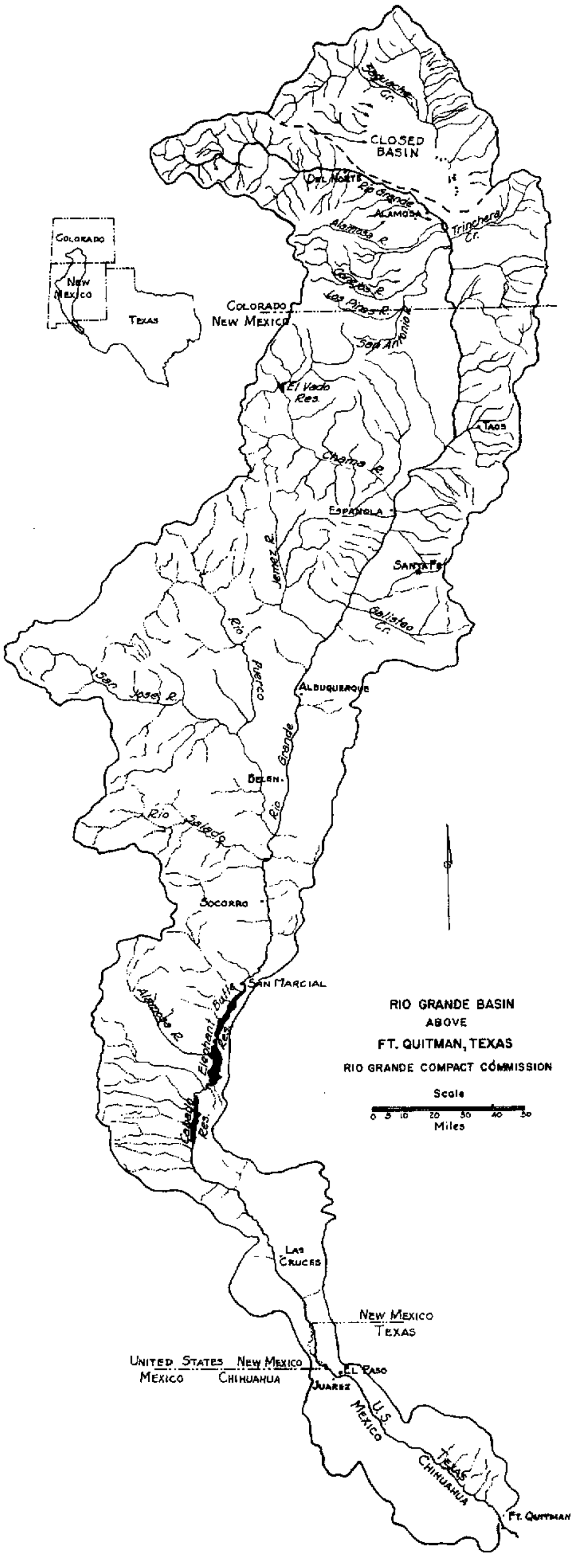
REPORT

of the

RIO GRANDE COMPACT COMMISSION

1964

TO THE GOVERNORS OF
Colorado, New Mexico and Texas


RIO GRANDE BASIN
ABOVE
FT. QUITMAN, TEXAS
RIO GRANDE COMPACT COMMISSION
Scale
0 5 10 20 30 40 50
Miles
CLOSED BASIN
Saguache Cr.
Del Norte
Rio Grande
Alamosa
Alamosa R.
Trinchera Cr.
Conejos R.
Los Pinos R.
San Antonio
Colorado
New Mexico
Texas
El Vado Res.
Taos
Chama R.
Espanola
Jemez R.
Santa Fe
Galisteo Cr.
Rio Puerco
San Jose R.
Albuquerque
Belen
Rio Salado
Socorro
San Marcial
Alamosa R.
Elephant Butte Res.
Caballo Res.
Las Cruces
New Mexico
Texas
United States
Mexico
New Mexico
Chihuahua
El Paso
Juarez
U.S.
Mexico
Texas
Chihuahua
Ft. Quitman

CONTENTS

ILLUSTRATIONS

February 18, 1965

His Excellency, Jack M. Campbell
Governor of the State of New Mexico
Santa Fe, New Mexico

His Excellency, John B. Connally
Governor of the State of Texas
Austin, Texas

His Excellency, John A. Love
Governor of the State of Colorado
Denver, Colorado

Sirs:

The 26th Annual Meeting of the Rio Grande Compact Commission was held in Santa Fe, New Mexico, on February 18, 1965.

The Commission reviewed the reports of the Secretary relative to stream flow at Compact gaging stations and storage in reservoirs. The Commission found that:

(a) The actual delivery of water by Colorado at Lobatos in 1964 was 57,600 acre-feet, which was 43 per cent of the scheduled delivery. The accrued debit of Colorado was 810,800 acre-feet as of December 31, 1964.

(b) The actual delivery of water by New Mexico, measured by the Elephant Butte Effective Supply, was 158,700 acre-feet in 1964, which was 71 per cent of the scheduled delivery. The accrued debit of New Mexico was 417,700 acre-feet as of December 31, 1964.

(c) Releases of usable water from Project Storage amounted to 207,100 acre-feet in 1964, which was 26 per cent of the normal release defined by the Compact. The accrued departure from normal releases was an under-release of 2,086,200 acre-feet as of December 31, 1964. The total quantity of water in Project storage was 98,400 acre-feet on that date.

Expenses of administration of the Rio Grande Compact were $31,384 during the fiscal year ending June 30, 1964; of which $14,650 was borne by the United States and the balance of $16,734 was borne equally by the three states party to the Compact.

Respectfully,

Commissioner for New Mexico

Commissioner for Texas

Commissioner for Colorado

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 Sauses;

(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 Sauses 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

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)
550	144
600	162
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:

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	
200	0
300	65
400	141
500	219
600	300
700	383
800	469
900	557
1,000	648
1,100	742
1,200	839
1,300	939
1,400	1,042
1,500	1,148
1,600	1,257
1,700	1,370
1,800	1,489
1,900	1,608
2,000	1,730
2,100	1,856
2,200	1,985
2,300	2,117
	2,253

Intermediate quantities shall be computed by proportional parts.

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

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

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

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

ARTICLE V

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

ARTICLE VI

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

In the case of Colorado, no annual debit nor accrued debit shall exceed 100,000 acre feet, except as either or both may be caused by holdover storage of water in reservoirs constructed after 1937 in the drainage basin of the

Rio Grande above Lobatos. Within the physical limitations of storage capacity in such reservoirs, Colorado shall retain water in storage at all times to the extent of its accrued debit.

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

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

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

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

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

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

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

ARTICLE VII

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

ARTICLE VIII

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

ARTICLE IX

Colorado agrees with New Mexico that in event the United States or the State of New Mexico decides to construct the necessary works for diverting the waters of the San Juan River, or any of its tributaries, into the Rio Grande, Colorado hereby consents to the construction of said works and the diversion of waters from the San Juan

River, or the tributaries thereof, into the Rio Grande in New Mexico, provided the present and prospective uses of water in Colorado by other diversions from the San Juan River, or its tributaries, are protected.

ARTICLE X

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

ARTICLE XI

New Mexico and Texas agree that upon the effective date of this Compact all controversies between said States relative to the quantity or quality of the water of the Rio Grande are composed and settled; however, nothing herein shall be interpreted to prevent recourse by a signatory state to the Supreme Court of the United States for redress should the character or quality of the water, at the point of delivery, be changed hereafter by one signatory state to the injury of another. Nothing herein shall be construed as an admission by any signatory state that the use of water for irrigation causes increase of salinity for which the user is responsible in law.

ARTICLE XII

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

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

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

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

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.

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

Quantities in thousands of acre-feet

Otowi Index Supply (5)	Elephant Butte Effective Index Supply (6)
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").

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.

GAGING STATIONS /1

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 stations on the Rio Grande below those reservoirs shall be equipped, maintained and operated by or on behalf of Texas through the agency of the U.S. Bureau of Reclamation.

/1 Amended at Eleventh Annual Meeting, February 23, 1950.

The equipment, method and frequency of measurements 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. 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.

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.

ACTUAL SPILL /2

(a) Water releases 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.

/1 Amended at Eleventh Annual Meeting, February 23, 1950.
/2 Adopted at Fourth Annual Meeting, February 24, 1943.

(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 physical capacity of that reservoir, to the level of the uncontrolled spillway, i.e.-2,219,000 acre-ft in 1942.

(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.

DEPARTURES FROM NORMAL RELEASES /3

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.

EVAPORATION LOSSES /4, /5, /6

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.

/3 Adopted June 2, 1959; made effective January 1, 1952.
/4 Amended at Tenth Annual Meeting, February 15, 1949.
/5 Amended at Twelfth Annual Meeting, February 24, 1951.
/6 Amended June 2, 1959.

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.

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.

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.

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.

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.

SECRETARY /7

The Commission, subject to the approval of the Director, U.S. Geological Survey, to a cooperative agreement for such purposes shall employ the U.S. Geological Survey on a yearly basis, to render such engineering and clerical aid as may reasonably be necessary for administration of the Compact. Said agreement shall provide that the Geological Survey shall:

(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 by letter on or before the fifteenth day of each month, except January, 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 in February 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.

/7 The substitution of this section for the section titled "Reports to Commissioners" was adopted at Ninth Annual Meeting, February 22, 1948.

