the timing of Article VII storage restrictions and upstream storage operations. In 2019, Article VII timing was different for both accounting methods. By method 1 (Reclamation and Texas), Article VII restrictions were lifted on May 12, 2019, and by method 2 (New Mexico and Colorado), Article VII restrictions were lifted on May 11, 2019.

New Mexico began 2020 with an accrued debit. In 2020, should New Mexico store native Rio Grande water, New Mexico plans to retain water in storage in upstream reservoirs to the extent of its 2020 accrued debit and may release all or part of this stored water after November 1, 2020 for delivery to Elephant Butte Reservoir.

RIO GRANDE BASIN CONDITIONS

Snowpack and snow-water equivalent (SWE) amounts were well-above average for the winter of 2018-2019. As a result, snowmelt runoff levels in 2019 were substantially above the long-term average for most areas across the basin in Colorado and in New Mexico.

After a large runoff, the summer monsoon precipitation was generally below average across the basin in Colorado and New Mexico in 2019. This resulted in a large swing from very high flows during the spring to relatively low flows in the late summer.

Due to the high-runoff flows, Platoro Reservoir reached a high of approximately 94 percent of capacity during early July of 2019. Usable Water in Rio Grande Project Storage was below the Article VII trigger of 400,000 acre-feet until mid-May when it rose above the 400,000 acre-foot threshold, lifting Article VII storage restrictions. Usable Water remained above 400,000 acre-feet throughout the rest of the year.

BIA requested that Reclamation store 14,345 acre-feet of Rio Grande water in El Vado Reservoir for Prior and Paramount (P&P) operations. All of this water was stored while in Article VII restrictions. None of the stored water was needed for P&P operations, and all of the water, minus evaporation losses, was released in November of 2019.

CONTINUING ISSUES

This section of the report summarizes new information about issues previously addressed by the Engineer Advisers. It reflects information obtained by the Engineer Advisers prior to the writing of the 2020 Engineer Advisers' report, including information obtained from the reports of the federal agencies at meetings with the Engineer Advisers or otherwise reported at the 2020 Engineer Advisers meetings. The terms "reported" and "indicated" herein reflect information provided by various entities without analysis by the Engineer Advisers.

Middle Rio Grande Endangered Species Collaborative Program

The Middle Rio Grande Endangered Species Collaborative Program (Collaborative Program) was authorized by the Omnibus Appropriations Act of 2009 (P.L. 111-8). The Collaborative Program continues to seek innovative and collaborative ways to support Endangered Species Act (ESA) compliance for listed species while protecting water uses in the Middle Rio Grande. In federal fiscal year 2019, Reclamation reported that their federal appropriations were $3,651,193 for Collaborative Program activities, including funding and contracting for:

- Captive propagation of Rio Grande silvery minnow (silvery minnow) at three facilities;
- Annual monitoring of silvery minnow population;
- Genetics study of the silvery minnow;
- Development of high-throughput markers to allow for an enhanced and rapid assessment of silvery minnow genetic diversity;
- Silvery minnow rescue and salvage efforts during river drying;
- Reproductive monitoring of Southwestern willow flycatcher (flycatcher) and Western yellow-billed cuckoo (cuckoo) population;
- Annual monitoring of flycatcher population and nests; and
- Program management, assessment, reporting, and outreach activities.

The Corps received over $2,100,000 in 2019 to support administrative and technical staff for engagement with the Collaborative Program. However, only $1,178,000 was appropriated in fiscal year 2020 (51 percent reduction), and there is currently no funding allocated for fiscal year 2021. The Corps reported that they expect numerous projects to be unfunded in the near future,

including long-term avian monitoring, sediment data collection for the Rio Puerco, San Acacia and San Marcial areas, as well as LiDAR and collaborative aerial imagery analysis.

The Collaborative Program nonfederal signatories have exceeded their required cost share contribution of 25 percent cash and in-kind services with the majority of the cost share from the State of New Mexico. Limited federal funding for Collaborative Program activities is expected to continue.

Update on WildEarth Guardian's Litigation over the 2003 Biological Opinion

In 2019, at the request of the Engineer Advisers, the Commission directed the legal committee to review the Federal District Court ruling in the *WildEarth Guardians v. U.S. Army Corps of Engineers* (case no. 1:14-cv-00666-RB-SCY) and to provide legal opinions on the implications and impacts, if any, to the Commission and the Compact. The legal committee will report on this issue at the 2020 Commission annual meeting.

Upper Rio Grande Water Operations Model

The Upper Rio Grande Water Operations Model (URGWOM) is a computational model developed through an interagency effort led by the Corps, Reclamation, and the New Mexico Interstate Stream Commission (NMISC). The effort includes regular meetings to discuss modeling outputs for daily water operations and accounting procedures. During 2019, URGWOM activities included:

- Developing an updated basin-wide annual operating plan (AOP);
- Updating the database to include data from years 2015 to 2018;
- Continuing the work on developing a real-time operation model by linking URGWOM to the Corps Water Management System (CWMS);
- Developing and presenting nine URGWOM training sessions in Albuquerque for lead agencies and participating partners;
- Continuing the work on water-quality data modeling for the Middle Rio Grande portion of the URGWOM model;
- Updating the five-year plan and model documentation; and
- Utilizing the new aquifer objects in RiverWare to model deep-aquifer-head elevation and the groundwater movement between the shallow aquifer and the deep aquifer.

Key objectives for 2020 include:

- Preparing basin-wide AOPs for 2020;
- Completing and calibrating aquifer object integration into the URGWOM model (completion of this task will eliminate the need for continued use and development of the MODFLOW model that has been historically used in support of URGWOM); and
- Continuing water-quality data collection and modeling.

Compliance by Federal and State Agencies with State Water Law

The NMISC continues to track habitat restoration projects implemented by various federal and state agencies, and to account and report on related depletions in the Middle Rio Grande. It coordinates with the New Mexico Office of the State Engineer (NMOSE) to determine if a permit is needed and to ensure the depletions are offset by the project sponsors. The NMISC reported that it continues to coordinate with the Corps on several recently implemented habitat restoration projects to ensure that those depletions are offset. The NMISC also coordinates with Reclamation in using the State's Strategic Water Reserve for ESA-related water management, including offsetting depletions associated with habitat restoration and river augmentation activities. Well-above-average spring snowmelt runoff flows in 2019 resulted in the need for substantial depletions offsets, which were provided by New Mexico's Strategic Water Reserve.

Elephant Butte Delta Channel Project

During the 2019 snowmelt runoff, flows in the Delta Channel exceeded the design capacity, resulting in overbanking and erosion of spoil berms. Several breaches in the project spoil berms occurred during the snowmelt runoff and two distinct sediment plugs formed. A breach on the east side of the channel was discovered early during snowmelt runoff, and Reclamation crews were able to mobilize and make necessary repairs. During September, October, and November of 2019, the NMISC construction contractor repaired spoil-bank breaches and excavated one of the sediment plugs. They also performed other in-channel maintenance, sandbar devegetation and access road grading throughout the Delta Channel Project area. The second sediment plug was located in a stretch of the Delta Channel project area that at the time of the maintenance operations was within the active pool of the reservoir and thus

not excavated. Reservoir projections for 2020 indicate that this second sediment plug could become exposed and impede flow late in the year and may need to be addressed in the 2020/2021 maintenance season. Since 2003, New Mexico has spent nearly $19 million to construct and maintain the Delta Channel.

Relinquishment Update

The total amount of Accrued Credit relinquished by Colorado since 2013 is 3,000 acre-feet. Between 2013 and 2019, Colorado stored a total of 2,068 acre-feet of relinquished water in Platoro Reservoir. Colorado did not store any relinquished water in 2019, which leaves a balance of 932 acre-feet in Colorado's relinquishment account.

The total amount of Accrued Credit relinquished by New Mexico since 2003 is 380,500 acre-feet. Four hundred acre-feet of relinquished water was stored in El Vado Reservoir in 2019 by Reclamation on behalf of the State of New Mexico. Relinquishment-water storage to date totals 288,728 acre-feet, leaving a balance of 91,772 acre-feet available to be stored in future years when Article VII storage restrictions are in effect.

Article VII storage restrictions are not currently in effect and are not expected to be in effect for the 2020 snowmelt runoff. Therefore, there are no plans to store relinquishment water for calendar year 2020.

Gaging Station Review

For the Rio Grande near Otowi streamflow gage (#08313000), the USGS reported that they instituted a new rating (#40) on October 10, 2019 and used this rating for the remainder of 2019. The USGS made a total of 16 measurements at the Otowi gage in 2019, with 12 rated good, 2 rated fair, and 2 rated poor. For 2019, the USGS utilized redundant primary sensors (non-contact radar and wire weight) as well as redundant secondary reference gages (bubbler and staff gage) for gage height readings. The USGS reported that the Rio Grande above Buckman gage (#08313150), installed by the USGS upstream of the City of Santa Fe's Buckman Direct Diversion Project in 2017, continues to help verify the Otowi gage record.

The USGS also reported that they reviewed and approved the 2019 Rio Grande below Caballo Reservoir streamflow gage (#08362500) flow records developed by Reclamation, and that all necessary documentation was provided. The USGS reported that the record accuracy

looked good, in large part due to the high number of measurements made at the gage (63 in total). In 2019, Reclamation was able to utilize the Acoustic Doppler Velocity Meter (ADVM) to collect data for the entire irrigation season. However, this data was not used in the development of the records because Reclamation is continuing to evaluate quality control methods for the ADVM data. The USGS stated that once the quality control issues have been resolved, measurement quantity could be reduced by fully utilizing the ADVM installed at the site. The USGS also reported that they ran levels in cooperation with Reclamation in 2019 to verify the gage datum at the site.

The USGS reported that during the 2019 calendar year, 31 measurements were collected at the Rio Grande below Elephant Butte streamflow gage (#08361000). Of the 31 measurements, seven were rated good, 13 were rated fair, 10 were rated poor and one was zero-flow. Aquatic vegetation growth on the streambed at the USGS gaging station section continues to cause a low bias in gaged flow during certain months. This issue has occurred for an undetermined period of time but began to be addressed in 2016 by utilizing an alternate section which is not impacted by vegetation growth during certain months. The gage records for 2016 through 2019 reflect improved precision and the NMISC will continue to coordinate with the USGS to provide more accurate gage records in the future.

At the 2020 pre-Engineer Advisers' meeting, Reclamation stated that they are in the process of relocating the Rio Grande below Caballo Reservoir gage (#08362500) to the opposite side of the river and approximately 100 feet upstream. Reclamation stated that the change in elevation between the two gage locations was calculated to be 0.008 feet, and they will run the gages concurrently to compare the discharge records for the two gage locations. Reclamation is currently coordinating with the USGS and is now anticipating that relocation work will be completed sometime during 2020. Reclamation also reported that they had investigated the feasibility of flow meters in the outlets of Caballo Reservoir but had decided not to install them due to the high costs.

The Colorado USGS reviewed gaging station records for the Colorado Compact gages. These records were reviewed and approved for 2019.

Reclamation reported that they conducted 127 elevation surveys of Elephant Butte Reservoir in 2019. Of these surveys, 22 exceeded the threshold criteria (<0.05 feet) for the Stage Discharge Recorder (SDR). The SDR was reset twice in 2019.

During 2019, the NMISC continued its survey of water-level elevations in Elephant Butte and Caballo reservoirs. NMISC's surveyor performed surveys alongside Reclamation staff in June, November, and December 2019. The June 2019 results from NMISC's survey indicated that Reclamation's reservoir stage elevations were not within the agreed upon threshold criteria. However, during the November and December 2019 reservoir survey, NMISC's survey data indicated improvement in the difference between the shoreline survey and that being reported by Reclamation's SDR encoder system in the stilling well for Elephant Butte Reservoir. However, NMISC's December 2019 survey indicated there was a +0.11-foot difference between the stilling well encoder reading and the shoreline elevation survey using portable stilling wells (with the encoder reading higher). This discrepancy is thought to be due mainly to windy conditions experienced during the time of the survey. Reclamation continued to perform verification surveys and also worked extensively with the USGS to improve the new SDR to get more reliable stage data for Elephant Butte. This included replacing the temporary fire hose connection from the reservoir to the stilling well with a 2-inch PVC line, and enlarging the bubbler stilling well intake to a one-inch line connection for improved reservoir connection.

At their 2018 meeting, the Engineer Advisers requested that Reclamation prepare a report on the cause of discrepancies between lake elevation surveys and the SDR and stressed the critical nature of this issue. Reclamation has not yet provided the requested report since they are still evaluating the issue. NMISC and Reclamation will continue to perform side-by-side surveys at select times during 2020 to ensure the accuracy of the reservoir elevation data.

Mass Balance Review

The NMISC conducted a mass balance analysis for the Rio Grande between the Elephant Butte and Caballo gages for calendar year 2019. The mass balance analysis indicated that the reach gained water in nine out of twelve months with a total calculated annual gain of 9,620 acre-feet. A significant portion of the gain occurred during the June-through-October rainy period.

Gaging Station Operating Costs

In recent years, the Engineer Advisers and Compact Commissioners have expressed concern over the large difference in costs between what Reclamation charges to operate the gage

below Caballo Reservoir as compared to what the Colorado Division of Water Resources (CDWR) and USGS charge on average for other Compact gages. The three Compact states split the costs of their operations in support of the Compact equally, including operation and maintenance of the Compact gaging stations.

In the last few years, Reclamation has decreased their charged amount for the gage below Caballo Reservoir. However, the charged amount for FY2021 rose by approximately 64 percent from FY2020. This FY2021 cost charged by Reclamation is over twice as high as the costs charged per gage by CDWR and the USGS. The Engineer Advisers are again concerned with Reclamation's high cost for the operation of this gage, and with the large fluctuations in the charged costs year to year.

Review of Compact Accounting Data

The document, titled "Schedule for Review and Approval of the Rio Grande Compact Accounting Records for the Previous Year," authorized at the 2016 RGCC meeting, outlines a process and schedule for development, evaluation, and approval of required RGCC accounting records. For calendar year 2019, city, state and federal agencies, for the most part, followed the schedule. However, the City of Santa Fe reservoir storage records were not received within the agreed upon schedule. The process will be reviewed and revised as necessary to meet Compact business needs.

YEAR 2019 OPERATIONS

Snowmelt Runoff Forecasting

As has been reported in previous Engineer Advisers' reports, Colorado and New Mexico rely heavily on accurate streamflow forecasts to determine their Compact obligations on a yearly basis. Some recent forecasts have lacked the accuracy and reliability needed to effectively administer the Rio Grande for Compact purposes, particularly in the Colorado area. The States are looking for ways to increase the accuracy of the Natural Resources Conservation Service (NRCS) forecasts and potentially use new forecasts and forecasting techniques developed by other federal agencies.

As part of this ongoing effort to increase the accuracy and reliability of the forecasts, unique solutions have been developed. In Colorado, a Doppler radar unit was installed at the Alamosa airport in May of 2019. The main purpose of this radar unit is to capture the SWE precipitation that falls in the upper basin of Colorado in the winter. By using the traditional SNOTEL gaging stations as ground truth stations, this radar better tracks the winter precipitation that occurs throughout the basin, and in turn increases the accuracy of the forecasting models. The radar was operational in the fall of 2019, and is currently being used for the first time for winter precipitation and water supply forecasting.

A second Doppler radar unit is planned to be installed at the Durango, Colorado airport later this year. While not specifically being installed for winter precipitation purposes, data from this radar should enhance the ability of water administrators to see winter storms approaching the Rio Grande Basin from the west, and increase the ability to determine the location and effects of those storms.

Closed Basin Project

The total production of the Closed Basin Project in calendar year 2019 was 12,334 acre-feet. This total includes water that was exchanged for Colorado Parks and Wildlife water to be delivered to the Blanca Wildlife Habitat Area and to the Alamosa National Wildlife Refuge. The amount creditable to the Rio Grande for Compact purposes from direct delivery and exchange was 8,967 acre-feet. The remainder of the water produced was delivered to various federal lands along the project to be used as mitigation for the project footprint. All of the water delivered to the Rio Grande in 2019 was of sufficient quality to qualify for credit under the Compact.

Reclamation continues to address problems of biofouling in the production wells of the Closed Basin Project. Reclamation replaced four wells in 2019, rehabilitated eighteen other wells, and installed ten new pumps. Wells will continue to be replaced as budgetary constraints allow in an effort to help maintain project production. The Closed Basin Operating Committee continues to monitor groundwater levels and groundwater production and to adjust project operations pursuant to the enabling legislation.

Platoro Reservoir

Platoro Reservoir is a post-Compact Reservoir on the Conejos River. In the winter, Platoro Reservoir is nearly inaccessible. For this reason, there were periods of inadvertent storage of water while Article VII restrictions were in place during the winter of 2018-2019. Due to the inaccessibility of the reservoir, inadvertent storage of water could occur in the future.

Colorado Groundwater Regulations

In late 2015, the State Engineer of Colorado completed the development of rules and regulations concerning the use of groundwater in the Upper Rio Grande Basin in Colorado. These rules require the owners of non-exempt wells in the Rio Grande Basin in Colorado to sustain the aquifers and mitigate injurious stream depletions caused by their groundwater withdrawals, either with a plan for augmentation or by joining a subdistrict to meet these goals through a groundwater management plan. As an integral part of these rules, the State Engineer of Colorado has also completed the development of Phase 6 of the Rio Grande Decision Support System Model. This model captures the interaction between surface and groundwater and shows the effect that wells have on senior surface water rights. The rules were submitted to the Division 3 Water Court in Alamosa for formal adoption, and a trial was held in 2018. The water judge issued a ruling on March 15, 2019, approving the groundwater rules. Nearly all non-exempt wells will be required to be in compliance with these new rules by March 15, 2021. It is anticipated that there will be a total of seven subdistricts and multiple individual augmentation plans that form as a result.

Aamodt Settlement and Pojoaque Basin Regional Water System

The Aamodt Water Rights Settlement Agreement (Settlement Agreement) was developed through multi-party negotiations, which began in 2000 between the Pueblos of Nambé, Pojoaque, Tesuque and San Ildefonso, the State of New Mexico, the United States of America, the City of Santa Fe, Santa Fe County, and representatives of non-Pueblo water users, to settle the Pueblos' water right claims in the Pojoaque Basin. The Settlement Agreement provides for the funding and construction of the Pojoaque Basin Regional Water System to supply treated water to Pueblo and non-Pueblo parties. As expressly stated in the Settlement Agreement, "Nothing in this agreement shall be construed to limit the authority of the State Engineer

to…ensure compliance with the Rio Grande Compact," (Section 6.6.1.6). The Engineer Advisers will continue to evaluate the project as it moves forward including evaluating potential impacts to the Otowi Index Supply.

The final Pojoaque Basin Regional Water System Environmental Impact Statement was published in the Federal Register in January 2018 and the Record of Decision was signed on September 11, 2019. Original cost estimates were well above the amount authorized for the project, but the settlement parties signed an agreement that renegotiated cost shares and cost savings measures for the project on September 17, 2019. No diversions of Rio Grande water occurred in 2019.

Reclamation's Middle Rio Grande Supplemental Water Program

Reclamation's supplemental water program is intended to provide additional water, primarily obtained through the voluntary leasing of San Juan Chama Project (SJCP) water, for endangered species needs and compliance with the 2016 Biological Opinion (BO). In 2019, Reclamation reported that a total of 9,669 acre-feet of leased SJCP water was released from August 23 through October 4.

Reclamation indicated that it continued to maintain portable pumping stations at four locations on the Low Flow Conveyance Channel (LFCC) in the San Acacia reach, and that only one of the four was operated during 2019. The pump at the south boundary site was operated from August 25 through October 6 to pump 1,817 acre-feet from the LFCC to the Rio Grande under a permit issued by the NMOSE.

Six Middle Rio Grande Pueblos Prior and Paramount Operations

BIA requested that Reclamation store 14,345 acre-feet of Rio Grande water in El Vado Reservoir for the Coalition of Six Middle Rio Grande Basin Pueblos' (Pueblos) P&P operations in 2019. The entire amount was stored when Article VII Compact restrictions were in place. None of this water was needed for P&P purposes, and about 13,707 acre-feet of P&P storage was released to Elephant Butte Reservoir during November 2019, after accounting for evaporative losses. The BIA is interested in incorporating a separate URGWOM account for the native Rio Grande flows at Otowi to improve P&P operations.

Based on the February 1, 2020, most-probable snowmelt runoff forecast, the BIA reported that Reclamation will have a preliminary storage target of approximately 16,047 acre-feet for their P&P operation in 2020. Additional forecasts in March, April and May may change this storage target.

The BIA continues to make funding available to the Pueblos to perform work upgrading their irrigation systems. The BIA also provides funds to the Middle Rio Grande Conservancy District (MRGCD) to perform maintenance work on the systems which serve Pueblo lands.

The BIA reported that discussions concerning the carryover storage of P&P water in El Vado are occurring infrequently, and no request to allow carryover storage is anticipated in the near future.

The Engineer Advisers remain concerned about the procedures for quantifying storage, release, and delivery of water for the P&P lands of the Pueblos. The Texas Engineer Adviser remains concerned about the storage of native Rio Grande water in El Vado Reservoir by Reclamation when the storage restrictions of Article VII are in effect.

2019 Rio Chama Water Supply Conditions

Snowpack conditions in the Rio Chama Basin were well-above average during the winter of 2018-2019. The March through July native inflow to El Vado Reservoir was 362,790 acre-feet, or nearly 160 percent of average.

Despite the very high runoff in the Rio Chama Basin, by September, the flows on the Rio Chama were insufficient to meet the direct-flow irrigation needs of the Rio Chama Acequia Association (RCAA). RCAA represents 16 acequias on the Rio Chama between Abiquiu Reservoir and the confluence with the Rio Grande that have direct surface flow diversion rights. On August 22, 2019, the NMISC notified the New Mexico State Engineer that the natural flow on the Rio Chama available to the RCAA was declining rapidly, and in the absence of any means for providing offset, RCAA diversions would have to be curtailed to the available natural flow of the river. RCAA diversions were curtailed by the NMOSE Water Master from September 1, 2019 through October 31, 2019 due to insufficient natural flow on the Rio Chama and to ensure no depletions to water belonging to other entities occurred.

Reclamation's Lower Reach Plan

As part of its requirements in the 2016 BO, Reclamation submitted the Lower Reach Plan to the Service in 2018. Reclamation stated that the Lower Reach Plan includes multiple projects that are intended to improve habitat and enhance flows in the Isleta and San Acacia reaches, while managing sediment and increasing safe channel capacity. Reclamation stated that the implementation of the Lower Reach Plan will not increase depletions. The New Mexico Engineer Adviser remains concerned that some of the projects as described may increase depletions. Reclamation has committed to work with NMISC to establish a methodology to quantify depletions and that they will offset any increased depletions. The Engineer Advisers support the intent of the Lower Reach Plan but want to ensure that the projects do not impact deliveries of water to Elephant Butte Reservoir and that Reclamation maintains the conveyance capacity of the river channel as authorized by the Middle Rio Grande project.

Rio Grande Project Operations

Reclamation delayed the initial 2019 allocation to the Rio Grande Project water users until April to allow reservoir storage to increase as much as possible. In April 2019, there was only enough usable water in storage for a release of 236,868 acre-feet (30 percent of a normal release). Combined with the anticipated river efficiency, a total allocation of 197,688 acre-feet was made in April, including Mexico's allocation of 10,596 acre-feet (18 percent of its full allocation). By July, the usable water in storage had increased, yielding a potential release of 736,570 acre-feet (93 percent of a normal release). This allowed for a final 2019 in-season allocation of 705,496 acre-feet, including Mexico's full allocation of 60,000 acre-feet.

Reclamation reported a final 2019 release from Caballo Reservoir during the irrigation season of 453,580 acre-feet for all three Rio Grande Project water users: El Paso County Water Improvement District No. 1 (EP No. 1), Elephant Butte Irrigation District (EBID), and Mexico. A total of 387,197 acre-feet of water were delivered to the Rio Grande Project water users. The 2019 deliveries are considered to be provisional until an agreement is reached between the districts and Reclamation. Reclamation reported end-of-year allocations at the diversion headings to EBID of 202,342 acre-feet and of 464,120 acre-feet to EP No. 1. The calculated charges to EBID and EP No. 1 were 191,462 acre-feet and 155,800 acre-feet, respectively. In 2019, EP No. 1 reached its maximum unused allocation balance of 232,915 acre-feet. This

meant that 75,098 acre-feet was transferred to EBID from EP No. 1 in accordance with the 2008 Operating Agreement (2008 OA), resulting in an account balance for EBID of 86,285 acre-feet.

During 2019, Mexico's diversion allocation was increased to 60,000 acre-feet, and 39,935 acre-feet were delivered due to the late start of the irrigation season. Reclamation's report indicates flows into Hudspeth County Conservation and Reclamation District No. 1 (HCCRD) during March through September 2019 were provisionally 29,341 acre-feet of tailwater. Reclamation indicated that their past reporting of HCCRD flow amounts have only been for the March through September period of each year. The Engineer Advisers requested that Reclamation provide them with full calendar year total flow data for HCCRD. Additionally, 888 acre-feet was delivered through the Bonita Lateral during calendar year 2019.

Reclamation reported that Rio Grande Project releases from Elephant Butte Reservoir started on May 2, 2019 and continued through October 7, 2019. The USGS reported that the total annual flow at the gage below Elephant Butte dam was 468,896 acre-feet. Elephant Butte Reservoir storage peaked at 577,261 acre-feet on July 14, 2019, and storage at Caballo Reservoir peaked at 55,947 acre-feet on May 30, 2019. Releases from Caballo Reservoir for irrigation began on May 24 and lasted until October 12, 2019. Diversions to Mexico began on June 5 and ended on September 30.

Reclamation also reported Usable Water in Rio Grande Project storage (Elephant Butte and Caballo reservoirs combined) was 128,816 acre-feet on January 1, 2019, and 579,377 acre-feet on December 31, 2019. Usable storage rose above 400,000 acre-feet on May 12 and reached a high for the year on July 14 at 607,303 acre-feet, according to method 1 utilized by the URGWOM. Usable Water in Rio Grande Project storage remained over 400,000 acre-feet through the remainder of 2019.

Combined end-of-year storage at Elephant Butte and Caballo Reservoirs was 591,163 acre-feet, which is about 25 percent of their total capacity, and includes 194 acre-feet of SJCP water in storage. Due to implementation of new area-capacity (ACAP) tables on January 1, 2020, combined total storage was reduced to 579,801 acre-feet. This included a reduction of 10,970 acre-feet in Elephant Butte and 392 acre-feet in Caballo, for a total reduction of 11,362 acre-feet of conservation storage in both reservoirs. Implementation of the new ACAP tables for Elephant Butte Reservoir resulted in a total reduction in storage at the spillway elevation

(4,407 ft), of 13,686 acre-feet between the last reservoir survey in 2007 and the 2017 survey. For Caballo Reservoir, the reduction in storage at the top of the flood control elevation (4,182 feet) was 425 acre-feet for this same period.

Using the new ACAP tables, the available storage for both reservoirs is equal to the capacity of Elephant Butte Reservoir, 2,010,900 acre-feet, minus the amount that Reclamation reserves for operational flood control space (25,000 acre-feet during the October 1 to March 31 winter period, and 50,000 acre-feet during the summer), plus the capacity of Caballo Reservoir of 324,509 acre-feet minus 100,000 acre-feet for flood control space, for a total of 2,210,409 acre-feet during the winter, and 2,185,409 acre-feet during the summer. The New Mexico Engineer Adviser notes that losses of storage capacity at Elephant Butte associated with the new ACAP tables borne by New Mexico will negatively impact its computed deliveries for 2020.

