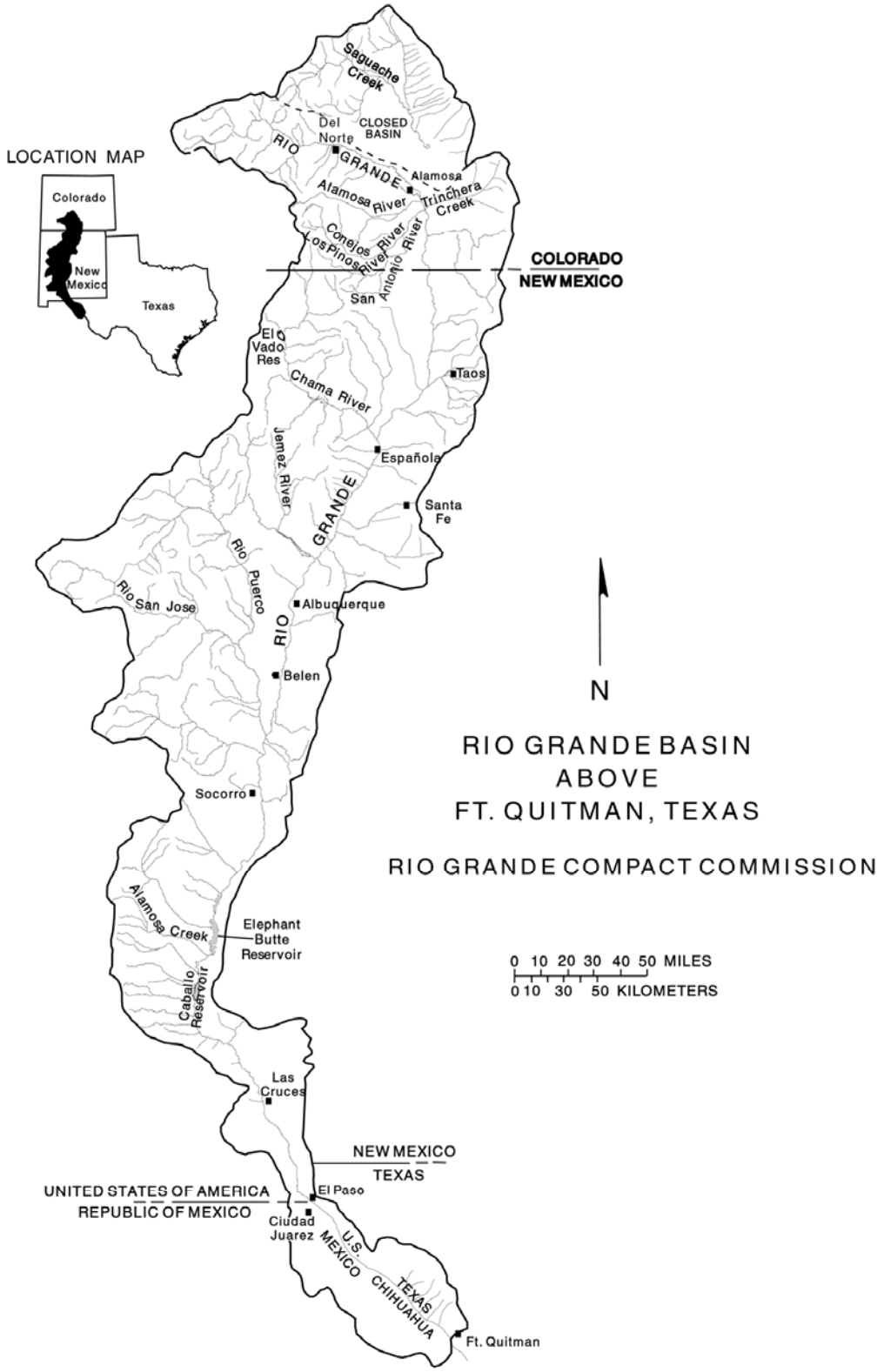
REPORT

of the

RIO GRANDE COMPACT COMMISSION

2018

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
TEXAS
CHIHUAHUA
Ft. Quitman

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ILLUSTRATIONS

RIO GRANDE COMPACT COMMISSION

COLORADO NEW MEXICO TEXAS

April 4, 2019

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

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

Honorable Governors:

The 80th Annual Meeting of the Rio Grande Compact Commission was held in Alamosa, Colorado on April 4, 2019. The meeting was held to discuss Rio Grande Compact issues such as compact accounting and administration. Public comment was also received by the Commission.

The Commission reviewed the cost of operation and found that the expenses for the administration of the Rio Grande Compact were $208,491 in the fiscal year ending June 30, 2018. The United States bore $56,033 of this total; the balance of $152,458 was borne equally by the three States party to the Compact.

Upon printing, the 2018 Report of the Rio Grande Compact Commission will be provided under separate cover.

Respectfully,

Kevin G. Rein, Commissioner for Colorado

John R. D'Antonio, Commissioner for New Mexico

Patrick R. Gordon, Commissioner for Texas

REPORT OF THE ENGINEER ADVISERS
TO THE RIO GRANDE COMPACT COMMISSION
March 7, 2019

The Engineer Advisers to the Rio Grande Compact Commission met in Albuquerque, New Mexico on January 14, 2019 and between March 4 and March 7, 2019 to:

- Receive reports
- Prepare the 2018 Rio Grande Compact (Compact) water accounting
- Discuss continuing and new issues in preparation for the 2019 annual meeting of the Rio Grande Compact Commission (Commission)
- 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 these meetings. The agencies each presented information about their specific water-related activities in the basin during 2018.

COMPACT ACCOUNTING

The Engineer Advisers reviewed the streamflow and reservoir storage records and other pertinent data for the Upper Rio Grande Basin for calendar year 2018 and are unable to reach a unanimous consensus on the Compact accounting. The lack of unanimous consensus arises from a disagreement that began in 2011 amongst the Texas Engineer Adviser and 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 unanimous consensus on how to finalize the 2011 through 2018 Compact Delivery Tables for Colorado and New Mexico and the Release and Spill from Project Storage Table. For 2018, as in previous years, each of the Engineer Advisers developed accounting procedures described in the addenda to this report. At the 2018 meeting, the Commission did not approve any of the proposed accounting scenarios. In 2019, the Engineer Advisers used the accounting scenarios they individually prepared to carry forward Compact accounting for the 2018 calendar year. As described in the New Mexico Engineer Adviser's addenda in previous years, the use of

accounting methods 1 and 2 has had an impact on the timing of Article VII storage restrictions and upstream storage operations. In 2018, Article VII timing was different for both accounting methods. By method 1 (Texas), Article VII restrictions went into effect on May 20, 2018, and by method 2 (New Mexico and Colorado), Article VII restrictions went into effect on May 23, 2018.

RIO GRANDE BASIN CONDITIONS

Snowpack and snow-water equivalent amounts were well below average for the winter of 2017-2018. As a result, snowmelt runoff levels in 2018 were near historic lows across the basin in Colorado and in New Mexico.

Summer monsoon precipitation was generally considered average across the basin in Colorado and New Mexico in 2018. Platoro Reservoir reached a high of approximately 47 percent of capacity during May of 2018. Usable Water in Rio Grande Project Storage was above the Article VII trigger of 400,000 acre-feet until late May when Usable Water dropped below the 400,000 acre-feet threshold and again put post-Compact reservoirs under the Article VII storage restrictions, where it remained throughout the rest of the year.

CONTINUING ISSUES

This section of the report summarizes updated information about issues previously addressed by the Engineer Advisers. It reflects information obtained by the Engineer Advisers prior to the 2019 Commission annual meeting, including information obtained from the reports of the federal agencies at meetings with the Engineer Advisers or otherwise reported at the 2019 Engineer Adviser 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 2018, Reclamation reported that their federal appropriations were $3,433,733 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 reproduction and population trends
- Genetics study of the silvery minnow including the addition of newer, more cost effective technologies
- Silvery minnow rescue and salvage efforts during river drying
- Annual monitoring of Southwestern willow flycatcher (flycatcher) population and nests
- Program management, assessment, reporting, and outreach activities

The Corps received $2,200,000 in 2018 to support administrative and technical staff for engagement with the Collaborative Program. The Corps reported that the appropriation was also used for development of an upgraded database through the USGS, avian monitoring, habitat restoration monitoring, sediment data collection, climate change evaluations, water quality monitoring, and tamarisk-leaf beetle monitoring.

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 2014, the WildEarth Guardians filed a lawsuit in Federal District Court against Reclamation and the Corps. The Middle Rio Grande Conservancy District (MRGCD) intervened in the case. The WildEarth Guardians alleged that Reclamation had made arbitrary and capricious decisions that departed from certain aspects of 2003 Biological Opinion (BO) for Middle Rio Grande operations and that the scope of Reclamation's then on-going ESA consultation was improper and too narrow. On March 1, 2017, the parties to the case voluntarily agreed to dismiss all claims against Reclamation. In June, 2014, after completion of a thorough reassessment of all its Middle Rio Grande Operations, the Corps determined there was no activity currently proposed or undertaken which required ESA consultation. WildEarth Guardians claims against the Corps were generally related to this determination. The Federal District Court provided a final decision in August, 2018. The Federal District Court fully upheld

the Corps' decision regarding its reassessment determinations. WildEarth Guardians has subsequently appealed that decision to the 10th Circuit Court of Appeals, and a briefing schedule has been issued in that case.

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 2018, URGWOM activities included:

- Basin-wide annual operating plans provided by the Corps
- Extending the database to include historical data from years 2016-2018
- Developing new groundwater objects to represent the deep groundwater system
- Developing a script to generate unregulated flow data
- Making operations rules improvements
- Conducting one URGWOM training session
- Developing a real-time operation model by linking URGWOM to the Corps Water Management System
- Improving the URGWOM's ability to estimate Colorado deliveries at the Lobatos gage
- Improving the accounting and the allocation procedures for the Lower Rio Grande portion of the URGWOM
- Updating the five-year plan and model documentation
- Software updates including implementation of RiverWISE into RiverWare

Compliance by Federal and State Agencies with New Mexico State Water Law

The NMISC continues to track habitat restoration projects implemented by various federal and state agencies within the Middle Rio Grande and accounts and reports depletions related to these projects. NMISC coordinates with the New Mexico Office of the State Engineer (NMOSE) to determine if a permit is needed and to ensure any increase in depletions is 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 the Corps project's 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-below average spring snowmelt runoff flows in 2018 resulted in small depletions for 2018, which were offset by NMISC's Strategic Water Reserve.

Elephant Butte Delta Channel Project

The Delta Channel project was successful in conveying the below-average 2018 snowmelt runoff into the active reservoir pool at Elephant Butte Reservoir. Monsoonal precipitation and corresponding summer river flows during 2018 were about average in the Middle Rio Grande, and the Delta Channel successfully conveyed all flow into Elephant Butte Reservoir during 2018. During January, February and March of 2018, Reclamation work crews, funded by the NMISC, conducted in-channel maintenance, sandbar de-vegetation and access road grading throughout the Delta Channel Project area. Since 2003, New Mexico has spent nearly $18 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 2018, Colorado stored a total of 2,068 acre-feet of relinquished water in Platoro Reservoir. Colorado did not store any relinquished water in 2018, 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. Forty-seven acre-feet of relinquished water was stored in New Mexico by the City of Santa Fe during 2018. Relinquishment water storage to date totals 288,328 acre-feet, leaving a balance of 92,172 acre-feet available to be stored in future years when Article VII storage restrictions are in effect.

For 2019, Reclamation reported that the MRGCD has requested that Reclamation store approximately 40,000 acre-feet of their relinquishment allocation in El Vado Reservoir, if conditions permit. Reclamation reported that they do not foresee storing any of their own relinquishment allocation for use in their supplemental water program during 2019. The New Mexico Engineer Adviser anticipates requesting that Reclamation store a portion of New Mexico's allocation of relinquishment credit in 2019, if conditions permit.

Gaging Station Review

For the Rio Grande near Otowi gage (#08313000), the USGS reported they utilized a single rating (#39) for all of 2018. The USGS made a total of 20 measurements at the Otowi gage in 2018, with 14 rated good, 4 rated fair, and 2 rated poor. For 2018, the USGS utilized redundant sensors (radar and pressure transducer) as well as redundant primary reference gages (wire weight gage 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 improve the Otowi gage record and used rating #1 until July 2018 when rating #2 provisionally went into effect. During 2018, the NMISC performed routine flow measurements at the Otowi gage under an access agreement with the San Ildefonso Pueblo. The NMISC provided three measurements to the USGS. The USGS stated that they believe these measurements from NMISC are accurate and therefore were included in the database.

The USGS reported that during the 2018 calendar year, 34 streamflow measurements were collected at the Rio Grande below Elephant Butte gage (#08361000). Of the 34 measurements, 16 were rated good, 16 were rated fair, and 2 were rated poor. 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, 2017, and 2018 reflect improved precision, and the NMISC will continue to coordinate with the USGS to provide more accurate gage records in the future.

The USGS also reported that they reviewed and approved the 2018 Rio Grande below Caballo Reservoir 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 (59 in total). In 2018, Reclamation was able to utilize the Acoustic Doppler Velocity Meter (ADVM) to collect data for approximately six months. 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.

At the 2019 Engineer Advisers' meeting, Reclamation proposed 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 will 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 anticipating that relocation work will be completed prior to the 2019 irrigation season. Reclamation also reported that they would be installing flow meters in the outlets of Caballo Reservoir near the end of 2019.

The Colorado USGS reviewed gaging station records for the Colorado Compact gages. These records were reviewed and approved for 2018.

Reclamation reported that they conducted 95 elevation surveys of Elephant Butte Reservoir in 2018. Of these surveys, 55 exceeded the threshold criteria (<0.05 feet) for the Stage Discharge Recorder (SDR). Reclamation also performed 33 surveys of a new bubbler system installed by the USGS in October 2018. Of these surveys, 24 exceeded the threshold criteria.