COSTS /1

In February of each year, 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.

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 which he 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 his State an appropriation of sufficient funds with which to meet the obligations of his State, as provided by the Compact.

/1 Amended at Eleventh Annual Meeting, February 23, 1950.

MEETING OF COMMISSION /1, /8

The Commission shall meet in Santa Fe, New Mexico, on the third Thursday of February of 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; provided that the Commission may agree to meet elsewhere. 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.
/8 Amended at Thirteenth Annual Meeting, February 25, 1952.

RECORDS OF DELIVERIES AND RELEASES

At the Annual Meeting of the Compact Commission in February of each year, the records of deliveries and releases for the year just ended are examined and the computations of debits and credits based thereon are reviewed and adopted. The records and computations for 1963 as adopted by the Commission are reproduced on the next three pages.

The delivery of water in the Rio Grande at the Colorado-New Mexico state line was obtained from records of stream flow adjusted in accordance with the provisions of Article III of the Compact: the obligation of Colorado to deliver water at the state line was computed as prescribed in Article III. Item C5, the Reduction of Debits prescribed in Article VI, was computed in accordance with the Rules and Regulations.

The delivery of water by New Mexico to Project Storage was computed from actual stream flow record and record of operation of Elephant Butte Reservoir and was adjusted as prescribed in Article IV of the Compact; the scheduled delivery was computed as prescribed in the Resolution of the Commission adopted at the Tenth Annual Meeting, and published in this Report. Item NM4, Reduction of Debits by Evaporation, is in accordance with the provisions of the third and the last paragraphs of Article VI of the Compact.

The actual release from Project Storage during the year was measured at stations below Caballo Dam: the adjustments, items P4, P5 and P6, are in accordance with the Rules and Regulations as amended June 2, 1959.

RIO GRANDE COMPACT

DELIVERIES BY COLORADO AT STATE LINE

YEAR 1964

003263

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	CHANGE IN STORAGE	OTHER ADJUSTMENTS	NET ADJUSTMENT	SUPPLY IN MONTH	ACCUMULATED TOTAL	RECORDED FLOW NEAR DEL NORTE	STORAGE AT END OF MONTH	CHANGE IN STORAGE	TRANSMOUNTAIN DIVERSIONS	OTHER ADJUSTMENTS	NET ADJUSTMENT	SUPPLY IN MONTH	ACCUMULATED TOTAL	CONEJOS RIVER AT MOUTH NEAR LOS SAUCES	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
	———	———	———	———	3.0	———	———	———	———	⊖	———	0.9	———	———	———	———	———	⊖	———	———	———	⊖
JAN	1.7	———	———	1.7	3.0	0	0	0	1.7	1.7	6.7	.9	0			0	6.7	6.7	1.5	5.5	7.0	7.0
FEB	1.7	———	———	1.7	3.0	0	0	0	1.7	3.4	6.7	.9	0			0	6.7	13.4	1.7	5.7	7.4	14.4
MAR	2.6	———	———	2.6	3.0	0	0	0	2.6	6.0	10.3	.9	0			0	10.3	23.7	2.7	10.6	13.3	27.7
APR	8.6	4.3	3.2	16.1	2.9	-.1	+.1	0	16.1	22.1	23.8	.9	0			0	23.8	47.5	.9	4.3	5.2	32.9
MAY	61.8	26.2	4.9	92.9	10.7	+7.8	0	+7.8	100.7	122.8	130.6	.9	0			0	130.6	178.1	1.9	2.6	4.5	37.4
JUN	38.1	6.4	.2	44.7	10.7	0	+.1	+.1	44.8	167.6	83.4	.9	0	-1.0	+.2	-.8	82.6	260.7	.3	1.5	1.8	39.2
JUL	9.7	1.7	.1	11.5	10.7	0	+.1	+.1	11.6	179.2	31.2	.9	0			0	31.2	291.9	0	.5	.5	39.7
AUG	16.0	2.3	.2	18.5	10.7	0	c+.1	+.1	18.6	197.8	30.2	.9	0			0	30.2	322.1	0	1.1	1.1	40.8
SEPT	4.2	1.0	0	5.2	10.7	0	0	0	5.2	203.0	17.0	.9	0			0	17.0	339.1	0	.6	.6	41.4
OCT	3.1	.9	.1	4.1	10.7	0	+.1	+.1	4.2	207.6	14.2	.9	0			0	14.2	353.3	0	1.6	1.6	43.0
NOV	11.8	———	———	11.8	2.8	-7.9	0	-7.9	3.9	211.1	9.1	.9	0			0	9.1	362.4	7.2	2.3	9.5	52.5
DEC	2.7	———	———	2.7	2.8	0	0	0	2.7	213.8	6.9	.9	0			0	6.9	369.3	2.2	2.9	5.1	57.6
YEAR	162.0	42.8	8.7	213.5	———	-.2	+.5	+.3	213.8	———	370.1	———	0	-1.0	+.2	-.8	369.3	———	18.4	39.2	57.6	———

REMARKS:
- Storage in recreational reservoirs not included.
- a Evaporation loss.
- b 1,245 acre-feet minus 243 acre-feet pre-compact.
- c Total for Trujillo Meadows Reservoir
- c6 Cancellation of improper credit for evaporation loss from Trujillo Meadows Reservoir for 1962 and 1963.
- c7 Rio Grande at Lobatos, November 1962, revised from 21,610 to 21,230 acre-feet.

SUMMARY OF DEBITS AND CREDITS

ITEM		DEBIT	CREDIT	BALANCE	
C1	Balance at Beginning of Year	———	———	Dr	734.4
C2	Scheduled Delivery from Conejos River	53.3	———	Dr	787.7
C3	Scheduled Delivery from Rio Grande	90.6	———	Dr	878.3
C4	Actual Delivery at Lobatos plus 10 000 Acre Feet	———	67.6	Dr	810.7
C5	Reduction of Debits a/c Evaporation	———	.4	Dr	810.3
C6	Reduction of Credits a/c Evaporation correction, 1962-63	.2	———	Dr	810.5
C7	" " " " Revisions, Lobatos 1962	.3	———	Dr	810.8
C8	Balance at End of Year	———	———	Dr	810.8

RIO GRANDE COMPACT
DELIVERIES BY NEW MEXICO AT ELEPHANT BUTTE

YEAR 1964

Quantities in Thousands of Acre Feet to Nearest Hundred

MONTH	NATURAL FLOW AT OTOWI BRIDGE							TOTAL WATER STORED IN NEW MEXICO ABOVE SAN MARCIAL AT END OF MONTH	ELEPHANT BUTTE EFFECTIVE SUPPLY					
	RECORDED FLOW AT OTOWI BRIDGE	STORAGE IN RESERVOIRS LOCATED TO OTOWI			OTHER ADJUSTMENTS PER ARTICLE IV	OTOWI INDEX SUPPLY			STORAGE IN ELEPHANT BUTTE RESERVOIR		RECORDED FLOW BELOW ELEPHANT BUTTE DAM	ADJUSTMENT OF MEASUREMENTS	ACTUAL EFFECTIVE SUPPLY	
		TOTAL AT END OF MONTH	CHANGE GAIN (+) LOSS (-)	EVAPORATION DURING MONTH		DURING MONTH (2+4+5+6)	ACCUMULATED TOTAL		AT END OF MONTH	CHANGE GAIN (+) LOSS (-)			DURING MONTH (11+12+13)	ACCUMULATED TOTAL
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	—	2.4	—	—	—	—	⊖	4.7	112.0	—	—	—	—	⊖
JAN	26.4	2.4	0	0	-	26.4	26.4	4.7	134.5	+22.5	0.3	-	22.8	22.8
FEB	26.1	2.4	0	0	-	26.1	52.5	4.7	160.6	+26.1	.3	-	26.4	49.2
MAR	34.8	3.8	+1.4	0	-	36.2	88.7	6.4	153.3	-7.3	22.0	-	14.7	63.9
APR	41.5	4.5	+.7	0	-	42.2	130.9	7.1	119.7	-33.6	40.3	-	6.7	70.6
MAY	88.4	29.5	+25.0	.2	-	113.6	244.5	32.4	135.4	+15.7	.8	-	16.5	87.1
JUN	26.7	27.4	-2.1	.1	-	24.7	269.2	29.9	126.9	-8.5	16.9	-	8.4	95.5
JUL	18.6	23.6	-3.8	.1	-	14.9	284.1	25.7	94.5	-32.4	41.4	-	9.0	104.5
AUG	29.0	23.0	-.6	.1	-	28.5	312.6	25.0	63.3	-31.2	41.9	-	10.7	115.2
SEPT	21.8	18.0	-5.0	.1	-	16.9	329.5	19.8	48.6	-14.7	18.8	-	4.1	119.3
OCT	14.4	18.0	0	0	-	14.4	343.9	19.7	50.1	+1.5	.3	-	1.8	121.1
NOV	40.0	2.4	-15.6	.1	-	24.5	368.4	4.2	64.7	+14.6	.2	-	14.8	135.9
DEC	26.1	2.6	+.2	0	-	26.3	394.7	4.6	87.3	+22.6	.2	-	22.8	158.7
YEAR	393.8	—	+.2	(a) .7	-	394.7	—	—	—	-24.7	183.4	-	158.7	—

REMARKS:

(a) Includes arbitrary allowance of 100 acre-feet for evaporation from Abiquiu Reservoir and 100 acre-feet for evaporation loss from stock tanks.