On January 31, 2020, combined storage in Elephant Butte and Caballo Reservoirs was 603,095 acre-feet. Water available to the Rio Grande Project water users was 611,691 acre-feet, including carryover water. Reclamation anticipates a near-full supply and an initial allocation of 570,921 acre-feet for irrigation during 2020 for the Rio Grande Project.

The 2020 irrigation season is tentatively scheduled to begin on March 13, 2020. Based on early 2020 storage in Elephant Butte and Caballo and the current runoff forecast, the Rio Grande Project is expected to have a full allocation to Mexico in 2020. With its 2019 unused allocation maximized and the current 2020 allocation, the EP No. 1 estimated allocation is 335,081 acre-feet. EBID is anticipated to have a higher allocation in 2020 than in 2019 of 187,980 acre-feet, and an estimated diversion ratio adjustment of 0.90.

The New Mexico Engineer Adviser expressed concern about continued use of the 2008 Operating Agreement for the Rio Grande Project. These concerns include changes in Reclamation's reported annual allocation and delivery values since 2008. Additionally, the New Mexico Engineer Adviser expressed concern over operational and administrative changes that have been made under the Operating Manual.

ADDITIONAL FEDERAL AGENCY REPORTED INFORMATION

Representatives of USGS, Reclamation, Corps, Service, and IBWC presented additional information to the Engineer Advisers as summarized below:

U. S. Geological Survey

The Engineer Advisers received reports from the USGS on their Rio Grande Basin projects. The USGS completed a four-year WaterSMART Focus Area Study to assess water use and availability from the headwaters in southern Colorado to Fort Quitman, Texas, and is in the process of finalizing the associated reports. The study investigated water use based on the eight-digit hydrologic unit code (HUC-8), evapotranspiration, snow and watershed processes, groundwater, and surface water. The data were analyzed and made easily accessible for use by stakeholders. The study was conducted by personnel from the USGS Colorado, New Mexico, Utah, and Texas Water Science Centers and the USGS Earth Resources Observation and Science Center. Data and reports are available on the Upper Rio Grande Basin Focus Area Study website.

The USGS, in cooperation with Reclamation, has developed a model of the transboundary aquifers and interconnected surface waters of the Palomas and Mesilla basins in New Mexico and Texas and the Conejos-Médanos Basin of northern Mexico, known as RGTIHM. The model is operational, and an interim report was published in May of 2018. A Techniques and Methods report is planned to be released in 2020, after which the final model report will be released. Through the Mesilla Basin Monitoring Program, which is supported by several cooperators, the USGS continues to maintain an observation well network and to monitor salinity in shallow groundwater in the Mesilla Valley. The USGS has also conducted a microgravity pilot study, as well as a seepage investigation, which may aid in understanding surface water and groundwater interactions in the basin. The Engineer Advisers also received a report on review procedures for non-USGS streamflow records in New Mexico and Colorado.

Corps Rio Grande Civil Works Projects

The Corps reported on the status of Civil Works projects under the Water Resources Development Act (WRDA) of 2007, which provided authorization for the Rio Grande Environmental Management Program in Colorado, New Mexico and Texas. Authorization for this program was extended in WRDA 2014 through fiscal year 2019, but the program is not funded in 2020. Reauthorization would be required to receive additional funding. Other current projects undergoing either a feasibility study, higher-level planning, or construction included: the

Española valley investigation on river restoration and flood risk management, a number of tribal partnerships for watershed assessment projects, acequia community ditch-system improvements, the Middle Rio Grande Restoration Project, Bernalillo to Belen levee rehabilitation, Las Cruces Dam environmental restoration, El Paso Bosque Restoration, and several multi-state assessments.

Zebra Mussels/Quagga Mussels

The Engineer Advisers continue to be concerned about the possible infestation of Zebra and Quagga mussels in the Upper Rio Grande basin and their possible spread throughout the entire basin. Reclamation has engaged in public outreach efforts since 2009.

The number of watercraft inspections statewide has increased from 9,346 in 2013 to 42,525 in 2019. Reclamation continues to sample seven of its New Mexico reservoirs under Reclamation's Detection Laboratory for Exotic Species direction. All tests came back negative for Polymerase Chain Reaction (PCR) and microscopy tests in 2019. Continued vigilance is important, as conditions more suitable to aquatic invasive species establishment may occur in the future. Reclamation reported that the routine, large fluctuations of water levels in the reservoirs may be one reason that no infestations have occurred in New Mexico.

Rio Grande Silvery Minnow

The Service and Reclamation reported on the 2019 monitoring results for the silvery minnow using the October Catch per Unit Effort (CPUE) data typically used to report long-term trends in relative abundance.

The 2019 October CPUE survey for the Middle Rio Grande resulted in an estimated silvery minnow density of 3.41 silvery minnow/100 square meter (m^2), a large increase from the 2018 CPUE of 0.09 silvery minnow/100 m^2. The Service acknowledged the impressive efforts in 2018 by water managers to ensure survival of the species, and they have made a determination that the low 2018 CPUE will not be counted against the proposed action in the 2016 BO. The Service recognized that the low density was a result of climatic conditions and not of the 2016 BO partner agencies' actions.

The Service reported that 83,635 silvery minnows were propagated and released to the Middle Rio Grande by the City of Albuquerque BioPark, the Service's Southwestern Native Aquatic Resources and Recovery Center located in Dexter, New Mexico, Uvalde National Fish Hatchery (Texas), and the NMISC's Los Lunas Silvery Minnow Refugium. The Service, with assistance from the BO partners, conducted rescue activities only in the San Acacia Reach for 2019, rescuing and relocating 988 silvery minnow to flowing portions of the river.

Reclamation has engaged in a study to examine fish movement within the Middle Rio Grande. In 2019, there were 10,000 silvery minnow tagged with passive integrated transponder (PIT) tags and released into the Middle Rio Grande. The study saw a 40 percent re-encounter rate, providing movement data on 4,000 fish. Eight minnow released below San Acacia Diversion Dam (SADD) were re-encountered above the dam, indicating that they moved upstream through the structure, and 500 which were released above SADD were re-encountered below the dam. The farthest upstream movement observed was 10.5 miles, and the farthest downstream movement was 31 miles.

Nonfederal involvement in 2016 BO and Collaborative Program activities continued, with over $1,500,000 contributed from the NMISC, the MRGCD, and the Albuquerque Bernalillo County Water Utility Authority, for silvery minnow research and management, habitat restoration monitoring, hydrologic surveys, irrigation return flow management and monitoring at silvery minnow refugia, fish passage investigations and pilot studies, and population monitoring program evaluations.

The Service's Texas team previously recommended to cease the stocking and monitoring efforts for the silvery minnow in the Big Bend reach of the Rio Grande until the Service completes an evaluation of survival.

Temporary Modification of Operations at El Vado Reservoir

It is anticipated that Article VII restrictions will not be in effect during the spring snowmelt runoff period in 2020, therefore no El Vado modification has been requested for 2020.

Middle Rio Grande Project Channel Maintenance

Reclamation's report indicates it is pursuing work at 16 active priority sites along the Middle Rio Grande Project reach where bank erosion or reduced channel capacity could cause

levee failure. Of the active priority sites, six require an annual review of channel capacity and possible maintenance due to sediment accumulation. Reclamation reported that in the spring of 2020 they are scheduled to implement maintenance work at the River Mile 202.2 project area near Sandia Pueblo, which was originally constructed in 2008. This project includes major side-channel construction intended to provide increased channel capacity, resulting in less lateral migration, as well as habitat improvements for listed species.

Reclamation took advantage of the formation of a sediment plug within the boundaries of the Bosque del Apache National Wildlife Refuge (BDANWR) in the San Acacia Reach during the 2019 spring snowmelt runoff to move forward with a pilot river realignment project previously in the planning stages. The 2019 sediment plug formed in the exact area that a sediment plug formed in 2017 and was subsequently excavated by Reclamation. It should be noted that the excavation conducted by Reclamation in 2017 left in place a large meander bend that was a significant factor in the formation of both sediment plugs.

The New Mexico Engineer Adviser had previously expressed concern over the impact that the pilot project might have on water delivery efficiency into Elephant Butte Reservoir, and Reclamation had agreed to reevaluate their project design to potentially address these concerns. The emergency nature of the 2019 sediment plug and Reclamation's decision to take advantage of the conditions on the ground to implement their pilot project meant that Reclamation, for environmental compliance reasons, had to implement their original design. Reclamation has agreed to work with NMISC to monitor the post-construction conditions of the pilot project and to conduct additional work as necessary to ensure efficient water delivery.

Vegetation Management at Elephant Butte and Caballo Reservoirs

Reclamation continued vegetation management efforts in Caballo Reservoir in 2019 pursuant to a Technical Services Agreement with the NMISC. Reclamation reported that maintenance at Caballo Reservoir was performed during 2019, and approximately 891 acres of phreatophytic vegetation was managed utilizing mowers and mulchers. Reclamation did not use any herbicide treatments during 2019. NMISC and Reclamation executed a task order using $70,000 of state funds for vegetation management activities during 2019.

At the 2017 Annual Compact meeting, Reclamation mentioned the 2012 cessation of vegetation clearing in Elephant Butte Reservoir because of the listed species and the designation

of critical habitat in the reservoir. At that time, Reclamation focused efforts on Caballo Reservoir. At the 2017 Annual Compact Meeting, Reclamation committed to work with the Service, the Commissioners, and the Engineer Advisers on trying to conduct vegetation management again in Elephant Butte Reservoir. Reclamation committed to develop a plan to enhance vegetation management in Elephant Butte and Caballo Reservoirs. Reclamation stated they would informally discuss with the Service potential impacts to endangered species habitat. It appears no such meeting occurred. At their 2018 annual meeting, the Engineer Advisers requested Reclamation complete a draft plan for further vegetation control and discuss the plan with the Service. Reclamation has not provided the Engineer Advisers with a report or plan on this request. The Engineer Advisers remain concerned about the lack of vegetation management activities by Reclamation at Elephant Butte Reservoir.

Southwestern Willow Flycatcher and Yellow-billed Cuckoo

Reclamation and others continued to conduct surveys and nest monitoring for the flycatcher during the summer along 200 miles of the Rio Grande mainly from SADD to Elephant Butte Reservoir, and some select areas near Caballo Reservoir. Reclamation did not complete surveys from the south boundary of Isleta Pueblo to the SADD. The Corps surveyed sites adjacent to Albuquerque, and the Service surveyed areas in BDANWR. In total, 440 flycatcher territories were documented from Albuquerque to the Texas state line. The majority of flycatchers were present in the San Marcial and Elephant Butte Reservoir area with a total of 294 territories. Nest success for flycatchers in the Middle Rio Grande was 42 percent, compared to 25 percent in 2017. Nest success in the Lower Rio Grande showed comparable results with 100 territories and a nest success of 48 percent.

Reclamation has historically conducted surveys for the cuckoo from Belen to El Paso, Texas. In 2019 however, the surveyed area only extended from SADD to El Paso. Within this area, an estimated 96 breeding territories (429 individual detections) were documented. As with the flycatcher, the San Marcial and Elephant Butte Reservoir pool had the highest concentration of cuckoo territories. A new, revised proposal for critical habitat for the cuckoo was announced in February 2020. The final designation of critical habitat is anticipated to be announced in the Federal Register on or before August 2020. The Service stated that they are strongly considering excluding the Elephant Butte and Caballo Reservoirs, and areas downstream from the critical

habitat designation because of the management plans being developed by Reclamation and IBWC. The Service also reported that they are working on a 12-month finding regarding the 2017 petition to delist the cuckoo, which was based on the petitioners' opinion that the original listing of the species was in error. The conclusion of the analysis is expected in the Federal Register in 2020.

The tamarisk leaf beetle is present in most of the Rio Grande area, and defoliation of saltcedar in occupied territories may result in impacts to nesting success. Several large-scale restoration projects are being conducted on Reclamation and Service lands located north of Elephant Butte Reservoir. These areas were primarily monotypic saltcedar and experienced severe wildfires over the past several years. After restoration, these lands are expected to eventually provide suitable habitat for flycatchers and possibly cuckoos.

Additional Listing Information Provided by the Service

In 2016, the Service found that listing the Rio Grande chub and the Rio Grande sucker may be warranted. A Conservation Agreement was signed in September 2018 between the Service and the states of New Mexico, Colorado and Texas, the Jicarilla Apache Nation, the Pueblo of Santa Ana, several counties in Colorado, the U.S. Forest Service, Bureau of Land Management, and the National Park Service to reduce the threats to these fishes. The goals of the agreement are to ensure the long-term viability of the chub and the sucker by characterizing populations and habitat and protecting the habitat from the identified threats using coordination, data sharing, outreach, and watershed management.

The Service reported that on September 26, 2019, the U.S. District Court for the District of Colorado vacated and remanded in part, the Service's determination that listing the Rio Grande Cutthroat trout under the Endangered Species Act (ESA) was not warranted. The court remanded the 2014 determination back to the Service for an explanation of the criteria used to calculate healthy trout populations. The Service provided a response to the court in December 2019 and is awaiting a decision.

During June through October 2019, Service staff conducted photographic monitoring of the New Mexico meadow jumping mouse (jumping mouse) in the BDANWR. High resolution trail cameras were placed on mounts and were able to collect data over a long period of time. The information gathered using the automated "camera trap" observations are being used to

guide management actions and allow for development of a programmatic habitat restoration plan for the jumping mouse. A 5-year habitat management plan has been developed to standardize inventory and monitoring and is being implemented by BDANWR staff. In 2019, there were 10 photo detections compared to 22 photo detections in 2018. The Service stated that the reduced number of detections in 2019 may be due in part to new habitat created at the refuge that is suitable for the jumping mouse.

International Boundary and Water Commission Activities

The IBWC provided a report of its activities along the Rio Grande in New Mexico and Texas during 2019 and their projected activities for 2020. The items discussed included their levee rehabilitation work and Federal Emergency Management Agency (FEMA) status. The Vado East Levee Rehabilitation Project documents were submitted to FEMA in 2018, and the Vado West Levee construction is scheduled to be completed in April 2020. The Sunland Park West Levee construction was awarded in September 2019, and the design for East and West Levee sections are planned to be completed in 2020. The IBWC also provided a list of the FEMA status for 11 levee projects which is either submitted to FEMA, pending design, in design, or pending construction.

Brief information and updates were also discussed for the IBWC's ongoing channel maintenance projects. Construction projects include the American Canal Upper Reach (in construction phase), and the American Canal Lower Reach (in design phase). Construction was completed for the Thurman arroyo sediment basins.

IBWC provided updates to the status of the Canalization River Management Plan (RMP). The RMP covers floodplain management, endangered species management, and channel maintenance. The 2009 Record of Decision (ROD) for the IBWC expired in 2019 with release of the Final Report on the 10-year implementation. Therefore, the ROD commitments have been incorporated into the RMP. An Environmental Assessment was initiated in 2018 and delivered for public comment in 2019. Additional revisions will be included in 2020 before finalization. The selected alternative will continue implementation of the RMP, designate up to 65 miles through the U.S. IBWC's right of way for the New Mexico Rio Grande Trail and Texas city and county trails, perform additional sediment removal in the channel, engage stakeholder

participation, and establish partnerships to create up to 500 acres of habitat areas outside of IBWC jurisdiction.

In the 2009 ROD, the IBWC committed to implement 30 habitat restoration projects under the River Habitat Restoration Program. Currently, work is underway at 22 habitat restoration sites, totaling about 500 acres. Under the River Habitat Restoration Program, IBWC treated over 370 acres of saltcedar, planted about 102,000 trees and 12,000 shrubs, and installed groundwater-monitoring wells. IBWC anticipates completing an Environmental Assessment for aquatic habitat restoration in the spring of 2020 and designs in summer of 2020.

Status updates were also provided for the Environmental Water Transaction Program which is also included under the 2009 ROD for the Canalization Project. Between 2014 and 2017 under the Environmental Water Transaction Program, IBWC acquired additional water rights for over 47 acres from EBID, irrigated 5 restoration sites, and conducted 19 irrigation events. They are currently working with other entities to obtain sufficient water to meet 2009 ROD obligations.

Under the 2017 BO, IBWC is required to move vegetation from islands being removed that have known endangered species nesting or have suitable habitat. In 2018 and 2019, IBWC contractors transplanted willows from islands in Sunland Park, Canutillo, Vinton, and Hatch to nearby restoration sites. In 2020, additional willows will be transplanted at the Vado West mitigation site.

IBWC estimated that 450,000 to 490,000 cubic yards of silt is deposited into the Rio Grande Canalization Project reach annually. This results in sediment plugs, island formations, raised riverbeds, increased flooding risks, and inhibited irrigation return flows. The Canalization reach is defined as 105 river miles from Percha Dam to El Paso. Prior to 1990, IBWC removed 250,000 to 300,000 cubic yards of sediment per year. During 2019, IBWC removed over 422,000 cubic yards, including 292,000 cubic yards as part of canalization and 130,000 cubic yards for rectification. They have outside contracts to remove about 1,188,000 cubic yards in 2020.

In 2019, the IBWC began development of a new hydraulic model for three separate reaches between Percha Dam and American Dam. The modeling system will include both 1-dimensional, steady-state and 2-dimensional, unsteady-state HEC-RAS hydraulic models. The

project will be 60 percent completed in December 2020, with a final completion date in June 2021.

The IBWC provided an update on the border wall fences in the Compact reach showing the locations and different types of designs being used. Some locations are adjacent to the river. The wall is not considered to be impacting any of the IBWC operations.

The IBWC is preparing for the Convention of 1906 deliveries to Mexico in 2020, including installing a radar sensor to monitor the deliveries to American Dam. This is the last year of the 5-year delivery cycle for the Treaty of 1944. Mexico has until October to complete their deliveries to the United States. At this time, they have provided 87 percent of the required deliveries.

ADDITIONAL NON-FEDERAL AGENCY UPDATES

In addition to the federal agency reports summarized above, the Engineer Advisers also requested that the City of Santa Fe give a presentation summarizing Santa Fe's water planning activities with emphasis on potential impacts to SJCP accounting. The City of Santa Fe declined the request of the Engineer Advisers, indicating that their plan to fully utilize their allocation of SJCP water was not sufficiently developed at this time and that they hoped to be able to present at the next annual meeting.

ENGINEER ADVISER RECOMMENDATIONS

Reclamation has recently conducted surveys to develop new area-capacity tables for Elephant Butte Reservoir. These tables account for the sediment buildup within the reservoir and the related loss of storage. They also are used to determine the current total storage volume of the reservoir. The Rio Grande Compact Rules and Regulations describe the now-outdated total storage volume in the reservoir. The Engineer Advisers recommend that the Commissioners direct the Engineer Advisers to review the best method to incorporate the new tables developed by Reclamation for Elephant Butte Reservoir into the Compact Rules and Regulations.

BUDGET

The Engineer Advisers reviewed the cost of operation for the year ending June 30, 2019 and the budget for the fiscal year ending June 30, 2021.

The Engineer Advisers found that the expenses for gaging stations and administration of the Compact for the year ending June 30, 2019 were $200,403. The United States federal government bore $51,594 of this total, with the balance of $148,809 to be borne equally by the three states.

The Engineer Advisers found that the proposed budget for the fiscal year ending June 30, 2021 indicates that a total of $228,043 will be spent for gaging and administration, with a proposed contribution by the United States federal government of $74,017.

Craig W. Cotten, P.E.

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The Colorado Engineer Adviser's Addendum to the 2020 Engineer Advisers' Report

November 12, 2020

At the 2020 Rio Grande Compact Commission (RGCC) Engineer Advisers' meeting held in Albuquerque, New Mexico on March 2-6, 2020, the Engineer Advisers did not reach consensus on the 2019 Rio Grande Compact (Compact) Accounting. The lack of consensus stems from the continuing disagreement regarding Colorado and New Mexico Credit Water that Reclamation released in 2011, the appropriate accounting of 2011 Colorado and New Mexico deliveries that were affected by Reclamation's release beyond the available Usable Water, and the directly relevant 2006 direction of the RGCC to Reclamation. There was no release of credit water by Reclamation in 2019 and the Engineer Advisers did reach agreement on the accounting of the 2019 streamflow numbers for the Colorado and New Mexico gaging stations. However, because of the lack of agreement on the effects of the releases of credit water in previous years, the amount of the accrued credit of Colorado and of New Mexico could not be agreed upon or finalized for 2019. Additionally, the unauthorized release of Colorado and New Mexico credit water in 2011 has caused a disagreement regarding the dates of Article VII timing under the Compact in 2019.

Therefore, the Colorado Engineer Adviser presents for the Commission's consideration the following method of accounting for the 2019 calendar year Compact Accounting:

> Method 2: Colorado and New Mexico Credit Water was released during 2011, and accounted as being reduced in the month it was released, as in a relinquishment.

Method 2:

With this Method, the Credit Water will have been reduced for evaporation at the end of the calendar year – in accordance with Article VI of the Compact and the 2006 direction of the RGCC to Reclamation. The Colorado Engineer Adviser carried forward the end of 2018 accounting results for Method 2 used through the 2019 calendar year. This method complies with the last paragraph of Article VI of the Compact, wherein Credit Water in Elephant Butte Reservoir is "reduced annually to compensate for evaporation losses in the proportion that such credits (or debits) bore to the total amount of water…during the year."

Under this method, Reclamation released accrued Credit Water from Elephant Butte Reservoir during the summer of 2011 unilaterally and without the permission of Colorado or New Mexico. This unauthorized release coupled with normal compact accounting resulted in 2019 Accrued Credits for Colorado that are less than those calculated in the Texas accounting method (Method 1). Method 2 results in Colorado having an Accrued Credit for the end of year 2019 of 800 acre-feet.

The difference in Colorado's Compact compliance status between the Texas method and Method 2 (minus 100 acre-feet) illustrates the effect of Reclamation's 2011 release of Credit Water on Colorado Compact compliance carried forward through 2019. Unlike an authorized relinquishment, however, Colorado did not receive the Article VII benefit of being able to store a like amount of water to that released by Reclamation in 2011 in post-compact reservoirs in the future when Article VII of the Compact is in effect.

Utilizing Method 2 accounting, the date that Article VII restrictions were lifted in 2019 was May 11. Method 1 accounting has the Article VII restrictions being lifted on May 12, potentially depriving Colorado of a day of storage in post-compact reservoirs.

Summary

The Colorado Engineer Adviser believes that the Texas method (Method 1) of accounting as put forth in the Texas addendum contravenes the last unnumbered paragraph of Article VI of the Compact and the unanimous direction of the Commission to Reclamation in 2006. Therefore, the Texas method is not acceptable to the Colorado Engineer Adviser.

No after-the-fact accounting can address the primary issues that occurred in 2011 when Reclamation made its unauthorized releases of accrued Credit Water, which are:

1) Colorado and New Mexico have sole authority to decide the disposition of any of their respective accrued Credit Water; and
2) Reclamation's actions denied Colorado and New Mexico the benefits associated with relinquishments or other negotiated solutions under the Compact and eliminated Texas' incentive to negotiate the terms of a relinquishment or other negotiated solution during drought times.

The method proposed above is a suggestion for the Commission's consideration. The Colorado Engineer Adviser recognizes that no accounting method may be approved without the unanimous approval of the Commission, and that any accounting method must not violate the express terms of the Compact.

New Mexico Addendum to the 2020 Engineer Advisers' Report to the Rio Grande Compact Commission

April 2020

At the 2020 Rio Grande Compact Commission (RGCC) Engineer Advisers' meeting, the Engineer Advisers again did not reach unanimous consensus on a method by which to finalize the Rio Grande Compact (Compact) Accounting. The lack of unanimous consensus stems from:

1) the continuing disagreement regarding New Mexico and Colorado Credit Water that Reclamation unilaterally released from Elephant Butte Reservoir in 2011 without authorization from either Colorado or New Mexico;
2) the appropriate accounting of New Mexico and Colorado deliveries from 2011 thru 2019 that were affected by Reclamation's unilateral and unauthorized 2011 Credit Water release;
3) Reclamation's disregard for Article VI in the Compact[1] and the 2006 direction of the RGCC to Reclamation regarding the accounting and release of accrued Credit Water; and
4) Reclamation's continued use of Method 1 accounting (see Method 1 accounting sheet) and the impacts on New Mexico of this accounting due to the differences in the timing and duration of the Article VII storage restriction on upstream reservoirs constructed after 1929.

Compact Accounting by Texas/Reclamation using Method 1, as compared to New Mexico's use of Method 2

The Texas Engineer Adviser conducted Compact accounting for the 2019 calendar year using a method (see Method 1 accounting sheets) that reduces Credit Water by subtracting evaporation losses on a monthly basis during the calendar year. This same method was put forward to the RGCC by Texas and Reclamation in 2012 and carried forward by them in subsequent years using the same accounting steps. At the start of calendar year 2019 using Method 1, Colorado had an Accrued Credit of 3,200 acre-feet, and New Mexico had an Accrued Credit of 10,900 acre-feet. At the beginning of calendar year 2020 using Method 1, Colorado had an Accrued Credit of 900 acre-feet and New Mexico had an Accrued Debit of 34,300 acre-feet. This method, however, is contrary to Article VI of the Compact for computing evaporation losses on both Credit and Debit water retained in storage and the 2006 direction of the RGCC to Reclamation. The New Mexico

[1] Pursuant to Article VI of the Compact, "all credits and debits of Colorado and New Mexico shall be computed for each calendar year" and "such credits and debits shall be reduced annually to compensate for evaporation losses in the proportion that such credits or debits bore to the total amount of water in such reservoirs during the year."

Engineer Adviser has repeatedly apprised the RGCC that approval of Method 1 would require the RGCC to disregard the explicit language of the Compact requiring annual accounting for evaporation and is contradictory to the unanimous RGCC directive in 2006. Furthermore, the 2006 resolution cannot be unilaterally rescinded by a single state nor by an Engineer Adviser. Therefore, Method 1 is not acceptable to the New Mexico Engineer Adviser.

The New Mexico Engineer Adviser conducted Compact accounting for the 2019 calendar year using a method (referred to as Method 2, see accounting sheets) that was proposed by both the New Mexico and the Colorado Engineer Advisers in 2012 (see the 2012 New Mexico and Colorado joint addendum to the 2012 Engineer Adviser Report). Method 2 reduces Credit Water for evaporation at the end of the calendar year in accordance with Article VI of the Compact and the 2006 direction of the RGCC to Reclamation. The New Mexico Engineer Adviser carried forward the end of 2011 accounting results with Method 2 through the 2019 calendar year using the same accounting steps (See 2019 New Mexico Addendum). During the 2019 calendar year, Colorado carried an Accrued Credit of 3,100 acre-feet, and New Mexico carried an Accrued Credit of 5,400 acre-feet by Method 2. The New Mexico Engineer Adviser used these values as inputs for the 2019 Compact accounting. Consequently, the Compact compliance status for 2020, using Method 2, is 800 acre-feet of Accrued Credit for Colorado and 38,800 acre-feet of Accrued Debit, for New Mexico. Method 2 accounting sheets and associated tables are attached to this New Mexico 2020 addendum.

For calendar year 2019 the timing of the lifting of Article VII storage restrictions occurred on different days based on Method 1 and Method 2 accounting. This difference in timing is documented in a letter from the New Mexico Rio Grande Compact Commissioner to the Commissioners of Colorado and Texas, dated May 13, 2019. For Method 1, Article VII storage restrictions were lifted on May 12, 2019. For method 2, Article VII storage restrictions were lifted on May 11, 2019. The difference in timing was due to New Mexico's Accrued Credit being 10,900 acre-feet by Method 1 and 5,400 acre-feet by Method 2 accounting, a difference of 5,500 acre-feet. However, despite the difference in timing of Article VII restrictions, 2019 storage in El Vado Reservoir would likely have begun on May 12, 2019 by either Method 1 or by Method 2 accounting because by Method 2, Usable Water in Project Storage rose above the 400,000 acre-foot level very late in the day on May 11, 2019. Storage in El Vado could not have started until May 12, 2019.

