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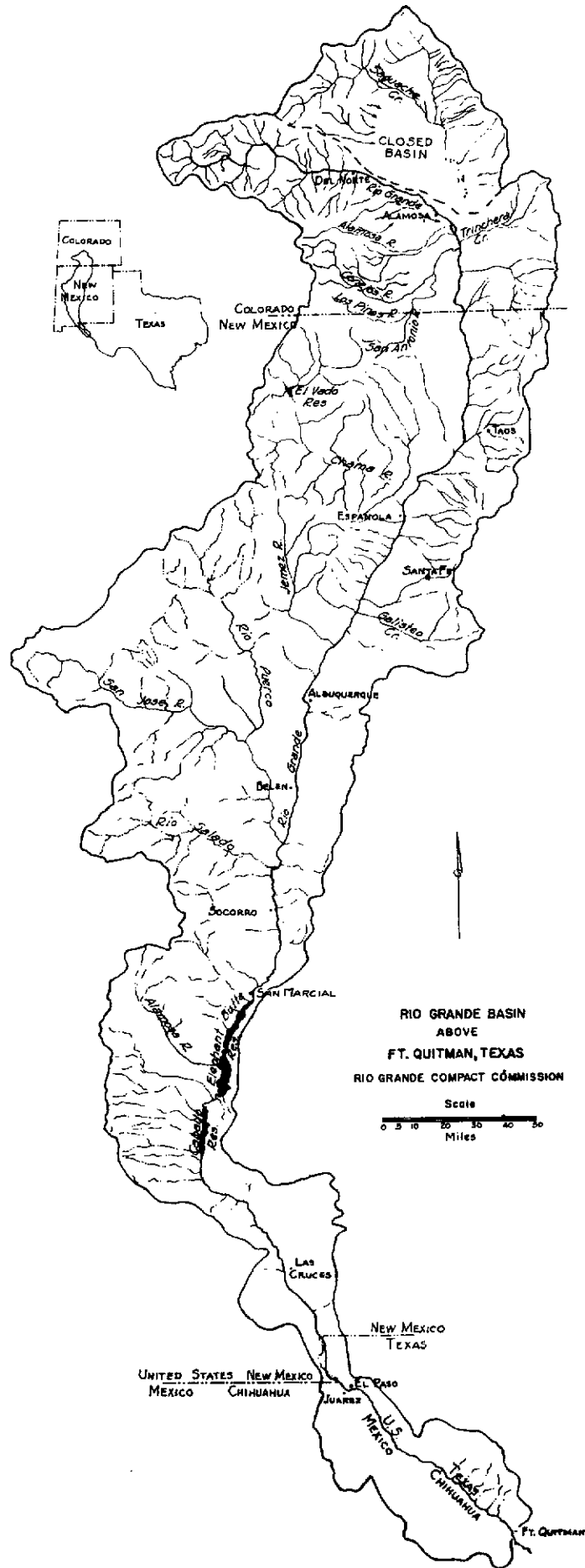
REPORT
of the
RIO GRANDE COMPACT
COMMISSION

1968



TO THE GOVERNORS OF
Colorado, New Mexico and Texas

003459



**RIO GRANDE BASIN
ABOVE
FT. QUITMAN, TEXAS
RIO GRANDE COMPACT COMMISSION**

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RIO GRANDE COMPACT COMMISSION

COLORADO

TEXAS

NEW MEXICO

May 15, 1969

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

His Excellency, David F. Cargo
Governor of the State of New Mexico
Santa Fe, New Mexico

His Excellency, Preston Smith
Governor of the State of Texas
Austin, Texas

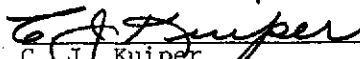
Sirs:

The postponed 30th Annual Meeting of the Rio Grande Compact Commission was held in Santa Fe, New Mexico, on May 15, 1969.

The Commission reviewed its prior reports and current reports of the Secretary relative to streamflow at Compact gaging stations and storage in reservoirs. The Commission found that:

Deliveries of water in the Rio Grande by Colorado at the Colorado-New Mexico State Line amounted to 330,800 acre-feet which was 20,500 acre-feet more than the scheduled amount. These are factual figures contained in the engineer advisers report. However, in the light of the, as yet unresolved, controversy between the States, Colorado cannot agree with the conclusions as to her indebtedness.