SUMMARY OF DEBITS AND CREDITS

	ITEM	DEBIT	CREDIT	BALANCE	
NM 1	Balance at Beginning of Year	—	—	Dr	351.8
NM 2	Scheduled Delivery at Elephant Butte	225.0	—	Dr	576.8
NM 3	Actual Elephant Butte Effective Supply	—	158.7	Dr	418.1
NM 4	Reduction of Debits % Evaporation	—	0.4	Dr	417.7
NM 5	Reduction of Credits % Evaporation		—		
NM 6					
NM 7					
NM 8	Balance at End of Year	—	—	Dr	417.7

RIO GRANDE COMPACT
RELEASE AND SPILL FROM PROJECT STORAGE

YEAR 1964

003265

Quantities in Thousands of Acre Feet to Nearest Hundred

MONTH	TOTAL PROJECT STORAGE CAPACITY AVAILABLE AT END OF MONTH	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							
		ELEPHANT BUTTE RESERVOIR	CABALLO RESERVOIR	TOTAL AT END OF MONTH		COLORADO CREDIT WATER	NEW MEXICO CREDIT WATER	TOTAL AT END OF MONTH			MEASURED FLOW AT CABALLO GAGING STATION	INTERVENING DIVERSIONS TO CANALS	TOTAL RELEASE AND SPILL	SPILL FROM STORAGE			USABLE RELEASE	
														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
	2,539.0	112.0	31.7	143.7	2,395.3	0	0	0	0	143.7	——	——	——	——	——	——	——	⊕
JAN	2,539.0	134.5	33.0	167.5	2,371.5	0	0	0	0	167.5	0.1	0	0.1	0	0	0	0.1	0.1
FEB	2,539.0	160.6	34.2	194.8	2,344.2	0	0	0	0	194.8	.1	0	.1	0	0	0	.1	.2
MAR	2,539.0	153.3	19.8	173.1	2,365.9	0	0	0	0	173.1	35.0	.1	35.1	0	0	0	35.1	35.3
APR	2,539.0	119.7	31.7	151.4	2,387.6	0	0	0	0	151.4	25.5	.1	25.6	0	0	0	25.6	60.9
MAY	2,539.0	135.4	33.4	168.8	2,370.2	0	0	0	0	168.8	.1	0	.1	0	0	0	.1	61.0
JUN	a2,439.0	126.9	11.0	137.9	a2,301.1	0	0	0	0	137.3	36.3	.3	36.6	0	0	0	36.6	97.6
JUL	a2,439.0	94.5	12.0	106.5	a2,332.5	0	0	0	0	106.5	41.3	.2	41.5	0	0	0	41.5	139.1
AUG	a2,439.0	63.3	5.1	68.4	a2,370.6	0	0	0	0	68.4	46.7	.2	46.9	0	0	0	46.9	186.0
SEPT	a2,439.0	48.6	7.3	55.9	a2,383.1	0	0	0	0	55.9	20.9	.1	21.0	0	0	0	21.0	207.0
OCT	2,539.0	50.1	8.6	58.7	2,480.3	0	0	0	0	58.7	.1	0	.1	0	0	0	.1	207.1
NOV	2,539.0	64.7	9.6	74.3	2,464.7	0	0	0	0	74.3	0	0	0	0	0	0	0	207.1
DEC	2,539.0	87.3	11.1	98.4	2,440.6	0	0	0	0	98.4	0	0	0	0	0	0	0	207.1
YEAR	——	——	——	——	——	——	——	——	——	——	206.1	1.0	207.1	0	0	0	207.1	——

REMARKS:

a The quantities of Project Storage and the unfilled portion of such storage do not include any of the 100,000 acre-feet of Caballo Reservoir capacity which the Regional Director, U. S. Bureau of Reclamation by letter of Feb. 12, 1960 stated is held inviolate by the Bureau of Reclamation for flood control purposes from June 1 to October 1.

Note.--Project storage was less than 400,000 acre-feet throughout year 1964.

ACCRUED DEPARTURE FROM NORMAL RELEASE

	ITEM	DEBIT	CREDIT	BALANCE	
P1	Accrued Departure at Beginning of Year	——	——	Cr	1,936.2
P2	Actual Release during Year	207.1	——	Cr	1,729.1
P3	Normal Release for Year	——	790.0	Cr	2,519.1
P4	Actual Evaporation from Elephant Butte Reservoir	——	——		
P5	Evaporation Loss if No Accrued Departure	——			
P6	Under-release in excess of 150.0	432.9	——	Cr	2,086.2
P7	Accrued Departure at End of Year	——	——	Cr	2,086.2

TIME OF HYPOTHETICAL SPILL Did not occur

COST OF OPERATION AND BUDGET

COST OF OPERATION, IN DOLLARS, FOR FISCAL YEAR ENDING JUNE 30, 1964
Adopted at the Twenty-sixth Annual Meeting

ITEM	Total Cost	Borne by United States	Borne by States		
			Colorado	New Mexico	Texas
GAGING STATIONS					
In Colorado	8,200	4,100	4,100		
In New Mexico, above Caballo Reservoir	12,700	9,000		3,700	
Caballo Reservoir and below	4,900	400		400	4,100
Sub-total	25,800	13,500	4,100	4,100	4,100
ADMINISTRATION					
U. S. G. S. Contract	5,050	1,150	1,300	1,300	1,300
Other expense	534		178	178	178
Sub-total	5,584	1,150	1,478	1,478	1,478
TOTAL	31,384	14,650	5,578	5,578	5,578
EQUAL SHARES OF STATES			5,578	5,578	5,578
CASH ADJUSTMENT BETWEEN STATES			0	0	0

BUDGET, IN DOLLARS, FOR FISCAL YEAR ENDING JUNE 30, 1966
Adopted at the Twenty-sixth Annual Meeting

ITEM	Total Cost	Borne by United States	Borne by States		
			Colorado	New Mexico	Texas
GAGING STATIONS					
In Colorado	8,400	4,200	4,200		
In New Mexico, above Caballo Reservoir	12,650	8,900		3,750	
Caballo Reservoir and below	4,750	100		450	4,200
Sub-total	25,800	13,200	4,200	4,200	4,200
ADMINISTRATION					
U. S. G. S. Contract	5,400	1,350	1,350	1,350	1,350
Other expense	900	0	300	300	300
Sub-total	6,300	1,350	1,650	1,650	1,650
TOTAL	32,100	14,550	5,850	5,850	5,850
EQUAL SHARES OF STATES			5,850	5,850	5,850
CASH ADJUSTMENT BETWEEN STATES			0	0	0

The recorded flow passing the gaging station on the Rio Grande near Del Norte, Colo. during the 1964 calendar year was 56 percent of the 75 year average. Similarly, the flow passing the station on Rio Grande at Otowi Bridge near San Ildefonso, N. Mex. was 35 percent of the 65 year average.

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 station description states the degree of accuracy of the records. "Excellent" indicates that, in general, the error in the daily records is believed to be less than 5 percent; "good" less than 10 percent; "fair", less than 15 percent; and "poor", probably more than 15 percent. The records of monthly runoff are, in general, more accurate than the daily records. These standards of accuracy are the same as those followed by the U. S. Geological Survey.

Acknowledgements

The water-supply data contained in this report have been furnished by various Federal and State Agencies.

The office of the State Engineer of Colorado furnished records of discharge on the following:

Rio Grande near Del Norte, Colo.
Conejos River near Mogote, Colo.
San Antonio River at Ortiz, Colo.
Los Pinos River near Ortiz, Colo.
Conejos River near La Sauses, Colo.
Rio Grande near Lobatos, Colo.

Records of 6 transmountain diversions and of storage in Squaw, Trout, Shaw, and Poage Lakes, Rito Hondo, Hermit Lakes Reservoir No. 3, Troutvale No. 2, Jumper Creek, Alberta Park, Beaver Park, Mill Creek, Fuchs, and Trujillo Meadows Reservoirs were also furnished by the office of the State Engineer of Colorado.

The U. S. Bureau of Reclamation, Monte Vista, Colo., furnished records for Platoro Reservoir and for Conejos River below Platoro Reservoir, Colo.

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

Storage in El Vado Reservoir near Tierra Amarilla, N. Mex.
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 corps of Engineers, Albuquerque, N. Mex. furnished the record of storage in Abiquiu Reservoir and Jemez Canyon Reservoir and, in cooperation with the U. S. Geological Survey, also furnished the record for Rio Chama below Abiquiu Dam and Jemez River below Jemez Canyon Dam, N. Mex.

The United Pueblos Agency, Albuquerque, N. Mex. supplied the records of storage for the following:

Acomita Reservoir near San Fidel, N. Mex.

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

Storage in Elephant Butte Reservoir, N. Mex.
Storage in Caballo Reservoir, 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 these agencies.

09269

Rio Grande near Del Norte, Colo.

Location.--Water-stage recorder, lat 37°41'20", long 106°27'30", in NW¼ sec.29, T.40 N., R.5 E., on right bank, 20 ft downstream from county highway bridge, 5 miles upstream from Pinos Creek, and 6 miles west of Del Norte. Datum of gage is 7,980.25 ft above mean sea level, datum of 1929. Prior to May 16, 1908, staff gage at site 4 miles downstream. Records are equivalent.

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

Average discharge.--75 years (1890-1964), 910 cfs (658,800 acre-ft per year).