Article VII restriction timing issues that have occurred since Reclamation's 2011 unilateral and unauthorized release of credit water has impacted New Mexico and Colorado up-stream storage benefits as documented in addenda included in the annual report of the Engineer Advisers to the Rio Grande Compact Commission since 2011. For example, as documented in the 2017 New Mexico Addendum to the Engineer Adviser report, if Reclamation's 2011 release had been an authorized relinquishment done in accordance with the Compact, New Mexico and Colorado would have received the ability to store and release 33,825 acre-feet of water when the Article VII storage restriction is in effect. These benefits were denied by Reclamation's unauthorized release of credit water described above. Reclamation's refusal to use Method 2 accounting as directed by

the RGCC to determine Usable Water in Rio Grande Project Storage also impacted El Vado Reservoir operations in 2015 and 2016.

Given the lack of resolution on the above issues and absent an explicit agreement by Reclamation to abide by Article VI of the Compact and the RGCC's 2006 directives regarding the accounting and release of Accrued Credit Water, the New Mexico Engineer Adviser again recommends that the RGCC not approve any Compact accounting for 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018 and 2019.

2019 STORAGE IN RESERVOIRS IN NEW MEXICO

New Mexico Accounting Method 2

ACRE-FEET

RESERVOIR	*ITEM*	*2018 DEC*	*2019 JAN*	*FEB*	*MAR*	*APR*	*MAY*	*JUNE*	*JULY*	*AUG*	*SEPT*	*OCT*	*NOV*	*2019 DEC*
ABOVE OTOWI BRIDGE														
EL VADO	TOTAL	13,957	15,484	17,429	27,221	32,076	62,285	114,938	104,153	109,980	100,890	70,640	19,940	32,109
	TRANS-MTN	(13,797)	(12,779)	(11,279)	(9,522)	(9,481)	(9,466)	(6,344)	(2,041)	(7,510)	(9,550)	(11,801)	(13,283)	(31,718)
ABIQUIU	TOTAL	78,078	72,176	71,004	63,308	75,233	84,547	61,650	58,104	71,940	87,124	81,204	78,078	81,921
	TRANS-MTN	(76,735)	(70,823)	(68,793)	(61,535)	(55,984)	(55,451)	(57,388)	(56,426)	(70,074)	(85,234)	(79,429)	(76,359)	(79,453)
	ACC. SED	(1,342)	(1,342)	(1,347)	(1,361)	(1,495)	(1,733)	(1,837)	(1,857)	(1,873)	(1,900)	(1,920)	(1,979)	(1,985)
SUBTOTAL RIO GRANDE		161	2,716	7,014	18,111	40,349	80,182	111,019	101,933	102,463	91,330	58,694	6,397	874
OTOWI BRIDGE TO SAN MARCIAL														
McCLURE	TOTAL	1,554	1,417	1,433	2,159	2,155	2,948	3,044	2,494	1,702	1,109	1,087	900	833
	PRE-COMP	(1,061)	(630)	(646)	(602)	(479)	(647)	(571)	(602)	(603)	(322)	(300)	(113)	(46)
	TRANS-MTN	0	0	0	0	0	0	0	0	0	0	0	0	0
NICHOLS	TOTAL	372	459	415	537	660	492	568	537	536	528	321	342	339
	PRE-COMP	0	(381)	(337)	(459)	(582)	(414)	(490)	(459)	(458)	(450)	(243)	(264)	(261)
	TRANS-MTN	(78)	(78)	(78)	(78)	(78)	(78)	(78)	(78)	(78)	(78)	(78)	(78)	(78)
COCHITI	TOTAL	43,634	45,079	46,176	45,559	53,510	45,946	46,316	46,586	45,820	45,067	46,003	46,084	47,383
	TRANS-MTN	(42,523)	(42,679)	(43,216)	(43,029)	(43,566)	(43,217)	(42,779)	(42,411)	(42,027)	(41,661)	(42,560)	(42,507)	(44,067)
	ACC. SED	(2,181)	(2,185)	(2,190)	(2,221)	(2,388)	(2,863)	(3,145)	(3,333)	(3,372)	(3,395)	(3,409)	(3,436)	(3,448)
GALISTEO	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0
JEMEZ	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0
	TRANS-MTN	0	0	0	0	0	0	0	0	0	0	0	0	0
	ACC.SED.[1]	0	0	0	0	0	0	0	0	0	0	0	0	0
ACOMITA	TOTAL[2]													
SEAMA	TOTAL[3]													
SUBTOTAL RIO GRANDE		(283)	1,002	1,557	1,866	9,232	2,167	2,865	2,734	1,520	798	821	928	655
NEW MEXICO														
TOTAL RIO GRANDE		(122)	3,718	8,571	19,977	49,581	82,349	113,884	104,667	103,983	92,128	59,515	7,325	1,529

[1] accumulated sediment (312 acre-feet) omitted from the accounting while Jemez Reservoir is dry by decision of the Engineer Advisers, March 4, 2005

[2] storage omitted from accounting by action of the Commission on March 23, 2000

[3] no data available.

2019 Evaporation Loss On Rio Grande Compact Water Stored in Elephant Butte Reservoir
(Unit = Acre-Feet) Except Col. (8)
(New Mexico Accounting Method-2)

Month	Total Rio Grande Stored in Elephant Butte (Ac-Ft)	Total Net Evap on Rio Grande Stored in Elephant Butte (Ac-Ft)	Colorado's Rio Grande Compact Credit Water Stored in Elephant Butte (Ac-Ft)	Colorado's Credit Water Evaporation Adjustment (Ac-Ft)	New Mexico's Rio Grande Compact Credit Water Stored in Elephant Butte (Ac-Ft)	New Mexico's Credit Water Evaporation Adjustment (Ac-Ft)	Total Credit Water Evaporation Adjustment (Ac-Ft)	Total Rio Grande Usable Water Stored in Elephant Butte (Kaf)	Total Water Relinquished (Ac-Ft)	CO Credit Water Relinquished (Ac-Ft)	NM Credit Water Relinquished (Ac-Ft)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
BOY Credit (2018)			3100		5400				NA	NA	NA
January	143422	797	3100	17	5400	30	47	135	0	0	0
February	170780	2640	3100	48	5400	83	131	162	0	0	0
March	214362	4060	3100	57	5400	100	157	206	0	0	0
April	310529	6969	3100	67	5400	116	183	302	0	0	0
May	482522	11388	3100	69	5400	120	189	474	0	0	0
June	550293	13847	3100	72	5400	125	197	542	0	0	0
July	542321	13553	3100	69	5400	121	190	534	0	0	0
August	458025	10487	3100	62	5400	108	170	450	0	0	0
September	427452	7578	3100	47	5400	82	129	419	0	0	0
October	435131	7096	3100	42	5400	74	116	427	0	0	0
November	500141	31	3100	0	5400	0	0	492	0	0	0
December	557097	2290	3100	10	5400	18	28	549	0	0	0
Annual		80736		560		977	1537	4690	0	0	0

(8) = (1) - [(3) + (5)] Total usable Rio Grande water in Elephant Butte Reservoir.

Addendum to the 2020 Engineer Advisers' Report
Texas Engineer Adviser
November 12, 2020

The Engineer Advisers to the Rio Grande Compact Commission (Commission) were unable to reach agreement on the accounting of water deliveries for 2019 at the 2020 Engineer Advisers' meeting held on March 2-6, 2020, in Albuquerque, New Mexico. The issue centered on how the evaporation losses on Credit Water are calculated and tabulated and are carried forward from the 2011 and 2012 Water Accounting. Three separate accountings were developed in 2014 and labeled as Method 1, 2, and 3. At the 2016 Rio Grande Compact Commission meeting, Colorado noted they will no longer follow Method 3. The Texas Engineer Adviser proposes that Method 1 be accepted and thus bases Texas' calculations on that method.

The history of this issue is addressed in a memorandum from the Engineer Advisers to the Commission dated March 23, 2006 (the "Memorandum"). As described in the Memorandum, the Commission has been inconsistent in the way it has tabulated Credit Water in storage based on evaporation losses during the year. There are times when the Commission has approved an accounting where Credit Water is held constant each month and the Credit Water is only reduced at the end of the year (Method 3), even though the calculation of Credit Water evaporation is a summation of monthly evaporation amounts. Under this method, whenever Usable Water amounts become negative and Credit Water was released, those amounts were repaid immediately as inflows occur. Also, there are times when the Commission has approved the evaporation of Credit Water monthly (Method 1); that is, when Credit Water and Usable Water are subject to evaporation as it occurs. Under this method, the Texas Engineer Adviser understands that Usable Water is not negative.

As understood by the Texas Engineer Adviser, Method 2 holds the Credit Water constant throughout the year. If there is insufficient Usable Water in Elephant Butte to cover all the evaporation losses on the Credit Water, Usable Water has gone negative. Method 2 then assumes that the negative dip into the Credit Water can never be repaid. The Texas Engineer Adviser was unable to find any instance where this method had been approved by the Commission. The Texas Commissioner believes that the intent and spirit of the Memorandum has not been followed by New Mexico and Colorado. Accordingly, Texas rescinded its support and approval of the Memorandum.

The Engineer Advisers presented recommendations to the Commission on this issue in 2006. The Commission approved the following three recommendations that:

> *The Commission direct that accrued Credit Water be held constant during the year.*
>
> *The Commission direct the Engineer Advisers to meet if the total combined accrued Credit Water exceeds 150,000 acre-feet and Usable Water is less than a full allocation, or if the combined accrued Credit Water exceeds 50% of Project Storage, and to make a recommendation to the Commission regarding optimum use of water in Project Storage for Commission approval.*
>
> *The Commission direct Reclamation to allocate or release Credit Water only as directed by the Commission.*

The Engineer Advisers have not agreed on a recommendation, and the Commission has not approved a proposal to optimize the use of water in Project Storage. Therefore, since one of the methods historically used by the Commission was to tabulate evaporation of Credit Water on a monthly basis, Reclamation proceeded with this historical practice and allocated the monthly tabulated evaporation of Credit Water to Usable Water.

An additional accounting concern for Texas involves the Bonita Lateral. Texas does not believe that any water taken from Elephant Butte Reservoir and Caballo Reservoir for the Bonita Lateral (Bonita Water) is a delivery of Compact water to Texas. The Bonita Water is delivered to lands outside the Rio Grande Project. Texas believes that the historical method of Compact accounting, where Bonita Water is added to the usable release, is wrong and that the methodology is double counting the Bonita Water. Texas has requested an explanation for the Bonita Water from Reclamation and has not received sufficient information which would settle this issue. Texas believes that under the Compact, the accounting for deliveries of water to the Rio Grande Project should be accurate. This would require an official explanation for the Bonita Lateral and why Compact waters which are counted as deliveries to Texas can be diverted by Reclamation for non-project users. Texas is ready to discuss this following receipt of an official response from Reclamation and looks forward to resolving this issue.

COMPACT ACCOUNTING 2019 - METHOD 1

The Texas Engineer Adviser has reviewed the streamflow and reservoir storage records and other pertinent data for calendar year 2019. This method, recommended by the Texas Engineer Adviser, reduces the Credit Water evaporation monthly. The scheduled and actual deliveries, release of Usable Water for the year 2019, and balances as of January 1, 2020, are as follows:

(a) Deliveries by Colorado at the State Line:

Balance as of January 1, 2019	3,200 acre-feet
Scheduled delivery	573,000 acre-feet
Actual delivery at Lobatos plus 10,000 acre-feet	571,300 acre-feet
Reduction of credits on account of evaporation	600 acre-feet
Accrued credit January 1, 2020	900 acre-feet

(b) Deliveries by New Mexico at Elephant Butte Dam:

Balance as of January 1, 2019	10,900 acre-feet
Scheduled delivery	957,400 acre-feet
Actual delivery	914,200 acre-feet
Reduction of credits on account of evaporation	2,000 acre-feet
Accrued debit January 1, 2020	34,300 acre-feet

(c) Project Storage and Releases:

Accrued departure (credit) as of January 1, 2019	2,315,800 acre-feet
Actual release of Usable Water	454,900 acre-feet
Normal release for year	790,000 acre-feet
Accrued departure (credit) as of January 1, 2020	2,465,800 acre-feet
Under-release capped at 150,000 acre-feet	

Method 1: Reduce Credit Water for Evaporation Monthly during the 2019 Calendar Year - Developed by Texas and Reclamation

RIO GRANDE COMPACT - DELIVERIES BY COLORADO AT STATE LINE

YEAR 2019 - Method 1

Quantities in thousands of acre feet to nearest hundred

MONTH	CONEJOS INDEX SUPPLY										RIO GRANDE INDEX SUPPLY								DELIVERIES			
	MEASURED FLOW				ADJUSTMENTS				SUPPLY			ADJUSTMENTS					SUPPLY					
	CONEJOS AT MOGOTE	LOS PINOS NEAR ORTIZ	SAN ANTONIO AT ORTIZ	TOTAL	STORAGE AT END OF MONTH[d]	CHANGE IN STORAGE[e]	OTHER ADJUSTMENTS	NET ADJUSTMENTS	SUPPLY IN MONTH	ACCUMULATED TOTAL	RECORDED FLOW NEAR DEL NORTE	STORAGE AT END OF MONTH	CHANGE IN STORAGE	TRANSMOUNTIAN DIVERSIONS[b]	OTHER ADJUSTMENTS[a]	NET ADJUSTMENTS	SUPPLY IN MONTH	ACCUMULATED TOTAL	CONEJOS RIVER AT MOUTH NEAR LASAUCES	RIO GRANDE LESS CONEJOS RIVER	RIO GRANDE AT LOBATOS	ACCUMULATED TOTAL AT LOBATOS
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	--------	--------	--------	--------	13.5	--------	--------	--------	--------	0.0	--------	0.5[f]	--------	--------	--------	--------	--------	0.0	--------	--------	--------	0.0
JAN	2.6	--------	--------	2.6	13.6	0.1		0.1	2.7	2.7	8.0	0.5	0.0			0.0	8.0	8.0	1.9	7.7	9.6	9.6
FEB	2.4	--------	--------	2.4	13.9	0.3		0.3	2.7	5.4	7.9	0.5	0.0			0.0	7.9	15.9	2.1	9.9	12.0	21.6
MAR	4.8	--------	--------	4.8	13.0	-0.9		-0.9	3.9	9.3	14.2	0.5	0.0			0.0	14.2	30.1	5.9	18.3	24.2	45.8
APR	21.7	17.2	7.4	46.3	13.4	0.4		0.4	46.7	56.0	72.0	0.5	0.0			0.0	72.0	102.1	17.7	14.1	31.8	77.6
MAY	49.3	39.7	11.5	100.5	13.3	-0.1	0.0	-0.1	100.4	156.4	173.3	0.5	0.0			0.0	173.3	275.4	41.9	50.8	92.7	170.3
JUN	101.8	46.0	2.2	150.0	44.4	31.1	0.0	31.1	181.1	337.5	335.7	0.5	0.0			0.0	335.7	611.1	69.0	98.3	167.3	337.6
JUL	57.2	7.4	0.2	64.8	40.5	-3.9	0.1	-3.8	61.0	398.5	186.7	0.5	0.0	-3.3	0.2	-3.1	183.6	794.7	32.2	85.8	118.0	455.6
AUG	24.7	2.2	0.1	27.0	29.2	-11.3	0.0	-11.3	15.7	414.2	65.0	0.5	0.0			0.0	65.0	859.7	11.9	40.9	52.8	508.4
SEPT	14.0	0.9	0.0	14.9	19.7	-9.5	0.1	-9.4	5.5	419.7	22.8	0.5	0.0			0.0	22.8	882.5	5.5	11.7	17.2	525.6
OCT	8.2	0.8	0.1	9.1	15.1	-4.6	0.1	-4.5	4.6	424.3	17.7	0.5	0.0			0.0	17.7	900.2	4.7	4.1	8.8	534.4
NOV	4.7	--------	--------	4.7	13.2	-1.9	0.1	-1.8	2.9	427.2	13.1	0.5	0.0			0.0	13.1	913.3	4.9	5.0	9.9	544.3
DEC	4.0	--------	--------	4.0	12.5	-0.7	0.0	-0.7	3.3	430.5	12.5	0.5	0.0			0.0	12.5	925.8	4.2	12.8	17.0	561.3
YEAR	295.4	114.2	21.5	431.1	--------	-1.0	0.4	-0.6	430.5	--------	928.9	--------	0.0	-3.3	0.2	-3.1	925.8	--------	201.9	359.4	561.3	--------

Remarks: Cols. 6 and 13 do not include transmountain water.

[a] Evaporation loss post-compact reservoirs; report of the Engineer Adviser for Colorado.

[b] 3,580 ac-ft minus 243 ac-ft pre-compact; report of the Engineer Adviser for Colorado.

[c] Reduction of credits for evaporation calculated on a monthly basis.

[d] Note: No relinquishment credit stored in 2019. Storage of relinquished credit to date has totaled 2,068 acre-feet; balance remaining is 932 acre-feet.

[e] See 2019 Engineer Adviser report regarding inadvertent storage in Platoro Reservoir during winter season.

[f] Col. 13 was erroneous for entire year in calendar year 2018 accounting; Alberta Park Reservoir storage did not get included; no effect on balance at end of year in 2018.

SUMMARY OF DEBITS AND CREDITS

	ITEM	DEBIT	CREDIT	BALANCE
C1	Balance at Beginning of Year	---------	---------	Cr. 3.2
C2	Scheduled Delivery from Conejos River	214.8	---------	Dr. 211.6
C3	Scheduled Delivery from Rio Grande	358.2	---------	Dr. 569.8
C4	Actual Delivery at Lobatos plus 10,000 Acre Feet	---------	571.3	Cr. 1.5
C5	Reduction of Debits a/c Evaporation	---------		
C6	Reduction of Credits a/c Evaporation[c]	0.6	---------	Cr. 0.9
C7				
C8	Balance at End of Year	---------	---------	Cr. 0.9

APPROVED:

Engineer Adviser for Colorado_____ Date: _____ Engineer Adviser for New Mexico _____ Date: _____ Engineer Adviser for Texas _____ Date: _____

Method 1: Reduce Credit Water for Evaporation Monthly during the 2019 Calendar Year - Developed by Texas and Reclamation

RIO GRANDE COMPACT - DELIVERIES BY NEW MEXICO AT ELEPHANT BUTTE

YEAR 2019 - Method 1

Quantities in thousands of acre feet to nearest hundred

MONTH	OTOWI INDEX SUPPLY									Total Water Stored in New Mexico Above San Marcial at End of Month[a]	ELEPHANT BUTTE EFFECTIVE SUPPLY				
		ADJUSTMENTS						INDEX SUPPLY			STORAGE IN ELEPHANT BUTTE RESERVOIR			Effective Supply	
		RESERVOIRS: LOBATOS TO OTOWI													
	Recorded Flow at Otowi Bridge	Storage End of Month[a]	Change in Storage	Reservoir Evaporation	Other Adjustments	Trans-mountain Diversions	Net Adjustments	During Month	Accumulated Total		End of Month[a]	Change Gain (+) Loss (-)	Recorded Flow Below Elephant Butte Dam[b]	During Month	Accumulated Total
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	--------	0.2	--------	--------	--------	--------	--------	--------	--------	-0.1	114.9	--------	--------	--------	--------
JAN	34.5	2.7	2.5	0.0		-7.0	-4.5	30.0	30.0	3.7	143.4	28.5	0.0	28.5	28.5
FEB	37.1	7.0	4.3	0.0		-3.2	1.1	38.2	68.2	8.6	170.8	27.4	0.0	27.4	55.9
MAR	81.0	18.1	11.1	0.1		-8.5	2.7	83.7	151.9	20.0	214.4	43.6	2.8	46.4	102.3
APR	155.9	40.3	22.2	0.2		-4.8	17.6	173.5	325.4	49.6	310.5	96.1	0.0	96.1	198.4
MAY	288.2	80.2	39.9	0.7		0.0	40.6	328.8	654.2	82.3	482.5	172.0	41.6	213.6	412.0
JUN	319.1	111.0	30.8	0.9		0.0	31.7	350.8	1005.0	113.9	550.3	67.8	132.1	199.9	611.9
JUL	174.6	101.9	-9.1	0.5		-4.3	-12.9	161.7	1166.7	104.7	542.3	-8.0	132.3	124.3	736.2
AUG	78.1	102.5	0.6	0.5		-7.4	-6.3	71.8	1238.5	104.0	458.0	-84.3	120.8	36.5	772.7
SEPT	50.3	91.3	-11.2	0.4		-10.3	-21.1	29.2	1267.7	92.1	427.5	-30.5	36.0	5.5	778.2
OCT	58.8	58.7	-32.6	0.4		-5.2	-37.4	21.4	1289.1	59.5	435.1	7.6	6.3	13.9	792.1
NOV	85.1	6.4	-52.3	0.1		-3.3	-55.5	29.6	1318.7	7.3	500.1	65.0	0.1	65.1	857.2
DEC	52.1	0.9	-5.5	0.2		-4.5	-9.8	42.3	1361.0	1.5	557.1	57.0	0.0	57.0	914.2
YEAR	1414.8	--------	0.7	4.0		-58.5	-53.8	1361.0	--------	--------	--------	442.2	472.0	914.2	--------

Remarks: Cols. 3, 11, and 12 do not include transmountain water.

[a] Note: In 2019, 400 acre-feet of relinquishment credit under previous relinquishment agreements was stored in New Mexico reservoirs. Storage of relinquished credit to date has totaled 288,728 acre-feet; balance remaining is 91,772 acre-feet.

[b] Gage record reflects improved precision since 2016. A low bias in gaged flow during certain months due to algae growth was identified and addressed for 2016 forward. New Mexico will continue to coordinate with USGS to provide a more accurate gage record in the future.

[c] Reduction of credits for evaporation calculated on a monthly basis.

SUMMARY OF DEBITS AND CREDITS

	ITEM	DEBIT	CREDIT	BALANCE
NM1	Balance at Beginning of Year	---------	---------	Cr. 10.9
NM2	Scheduled Delivery at Elephant Butte	957.4	---------	Dr. 946.5
NM3	Actual Elephant Butte Effective Supply	---------	914.2	Dr. 32.3
NM4	Reduction of Debits a/c Evaporation	---------		
NM5	Reduction of Credits a/c Evaporation and Spill[c]	2.0	---------	Dr. 34.3
NM6			---------	
NM7				
NM8	Balance at End of Year	---------	---------	Dr. 34.3

APPROVED:

Engineer Adviser for Colorado_____ Date: _____ Engineer Adviser for New Mexico _____ Date: _____ Engineer Adviser for Texas _____ Date: _____

Method 1: Reduce Credit Water for Evaporation Monthly during the 2019 Calendar Year - Developed by Texas and Reclamation

RIO GRANDE COMPACT - RELEASE AND SPILL FROM PROJECT STORAGE
YEAR 2019 - Method 1

Quantities in thousands of acre feet to nearest hundred

MONTH	Total Project Storage Capacity Available at End of Month[a]	USABLE WATER IN STORAGE			Unfilled Capacity of Project Storage at End of Month	CREDIT WATER IN STORAGE			Flood Water in Storage in Caballo Reservoir at End of Month	Total Water in Project Storage at End of Month	RIO GRANDE BELOW CABALLO DAM							
														SPILL FROM STORAGE			USABLE RELEASE	
		Elephant Butte Reservoir	Caballo Reservoir	Total at End of Month		Colorado Credit Water[c]	New Mexico Credit Water[c]	Total at End of Month			Measured Flow at Caballo Gaging Station	Intervening Diversions to Canals	Total Release and Spill	Caballo Flood Water	Credit Water	Usable Water	Net During Month	Accumulated Total
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	--------	--------	--------	--------	--------	3.2[b]	10.9[b]	14.1[b]		--------	--------	--------	--------	--------	--------	--------	--------	--------
JAN	1,999.6	129.4	27.4	156.8	1,842.8	3.2	10.8	14.0		170.8	0.0	0.1	0.1				0.1	0.1
FEB	1,999.6	157.0	27.7	184.7	1,814.9	3.1	10.7	13.8		198.5	0.0	0.1	0.1				0.1	0.2
MAR	1,999.6	200.8	31.1	231.9	1,767.7	3.1	10.5	13.6		245.5	0.1	0.1	0.2				0.2	0.4
APR	1,974.6	297.3	30.7	328.0	1,646.6	3.0	10.2	13.2		341.2	0.1	0.1	0.2				0.2	0.6
MAY	1,974.6	469.6	55.7	525.3	1,449.3	2.9	10.0	12.9		538.2	7.0	0.1	7.1				7.1	7.7
JUN	1,974.6	537.7	47.8	585.5	1,389.1	2.9	9.7	12.6		598.1	137.1	0.1	137.2				137.2	144.9
JUL	1,974.6	530.0	41.4	571.4	1,403.2	2.8	9.5	12.3		583.7	135.4	0.1	135.5				135.5	280.4
AUG	1,974.6	446.0	47.6	493.6	1,481.0	2.7	9.3	12.0		505.6	112.5	0.1	112.6				112.6	393.0
SEPT	1,974.6	415.7	32.6	448.3	1,526.3	2.7	9.1	11.8		460.1	50.9	0.1	51.0				51.0	444.0
OCT	1,999.6	423.5	29.7	453.2	1,546.4	2.6	9.0	11.6		464.8	10.8	0.0	10.8				10.8	454.8
NOV	1,999.6	488.5	32.1	520.6	1,479.0	2.6	9.0	11.6		532.2	0.1	0.0	0.1				0.1	454.9
DEC	1,999.6	545.6	33.9	579.5	1,420.1	2.6	8.9	11.5		591.0	0.0	0.0	-				0.0	454.9
YEAR	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	454.0	0.9	454.9	0.0	0.0	0.0	454.9	--------

Remarks: Cols. 2, 6 and 11 reflect implementation of revised area-capacity tables from Elephant Butte and Caballo Reservoirs, effective Jan 1, 2009

[a] Project Storage Capacity is 1,974,600 acre-feet (April to September) and 1,999,600 acre-feet (October to March), as adopted by the Rio Grande Compact Commission on March 31, 2009, which includes flood control storage reservation at Elephant Butte Reservoir of 50,000 acre-feet from April through September and 25,000 acre-feet from October through March.

[b] Based on Balance at Beginning of Year (C1 and NM1).

[c] Calculated on a monthly basis.