Respectfully,


C. J. Kuiper
Commissioner for Colorado

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RIO GRANDE COMPACT COMMISSION
COLORADO TEXAS NEW MEXICO

His Excellency, David F. Cargo
Governor of the State of New Mexico
Santa Fe, New Mexico

May 15, 1969

His Excellency, Preston Smith
Governor of the State of Texas
Austin, Texas

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

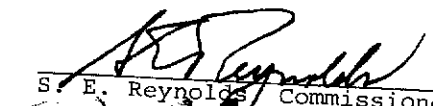
Sirs:


The postponed 30th Annual Meeting of the Rio Grande Compact Commission was held at Santa Fe, New Mexico, on May 15, 1969.

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

- (a) Deliveries of water in Rio Grande by Colorado at the Colorado-New Mexico State line amounted to 330,800 acre-feet, which was approximately six percent more than the scheduled delivery in 1968. The accrued debit of Colorado was thereby reduced to 923,900 acre-feet as of December 31, 1968.
- (b) Deliveries of water into Elephant Butte Reservoir by New Mexico, as measured by the Elephant Butte Effective Supply, was 604,600 acre-feet, which was sixteen percent in excess of the scheduled delivery in 1968. The accrued debit of New Mexico was thereby reduced to 296,900 acre-feet as of December 31, 1968.
- (c) Releases of usable water in 1968 from Project Storage amounted to 506,300 acre-feet, which was about 64 percent of the normal release defined by the Compact.
- (d) Expenses of administration of the Rio Grande Compact were \$33,279 in the fiscal year ending June 30, 1968. The United States bore \$15,150 of this total; the balance of \$18,129 was borne equally by the three States party to the Compact.

Respectfully,


S. E. Reynolds, Commissioner for New Mexico


J. B. Gilmer, Commissioner for Texas

C. J. Kuiper, 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.

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

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

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

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

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

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

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

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

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

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

ARTICLE II

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

- (a) On the Rio Grande near Del Norte above the principal points of diversion to the San Luis Valley;
- (b) On the Conejos River near Mogote;
- (c) On the Los Pinos River near Ortiz;
- (d) On the San Antonio River at Ortiz;
- (e) On the Conejos River at its mouths near Los Sauces;
- (f) On the Rio Grande near Lobatos;
- (g) On the Rio Chama below El Vado Reservoir;
- (h) On the Rio Grande at Otowi Bridge near San Ildefonso;
- (i) On the Rio Grande near San Acacia;
- (j) On the Rio Grande at San Marcial;
- (k) On the Rio Grande below Elephant Butte Reservoir;
- (l) On the Rio Grande below Caballo Reservoir.

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

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

ARTICLE III

The obligation of Colorado to deliver water in the Rio Grande at the Colorado-New Mexico State Line, measured at or near Lobatos, in each calendar year, shall be ten

RIO GRANDE COMPACT

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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

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RIO GRANDE COMPACT COMMISSION REPORT

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)
	144
550	162
600	182
650	204
700	229
750	257
800	292
850	335
900	380
950	430
1,000	540
1,100	640
1,200	740
1,300	840
1,400	

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.

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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.

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(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

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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.

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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

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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.

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

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

ARTICLE XIII

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

ARTICLE XIV

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

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.

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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.

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

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R E S O L U T I O N

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

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

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

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

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

Now, Therefore, Be it Resolved:

The Commission finds as follows:

- (a) That because of change of physical conditions, reliable records of the amount of water passing San Marcial are no longer obtainable at the stream gaging station at San Marcial and that the same should be abandoned for Compact purposes.
- (b) That the need for concurrent records at San Marcial and San Acacia no longer exists and that the gaging station at San Acacia should be abandoned for Compact purposes.
- (c) That it is desirable and necessary that the obligations of New Mexico under the Compact to deliver water in the months of July, August, September, should be scheduled.