Extremes.--1889-1964: Maximum discharge, 18,000 cfs Oct. 5, 1911 (gage height, 6.80 ft), from rating curve extended above 6,000 cfs; minimum daily, 69 cfs Aug. 21, 1902.

Remarks.--Records excellent except for some winter months, which are fair. 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	3,335	130	80	108	6,650
February	3,395	135	105	117	6,730
March	5,180	230	130	167	10,270
April	12,008	688	190	400	23,820
May	65,869	4,140	395	2,125	130,600
June	42,068	2,260	737	1,402	83,440
July	15,727	729	359	507	31,190
August	15,210	754	248	491	30,170
September	8,554	383	208	285	16,970
October	7,168	330	174	231	14,220
November	4,604	198	120	153	9,130
December	3,470	130	95	112	6,880
Calendar year 1964	186,608	4,140	80	510	370,100

Conejos River below Platoro Reservoir, Colo.

Location.--Water-stage recorder and concrete control, lat 37° 21'20", long 106°32'35", in NW¼NW¼ sec.22, T.36 N., R.4 E., on left bank 1,500 ft downstream from valve house for Platoro Reservoir and half a mile northwest of Platoro. Datum of gage is 9,866.60 ft above mean sea level (levels by Bureau of Reclamation).

Drainage area.--40 sq mi, approximately.

Average discharge.--12 years (1953-64), 82.7 cfs (59,970 acre-ft per year).

Extremes.--1952-64: Maximum discharge, 1,160 cfs Nov. 1, 1957; maximum gage height, 4.29 ft June 15, 1958; no flow Oct. 16-20, 1955.

Remarks.--Records good except those for winter months, which are poor. No diversions above station. Flow completely regulated by Platoro Reservoir (capacity, 60,000 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	310	-	-	10	615
February	319	-	-	11	633
March	341	-	-	11	676
April	360	-	-	12	714
May	7,377.4	600	3.8	238	14,630
June	7,416	550	98	247	14,710
July	1,847	100	27	59.6	3,660
August	3,641	322	18	117	7,220
September	762	40	11	25.4	1,510
October	468	32	11	15.1	928
November	4,429	576	12	148	8,780
December	372	-	-	12	738
Calendar year 1964	27,642.4	600	3.8	75.5	54,810

Conejos River near Mogote, Colo.

Location.--Water-stage recorder, lat 37°03'20", long 106°11'20", in SE¼ sec.34, T.33 N., R.7 E., on right bank 20 ft downstream from bridge on State Highway 174, three-quarters of a mile downstream from Fox Creek and 5½ miles west of Mogote. Altitude of gage is 8,240 ft.

Drainage area.--282 sq mi.

Average discharge.--54 years (1904, 1912-64), 334 cfs (241,800 acre-ft per year).

Extremes.--1903-5, 1911-64: Maximum discharge, 9,000 cfs Oct. 5, 1911 (gage height, 8.50 ft, from rating curve extended above 3,000 cfs; minimum daily determined, 10 cfs July 18, 1904.

Remarks.--Records good except those for winter months, which are fair. 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	840	36	20	27.1	1,670
February	872	51	21	30.1	1,730
March	1,321	71	34	42.6	2,620
April	4,349	260	54	145	8,630
May	31,140	2,180	161	1,005	61,770
June	19,231	1,430	248	641	38,140
July	4,885	248	112	158	9,690
August	8,069	512	68	260	16,000
September	2,117	95	47	70.6	4,200
October	1,558	77	39	50.3	3,090
November	*5,878	647	40	*196	*11,660
December	1,342	47	38	43.3	2,660
Calendar year	*81,602	2,180	20	223	*161,900

* Revised Feb. 25, 1965.

San Antonio River at Ortiz, Colo.

Location.--Water-stage recorder, lat 37°00', long 106°02', in New Mexico in sec.19, T.32 N., R.9 E., on left bank a quarter of a mile south of New Mexico-Colorado State line, half a mile south of Ortiz, and half a mile upstream from Los Pinos River. Altitude of gage is 8,000 ft.

Drainage area.--110 sq mi.

Average discharge.--24 years (1941-64), 26.0 cfs (18,820 acre-ft per year).

Extremes.--1920, 1925-64: Maximum discharge, 1,750 cfs Apr. 15, 1937 (gage height, 5.38 ft), from rating curve extended above 1,100 cfs; no flow at times.

Remarks.--Records good above 10 cfs and fair below. 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	15.5	-	-	0.5	31
February	29.0	-	-	1.0	58
March	139.5	-	-	4.5	277
April	1,612	114	-	53.7	3,200
May	2,449	182	15	79.0	4,860
June	118	15	0	3.93	234
July	35.8	9.7	0	1.15	71
August	87.5	12	0	2.82	174
September	22.3	5.7	0	.74	44
October	37.6	2.3	.4	1.21	75
November	75.9	5.4	.6	2.53	151
December	68.2	-	-	2.20	135
Calendar year 1964	4,690.3	182	0	12.8	9,310

09271

Los Pinos River near Ortiz, Colo.

Location.--Water-stage recorder, lat 36°58', long 106°03', in New Mexico in N½ sec.34, T.32 N., R.8 E., on left bank 1 mile south of New Mexico-Colorado State line, 2 miles southwest of Ortiz, and 2½ miles upstream from mouth. Altitude of gage is 8,100 ft.

Drainage area.--167 sq mi.

Average discharge.--46 years (1915-20, 1925-64), 124 cfs (89,770 acre-ft per year).

Extremes.--1915-20, 1925-64: Maximum discharge, 3,160 cfs May 12, 1941 (gage height, 5.77 ft, site and datum then in use), from rating curve extended above 1,600 cfs; minimum observed, 4.0 cfs Dec. 17, 1945.

Remarks.--Records good except those for winter months, which are fair. Diversion 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	201.5	-	-	6.5	400
February	217.5	-	-	7.5	431
March	496	-	-	16	984
April	2,164	199	-	72.1	4,290
May	13,191	660	226	426	26,160
June	3,208	211	33	107	6,360
July	878	44	21	28.3	1,740
August	1,159	80	14	37.4	2,300
September	490	25	13	16.3	972
October	431	16	12	13.9	855
November	450	25	11	15.0	893
December	341	-	-	11.0	676
Calendar year 1964	23,227.0	660	-	63.5	46,060

Conejos River near La Sauses, Colo.

Location.--Water-stage recorders, lat 37°18", long 105°45', in secs. 2 and 11 (two channels), T.35 N., R.11 E., on left bank of main channel 100 ft downstream from bridge on State Highway 158 and on right bank of secondary channel 130 ft downstream from bridge, half a mile upstream from mouth, and 2 miles north of Las Sauses. Datum of gage on main channel is 7,495.02 ft and on secondary (south) channel is 7,495.89 ft above mean sea levels (levels by Bureau of Reclamation).

Drainage area.--887 sq mi.

Average discharge.--43 years (1922-64), 189 cfs (136,800 acre-ft per year).

Extremes.--1921-64: Maximum discharge, 3,890 cfs May 15, 1941; no flow at times in 1934, 1948, 1950-51, 1953-56, 1958-64.

Remarks.--Records fair above 10 cfs and poor below. Diversions 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	743	29	19	24.0	1,470
February	857	36	24	29.6	1,700
March	1,331	49	36	42.9	2,640
April	471.7	37	1.0	15.7	936
May	974.4	142	.5	31.4	1,930
June	149.7	18	1.0	4.99	297
July	5.7	.8	0	0	11
August	0	0	0	0	0
September	.6	.1	0	.02	1.2
October	17.7	2.5	.1	.57	35
November	*3,601.1	498	.4	120	*7,140
December	1,116	48	21	36.0	2,210
Calendar year 1964	*9,267.9	498	0	25.3	18,370

* Revised Feb. 25, 1965.

Rio Grande near Lobatos, Colo.

Location.--Water-stage recorder, lat 37°05', long 105°45', in sec.22, T.33 N., R.11 E., on right bank just downstream from highway bridge, 6 miles north of Colorado-New Mexico State line, 10 miles east of Lobatos, and 14 miles east of Antonito. Datum of gage is 7,426.79 ft above mean sea level, datum of 1929.

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

Average discharge.--64 years (1900-64), 616 cfs (446,000 acre-ft per year).

Extremes.--1899-1964: Maximum discharge observed, 13,200 cfs June 8,1905, (gage height, 9.1 ft), from rating curve extended above 8,000 cfs; no flow at times in 1950-51, 1956.

Remarks.--Records good except those for winter months, which are fair. Natural flow of streams 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	3,525	145	90	114	6,990
February	3,730	150	105	129	7,400
March	6,734	275	155	217	13,360
April	2,609	227	19	87.0	5,170
May	*2,267	196	29	* 73.1	*4,500
June	*916	54	*12	*30.5	*1,820
July	*264.9	15	4.5	*8.55	*525
August	539.5	47	4.0	17.4	1,070
September	297.0	20	5.0	9.90	589
October	805.6	40	7.0	26.0	1,600
November	4,780	513	39	159	9,480
December	*2,490	115	60	*80.3	*4,940
Calendar year 1964	*28,958.0	513	4.0	*79.1	*57,440

* Revised Feb. 25, 1965

Rio Chama below El Vado Dam, N. Mex.