ACCRUED DEPARTURE FROM NORMAL RELEASE

	ITEM	DEBIT	CREDIT	BALANCE
P1	Accrued Departure at Beginning of Year	---------	---------	Cr. 2315.8
P2	Actual Release during Year	454.9	---------	Cr. 1860.9
P3	Normal Release for Year	---------	790.0	Cr. 2650.9
P4	Under Release in Excess of 150.0	185.1	---------	Cr. 2465.8
P5		---------		
P6				
P7	Accrued Departure at End of Year	---------	---------	Cr. 2465.8

TIME OF HYPOTHETICAL SPILL Did not occur

APPROVED:
Engineer Adviser for Colorado_____ Date: _____ Engineer Adviser for New Mexico _____ Date: _____ Engineer Adviser for Texas _____ Date: _____

Method 2: Reduce Credit Water for Evaporation at the End of the 2019 Calendar Year - Developed by Colorado and New Mexico

RIO GRANDE COMPACT - DELIVERIES BY COLORADO AT STATE LINE

YEAR 2019 - Method 2

Quantities in thousands of acre feet to nearest hundred

MONTH	CONEJOS INDEX SUPPLY										RIO GRANDE INDEX SUPPLY								DELIVERIES			
	MEASURED FLOW				ADJUSTMENTS				SUPPLY			ADJUSTMENTS					SUPPLY					
	CONEJOS AT MOGOTE	LOS PINOS NEAR ORTIZ	SAN ANTONIO AT ORTIZ	TOTAL	STORAGE AT END OF MONTH[d]	CHANGE IN STORAGE[e]	OTHER ADJUSTMENTS	NET ADJUSTMENTS	SUPPLY IN MONTH	ACCUMULATED TOTAL	RECORDED FLOW NEAR DEL NORTE	STORAGE AT END OF MONTH	CHANGE IN STORAGE	TRANSMOUNTIAN DIVERSIONS[b]	OTHER ADJUSTMENTS[a]	NET ADJUSTMENTS	SUPPLY IN MONTH	ACCUMULATED TOTAL	CONEJOS RIVER AT MOUTH NEAR LASAUCES	RIO GRANDE LESS CONEJOS RIVER	RIO GRANDE AT LOBATOS	ACCUMULATED TOTAL AT LOBATOS
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	--------	--------	--------	--------	13.5	--------	--------	--------	--------	0.0	--------	0.5[f]	--------	--------	--------	--------	--------	0.0	--------	--------	--------	0.0
JAN	2.6	--------	--------	2.6	13.6	0.1		0.1	2.7	2.7	8.0	0.5	0.0			0.0	8.0	8.0	1.9	7.7	9.6	9.6
FEB	2.4	--------	--------	2.4	13.9	0.3		0.3	2.7	5.4	7.9	0.5	0.0			0.0	7.9	15.9	2.1	9.9	12.0	21.6
MAR	4.8	--------	--------	4.8	13.0	-0.9		-0.9	3.9	9.3	14.2	0.5	0.0			0.0	14.2	30.1	5.9	18.3	24.2	45.8
APR	21.7	17.2	7.4	46.3	13.4	0.4		0.4	46.7	56.0	72.0	0.5	0.0			0.0	72.0	102.1	17.7	14.1	31.8	77.6
MAY	49.3	39.7	11.5	100.5	13.3	-0.1	0.0	-0.1	100.4	156.4	173.3	0.5	0.0			0.0	173.3	275.4	41.9	50.8	92.7	170.3
JUN	101.8	46.0	2.2	150.0	44.4	31.1	0.0	31.1	181.1	337.5	335.7	0.5	0.0			0.0	335.7	611.1	69.0	98.3	167.3	337.6
JUL	57.2	7.4	0.2	64.8	40.5	-3.9	0.1	-3.8	61.0	398.5	186.7	0.5	0.0	-3.3	0.2	-3.1	183.6	794.7	32.2	85.8	118.0	455.6
AUG	24.7	2.2	0.1	27.0	29.2	-11.3	0.0	-11.3	15.7	414.2	65.0	0.5	0.0			0.0	65.0	859.7	11.9	40.9	52.8	508.4
SEPT	14.0	0.9	0.0	14.9	19.7	-9.5	0.1	-9.4	5.5	419.7	22.8	0.5	0.0			0.0	22.8	882.5	5.5	11.7	17.2	525.6
OCT	8.2	0.8	0.1	9.1	15.1	-4.6	0.1	-4.5	4.6	424.3	17.7	0.5	0.0			0.0	17.7	900.2	4.7	4.1	8.8	534.4
NOV	4.7	--------	--------	4.7	13.2	-1.9	0.1	-1.8	2.9	427.2	13.1	0.5	0.0			0.0	13.1	913.3	4.9	5.0	9.9	544.3
DEC	4.0	--------	--------	4.0	12.5	-0.7	0.0	-0.7	3.3	430.5	12.5	0.5	0.0			0.0	12.5	925.8	4.2	12.8	17.0	561.3
YEAR	295.4	114.2	21.5	431.1	--------	-1.0	0.4	-0.6	430.5	--------	928.9	--------	0.0	-3.3	0.2	-3.1	925.8	--------	201.9	359.4	561.3	--------

Remarks: Cols. 6 and 13 do not include transmountain water.

[a] Evaporation loss post-compact reservoirs; report of the Engineer Adviser for Colorado.

[b] 3,580 ac-ft minus 243 ac-ft pre-compact; report of the Engineer Adviser for Colorado.

[c] Evaporation of credit water accounted as described in Article VI of the Rio Grande Compact.

[d] Note: No relinquishment credit stored in 2019. Storage of relinquished credit to date has totaled 2,068 acre-feet; balance remaining is 932 acre-feet.

[e] See 2019 Engineer Adviser report regarding inadvertent storage in Platoro Reservoir during winter season.

[f] Col. 13 was erroneous for entire year in calendar year 2018 accounting; Alberta Park Reservoir storage did not get included; no effect on balance at end of year in 2018.

SUMMARY OF DEBITS AND CREDITS

	ITEM	DEBIT	CREDIT	BALANCE
C1	Balance at Beginning of Year	---------	---------	Cr. 3.1
C2	Scheduled Delivery from Conejos River	214.8	---------	Dr. 211.7
C3	Scheduled Delivery from Rio Grande	358.2	---------	Dr. 569.9
C4	Actual Delivery at Lobatos plus 10,000 Acre Feet	---------	571.3	Cr. 1.4
C5	Reduction of Debits a/c Evaporation	---------		
C6	Reduction of Credits a/c Evaporation[c]	0.6	---------	Cr. 0.8
C7				
C8	Balance at End of Year	---------	---------	Cr. 0.8

APPROVED:

Engineer Adviser for Colorado_____ Date: _____ Engineer Adviser for New Mexico _____ Date: _____ Engineer Adviser for Texas _____ Date: _____

Method 2: Reduce Credit Water for Evaporation at the End of the 2019 Calendar Year - Developed by Colorado and New Mexico

RIO GRANDE COMPACT - DELIVERIES BY NEW MEXICO AT ELEPHANT BUTTE

YEAR 2019 - Method 2

Quantities in thousands of acre feet to nearest hundred

MONTH	OTOWI INDEX SUPPLY									Total Water Stored in New Mexico Above San Marcial at End of Month[a]	ELEPHANT BUTTE EFFECTIVE SUPPLY				
		ADJUSTMENTS						INDEX SUPPLY			STORAGE IN ELEPHANT BUTTE RESERVOIR			Effective Supply	
		RESERVOIRS: LOBATOS TO OTOWI													
	Recorded Flow at Otowi Bridge	Storage End of Month[a]	Change in Storage	Reservoir Evaporation	Other Adjustments	Trans-mountain Diversions	Net Adjustments	During Month	Accumulated Total		End of Month[a]	Change Gain (+) Loss (-)	Recorded Flow Below Elephant Butte Dam[b]	During Month	Accumulated Total
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	--------	0.2	--------	--------	--------	--------	--------	--------	--------	-0.1	114.9	--------	--------	--------	--------
JAN	34.5	2.7	2.5	0.0		-7.0	-4.5	30.0	30.0	3.7	143.4	28.5	0.0	28.5	28.5
FEB	37.1	7.0	4.3	0.0		-3.2	1.1	38.2	68.2	8.6	170.8	27.4	0.0	27.4	55.9
MAR	81.0	18.1	11.1	0.1		-8.5	2.7	83.7	151.9	20.0	214.4	43.6	2.8	46.4	102.3
APR	155.9	40.3	22.2	0.2		-4.8	17.6	173.5	325.4	49.6	310.5	96.1	0.0	96.1	198.4
MAY	288.2	80.2	39.9	0.7		0.0	40.6	328.8	654.2	82.3	482.5	172.0	41.6	213.6	412.0
JUN	319.1	111.0	30.8	0.9		0.0	31.7	350.8	1005.0	113.9	550.3	67.8	132.1	199.9	611.9
JUL	174.6	101.9	-9.1	0.5		-4.3	-12.9	161.7	1166.7	104.7	542.3	-8.0	132.3	124.3	736.2
AUG	78.1	102.5	0.6	0.5		-7.4	-6.3	71.8	1238.5	104.0	458.0	-84.3	120.8	36.5	772.7
SEPT	50.3	91.3	-11.2	0.4		-10.3	-21.1	29.2	1267.7	92.1	427.5	-30.5	36.0	5.5	778.2
OCT	58.8	58.7	-32.6	0.4		-5.2	-37.4	21.4	1289.1	59.5	435.1	7.6	6.3	13.9	792.1
NOV	85.1	6.4	-52.3	0.1		-3.3	-55.5	29.6	1318.7	7.3	500.1	65.0	0.1	65.1	857.2
DEC	52.1	0.9	-5.5	0.2		-4.5	-9.8	42.3	1361.0	1.5	557.1	57.0	0.0	57.0	914.2
YEAR	1414.8	--------	0.7	4.0		-58.5	-53.8	1361.0	--------	--------	--------	442.2	472.0	914.2	--------

Remarks: Cols. 3, 11, and 12 do not include transmountain water.

[a] Note: In 2019, 400 acre-feet of relinquishment credit under previous relinquishment agreements was stored in New Mexico reservoirs. Storage of relinquished credit to date has totaled 288,728 acre-feet; balance remaining is 91,772 acre-feet.

[b] Gage record reflects improved precision since 2016. A low bias in gaged flow during certain months due to algae growth was identified and addressed for 2016 forward. New Mexico will continue to coordinate with USGS to provide a more accurate gage record in the future.

[c] Evaporation of credit water accounted as described in Article VI of the Rio Grande Compact.

SUMMARY OF DEBITS AND CREDITS

	ITEM	DEBIT	CREDIT	BALANCE
NM1	Balance at Beginning of Year	---------	---------	Cr. 5.4
NM2	Scheduled Delivery at Elephant Butte	957.4	---------	Dr. 952.0
NM3	Actual Elephant Butte Effective Supply	---------	914.2	Dr. 37.8
NM4	Reduction of Debits a/c Evaporation	---------		
NM5	Reduction of Credits a/c Evaporation and Spill[c]	1.0	---------	Dr. 38.8
NM6			---------	
NM7				
NM8	Balance at End of Year	---------	---------	Dr. 38.8

APPROVED:

Engineer Adviser for Colorado_____ Date: _____ Engineer Adviser for New Mexico _____ Date: _____ Engineer Adviser for Texas _____ Date: _____

Method 2: Reduce Credit Water for Evaporation at the End of the 2019 Calendar Year - Developed by Colorado and New Mexico

RIO GRANDE COMPACT - RELEASE AND SPILL FROM PROJECT STORAGE

YEAR 2019 - Method 2

Quantities in thousands of acre feet to nearest hundred

MONTH	Total Project Storage Capacity Available at End of Month[a]	USABLE WATER IN STORAGE			Unfilled Capacity of Project Storage at End of Month	CREDIT WATER IN STORAGE			Flood Water in Storage in Caballo Reservoir at End of Month	Total Water in Project Storage at End of Month	RIO GRANDE BELOW CABALLO DAM							
														SPILL FROM STORAGE			USABLE RELEASE	
		Elephant Butte Reservoir	Caballo Reservoir	Total at End of Month		Colorado Credit Water[c]	New Mexico Credit Water[c]	Total at End of Month			Measured Flow at Caballo Gaging Station	Intervening Diversions to Canals	Total Release and Spill	Caballo Flood Water	Credit Water	Usable Water	Net During Month	Accumulated Total
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	---	---	---	---	---	3.1[b]	5.4[b]	8.5[b]		---	---	---	---	---	---	---	---	---
JAN	1,999.6	134.9	27.4	162.3	1,837.3	3.1	5.4	8.5		170.8	0.0	0.1	0.1				0.1	0.1
FEB	1,999.6	162.3	27.7	190.0	1,809.6	3.1	5.4	8.5		198.5	0.0	0.1	0.1				0.1	0.2
MAR	1,999.6	205.9	31.1	237.0	1,762.6	3.1	5.4	8.5		245.5	0.1	0.1	0.2				0.2	0.4
APR	1,974.6	302.0	30.7	332.7	1,641.9	3.1	5.4	8.5		341.2	0.1	0.1	0.2				0.2	0.6
MAY	1,974.6	474.0	55.7	529.7	1,444.9	3.1	5.4	8.5		538.2	7.0	0.1	7.1				7.1	7.7
JUN	1,974.6	541.8	47.8	589.6	1,385.0	3.1	5.4	8.5		598.1	137.1	0.1	137.2				137.2	144.9
JUL	1,974.6	533.8	41.4	575.2	1,399.4	3.1	5.4	8.5		583.7	135.4	0.1	135.5				135.5	280.4
AUG	1,974.6	449.5	47.6	497.1	1,477.5	3.1	5.4	8.5		505.6	112.5	0.1	112.6				112.6	393.0
SEPT	1,974.6	419.0	32.6	451.6	1,523.0	3.1	5.4	8.5		460.1	50.9	0.1	51.0				51.0	444.0
OCT	1,999.6	426.6	29.7	456.3	1,543.3	3.1	5.4	8.5		464.8	10.8	0.0	10.8				10.8	454.8
NOV	1,999.6	491.6	32.1	523.7	1,475.9	3.1	5.4	8.5		532.2	0.1	0.0	0.1				0.1	454.9
DEC	1,999.6	548.6	33.9	582.5	1,417.1	3.1	5.4	8.5		591.0	0.0	0.0	-				0.0	454.9
YEAR	---	---	---	---	---	---	---	---	---	---	454.0	0.9	454.9	0.0	0.0	0.0	454.9	---

Remarks: Cols. 2, 6 and 11 reflect implementation of revised area-capacity tables from Elephant Butte and Caballo Reservoirs, effective Jan 1, 2009.

[a] Project Storage Capacity is 1,974,600 acre-feet (April to September) and 1,999,600 acre-feet (October to March), as adopted by the Rio Grande Compact Commission on March 31, 2009, which includes flood control storage reservation at Elephant Butte Reservoir of 50,000 acre-feet from April through September and 25,000 acre-feet from October through March.

[b] Based on Balance at Beginning of Year (C1 and NM1).

[c] Credit water held constant during the year in accordance with Article VI and per direction of Compact Commisssion in March 2006. Evaporation for credit water is accounted at end of calendar year in the proportion that the credit water bore to the total amount of water in Elephant Butte Reservoir during the year. If loan during 2011 had been approved, credit water would have been decreased by the amount of the negative usable water.

[d] Due to Caballo release discrepancies during 2011, data was not approved for 2011; consequently, the accrued departure at the beginning of 2012, 2013, 2014, 2015, 2016, 2017, 2018, and 2019 could not be computed.

ACCRUED DEPARTURE FROM NORMAL RELEASE

	ITEM	DEBIT	CREDIT	BALANCE
P1	Accrued Departure at Beginning of Year[d]	---	---	Cr.
P2	Actual Release during Year		---	Cr.
P3	Normal Release for Year	---	790.0	Cr.
P4			---	Cr.
P5		---		
P6				
P7	Accrued Departure at End of Year	---	---	Cr.

TIME OF HYPOTHETICAL SPILL Not applicable

APPROVED:

Engineer Adviser for Colorado_____ Date: _____ Engineer Adviser for New Mexico _____ Date: _____ Engineer Adviser for Texas _____ Date: _____

BUDGET FOR FISCAL YEAR ENDING JUNE 30, 2019

Item	Total Cost	Borne by United States	Borne by Colorado	Borne by New Mexico	Borne by Texas
GAGING STATIONS					
In Colorado	$78,897		$78,897		
In New Mexico, above Caballo Reservoir	$76,574	$41,149		$35,425	
In New Mexico, Caballo Reservoir and below	$21,936	$4,387			$17,549
Subtotal	$177,407	$45,536	$78,897	$35,425	$17,549
ADMINISTRATION					
U.S.G.S. Technical Services	$19,996	$6,058	$4,646	$4,646	$4,646
Other expenses[1]	$3,000		$1,000	$1,000	$1,000
Subtotal	$22,996	$6,058	$5,646	$5,646	$5,646
GRAND TOTAL	$200,403	$51,594	$84,543	$41,071	$23,195
EQUAL SHARES			$49,603	$49,603	$49,603

[1]Includes estimated cost of court reporter.

BUDGET FOR FISCAL YEAR ENDING JUNE 30, 2021

Item	Total Cost	Borne by United States	Borne by Colorado	Borne by New Mexico	Borne by Texas
GAGING STATIONS					
In Colorado	$84,058		$84,058		
In New Mexico, above Caballo Reservoir	$86,274	$61,040		$25,234	
In New Mexico, Caballo Reservoir and below	$33,684	$6,737			$26,947
Subtotal	$204,016	$67,777	$84,058	$25,234	$26,947
ADMINISTRATION					
U.S.G.S. Technical Services	$21,027	$6,240	$4,929	$4,929	$4,929
Other expenses[1]	$3,000		$1,000	$1,000	$1,000
Subtotal	$24,027	$6,240	$5,929	$5,929	$5,929
GRAND TOTAL	$228,043	$74,017	$89,987	$31,163	$32,876
EQUAL SHARES			$51,342	$51,342	$51,342

[1]Includes estimated cost of court reporter.

Agreement No: 19RGJFA12
Customer No:
6000001029/6000001775/6000000631
Project No: RG00GVC
Tax ID: 84-0644739 (CO)
85-6000565 (NM)
74-1694284 (TX)
Fixed-price agreement

COOPERATIVE AGREEMENT
FOR
INVESTIGATION OF WATER RESOURCES

THIS AGREEMENT, entered into this 1st day of July, 2019 by and between the United States Geological Survey, party of the first part, and each of the Commissioners representing the three signatory states and the Representative of the United States, constituting the Rio Grande Compact Commission, party of the second part.

In consideration of the mutual promises and agreements herein contained, it is agreed by and between the parties hereto as follows:

1. The parties agree that, subject to the availability of appropriations and in accordance with their respective authorities, there shall be maintained a cooperative program for duties as stated in the attached Statement of Work, for the Rio Grande Compact Commission within and among the three states in accordance with the terms of the Rio Grande Compact, incorporated herein by reference.

The parties further agree that this agreement shall in no manner affect any other agreement between the United States Geological Survey and any of the three states of the basin concerning the collection of hydrologic data, but in each case where there is or may be another agreement covering the collection of such data, the duty of the United States Geological Survey as provided here, shall be to compile, correlate, and present hydrographic data that has been collected under such agreements.

2. The parties agree to contribute to this program in the amounts specified or as are from time to time agreed upon in writing, funds needed and available to cover all the cost of the necessary field and office work directly related to the program, excluding any general administrative or accounting work in the office of any of the parties, and excluding the costs of publication by any of the parties of the results of the program.

3. The United States Geological Survey and state members of the Rio Grande Compact agree to contribute to the program during the period from July 1, 2019 to June 30, 2020, the following amounts:

(a)	U.S. Geological Survey	$6,240
(b)	State of Colorado	$4,785
(c)	State of New Mexico	$4,785
(d)	State of Texas	$4,785

4. So far as may be mutually agreed, all expenses shall be paid in the first instance by the United States Geological Survey with appropriate reimbursement thereafter by the other parties hereto. Each of the parties shall furnish to each of the other parties such statements or reports of expenditures as may be needed to satisfy fiscal requirements.

5. Unless previously terminated by the parties hereto, this agreement shall terminate on June 30, 2020, provided it may be renewed by the mutual agreement of the United States Geological Survey and each of the Commissioners representing the three signatory states to the Rio Grande Compact, as the voting members of the Rio Grande Compact Commission, on or before June 30, 2020, for a period of 1 year, and may be renewed in a like manner on or before June 30th of any year thereafter for a similar period. Any party may terminate this agreement by providing 60 day's written notice to the other party. When an accepted agreement is terminated by the State members of the Rio Grande Compact Commission, the USGS is authorized to collect costs incurred prior to the effective date of termination of the agreement plus any termination cost.

6. The original records resulting from this program will be deposited in the office of origin of those records. Upon request, copies of the original records will be provided to the office of the other parties.

7. In the event this Agreement is renewed as herein provided, the amounts to be contributed by the parties for each renewal period may be determined by mutual agreement and set forth by exchange of letters between the parties at or near the beginning of each such period.

8. Billing for this agreement will be rendered semi-annually in January 2020 and July 2020. Payments of bills are due within 60 days after the billing date. If not paid by the due date, interest will be charged at the current Treasury rate for each 30-day period, or portion thereof, that the payment is delayed beyond the due date. (31 USC 3717, Comptroller General File-B212222, August 23, 1983.)

9. The Legal authorities for the U.S. Geological Survey to enter into this Agreement are 43 USC 36C; 43 USC 50; and 43 USC50b.

UNITED STATES GEOLOGICAL SURVEY

Johnathan Bumgarner 3/19/2019
Director, New Mexico Water Science Center

RIO GRANDE COMPACT COMMISSION

4-4-2019
Commissioner for Colorado Date

4/4/2019
Commissioner for New Mexico Date

4/4/2019
Commissioner for Texas Date

4/4/2019
Representative of the United States Date

Statement of Work
for
19RGJFA12

The duties of the United States Geological Survey are as follows:

1. Obtain data for yearly accounting from U.S. Geological Survey in New Mexico and Colorado as well as U.S. Bureau of Reclamation, Albuquerque and El Paso Offices, and Colorado Division of Water Resources.

2. Prepare and submit provisional water accounting reports on the deliveries of the Rio Grande water.

3. Compile Rio Grande Compact Commission water accounting from the data supplied by various agencies. Present annual accounting at the Engineer Advisor's Meeting. Obtain signature of Engineer Advisors on approved accounting sheets.

WATER RESOURCES DATA

ACKNOWLEDGMENTS

This report was prepared by the U.S. Geological Survey, secretary to the Rio Grande Compact Commission. The water-supply data contained in this report have been provided by various Federal and State agencies.

The office of the State Engineer of Colorado provided records of transmountain diversions and of storage for the following:

Squaw Lake	Jumper Creek Reservoir	Mill Creek Reservoir
Rito Hondo Reservoir	Big Meadows Reservoir	Fuchs Reservoir
Hermit Lakes Reservoir No. 3	Alberta Park Reservoir	Platoro Reservoir
Troutvale No. 2 Reservoir	Shaw Lake Enlargement	Trujillo Meadows Reservoir

The office of the State Engineer of Colorado provided records of discharge for the following:

Rio Grande near Del Norte, Colo.	Los Pinos River near Ortiz, Colo.
Conejos River below Platoro Reservoir, Colo.	Conejos River near Lasauses, Colo.
Conejos River near Mogote, Colo.	Rio Grande near Lobatos, Colo.
San Antonio River at Ortiz, Colo.	

The U.S. Bureau of Reclamation, Albuquerque, N. Mex., provided the following records:

Azotea Tunnel at Outlet, near Chama, N. Mex.	Willow Creek below Heron Dam, N. Mex.
Willow Creek above Heron Res., near Los Ojos, N. Mex.	
Storage in El Vado Reservoir near Tierra Amarilla, N. Mex.	
Storage in Heron Reservoir near Los Ojos, N. Mex.	

The U.S. Geological Survey, in cooperation with the U.S. Bureau of Reclamation, Albuquerque, N. Mex, provided the following records:

Storage in Nambe Falls Reservoir near Nambe, N. Mex.
Rio Nambe below Nambe Falls Dam, near Nambe, N. Mex.

The U.S. Geological Survey supplied the record for Rio Grande below Elephant Butte Dam, and in cooperation with the New Mexico Interstate Stream Commission, also provided the following:

Rio Chama below El Vado Dam, N. Mex.	Santa Fe River near Santa Fe, N. Mex.
Rio Grande at Otowi Bridge, near San Ildefonso, N. Mex	
Storage in Nichols and McClure Reservoir near Santa Fe, N. Mex.	

The U.S. Geological Survey, in cooperation with the Corps of Engineers, Albuquerque, N. Mex., also provided the following records:

Rio Chama below Abiquiu Dam, N. Mex.	Rio Grande below Cochiti Dam, N. Mex.
Galisteo Creek below Galisteo Dam, N. Mex.	Jemez River below Jemez Canyon Dam, N. Mex.

The Corps of Engineers, Albuquerque, N. Mex., provided the following records of storage:

Abiquiu Reservoir.	Galisteo Reservoir.	Jemez Canyon Reservoir.	Cochiti Lake.

The U.S. Bureau of Reclamation, El Paso, Texas, provided the following records:

Storage in Elephant Butte Reservoir at Elephant Butte, N. Mex.
Storage in Caballo Reservoir near Arrey, N. Mex.
Rio Grande below Caballo Dam, N. Mex.
Bonito ditch below Caballo Dam, N. Mex.

The Rio Grande Compact Commission gratefully acknowledges the cooperation received from the agencies listed above.

ACCURACY OF RECORDS

The Rules and Regulations of the Commission state that the equipment, method, and frequency of measurement at each gaging station shall be sufficient to obtain records at least equal in accuracy to those classified as "good" by the U.S. Geological Survey. Within the physical limitations of stream gaging, the agencies obtaining the records at Compact gaging stations have complied with these regulations.

The accuracy of streamflow records depends primarily on (1) the stability of the stage- discharge relation or, if the control is unstable, the frequency of discharge measurements, and (2) the accuracy of observations of stage, measurements of discharge, and interpretation of records.

The station description states the degree of accuracy attributed to the records. "Excellent" means that about 95 percent of the daily discharges are within 5 percent of the true value; "good" within 10 percent; and "fair" within 15 percent. Records that do not meet the criteria mentioned are rated "poor." Different accuracies may be attributed to different parts of a given record. The probable error in a monthly or annual mean discharge depends more on the distribution of the daily errors between the limits than it does on the limits themselves. For this reason, monthly and annual records are more accurate than most daily records.

Rio Grande near Del Norte, Colo

Location. -- Water-stage recorder with satellite telemetry, lat 37°41'19.0", long 106°27'35.5", in NW1/4 NW 1/4 sec. 29, T. 40 N., R. 5 E., on right bank, 40 ft downstream from county highway bridge, 6.0 mi west of Del Norte, and 5.0 mi upstream from Pinos Creek. Datum of gage is 7,980.25 ft above National Geodetic Vertical Datum of 1929. Prior to May 16, 1908, nonrecording gage at site 4 mi downstream at different datum. Records are equivalent.

Drainage area. -- 1,320 sq mi, approximately.

Average discharge. -- 130 years (1890-2019), 887 ft^3/s (642,500 acre-ft per year).

Extremes. -- 1889-2019: Maximum discharge, 18,000 ft^3/s Oct. 5, 1911 (gage height, 6.80 ft), from rating curve extended above 12,900 ft^3/s; minimum daily, 74 ft^3/s Nov. 16, 1956.

Remarks. -- Records good except for estimated for estimated daily discharges, which are poor. Natural flow of stream affected by storage reservoirs, transmountain diversions from Colorado River Basin, diversions for irrigation and municipal use, groundwater withdrawals, return flows from irrigated areas, and flows from sewage-treatment plants. Flow regulated by four reservoirs, total capacity 126,100 acre-ft, and by several smaller ones.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	4,031	230	86	130	7,995
February	4,005	215	125	143	7,944
March	7,144	383	145	230	14,170
April	36,316	3,430	280	1,211	72,033
May	87,380	5,380	1,960	2,819	173,318
June	169,260	7,610	3,220	5,642	335,727
July	94,130	5,270	1,980	3,036	186,707
August	32,749	2,030	427	1,056	64,958
September	11,493	487	306	383	22,796
October	8,911	338	225	287	17,675
November	6,588	295	148	220	13,067
December	6,305	320	135	203	12,506
Calendar year 2019	468,312	7,610	86	1,283	928,897

Conejos River below Platoro Reservoir, Colo.