During 2018, the NMISC continued its survey of water level elevations in Elephant Butte and Caballo reservoirs. The results from NMISC's November 2018 survey indicated that Reclamation's reservoir stage elevations were not within the agreed upon threshold criteria. However, during the December 2018 reservoir survey, NMISC's survey indicated improvement in the difference between the shoreline survey and that being reported by Reclamation's SDR encoder system (-0.06 ft) in the stilling well for Elephant Butte Reservoir. Reclamation continued to perform verification surveys and also worked extensively with the USGS to install a new SDR to get more reliable stage data for Elephant Butte. Reclamation noted that low reservoir levels and resulting sedimentation in stilling well orifices contributed to difficulties in data reliability. Reclamation reset the SDR during 2018 based on survey results and will continue to work to improve Elephant Butte stage recording.

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 2019 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 2018. The mass balance analysis indicated that the

reach gained water in eight out of twelve months, with a total calculated gain of 9,185 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 Rio Grande Compact Commissioners (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 equally split the costs of their operations in support of the Compact, including operation and maintenance of the Compact gaging stations. The Compact gaging stations are operated by the CDWR, USGS and Reclamation.

In the last few years, Reclamation has decreased their amount charged for the gage below Caballo Reservoir. The Engineer Advisers note that costs have been reduced and urge Reclamation to continue to seek ways to further reduce costs associated with the gage below Caballo. One method to reduce costs would be to better utilize the ADVM.

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 2018, city, state, and federal agencies for the most part followed the schedule. However, the Rio Grande below Caballo gage, Caballo Reservoir, and Bonita Lateral records were not received within the agreed upon schedule. The Federal government's partial shutdown of 2018/2019 also resulted in some minor delays of other Compact accounting records.

YEAR 2018 OPERATIONS

Snowmelt Runoff Forecasting

As has been reported in previous Engineer Advisers' reports, Colorado and New Mexico rely heavily on accurate streamflow and snowmelt forecasts to estimate 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 is being installed at the Alamosa airport. The main purpose of this radar unit is to capture the snow water equivalent (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 should be able to better track the winter precipitation that occurs throughout the basin, and in turn increase the accuracy of the forecasting models. This radar should be operational by early spring of 2019, and be used for the first time for winter precipitation accounting during the winter of 2019/2020.

A second Doppler radar unit is planned to be installed at the Durango airport later this year. While not specifically being installed for winter precipitation purposes, this radar data 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 2018 was 10,209 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 Head Lake. The amount creditable to the Rio Grande for Compact purposes from direct delivery and exchange was 6,808 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 2018 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 2018 that were most affected by iron bacteria and rehabilitated twenty-four other wells. These new replacement wells were constructed using a glass bead (round silica) filter pack with a stainless-steel casing to assist in the mitigation of biofouling issues. Wells will continue to be replaced as budgetary constraints allow in an effort to help maintain production of the project. The Closed Basin Operating

Committee continues to monitor groundwater levels and groundwater production and adjust project operations pursuant to the enabling legislation.

Platoro Reservoir

Colorado stored water in Platoro Reservoir in 2018 to the extent of its accrued debit of 400 acre-feet, as is required under Article VI of the Rio Grande Compact. Computation of evaporation on the debit water stored in Platoro Reservoir resulted in an annual evaporative loss of approximately 15 acre-feet. Compact accounting numbers are typically rounded to the nearest 100 acre-feet. Therefore, this amount rounds to zero and is entered into the summary of debits and credits calculated on the Colorado accounting sheet on line C5: "Reduction of debits a/c Evaporation."

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 augment injurious stream depletions caused by their groundwater withdrawals, either with a plan for augmentation or 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 number of water users objected to them. The State Engineer worked diligently with the objectors in attempts to address their concerns and entered into stipulations with most of the objectors, but several of them pushed the case to a 13-day trial concluding on February 14, 2018. As of the writing of this report, a ruling by the Water Judge has not been issued. However, it is anticipated that a ruling will be issued prior to the Compact Commission meeting in early April.

Aamodt Settlement

The Aamodt Water Rights Settlement Agreement (Settlement Agreement) was developed through multi-party negotiations begun 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 a Regional Water System to supply treated water to Pueblo and non-Pueblo parties. The Settlement Agreement relies on three sources of water including Pueblo-reserved rights, transferred agricultural rights, and San Juan Chama Project (SJCP) water. One of the intentions of the Settlement Agreement is that the Compact accounting will not be affected by the use of these sources of water. 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.

Reclamation reported to the Engineer Advisers that the Final EIS was published in the Federal Register in January 2018, and a Record of Decision will be signed by April 2019. Reclamation has completed designs on Phase 1 at the 90 percent level, Phase 2 at the 60 percent level and Phase 3 at the 30 percent level. Construction on Phase 1 is anticipated to begin in August or September of 2019, and Phases 2 and 3 are on hold until agreement is reached with stakeholders on features to be designed and constructed. Associated cost estimates are well above the amount authorized for the project, and negotiations are underway regarding non-federal cost contributions. No diversions of Rio Grande water occurred in 2018.

Reclamation's Middle Rio Grande Supplemental Water Program

Reclamation's supplemental water program is intended to provide additional water, primarily obtained through voluntary leasing of SJCP water, for endangered species needs and compliance with the 2016 BO. In 2018, Reclamation reported that a total of 35,739 acre-feet of leased SJCP water was released during the period April 1 through October 29.

In addition to the water released by Reclamation, Audubon New Mexico released a total of 962 acre-feet of purchased SJCP water between July 16 and September 14. A total of 294 acre-feet of pre-1907 native water rights owned by Reclamation and permitted to be used for offset via the NMISC's Strategic Water Reserve were released from drain outfalls from June 21 to 25 and from October 1 to 5.

Reclamation indicated 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 were operated during 2018. The pumps at the South Boundary site were operated from March 26 through July 8 and resumed on August 3 through October 24 to pump 19,989 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 45,495 acre-feet of Rio Grande water in El Vado Reservoir for the Coalition of Six Middle Rio Grande Basin Pueblos' (Pueblos) Prior and Paramount (P&P) operations in 2018. By mid-May, only 21,493 acre-feet of native water had been stored in El Vado Reservoir for P&P operations due to poor hydrologic conditions. This precipitated a paper water exchange on May 19 between BIA and MRGCD in which 24,002 acre-feet of native water, which had been stored in 2017, was transferred to the P&P account in El Vado Reservoir. This native water was exchanged for SJCP water in Heron Reservoir belonging to MRGCD. All of the transferred water was stored outside of Article VII restrictions. As monthly allocations of P&P water went unused, that unused water was made available to MRGCD to use for its basic, district-wide water operations, which include P&P lands.

Based on the February 1, 2019, most probable snowmelt runoff forecast, the BIA reported that Reclamation will have a preliminary storage target of approximately 18,522 acre-feet for their P&P operation in 2019. Additional forecasts in March, April and May, as well as discussions between Reclamation and the Pueblos, may change this storage target.

The BIA continues to make funding available to the Pueblos to perform work upgrading their irrigation systems. Most of the funding goes toward water control structures such as turnouts and check structures, mainly in MRGCD ditches, which enable the Pueblos to make better, more efficient use of their water supply. In some cases, BIA money is combined with Reclamation and NRCS funding to complete larger projects, including laser leveling, installation of subsurface pressure pipe systems, and concrete lining of ditches.

The BIA funds the MRGCD to perform work on their systems which serve Pueblo lands. The BIA cooperates with the MRGCD to improve water delivery and efficiency. Examples include working towards the MRGCD's policy of irrigating a minimum of one acre per hour, scheduling irrigation, and helping coordinate with Pueblo farmers for delivery and an adequate water supply.

The BIA reported that no discussions occurred concerning the carryover storage of P&P water in 2018. The BIA also reported that there were no Executive Orders issued related to BIA and/or P&P operations.

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.

2018 Rio Chama Water Supply Conditions

Snowpack conditions in the Rio Chama Basin were at or below historic lows during the winter of 2017-2018. The spring 2018 snowmelt runoff was of such low volume that there were significant water supply shortages for native water users. By late June, native storage in El Vado Reservoir was completely exhausted, and native inflow on the Rio Chama, as measured at the USGS stream gage near La Puente (#08284100), was extremely low. Beginning in late June, nearly all of the water flowing in the Rio Chama below El Vado consisted of SJCP water.

The Rio Chama Acequia Association (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. With native flows on the Rio Chama being insufficient to meet the needs of the direct flow irrigators of the RCAA, agreements were made to allow RCAA to continue to irrigate using SJCP water belonging to others. Relinquishment credit previously allocated to the NMISC was utilized for mitigating the impact to the SJCP water.

Depletions to SJCP water by RCAA for the period June 28, 2018, through October 31, 2018, totaled 1,750 acre-feet. To account for this, the New Mexico Engineer Adviser requested that Reclamation reduce the SJCP water at Otowi gage by 1,750 acre-feet, plus associated transit losses, in Table 8 of their annual Water Accounting Report. The adjustment was made for the months of June through October, resulting in a reduction of SJCP water at Otowi and an increase to the Otowi Index Supply.

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. The region of the Rio Grande considered in the Lower Reach Plan is from the Isleta Pueblo southern boundary to the headwaters of Elephant Butte Reservoir. 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 once the projects come into equilibrium. The

New Mexico Engineer Adviser is concerned that some of the projects, as described, may increase depletions within the Lower Reach Plan area. Reclamation has committed to work with NMISC to establish a methodology to quantify depletions. Reclamation committed that they will offset any increased depletions that do occur. 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.

Rio Grande Project Operations

The 2008 Operating Agreement (2008 OA) and its manual provide the procedures used to operate the Rio Grande Project. A January 2017 Record of Decision for the final Environmental Impact Statement allows the 2008 OA to remain in effect through 2050. With the combined Project storage and runoff, Reclamation allotted 475,505 acre-feet, or 60 percent of a full irrigation supply, to Rio Grande Project water users for 2018. Reclamation reported a final 2018 release from Caballo Reservoir during irrigation season of 491,305 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 444,433 acre-feet of water were delivered to the Rio Grande Project water users. Reclamation reported end of year allocations to EBID at the diversion headings of 123,315 acre-feet (127,487 acre-feet were delivered, resulting in an over-delivery of 6,038 acre-feet), and to EP No.1 of 314,520 acre-feet (279,211 acre-feet were delivered, resulting in an unused allocation of 33,889 acre-feet). During 2018, Mexico's diversion allocation was 37,670 acre-feet, and 37,735 acre-feet were delivered. Reclamation's report indicates flows into Hudspeth County Water Conservation and Reclamation District during 2018 were provisionally 39,603 acre-feet, and 1,418 acre-feet were delivered through the Bonita Lateral.

Reclamation reported that Project releases started on March 16, 2018 and continued through September 29, 2018. The USGS reported that the total annual flow at the gage below Elephant Butte dam was 408,431 acre-feet. Elephant Butte Reservoir storage peaked at 483,692 acre-feet on February 27, 2018, and storage at Caballo Reservoir peaked at 65,917 acre-feet on March 15, 2018. Combined end-of-year storage at Elephant Butte and Caballo Reservoirs was 141,607 acre-feet, which is 6 percent of their total capacity, with no SJCP water in storage.

Usable Water in Project storage was above 400,000 acre-feet from January 1, 2018 through May 20, 2018, according to method 1, and through late in the day on May 23, 2018, according to method 2. Usable Water in Project storage remained under 400,000 acre-feet, as

calculated by either method 1 or 2, through the remainder of 2018.

An initial allocation for 2019 was made in February, based on provisional data. On January 31, 2019, combined storage in Elephant Butte and Caballo Reservoirs was 170,824 acre-feet. Water available to the Project water users was 164,725 acre-feet. The Natural Resources Conservation Service spring runoff forecast at the San Marcial gaging station was not available for January 2019. Using the National Weather Service predictions for the El Niño Southern Oscillation activity and current hydrologic conditions, Reclamation anticipates that there will be only 30 percent to 60 percent of a full irrigation allocation for the Rio Grande Project during 2019. The first allocation may be deferred to April 2019, with irrigation beginning in early June according to the Reclamation.

The New Mexico Engineer Adviser expressed concern about continued use of the 2008 OA 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 is in the final year of a WaterSmart Focus Area Study to assess water use and availability from the headwaters in southern Colorado to Fort Quitman, Texas. The study is investigating water budget components on the basis of an eight-digit hydrologic unit code (HUC-8). Data on water use, evapotranspiration, snow and watershed processes, groundwater, and surface water will be analyzed and made easily accessible for use by stakeholders. The study is being conducted by personnel from the USGS Colorado, New Mexico, Utah, and Texas Water Science centers and the USGS Earth Resources Observation and Science Center.

The USGS, in cooperation with Reclamation, has developed an improved 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. The model is operational, and an interim report was published in May of 2018. A Techniques and Methods report is planned to be released by April 2019, and the final report will be released after that. 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 is also conducting 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 Environmental Management Program

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, and reauthorization beyond that year is uncertain. The Corps is revising its current processes so that Civil Works projects can be done in a more streamlined manner. Current projects undergoing either feasibility or higher level planning (e.g., Chief Report) include 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 (pending), the Middle Rio Grande Restoration Project, Bernalillo to Belen levee rehabilitation assessment, Las Cruces Dam environmental restoration, El Paso Bosque Restoration, and several multi-state assessments. The San Acacia Levee Project Phase 1 section has been completed.