Location.--Water-stage recorder, lat 36°34'50", long 106°43'30", in Tierra Amarilla Grant, 1.5 miles downstream from El Vado Dam, 2.7 miles upstream from Rio Nutrias, and 13 miles southwest of Tierra Amarilla, Rio Arriba County. Datum of gage is 6,696.12 ft above mean sea level, datum of 1929. Prior to October 1935, at site 1.5 miles upstream and October 1935 to September 1938, at site 1.1 miles upstream at different datum.

Drainage area.--877 sq mi.

Average discharge.--4 years (1914, 1921-23), 444 cfs prior to completion of dam; 29 years (1936-64) 383 cfs (272,200 acre-ft per year) subsequent to completion of El Vado Dam.

Extremes.--1914-16, 1920-24, 1936-64: Maximum discharge observed, 9,000 cfs May 22, 1920 (gage height, 12 ft); no flow Mar. 25, 26, 31, 1955.

Remarks.--Records are good except those for some winter months, which are poor. Diversions above station for irrigation of about 8,000 acres. Since 1935 flow regulated by El Vado Reservoir.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in Acre-feet
January	1,020	42	25	32.9	2,020
February	851	34	28	29.3	1,690
March	2,013	254	36	64.9	3,990
April	7,771	544	92	259	15,410
May	25,568	1,080	430	825	50,710
June	5,988	430	27	300	11,880
July	2,074	420	16	66.9	4,110
August	5,756	840	38	186	11,420
September	3,933	630	22	131	7,800
October	778	30	21	25.1	1,540
November	7,932	982	26	264	15,730
December	1,520	85	42	49.0	3,010
Calendar year 1964	65,204	1,080	16	178	129,300

Rio Chama below Abiquiu Dam, N. Mex.

Location.--Water-stage recorder, lat 36°14'10", long 106°25'00", in SE¼SE¼ sec.8, T.23 N., R.5 E., on right bank half a mile downstream from Abiquiu Dam and 6 miles northwest of Abiquiu. Altitude of gage is 6,040 ft (from river-profile map and topographic map).

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

Average discharge.--3 years (1926-64), 308 cfs (223,000 acre-feet per year).

Extremes.--1961-64: Maximum discharge, 2,300 cfs Nov. 11, 1963 (gage height, 6.00 ft); minimum 5.6 cfs July 23, 1963.

Remarks.--Records fair except those for winter months, which are poor. Flow regulated by El Vado and Abiquiu Reservoirs. Diversions above station for irrigation of about 17,600 acres.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in Acre-feet
January	1,148	40	30	37.0	2,280
February	1,056	43	32	36.4	2,090
March	2,521	159	44	81.3	5,000
April	7,909	535	83	264	15,690
May	26,908	1,110	452	868	53,370
June	6,134	595	35	204	12,170
July	3,759	444	17	121	7,460
August	8,052	920	32	260	15,970
September	4,434	550	26	148	8,790
October	943	35	24	30.4	1,870
November	8,927	1,040	32	298	17,710
December	1,573	81	35	50.7	3,120
Calendar year 1964	73,364	1,110	17	200	145,500

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

Location.--Water-stage recorder, lat 35°52'30", long 106°08'30", in San Ildefonso Pueblo Grant, 400 ft downstream from bridge on State Highway 4, 1¾ miles southwest of San Ildefonso Pueblo, 2½ miles downstream from Pojoaque River, and 7 miles west of Pojoaque. Datum of gage is 5,488.48 ft above mean sea level, 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.--65 years (1896-1905) 1910-64) 1,551 cfs (1,123,000 acre-ft per year).

Extremes.--1895-1905, 1910-64: Maximum discharge, 24,400 cfs May 23, 1920 (gage height, 14.1 ft); minimum daily, 60 cfs July 4, 5, 1902.

Remarks.--Records good. Flow partly regulated by El Vado Reservoir since 1935 and Abiquiu Reservoir since 1962. Diversions above station for irrigation of about 600,000 acres in Colorado and 75,000 acres in New Mexico.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in Acre-feet
January	13,306	482	344	429	26,390
February	13,175	496	406	454	26,130
March	17,557	679	487	566	34,820
April	20,941	997	474	698	41,540
May	44,554	2,010	722	1,437	88,370
June	13,459	1,250	131	449	26,700
July	9,359	516	164	302	18,560
August	14,619	1,430	179	472	29,000
September	10,965	1,000	159	366	21,750
October	7,244	264	190	234	14,370
November	20,165	1,730	264	672	40,000
December	13,182	679	300	425	26,150
Calendar year 1964	198,526	2,010	131	542	393,800

Santa Fe River near Santa Fe, N. Mex

Location.--Water-stage recorder and concrete control, lat 35°41'10", long 105°50'35", in NE¼SE¼ sec.23, T.17 N., R.10 E., 0.4 mile downstream from McClure Dam, and 5½ miles east of Santa Fe. Datum of gage is 7,718 ft above mean sea level, datum of 1929. Prior to Nov. 4, 1930, at site 1.5 miles downstream and Apr. 11, 1931, to September 1947 at site 0.3 mile upstream.

Drainage area.--18.2 sq mi.

Average discharge.--52 years (1913-64), 8.25 cfs (5,970 acre-ft per year).

Extremes.--1813-64: Maximum discharge, 1,500 cfs Aug. 14, 1921; minimum daily 0.1 cfs Feb. 7-10, 20, 21, 1927, Aug. 1-4, 1951.

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

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in Acre-feet
January	84.7	3.6	1.4	2.73	168
February	42.7	1.5	1.4	1.47	85
March	42.4	1.4	1.3	1.37	84
April	26.1	1.1	.7	.87	52
May	79.9	4.7	.7	2.58	158
June	234.1	12	4.7	7.80	464
July	315.0	11	9.1	10.2	625
August	128.9	9.1	2.8	4.16	256
September	173.6	8.1	1.5	5.79	344
October	43.7	1.5	1.4	1.41	87
November	41.2	1.4	1.3	1.37	82
December	49.2	1.8	1.4	1.59	98
Calendar year 1964	1,261.5	12	.7	3.45	2,500

Jemez River below Jemez Canyon Dam, N. Mex.

Location.--Water-stage recorder, lat 35°23'10", long 106°31'45", in NE¼ sec.5, T.13 N., R.4 E., on right bank three-quarters of a mile downstream from Jemez Canyon Dam, 1½ miles upstream from mouth, and 6 miles north of Bernalillo. Datum of gage is 5,095.60 ft above mean sea level, datum of 1929. Prior to Apr. 24, 1951, at site three-quarters of a mile upstream at datum 24.51 ft higher. Apr. 24, 1951, to June 25, 1958, at site 37 ft upstream at datum 4.40 ft higher.

Drainage area.--1,040 sq mi.

Average discharge.--21 years (1937, 1944-64), 49.7 cfs (35,980 acre-ft per year).

Extremes.--1937, 1944-64: Maximum discharge, 16,300 cfs Aug. 29, 1943 (gage height, 5.62 ft); no flow at times.

Remarks.--Records 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	421.8	50	0	13.6	837
February	607.1	100	0	20.9	1,200
March	700.3	124	2.2	22.6	1,390
April	2,635	264	25	87.8	5,230
May	1,245	78	14	40.2	2,470
June	41.6	14	0	1.39	83
July	17.1	15	0	.55	34
August	801.8	157	0	25.9	1,590
September	82.3	32	0	2.74	163
October	7.6	.9	0	.24	15
November	309.4	40	.8	10.3	614
December	406.1	46	0	13.1	805
Calendar year 1964	7,275.1	264	0	19.9	14,430

Rio Grande below Elephant Butte Dam, N. Mex

Location.--Water-stage recorder, lat 33°08'45", long 107°12'20", in SW¼ sec.25, T.13 S., R.4 W., (projected), in Pedro Armendariz Grant, on left bank 1.0 mile downstream from dam and 1½ miles upstream from Cuchillo Negro River. Datum of gage is 4,242.09 ft above mean sea level, datum of 1929. Prior to Apr. 23, 1942, at several different sites and datums.

Drainage area.--28,900 sq mi, approximately (indludes 2,940 sq mi in closed basin in San Luis Valley, Colo.).

Average discharge.--50 years (1915-64), 1,038 cfs (751,500 acre-feet per year).

Extremes.--1915-64: Maximum daily discharge, 8,200 cfs May 22, 1942; no flow at times prior to 1929.

Remarks.--Records good. 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	154.0	7.8	3.5	4.97	305
February	162.1	8.4	4.4	5.59	322
March	11,108.3	728	5.4	358	22,030
April	20,337	740	390	678	40,340
May	412	18	12	13.3	817
June	8,527	793	13	284	16,910
July	20,848	758	383	673	41,350
August	21,132	1,090	278	682	41,910
September	9,494.2	1,380	4.1	316	18,830
October	127.6	5.0	2.8	4.12	253
November	77.6	3.2	1.6	2.59	154
December	91.1	4.6	2.6	2.94	181
Calendar year 1964	92,470.9	1,380	1.6	253	183,400

Rio Grande below Caballo Dam, N. Mex.

Location.--Water-stage recorder, lat 32°53'05", long 107°17'30", in NE¼SW¼ sec.30,T.16S., R.4 W., 600 ft upstream from Bojarquez Bridge, 4,200 ft downstream from Caballo Dam, 1 1/3 miles upstream from Percha diversion dam, and 3 miles northeast of Arrey. Datum of gage is 4,140.9 ft above mean sea level, datum of 1929. Oct. 13, 1938, to Dec. 31, 1945 at datum 5.0 ft higher.