Location. -- Water-stage recorder with satellite telemetry and concrete control, lat 37°21'17.65", long 106°32'39", in SW 1/4 NW 1/4 sec. 22, T. 36 N., R. 4 E., on left bank 1,100 ft downstream from valvehouse for Platoro Reservoir, and 0.7 mi northwest of Platoro. Datum of gage is 9,866.60 ft above National Geodetic Vertical Datum of 1929 (levels by Bureau of Reclamation).

Drainage area. -- 40 sq mi, approximately.

Average discharge. -- 67 years (1952-2019), 91 ft^3/s (66,050 acre-ft per year).

Extremes. -- 1952-2019: Maximum discharge, 1,160 ft^3/s Nov. 1, 1957; maximum gage height, 4.29 ft June 15, 1958; no flow Oct. 16-20, 1955.

Remarks. -- Records fair except for the periods Nov. 6 to Apr. 12, Aug. 15, and estimated daily discharges, which are poor. Flow completely regulated by Platoro Reservoir (0.2 mi upstream) since Nov. 7, 1951.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	273	12	8	9	541
February	245	11	8	9	486
March	500	18	11	16	992
April	1,579	177	11	53	3,132
May	5,161	390	85	166	10,237
June	7,316	696	54	244	14,511
July	13,745	703	238	443	27,263
August	8,252	388	181	266	16,368
September	5,279	204	121	176	10,471
October	2,577	121	11	83	5,111
November	1,153	40	28	38	2,287
December	739	39	10	24	1,466
Calendar year 2019	46,819	703	8	128	92,865

Conejos River near Mogote, Colo

Location. -- Water-stage recorder with satellite telemetry, lat 37°03'14", long 106°11'13", in SE 1/4SE 1/4 sec. 34, T. 33 N., R. 7 E., on left bank 75 ft downstream from bridge on State Highway 174, 0.4 mi downstream from Fox Creek, and 5.3 mi west of Mogote, and 10 mi west of Antonito. Datum of gage is 8,269.39 ft above National Geodetic Vertical Datum of 1929.

Drainage area. -- 282 sq mi.

Average discharge. -- 109 years (1904, 1912-2019), 317 ft^3/s (229,900 acre-ft per year).

Extremes. -- 1903-1905, 1911-2019: Maximum discharge, 9,000 ft^3/s Oct. 5, 1911 (gage height, 8.50 ft), from rating curve extended above 3,100 ft^3/s; minimum daily determined, 10 ft^3/s July 18, 1904, also occurred Aug. 19, 2002.

Remarks. -- Records good except for estimated daily discharges, which are poor. Natural flow of stream affected by diversions for irrigation and return flows from irrigated areas. Some regulation by Platoro Reservoir (59 mi upstream) since Nov. 7, 1951.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	1,321	46	40	43	2,620
February	1,235	49	41	44	2,450
March	2,402	151	46	77	4,764
April	10,967	1,010	91	366	21,753
May	24,864	1,530	532	802	49,318
June	51,346	2,060	956	1,712	101,845
July	28,824	2,070	450	930	57,172
August	12,460	594	259	402	24,714
September	7,037	270	174	235	13,958
October	4,133	174	71	133	8,198
November	2,355	90	50	79	4,671
December	2,000	96	50	65	3,967
Calendar year 2019	148,944	2,070	40	408	295,430

San Antonio River at Ortiz, Colo

Location. -- Water-stage recorder with satellite telemetry, lat 36°59'35", long 106°02'17", in New Mexico in NE 1/4 SE 1/4, sec. 24, T. 32 N., R. 8 E., on left bank 800 ft south of New Mexico-Colorado State line, 0.4 mi southeast of Ortiz, and 0.4 mi upstream from Los Pinos River. Altitude of gage is 7,970 ft above National Geodetic Vertical Datum of 1929.

Drainage area. -- 110 sq mi, approximately.

Average discharge. -- 79 years (1941-2019), 24 ft^3/s (17,290 acre-ft per year).

Extremes. -- 1920, 1925-2019: Maximum discharge, 1,750 ft^3/s Apr. 15, 1937 (gage height, 5.38 ft), from rating curve extended above 1,100 ft^3/s; no flow at times.

Remarks. -- Records fair except for flows below 1 ft^3/s, and estimated daily discharges, which are poor. Natural flow of stream affected by diversions for irrigation and return flows from irrigated areas.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	39	2	1	1	78
February	77	4	2	3	153
March	310	27	4	10	615
April	3,706	341	25	124	7,351
May	5,772	279	91	186	11,449
June	1,122	103	5	37	2,225
July	115	12	1	4	228
August	57	6	0	2	113
September	3	0	0	0	5
October	42	2	0	1	83
November	54	3	1	2	107
December	102	5	2	3	201
Calendar year 2019	11,398	341	0	31	22,608

Los Pinos River near Ortiz, Colo

Location. -- Water-stage recorder with satellite telemetry, lat 36°58'56", long 106°04'23", in New Mexico on line between secs. 26 and 27, T. 32 N., R. 8 E., on left bank 0.9 mi south of New Mexico-Colorado State line, 2.1 mi southwest of Ortiz, and 2.9 mi upstream from mouth. Altitude of gage is 8,040 ft above National Geodetic Vertical Datum of 1929.

Drainage area. -- 167 sq mi.

Average discharge. -- 101 years (1915-1920, 1925-2019), 116 ft^3/s (83,720 acre-ft per year).

Extremes. -- 1915-1920, 1925-2019: Maximum discharge, 3,160 ft^3/s May 12, 1941 (gage height, 5.77 ft, site and datum then in use), from rating curve extended above 1,600 ft^3/s; minimum observed, 1.7 ft^3/s Aug. 27, 2002.

Remarks. -- Records good except for those from June 9 and flows below 10 ft^3/s, which are fair, and estimated daily discharges, which are poor. Natural flow of stream affected by diversions for irrigation and return flows from irrigated areas.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	474	19	11	15	940
February	397	17	12	14	787
March	880	56	18	28	1,745
April	8,679	972	42	289	17,215
May	20,002	1,010	406	645	39,674
June	23,186	1,220	360	773	45,989
July	3,737	401	44	121	7,412
August	1,126	79	14	36	2,233
September	456	27	10	15	904
October	371	17	8	12	736
November	325	13	8	11	645
December	388	14	11	13	770
Calendar year 2019	60,022	1,220	8	164	119,053

Conejos River near Lasauses, Colo

Location. -- Two water-stage recorders with satellite telemetry, lat 37°18'01", long 105°44'47", in SW 1/4 SW 1/4 sec. 2, T. 35 N., R. 11 E., on left bank of main channel 125 ft downstream from bridge on State Highway 158, 2.1 mi north of Lasauses, and on left bank of secondary channel 1,550 ft upstream from bridge, 1.0 mi upstream from mouth, and 1.5 mi north of Lasauses. Datum of gage on main (north) channel is 7,495.02 ft above National Geodetic Vertical Datum of 1929, and on secondary (south) channel is 7,499.86 ft above National Geodetic Vertical Datum of 1929 (levels by Bureau of Reclamation).

Drainage area. -- 887 sq mi.

Average discharge. -- 98 years (1922-2019), 170 ft^3/s (123,000 acre-ft per year).

Extremes. -- 1921-2019: Maximum discharge, 3,890 ft^3/s May 15, 1941; no flow at times in some years.

Remarks. -- Records good except for flows below 1.0 ft^3/s, and estimated daily discharges, which are poor. Natural flow of stream affected by diversions for irrigation, groundwater withdrawals, and return flows from irrigated areas. Flow regulated to some extent by Platoro Reservoir (about 83 mi upstream) since Nov. 7, 1951.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	938	37	22	30	1,861
February	1,058	46	31	38	2,099
March	2,951	163	68	95	5,853
April	8,944	894	80	298	17,740
May	21,144	1,220	426	682	41,939
June	34,790	1,450	588	1,160	69,006
July	16,224	1,190	217	523	32,180
August	6,020	385	90	194	11,941
September	2,777	149	49	93	5,508
October	2,350	142	53	76	4,661
November	2,497	94	71	83	4,953
December	2,108	89	41	68	4,181
Calendar year 2019	101,801	1,450	22	279	201,922

Rio Grande near Lobatos, Colo

Location. -- Water-stage recorder with satellite telemetry, lat 37°04'43", long 105°45'25", in NE 1/4 NW 1/4 sec. 27, T. 33 N., R. 11 E., on right bank at highway bridge, 5.7 mi north of Colorado-New Mexico State line, 11 mi east of Lobatos, and 14 mi east of Antonito. Datum of gage is 7,427.63 ft above National Geodetic Vertical Datum of 1929.

Drainage area. -- 7,700 sq mi, approximately (includes 2,940 sq mi in closed basin in San Luis Valley).

Average discharge. -- 31 years (1900-1930), 846 ft^3/s (612,900 acre-ft per year); 89 years (1931-2019) 428 ft^3/s (309,900) acre-ft per year).

Extremes. -- 1899-2019: Maximum discharge observed, 13,200 ft^3/s June 8, 1905 (gage height, 9.1 ft); from rating curve extended above 8,000 ft^3/s; no flow at times in 1950-51, 1956.

Remarks. -- Records good except for flows below 20 ft^3/s, which are fair, and estimated daily discharges, which are poor. Natural flow of stream affected by storage reservoirs, transmountain diversions, diversions for irrigation and municipal use, groundwater withdrawals, return flows from irrigated areas, and flows from sewage-treatment plants.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	4,830	170	120	156	9,580
February	6,035	270	170	216	11,970
March	12,193	519	300	393	24,185
April	16,057	1,470	219	535	31,849
May	46,730	2,300	1,130	1,507	92,689
June	84,330	3,440	1,370	2,811	167,269
July	59,523	3,050	932	1,920	118,064
August	26,605	1,330	423	858	52,771
September	8,661	390	130	289	17,179
October	4,443	216	95	143	8,813
November	5,018	310	102	167	9,953
December	8,564	440	185	276	16,987
Calendar year 2019	282,989	3,440	95	775	561,309

Willow Creek above Heron Reservoir, near Los Ojos, N. Mex.

Location. -- Water-stage recorder, lat 36°44'33", long 106°37'34", in Tierra Amarilla Grant, on right bank 200 ft downstream from bridge, 0.2 mi downstream from Iron Spring Creek, 3.3 mi west of Los Ojos, and at mi 9.7. Datum of gage is 7,196.29 ft above mean sea level. Prior to Apr. 1, 1971, at site 900 ft downsteam.

Drainage area. -- 112 sq mi.

Average discharge. -- 7 years (1963-1969), 11.5 ft^3/s (8,330 acre-ft per year) prior to completion of Azotea tunnel; 50 years (1970-2019) 134 ft^3/s (97,070 acre-ft per year) subsequent to completion of Azotea tunnel.

Extremes. -- 1963-2003: Maximum discharge, 1,610 ft^3/s Mar. 12, 1985 (gage height, 6.65 ft); 2003-2019: Maximum daily discharge, 1,030 ft^3/s Apr. 4, 2005; no flow at times.

Remarks. -- Subsequent to Nov. 16, 1970, flow affected by transmountain diversions through Azotea tunnel. Flow in Rutheron Drain included prior to Apr. 1, 1971.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	0	0	0	0	0
February	0	0	0	0	0
March	3,572	439	0	115	7,085
April	13,189	895	131	440	26,160
May	16,907	892	305	545	33,535
June	26,062	988	679	869	51,694
July	13,217	942	156	426	26,215
August	3,719	345	2	120	7,376
September	113	54	0	4	224
October	0	0	0	0	0
November	0	0	0	0	0
December	0	0	0	0	0
Calendar year 2019	76,779	988	0	210	152,289

Horse Lake Creek above Heron Reservoir, near Los Ojos, N. Mex.

Location. -- Water-stage recorder, lat 36°42'24", long 106°44'42", in Tierra Amarilla Grant, on right bank 3.7 mi northwest of Heron Dam, 7.8 mi downstream from Horse Lake, and 9.9 mi west of Los Ojos. Datum of gage is 7,188.85 ft above National Geodetic Vertical Datum of 1929. Prior to July 1, 1971, at site 1,100 ft upstream.

Drainage area. -- 45 sq mi, approximately.

Average discharge. -- 12 years (1963-1973,1986), 1.17 ft^3/s (848 acre-ft per year).

Extremes. -- 1963-2011: Maximum discharge, 3,960 ft^3/s July 30, 1968 (gage height, 4.9 ft); no flow most of time.

Remarks. -- Records good for period of record. Diversions above station for irrigation of meadows and for off-channel stock tanks. Seasonal gage discontinued in 2011.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	---	---	---	---	---
February	---	---	---	---	---
March	---	---	---	---	---
April	---	---	---	---	---
May	---	---	---	---	---
June	---	---	---	---	---
July	---	---	---	---	---
August	---	---	---	---	---
September	---	---	---	---	---
October	---	---	---	---	---
November	---	---	---	---	---
December	---	---	---	---	---
Calendar year 2019	---	---	---	---	---

Willow Creek below Heron Dam, N. Mex.

Location. -- Totalizing flowmeters, lat 36°39'46", long 106°42'20", in Tierra Amarilla Grant, in outlet conduits at Heron Dam, 0.2 mi upstream from Rio Chama, 5.1 mi northeast of El Vado Dam, and 8.7 mi southwest of Los Ojos.

Drainage area. -- 193 sq mi.

Average discharge. -- 49 years (1971-2019), 131 ft^3/s (94,600 acre-ft per year).

Extremes. -- 1971-2019: Maximum daily discharge, 2,780 ft^3/s Dec. 18, 19, 1982; no flow at times each year.

Remarks. -- Flow completely regulated by Heron Dam.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	191	25	0	6	379
February	10	10	0	0	20
March	4,867	402	0	157	9,654
April	2,722	397	0	91	5,399
May	628	43	0	20	1,246
June	281	44	0	9	557
July	0	0	0	0	0
August	14,908	510	0	481	29,570
September	14,632	705	45	488	29,022
October	1,422	46	45	46	2,820
November	1,380	46	46	46	2,737
December	13,202	503	44	426	26,186
Calendar year 2019	54,243	705	0	149	107,590

Rio Chama below El Vado Dam, N. Mex

Location. -- Water-stage recorder with satellite telemetry, lat 36°34'49.38", long 106°43'29.16", in Tierra Amarilla Grant, on left bank 1.5 mi downstream from El Vado Dam, 2.8 mi upstream from Rio Nutrias, and 13 mi southwest of Tierra Amarilla. Datum of gage is 6,696.12 ft above National Geodetic Vertical Datum of 1929. Prior to October 1935, at site 1.5 mi upstream at different datum. October 1935 to September 1938, at site 1.1 mi upstream at datum 30.34 ft higher.

Drainage area. -- 877 sq mi of which about 100 sq mi is probably noncontributing.

Average discharge. -- 4 years (1914, 1921-1923), 448 ft^3/s (324,600 acre-ft per year), prior to completion of El Vado Dam; 35 years (1936-1970), 373 ft^3/s (270,200 acre-feet per year), prior to release of transmountain water; 46 years (1971-2019) 457 ft^3/s (330,900 acre-feet per year).

Extremes. -- 1914-1916, 1920-1924, 1936-2019; Maximum discharge observed, 9,000 ft^3/s May 22, 1920 (gage height, 12 ft); no flow Mar. 25, 26, 31, 1955.

Remarks. -- Records good except for estimated discharges, which are fair. Flow regulated by El Vado Reservoir since 1935. Flow affected by release of transmountain water from Heron Reservoir since May 1971. Diversions for irrigation of about 10,600 acres upstream from station.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	794	26	26	26	1,575
February	775	43	26	28	1,536
March	6,670	789	28	215	13,229
April	33,202	2,860	373	1,107	65,856
May	49,337	3,150	790	1,592	97,860
June	33,694	1,340	794	1,123	66,832
July	15,468	961	132	499	30,681
August	15,544	801	121	501	30,832
September	21,018	802	414	701	41,689
October	18,472	750	201	596	36,639
November	28,404	1,210	619	947	56,339
December	8,551	646	108	276	16,961
Calendar year 2019	231,928	3,150	26	635	460,029

Rio Chama below Abiquiu Dam, N. Mex.

Location. -- Water-stage recorder with satellite telemetry, lat 36°14'14", long 106°25'02.7", on right bank 0.8 mi downstream from Abiquiu Dam and 5.9 mi northwest of Abiquiu. Altitude of gage is 6,040 ft above National Geodetic Vertical Datum of 1929 (from river-profile map and topographic map).

Drainage area. -- 2,147 sq mi, of which about 100 sq mi is probably noncontributing.

Average discharge. -- 9 years (1962-1970), 384 ft^3/s (278,200 acre-ft per year), prior to release of transmountain water; 49 years (1971-2019), 504 ft^3/s (364,900 acre-feet per year).

Extremes. -- 1961-2019; Maximum discharge, 2,990 ft^3/s July 1, 1965 (gage height, 6.69 ft); minimum, about 0.5 ft^3/s Mar. 17, 1966, Jan. 28, 1972.

Remarks. -- Records good except for estimated discharges, which are poor. Flow regulated by El Vado and Abiquiu reservoirs since Feb. 1963. Since May 1971, flow affected by release of transmountain water from Heron Reservoir. Diversions for irrigation of about 17,600 acres upstream from station.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	3,890	185	40	125	7,715
February	4,588	293	99	164	9,101
March	15,412	959	147	497	30,570
April	35,796	1,520	783	1,193	71,001
May	53,170	1,740	1,520	1,715	105,463
June	48,300	1,740	1,410	1,610	95,803
July	16,959	1,430	185	547	33,638
August	7,375	448	141	238	14,628
September	11,931	558	226	398	23,665
October	19,753	807	348	637	39,180
November	29,873	1,320	663	996	59,253
December	7,002	735	51	226	13,889
Calendar year 2019	254,049	1,740	40	696	503,907

Rio Nambe below Nambe Falls Dam, near Nambe, N. Mex.

Location. -- Water-stage recorder with satellite telemetry, lat 35°50'46", long 105°54'35", on Nambe Indian Reservation, in outlet conduits at Nambe Falls Dam, 300 ft upstream from Nambe Falls, 2.6 mi upstream from confluence of Rio Nambe and Rio En Medio, 4.4 mi southeast of Nambe Pueblo, and 5.4 mi southeast of Nambe. Datum of gage is 6,840 ft above National Geodetic Vertical Datum of 1929, from topographic map.

Drainage area. -- 34.1 sq mi.

Average discharge. -- -- 41 years (1979-2019), 12.6 ft^3/s (9,140 acre-feet per year).

Extremes. -- 1979-2019; Maximum discharge, 312 ft^3/s June 9, 1979 at site 1,100 ft downstream; no flow December 31, 1993.

Remarks. -- Records good except for estimated discharges, which are poor. Flow completely regulated by Nambe Falls Reservoir.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	37	1	1	1	74
February	72	4	1	3	142
March	463	36	4	15	918
April	924	43	21	31	1,834
May	1,017	41	26	33	2,018
June	1,175	54	22	39	2,331
July	456	21	10	15	903
August	396	19	5	13	786
September	375	19	5	13	744
October	63	13	1	2	125
November	23	1	1	1	45
December	28	1	1	1	55
Calendar year 2019	5,029	54	1	14	9,975

Rio Grande at Otowi Bridge, near San Ildefonso, N. Mex.

Location. -- Water-stage recorder with satellite telemetry, lat 35°52'28.2", long 106°08'32.8", in San Ildefonso Pueblo Grant, 400 ft downstream from bridge on State Highway 502, 1.8 mi southwest of San Ildefonso Pueblo, 2.5 mi downstream from Pojoaque River, and 6.8 mi west of Pojoaque. Datum of gage is 5,491.66 ft above North American Vertical Datum of 1988, from global navigation satellite system survey. Prior to May 19, 1904, and July 25 to Oct 1, 1904, staff gage at site 180 ft upstream at datum 2.02 ft lower.

Drainage area. -- 14,300 sq mi, approximately (includes 2,940 sq mi in closed basin in San Luis Valley, Colo.).

Average discharge. -- 120 years (1896-1905, 1910-2019), 1,477 ft^3/s (1,070,000 acre-feet per year).

Extremes. -- 1895-1905, 1910-2019; Maximum discharge, 24,400 ft^3/s May 23, 1920 (gage height, 14.1 ft); minimum daily, 195 ft^3/s Aug. 4, 1977.

Remarks. -- Records good except for estimated discharges, which are poor. Considerable regulation by Heron, El Vado, and Abiquiu reservoirs on Rio Chama. Flow affected by release of transmountain water from Heron Reservoir since May 1971. Diversions upstream from station for irrigation of about 620,000 acres in Colorado and 75,000 acres in New Mexico.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	17,376	619	405	561	34,465
February	18,700	876	558	668	37,091
March	40,841	2,060	818	1,317	81,008
April	78,590	5,170	1,490	2,620	155,883
May	145,310	5,670	3,840	4,687	288,222
June	160,860	6,540	3,830	5,362	319,066
July	88,020	4,950	1,540	2,839	174,588
August	39,397	1,780	869	1,271	78,144
September	25,388	1,030	642	846	50,357
October	29,644	1,090	645	956	58,799
November	42,889	1,920	982	1,430	85,070
December	26,262	1,370	476	847	52,091
Calendar year 2019	713,277	6,540	405	1,954	1,414,785

Santa Fe River near Santa Fe, N. Mex.

Location. -- Water-stage recorder with satellite telemetry and concrete control, lat 35°41'11.2", long 105°50'37", in Santa Fe National Forest, on left bank 0.4 mi downstream from McClure Dam, and 5.3 mi east of Santa Fe at mile 36.6. Altitude of gage is 7,720 ft above National Geodetic Vertical Datum of 1929, from topographic map. Prior to Nov. 4, 1930, at site 1.5 mi downstream, and Apr. 11, 1931 to Sept. 30, 1947, at site 0.3 mi upstream, each at different datum.

Drainage area. -- 18.2 sq mi.

Average discharge. -- 107 years (1913-2019), 7.8 ft^3/s (5,600 acre-feet per year).

Extremes. -- 1913-2019; Maximum discharge, 1,500 ft^3/s Aug. 14, 1921 (gage height, 5.17 ft); from rating curve extended above 150 ft^3/s; no flow at times.

Remarks. -- Records good. Flow regulated by McClure Reservoir, completed in 1926, raised in 1935, 1947 and again in 1989.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	152	5	4	5	301
February	106	5	2	4	210
March	376	26	4	12	746
April	982	36	27	33	1,948
May	620	36	2	20	1,230
June	377	17	2	13	747
July	444	20	5	14	881
August	531	20	14	17	1,053
September	363	17	6	12	721
October	60	7	0	2	119
November	146	6	4	5	289
December	95	4	3	3	189
Calendar year 2019	4,251	36	0	12	8,433

Rio Grande below Cochiti Dam, N. Mex.

Location. -- Water-stage recorder with satellite telemetry, lat 35°37'04.8", long 106°19'26.2", in Pueblo de Cochiti Grant, 320 ft upstream from bridge on State Highway 22, 700 ft downstream from Cochiti Dam, and 1.4 mi northeast of Cochiti Pueblo, and at mile 1,587.6. Datum of gage is 5,229.01 ft above North American Vertical Datum of 1988. Prior to Nov. 14, 1973, at site 2.4 mi downstream at altitude 5,210 ft, from topographic map. Nov. 14, 1973 to Jan. 8, 1976, at site 320 ft downstream at datum 1.79 ft lower.

Drainage area. -- 14,900 sq mi, approximately (includes 2,940 sq mi in closed basin in San Luis Valley, Colo.).

Average discharge. -- 49 years (1971-2019), 1,273 ft^3/s (923,000 acre-feet per year).

Extremes. -- 1971-2019; Maximum discharge, 10,300 ft^3/s July 26, 1971 (gage height, 7.90 ft) at site 2.4 mi downstream prior to closure of Cochiti Dam; from rating curve extended above 2,600 ft^3/s; minimum discharge 0.51 ft^3/s Aug. 3-5, 1977, Aug. 27-28, 1978.

Remarks. -- Records good except for estimated discharges, which are poor. Discharges include flow of Santa Fe River, which is intercepted by Cochiti Dam and released through the combined outlet works. Flow regulated by Cochiti Dam since Nov. 12, 1973. Diversions upstream from station for irrigation of about 620,000 acres in Colorado and about 81,000 acres in New Mexico. Cochiti Eastside Main canal, on left bank, and Sili Main canal, on right bank, head at Cochiti Dam and bypass gage for irrigation of about 6,000 acres downstream from station.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	15,419	618	334	497	30,584
February	16,669	865	446	595	33,063
March	39,250	2,010	653	1,266	77,852
April	71,930	4,340	1,260	2,398	142,673
May	143,030	5,360	3,610	4,614	283,700
June	153,920	6,170	3,620	5,131	305,300
July	83,500	4,530	1,450	2,694	165,622
August	35,655	1,870	805	1,150	70,722
September	20,722	901	555	691	41,102
October	24,764	905	548	799	49,119
November	40,463	1,940	874	1,349	80,258
December	24,926	1,450	337	804	49,441
Calendar year 2019	670,248	6,170	334	1,836	1,329,437

Galisteo Creek below Galisteo Dam, N. Mex.

Location. -- Water-stage recorder with satellite telemetry, lat 35°27'52.75", long 106°12'48.2", in Mesita de Juana Lopez Grant, on right bank 0.4 mi downstream from Galisteo Dam, 5.3 mi northwest of Cerrillos, and at mile 11.4. Elevation of gage is 5,450 ft above National Geodetic Vertical Datum of 1929, from topographic map. Prior to Dec. 21, 1981, at site 1,200 ft downstream at different datum.

Drainage area. -- 596 sq mi.

Average discharge. -- 49 years (1971-2019), 5.0 ft^3/s (3,610 acre-feet per year).

Extremes. -- 1970-2019; Maximum discharge, 3,460 ft^3/s Aug. 24, 1997 (gage height, 5.57 ft); no flow many days each year.

Remarks. -- Records fair. Flow regulated by Galisteo Reservoir 0.4 mi upstream. Diversions for irrigation of about 50 acres above reservoir.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	0	0	0	0	1
February	0	0	0	0	0
March	41	7	0	1	82
April	1	0	0	0	1
May	0	0	0	0	0
June	0	0	0	0	0
July	13	8	0	0	25
August	362	189	0	12	718
September	2	2	0	0	4
October	2	1	0	0	3
November	0	0	0	0	0
December	0	0	0	0	0
Calendar year 2019	420	189	0	1	834

Jemez River Outlet below Jemez Canyon Dam, N. Mex.

Location. -- Water-stage recorder with satellite telemetry, lat 35°23'41", long 106°32'41", in NE1/4 SW1/4 SW1/4 sec. 32, T. 14 N., R. 4 E., gage located at outlet pipe for Jemez Canyon Dam, 0.7 mi upstream from prior gage location. Elevation of gage is 5,162 ft above National Geodetic Vertical Datum of 1929, from topographic map. Gage replaces Jemez River below Jemez Canyon Dam. Discharge records for two gages are comparable except the period 2002-2009, when original gage was affected by siltation.

Drainage area. -- 1,034 sq mi.

Average discharge. -- 10 years (2010-2019), 36.7 ft^3/s (26,620 acre-feet per year).

Extremes. -- 2010-2019; Maximum discharge, 1,420 cfs Jul. 27, 2013 (gage height, 4.82); no flow many days each year.

Remarks. -- Records fair except for estimated discharges, which are poor. Flow regulated by Jemez Canyon Dam since October 1953. Diversions for irrigation of about 3,000 acres above station.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	427	37	2	14	846
February	387	28	7	14	767
March	5,873	632	23	189	11,650
April	10,104	524	220	337	20,041
May	7,684	550	120	248	15,241
June	1,825	176	0	61	3,620
July	123	65	0	4	244
August	308	262	0	10	612
September	4	2	0	0	8
October	53	31	0	2	106
November	172	28	0	6	342
December	290	27	1	9	575
Calendar year 2019	27,250	632	0	75	54,051

Rio Grande below Elephant Butte Dam, N. Mex.