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, which includes printing 41,000 ‘Zap the Zebra’ brochures and 1,000 mussel posters. These brochures and posters have been dispersed throughout New Mexico at the New Mexico State Parks facilities, convenience and sporting good shops and libraries. Permanent signs with the “Stop Aquatic Hitchhikers!” message have been installed at boating docks and other key locations at both Elephant Butte and Navajo Reservoirs. Information is distributed to the public at New Mexico

reservoirs where quagga or zebra mussel inspections occur.

Since 2013, aquatic invasive species inspections have increased from two to fifteen waterbodies in New Mexico. The number of watercraft inspections statewide has increased from 9,346 in 2013 to 40,834 in 2018. Reclamation sampled 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 2018. Continued vigilance is important, as conditions more suitable to aquatic invasive species establishment may occur in the future.

Rio Grande Silvery Minnow

The Service and Reclamation reported on the 2018 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 2018 October CPUE survey for the Middle Rio Grande resulted in an estimated silvery minnow density of 0.09 silvery minnow/100 m^2. The 2018 October CPUE was a sharp decline in silvery minnow densities from that of 2017, which was one of the highest densities observed in the 24-year history of similar monitoring efforts. The Service indicated the primary cause for the precipitous drop was likely from effects of the drought and low spring runoff, including low success of silvery minnow spawning and survival. The Service acknowledged the impressive efforts in 2018 by water managers to create spawning events in the spring and to reduce the extent of river drying during the summer months.

Extensive coordination and implementation of conservation and recovery actions occurred among many stakeholders in 2018 to minimize the adverse effects of the drought and low flows. The Service reported that captive silvery minnows are maintained and propagated at 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 as part of conservation of the species. The Service, with assistance from BO partners, conducted rescue activities primarily in the San Acacia Reach, moving 70,797 silvery minnows to flowing portions of the river.

Nonfederal involvement in the 2016 BO and Collaborative Program activities continued with over $1,500,000 in contributions 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 of silvery minnow refugia, fish passage investigations and pilot studies, and population monitoring program evaluations.

The Service's Texas team previously recommended ceasing their stocking and monitoring efforts for the silvery minnow in the Big Bend reach of the Rio Grande until environmental flow requirements can be determined and implemented. In the interim, before an official decision is made, the Service's Texas team will continue to stock and monitor for silvery minnows within the Big Bend National Park boundaries, not including the canyon reaches.

Temporary Modification of Operations at El Vado Reservoir

At the March 2019 Engineer Advisers' meeting Reclamation made a verbal request to conduct a temporary modification of operations at El Vado Reservoir during the spring of 2019. The purpose of this request is to aid in creating a spawning flow for the benefit of the silvery minnow in the Middle Rio Grande while Article VII storage restrictions are in effect. The Engineer Advisers notified Reclamation that a formal, written request of this modification must be made to the Engineer Advisers.

The Engineer Advisers discussed this proposed modification and were concerned if this operation would be inconsistent with Article VII of the Compact. Therefore, the Engineer Advisers have recommended to the Compact Commissioners that the legal committee be directed to review this issue and provide the Commissioners and Engineer Advisers with a determination as to the legality of this operation. Further, the Engineer Advisers requested that the legal committee develop potential solutions to allow the modification while still remaining in compliance with the Compact.

Middle Rio Grande Project Channel Maintenance

Reclamation's report indicates it is pursuing work at 15 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 on and is moving forward with a pilot river realignment project for

a three-mile section of river in the San Acacia Reach to address channel perching and sediment plug issues at one active priority site. This pilot project is entirely within the Bosque del Apache boundary, and will be used to assist in the planning of maintenance work on an additional five miles of the priority site upstream from the pilot project area. Reclamation reported that it is waiting on a Clean Water Act 404 permit from the Corps before starting the project.

The New Mexico Engineer Adviser has expressed concern over the impact the pilot project might have on water delivery efficiency into Elephant Butte Reservoir, and Reclamation is in the process of reevaluating their project design to potentially address these concerns.

Vegetation Management at Elephant Butte and Caballo Reservoirs

Reclamation continued vegetation management efforts in Caballo Reservoir in 2018 pursuant to a Technical Services Agreement with the NMISC. Reclamation reported that maintenance of vegetation at Caballo Reservoir was performed during 2018, and approximately 794 acres of phreatophytic vegetation was managed utilizing mowers and mulchers. NMISC and Reclamation executed a task order using $70,000 of state funds for vegetation management activities during 2018.

At the 2017 Annual Compact meeting, Reclamation mentioned the cessation of vegetation clearing in Elephant Butte Reservoir in about 2012 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 Compact Commissioners and the Engineer Advisers to conduct vegetation management again in Elephant Butte Reservoir. Reclamation stated that they would visit informally with the Service to discuss 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 vegetative control and discuss the plan with the Service. Reclamation has not provided the Engineer Advisers with a report or plan on this request.

Southwestern Willow Flycatcher and Yellow-billed Cuckoo

Reclamation continued to conduct surveys and nest monitoring for the Southwestern willow flycatcher (flycatcher) during the summer along about 250 miles of the Rio Grande between Isleta Pueblo and Elephant Butte Reservoir. Other areas surveyed included above Cochiti Lake and select locations between Caballo Reservoir and El Paso, Texas. In 2018, a

total of 780 resident flycatchers were documented. Four hundred twenty-one territories, of which 359 were pairs, were documented in 2018, which is an increase of 14 percent above the 2017 territory numbers. As in previous years, the majority of flycatchers were present in the San Marcial/Elephant Butte Reservoir area (277 territories – 8 percent increase). A 28 percent increase in flycatcher territories from 2017 to 2018 was recorded in the Lower Rio Grande with 73 territories documented (compared to 68 in 2017). Nest success for flycatchers in the Middle Rio Grande also improved to 47 percent, compared to 25 percent in 2017. Nest success in the Lower Rio Grande showed comparable results.

Reclamation conducted surveys in 12 distinct reaches for the Western yellow billed cuckoo (cuckoo) from the southern boundary of Isleta Pueblo to El Paso, Texas. In 2018, an estimated 138 breeding territories, assumed to be pairs, were documented. As with the flycatcher, the San Marcial/Elephant Butte Reservoir pool had the highest concentration of cuckoo territories. Critical habitat for the cuckoo is under review and will be re-proposed for public comments in approximately August 2019. 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 tamarisk leaf beetle is present in most of the Rio Grande area and defoliation of saltcedar in flycatcher-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 to protect the habitat from the identified threats using coordination, data sharing, outreach, and watershed management.

During June through October 2018, Service staff conducted photographic monitoring of

the New Mexico meadow jumping mouse in the Bosque del Apache National Wildlife Refuge. High resolution trail cameras were able to collect continuous data over this period of time. The information gathered using these 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 plan is in the process of being developed which will outline specific goals and needs to create and restore habitat for the species.

International Boundary and Water Commission Activities

The IBWC provided a report of its activities along the Rio Grande in New Mexico and Texas during 2018 and their projected activities for 2019. A brief discussion of IBWC's mission and international treaties was given. This discussion included their flood control mission under the Convention of 1933, water deliveries under the Convention of 1906, and environmental restoration.

In 2018, the IBWC stated that Mexico was allocated 37,670 acre-feet, or 62.78 percent of a full supply of 60,000 acre-feet under the 1906 Treaty, and was delivered 37,735 acre-feet at Acequia Madre. In 2019, there is projected to be less than a full supply, with allocations in a range of 30 to 60 percent. Mexico has agreed to begin taking water at the same time as EP No. 1. The 2019 release is anticipated to begin May 31, with Mexico taking water around June 5. The monthly binational meetings have been helpful in coordinating irrigation schedules, basin hydrologic conditions, Project storage conditions, as well as operations and maintenance activities.

The IBWC provided updates to the status of their River Management Plan (RMP) which is targeted for release in the spring of 2019. The RMP covers floodplain management, endangered species management, and channel maintenance. The 2009 Record of Decision (ROD) for the IBWC expires in 2019. Therefore, the ROD commitments have been incorporated into the RMP. Requirements from the 2017 Channel Maintenance Plan Biological Opinion (BO) are also incorporated into the RMP. An Environmental Assessment (EA) was initiated in 2018, which along with the RMP, will supersede the ROD. At least six alternatives will be evaluated for feasibility, costs, water availability, offsets, water rights, species benefitted, and maintenance requirements. The alternatives include sediment removal, construction of sediment structures, new recreation opportunities, different and additional restoration, and official protection for restoration areas. The draft EA is scheduled to be delivered for public comment in mid-May 2019.

In the 2009 ROD, the IBWC committed to implement 30 habitat restoration projects under their River Habitat Restoration program. Currently, work is underway at 22 habitat restoration sites, totaling about 500 acres. Under the River Habitat Restoration program, IBWC has installed 55 shallow groundwater monitoring wells, most of which were installed between 2013 and 2014. Data from the wells are being processed and are targeted for release in 2019. According to the IBWC, based on preliminary data, fluctuations in groundwater levels during irrigation season versus non-irrigation season were highly correlated with river flows

Status updates were also provided for the Environmental Water Transaction Program and Channel Maintenance Plan, which are also included under the 2009 ROD for the Canalization Project. Between 2013 to 2018 under the Environmental Water Transaction Program, the IBWC acquired additional water rights and is currently working with other entities to obtain sufficient water required to meet 2009 ROD obligations (about 650 acre-feet of offset/supplemental irrigation).

In 2018 under the Channel Maintenance Plan, IBWC contractors transplanted willows from islands in Sunland Park, NM, to nearby restoration sites. Similar work was done in Hatch, NM, for Thurman Arroyo islands to address sediment issues, consistent with the 2009 ROD. For the purposes of the Channel Maintenance Plan BO, IBWC is working with EBID on irrigation infrastructure and anticipates irrigating several restoration sites in 2019.

The IBWC estimated that 450,000 to 490,000 cubic yards of silt are deposited into the Rio Grande Canalization Project reach annually. The Canalization Project reach is defined as 105 river miles from Percha Dam to El Paso, TX. This silt results in sediment plugs, island formations, raised river beds, increased flooding risks and inhibited irrigation return flows. During FY18, the IBWC removed 182,521 cubic yards of sediment from within the Canalization Project at 13 bridge crossings and the Montana Drain intersection. Another 320,111 cubic yards of sediment were removed from within the Rectification Project (defined as El Paso to Ft Quitman, TX) at Alamo and Guayuco Arroyos, Ft. Quitman and downstream. They also inspected and maintained five New Mexico sediment control dams/basins and conducted levee maintenance throughout the reach.

The IBWC provided brief information and updates on other ongoing channel maintenance projects and projected desilting work in 2019. This work includes the pilot studies for the Thurman arroyo sediment basins, the Hatch Siphon, and Placitas Arroyo. Construction projects in the report include the American Canal Upper Reach (construction phase), American

Canal Lower Reach (design phase), Sunland Park (levee design) and Wasteway #2 (construction).

ENGINEER ADVISER RECOMMENDATIONS

The Engineer Advisers recommend that the Commissioners direct 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 provide legal opinions on the implications and impacts, if any, to the Commission and the Compact.

The Engineer Advisers recommend that the Commission direct the legal committee to review Reclamation's request to temporarily modify storage operations at El Vado Reservoir this spring while under Article VII restrictions. Specifically, the Engineer Advisers request that the legal committee be directed to investigate whether this type of operation can be accomplished in a manner that is in accord with the Article VII provisions. A letter with this request was sent from the Engineer Advisers to the Compact Commission on March 7, 2019.

BUDGET

The Engineer Advisers reviewed the cost of operation for the year ending June 30, 2018 and the budget for the fiscal year ending June 30, 2020.

The Engineer Advisers found that the expenses for gaging stations and administration of the Compact for the year ending June 30, 2018 were $208,491. The United States federal government bore $56,033 of this total, with the balance of $152,458 borne equally by the three states.

The Engineer Advisers find that the proposed budget for the fiscal year ending June 30, 2020 indicates a total of $203,868 will be spent for gaging and administration, with a proposed contribution by the United States federal government of $52,733.

Craig W. Cotten, P.E.

Engineer Adviser for Colorado

John W. Longworth, P.E.

Engineer Adviser for New Mexico

Suzy Valentine, P.E.

Engineer Adviser for Texas

The Colorado Engineer Adviser's Addendum to the 2019 Engineer Advisers' Report

April 4, 2019

At the 2019 Rio Grande Compact Commission (RGCC) Engineer Advisers' meeting held in Albuquerque, New Mexico on March 4-7, 2019, the Engineer Advisers did not reach consensus on the 2018 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 2018 and the Engineer Advisers did reach agreement on the accounting of the 2018 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 2018. 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 2018.

Therefore, the Colorado Engineer Adviser presents for the Commission's consideration the following method of accounting for the 2018 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 2017 accounting results for Method 2 used through the 2018 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 2018 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 2018 of 3,100 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 2018. 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 went into effect in 2018 is May 23. Method 1 accounting has the Article VII restrictions going into effect on May 20, potentially depriving Colorado of three days 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 2018 Engineer Advisers' Report to the Rio Grande Compact Commission

March 2019

At the 2019 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 raised in litigation by New Mexico against the U.S. Bureau of Reclamation (Reclamation) 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 2011 thru 2018 New Mexico and Colorado deliveries 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 2018 calendar year using a method (see Method 1 accounting sheets) that reduces Credit Water for evaporation monthly during the calendar year. This same method was put forward to the Commission 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 2018 using Method 1, Colorado had an Accrued Debit of 300 acre-feet, and New Mexico had an Accrued Credit of 6,400 acre-feet. At the beginning 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. This method, however, is contrary to Article VI of the Compact for computing evaporation on both Credit and Debit water retained in storage,

[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."

and the 2006 direction of the RGCC to Reclamation. The New Mexico Engineer Adviser has repeatedly apprised the Commission 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 2018 calendar year using a method (referred to as Method 2, see accounting sheets) that he and the Colorado Engineer Adviser proposed 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. Additionally, Method 2 adheres to Article VI of the Compact, computing evaporation at the end of the calendar year on debit water retained in storage in post-Compact reservoirs; El Vado Reservoir in 2018 for New Mexico, and Platoro Reservoir in 2018 for Colorado. The New Mexico Engineer Adviser carried forward the end of 2011 accounting results with Method 2 through the 2018 calendar year using the same accounting steps (See 2018 New Mexico Addendum). During the 2018 calendar year, Colorado carried an Accrued Debit of 400 acre-feet, and New Mexico carried an Accrued Debit of 700 acre-feet by Method 2. The New Mexico Engineer Adviser used these values as inputs for the 2018 Compact accounting. Consequently, the Compact compliance status for Colorado and New Mexico for 2019, using Method 2, is 3,100 acre-feet of Accrued Credit and 5,400 acre-feet of Accrued Credit, respectively. Method 2 accounting sheets and associated tables are attached to this New Mexico 2019 addendum.