Drainage area.--30,200 sq mi, approximately (includes 2,940 sq mi in closed basin in San Luis Valley, Colo.).

Average discharge.--27 year (1938-64), 912 cfs (660,300 acre-ft per year).

Extremes.--1938-64: Maximum daily discharge, 7,650 cfs May 20, 1942; minimum daily, 0.1 cfs Oct. 31 to Nov.14, 1954, Nov. 7 to Dec. 31, 1955.

Remarks.--Records good. Considerable diversion above station for irrigation. Flow regulated by Caballo and Elephant Butte Reservoirs.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in Acre-feet
January	44.7	1.5	1.4	1.4	89
February	41.4	1.5	1.4	1.4	82
March	17,655.6	1,270	1.4	570	35,020
April	12,841	1,020	2	428	25,470
May	62	2	2	2.0	123
June	18,285	1,010	2	610	36,270
July	20,813	881	529	671	41,280
August	23,543	1,060	286	759	46,700
September	10,517.2	1,350	1.6	351	20,860
October	35.0	1.6	1.0	1.1	69
November	29.0	1.0	.9	1.0	58
December	32.2	1.1	1.0	1.0	64
Calendar year 1964	103,899.1	1,350	.9	284	206,100

Bonito ditch below Caballo Dam, N. Mex.

Records available.--January 1938 to December 1964. Published as supplentary data with Rio Grande below Caballo Dam in U. S. G. S. Water-supply papers beginning with October 1947.

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.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff Acre-feet
January					0
February					0
March					114
April					133
May					0
June					246
July					182
August					227
September					104
October					0
November					0
December					0
Calendar year 1964					1,010

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

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal. yr.
Gage height	-	-	-	-	-	-	-	-	-	-	-	-	-
Contents	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

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

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.

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

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 E½ 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.

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

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal. yr.
Gage Height	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	-
Contents	257	257	257	257	257	257	257	257	257	257	257	257	-
Change	0	0	0	0	0	0	0	0	0	0	0	0	0

STORAGE RESERVOIRS

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

Trout Lake.--Staff gage in sec.12, T.39 N., R.3 W., on tributary to Trout Creek. Completed about 1932; capacity, 198 acre-ft; enlarged in 1948 to a capacity of 320 acre-ft. Only the storage in excess of 198 acre-ft is subject to terms of Rio Grande Compact.

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

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal. yr.
Gage height	-	-	-	4.8	4.8	3.2	-	-	-	-	-	-	-
Contents	60	81	104	112	112	73	0	0	0	0	7	55	-
Change	+22	+21	+23	+8	0	-39	0	0	0	0	+17	+38	+17

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.

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

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

Alberta Park Reservoir.--In sec.34, T.38 N., R.2 E., on Pass Creek. Completed in 1953; capacity, 598 acre-feet. Capacity table based on elevation above bottom of outlet.

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

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

Shaw Lake.--In 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.

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

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal. yr.
Gage height	-	-	-	2.0	2.0	7.3	6.1	2.5	2.5	2.5	-	-	-
Contents	26	30	35	37	37	177	141	49	49	49	55	67	-
Change	+4	+4	+5	+2	0	+140	-36	-92	0	0	+6	+12	+45

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

Poage Lake.--In Sec.26, T.38 N., R.3 E., on tributary to Race Creek. Constructed in 1918; capacity, 258 acre-ft; enlarged in 1954 to 370 acre-ft. Capacity based on elevation above outlet. Only the storage in excess of 258 acre-ft is subject to terms of Rio Grande Compact.

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

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal. yr.
Gage height	-	-	-	2.2	2.2	2.2	1.2	1.2	1.2	1.2	-	-	-
Contents	23	32	42	45	45	45	25	25	25	25	33	48	-
Change	+9	+9	+10	+3	0	0	-20	0	0	0	+8	+15	+34

Beaver Park Reservoir.--In sec.28, T.39 N., R.3 E., on Beaver Creek. Constructed in 1921. Enlarged in 1957 from capacity of 4,194 acre-ft to 4,758 acre-ft. Only the storage in excess of 4,194 is subject to terms of Rio Grande Compact.

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

Date	Gage height	Contents	Change in contents
December 31, 1963	32.4	740	-
January 31, 1964	42.5	1,230	+490
February 29	49.3	1,630	+400
March 31	54.6	1,980	+350
April 30	56.0	2,083	+103
May 31	56.0	2,083	0
June 30	37.0	943	-1,140
July 31	-	0	-943
August 31	-	0	0
September 30	-	0	0
October 31	-	0	0
November 31	23.0	380	+380
December 31	39.2	1,050	+670
Calendar year 1964	-	-	+310

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.

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

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal. yr.
Gage height	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	-
Contents	34	34	34	34	34	34	34	34	34	34	34	34	-
Change	0	0	0	0	0	0	0	0	0	0	0	0	0

uchs 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. Pinos Creek enters Rio Grande below station near Del Norte.

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

onth	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal. yr.
ıge height	-	-	-	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	-
ıntents	142	165	188	196	196	196	196	196	196	196	196	196	-
ıange	+23	+23	+23	+8	0	0	0	0	0	0	0	0	+77

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

Platoro Reservoir.--Water-stage recorder in NW¼SW¼ sec.22, T.36 N., R.4 E., on Conejos River. Completed in 1951; capacity, 60,000 acre-ft at crest of spillway. Reservoir is used for irrigation and flood control. Storage affects Conejos Index Supply.

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

Date	Elevation	Contents	Change in contents
December 31, 1963	-	3,000	0
January 31, 1964	9,942.3	3,000	0
February 29	-	3,000	0
March 31	9,942.3	3,000	0
April 30	9,942.0	2,900	-100
May 31	9,964.5	10,700	+7,800
June 30	9,964.5	10,700	0
July 31	9,964.5	10,700	0
August 31	9,964.5	10,700	0
September 30	9,964.5	10,700	0
October 31	9,964.5	10,700	0
November 30	9,941.7	2,800	-7,900
December 31	9,941.7	2,800	0
Calendar year 1964	-	-	-200

Trujillo Meadows Reservoir.--In sec.5, T.32 N., R.5 E., on Los Pinos River. Completed in 1957; capacity, 913 acre-ft. Water is used for fish culture. St orage affects Conejos Index Supply. Storage removed from debit status by exchange of transmountain water (See minutes of meeting Feb. 19, 1960).

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

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal. yr.
Gage height	31.0	31.0	31.0	31.0	31.0	31.0	31.0	31.0	31.0	31.0	31.0	31.0	-
Contents	913	913	913	913	913	913	913	913	913	913	913	913	-
Change	0	0	0	0	0	0	0	0	0	0	0	0	0

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

El Vado Reservoir.--Water-stage recorder (staff gage only below elevation 6,878.0 ft), lat 36°34'45", long 106°43'55" on Rio Chama. Storage began in January 1935. Capacity, 194,500 acre-ft at elevation 6,902.0 ft (crest of spillway), as determined by partial-sediment survey in 1954. Staff gage readings furnished by Middle Rio Grande Conservancy District.

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

Date	Gage height	Contents	Change in contents
December 31, 1963	6,775.0	2,430	-
January 31, 1964	6,775.0	2,430	0
February 29	6,775.0	2,430	0
March 31	6,777.2	3,110	+680
April 30	6,778.2	3,450	+340
May 31	6,815.5	28,040	+24,590
June 30	6,813.6	26,290	-1,750
July 31	6,809.9	23,040	-3,250
August 31	6,809.9	23,040	0
September 30	6,803.7	18,040	-5,000
October 31	6,803.7	18,040	0
November 30	6,775.0	2,430	-15,610
December 31	6,775.5	2,580	+150
Calendar year 1964	-	-	+150

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

Abiquiu Reservoir.--Water-stage recorder in SW¼ sec.8, T.23 N., R.5 E., on Rio Chama. Completed in February 1963; capacity 1,225,000 acre-ft at elevation of 6,350.0 ft (crest of spillway). Reservoir is operated by Corps of Engineers for flood control and sediment storage.

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

Date	Elevation	Contents	Change in contents
December 31, 1963	-	0	
January 31, 1964	-	0	-
February 29	-	0	0
March 31	6,075.00	645	0
April 30	6,079.26	1,013	+645
May 31	6,083.18	1,426	+368
June 30	6,080.20	1,103	+413
July 31	6,074.15	580	-323
August 31	-	0	-523
September 30	-	0	-580
October 31	-	0	0
November 30	-	0	0
December 31	-	0	0
Calendar year 1964	-	-	0

McClure (Granite Point) Reservoir.--Water-stage recorder in NE¼SW¼ sec.24, T.17 N., R.10 E., on Santa Fe River. Original reservoir, capacity, 561 acre-ft, completed in 1926 and not subject to terms of Rio Grande compact; in 1935, permanent flash boards were installed in spillway increasing capacity to 650 acre-ft; in 1947 both dam and spillway were raised increasing capacity to 3,090 acre-ft (gage height, 103.1 ft, at which radial gates open automatically).