Location. -- Water-stage recorder with satellite telemetry, lat 33°08'54.64", long 107°12'24.42", in Pedro Armendariz Grant, on left bank 1.0 mi downstream from dam, 1.5 mi upstream from Cuchillo Negro River. Datum of gage is 4,243.22 ft above North American Vertical Datum of 1988. Prior to Mar. 24, 1980, at datum 1.0 ft higher. Prior to April 24, 1942, at several different sites and datums.

Drainage area. -- 29,450 sq mi approximately (includes 2,940 sq mi in closed basin in San Luis Valley, Colo.).

Average discharge. -- 105 years (1915-2019), 962 ft^3/s (696,800 acre-feet per year).

Extremes. -- 1915-2019; Maximum daily discharge, 8,220 ft^3/s May 22, 1942; no flow at times.

Remarks. -- Records good except for estimated discharges, which are poor. Flow regulated by Elephant Butte Reservoir. Diversions for irrigation of about 800,000 acres above station.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	11	0	0	0	22
February	9	1	0	0	18
March	1,439	624	0	46	2,854
April	2	2	0	0	4
May	20,951	2,160	0	676	41,556
June	66,590	2,360	1,910	2,220	132,081
July	66,680	2,230	2,000	2,151	132,260
August	60,920	2,260	1,350	1,965	120,835
September	18,156	1,370	490	605	36,012
October	3,153	591	0	102	6,254
November	28	8	0	1	56
December	23	1	1	1	46
Calendar year 2019	237,962	2,360	0	643	471,998

Rio Grande below Caballo Dam, N. Mex.

Location. -- Water-stage recorder, lat 32°53'05.68", long 107°17'33.71", on left bank 2,000 ft upstream from Interstate Highway 25, 4,200 ft downstream from Caballo Dam, 1.2 mi downstream from Apache Canyon 1.3 mi upstream from Percha diversion dam, and 3 mi northeast of Arrey. Datum of gage is 4,133.19 ft above North American Vertical Datum of 1988. October 13, 1938 to December 31, 1945, at datum 5.0 ft higher.

Drainage area. -- 30,700 sq mi, approximately (includes 2,940 sq mi in closed basin in San Luis Valley, Colo.).

Average discharge. -- 82 years (1938-2019), 888 ft^3/s (643,300 acre-feet per year).

Extremes. -- 1938-2019; Maximum daily discharge, 7,650 ft^3/s May 20, 1942; minimum daily, 0.0 ft^3/s May 9-15, 2012 and Oct 3, 2012.

Remarks. -- Records good. Flow regulated by Elephant Butte Reservoir and Caballo Reservoirs. Diversions for irrigation of about 800,000 acres above station.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	21	1	1	1	41
February	19	1	1	1	38
March	25	1	1	1	50
April	29	1	1	1	58
May	3,547	1,890	1	114	7,035
June	69,139	2,710	1,755	2,305	137,137
July	68,269	2,454	1,882	2,202	135,412
August	56,692	2,239	787	1,829	112,449
September	25,666	1,148	595	856	50,909
October	5,426	596	1	175	10,762
November	23	1	1	1	45
December	21	1	1	1	42
Calendar year 2019	228,877	2,710	1	627	453,978

Bonito Ditch below Caballo Dam, N. Mex.

Records available. -- January 1938 to current year. Published as supplementary data with Rio Grande below Caballo Dam in USGS Water-Supply Papers and Water-Data Reports from October 1947 until September, 2005.

Remarks. -- Ditch diverts directly from Caballo Reservoir for irrigation of lands on right bank of river. The total release from Project Storage, as used in computations of Compact Commission, is the combined flow of this ditch and Rio Grande below Caballo Dam.

Diversion, in acre-ft

January	60.9
February	51.1
March	86.9
April	96.8
May	142.2
June	118.9
July	59.2
August	119.8
September	126.2
October	25.7
November	0.0
December	0.0
Calendar year 2019	887.7

STORAGE IN RESERVOIRS

Reservoirs in Rio Grande Basin in Colorado
(constructed or enlarged since 1937)

Squaw Lake. – Staff gage in sec. 12, T. 39 N., R. 4 W., on tributary to Squaw Creek. Completed in 1938; capacity, 162 acre-ft by 1953 survey. Water is used for irrigation below gaging station on Rio Grande near Del Norte.

Month-end gage height, in feet, and contents, in acre-feet

Calendar Year 2019

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal. Yr.
Gage height	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	-
Contents	162	162	162	162	162	162	162	162	162	162	162	162	-
Change	0	0	0	0	0	0	0	0	0	0	0	0	0

Rito Hondo Reservoir. – Staff gage in sec. 22, T. 42 N., R. 3 W., on Rito Hondo (Deep Creek) tributary to Clear Creek. Completed in 1957; capacity, 561 acre-ft. Originally filled during May and June 1958 with transmountain water; storage is not in debit status. Water is used for fish culture.

Month-end gage height, in feet, and contents, in acre-feet

Calendar Year 2019

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal. Yr.
Gage height	30.0	30.0	30.0	30.0	30.0	30.0	30.0	0.0	0.0	0.0	0.0	15.6	-
Contents	561	561	561	561	561	561	561	0	0	0	0	142	-
Change	0	0	0	0	0	0	0	-561	0	0	0	+142	-419

Hermit Lakes Reservoir No.3. – In sec. 25, T. 41 N., R. 4 W., on South Clear Creek. Completed prior to 1960; capacity, 192 acre-ft. Capacity table based on elevation above bottom of outlet. Water is used for fish culture. Includes 169 acre-feet of transmountain water by exchange in 1984 and 23 acre-ft of transmountain water by exchange in 1985.

Month-end gage height, in feet, and contents, in acre-feet

Calendar Year 2019

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal. Yr.
Gage height	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	-
Contents	192	192	192	192	192	192	192	192	192	192	192	192	-
Change	0	0	0	0	0	0	0	0	0	0	0	0	0

Troutvale No. 2 Reservoir. – Staff gage in E1/2 sec. 10, T. 41 N., R. 3 W., on South Clear Creek. Completed in 1940; capacity, 435 acre-ft. Condition of spillway limited storage to 168 acre-ft after May 1942. Repairs to spillway in 1947 increased capacity to 257 acre-ft. Water is used for fish culture with only occasional sale for irrigation. Storage omitted from accounting by action of Commission on Feb. 15, 1962.

Month-end gage height, in feet, and contents, in acre-feet

Calendar Year 2019

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal. Yr.
Gage height	0.0	0.0	0.0	0.0	0.0	0.0	6.9	6.9	6.9	6.9	6.9	6.9	-
Contents	0	0	0	0	0	0	213	213	213	213	213	213	-
Change	0	0	0	0	0	0	+213	0	0	0	0	0	+213

STORAGE IN RESERVOIRS

Reservoirs in Rio Grande Basin in Colorado
(constructed or enlarged since 1937)

Jumper Creek Reservoir. – In sec. 5, T. 39 N., R. 2 W., on Jumper Creek, tributary to Trout Creek. Completed in 1951; capacity, 38 acre-ft. Capacity table based on elevation above bottom of outlet. Storage omitted from accounting by action of Commission on Feb. 15, 1962.

Month-end gage height, in feet, and contents, in acre-feet

Calendar Year 2019

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal. Yr.
Gage height	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	-
Contents	38	38	38	38	38	38	38	38	38	38	38	38	-
Change	0	0	0	0	0	0	0	0	0	0	0	0	0

Big Meadows Reservoir. – In NW1/4 sec. 17, T. 38 N., R. 2 E., on South Fork about 0.9 mi upstream from Hope Creek. Completed in 1967; capacity, 2,437 acre-ft. Capacity table based on elevation above outlet. Water is used for fish culture. Includes 140 acre-ft of transmountain water, by exchange, in 1967; 838 acre-ft, by exchange, in 1968; 347 acre-ft, by exchange, in 1969; and 1,112 acre-ft, by exchange, in 1983, for a total of 2,437 acre-ft.

Month-end gage height, in feet, and contents, in acre-feet

Calendar Year 2019

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal. Yr.
Gage height	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	-
Contents	2,437	2,437	2,437	2,437	2,437	2,437	2,437	2,437	2,437	2,437	2,437	2,437	-
Change	0	0	0	0	0	0	0	0	0	0	0	0	0

Alberta Park Reservoir. – In sec. 34, T. 38 N., R. 2 E., on Pass Creek. Completed in 1953; capacity, 598 acre-ft. Capacity table based on elevation above bottom of outlet. Storage prior to June 30, 1983 included 244 acre-ft of transmountain water imported in 1963. By a 1983 resolution of the Rio Grande Compact Commission, the reservoir was drained for repairs in July 1983; recovery was completed in 1984. The reservoir also contains 100 acre-ft of transmountain water stored by exchange in 1983 and 254 acre-ft of transmountain water stored in 1984.

Month-end gage height, in feet, and contents, in acre-feet

Calendar Year 2019

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal. Yr.
Gage height	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	-
Contents	598	598	598	598	598	598	598	598	598	598	598	598	-
Change	0	0	0	0	0	0	0	0	0	0	0	0	0

Shaw Lake Enlargement. – sec. 5, T. 38 N., R. 2 E., on tributary to Lake Creek. Capacity, 638 acre-ft by 1916 decree; enlarged in 1955 to 681 acre-ft. Only the storage in excess of 638 acre-ft is subject to terms of Rio Grande Compact. Includes 42 acre-ft of transmountain water imported in 1965.

Month-end gage height, in feet, and contents, in acre-feet

Calendar Year 2019

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal. Yr.
Gage height	-	-	-	-	-	-	-	-	-	-	-	-	-
Contents	42	42	42	42	42	42	42	42	42	42	42	42	-
Change	0	0	0	0	0	0	0	0	0	0	0	0	0

STORAGE IN RESERVOIRS

Reservoirs in Rio Grande Basin in Colorado
(constructed or enlarged since 1937)

Mill Creek Reservoir. – In sec. 16, T. 39 N., R. 3 E., on Mill Creek. Completed in 1953; capacity, 43 acre-ft. Capacity based on elevation above bottom of outlet. Includes 43 acre-ft of transmountain water, by exchange, in 1976.

Month-end gage height, in feet, and contents, in acre-feet

Calendar Year 2019

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal. Yr.
Gage height	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	-
Contents	41	41	41	41	41	41	41	41	41	41	41	41	-
Change	0	0	0	0	0	0	0	0	0	0	0	0	0

Fuchs Reservoir. – Staff gage in sec. 2, T. 37 N., R. 4 E., on East Pinos Creek. Completed in 1939; capacity, 237 acre-ft with 2 ft of flash boards in spillway. Prior to calendar year 1999, contents reported as 238 acre-ft were actually 237 acre-ft. Pinos Creek enters Rio Grande below station near Del Norte.

Month-end gage height, in feet, and contents, in acre-feet

Calendar Year 2019

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal. Yr.
Gage height	10.4	13.3	17.2	17.2	17.2	17.2	17.2	17.2	13.8	7.3	9.8	12.0	-
Contents	55	118	174	237	237	237	237	237	164	55	91	128	-
Change	+63	+56	+63	0	0	0	0	0	-73	-109	+36	+37	+73

Platoro Reservoir. – Water-stage recorder in NW1/4 sec. 22, T. 36 N., R. 4 E., on Conejos River. Completed in 1951; capacity, 59,570 acre-ft at crest of spillway. Reservoir is used for irrigation and flood control. Storage affects Conejos Index Supply. Contents include 3,000 acre-ft of transmountain water stored by exchange in April 1985 on behalf of the Colorado Division of Wildlife.

Month-end elevation, in feet, and contents, in acre-feet

Date	Elevation	Contents	Change in contents
December 31, 2018	9,981.32	19,079	-
January 31, 2019	9,981.29	19,064	-15
February 28	9,981.57	19,223	+159
March 31	9,980.96	18,896	-327
April 30	9,981.63	19,256	+360
May 31	9,980.59	18,672	-584
June 30	10,023.48	49,800	+31,128
July 31	10,018.95	45,884	-3,916
August 31	10,005.74	35,178	-10,706
September 30	9,992.60	25,924	-9,254
October 31	9,985.16	21,297	-4,627
November 30	9,981.96	19,439	-1,858
December 31, 2019	9,980.46	18,599	-840
Calendar year 2019	-	-	-480

Trujillo Meadows Reservoir. – In sec. 5, T. 32 N., R. 5 E., on Los Pinos River. Completed in 1957; capacity, 869 acre-ft, effective Jan. 1, 1999. Water is used for fish culture. Storage is transmountain water, by exchange, in 1959.

Month-end gage height, in feet, and contents, in acre-feet

Calendar Year 2019

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal. Yr.
Gage height	1.6	1.6	1.6	1.6	24.6	24.6	24.6	24.6	24.6	24.6	24.6	24.6	-
Contents	0	0	0	0	869	869	869	869	869	869	869	869	-
Change	0	0	0	0	+869	0	0	0	0	0	0	0	+869

STORAGE IN RESERVOIRS

Reservoirs in Rio Grande Basin in New Mexico
(constructed or enlarged since 1929)

Heron Reservoir. – Water-stage recorder with satellite telemetry, lat 36°39'56", long 106°42'13", on Willow Creek. Storage began in October 1970. Capacity, 401,300 acre-ft at elevation 7,186.1 ft (low point on crest of spillway); dead storage, 1,340 acre-ft at elevation 7,003.0 ft. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Used for storage of transmountain water.

Month-end elevation, in feet, and contents, in acre-feet

Date	Elevation	Contents	Change in contents
December 31, 2018	7,090.61	56,308	-
January 31, 2019	7,090.48	56,124	-184
February 28	7,090.92	56,749	+625
March 31	7,092.59	59,175	+2,426
April 30	7,105.48	81,151	+21,976
May 31	7,120.34	115,733	+34,582
June 30	7,137.50	169,624	+53,891
July 31	7,143.78	193,079	+23,455
August 31	7,137.25	168,731	-24,348
September 30	7,128.30	138,890	-29,841
October 31	7,126.90	134,590	-4,300
November 30	7,125.98	131,818	-2,772
December 31, 2019	7,116.69	106,197	-25,621
Calendar year 2019	-	-	+49,889

El Vado Reservoir. – Water-stage recorder and surface follower, lat 36°35'39", long 106°44'00", on Rio Chama. Storage began in January 1935. Capacity, 186,250 acre-ft at gage height 6,902.0 ft (crest of spillway); dead storage, 480 acre-ft, below gage height 6,775.0 ft (invert of outlet works), as determined by survey in 1984. Datum of gage is 8.21 ft above National Geodetic Vertical Datum of 1929. Storage includes both Rio Grande and transmountain water.

Month-end gage height, in feet, and contents, in acre-feet

Date	Gage Height	Contents	Change in contents	Transmountain water
December 31, 2018	6,805.45	13,957	-	13,797
January 31, 2019	6,807.51	15,484	+1,527	12,779
February 28	6,809.99	17,429	+1,945	11,279
March 31	6,820.78	27,221	+9,792	9,522
April 30	6,825.44	32,076	+4,855	9,481
May 31	6,848.04	62,285	+30,209	9,466
June 30	6,875.31	114,938	+52,653	6,344
July 31	6,870.59	104,153	-10,785	2,041
August 31	6,873.19	109,980	+5,827	7,510
September 30	6,869.08	100,890	-9,090	9,550
October 31	6,853.13	70,640	-30,250	11,801
November 30	6,812.99	19,940	-50,700	13,283
December 31, 2019	6,825.47	32,109	+12,169	31,718
Calendar year 2019	-	-	+18,152	-

STORAGE IN RESERVOIRS

Reservoirs in Rio Grande Basin in New Mexico
(constructed or enlarged since 1929)

Abiquiu Reservoir. -- Water-stage recorder, lat 36°14'24", long l06°25'44", on Rio Chama. Completed in February 1963; capacity, 1,192,800 acre-ft at elevation 6,350 feet (crest of spillway) by 1998 survey. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Reservoir is operated by Corps of Engineers for flood control and sediment storage. A resolution granting permission to store transmountain waters was approved by Rio Grande Compact Commission on May 3, 1974. Storage includes both Rio Grande and transmountain water.

Month-end elevation, in feet, and contents, in acre-feet

Date	Elevation	Contents	Change in contents	Transmountain water
December 31, 2018	6,187.13	78,078	-	76,735
January 31, 2019	6,184.69	72,176	-5,902	70,823
February 28	6,184.19	71,004	-1,172	68,793
March 31	6,180.77	63,308	-7,696	61,535
April 30	6,185.97	75,233	+11,925	55,984
May 31	6,189.66	84,547	+9,314	55,451
June 30	6,180.00	61,650	-22,897	57,388
July 31	6,178.31	58,104	-3,546	56,426
August 31	6,184.59	71,940	+13,836	70,074
September 30	6,190.63	87,124	+15,184	85,234
October 31	6,188.37	81,204	-5,920	79,429
November 30	6,187.13	78,078	-3,126	76,359
December 31, 2019	6,188.65	81,921	+3,843	79,453
Calendar year 2019	-	-	+3,843	-

Nambe Falls Reservoir. – Water-stage recorder, lat 35°50'46", long 105°54'17", in NE1/4SW1/4 sec. 29, T. 19 N., R. 10 E., in Nambe Indian Reservation, on Rio Nambe. Completed in 1976; capacity 1,920 acre-ft at elevation 6,826.6 feet (crest of spillway) by 2004 survey, dead storage 121 acre-ft at elevation 6,760.9 ft. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by Bureau of Reclamation). Storage is transmountain water by exchange (see resolution adopted March 27, 1975).

Month-end elevation, in feet, and contents, in acre-feet

Date	Elevation	Contents	Change in contents
December 31, 2018	6,821.25	1,447	-
January 31, 2019	6,824.13	1,595	+148
February 28	6,825.18	1,651	+56
March 31	6,826.75	1,737	+86
April 30	6,826.87	1,744	+7
May 31	6,826.82	1,741	-3
June 30	6,826.74	1,737	-4
July 31	6,825.65	1,676	-61
August 31	6,818.04	1,291	-385
September 30	6,806.60	825	-466
October 31	6,811.31	999	+174
November 30	6,816.59	1,224	+225
December 31, 2019	6,820.91	1,430	+206
Calendar year 2019	-	-	-17

Reservoirs in Rio Grande Basin in New Mexico
(constructed or enlarged since 1929)

McClure (Granite Point) Reservoir. – Water-stage recorder, lat 35°41'18", long l05°50'06", in NE1/4SW1/4 sec. 24, T. 17 N., R. 10 E., on Santa Fe River. Original reservoir completed in 1926, capacity, 561 acre-ft; in 1935, permanent flash boards were installed in spillway increasing capacity to 650 acre-ft; in 1947 both dam and spillway were reconstructed increasing capacity to 2,615 acre-ft (gage height, 96.6 ft, crest of spillway). In 1953 spillway was equipped with radial gates that opened automatically, increasing capacity to over 3,000 acre-ft. In 1972, radial gates were removed decreasing capacity to 2,615 acre-ft. In 1989, modifications to the dam and spillway increased capacity to 2,813 acre-ft. In 1995, modification to the dam and spillway increased capacity to 3,257 acre-ft. No dead storage. Elevation of gage is 7,800 ft above North American Vertical Datum of 1988 (levels by City of Santa Fe). Water is for municipal use in Santa Fe. Storage includes both Rio Grande water and transmountain water by exchange. Capacity includes 561 acre-ft for pre-Compact storage and additional capacity as may be available to accomodate up to a total of 1,061 acre-feet of pre-Compact storage in McClure and Nichols Reservoirs combined.

Month-end gage height, in feet, and contents, in acre-feet

Date	Gage height	Contents	Change in contents	Pre-Compact water	Transmountain water
December 31, 2018	7,864.22	1,554	-	1061	0
January 31, 2019	7,861.72	1,417	-137	630	0
February 28	7,862.02	1,433	+16	646	0
March 31	7,874.12	2,159	+726	602	0
April 30	7,874.03	2,155	-4	479	0
May 31	7,885.25	2,948	+793	647	0
June 30	7,886.55	3,044	+96	571	0
July 31	7,879.06	2,494	-550	602	0
August 31	7,866.82	1,702	-792	603	0
September 30	7,855.45	1,109	-593	322	0
October 31	7,854.97	1,087	-22	300	0
November 30	7,850.54	900	-187	113	0
December 31, 2019	7,848.79	833	-67	46	0
Calendar year 2019	-		-721		

Nichols Reservoir. – Water-stage recorder, lat 35°41'24", long l05°52'46", in SE1/4NE1/4 sec. 21, T. 17 N., R. 10 E., on Santa Fe River. Completed in 1942; capacity, 685 acre-ft at gage height 167.0 feet (crest of spillway), dead storage, 14 acre-ft at gage height 121.1 feet. Datum of gage is 7,400 ft above North American Vertical Datum of 1988 (levels by City of Santa Fe). Water is for municipal use in Santa Fe. Storage includes both Rio Grande water and transmountain water by exchange. Capacity may include pre-Compact storage such that total pre-Compact storage in McClure and Nichols Reservoirs combined does not exceed 1,061 acre-ft.

Month-end gage height, in feet, and contents, in acre-feet

Date	Gage height	Contents	Change in contents	Pre-Compact water	Transmountain water
December 31, 2018	7,475.30	372	-	0	78
January 31, 2019	7,479.15	459	+87	381	78
February 28	7,477.22	415	-44	337	78
March 31	7,482.14	537	+122	459	78
April 30	7,486.67	660	+123	582	78
May 31	7,480.54	492	-168	414	78
June 30	7,483.31	568	+76	490	78
July 31	7,482.18	537	-31	459	78
August 31	7,482.13	536	-1	458	78
September 30	7,481.83	528	-8	450	78
October 31	7,472.68	321	-207	243	78
November 30	7,473.75	342	+21	264	78
December 31, 2019	7,473.63	339	-3	261	78
Calendar year 2019	-		-33		

STORAGE IN RESERVOIRS

Reservoirs in Rio Grande Basin in New Mexico
(constructed or enlarged since 1929)

Cochiti Lake. – Water-stage recorder with satellite telemetry, lat 35°37'01", long l06°18'58", in NW1/4SW1/4 sec. 16, T. 16 N., R. 6 E., in Pueblo de Cochiti Grant, on Rio Grande. Completed in l975; capacity 491,259 acre-ft at elevation 5,450.0 ft (crest of service spillway); zero storage at elevation 5,255.0 from 1998 survey. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by the U.S. Army Corps of Engineers). A 50,000 acre-foot permanent pool was authorized by Public Law 88-293, 88th Congress, March 26, 1964. Reservoir is operated by Corps of Engineers for flood control, sediment storage, and recreation. Storage began Nov. 12, 1973.

Month-end elevation, in feet, and contents, in acre-feet

Date	Elevation	Contents	Change in contents	Transmountain water
December 31, 2018	5,340.71	43,634	-	42,523
January 31, 2019	5,342.04	45,079	+1,445	42,679
February 28	5,343.01	46,176	+1,097	43,216
March 31	5,342.47	45,559	-617	43,029
April 30	5,348.41	53,510	7,951	43,566
May 31	5,342.81	45,946	-7564	43,217
June 30	5,343.13	46,316	+370	42,779
July 31	5,343.36	46,586	+270	42,411
August 31	5,342.70	45,820	-766	42,027
September 30	5,342.03	45,067	-753	41,661
October 31	5,342.86	46,003	+936	42,560
November 30	5,342.93	46,084	+81	42,507
December 31, 2019	5,344.02	47,383	+1,299	44,067
Calendar year 2019	-	-	+3,749	-

Galisteo Reservoir. – Water-stage recorder above elevation 5,500.3 ft, nonrecording below, lat 35°27'44", long 106°12'30", in NW1/4 sec. 9, T. 14 N., R. 7 E., on Galisteo Creek. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Storage records begin in October 1970. Capacity 88,990 acre-ft at elevation 5,608.0 ft (crest of spillway). No dead storage. Reservoir is operated by Corps of Engineers for flood control and sediment storage.

Month-end contents, in acre-feet

Calendar Year 2019

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal. Yr.
Contents	0	0	0	0	0	0	0	0	0	0	0	0	0
Change	0	0	0	0	0	0	0	0	0	0	0	0	0

STORAGE IN RESERVOIRS

Reservoirs in Rio Grande Basin in New Mexico
(constructed or enlarged since 1929)

Jemez Canyon Reservoir. – Water-stage recorder, lat 35°23'40", long l06°32'50", in SW1/4SW1/4 sec. 32, T. 14 N., R. 4 E., on Jemez River. Completed in 1953; capacity, 259,423 acre-ft at elevation 5,271.20 ft. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Maximum controlled capacity at elevation 5,232.0 ft (floor of spillway) is 97,425 acre-ft by 1998 survey. Reservoir is operated by Corps of Engineers for flood control and sediment storage. A sediment pool of about 2,000 acre-ft of transmountain water has been maintained since August l979.

Month-end elevation, in feet, and contents, in acre-feet

Date	Elevation	Contents	Change in contents	Transmountain water
December 31, 2018	5,133.00	0	-	0
January 31, 2019	5,133.00	0	0	0
February 28	5,133.00	0	0	0
March 31	5,133.00	0	0	0
April 30	5,133.00	0	0	0
May 31	5,133.00	0	0	0
June 30	5,133.00	0	0	0
July 31	5,133.00	0	0	0
August 31	5,133.00	0	0	0
September 30	5,133.00	0	0	0
October 31	5,133.00	0	0	0
November 30	5,133.00	0	0	0
December 31, 2019	5,133.00	0	0	0
Calendar year 2019	-	-	0	-

Acomita Reservoir. – Staff gage in SE1/4 sec. 29, T. 10 N., R. 7 W., on San Fidel Arroyo; water for reservoir is diverted from Rio San Jose. Completed in 1938; original capacity, 850 acre-ft; present capacity 650 acre-ft on basis of 1956 sediment survey. Water is used for irrigation on Acoma Indian Reservation. Storage omitted from accounting by action of Commission on March 23, 2000.

Month-end contents, in acre-feet

Calendar Year 2019

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal. Yr.
Contents	-	-	-	-	-	-	-	-	-	-	-	-	-
Change	-	-	-	-	-	-	-	-	-	-	-	-	-

Seama Reservoir. – In sec. 36, T. 10 N., R. 7 W., off channel from Rio San Jose. Completed in October 1980; capacity approximately 400 acre-ft. Water is used for irrigation on Laguna Indian Reservation.

No storage during 2019.

STORAGE IN RESERVOIRS

Reservoirs in Rio Grande Basin in New Mexico
(project storage)

Elephant Butte Reservoir. – Water-stage recorder, lat 33°09'15", long l07°11'28", in NW1/4 sec. 30, T. 13 S., R. 3 W., on Rio Grande. Storage began Jan. 6, 1915; capacity, 2,023,400 acre-ft at gage height 4,407.0 ft (crest of spillway), by survey of 1999 with flood control storage reservation of 50,000 acre-ft from April through September and 25,000 acre-ft from October through March in accordance with Sept. 9, 1998 resolution of the Rio Grande Compact Commission. Datum of gage is 43.3 ft above National Geodetic Vertical Datum of 1929. Water is used for power development and irrigation in New Mexico and Texas. Records furnished by Bureau of Reclamation. Delivery of transmountain water for minimum recreation pool was initiated in December 1975. Beginning Jan. 1, 1977 gage readings are midnight readings.