By letter, dated April 19, 2018, to the Middle Rio Grande Conservancy District (MRGCD) and Reclamation, the New Mexico Engineer Adviser requested, pursuant to Article VI of the Rio Grande Compact, "that 700 acre-feet of native water be retained in El Vado Reservoir at all times during calendar year 2018." The 700 acre-feet was retained in El Vado Reservoir between January and the end of May 2018. By the end of June 2018, MRGCD/Reclamation had released all remaining native water from storage in El Vado Reservoir, contrary to the New Mexico Engineer Adviser's April 19, 2018 request. In accordance with Article VI of the Compact, Debit water was held constant while in storage. Computation of evaporation on the debit water stored in El Vado Reservoir between January and May 2018, resulted in an annual evaporative loss of approximately 9 acre-feet. Compact accounting procedures round values to the nearest 100 acre-feet. Therefore, this amount rounds to zero and is entered into the summary of debits and credits calculated on the "Deliveries by New Mexico at Elephant Butte" accounting sheet on line NM4, "Reduction of debits a/c Evaporation."

For calendar year 2018 the timing of Article VII storage restrictions occurred on different days based on Method 1 and Method 2 accounting. For Method 1, Article VII storage restrictions went into effect on May 20, 2018. For method 2, Article VII storage restrictions went into effect

on May 23, 2018. The difference in timing was due to New Mexico being in an Accrued Credit using Method 1 and being in an Accrued Debit using Method 2, as well a difference in the total of Colorado's Accrued Debit. However, due to historically dry conditions on the Rio Chama in 2018, there were no native water storage operations occurring at El Vado Reservoir during this time. However, Article VII timing issues that have occurred since Reclamation's 2011 unilateral and unauthorized release of credit water, have impacted New Mexico and Colorado up-stream storage benefits.

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, and by Reclamation's refusal to use Method 2 accounting to determine Usable Water in Rio Grande Project Storage, which 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, and 2018.

TABLE 12. **EVAPORATION LOSS ON RIO GRANDE WATER STORED IN RESERVOIRS ABOVE OTOWI AND TOTAL RIO GRANDE STORAGE AT EL VADO AND ABIQUIU.**

Method 2 - 2018

(UNIT = ACRE-FEET)

TABLE 12. Evap abv Otowi MONTH	EL VADO AND ABIQUIU RIO GRANDE STORAGE	R.G. COMPACT DEBT WATER STORED IN EL VADO	LOSSES ON R.G. COMPACT DEBT WATER STORED IN EL VADO	LOSSES ON RIO GRANDE STORED IN EL VADO	LOSSES ON RIO GRANDE STORED IN ABIQUIU	OTOWI EVAPORATION ADJUSTMENT
	(1)	(2)	(3)	(4)	(5)	(6) = (4) + (5)
JANUARY	41945	700	2	91	0	91
FEBRUARY	45234	700	2	123	0	123
MARCH	48287	700	3	184	6	190
APRIL	58528	700	5	366	0	366
MAY	34058	700	4	300	5	305
JUNE	0	0	0	-49	-1	-50
JULY	0	0	0	-191	-4	-195
AUGUST	0	0	0	-239	-4	-243
SEPTEMBER	-1	0	0	-241	-6	-247
OCTOBER	468	0	0	181	0	181
NOVEMBER	754	0	0	10	1	11
DECEMBER	160	0	0	80	1	81
ANNUAL			9	615	-2	613

(1) SUM OF NATURAL STORAGE IN EL VADO AND ABIQUIU.

(2) AMOUNT OF DEBT WATER IN STORAGE IN EL VADO.

(3) ACTUAL NET EVAPORATION LOSS TO DEBT WATER IN EL VADO EQUAL TO PERCENT DEBIT WATER TO TOTAL NATIVE TIMES NET LOSS; ARTICLE VI OF COMPACT

(4) ACTUAL NET EVAPORATION LOSS TO NATURAL POOL IN EL VADO.

(5) ACTUAL NET EVAPORATION LOSS TO NATURAL POOL IN ABIQUIU.

(6) SUM OF NET EVAPORATION LOSSES IN EL VADO AND ABIQUIU.

2018 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)			0		0				NA	NA	NA
January	458005	3804	0	0	0	0	0	458	0	0	0
February	483049	5635	0	0	0	0	0	483	0	0	0
March	434879	7922	0	0	0	0	0	435	0	0	0
April	394293	11216	0	0	0	0	0	394	0	0	0
May	337869	13057	0	0	0	0	0	338	0	0	0
June	227701	10449	0	0	0	0	0	228	0	0	0
July	128943	4150	0	0	0	0	0	129	0	0	0
August	85442	4091	0	0	0	0	0	85	0	0	0
September	58695	1548	0	0	0	0	0	59	0	0	0
October	72461	945	0	0	0	0	0	72	0	0	0
November	89448	1491	0	0	0	0	0	89	0	0	0
December	114872	589	0	0	0	0	0	115	0	0	0
Annual		64897		0		0	0		0	0	0

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

Addendum to the 2019 Engineer Advisers' Report
Texas Engineer Adviser
April 4, 2019

The Engineer Advisers to the Rio Grande Compact Commission (Commission) were unable to reach agreement on the Accounting of water deliveries for 2018 at the 2019 Engineer Advisers' meeting held on March 4-7, 2019, 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, 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 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 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 2018 - METHOD 1

The Texas Engineer Adviser has reviewed the streamflow and reservoir storage records and other pertinent data for calendar year 2018. 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 2018, and balances as of January 1, 2019, are as follows:

(a) Deliveries by Colorado at the State line:

Balance as of January 1, 2018	-300 acre-feet
Scheduled delivery	95,700 acre-feet
Actual delivery at Lobatos plus 10,000 acre-feet	99,200 acre-feet
Reduction of debits on account of evaporation	0 acre-feet
Accrued credit January 1, 2019	3,200 acre-feet

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

Balance as of January 1, 2018	6,400 acre-feet
Scheduled delivery	178,100 acre-feet
Actual delivery	184,200 acre-feet
Reduction of credits on account of evaporation	1,600 acre-feet
Accrued credit January 1, 2019	10,900 acre-feet

(c) Project Storage and Releases:

Accrued departure (credit) as of January 1, 2018	2,165,800 acre-feet
Actual release of Usable Water	493,000 acre-feet
Normal release for year	790,000 acre-feet
Accrued departure (credit) as of January 1, 2019	2,315,800 acre-feet
Under-release capped at 150,000 acre-feet	

Method 1: Reduce Credit Water for Evaporation Monthly during the 2018 Calendar Year - Developed by Texas and Reclamation

RIO GRANDE COMPACT - DELIVERIES BY COLORADO AT STATE LINE

YEAR 2018 - 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
	--------	--------	--------	--------	18.7	--------	--------	--------	--------	0.0	--------	0.2	--------	--------	--------	--------	--------	0.0	--------	--------	--------	0.0
JAN	3.7	--------	--------	3.7	18.6	-0.1		-0.1	3.6	3.6	10.5	0.2	0.0			0.0	10.5	10.5	3.9	13.5	17.4	17.4
FEB	3.1	--------	--------	3.1	18.6	0.0		0.0	3.1	6.7	10.2	0.2	0.0			0.0	10.2	20.7	4.0	15.1	19.1	36.5
MAR	5.6	--------	--------	5.6	18.7	0.1		0.1	5.7	12.4	15.7	0.2	0.0			0.0	15.7	36.4	3.9	16.2	20.1	56.6
APR	23.1	14.8	2.7	40.6	19.4	0.7		0.7	41.3	53.7	48.5	0.2	0.0			0.0	48.5	84.9	2.3	4.0	6.3	62.9
MAY	52.2	11.8	0.5	64.5	19.2	-0.2	0.2	0.0	64.5	118.2	96.0	0.2	0.0			0.0	96.0	180.9	1.4	6.6	8.0	70.9
JUN	18.2	1.9	0.0	20.1	17.1	-2.1	0.2	-1.9	18.2	136.4	26.8	0.2	0.0	-3.1	0.3	-2.8	24.0	204.9	0.3	3.9	4.2	75.1
JUL	7.3	1.0	0.0	8.3	14.9	-2.2	0.1	-2.1	6.2	142.6	13.3	0.2	0.0			0.0	13.3	218.2	0.0	0.9	0.9	76.0
AUG	3.4	0.7	0.0	4.1	14.1	-0.8	0.0	-0.8	3.3	145.9	13.4	0.2	0.0			0.0	13.4	231.6	0.0	0.6	0.6	76.6
SEPT	2.3	0.7	0.0	3.0	13.8	-0.3	0.1	-0.2	2.8	148.7	14.0	0.2	0.0			0.0	14.0	245.6	0.0	0.6	0.6	77.2
OCT	4.3	1.6	0.1	6.0	14.1	0.3	0.0	0.3	6.3	155.0	13.4	0.2	0.0			0.0	13.4	259.0	0.0	1.0	1.0	78.2
NOV	3.4	--------	--------	3.4	13.8	-0.3	0.0	-0.3	3.1	158.1	10.2	0.2	0.0			0.0	10.2	269.2	0.1	2.0	2.1	80.3
DEC	2.6	--------	--------	2.6	13.5	-0.3	0.0	-0.3	2.3	160.4	8.2	0.2	0.0			0.0	8.2	277.4	1.5	7.4	8.9	89.2
YEAR	129.2	32.5	3.3	165.0	--------	-5.2	0.6	-4.6	160.4	--------	280.2	--------	0.0	-3.1	0.3	-2.8	277.4	--------	17.4	71.8	89.2	--------

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

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

[b] 3,301 ac-ft minus 243 ac-ft pre-compact; report of the Engineer Adviser for Colorado.

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

[d] Note: No relinquishment credit stored in 2018. Storage of relinquished credit to date has totaled 2,068 acre-feet; balance remaining is 932 acre-feet.

[e] See Engineer Adviser report in regards to change of storage.

SUMMARY OF DEBITS AND CREDITS

	ITEM	DEBIT	CREDIT	BALANCE
C1	Balance at Beginning of Year	---------	---------	Dr. 0.3
C2	Scheduled Delivery from Conejos River	25.2	---------	Dr. 25.5
C3	Scheduled Delivery from Rio Grande	70.5	---------	Dr. 96.0
C4	Actual Delivery at Lobatos plus 10,000 Acre Feet	---------	99.2	Cr. 3.2
C5	Reduction of Debits a/c Evaporation [c]	---------	0	Cr. 3.2
C6	Reduction of Credits a/c Evaporation		---------	
C7				
C8	Balance at End of Year	---------	---------	Cr. 3.2

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 2018 Calendar Year - Developed by Texas and Reclamation

RIO GRANDE COMPACT - DELIVERIES BY NEW MEXICO AT ELEPHANT BUTTE

YEAR 2018 - 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[d]	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
	--------	39.8	--------	--------	--------	--------	--------	--------	--------	41.3	425.1	--------	--------	--------	--------
JAN	41.1	41.9	2.1	0.1		-3.5	-1.3	39.8	39.8	43.3	458.0	32.9	0.1	33.0	33.0
FEB	38.2	45.2	3.3	0.1		-1.7	1.7	39.9	79.7	46.7	483.0	25.0	7.5	32.5	65.5
MAR	41.6	48.3	3.1	0.2		-2.2	1.1	42.7	122.4	49.3	434.9	-48.1	66.6	18.5	84.0
APR	48.9	58.5	10.2	0.4		-6.0	4.6	53.5	175.9	59.9	394.3	-40.6	48.6	8.0	92.0
MAY	59.4	34.1	-24.4	0.3		-9.1	-33.2	26.2	202.1	34.9	337.9	-56.4	59.8	3.4	95.4
JUN	60.9	0.0	-34.1	0.0		-19.0	-53.1	7.8	209.9	1.4	227.7	-110.2	110.7	0.5	95.9
JUL	52.4	0.0	0.0	-0.2		-41.1	-41.3	11.1	221.0	0.6	128.9	-98.8	107.8	9.0	104.9
AUG	48.7	0.0	0.0	-0.3		-35.2	-35.5	13.2	234.2	0.8	85.4	-43.5	57.0	13.5	118.4
SEPT	33.7	0.0	0.0	-0.3		-22.3	-22.6	11.1	245.3	0.8	58.7	-26.7	35.7	9.0	127.4
OCT	30.6	0.5	0.5	0.2		-13.6	-12.9	17.7	263.0	1.5	72.5	13.8	0.6	14.4	141.8
NOV	23.1	0.8	0.3	0.0		-2.6	-2.3	20.8	283.8	1.6	89.4	16.9	0.0	16.9	158.7
DEC	31.7	0.2	-0.6	0.1		-2.6	-3.1	28.6	312.4	-0.1	114.9	25.5	0.0	25.5	184.2
YEAR	510.3	--------	-39.6	0.6		-158.9	-197.9	312.4	--------	--------	--------	-310.2	494.4	184.2	--------

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

[a] Note: In 2018, 47 acre-feet of relinquishment credit under previous relinquishment agreements was stored in New Mexico reservoirs. Storage of relinquished credit to date has totaled 288,328 acre-feet; balance remaining is 92,172 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. The low bias occurred for an undetermined amount of time. 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.