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

Date	Gage height	Contents	Change in contents
December 31, 1963	80.3	1,570	
January 31, 1964	79.7	1,540	-
February 29	79.7	1,540	-30
March 31	78.7	1,480	0
April 30	86.3	1,920	-60
May 31	95.3	2,520	+440
June 30	92.1	2,300	+600
July 31	85.0	1,840	-220
August 31	84.4	1,810	-460
September 30	80.4	1,580	-30
October 31	79.9	1,550	-230
November 30	79.6	1,530	-30
December 31	79.4	1,520	-20
Calendar year 1964	-	-	-10
			-50

Nichols Reservoir.--Water-stage recorder in E½NE¼ sec.21, T.17 N., R.10 E., on Santa Fe River. Completed in 1942; capacity, 796 acre-ft. Water is for minicipal use in Santa Fe.

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

Date	Gage height	Contents	Change in contents
December 31, 1963	157.6	435	
January 31, 1964	158.2	449	-
February 29	158.6	458	+14
March 31	160.5	504	+9
April 30	156.4	407	+46
May 31	149.7	274	-97
June 30	148.3	253	-133
July 31	158.0	444	-21
August 31	155.7	391	+191
September 30	160.2	496	-53
October 31	155.0	375	+105
November 30	155.2	380	-121
December 31	159.1	470	+5
Calendar year 1964	-	-	+90

Reservoirs in Rio Grande Basin in New Mexico

San Gregorio Reservoir.--Staff gage in SW¼NE¼ sec.20, T.21 N., R.1 E. (projected), on Clear Creek tributary to Rio Las Vacas and Jemez River. Completed in October 1958; capacity 254 acre-ft at elevation 9,408.0 ft (crest of spillway).

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

Date	Gage height	Contents	Change in contents
December 31, 1963	-	a190	0
January 31, 1964	-	a190	0
February 29	-	a190	0
March 31	-	a200	+10
April 30	-	a210	+10
May 31	-	a230	+20
June 30	-	a190	-40
July 31	13.5	130	-60
August 31	14.0	140	+10
September 30	14.5	152	+12
October 31	-	a170	+18
November 30	-	a180	+10
December 31	-	a190	+10
Calendar year 1964	-	-	0

a Contents estimated.

Jemez Canyon Reservoir.--Water-stage recorder in SW¼SW¼ sec.32, T.14 N., R.4 E., on Jemez River 2½ miles above mouth. Completed in 1953; capacity, 183,900 acre-ft at elevation of 5,252.3 ft. Capacity at elevation 5,232.0 ft (crest of spillway), 113,900 acre-ft by 1959 survey. Reservoir is operated by Corps of Engineers for flood control and sediment storage.

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

Date	Elevation	Contents	Change in contents
December 31, 1963	-	0	-
January 31, 1964	-	0	0
February 29	-	0	0
March 31	5,145.4	337	+337
April 30	5,141.6	52	-285
May 31	5,138.0	8	-44
June 30	-	0	-8
July 31	-	0	0
August 31	-	0	0
September 30	-	0	0
October 31	-	0	0
November 30	-	0	0
December 31	-	0	0
Calendar year 1964	-	-	0

Acomita Reservoir.--Staff gage in SE¼ 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 and Laguna Indian Reservations.

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

Date	Gage height	Contents	Change in contents
December 31, 1963	-	650	-
January 31, 1964	-	650	0
February 29	-	650	0
March 31	-	650	0
April 30	-	565	-85
May 31	-	410	-155
June 30	-	280	-130
July 31	-	208	-72
August 31	-	160	-48
September 30	-	140	-20
October 31	-	168	+28
November 30	-	268	+100
December 31	-	438	+130
Calendar year 1964	-	-	-212

Reservoirs in Rio Grande Basin in New Mexico

Elephant Butte Reservoir.--Water-stage recorder in NW¼ sec.30, T.13 S., R.3 W., at dam on Rio Grande. Storage began Jan. 6, 1915; capacity 2,195,000 acre-ft at gage height 4,407.0 ft (crest of spillway), by survey of 1961. Datum of gage is 43.3 ft above mean sea level, datum of 1929. Water is used for power development and irrigation in New Mexico and Texas. Records furnished by Bureau of Reclamation.

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

Date	Gage height	Contents	Change in contents
December 31, 1963	4,291.18	112,000	-
January 31, 1964	4,294.91	134,500	+22,500
February 29	4,298.80	160,600	+26,100
March 31	4,297.76	153,300	-7,300
April 30	4,292.51	119,700	-33,600
May 31	4,295.04	135,400	+15,700
June 30	4,293.70	126,900	-8,500
July 31	4,287.99	94,500	-32,400
August 31	4,281.27	63,300	-31,200
September 30	4,277.42	48,600	-14,700
October 31	4,277.86	50,100	+1,500
November 30	4,281.62	64,700	+14,600
December 31	4,286.57	87,300	+22,600
Calendar year 1964	-	-	-24,700

Caballo Reservoir.--Water-stage recorder in SE¼SW¼ sec.19, T.16 S., R.4 W., at dam on Rio Grande. Storage began Feb. 8, 1938; capacity, 344,000 acre-ft (by 1958 survey), at gage height, 4,192.0 ft (above which spillway gates open automatically). Datum of gage is 43.3 ft above mean sea level, datum of 1929. 100,000 acre-ft of storage reserved for flood control. Records furnished by Bureau of Reclamation.

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

Date	Gage height	Contents	Change in contents
December 31, 1963	4,137.14	31,740	-
January 31, 1964	4,137.60	33,050	+1,310
February 29	4,138.00	34,190	+1,140
March 31	4,132.39	19,770	-14,420
April 30	4,137.13	31,710	+11,940
May 31	4,137.72	33,390	+1,680
June 30	4,127.95	10,980	-22,410
July 31	4,128.54	12,000	+1,020
August 31	4,123.66	5,100	-6,900
September 30	4,125.48	7,310	+2,210
October 31	4,126.39	8,570	+1,260
November 30	4,127.12	9,650	+1,080
December 31	4,128.00	11,060	+1,410
Calendar year 1964	-	-	-20,680

Project Storage.--This is the combined storage in Elephant Butte and Caballo Reservoirs. Total Project Storage capacity is 2,439,000 acre-ft which excludes the 100,000 acre-ft reserved for flood control in Caballo Reservoir.

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

Date	Gage height	Contents	Change in contents
ecember 31, 1963	-	143,700	-
anuary 31, 1964	-	167,600	+23,900
ebruary 29	-	194,800	+27,200
larch 31	-	173,100	-21,700
pril 30	-	151,400	-21,700
ay 31	-	168,800	+17,400
ne 30	-	137,900	-30,900
ly 31	-	106,500	-31,400
gust 31	-	68,400	-38,100
ptember 30	-	55,910	-12,490
tober 31	-	58,670	+2,760
vember 30	-	74,350	+15,680
cember 31	-	98,360	+24,010
lendar year 1964	-	-	-45,340

TRANSMOUNTAIN DIVERSIONS

Fuchs ditch.--Water-stage recorder and 3-ft Parshall flume in sec.33, T.40 N., R.4 W., at Weminuche Pass in Colorado. Diversions 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.

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.

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.

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 1938, 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 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.

Imported quantities, in acre-feet, 1964

Month	Fuchs ditch	Raber-Lohr ditch	Squaw Pass ditch	Tabor ditch	Piedra Pass ditch	Treasure Pass ditch
January	0	0	0	0	0	0
February	0	0	0	0	0	0
March	0	0	0	0	0	0
April	0	0	0	0	0	0
May	54	168	0	166	0	37
June	191	607	67	218	362	92
July	0	0	109	75	146	0
August	0	0	25	0	46	0
September	0	0	0	0	0	0
October	0	0	0	0	0	0
November	0	0	0	0	0	0
December	0	0	0	0	0	0
Calendar year	245	775	201	459	554	129

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 station at Bosque del Apache was established for the U. S. Fish and Wildlife Service; the station at Jemez Canyon Dam was established for 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 U. S. Weather Bureau and U. S. Bureau of Reclamation for furnishing the climatological records contained in this report.

EVAPORATION AND PRECIPITATION

Wagon Wheel Gap.--Lat 37°46', long 106°49', in Mineral County near Creede, Colo. Standard class A pan, anemometer, maximum and minimum thermometers, standard 8-inch and recording rain gages at elevation 8,500 ft.

Alamosa.--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. Records furnished by Bureau of Reclamation.

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.

Santa Fe.--Lat 35°39', long 105°56', in Santa Fe, N. Mex. Standard class A pan, anemometer, maximum and minimum thermometers, standard 8-inch and recording rain gates at elevation 7,045 ft.

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

Bosque del Apache.--Lat 33°46', long 106°54', in Socorro County, 7 miles south of San Antonio, N. Mex. Standard class A pan, anemometer, maximum and minimum thermometers, standard 8-inch and recording rain gages at elevation 4,520 ft.