Month-end gage height, in feet, and contents, in acre-feet

Date	Gage Height	Contents	Change in contents	Transmountain water
December 31, 2018	4,298.21	114,872	-	0
January 31, 2019	4,303.08	143,422	+28,550	0
February 28	4,307.31	170,780	+27,358	0
March 31	4,314.01	219,618	+48,838	5,256
April 30	4,324.76	317,257	+97,639	6,727
May 31	4,339.61	486,271	+169,014	3,749
June 30	4,344.47	551,319	+65,048	1,026
July 31	4,343.88	543,182	-8,137	861
August 31	4,337.45	458,876	-84,306	851
September 30	4,334.94	428,293	-30,583	841
October 31	4,335.58	435,963	+7,670	832
November 30	4,340.69	500,336	+64,373	195
December 31, 2019	4,344.90	557,291	+56,955	194
Calendar year 2019	-	-	+442,419	-

Caballo Reservoir. – Water-stage recorder, lat 32°53'47", long l07°17'30", in SE1/4SW1/4 sec. 19, T. 16 S., R. 4 W., on Rio Grande. Storage began Feb. 8, 1938; capacity, 326,700 acre-ft (by 1999 resurvey), at gage height 4,182.0 ft (above which spillway gates open automatically). Datum of gage is 43.3 ft above National Geodetic Vertical Datum of 1929.

Month-end gage height, in feet, and contents, in acre-feet

Date	Gage height	Contents	Change in contents
December 31, 2018	4,139.18	26,735	-
January 31, 2019	4,139.44	27,402	+667
February 28	4,139.57	27,738	+336
March 31	4,140.83	31,140	+3,402
April 30	4,140.66	30,664	-476
May 31	4,147.83	55,733	+25,069
June 30	4,145.86	47,752	-7,981
July 31	4,144.11	41,411	-6,341
August 31	4,145.81	47,561	+6,150
September 30	4,141.34	32,601	-14,960
October 31	4,140.31	29,701	-2,900
November 30	4,141.18	32,137	+2,436
December 31, 2019	4,141.77	33,872	+1,735
Calendar year 2019	-	-	+7,137

STORAGE IN RESERVOIRS

Reservoirs in Rio Grande Basin in New Mexico
(project storage)

Project storage. – The combined total storage in Elephant Butte and Caballo Reservoirs.

Month-end contents, in acre-feet

Date	Contents	Change in contents
December 31, 2018	141,607	-
January 31, 2019	170,824	+29,217
February 28	198,518	+27,694
March 31	250,758	+52,240
April 30	347,921	+97,163
May 31	542,004	+194,083
June 30	599,071	+57,067
July 31	584,593	-14,478
August 31	506,437	-78,156
September 30	460,894	-45,543
October 31	465,664	+4,770
November 30	532,473	+66,809
December 31, 2019	591,163	+58,690
Calendar year 2019	-	+449,556

NOTE.-- Values of combined contents may not agree with sum of individual values because of rounding.

Pine River - Weminuche Pass ditch (Fuchs ditch).-- Water-stage recorder and 3-ft Parshall flume in sec. 33, T. 40 N., R. 4 W., at Weminuche Pass in Colorado. Diversion is from North Fork Los Pinos River in San Juan River Basin into Weminuche Creek in Rio Grande Basin. Second enlargement was completed in 1936. Diversion for irrigation is from Rio Grande above the Del Norte gaging station.

Weminuche Pass ditch (Raber-Lohr ditch).-- Water-stage recorder and 4-ft rectangular flume in sec. 33, T. 40 N., R. 4 W., at Weminuche Pass in Colorado. Diversion is from Rincon la Vaca Creek in San Juan River Basin into Weminuche Creek in Rio Grande Basin. Second enlargement was completed in 1936. Diversion for irrigation is from Rio Grande above the Del Norte gaging station.

Williams Creek - Squaw Pass ditch.-- Water-stage recorder and 2-ft Parshall flume in sec. 21, T. 39 N., R. 3 W., at Squaw Pass in Colorado. Diversion is from Williams Creek in San Juan River Basin into Squaw Creek in Rio Grande Basin. Constructed in 1938. Diversion for irrigation is from Rio Grande below Del Norte gaging station.

Tabor ditch.-- Water-stage recorder and 3-ft Parshall flume in sec. 35, T. 43 N., R. 3 W., at Spring Creek Pass in Colorado. Diversion is from Cebolla Creek in Gunnison River Basin into tributary of Clear Creek in Rio Grande Basin. Completed in 1910 or 1911. Diversion for irrigation is from Rio Grande below Del Norte gaging station.

Don La Font No. 1 & 2 ditches (Piedra Pass ditch).-- Water-stage recorder and 2-ft Parshall flume in sec. 4, T. 38 N., R. 1 W., at Piedra Pass in Colorado. Diversion is from tributaries of Piedra River in San Juan River Basin to South River in Rio Grande Basin. Original ditch completed in l938, first enlargement completed in 1940. Water is imported by Colorado Game and Fish Department, beginning in 1959, to offset losses from fish culture reservoirs.

Treasure Pass diversion ditch.-- Water-stage recorder and 2-ft Parshall flume in sec. 31, T. 38 N., R. 2 E., at Wolf Creek Pass in Colorado. Diversion is from Wolf Creek in San Juan River Basin to a tributary of South Fork Rio Grande. Completed in 1923 or 1924. Water is diverted for irrigation from Rio Grande above the Del Norte gaging station, beginning in 1959. Prior to 1959 it was diverted below gaging station.

Azotea tunnel.-- Water-stage recorder and 10-ft Parshall flume, lat 36°51’12", long 106°40’18", at south portal of Azotea tunnel, San Juan-Chama Project. Diversion is from Rio Blanco, Little Navajo River, and Navajo River in Colorado and discharge is into Azotea in New Mexico. Construction completed in 1970.

Imported quantities, in acre-feet, 2019

Month	Pine River-Weminuche Pass ditch	Weminuche Pass ditch	Williams Creek-Squaw Pass ditch	Tabor ditch	Don La Font ditches	Treasure Pass diversion ditch	Azotea tunnel
January	0	0	0	0	0	0	0
February	0	0	0	0	0	0	0
March	0	0	0	0	0	0	1,036
April	0	0	0	0	0	0	24,049
May	0	0	0	55	0	2	33,926
June	83	136	0	536	41	216	56,925
July	359	589	280	440	97	203	26,285
August	2	0	62	164	72	18	5,841
September	0	0	1	68	3	0	208
October	0	0	0	25	0	0	0
November	0	0	0	0	0	0	0
December	0	0	0	0	0	0	0
Calendar year	444	725	343	1,288	213	439	148,270

EVAPORATION AND PRECIPITATION

The last paragraph of Article VI of the Compact states, in part, --- "such credits and debits shall be reduced annually to compensate for evaporation losses in the proportion that such credits or debits bear to the total amount of water in such reservoirs during the year."

To provide the data needed for the computation of such evaporation losses, the Commission has encouraged the establishment and operation of evaporation stations near each major reservoir in the basin and at other selected locations.

Evaporation and other climatological data collected at the several stations in Colorado and New Mexico are tabulated on the next page. At some of the stations, it was not possible to obtain evaporation records throughout the winter period.

The measurements of evaporation were made in accordance with standard practice for the type of pan in use. Measurements of precipitation were made in standard 8-inch rain gages, which were supplemented at some of the stations by recording rain gages.

Records for the evaporation stations at the State University, Elephant Butte Dam, and El Vado Dam antedated the creation of the Commission; the stations at Abiquiu Dam, Cochiti Dam, and Jemez Canyon Dam were established by the Corps of Engineers. All others were established at the request of the Commission.

The Rio Grande Compact Commission gratefully acknowledges the cooperation of the National Oceanic and Atmospheric Administration, U.S. Army Corps of Engineers, and U.S. Bureau of Reclamation for furnishing the climatological records contained in this report.

Alamosa Airport.--Lat 37°27', long 105°52', in Alamosa County at airport near Alamosa, Colo. Standard class A pan, anemometer, maximum and minimum thermometers, standard 8-inch and recording rain gages at elevation 7,536 ft.

Platoro Dam.--Lat 37°21', long 106°30', in Conejos County near Platoro, Colo. Standard class A pan, anemometer, maximum and minimum thermometers, fan type psychrometer, standard 8-inch and recording rain gages at elevation 9,826 ft.

Heron Dam.--Lat 36°40', long 106°42', in Rio Arriba County about 4 mi. northeast of Heron Dam near Tierra Amarilla, N. Mex Standard class A pan, maximum and minimum thermometers, and standard 8-inch rain gage at elevation 7,310 ft.

El Vado Dam.--Lat 36°36', long 106°44', in Rio Arriba County at El Vado Dam near Tierra Amarilla, N. Mex. Standard class A pan, anemometer, maximum and minimum thermometers, standard 8-inch and recording rain gages at elevation 6,750 ft.

Abiquiu Dam.--Lat 36°14', long 106°26', in Rio Arriba County at Abiquiu Dam near Abiquiu, N. Mex. Standard class A pan, maximum and minimum thermometers, standard 8-inch and recording rain gages at elevation 6,380 ft.

Nambe Falls Dam.--Lat 35°51', long 105°54', in Santa Fe County at Nambe Falls Dam, N. Mex. Standard class A pan, maximum and minimum thermometers, recording thermograph, standard 8-inch and recording rain gages at elevation 6,840 ft.

Cochiti Dam.--Lat 35°38', long 106°19', in Sandoval County at operations building, at Cochiti Dam, N. Mex. Standard class A pan, anemometer, maximum and minimum thermometers, standard 8-inch and recording rain gages at elevation 5,560 ft.

Jemez Canyon Dam.--Lat 35°23', long 106°32', in Sandoval County at Jemez Canyon Dam, N. Mex. Standard class A pan, anemometer, maximum and minimum thermometers, standard 8-inch and recording rain gages at elevation 5,388 ft.

Elephant Butte Dam.--Lat 33°09', long 107°11', in Sierra County at Elephant Butte Dam, N. Mex. Standard class A pan, anemometer, maximum and minimum thermometers, and standard 8-inch rain gage at elevation 4,576 ft.

Caballo Dam.--Lat 32°54', long 107°18', in Sierra County at Caballo Dam, N. Mex. Standard class A pan, anemometer, maximum and minimum thermometers, standard 8-inch and recording rain gages at elevation 4,190 ft.

New Mexico State University.--Lat 32°17', long 106°45', in Doña Ana County at University Park, N. Mex. Standard class A pan, anemometer, maximum and minimum thermometers, standard 8-inch and recording rain gages at elevation 3,881 ft.

EVAPORATION AND PRECIPITATION

Evaporation and precipitation, in inches
2019

Station		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug	Sept.	Oct.	Nov.	Dec.	Annual
Alamosa	Evap.	-	-	-	-	-	-	-	-	-	-	-	-	-
Airport	Precip.	1.17	0.37	1.42	0.80	0.93	0.43	0.08	0.85	0.73	0.07	0.45	0.51	7.81
Platoro	Evap.	-	-	-	-	-	4.50	7.21	4.31	5.00	4.56	-	-	-
Dam	Precip.	-	-	-	-	-	1.29	3.74	2.02	0.90	0.63	-	-	-
Heron	Evap.	-	-	-	4.97	5.06	8.08	9.05	8.37	6.96	6.54	-	-	-
Dam	Precip.	2.39	3.49	2.73	1.35	3.08	0.96	1.74	1.29	1.17	0.14	2.08	2.21	22.63
El Vado	Evap.	-	-	-	5.65	5.64	8.52	8.80	8.10	6.49	5.91	-	-	-
Dam	Precip.	2.25	2.35	2.06	1.32	2.51	1.04	1.87	0.84	1.34	0.11	0.21	1.83	17.73
Abiquiu	Evap.	2.48	3.64	6.20	7.64	8.32	11.75	11.67	10.11	8.71	6.59	3.60	2.22	82.93
Dam	Precip.	0.42	0.87	1.22	1.24	1.10	0.16	2.57	0.97	0.69	0.15	0.37	1.49	11.25
Nambe	Evap.	-	-	-	6.63	8.51	10.54	9.96	9.74	7.90	5.60	-	-	-
Canyon Dam	Precip.	1.14	1.15	1.53	0.00	1.08	0.33	2.49	0.95	0.81	1.34	0.00	0.61	11.43
Cochiti	Evap.	2.79	4.14	7.13	8.56	7.38	8.73	8.93	9.01	7.71	5.71	3.99	2.83	76.91
Dam	Precip.	1.11	0.08	1.69	1.26	0.64	0.29	1.35	1.18	0.46	0.83	1.86	0.74	11.49
Jemez	Evap.	3.10	4.48	7.75	9.60	12.71	14.40	13.68	12.74	11.43	6.00	4.25	3.14	103.28
Canyon Dam	Precip.	0.31	0.08	0.76	0.90	0.57	0.07	0.64	0.68	0.55	0.60	1.88	0.46	7.50
Elephant	Evap.	4.23	6.99	9.92	13.50	17.16	18.90	16.59	14.26	12.06	11.06	5.02	3.14	132.83
Butte Dam	Precip.	1.35	0.00	0.32	0.06	0.26	0.71	0.00	0.36	0.96	0.60	3.36	0.18	8.16
Caballo	Evap.	3.85	5.98	9.09	12.65	15.02	16.61	15.80	13.48	11.30	9.29	6.67	2.99	122.73
Dam	Precip.	0.14	0.02	0.23	0.08	0.26	0.20	0.64	0.94	1.18	1.00	3.50	0.33	8.52
State	Evap.	3.65	5.43	7.94	9.62	12.03	12.50	12.81	11.60	8.70	6.71	3.70	2.64	97.33
University	Precip.	0.18	0.00	0.18	0.40	0.24	2.54	0.60	1.59	0.55	0.14	1.68	0.57	8.67

RIO GRANDE COMPACT

The State of Colorado, the State of New Mexico, and the State of Texas, desiring to remove all causes of present and future controversy among these States and between citizens of one of these States and citizens of another State with respect to the use of the waters of the Rio Grande above Fort Quitman, Texas, and being moved by considerations of interstate comity, and for the purpose of effecting an equitable apportionment of such waters, have resolved to conclude a Compact for the attainment of these purposes, and to that end, through their respective Governors, have named as their respective Commissioners:

For the State of Colorado	M. C. Hinderlider
For the State of New Mexico	Thomas M. McClure
For the State of Texas	Frank B. Clayton

who, after negotiations participated in by S. O. Harper, appointed by the President as the representative of the United States of America, have agreed upon the following articles, to- wit:

ARTICLE I

(a) The State of Colorado, the State of New Mexico, the State of Texas, and the United States of America, are hereinafter designated “Colorado,” “New Mexico,” “Texas,” and the “United States,” respectively.

(b) “The Commission” means the agency created by this Compact for the administration thereof.

(c) The term “Rio Grande Basin” means all of the territory drained by the Rio Grande and its tributaries in Colorado, in New Mexico, and in Texas above Fort Quitman, including the Closed Basin in Colorado.

(d) The “Closed Basin” means that part of the Rio Grande Basin in Colorado where the streams drain into the San Luis Lakes and adjacent territory, and do not normally contribute to the flow of the Rio Grande.

(e) The term “tributary” means any stream which naturally contributes to the flow of the Rio Grande.

(f) “Transmountain Diversion” is water imported into the drainage basin of the Rio Grande from any stream system outside of the Rio Grande Basin, exclusive of the Closed Basin.

(g) “Annual Debits” are the amounts by which actual deliveries in any calendar year fall below scheduled deliveries.

(h) “Annual Credits” are the amounts by which actual deliveries in any calendar year exceed scheduled deliveries.

(i) “Accrued Debits” are the amounts by which the sum of all annual debits exceeds the sum of all annual credits over any common period of time.

(j) “Accrued Credits” are the amounts by which the sum of all annual credits exceeds the sum of all annual debits over any common period of time.

(k) “Project Storage” is the combined capacity of Elephant Butte Reservoir and all other reservoirs actually available for the storage of usable water below Elephant Butte and above the first diversion to lands of the Rio Grande Project, but not more than a total of 2,638,860 acre feet.

(l) “Usable Water” is all water, exclusive of credit water, which is in project storage and which is available for release in accordance with irrigation demands, including deliveries to Mexico.

(m) “Credit Water” is that amount of water in project storage which is equal to the accrued credit of Colorado, or New Mexico, or both.

(n) “Unfilled Capacity” is the difference between the total physical capacity of project storage and the amount of usable water then in storage.

(o) “Actual Release” is the amount of usable water released in any calendar year from the lowest reservoir comprising project storage.

(p) “Actual Spill” is all water which is actually spilled from Elephant Butte Reservoir, or is released therefrom for flood control, in excess of the current demand on project storage and which does not become usable water by storage in another reservoir; provided, that actual spill of usable water cannot occur until all credit water shall have been spilled.

(q)”Hypothetical Spill” is the time in any year at which usable water would have spilled from project storage if 790,000 acre feet had been released therefrom at rates proportional to the actual release in every year from the starting date to the end of the year in which hypothetical spill occurs; in computing hypothetical spill the initial condition shall be the amount of usable water in project storage at the beginning of the calendar year following the effective date of this Compact, and thereafter the initial condition shall be the amount of usable water in project storage at the beginning of the calendar year following each actual spill.

ARTICLE II

The Commission shall cause to be maintained and operated a stream gaging station equipped with an automatic water stage recorder at each of the following points, to-wit:

(a) On the Rio Grande near Del Norte above the principal points of diversion to the San Luis Valley;

(b) On the Conejos River near Mogote;

(c) On the Los Pinos River near Ortiz;

(d) On the San Antonio River at Ortiz;

(e) On the Conejos River at its mouths near Los Sauces;

(f) On the Rio Grande near Lobatos;

(g) On the Rio Chama below El Vado Reservoir;

(h) On the Rio Grande at Otowi Bridge near San Ildefonso;

(i) On the Rio Grande near San Acacia;

(j) On the Rio Grande at San Marcial;

(k) On the Rio Grande below Elephant Butte Reservoir;

(l) On the Rio Grande below Caballo Reservoir.

Similar gaging stations shall be maintained and operated below any other reservoir constructed after 1929, and at such other points as may be necessary for the securing of records required for the carrying out of the Compact; and automatic water stage recorders shall be maintained and operated on each of the reservoirs mentioned, and on all others constructed after 1929.

Such gaging stations shall be equipped, maintained and operated by the Commission directly or in cooperation with an appropriate Federal or State agency, and the equipment, method and frequency of measurement at such stations shall be such as to produce reliable records at all times. (Note: See Resolution of Commission printed elsewhere in this report.)

ARTICLE III

The obligation of Colorado to deliver water in the Rio Grande at the Colorado-New Mexico State Line, measured at or near Lobatos, in each calendar year, shall be ten thousand acre feet less than the sum of those quantities set forth in the two following tabulations of relationship, which correspond to the quantities at the upper index stations:

DISCHARGE OF CONEJOS RIVER

Quantities in thousands of acre feet

Conejos Index Supply (1)	Conejos River at Mouths (2)
100	0
150	20
200	45
250	75
300	109
350	147
400	188
450	232
500	278
550	326
600	376
650	426
700	476

Intermediate quantities shall be computed by proportional parts.

(1) Conejos Index Supply is the natural flow of Conejos River at the U.S.G.S. gaging station near Mogote during the calendar year, plus the natural flow of Los Pinos River at the U.S.G.S. gaging station near Ortiz and the natural flow of San Antonio River at the U.S.G.S. gaging station at Ortiz, both during the months of April to October, inclusive.

(2) Conejos River at Mouths is the combined discharge of branches of this river at the U.S.G.S. gaging stations near Los Sauces during the calendar year.

DISCHARGE OF RIO GRANDE EXCLUSIVE OF CONEJOS RIVER

Quantities in thousands of acre feet

Rio Grande at Del Norte (3)	Rio Grande at Lobatos less Conejos at Mouths (4)
200	60
250	65
300	75
350	86
400	98
450	112
500	127
550	144
600	162

DISCHARGE OF RIO GRANDE EXCLUSIVE OF CONEJOS RIVER--Con.
Quantities in thousands of acre feet

Rio Grande at Del Norte (3)	Rio Grande at Lobatos less Conejos at Mouths (4)
650	182
700	204
750	229
800	257
850	292
900	335
950	380
1,000	430
1,100	540
1,200	640
1,300	740
1,400	840

Intermediate quantities shall be computed by proportional parts.

(3) Rio Grande at Del Norte is the recorded flow of the Rio Grande at the U.S.G.S. gaging station near Del Norte during the calendar year (measured above all principal points of diversion to San Luis Valley) corrected for the operation of reservoirs constructed after 1937.

(4) Rio Grande at Lobatos less Conejos at Mouths is the total flow of the Rio Grande at the U.S.G.S. gaging station near Lobatos, less the discharge of Conejos River at its Mouths, during the calendar year.

The application of these schedules shall be subject to the provisions hereinafter set forth and appropriate adjustments shall be made for (a) any change in location of gaging stations; (b) any new or increased depletion of the runoff above inflow index gaging stations; and (c) any transmountain diversions into the drainage basin of the Rio Grande above Lobatos.

In event any works are constructed after 1937 for the purpose of delivering water into the Rio Grande from the Closed Basin, Colorado shall not be credited with the amount of such water delivered, unless the proportion of sodium ions shall be less than forty-five percent of the total positive ions in that water when the total dissolved solids in such water exceeds three hundred fifty parts per million.

ARTICLE IV

The obligation of New Mexico to deliver water in the Rio Grande at San Marcial, during each calendar year, exclusive of the months of July, August, and September, shall be that quantity set forth in the following tabulation of relationship, which corresponds to the quantity at the upper index station:

RIO GRANDE COMPACT

DISCHARGE OF RIO GRANDE AT OTOWI BRIDGE AND AT SAN MARCIAL
EXCLUSIVE OF JULY, AUGUST AND SEPTEMBER

Quantities in thousands of acre feet

Otowi Index Supply (5)	San Marcial Index Supply (6)
100	0
200	65
300	141
400	219
500	300
600	383
700	469
800	557
900	648
1,000	742
1,100	839
1,200	939
1,300	1,042
1,400	1,148
1,500	1,257
1,600	1,370
1,700	1,489
1,800	1,608
1,900	1,730
2,000	1,856
2,100	1,985
2,200	2,117
2,300	2,253

Intermediate quantities shall be computed by proportional parts.

(5) The Otowi Index Supply is the recorded flow of the Rio Grande at the U.S.G.S. gaging station at Otowi Bridge near San Ildefonso (formerly station near Buckman) during the calendar year, exclusive of the flow during the months of July, August and September, corrected for the operation of reservoirs constructed after 1929 in the drainage basin of the Rio Grande between Lobatos and Otowi Bridge.

(6) San Marcial Index Supply is the recorded flow of the Rio Grande at the gaging station at San Marcial during the calendar year exclusive of the flow during the months of July, August and September.

The application of this schedule shall be subject to the provisions hereinafter set forth and appropriate adjustments shall be made for (a) any change in location of gaging stations; (b) depletion after 1929 in New Mexico at any time of the year of the natural runoff at Otowi Bridge; (c) depletion of the runoff during July, August and September of tributaries between Otowi Bridge and San Marcial, by works constructed after 1937; and (d) any transmountain diversions into the Rio Grande between Lobatos and San Marcial.

Concurrent records shall be kept of the flow of the Rio Grande at San Marcial, near San Acacia, and of the release from Elephant Butte Reservoir to the end that the records at these three stations may be correlated. (Note: See Resolution of Commission printed elsewhere in this report.)

ARTICLE V

If at any time it should be the unanimous finding and determination of the Commission that because of changed physical conditions, or for any other reason, reliable records are not obtainable, or cannot be obtained, at any of the stream gaging stations herein referred to, such stations may, with the unanimous approval of the Commission, be abandoned, and with such approval another station, or other stations, shall be established and new measurements shall be substituted which, in the unanimous opinion of the Commission, will result in substantially the same results so far as the rights and obligations to deliver water are concerned, as would have existed if such substitution of stations and measurements had not been so made. (Note: See Resolution of Commission printed elsewhere in this report.)

ARTICLE VI

Commencing with the year following the effective date of this Compact, all credits and debits of Colorado and New Mexico shall be computed for each calendar year; provided, that in a year of actual spill no annual credits nor annual debits shall be computed for that year.

In the case of Colorado, no annual debit nor accrued debit shall exceed 100,000 acre feet, except as either or both may be caused by holdover storage of water in reservoirs constructed after 1937 in the drainage basin of the Rio Grande above Lobatos. Within the physical limitations of storage capacity in such reservoirs, Colorado shall retain water in storage at all times to the extent of its accrued debit.

In the case of New Mexico, the accrued debit shall not exceed 200,000 acre feet at any time, except as such debit may be caused by holdover storage of water in reservoirs constructed after 1929 in the drainage basin of the Rio Grande between Lobatos and San Marcial. Within the physical limitations of storage capacity in such reservoirs, New Mexico shall retain water in storage at all times to the extent of its accrued debit. In computing the magnitude of accrued credits or debits, New Mexico shall not be charged with any greater debit in any one year than the sum of 150,000 acre-feet and all gains in the quantity of water in storage in such year.

The Commission by unanimous action may authorize the release from storage of any amount of water which is then being held in storage by reason of accrued debits of Colorado or New Mexico; provided, that such water shall be replaced at the first opportunity thereafter.

In computing the amount of accrued credits and accrued debits of Colorado or New Mexico, any annual credits in excess of 150,000 acre feet shall be taken as equal to that amount.

In any year in which actual spill occurs, the accrued credits of Colorado, or New Mexico, or both, at the beginning of the year shall be reduced in proportion to their respective credits by the amount of such actual spill; provided that the amount of actual spill shall be deemed to be increased by the aggregate gain in the amount of water in storage, prior to the time of spill, in reservoirs above San Marcial constructed after 1929; provided, further, that if the Commissioners for the States having accrued credits authorize the release of part, or all, of such credits in advance of spill, the amount so released shall be deemed to constitute actual spill.

In any year in which there is actual spill of usable water, or at the time of hypothetical spill thereof, all accrued debits of Colorado, or New Mexico, or both, at the beginning of the year shall be cancelled.

In any year in which the aggregate of accrued debits of Colorado and New Mexico exceeds the minimum unfilled capacity of project storage, such debits shall be reduced proportionally to an aggregate amount equal to such minimum unfilled capacity.

To the extent that accrued credits are impounded in reservoirs between San Marcial and Courchesne, and to the extent that accrued debits are impounded in reservoirs above San Marcial, such credits and debits shall be reduced annually to compensate for evaporation losses in the proportion that such credits or debits bore to the total amount of water in such reservoirs during the year.

ARTICLE VII

Neither Colorado nor New Mexico shall increase the amount of water in storage in reservoirs constructed after 1929 whenever there is less than 400,000 acre feet of usable water in project storage; provided, that if the actual releases of usable water from the beginning of the calendar year following the effective date of this Compact, or from the beginning of the calendar year following actual spill, have aggregated more than an average of 790,000 acre feet per annum, the time at which such minimum stage is reached shall be adjusted to compensate for the difference between the total actual release and releases at such average rate; provided, further, that Colorado, or New Mexico, or both, may relinquish accrued credits at any time, and Texas may accept such relinquished water, and in such event the state, or states, so relinquishing shall be entitled to store water in the amount of the water so relinquished.

ARTICLE VIII

During the month of January of any year the Commissioner for Texas may demand of Colorado and New Mexico, and the Commissioner for New Mexico may demand of Colorado, the release of water from storage reservoirs constructed after 1929 to the amount of the accrued debits of Colorado and New Mexico, respectively, and such releases shall be made by each at the greatest rate practicable under the conditions then prevailing, and in proportion to the total debit of each, and in amounts, limited by their accrued debits, sufficient to bring the quantity of usable water in project storage to 600,000 acre feet by March first and to maintain this quantity in storage until April thirtieth, to the end that a normal release of 790,000 acre feet may be made from project storage in that year.