[d] At the request of the New Mexico Engineer Adviser, in 2018 the San Juan-Chama Project water (SJCP) at Otowi has been reduced to account for depletions and associated tranist losses of SJCP that occurred on the Rio Chama below Abiquiu during the months of June through October. See Table 8, Bureau of Reclamation 2018 Water Accounting Report.

SUMMARY OF DEBITS AND CREDITS

	ITEM	DEBIT	CREDIT	BALANCE
NM1	Balance at Beginning of Year	---------	---------	Cr. 6.4
NM2	Scheduled Delivery at Elephant Butte	178.1	---------	Dr. 171.7
NM3	Actual Elephant Butte Effective Supply	---------	184.2	Cr. 12.5
NM4	Reduction of Debits a/c Evaporation	---------		
NM5	Reduction of Credits a/c Evaporation and Spill[c]	1.6	---------	Cr. 10.9
NM6			---------	
NM7				
NM8	Balance at End of Year	---------	---------	Cr. 10.9

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 2018 Calendar Year - Developed by Texas and Reclamation

RIO GRANDE COMPACT - RELEASE AND SPILL FROM PROJECT STORAGE

YEAR 2018 - 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
	--------	--------	--------	--------	--------	0.0[b]	6.4[b]	6.4[b]		--------	--------	--------	--------	--------	--------	--------	--------	--------
JAN	1,999.6	451.6	37.7	489.3	1,510.3	0.0	6.4	6.4		495.7	0.1	0.0	0.1				0.1	0.1
FEB	1,999.6	476.7	44.5	521.2	1,478.4	0.0	6.3	6.3		527.5	0.0	0.1	0.1				0.1	0.2
MAR	1,999.6	428.7	57.9	486.6	1,513.0	0.0	6.2	6.2		492.8	47.8	0.1	47.9				47.9	48.1
APR	1,974.6	388.3	46.1	434.4	1,540.2	0.0	6.0	6.0		440.4	56.7	0.2	56.9				56.9	105.0
MAY	1,974.6	332.1	38.7	370.8	1,603.8	0.0	5.8	5.8		376.6	63.0	0.2	63.2				63.2	168.2
JUN	1,974.6	222.1	34.0	256.1	1,718.5	0.0	5.6	5.6		261.7	115.2	0.3	115.5				115.5	283.7
JUL	1,974.6	123.4	36.5	159.9	1,814.7	0.0	5.5	5.5		165.4	106.2	0.1	106.3				106.3	390.0
AUG	1,974.6	80.1	29.8	109.9	1,864.7	0.0	5.3	5.3		115.2	59.8	0.2	60.0				60.0	450.0
SEPT	1,974.6	53.5	23.9	77.4	1,897.2	0.0	5.2	5.2		82.6	42.7	0.2	42.9				42.9	492.9
OCT	1,999.6	67.3	25.8	93.1	1,906.5	0.0	5.2	5.2		98.3	0.0	0.0	-				0.0	492.9
NOV	1,999.6	84.3	25.9	110.2	1,889.4	0.0	5.1	5.1		115.3	0.0	0.0	-				0.0	492.9
DEC	1,999.6	109.8	26.7	136.5	1,863.1	0.0	5.1	5.1		141.6	0.1	0.0	0.1				0.1	493.0
YEAR	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	491.6	1.4	493.0	0.0	0.0	0.0	493.0	--------

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. 2165.8
P2	Actual Release during Year	493.0	---------	Cr. 1672.8
P3	Normal Release for Year	---------	790.0	Cr. 2462.8
P4	Under Release in Excess of 150.0	147.0	---------	Cr. 2315.8
P5		---------		
P6				
P7	Accrued Departure at End of Year	---------	---------	Cr. 2315.8

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 2018 Calendar Year - Developed by Colorado and New Mexico

RIO GRANDE COMPACT - DELIVERIES BY COLORADO AT STATE LINE

YEAR 2018 - 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
	--------	--------	--------	--------	18.7	--------	--------	--------	--------	0.0	--------	0.2	--------	--------	--------	--------	--------	0.0	--------	--------	--------	0.0
JAN	3.7	--------	--------	3.7	18.6	-0.1		-0.1	3.6	3.6	10.5	0.2	0.0			0.0	10.5	10.5	3.9	13.5	17.4	17.4
FEB	3.1	--------	--------	3.1	18.6	0.0		0.0	3.1	6.7	10.2	0.2	0.0			0.0	10.2	20.7	4.0	15.1	19.1	36.5
MAR	5.6	--------	--------	5.6	18.7	0.1		0.1	5.7	12.4	15.7	0.2	0.0			0.0	15.7	36.4	3.9	16.2	20.1	56.6
APR	23.1	14.8	2.7	40.6	19.4	0.7		0.7	41.3	53.7	48.5	0.2	0.0			0.0	48.5	84.9	2.3	4.0	6.3	62.9
MAY	52.2	11.8	0.5	64.5	19.2	-0.2	0.2	0.0	64.5	118.2	96.0	0.2	0.0			0.0	96.0	180.9	1.4	6.6	8.0	70.9
JUN	18.2	1.9	0.0	20.1	17.1	-2.1	0.2	-1.9	18.2	136.4	26.8	0.2	0.0			0.0	26.8	207.7	0.3	3.9	4.2	75.1
JUL	7.3	1.0	0.0	8.3	14.9	-2.2	0.1	-2.1	6.2	142.6	13.3	0.2	0.0	-3.1	0.3	-2.8	10.5	218.2	0.0	0.9	0.9	76.0
AUG	3.4	0.7	0.0	4.1	14.1	-0.8	0.0	-0.8	3.3	145.9	13.4	0.2	0.0			0.0	13.4	231.6	0.0	0.6	0.6	76.6
SEPT	2.3	0.7	0.0	3.0	13.8	-0.3	0.1	-0.2	2.8	148.7	14.0	0.2	0.0			0.0	14.0	245.6	0.0	0.6	0.6	77.2
OCT	4.3	1.6	0.1	6.0	14.1	0.3	0.0	0.3	6.3	155.0	13.4	0.2	0.0			0.0	13.4	259.0	0.0	1.0	1.0	78.2
NOV	3.4	--------	--------	3.4	13.8	-0.3	0.0	-0.3	3.1	158.1	10.2	0.2	0.0			0.0	10.2	269.2	0.1	2.0	2.1	80.3
DEC	2.6	--------	--------	2.6	13.5	-0.3	0.0	-0.3	2.3	160.4	8.2	0.2	0.0			0.0	8.2	277.4	1.5	7.4	8.9	89.2
YEAR	129.2	32.5	3.3	165.0	--------	-5.2	0.6	-4.6	160.4	--------	280.2	--------	0.0	-3.1	0.3	-2.8	277.4	--------	17.4	71.8	89.2	--------

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

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

[b] 3,301 ac-ft minus 243 ac-ft pre-compact; report of the Engineer Adviser for Colorado.

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

[d] Note: No relinquishment credit stored in 2018. Storage of relinquished credit to date has totaled 2,068 acre-feet; balance remaining is 932 acre-feet.

[e] See Engineer Adviser report in regards to change of storage.

SUMMARY OF DEBITS AND CREDITS

	ITEM	DEBIT	CREDIT	BALANCE
C1	Balance at Beginning of Year	---------	---------	Dr. 0.4
C2	Scheduled Delivery from Conejos River	25.2	---------	Dr. 25.6
C3	Scheduled Delivery from Rio Grande	70.5	---------	Dr. 96.1
C4	Actual Delivery at Lobatos plus 10,000 Acre Feet	---------	99.2	Cr. 3.1
C5	Reduction of Debits a/c Evaporation[c]	---------	0	
C6	Reduction of Credits a/c Evaporation		---------	
C7				
C8	Balance at End of Year	---------	---------	Cr. 3.1

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 2018 Calendar Year - Developed by Colorado and New Mexico

RIO GRANDE COMPACT - DELIVERIES BY NEW MEXICO AT ELEPHANT BUTTE

YEAR 2018 - 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[d]	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
	--------	39.8	--------	--------	--------	--------	--------	--------	--------	41.3	425.1	--------	--------	--------	--------
JAN	41.1	41.9	2.1	0.1		-3.5	-1.3	39.8	39.8	43.3	458.0	32.9	0.1	33.0	33.0
FEB	38.2	45.2	3.3	0.1		-1.7	1.7	39.9	79.7	46.7	483.0	25.0	7.5	32.5	65.5
MAR	41.6	48.3	3.1	0.2		-2.2	1.1	42.7	122.4	49.3	434.9	-48.1	66.6	18.5	84.0
APR	48.9	58.5	10.2	0.4		-6.0	4.6	53.5	175.9	59.9	394.3	-40.6	48.6	8.0	92.0
MAY	59.4	34.1	-24.4	0.3		-9.1	-33.2	26.2	202.1	34.9	337.9	-56.4	59.8	3.4	95.4
JUN	60.9	0.0	-34.1	0.0		-19.0	-53.1	7.8	209.9	1.4	227.7	-110.2	110.7	0.5	95.9
JUL	52.4	0.0	0.0	-0.2		-41.1	-41.3	11.1	221.0	0.6	128.9	-98.8	107.8	9.0	104.9
AUG	48.7	0.0	0.0	-0.3		-35.2	-35.5	13.2	234.2	0.8	85.4	-43.5	57.0	13.5	118.4
SEPT	33.7	0.0	0.0	-0.3		-22.3	-22.6	11.1	245.3	0.8	58.7	-26.7	35.7	9.0	127.4
OCT	30.6	0.5	0.5	0.2		-13.6	-12.9	17.7	263.0	1.5	72.5	13.8	0.6	14.4	141.8
NOV	23.1	0.8	0.3	0.0		-2.6	-2.3	20.8	283.8	1.6	89.4	16.9	0.0	16.9	158.7
DEC	31.7	0.2	-0.6	0.1		-2.6	-3.1	28.6	312.4	-0.1	114.9	25.5	0.0	25.5	184.2
YEAR	510.3	--------	-39.6	0.6		-158.9	-197.9	312.4	--------	--------	--------	-310.2	494.4	184.2	--------

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

[a] Note: In 2018, 47 acre-feet of relinquishment credit under previous relinquishment agreements was stored in New Mexico reservoirs. Storage of relinquished credit to date has totaled 288,328 acre-feet; balance remaining is 92,172 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. The low bias occurred for an undetermined amount of time. New Mexico will continue to coordinate with USGS to provide a more accurate gage record in the future.

[c] Reduction of debits for evaporation of debit water stored in El Vado calculated in accordance with Article VI of the Compact. For 2018, values round to zero.

[d] At the request of the New Mexico Engineer Adviser, in 2018 the San Juan-Chama Project water (SJCP) at Otowi has been reduced to account for depletions and associated tranist losses of SJCP that occurred on the Rio Chama below Abiquiu during the months of June through October. See Table 8, Bureau of Reclamation 2018 Water Accounting Report.

SUMMARY OF DEBITS AND CREDITS

	ITEM	DEBIT	CREDIT	BALANCE
NM1	Balance at Beginning of Year	---------	---------	Dr. 0.7
NM2	Scheduled Delivery at Elephant Butte	178.1	---------	Dr. 178.8
NM3	Actual Elephant Butte Effective Supply	---------	184.2	Cr. 5.4
NM4	Reduction of Debits a/c Evaporation[c]	---------	0.0	Cr. 5.4
NM5	Reduction of Credits a/c Evaporation and Spill		---------	
NM6			---------	
NM7				
NM8	Balance at End of Year	---------	---------	Cr. 5.4

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 2018 Calendar Year - Developed by Colorado and New Mexico

RIO GRANDE COMPACT - RELEASE AND SPILL FROM PROJECT STORAGE
YEAR 2018 - 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
	---	---	---	---	---	0.0[b]	0.0[b]	0.0[b]		---	---	---	---	---	---	---	---	---
JAN	1,999.6	458.0	37.7	495.7	1,503.9	0.0	0.0	0.0		495.7	0.1	0.0	0.1				0.1	0.1
FEB	1,999.6	483.0	44.5	527.5	1,472.1	0.0	0.0	0.0		527.5	0.0	0.1	0.1				0.1	0.2
MAR	1,999.6	434.9	57.9	492.8	1,506.8	0.0	0.0	0.0		492.8	47.8	0.1	47.9				47.9	48.1
APR	1,974.6	394.3	46.1	440.4	1,534.2	0.0	0.0	0.0		440.4	56.7	0.2	56.9				56.9	105.0
MAY	1,974.6	337.9	38.7	376.6	1,598.0	0.0	0.0	0.0		376.6	63.0	0.2	63.2				63.2	168.2
JUN	1,974.6	227.7	34.0	261.7	1,712.9	0.0	0.0	0.0		261.7	115.2	0.3	115.5				115.5	283.7
JUL	1,974.6	128.9	36.5	165.4	1,809.2	0.0	0.0	0.0		165.4	106.2	0.1	106.3				106.3	390.0
AUG	1,974.6	85.4	29.8	115.2	1,859.4	0.0	0.0	0.0		115.2	59.8	0.2	60.0				60.0	450.0
SEPT	1,974.6	58.7	23.9	82.6	1,892.0	0.0	0.0	0.0		82.6	42.7	0.2	42.9				42.9	492.9
OCT	1,999.6	72.5	25.8	98.3	1,901.3	0.0	0.0	0.0		98.3	0.0	0.0	-				0.0	492.9
NOV	1,999.6	89.4	25.9	115.3	1,884.3	0.0	0.0	0.0		115.3	0.0	0.0	-				0.0	492.9
DEC	1,999.6	114.9	26.7	141.6	1,858.0	0.0	0.0	0.0		141.6	0.1	0.0	0.1				0.1	493.0
YEAR	---	---	---	---	---	---	---	---	---	---	491.6	1.4	493.0	0.0	0.0	0.0	493.0	---

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 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 and 2018 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: _____

RIO GRANDE COMPACT COMMISSION REPORT

COST OF OPERATION AND BUDGET

BUDGET FOR FISCAL YEAR ENDING JUNE 30, 2018 (FY-2018)

Item	Total Cost	Borne by United States	Borne by Colorado	Borne by New Mexico	Borne by Texas
GAGING STATIONS					
In Colorado	$76,635		$76,635		
In New Mexico, above Caballo Reservoir	$77,313	$42,375		$34,938	
In New Mexico, Caballo Reservoir and below	$31,547	$7,600		$3,354	$20,593
Subtotal	$185,495	$49,975	$76,635	$38,292	$20,593
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	$208,491	$56,033	$82,281	$43,938	$26,239
EQUAL SHARES			$50,819	$50,819	$50,819

[1]Includes estimated cost of court reporter.