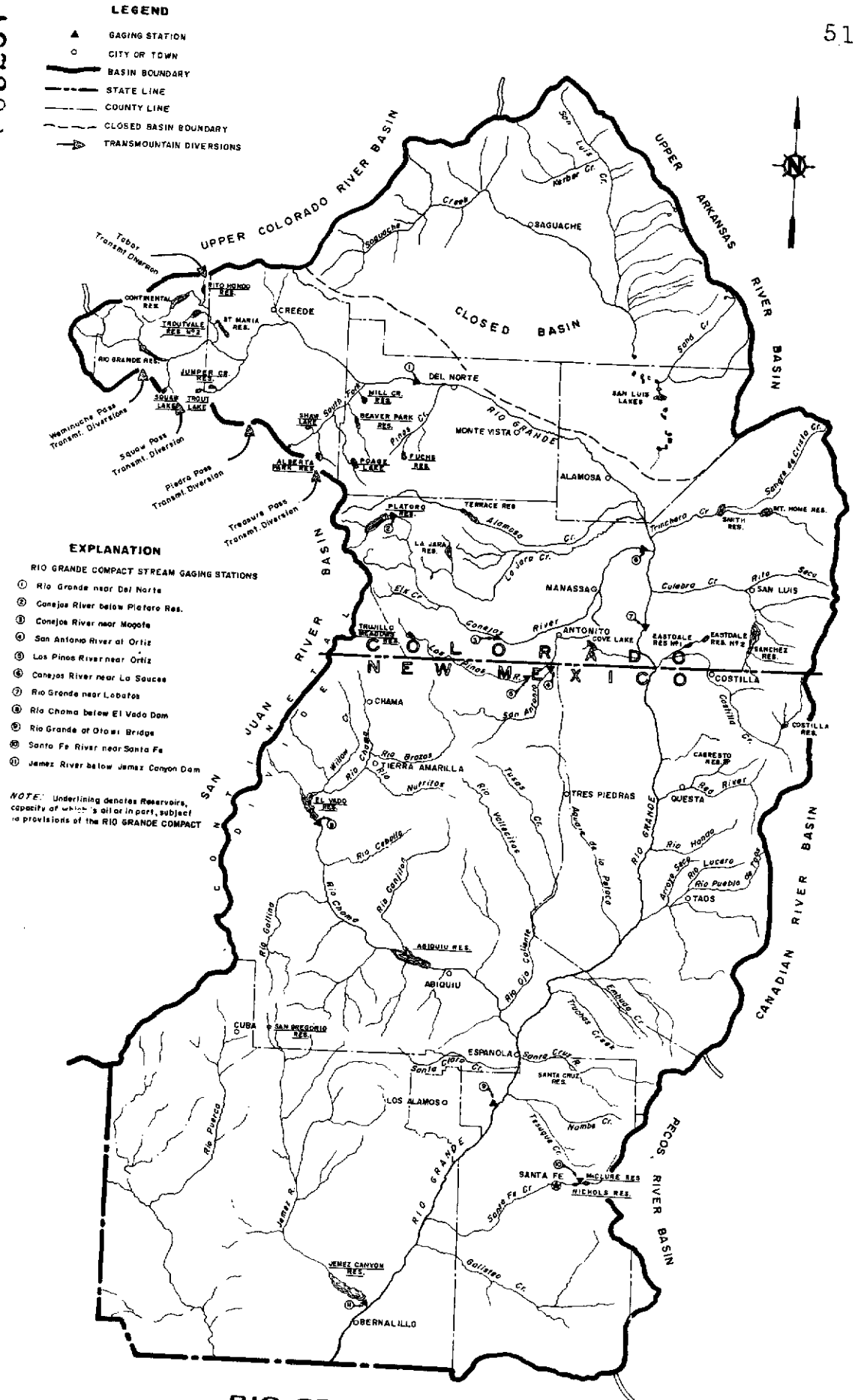
Elephant Butte Dam.--Lat 33°09', long 107°11', in Sierra County at Elephant Butte Dam, N. Mex. Standard class A pan, anemometer, maximum and minimum thermometers, and standard 8-inch rain gage at elevation 4,576 ft.

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 Dona 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 3,909 ft.

Evaporation and precipitation, in inches

Month		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
Wagon Wheel Gap	Evap.	-	-	-	-	-	-	7.49	6.85	4.72	-	-	-	-
	Precip.	0.12	0.35	0.73	0.88	-	0.58	2.38	2.65	1.64	T	3.11	1.45	-
Alamosa	Evap.	-	-	-	6.69	10.21	11.82	10.19	9.15	6.23	-	-	-	-
	Precip.	.26	.27	.41	.22	.50	.39	.91	.73	1.06	T	.80	1.52	7.07
Platoro Dam	Evap.	-	-	-	-	4.60	8.17	6.30	5.57	3.91	3.76	-	-	-
	Precip.	-	-	-	-	1.01	1.06	3.53	2.79	2.20	.09	-	-	-
El Vado Dam	Evap.	-	-	-	5.49	8.72	9.82	7.92	6.86	4.78	4.07	-	-	-
	Precip.	.51	.60	.78	.98	.89	.17	2.23	3.65	2.18	.00	1.27	2.18	15.44
Abiquiu Dam	Evap.	-	-	-	8.16	11.77	13.92	11.17	10.26	6.58	6.68	-	-	-
	Precip.	.03	.59	.53	.37	.69	.02	2.05	2.78	2.45	.00	.43	.50	10.44
Santa Fe	Evap.	-	-	-	-	9.72	12.75	9.97	9.23	6.35	6.44	-	-	-
	Precip.	.30	1.48	.80	1.27	.91	.22	3.13	2.09	1.67	.02	.46	1.00	13.35
Jemez Dam	Evap.	-	-	-	9.22	11.84	15.85	13.69	12.37	8.07	7.26	4.19	-	-
	Precip.	T	1.39	.14	.51	.31	.10	1.25	.97	1.14	.09	.24	.60	6.74
Bosque del Apache	Evap.	2.40	2.70	6.91	10.32	12.40	13.36	12.16	10.76	8.06	6.59	3.69	-	-
	Precip.	.05	.88	.32	.84	.43	.00	1.50	.43	2.15	.00	.00	.19	6.79
Elephant Butte Dam	Evap.	3.47	4.25	9.93	13.64	16.66	18.96	15.09	13.76	9.53	8.74	6.07	3.35	123.45
	Precip.	.00	.30	.18	.60	.05	.00	3.30	.52	2.45	.00	.00	.36	7.76
Caballo Dam	Evap.	3.77	4.48	9.87	12.18	15.10	16.29	13.36	12.51	8.66	7.32	5.27	3.44	112.25
	Precip.	.04	.03	.36	.53	.03	.01	1.64	1.27	2.43	.11	.00	.49	6.94
State University	Evap.	3.08	4.12	8.06	10.64	13.96	13.80	12.25	11.42	8.31	6.19	4.28	2.38	98.49
	Precip.	.02	T	.56	.12	.07	.27	.51	.32	1.18	.03	T	.54	3.62


LEGEND
GAGING STATION
CITY OR TOWN
BASIN BOUNDARY
STATE LINE
COUNTY LINE
CLOSED BASIN BOUNDARY
TRANSMOUNTAIN DIVERSIONS
EXPLANATION
RIO GRANDE COMPACT STREAM GAGING STATIONS
1 Rio Grande near Del Norte
2 Conejos River below Platoro Res.
3 Conejos River near Mogote
4 San Antonio River at Ortiz
5 Los Pinos River near Ortiz
6 Conejos River near La Sauces
7 Rio Grande near Lobatos
8 Rio Chama below El Vado Dam
9 Rio Grande at Otowi Bridge
10 Santa Fe River near Santa Fe
11 Jemez River below Jemez Canyon Dam
NOTE: Underlining denotes Reservoirs, capacity of which is all or in part, subject to provisions of the RIO GRANDE COMPACT
UPPER COLORADO RIVER BASIN
UPPER ARKANSAS RIVER BASIN
CLOSED BASIN
SAN JUAN - CHAMA BASIN
CANADIAN RIVER BASIN
PECOS RIVER BASIN
RIO GRANDE
COLORADO
NEW MEXICO
CREEDE
SAGUACHE
DEL NORTE
MONTE VISTA
ALAMOSA
MANASSA
ANTONITO
CHAMA
TIERRA AMARILLA
TRES PIEDRAS
QUESTA
TAOS
COSTILLA
ABIQUIU
CUBA
ESPANOLA
LOS ALAMOS
SANTA FE
OBERNALILLO
SAN LUIS
Tabor Transmt. Diversion
Weminuche Pass Transmt. Diversion
Squaw Pass Transmt. Diversion
Piedra Pass Transmt. Diversion
Treasure Pass Transmt. Diversion
RIO GRANDE BASIN
ABOVE BERNALILLO, NEW MEXICO
SCALE

ERRATA

The minutes of the Sixth Annual (Sixteen) Meeting of the Rio Grande Compact Commission state in part:

> "--factual data used in the compilation of reports of the Commission which factual data had been revised and published by the U. S. G. S. ----subsequent to use by the Compact Commission in computing debits and credits should be published in succeeding reports of the Commission together with proper explanatory notes."

The Rio Grande Compact provides that the Annual Report of the Commission for each calendar year shall be transmitted to the Governors of the signatory states before March first of the following year. Although every effort is made to furnish correct data to the commission for use in their report, the limited time available to the collecting agency does not permit a thorough analysis of the data and they are necessarily subject to revision.

The Commission bases all computations of debits and credits on volumes in thousands of acre-feet, expressed to the nearest hundred. A check was made of all records published in these annual reports against those published by the U. S. G. S. and it was found that in most instances the changes were not of sufficient magnitude to affect the computations of debits and credits; other changes were of items not used by the Commission; but whenever a corrected value affected the computations of credits or debits, such revisions have been published. The effect of changes or revisions on the credits, debits or departures from normal release have been adjusted from time to time by appropriate correction entries.

The figures shown below are the corrected values of runoff in acre-feet for the period indicated.

Conejos River below Platoro Reservoir, Colo.

1963 October 746; November 3,970; Annual 43,240

Conejos River at La Sauses, Colo.

1963 October 8.3; November 2,830; December 1,470
Annual 17,990