ARTICLE IX

Colorado agrees with New Mexico that in event the United States or the State of New Mexico decides to construct the necessary works for diverting the waters of the San Juan River, or any of its tributaries, into the Rio Grande, Colorado hereby consents to the construction of said works and the diversion of waters from the San Juan River, or the tributaries thereof, into the Rio Grande in New Mexico, provided the present and prospective uses of water in Colorado by other diversions from the San Juan River, or its tributaries, are protected.

ARTICLE X

In the event water from another drainage basin shall be imported into the Rio Grande Basin by the United States or Colorado or New Mexico, or any of them jointly, the State having the right to the use of such water shall be given proper credit therefor in the application of the schedules.

ARTICLE XI

New Mexico and Texas agree that upon the effective date of this Compact all controversies between said States relative to the quantity or quality of the water of the Rio Grande are composed and settled; however, nothing herein shall be interpreted to prevent

recourse by a signatory state to the Supreme Court of the United States for redress should the character or quality of the water, at the point of delivery, be changed hereafter by one signatory state to the injury of another. Nothing herein shall be construed as an admission by any signatory state that the use of water for irrigation causes increase of salinity for which the user is responsible in law.

ARTICLE XII

To administer the provisions of this Compact there shall be constituted a Commission composed of one representative from each state, to be known as the Rio Grande Compact Commission. The State Engineer of Colorado shall be ex-officio the Rio Grande Compact Commissioner for Colorado. The State Engineer of New Mexico shall be ex-officio the Rio Grande Compact Commissioner for New Mexico. The Rio Grande Compact Commissioner for Texas shall be appointed by the Governor of Texas. The President of the United States shall be requested to designate a representative of the United States to sit with such Commission, and such representative of the United States, if so designated by the President, shall act as Chairman of the Commission without vote.

The salaries and personal expenses of the Rio Grande Compact Commissioners for the three States shall be paid by their respective States, and all other expenses incident to the administration of this Compact, not borne by the United States, shall be borne equally by the three States.

In addition to the powers and duties hereinbefore specifically conferred upon such Commission, and the members thereof, the jurisdiction of such Commission shall extend only to the collection, correlation and presentation of factual data and the maintenance of records having a bearing upon the administration of this Compact, and, by unanimous action, to the making of recommendations to the respective States upon matters connected with the administration of this Compact. In connection therewith, the Commission may employ such engineering and clerical aid as may be reasonably necessary within the limit of funds provided for that purpose by the respective States. Annual reports compiled for each calendar year shall be made by the Commission and transmitted to the Governors of the signatory States on or before March first following the year covered by the report. The Commission may, by unanimous action, adopt rules and regulations consistent with the provisions of this Compact to govern their proceedings.

The findings of the Commission shall not be conclusive in any court or tribunal which may be called upon to interpret or enforce this Compact.

ARTICLE XIII

At the expiration of every five-year period after the effective date of this Compact, the Commission may, by unanimous consent, review any provisions hereof which are not substantive in character and which do not affect the basic principles upon which the Compact is founded, and shall meet for the consideration of such questions on the request of any member of the Commission; provided, however, that the provisions hereof shall remain in full force and effect until changed and amended within the intent of the Compact by unanimous action of the Commissioners, and until any changes in this Compact are ratified by the legislatures of the respective states and consented to by the Congress, in the same manner as this Compact is required to be ratified to become effective.

ARTICLE XIV

The schedules herein contained and the quantities of water herein allocated shall never be increased nor diminished by reason of any increase or diminution in the delivery or loss of water to Mexico.

RIO GRANDE COMPACT

ARTICLE XV

The physical and other conditions characteristic of the Rio Grande and peculiar to the territory drained and served thereby, and to the development thereof, have actuated this Compact and none of the signatory states admits that any provisions herein contained establishes any general principle or precedent applicable to other interstate streams.

ARTICLE XVI

Nothing in this Compact shall be construed as affecting the obligations of the United States of America to Mexico under existing treaties, or to the Indian Tribes, or as impairing the rights of the Indian Tribes.

ARTICLE XVII

This Compact shall become effective when ratified by the legislatures of each of the signatory states and consented to by the Congress of the United States. Notice of ratification shall be given by the Governor of each state to the Governors of the other states and to the President of the United States, and the President of the United States is requested to give notice to the Governors of each of the signatory states of the consent of the Congress of the United States.

IN WITNESS WHEREOF, the Commissioners have signed this Compact in quadruplicate original, one of which shall be deposited in the archives of the Department of State of the United States of America and shall be deemed the authoritative original, and of which a duly certified copy shall be forwarded to the Governor of each of the signatory States.

Done at the City of Santa Fe, in the State of New Mexico, on the 18th day of March, in the year of our Lord, One Thousand Nine Hundred and Thirty-eight.

(Sgd.) M. C. HINDERLIDER

(Sgd.) THOMAS M. McCLURE

(Sgd.) FRANK B. CLAYTON

APPROVED:

(Sgd.) S. O. HARPER

RATIFIED BY:

Colorado, February 21, 1939
New Mexico, March 1, 1939
Texas, March 1, 1939

Passed Congress as Public Act No. 96, 76th Congress,

Approved by the President May 31, 1939

RESOLUTION ADOPTED BY RIO GRANDE COMPACT COMMISSION
AT THE ANNUAL MEETING HELD AT EL PASO, TEXAS, FEBRUARY 22-24, 1948, CHANGING
GAGING STATIONS AND MEASUREMENTS OF
DELIVERIES BY NEW MEXICO

R E S O L U T I O N

Whereas, at the Annual Meeting of the Rio Grande Compact Commission in the year 1945, the question was raised as to whether or not a schedule for delivery of water by New Mexico during the entire year could be worked out, and

Whereas, at said meeting the question was referred to the Engineering Advisers for their study, recommendations and report, and

Whereas, said Engineering Advisers have met, studied the problems and under date of February 24, 1947, did submit their Report, which said Report contains the findings of said Engineering Advisers and their recommendations, and

Whereas, the Compact Commission has examined said Report and finds that the matters and things therein found and recommended are proper and within the terms of the Rio Grande Compact, and

Whereas, the Commission has considered said Engineering Advisers' Report and all available evidence, information and material and is fully advised:

Now, Therefore, Be it Resolved:

The Commission finds as follows:

(a) That because of change of physical conditions, reliable records of the amount of water passing San Marcial are no longer obtainable at the stream gaging station at San Marcial and that the same should be abandoned for Compact purposes.

(b) That the need for concurrent records at San Marcial and San Acacia no longer exists and that the gaging station at San Acacia should be abandoned for Compact purposes.

(c) That it is desirable and necessary that the obligations of New Mexico under the Compact to deliver water in the months of July, August, September, should be scheduled.

(d) That the change in gaging stations and substitution of the new measurements as hereinafter set forth will result in substantially the same results so far as the rights and obligations to deliver water are concerned, and would have existed if such substitution of stations and measurements had not been so made.

Be it Further Resolved:

That the following measurements and schedule thereof shall be substituted for the measurements and schedule thereof as now set forth in Article IV of the Compact:

"The obligation of New Mexico to deliver water in the Rio Grande into Elephant Butte Reservoir during each calendar year shall be measured by that quantity set forth in the following tabulation of relationship which corresponds to the quantity at the upper index station:

DISCHARGE OF RIO GRANDE AT OTOWI BRIDGE AND ELEPHANT BUTTE EFFECTIVE SUPPLY

Quantities in thousands of acre-feet

Otowi Index Supply (5)	Elephant Butte Effective Index Supply (6)
100	57
200	114
300	171
400	228
500	286
600	345
700	406
800	471
900	542
1,000	621
1,100	707
1,200	800
1,300	897
1,400	996
1,500	1,095
1,600	1,195
1,700	1,295
1,800	1,395
1,900	1,495
2,000	1,595
2,100	1,695
2,200	1,795
2,300	1,895
2,400	1,995
2,500	2,095
2,600	2,195
2,700	2,295
2,800	2,395
2,900	2,495
3,000	2,595

Intermediate quantities shall be computed by proportional parts.

(5) The Otowi Index Supply is the recorded flow of the Rio Grande at the U.S.G.S. gaging station at Otowi Bridge near San ildefonso (formerly station near Buckman) during the calendar year, corrected for the operation of reservoirs constructed after 1929 in the drainage basin of the Rio Grande between Lobatos and Otowi Bridge.

(6) Elephant Butte Effective Index Supply is the recorded flow of the Rio Grande at the gaging station below Elephant Butte Dam during the calendar year plus the net gain in storage in Elephant Butte Reservoir during the same year or minus the net loss in storage in said reservoir, as the case may be.

The application of this schedule shall be subject to the provisions hereinafter set forth and appropriate adjustments shall be made for (a) any change in location of gaging stations; (b) depletion after 1929 in New Mexico of the natural runoff at Otowi Bridge; and (c) any transmountain diversions into the Rio Grande between Lobatos and Elephant Butte Reservoir."

Be it Further Resolved:

That the gaging stations at San Acacia and San Marcial be, and the same are hereby abandoned for Compact purposes.

Be it Further Resolved:

That this Resolution has been passed unanimously and shall be effective January 1, 1949, if within 120 days from this date the Commissioner for each State shall have received from the Attorney General of the State represented by him, an opinion approving this Resolution, and shall have so advised the Chairman of the Commission, otherwise, to be of no force and effect.

(Note: The following paragraph appears in the Minutes of the Annual Meeting of the Commission held at Denver, Colorado, February 14-16, 1949.

"The Chairman announced that he had received, pursuant to the Resolution adopted by the Commission at the Ninth Annual Meeting on February 24, 1948, opinions from the Attorneys General of Colorado, New Mexico and Texas that the substitution of stations and measurements of deliveries by New Mexico set forth in said resolution was within the powers of the Commission").

RULES AND REGULATIONS FOR ADMINISTRATION OF THE RIO GRANDE COMPACT

A Compact, known as the Rio Grande Compact, between the States of Colorado, New Mexico and Texas, having become effective on May 31, 1939 by consent of the Congress of the United States, which equitably apportions the waters of the Rio Grande above Fort Quitman and permits each State to develop its water resources at will, subject only to its obligations to deliver water in accordance with the schedules set forth in the Compact, the following Rules and Regulations have been adopted for its administration by the Rio Grande Compact Commission; to be and remain in force and effect only so long as the same may be satisfactory to each and all members of the Commission, and provided always that on the objection of any member of the Commission, in writing, to the remaining two members of the Commission after a period of sixty days from the date of such objection, the sentence, paragraph or any portion or all of these rules to which any such objection shall be made, shall stand abrogated and shall thereafter have no further force and effect; it being the intent and purpose of the Commission to permit these rules to obtain and be effective only so long as the same may be satisfactory to each and all of the Commissioners.

(1) GAGING STATIONS /1, /2

Responsibility for the equipping, maintenance and operation of the stream gaging stations and reservoir gaging stations required by the provisions of Article II of the Compact shall be divided among the signatory States as follows:

(a) Gaging stations on streams and reservoirs in the Rio Grande Basin above the Colorado-New Mexico boundary shall be equipped, maintained, and operated by Colorado in cooperation with the U.S. Geological Survey.

(b) Gaging stations on streams and reservoirs in the Rio Grande Basin below Lobatos and above Caballo Reservoir shall be equipped, maintained and operated by New Mexico in cooperation with the U.S. Geological Survey to the extent that such stations are not maintained and operated by some other Federal agency.

(c) Gaging stations on Elephant Butte Reservoir and on Caballo Reservoir, and the stream gaging station on the Rio Grande below Caballo Reservoir shall be equipped, maintained and operated by or on behalf of Texas through the agency of the U.S. Bureau of Reclamation.

The equipment, method and frequency of measurements at each compact stream gaging station shall be sufficient to obtain stream flow records at least equal in accuracy to those classified as “good” by the U.S. Geological Survey. The stream flow records for each compact stream gaging station shall be reviewed annually by the U.S. Geological Survey to ensure accuracy. Water-stage recorders on the reservoirs specifically named in Article II of the Compact shall have sufficient range below maximum reservoir level to record major fluctuations in storage. Staff gages may be used to determine fluctuations below the range of the water-stage recorders on these and other large reservoirs, and staff gages may be used upon approval of the Commission in lieu of water-stage recorders on small reservoirs, provided that the frequency of observation is sufficient in each case to establish any material changes in water levels in such reservoirs.

/1 Amended at Eleventh Annual Meeting, February 23, 1950.
/2 Amended at Seventy-Seventh Annual Meeting, March 31, 2016.

(2) RESERVOIR CAPACITIES /1

Colorado shall file with the Commission a table of areas and capacities for each reservoir in the Rio Grande Basin above Lobatos constructed after 1937; New Mexico shall file with the Commission a table of areas and capacities for each reservoir in the Rio Grande Basin between Lobatos and San Marcial constructed after 1929; and Texas shall file with the Commission tables of areas and capacities for Elephant Butte Reservoir and for all other reservoirs actually available for the storage of water between Elephant Butte and the first diversion to lands under the Rio Grande Project.

Whenever it shall appear that any table of areas and capacities is in error by more than five per cent, the Commission shall use its best efforts to have a re-survey made and a corrected table of areas and capacities to be substituted as soon as practicable. To the end that the Elephant Butte effective supply may be computed accurately, the Commission shall use its best efforts to have the rate of accumulation and the place of deposition of silt in Elephant Butte Reservoir checked at least every three years.

(3) ACTUAL SPILL /2, /3, /4, /6

(a) Water released from Elephant Butte in excess of Project requirements, which is currently passed through Caballo Reservoir, prior to the time of spill, shall be deemed to have been Usable Water released in anticipation of spill, or Credit Water if such release shall have been authorized.

(b) Excess releases from Elephant Butte Reservoir, as defined in (a) above, shall be added to the quantity of water actually in storage in that reservoir, and Actual Spill shall be deemed to have commenced when this sum equals the total capacity of that reservoir to the level of the uncontrolled spillway less capacity reserved for flood purposes, i.e., 1,999,600 acre-feet in the months of October through March inclusive, and 1,974,600 acre-feet in the months of April through September, inclusive, as determined from the 2009 area-capacity table or successor area-capacity tables and flood control storage reservation of 50,000 acre-feet from April through September and 25,000 acre-feet from October through March.

(c) All water actually spilled at Elephant Butte Reservoir, or released therefrom, in excess of Project requirements, which is currently passed through Caballo Reservoir, after the time of spill, shall be considered as Actual Spill, provided that the total quantity of water then in storage in Elephant Butte Reservoir exceeds the physical capacity of that reservoir at the level of the sill of the spillway gates, i.e. -1,830,000 acre-ft in 1942.

(d) Water released from Caballo Reservoir in excess of Project requirements and in excess of water currently released from Elephant Butte Reservoir, shall be deemed Usable Water released, excepting only flood water entering Caballo Reservoir from tributaries below Elephant Butte Reservoir.

(4) DEPARTURES FROM NORMAL RELEASES /5

For the purpose of computing the time of Hypothetical Spill required by Article VI and for the purpose of the adjustment set forth in Article VII, no allowance shall be made for the difference between Actual and Hypothetical Evaporation, and any under-release of usable water from Project Storage in excess of 150,000 acre-ft in any year shall be taken as equal to that amount.

/1 Amended at Eleventh Annual Meeting, February 23, 1950.
/2 Adopted at Fourth Annual Meeting, February 24, 1943.
/3 Amended September 9, 1998.
/4 Amended March 22, 2001; made effective January 1, 2001.
/5 Adopted June 2, 1959; made effective January 1, 1952.
/6 Adopted March 31, 2009; made effective January 1, 2010.

(5) EVAPORATION LOSSES /6, /7, /8

The Commission shall encourage the equipping, maintenance and operation, in cooperation with the U.S. Weather Bureau or other appropriate agency, of evaporation stations at Elephant Butte Reservoir and at or near each major reservoir in the Rio Grande Basin within Colorado constructed after 1937 and in New Mexico constructed after 1929. The net loss by evaporation from a reservoir surface shall be taken as the difference between the actual evaporation loss and the evapo-transpiration losses which would have occurred naturally, prior to the construction of such reservoir. Changes in evapo-transpiration losses along stream channels below reservoirs may be disregarded.

Net losses by evaporation, as defined above, shall be used in correcting Index Supplies for the operation of reservoirs upstream from Index Gaging Stations as required by the provisions of Article III and Article IV of the Compact.

In the application of the provisions of the last unnumbered paragraph of Article VI of the Compact:

(a) Evaporation losses for which accrued credits shall be reduced shall be taken as the difference between the gross evaporation from the water surface of Elephant Butte Reservoir and rainfall on the same surface.

(b) Evaporation losses for which accrued debits shall be reduced shall be taken as the net loss by evaporation as defined in the first paragraph.

(6) ADJUSTMENT OF RECORDS

The Commission shall keep a record of the location, and description of each gaging station and evaporation station, and, in the event of change in location of any stream gaging station for any reason, it shall ascertain the increment in flow or decrease in flow between such locations for all stages. Wherever practicable, concurrent records shall be obtained for one year before abandonment of the previous station.

(7) NEW OR INCREASED DEPLETIONS

In the event any works are constructed which alter or may be expected to alter the flow at any of the Index Gaging Stations mentioned in the Compact, or which may otherwise necessitate adjustments in the application of the schedules set forth in the Compact, it shall be the duty of the Commissioner specifically concerned to file with the Commission all available information pertaining thereto, and appropriate adjustments shall be made in accordance with the terms of the Compact; provided, however, that any such adjustments shall in no way increase the burden imposed upon Colorado or New Mexico under the schedules of deliveries established by the Compact.

(8) TRANSMOUNTAIN DIVERSIONS

In the event any works are constructed for the delivery of waters into the drainage basin of the Rio Grande from any stream system outside of the Rio Grande Basin, such waters shall be measured at the point of delivery into the Rio Grande Basin and proper allowances shall be made for losses in transit from such points to the Index Gaging Station on the stream with which the imported waters are comingled.

/6 Amended at Tenth Annual Meeting, February 15, 1949.
/7 Amended at Twelfth Annual Meeting, February 24, 1951.
/8 Amended June 2, 1959.

(9) QUALITY OF WATER

In the event that delivery of water is made from the Closed Basin into the Rio Grande, sufficient samples of such water shall be analyzed to ascertain whether the quality thereof is within the limits established by the Compact.

(10) SECRETARY /8, /9, /10

The Commission may, on a yearly basis, employ appropriate entities to render such engineering and clerical aid as may reasonably be necessary for administration of the Compact. The entities may be employed to:

(1) Collect and correlate all factual data and other records having a material bearing on the administration of the Compact and keep each Commissioner advised thereof.

(2) Inspect all gaging stations required for administration of the Compact and make recommendations to the Commission as to any changes or improvements in methods of measurement or facilities for measurement which may be needed to insure that reliable records be obtained.

(3) Report to each Commissioner in writing within thirty days after the end of each quarter a summary of all hydrographic data then available for the current year - on forms prescribed by the Commission - pertaining to:

(a) Deliveries by Colorado
(b) Deliveries by New Mexico
(c) Operation of Project Storage

(4) Make such investigations as may be requested by the Commission in aid of its administration of the Compact.

(5) Act as Secretary to the Commission and submit to the Commission at its regular meeting a report on its activities and a summary of all data needed for determination of debits and credits and other matters pertaining to administration of the Compact.

(11) COSTS /1, /2, /3

At its annual meeting, the Commission shall adopt a budget for the ensuing fiscal year beginning July first.

Such budget shall set forth the total cost of maintenance and operating of gaging stations, of evaporation stations, the cost of engineering and clerical aid, and all other necessary expenses excepting the salaries and personal expenses of the Rio Grande Compact Commissioners.

Contributions made directly by the United States and the cost of services rendered by the United States without cost shall be deducted from the total budget amount; the remainder shall then be allocated equally to Colorado, New Mexico and Texas.

/8 The substitution of this section for the section titled “Reports to Commissioners” was adopted at Ninth Annual Meeting, February 22, 1948.
/9 Amended March 31, 2009.
/10 Amended at Seventy-Seventh Annual Meeting, March 31, 2016.
/1 Amended at Eleventh Annual Meeting, February 23, 1950.
/2 Amended March 31, 2009.
/3 Amended at Seventy-Seventh Annual Meeting, March 31, 2016.

Expenditures made directly by any State for purposes set forth in the budget shall be credited to that State; contributions in cash or in services by any State under a cooperative agreement with any federal agency shall be credited to such State, but the amount of the federal contribution shall not so be credited; in event any State, through contractual relationships, causes work to be done in the interest of the Commission, such State shall be credited with the cost thereof, unless such cost is borne by the United States.

Costs incurred by the Commission under any cooperative agreement between the Commission and any U.S. Government Agency, not borne by the United States, shall be apportioned equally to each State, and each Commissioner shall arrange for the prompt payment of one-third thereof by his State.

The Commissioner of each State shall report at the annual meeting each year the amount of money expended during the year by the State that the Commissioner represents, as well as the portion thereof contributed by all cooperating federal agencies, and the Commission shall arrange for such proper reimbursement in cash or credits between States as may be necessary to equalize the contributions made by each State in the equipment, maintenance and operation of all gaging stations authorized by the Commission and established under the terms of the Compact.

It shall be the duty of each Commissioner to endeavor to secure from the Legislature of the State represented by the Commissioner an appropriation of sufficient funds with which to meet the obligations of that State, as provided by the Compact.

(12) MEETING OF COMMISSION /1, /10, /11

The Commission shall meet each year for the consideration and adoption of the annual report for the calendar year preceding, and for the transaction of any other business consistent with its authority. Other meetings as may be deemed necessary shall be held at any time and place set by mutual agreement, for the consideration of data collected and for the transaction of any business consistent with its authority.

No action of the Commission shall be effective until approved by the Commissioner from each of the three signatory States.

(Signed) M. C. HINDERLIDER

M. C. Hinderlider

Commissioner for Colorado

(Signed) THOMAS M. McCLURE

Thomas M. McClure

Commissioner for New Mexico

(Signed) JULIAN P. HARRISON

Julian P. Harrison

Commissioner for Texas

Adopted December 19, 1939.

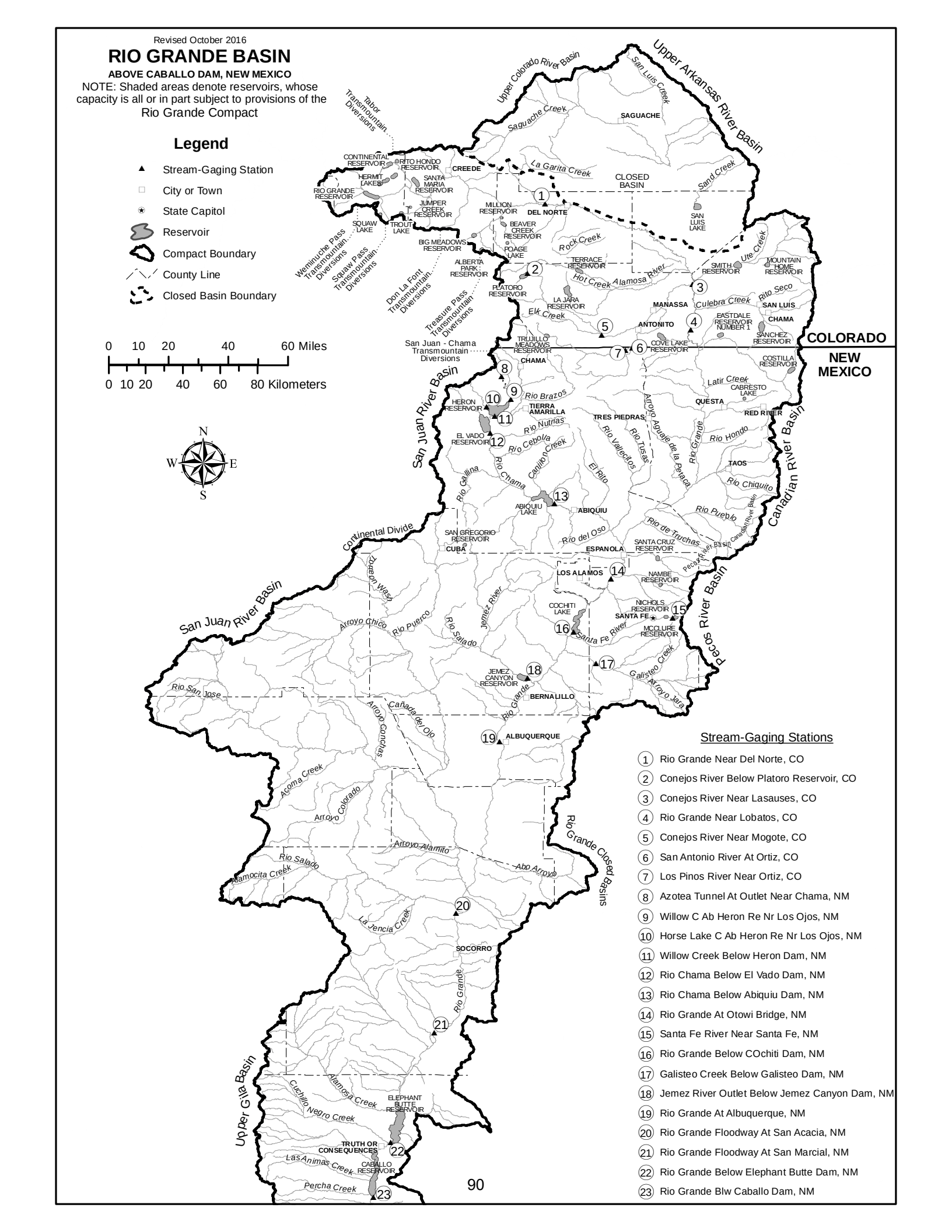
/1 Amended at Eleventh Annual Meeting, February 23, 1950.
/10 Amended at Thirteenth Annual Meeting, February 25, 1952.
/11 Amended at Seventy-Seventh Annual Meeting, March 31, 2016.

Revised October 2016

RIO GRANDE BASIN

ABOVE CABALLO DAM, NEW MEXICO

NOTE: Shaded areas denote reservoirs, whose capacity is all or in part subject to provisions of the Rio Grande Compact



Legend

- ▲ Stream-Gaging Station
- □ City or Town
- ⍟ State Capitol
- Reservoir
- Compact Boundary
- County Line
- Closed Basin Boundary

0 10 20 40 60 Miles

0 10 20 40 60 80 Kilometers

N

W E

S

Stream-Gaging Stations

1. Rio Grande Near Del Norte, CO
2. Conejos River Below Platoro Reservoir, CO
3. Conejos River Near Lasauses, CO
4. Rio Grande Near Lobatos, CO
5. Conejos River Near Mogote, CO
6. San Antonio River At Ortiz, CO
7. Los Pinos River Near Ortiz, CO
8. Azotea Tunnel At Outlet Near Chama, NM
9. Willow C Ab Heron Re Nr Los Ojos, NM
10. Horse Lake C Ab Heron Re Nr Los Ojos, NM
11. Willow Creek Below Heron Dam, NM
12. Rio Chama Below El Vado Dam, NM
13. Rio Chama Below Abiquiu Dam, NM
14. Rio Grande At Otowi Bridge, NM
15. Santa Fe River Near Santa Fe, NM
16. Rio Grande Below COchiti Dam, NM
17. Galisteo Creek Below Galisteo Dam, NM
18. Jemez River Outlet Below Jemez Canyon Dam, NM
19. Rio Grande At Albuquerque, NM
20. Rio Grande Floodway At San Acacia, NM
21. Rio Grande Floodway At San Marcial, NM
22. Rio Grande Below Elephant Butte Dam, NM
23. Rio Grande Blw Caballo Dam, NM