BUDGET FOR FISCAL YEAR ENDING JUNE 30, 2020 (FY-2020)

Item	Total Cost	Borne by United States	Borne by Colorado	Borne by New Mexico	Borne by Texas
GAGING STATIONS					
In Colorado	$80,854		$80,854		
In New Mexico, above Caballo Reservoir	$78,871	$42,383		$36,488	
In New Mexico, Caballo Reservoir and below	$20,548	$4,110			$16,439
Subtotal	$180,273	$46,493	$80,854	$36,488	$16,439
ADMINISTRATION					
U.S.G.S. Technical Services	$20,595	$6,240	$4,785	$4,785	$4,785
Other expenses[1]	$3,000		$1,000	$1,000	$1,000
Subtotal	$23,595	$6,240	$5,785	$5,785	$5,785
GRAND TOTAL	$203,868	$52,733	$86,639	$42,273	$22,224
EQUAL SHARES			$50,379	$50,379	$50,379

[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

Dennis D. Lessi 4-4-2019
Commissioner for Colorado Date

John R. Utton 4/4/2019
Commissioner for New Mexico Date

Pat Gordon 4/4/2019
Commissioner for Texas Date

Hal D. Sy 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.

RESOLUTION OF THE RIO GRANDE COMPACT COMMISSION

Honoring Curtis Seaton

April 4, 2019

WHEREAS, *Curtis Seaton served as the Texas Engineer Adviser from 2015 through 2018; and*

WHEREAS, *during that time, Mr. Seaton did faithfully and conscientiously carry out his responsibilities to the overall benefit of the Rio Grande Compact Commission; and*

WHEREAS, *during his tenure as Engineer Adviser, the Rio Grande Compact Commissioners and Engineer Advisers of the three states of Colorado, New Mexico and Texas did develop great admiration, respect, and appreciation for Mr. Seaton and his work;*

NOW THEREFORE, BE IT RESOLVED, *that the Rio Grande Compact Commission assembled in its 80th annual meeting held in Alamosa, Colorado, acknowledges the dedicated service of Curtis Seaton to the people of the Rio Grande basin which greatly benefited the Rio Grande Compact Commission, and this Commission extends to Mr. Seaton and his family its best wishes for a prosperous and enjoyable future; and*

BE IT FURTHER RESOLVED, *that the Texas Engineer Adviser of the Rio Grande Compact Commission is hereby directed to furnish a copy of this unanimously adopted resolution to Curtis Seaton, and to cause said resolution to be included in the Minutes of the 80th Annual Meeting of the Rio Grande Compact Commission.*

Hal Simpson
Chairman and Commissioner for the United States of America

John R. D'Antonio
Commissioner for New Mexico

Kevin G. Rein
Commissioner for Colorado

Patrick R. Gordon
Commissioner for Texas

RESOLUTION
RIO GRANDE COMPACT COMMISSION
Honoring Tom Blaine

April 4, 2019

WHEREAS, Tom Blaine *served as the New Mexico State Engineer and Secretary of the New Mexico Interstate Stream Commission from 2014 through 2018; and*

WHEREAS, Tom Blaine *served as the Rio Grande Compact Commissioner for New Mexico from 2014 through 2018; and*

WHEREAS, Tom Blaine *worked tirelessly and calmly to address difficult New Mexico water resources issues during one of the most severe and protracted droughts in more than a century; and*

WHEREAS, *during his tenure, Tom Blaine protected New Mexico's compact entitlements to the waters of the Rio Grande, and is regarded by all as a competent and knowledgeable professional whose judgment can be trusted; and*

WHEREAS, *Tom Blaine rendered meritorious service to the Rio Grande Compact Commission in matters related to the conservation, utilization and development of the water and related land resources of the Rio Grande Basin; and*

WHEREAS, *as a result of his professional conduct in addressing numerous matters regarding administration of the Rio Grande, his fellow Commissioners, their advisers and staff have developed great respect, admiration and appreciation for Tom Blaine; and*

NOW, THEREFORE, BE IT RESOLVED, *that the Rio Grande Compact Commission, at its 80th annual meeting held in Alamosa, Colorado on April 4, 2019 does hereby express the gratitude and appreciation of the Commission and its staff for the untiring service and counsel rendered by Tom Blaine in addressing the many technical, legal, and political water resource problems that have confronted the Commission during his tenure as the Rio Grande Compact Commissioner for New Mexico; and*

BE IT FURTHER RESOLVED, *that the Rio Grande Compact Commission, its advisers and staff sincerely wish Tom Blaine, Sandra Leigh Blaine and their family the best of all health, happiness and prosperity in all their future endeavors; and*

BE IT FURTHER RESOLVED, *that the New Mexico Engineer Adviser of the Rio Grande Compact Commission is hereby directed to furnish copies of this unanimously adopted Resolution to Tom Blaine and the Governor of the State of New Mexico, and to cause said resolution to be included in the Minutes of the 80th annual meeting of the Rio Grande Compact Commission.*

Hal Simpson
Chairman and Commissioner
For the United States of America

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

Kevin G. Rein
Commissioner for Colorado

Patrick R. Gordon
Commissioner for Texas

WATER RESOURCES DATA
ACKNOWLEDGMENTS

This report was prepared by the U.S. Geological Survey, technical adviser 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
Rito Hondo Reservoir
Hermit Lakes Reservoir No. 3
Troutvale No. 2 Reservoir
Jumper Creek Reservoir
Big Meadows Reservoir
Alberta Park Reservoir
Shaw Lake Enlargement
Mill Creek Reservoir
Fuchs Reservoir
Platoro Reservoir
Trujillo Meadows Reservoir

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

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

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

Azotea Tunnel at Outlet, near Chama, N. Mex.
Willow Creek above Heron Res., near Los Ojos, N. Mex.
Storage in Heron Reservoir near Los Ojos, N. Mex
Willow Creek below Heron Dam, N. Mex.
Storage in El Vado Reservoir near Tierra Amarilla, 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.
Rio Grande at Otowi Bridge, near San Ildefonso, N. Mex.
Storage in McClure Reservoir near Santa Fe, N. Mex.
Santa Fe River near Santa Fe, N. Mex.
Storage in Nichols 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 Outlet 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 Bureau of Indian Affairs, Albuquerque, N. Mex., provided the records of storage in Seama Reservoir.

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.

STREAMFLOW

Rio Grande near Del Norte, Colo

Location. -- Water-stage recorder, 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 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, staff gage at site 4 mi downstream at different datum. Records are equivalent.

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

Average discharge. -- 129 years (1890-2018), 884 ft^3/s (640,300 acre-ft per year).

Extremes. -- 1889-2018: 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. Flow regulated by four reservoirs, total capacity 126,100 acre-ft, and by several smaller ones. Six transmountain diversions import water into basin 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	5,280	205	150	170	10,473
February	5,126	200	160	183	10,167
March	7,906	358	187	255	15,682
April	24,483	1,720	373	816	48,562
May	48,420	2,580	803	1,562	96,041
June	13,521	767	220	451	26,819
July	6,735	281	196	217	13,359
August	6,754	289	152	218	13,397
September	7,055	343	161	235	13,994
October	6,745	291	166	218	13,379
November	5,125	335	110	171	10,165
December	4,120	215	80	133	8,172
Calendar year 2018	141,270	2,580	80	387	280,209

Conejos River below Platoro Reservoir, Colo.

Location. -- Water-stage recorder and concrete control, lat 37°21'17.65", long 106°32'39", in SW 1/4NW 1/4 sec. 22, T. 36 N., R. 4 E., on left bank 1,100 ft downstream from valve house 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. -- 66 years (1952-2018), 91 ft^3/s (65,640 acre-ft per year).

Extremes. -- 1952-2018: 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 period Nov. 9 to Apr. 5, and estimated discharges, which are poor. No diversions above station. Flow completely regulated by Platoro Reservoir (capacity, 59,570 acre-ft).

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	299	10	7	10	592
February	205	8	7	7	407
March	235	8	7	8	465
April	2,836	289	8	95	5,625
May	8,972	433	155	289	17,796
June	4,233	286	59	141	8,396
July	1,817	140	17	59	3,604
August	607	44	8	20	1,204
September	253	40	1	8	503
October	634	36	6	20	1,258
November	450	23	8	15	893
December	385	14	12	12	764
Calendar year 2018	20,926	433	1	57	41,506

STREAMFLOW

Conejos River near Mogote, Colo

Location. -- Water-stage recorder, 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. -- 108 years (1904, 1912-2018), 316 ft3/s (229,300 acre-ft per year).

Extremes. -- 1903-1905, 1911-2018: Maximum discharge, 9,000 ft3/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. Diversions above station for irrigation of about 500 acres. Since 1951 flow partly regulated by Platoro Reservoir.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	1,850	70	52	60	3,669
February	1,564	62	42	56	3,102
March	2,827	134	62	91	5,607
April	11,612	883	131	387	23,032
May	26,316	1,320	506	849	52,198
June	9,190	594	130	306	18,228
July	3,682	191	65	119	7,303
August	1,726	99	35	56	3,424
September	1,168	80	27	39	2,317
October	2,159	93	30	70	4,282
November	1,709	78	31	57	3,390
December	1,318	47	37	43	2,614
Calendar year 2018	65,121	1,320	27	178	129,168

San Antonio River at Ortiz, Colo

Location. -- Water-stage recorder, lat 36°59'35", long 106°02'17", in New Mexico in NE1/4 SE1/4, 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.

Average discharge. -- 78 years (1941-2018), 24 ft^3/s (17,230 acre-ft per year).

Extremes. -- 1920, 1925-2018: 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. A few small diversions above station for irrigation.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	48	2	1	2	96
February	60	3	1	2	119
March	266	26	3	9	528
April	1,335	193	16	45	2,648
May	223	18	1	7	443
June	15	5	0	0	30
July	2	2	0	0	5
August	4	1	0	0	7
September	5	1	0	0	10
October	59	7	0	2	117
November	51	4	1	2	102
December	33	1	1	1	65
Calendar year 2018	2,102	193	0	6	4,170

STREAMFLOW

Los Pinos River near Ortiz, Colo

Location. -- Water-stage recorder, 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. -- 100 years (1915-1920, 1925-2018), 115 ft^3/s (83,360 acre-ft per year).

Extremes. -- 1915-1920, 1925-2018: 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 estimated daily discharges, which are poor. Diversions above station for irrigation.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	480	17	14	15	952
February	475	20	15	17	942
March	929	51	18	30	1,843
April	7,475	777	66	249	14,827
May	5,964	299	88	192	11,830
June	960	87	11	32	1,904
July	491	42	10	16	974
August	344	24	7	11	683
September	357	22	8	12	708
October	808	54	9	26	1,602
November	586	31	13	20	1,162
December	405	15	11	13	803
Calendar year 2018	19,274	777	7	53	38,229

Conejos River near Lasauses, Colo

Location. -- Water-stage recorder, 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. -- 97 years (1922-2018), 169 ft^3/s (122,200 acre-ft per year).

Extremes. -- 1921-2018: 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. Diversions above station for irrigation of about 75,000 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	1,950	80	51	63	3,868
February	1,993	82	57	71	3,953
March	1,966	129	1	63	3,900
April	1,144	527	1	38	2,270
May	686	93	5	22	1,360
June	173	30	0	6	342
July	1	0	0	0	1
August	0	0	0	0	0
September	0	0	0	0	0
October	0	0	0	0	0
November	62	26	0	2	123
December	774	32	17	25	1,535
Calendar year 2018	8,749	527	0	24	17,353

STREAMFLOW

Rio Grande near Lobatos, Colo

Location. -- Water-stage recorder, lat 37°04'43", long 105°45'25", in NE1/4 NW1/4 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); 88 years (1931-2018) 424 ft^3/s (307,000) acre-ft per year).

Extremes. -- 1899-2018: 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 the period July 1 to Sept. 30, which is fair, and estimated daily discharges, which are poor. Natural flow of stream affected by transmountain diversions, storage reservoirs, ground-water withdrawals and diversions for irrigation, and return flow 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	8,750	345	245	282	17,356
February	9,626	385	318	344	19,093
March	10,152	471	125	327	20,136
April	3,157	496	49	105	6,262
May	4,030	210	69	130	7,994
June	2,128	165	22	71	4,221
July	451	21	12	15	895
August	308	14	8	10	611
September	328	19	7	11	651
October	504	34	10	16	1,000
November	1,070	170	13	36	2,122
December	4,470	200	90	144	8,866
Calendar year 2018	44,974	496	7	123	89,207

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; 49 years (1970-2018) 132 ft3/s (95,940 acre-ft per year) subsequent to completion of Azotea tunnel.

Extremes. -- 1963-2003: Maximum discharge, 1,610 ft3/s Mar. 12, 1985 (gage height, 6.65 ft); 2003-2018: 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	817	79	0	26	1,621
April	6,481	496	74	216	12,854
May	8,068	490	111	260	16,002
June	1,597	203	0	53	3,168
July	86	26	0	3	171
August	4	4	0	0	7
September	0	0	0	0	0
October	590	51	0	19	1,170
November	140	27	0	5	278
December	0	0	0	0	0
Calendar year 2018	17,782	496	0	49	35,271

STREAMFLOW

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 ft3/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 2018	---	---	---	---	---

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. -- 48 years (1971-2018), 130 ft^3/s (94,330 acre-ft per year).

Extremes. -- 1971-2018: 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	269	105	0	9	534
February	2,927	105	102	105	5,806
March	778	105	0	25	1,543
April	0	0	0	0	0
May	0	0	0	0	0
June	1,822	497	0	61	3,614
July	15,432	901	303	498	30,609
August	16,590	747	304	535	32,906
September	17,148	700	100	572	34,013
October	2,217	101	40	72	4,397
November	1,151	40	10	38	2,283
December	1,139	154	0	37	2,259
Calendar year 2018	59,473	901	0	163	117,963

STREAMFLOW

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 and October 1935 to September 1938, at site 1.1 mi upstream at different datums.

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

Average discharge. -- 4 years (1914, 1921-1923), 448 ft3/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 (1971-2018) 453 ft^3/s (328,200 acre-feet per year).

Extremes. -- 1914-1916, 1920-1924, 1936-2018; Maximum discharge observed, 9,000 ft3/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. Diversions above station for irrigation of about 10,600 acres. Since 1935 flow regulated by El Vado Reservoir and since October 1970 flow partly regulated by Heron Reservoir. Subsequent to May 1971 flow affected by releases of transmountain water from Heron Reservoir.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	3,900	129	122	126	7,736
February	2,871	121	85	103	5,694
March	2,649	110	77	85	5,255
April	13,542	592	110	451	26,861
May	21,895	829	585	706	43,429
June	22,108	1,000	571	737	43,851
July	20,592	992	290	664	40,844
August	16,307	788	292	526	32,345
September	17,725	599	578	591	35,158
October	4,936	316	68	159	9,790
November	2,603	110	35	87	5,163
December	1,457	81	25	47	2,891
Calendar year 2018	130,585	1,000	25	358	259,016

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; 48 years (1971-2018), 500 ft3/s (362,000 acre-feet per year).

Extremes. -- 1961-2018; Maximum discharge, 2,990 ft^3/s July 1, 1965 (gage height, 6.69 ft); minimum, about 0.5 ft3/s Mar. 17, 1966, Jan. 28, 1972.

Remarks. -- Records good except for estimated discharges, which are fair. Flow regulated by Heron, El Vado, and Abiquiu Reservoirs. Diversions above station for irrigation of about 17,600 acres. Subsequent to May 1971 flow affected by the release of transmountain water from Heron Reservoir.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	2,309	105	47	74	4,581
February	1,155	58	37	41	2,291
March	2,815	326	56	91	5,584
April	17,054	742	190	568	33,827
May	26,107	1,010	738	842	51,783
June	27,609	1,130	806	920	54,762
July	24,469	1,040	348	789	48,534
August	20,738	857	476	669	41,134
September	12,345	486	288	412	24,486
October	9,093	417	128	293	18,036
November	2,633	176	47	88	5,223
December	3,359	141	64	108	6,663
Calendar year 2018	149,687	1,130	37	410	296,905

STREAMFLOW

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. -- -- 40 years (1979-2018), 12.6 ft3/s (9,110 acre-feet per year).

Extremes. -- 1979-2018; Maximum discharge, 312 ft3/s June 9, 1979 at site 1,100 ft downstream; no flow December 31, 1993.

Remarks. -- Records fair. 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	98	3	3	3	195
February	125	5	3	4	248
March	127	6	1	4	251
April	155	11	1	5	307
May	354	24	4	11	702
June	347	31	1	12	689
July	83	7	1	3	165
August	65	2	2	2	130
September	75	5	2	3	149
October	113	8	2	4	224
November	21	1	1	1	41
December	23	1	1	1	45
Calendar year 2018	1,586	31	1	4	3,146

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 5,488.48 ft above National Geodetic Vertical Datum of 1929. 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. -- 119 years (1896-1905, 1910-2018), 1,473 ft^3/s (1,067,000 acre-feet per year).

Extremes. -- 1895-1905, 1910-2018; 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. Flow partly regulated by Heron, El Vado, and Abiquiu Reservoirs. Diversions above station for irrigation of about 620,000 acres in Colorado and 75,000 acres in New Mexico. Subsequent to May 1971 flow affected by releases of transmountain water from Heron Reservoir.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	20,697	753	557	668	41,052
February	19,240	718	649	687	38,163
March	20,983	770	586	677	41,620
April	24,679	967	602	823	48,951
May	29,933	1,160	872	966	59,372
June	30,716	1,150	877	1,024	60,925
July	26,413	1,070	505	852	52,390
August	24,554	1,110	569	792	48,703
September	16,984	715	456	566	33,688
October	15,413	605	378	497	30,572
November	11,650	479	340	388	23,108
December	16,001	560	393	516	31,738
Calendar year 2018	257,263	1,160	340	705	510,281

STREAMFLOW

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. -- 106 years (1913-2018), 7.8 ft3/s (5,600 acre-feet per year).

Extremes. -- 1913-2018; Maximum discharge, 1,500 ft3/s Aug. 14, 1921 (gage height, 5.17 ft); from rating curve extended above 150 ft^3/s; no flow at times.

Remarks. -- Records fair. 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	99	3	3	3	197
February	90	3	3	3	179
March	103	4	3	3	205
April	75	3	2	3	150
May	87	5	2	3	173
June	84	4	2	3	167
July	119	5	3	4	236
August	52	5	0	2	104
September	32	4	0	1	63
October	48	3	1	2	95
November	22	2	0	1	45
December	88	4	2	3	175
Calendar year 2018	901	5	0	2	1,788

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. -- 48 years (1971-2018), 1,262 ft^3/s (914,000 acre-feet per year).

Extremes. -- 1971-2018; 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. Since Nov. 12, 1973, flow completely regulated by Cochiti Dam. Cochiti Eastside Main Canal on left bank and Sili Main Canal on right bank bypass station.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	18,671	709	504	602	37,034
February	17,826	676	568	637	35,358
March	17,054	616	508	550	33,827
April	18,772	700	515	626	37,234
May	23,683	834	689	764	46,975
June	24,432	908	745	814	48,461
July	21,479	849	496	693	42,604
August	18,184	688	476	587	36,068
September	11,303	436	352	377	22,420
October	10,214	376	272	329	20,259
November	9,702	378	290	323	19,244
December	14,213	535	331	458	28,191
Calendar year 2018	205,533	908	272	563	407,675

STREAMFLOW

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. -- --48 years (1971-2018), 5.1 ft3/s (3,667 acre-feet per year).

Extremes. -- 1970-2018; Maximum discharge, 3,460 ft3/s Aug. 24, 1997 (gage height, 5.57 ft); no flow many days each year.

Remarks. -- Records good. Flow regulated by Galisteo Reservoir 0.4 mi upstream. Capacity of outlet, 5,000 ft^3/s when reservoir is full. 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	0
February	1	1	0	0	2
March	1	1	0	0	2
April	0	0	0	0	0
May	0	0	0	0	0
June	6	6	0	0	12
July	826	509	0	27	1,639
August	230	93	0	7	457
September	70	61	0	2	138
October	93	47	0	3	185
November	3	3	0	0	6
December	0	0	0	0	0
Calendar year 2018	1,231	509	0	3	2,441

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. -- 9 years (2010-2018), 32.5 ft3/s (23,570 acre-feet per year).

Extremes. -- 2010-2018; Maximum discharge, 1,420 cfs Jul. 27, 2013 (gage height, 4.82); no flow many days each year.

Remarks. -- Records fair except for estimated daily 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	308	14	6	10	612
February	365	23	9	13	724
March	402	22	8	13	797
April	282	58	0	9	559
May	0	0	0	0	0
June	6	5	0	0	11
July	837	542	0	27	1,659
August	349	74	0	11	692
September	21	14	0	1	42
October	1,030	694	0	33	2,042
November	99	6	1	3	197
December	162	10	0	5	321
Calendar year 2018	3,861	694	0	11	7,657

STREAMFLOW

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 April 23, 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. -- 104 years (1915-2018), 965 ft3/s (699,000 acre-feet per year).

Extremes. -- 1915-2018; Maximum daily discharge, 8,220 ft^3/s May 22, 1942; no flow at times.

Remarks. -- Records good except for estimated daily 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	36	9	1	1	72
February	3,764	661	0	134	7,467
March	33,589	1,380	39	1,084	66,623
April	24,503	1,350	351	817	48,602
May	30,123	1,890	625	972	59,749
June	55,810	2,070	1,560	1,860	110,699
July	54,360	1,990	1,230	1,754	107,823
August	28,718	1,580	804	926	56,962
September	18,023	976	35	601	35,748
October	308	35	0	10	612
November	6	1	0	0	12
December	7	0	0	0	13
Calendar year 2018	249,247	2,070	0	683	494,382

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 4,140.90 ft above National Geodetic Vertical Datum of 1929. 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. -- 81 years (1938-2018), 891 ft3/s (645,600 acre-feet per year).

Extremes. -- 1938-2018; 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	39	2	1	1	78
February	20	1	1	1	39
March	24,074	1,851	1	777	47,751
April	28,581	1,347	725	953	56,690
May	31,774	1,524	651	1,025	63,024
June	58,063	2,349	1,342	1,935	115,168
July	53,539	2,219	1,047	1,727	106,195
August	30,140	1,183	845	972	59,783
September	21,538	867	1	718	42,720
October	19	1	1	1	38
November	19	1	1	1	38
December	20	1	1	1	40
Calendar year 2018	247,826	2,349	1	679	491,564

STREAMFLOW

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 U.S.G.S. 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	4.5
February	117.4
March	86.3
April	224.8
May	149.9
June	235.1
July	134.6
August	222.4
September	168.4
October	30.4
November	30.4
December	13.4
Calendar year 2018	1,417.6

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 2018

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 2018

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	30.0	30.0	30.0	30.0	30.0	-
Contents	561	561	561	561	561	561	561	561	561	561	561	561	-
Change	0	0	0	0	0	0	0	0	0	0	0	0	0

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 2018

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 2018

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal. Yr.
Gage height	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	0	0	0	0	-
Contents	213	213	213	213	213	213	213	213	0	0	0	0	-
Change	0	0	0	0	0	0	0	0	-213	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 2018

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 2018

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 2018

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal. Yr.
Gage height	20.5	23.4	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	-
Contents	378	469	598	598	598	598	598	598	598	598	598	598	-
Change	+96	+91	+129	0	0	0	0	0	0	0	0	0	+316

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 2018

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 2018

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 2018

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal. Yr.
Gage height	14.7	15.9	17.2	17.2	17.2	13.9	7.3	7.3	7.3	7.3	7.3	7.3	-
Contents	155	182	209	237	237	237	165	55	55	55	55	55	-
Change	+27	+27	+28	0	0	-72	-110	0	0	0	0	0	-100

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, 2017	9,988.48	23,304	-
January 31, 2018	9,988.32	23,209	-95
February 28	9,988.75	23,474	+265
March 31	9,989.20	23,772	+298
April 30	9,990.37	24,489	+717
May 31	9,990.88	24,811	+322
June 30	9,987.50	22,703	-2,108
July 31	9,983.82	20,508	-2,195
August 31	9,982.29	19,628	-880
September 30	9,981.75	19,320	-308
October 31	9,982.28	19,623	+303
November 30	9,981.90	19,408	-215
December 31, 2018	9,981.32	19,079	-329
Calendar year 2018	-	-	-4,225

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 2018

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal. Yr.
Gage height	22.6	22.6	22.6	22.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	-
Contents	738	738	738	738	0	0	0	0	0	0	0	0	-
Change	0	0	0	0	-738	0	0	0	0	0	0	0	-738

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, 2017	7,130.75	146,650	-
January 31, 2018	7,130.51	145,876	-774
February 28	7,128.64	139,949	-5,927
March 31	7,128.63	139,918	-31
April 30	7,132.48	152,313	+12,395
May 31	7,136.66	166,637	+14,324
June 30	7,136.02	164,386	-2,251
July 31	7,126.42	133,139	-31,247
August 31	7,113.68	98,855	-34,284
September 30	7,095.98	64,382	-34,473
October 31	7,093.82	61,020	-3,362
November 30	7,092.22	58,630	-2,390
December 31, 2018	7,090.61	56,308	-2,322
Calendar year 2018	-	-	-90,342

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, 2017	6,854.91	73,693	-	33,850
January 31, 2018	6,852.20	69,072	-4,621	26,788
February 28	6,853.97	72,072	+3,000	27,220
March 31	6,854.85	73,589	+1,517	25,467
April 30	6,860.23	83,257	+9,668	24,710
May 31	6,843.48	55,290	-27,967	22,225
June 30	6,810.42	17,779	-37,511	17,779
July 31	6,798.61	9,411	-8,368	9,411
August 31	6,803.28	12,429	+3,018	12,429
September 30	6,805.48	13,978	+1,549	13,978
October 31	6,802.36	11,807	-2,171	11,558
November 30	6,802.60	11,968	+161	11,790
December 31, 2018	6,805.45	13,957	+1,989	13,797
Calendar year 2018	-	-	-59,736	-

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, 2017	6,200.95	117,726	-	116,537
January 31, 2018	6,201.97	121,013	+3,287	120,164
February 28	6,203.20	125,011	+3,998	123,440
March 31	6,203.18	124,946	-65	123,592
April 30	6,201.02	117,950	-6,996	116,766
May 31	6,198.53	110,073	-7,877	107,843
June 30	6,193.82	95,983	-14,090	94,714
July 31	6,191.58	89,702	-6,281	88,400
August 31	6,188.65	81,921	-7,781	80,600
September 30	6,191.69	90,003	8,082	88,665
October 31	6,188.91	82,591	-7,412	81,030
November 30	6,188.58	81,741	-850	79,823
December 31, 2018	6,187.13	78,078	-3,663	76,735
Calendar year 2018	-	-	-39,648	-

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, 2017	6,825.14	1,649	-
January 31, 2018	6,826.22	1,707	+58
February 28	6,825.96	1,693	-14
March 31	6,826.61	1,729	+36
April 30	6,826.61	1,729	0
May 31	6,816.93	1,240	-489
June 30	6,801.90	675	-565
July 31	6,806.94	837	+162
August 31	6,809.43	927	+90
September 30	6,810.69	975	+48
October 31	6,812.93	1,065	+90
November 30	6,817.82	1,281	+216
December 31, 2018	6,821.25	1,447	+166
Calendar year 2018	-	-	-202

STORAGE IN RESERVOIRS

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, 2017	7,858.25	1,240	-	230	0
January 31, 2018	7,856.27	1,147	-93	120	0
February 28	7,854.41	1,063	-84	46	0
March 31	7,852.09	963	-100	0	0
April 30	7,850.62	904	-59	0	0
May 31	7,847.82	798	-106	0	0
June 30	7,840.57	563	-235	0	0
July 31	7,843.78	661	+98	251	0
August 31	7,845.80	727	+66	306	0
September 30	7,851.08	922	+195	462	0
October 31	7,856.98	1,181	+259	813	0
November 30	7,863.42	1,509	+328	1061	0
December 31, 2018	7,864.22	1,554	+45	1061	0
Calendar year 2018	-		+314		

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, 2017	7,473.38	335	-	17	78
January 31, 2018	7,471.61	302	-33	0	78
February 28	7,472.20	313	+11	0	78
March 31	7,472.80	324	+11	0	78
April 30	7,470.75	285	-39	0	78
May 31	7,469.59	265	-20	0	78
June 30	7,472.89	326	+61	0	78
July 31	7,477.56	424	+98	0	78
August 31	7,477.05	412	-12	0	78
September 30	7,475.33	373	-39	0	78
October 31	7,479.38	465	+92	0	78
November 30	7,477.95	432	-33	0	78
December 31, 2018	7,475.29	372	-60	0	78
Calendar year 2018	-		+37		

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, 2017	5,343.75	47,053	-	44,788
January 31, 2018	5,344.65	48,175	+1,122	45,958
February 28	5,344.62	48,137	-38	45,798
March 31	5,343.98	47,334	-803	45,479
April 30	5,343.96	47,309	-25	44,997
May 31	5,343.24	46,445	-864	44,451
June 30	5,343.22	46,421	-24	43,764
July 31	5,342.21	45,268	-1153	43,332
August 31	5,342.06	45,101	-167	42,904
September 30	5,341.78	44,792	-309	42,557
October 31	5,341.90	44,924	+132	42,516
November 30	5,341.57	44,562	-362	42,350
December 31, 2018	5,340.71	43,634	-928	42,523
Calendar year 2018	-	-	-3,419	-

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 2018

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, 2017	5,155.00	0	-	0
January 31, 2018	5,155.00	0	0	0
February 28	5,155.00	0	0	0
March 31	5,155.00	0	0	0
April 30	5,155.00	0	0	0
May 31	5,155.00	0	0	0
June 30	5,155.00	0	0	0
July 31	5,155.00	0	0	0
August 31	5,155.00	0	0	0
September 30	5,155.00	0	0	0
October 31	5,155.00	0	0	0
November 30	5,155.00	0	0	0
December 31, 2018	5,155.00	0	0	0
Calendar year 2018	-	-	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 2017

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 2018.

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, 2017	4,334.67	425,083	-	0
January 31, 2018	4,337.38	458,005	+32,922	0
February 28	4,339.36	483,049	+25,044	0
March 31	4,335.49	434,879	-48,170	0
April 30	4,332.01	394,293	-40,586	0
May 31	4,326.78	337,869	-56,424	0
June 30	4,315.01	227,701	-110,168	0
July 31	4,300.68	128,943	-98,758	0
August 31	4,292.38	85,442	-43,501	0
September 30	4,285.79	58,695	-26,747	0
October 31	4,289.40	72,461	+13,766	0
November 30	4,293.24	89,448	+16,987	0
December 31, 2018	4,298.21	114,872	+25,424	0
Calendar year 2018	-	-	-310,211	-

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, 2017	4,142.80	37,061	-
January 31, 2018	4,143.00	37,704	+643
February 28	4,144.98	44,482	+6,778
March 31	4,148.32	57,860	+13,378
April 30	4,145.42	46,094	-11,766
May 31	4,143.31	38,715	-7,379
June 30	4,141.81	33,992	-4,723
July 31	4,142.61	36,457	+2,465
August 31	4,140.36	29,837	-6,620
September 30	4,138.04	23,920	-5,917
October 31	4,138.80	25,777	+1,857
November 30	4,138.85	25,902	+125
December 31, 2018	4,139.18	26,735	+833
Calendar year 2018	-	-	-10,326

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, 2017	462,144	-
January 31, 2018	495,709	+33,565
February 28	527,531	+31,822
March 31	492,739	-34,792
April 30	440,387	-52,352
May 31	376,584	-63,803
June 30	261,693	-114,891
July 31	165,400	-96,293
August 31	115,279	-50,121
September 30	82,615	-32,664
October 31	98,238	+15,623
November 30	115,350	+17,112
December 31, 2018	141,607	+26,257
Calendar year 2018	-	-320,537

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

TRANSMOUNTAIN DIVERSIONS

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, 2018

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	1,598
April	0	0	0	21	0	5	12,869
May	124	8	97	131	24	131	15,616
June	0	278	77	27	21	13	2,636
July	0	0	1	17	0	0	152
August	0	0	1	15	0	0	7
September	0	0	0	10	0	0	0
October	0	0	13	0	0	0	1,216
November	0	0	0	0	0	0	283
December	0	0	0	0	0	0	0
Calendar year	124	286	189	221	45	149	34,377

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.

RIO GRANDE COMPACT COMMISSION REPORT

EVAPORATION AND PRECIPITATION

Evaporation and precipitation, in inches
2018

Station		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug	Sept.	Oct.	Nov.	Dec.	Annual
Alamosa	Evap.	-	-	-	-	-	-	-	-	-	-	-	-	-
Airport	Precip.	0.08	0.23	0.15	0.20	0.14	0.62	1.05	0.64	1.02	1.16	0.16	0.32	5.77
Platoro	Evap.	-	-	-	-	7.09	8.45	6.69	5.87	4.77	-	-	-	-
Dam	Precip.	-	-	-	-	0.74	1.18	2.72	3.00	1.57	-	-	-	-
Heron	Evap.	-	-	-	6.53	8.94	10.60	9.07	8.74	7.81	3.94	-	-	-
Dam	Precip.	0.53	1.12	1.25	0.56	0.17	0.88	2.28	1.25	0.59	2.63	0.68	1.73	13.67
El Vado	Evap.	-	-	-	6.74	8.86	10.55	9.14	8.17	6.48	3.76	-	-	-
Dam	Precip.	0.37	0.83	0.80	0.54	0.16	0.76	2.19	1.49	0.63	2.29	0.36	1.41	11.83
Abiquiu	Evap.	2.47	3.59	6.06	7.97	11.77	13.63	11.74	9.60	8.95	5.83	3.60	2.17	87.38
Dam	Precip.	0.06	0.34	0.13	0.19	0.14	0.18	0.77	1.61	0.42	2.09	0.25	0.49	6.67
Nambe	Evap.	-	-	-	8.69	11.69	12.82	10.51	9.60	8.54	4.05	-	-	-
Canyon Dam	Precip.	0.05	0.66	0.27	0.00	0.00	0.12	2.53	1.58	0.70	2.88	0.37	1.47	10.63
Cochiti	Evap.	2.79	4.20	7.13	8.39	10.15	13.38	10.29	9.09	7.71	4.13	3.56	2.79	83.61
Dam	Precip.	0.00	0.48	0.48	0.02	0.37	0.40	1.51	0.60	0.66	2.69	0.12	1.17	8.50
Jemez	Evap.	3.10	4.42	7.75	9.6	12.71	14.4	13.64	11.78	9.60	5.89	4.20	3.10	100.19
Canyon Dam	Precip.	0.03	0.55	0.19	0.00	0.33	0.27	2.03	1.11	0.95	2.32	0.03	0.26	8.07
Elephant	Evap.	5.35	7.80	11.03	16.5	20.77	20.07	13.79	14.22	10.25	7.25	5.82	3.58	136.43
Butte Dam	Precip.	0.00	0.12	0.12	0.00	0.00	0.62	2.57	0.62	2.27	1.98	0.00	1.13	9.43
Caballo	Evap.	5.29	6.79	10.63	14.64	17.10	16.73	13.33	12.68	10.12	6.31	5.15	3.20	121.97
Dam	Precip.	0.00	0.91	0.10	0.00	0.00	1.04	2.08	0.50	0.89	2.72	0.00	0.95	9.19
State	Evap.	4.05	5.74	8.73	11.44	13.13	13.81	11.99	10.55	8.05	4.75	4.26	2.96	99.46
University	Precip.	0.00	0.74	0.07	0.00	0.00	0.73	1.92	0.94	1.45	2.27	0.13	1.11	9.36

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.)

RIO GRANDE COMPACT

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:

RIO GRANDE COMPACT COMMISSION REPORT

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.

RULES AND REGULATIONS

(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.

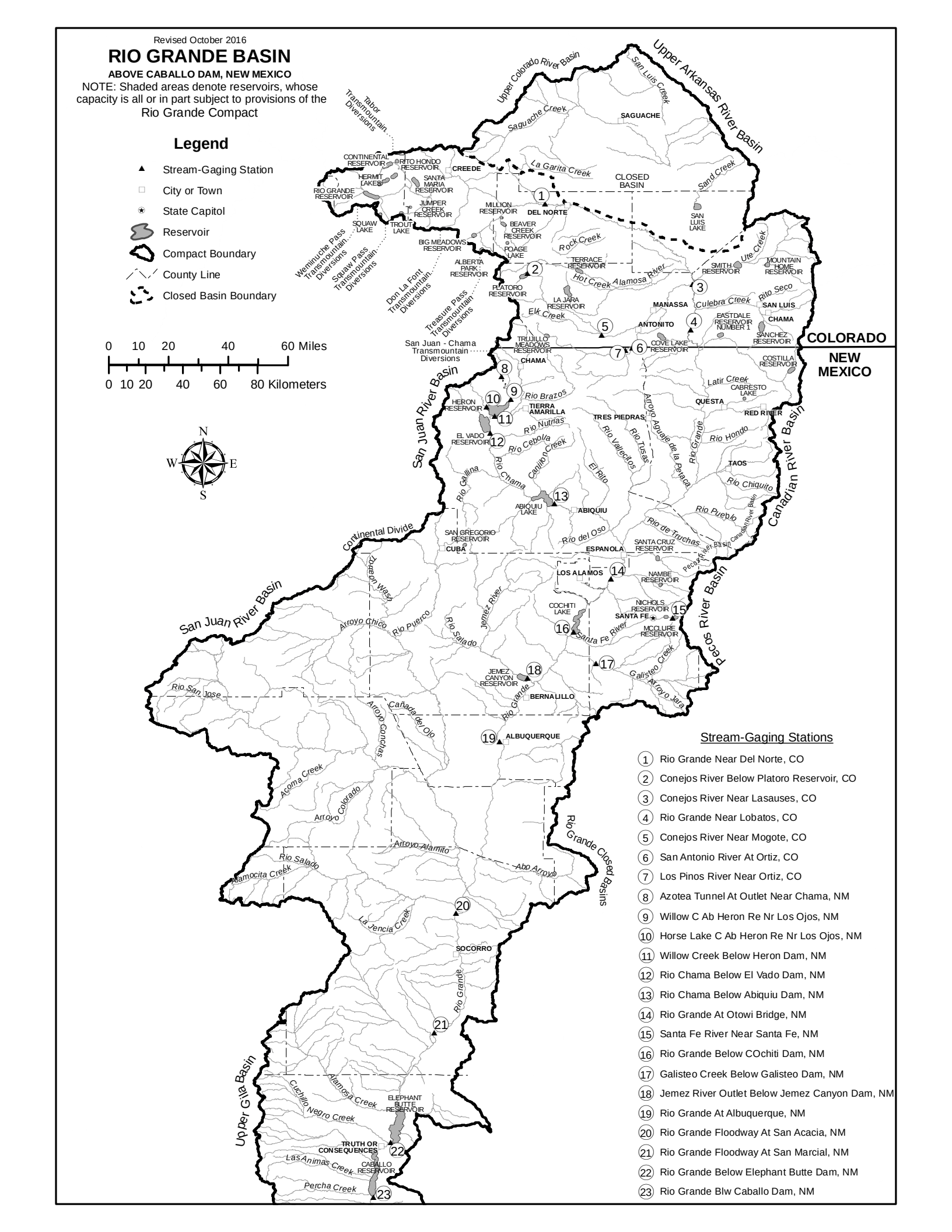
/1 Amended at Eleventh Annual Meeting, February 23, 1950.
/10 Amended at Thirteenth Annual Meeting, February 25, 1952.
/11 Amended at Seventy-Seventh Annual Meeting, March 31, 2016.

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



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