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

Be it Further Resolved:

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

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

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

Quantities in thousands of acre-feet

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

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RESOLUTION OF COMMISSION

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	
2,200	1,695
2,300	1,795
2,400	1,895
2,500	1,995
2,600	2,095
2,700	2,195
2,800	2,295
2,900	2,395
3,000	2,495
	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."

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Be it Further Resolved:

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

Be it Further Resolved:

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

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

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

RULES AND REGULATIONS FOR
ADMINISTRATION OF THE RIO GRANDE COMPACT

19

003480

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.

003481

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

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

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(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.

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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.

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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.

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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.

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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.

RIO GRANDE COMPACT COMMISSION REPORT

RECORDS OF DELIVERIES AND RELEASES

003487

At the annual meeting of the Compact Commission, on May 15, 1969, the records of deliveries and releases for calendar year 1968 were examined and the computations of debits and credits based thereon were reviewed. The records and computations as reviewed by the Commission are reproduced on the next four pages. The computations shown on page 27 include some minor adjustments under the Rio Grande Index Supply that are acceptable to Colorado, but not to New Mexico or Texas. The computations shown on page 28 include minor adjustments under the same index supply that are acceptable to Texas and New Mexico, but not to Colorado. The differences in the two computations or proposals are the result of different interpretations of the status of small volumes of water transferred from Beaver Park Reservoir to Big Meadows Reservoir, in Colorado, during 1967 and 1968.

The delivery of water in the Rio Grande at the Colorado-New Mexico state line was obtained from record of stream flow near Lobatos, Colorado; the obligation of Colorado to deliver water at the state line was computed as prescribed in Article III, with different interpretations. Item C5, the Reduction of Debits prescribed in Article VI, was computed in accordance with the Rules and Regulations. Item C7, on page 28, Reduction of Credits for change in storage reported in 1967 for Big Meadows Reservoir is in accordance with standard procedures for such changes.

The delivery of water by New Mexico to Project Storage was computed from the actual stream-flow record and the record of operation of Elephant Butte Reservoir; 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, was computed in accordance with the Rules and Regulations.

The actual release from Project Storage during the year was measured at stations below Caballo Dam. The Accrued Departure from Normal Release is omitted in accordance with a decision of the Commission at the meeting on Feb. 15, 1968.

RIO GRANDE COMPACT COMMISSION REPORT

003489

RIO GRANDE COMPACT
DELIVERIES BY COLORADO AT STATE LINE
TEXAS - NEW MEXICO PROPOSAL
YEAR 1968

Quantities in Thousands of Acre Feet to Nearest Hundred

MONTH	CONEJOS INDEX SUPPLY										RIO GRANDE INDEX SUPPLY										DELIVERIES			
	MEASURED FLOW			ADJUSTMENTS				SUPPLY			NEAR DEL. WATER	ADJUSTMENTS						SUPPLY			NEAR LOS SAUCES AT MOUNTS	CONEJOS RIVER	AT RIO GRANDE	AT LOBATOS
	LOS PINOS	SAN ANTONIO	ONITE	TOTAL	STORAGE AT END OF MONTH	CHANGE IN STORAGE	OTHER ADJUSTMENTS	NET ADJUSTMENT	SUPPLY IN MONTH	ACCUMULATED TOTAL		12	STORAGE AT END OF MONTH	CHANGE IN STORAGE	TRANSMOUNTAIN DIVERSIONS	OTHER ADJUSTMENTS	NET ADJUSTMENT	SUPPLY IN MONTH	ACCUMULATED TOTAL	20	21	22	23	
1																								
JAN	2.7				2.7	0	0	0	2.7	2.7	8.5	1.2	0			0	0	8.5	8.5	4.6	10.4	15.0	15.0	15.0
FEB	2.9				2.9	0	0	0	2.9	5.6	8.8	1.2	0			0	0	8.8	17.3	6.1	10.4	16.5	31.5	31.5
MAR	4.6				4.6	0	0	0	4.6	10.2	12.8	1.2	0			0	0	12.8	30.1	7.7	23.6	31.3	62.8	62.8
APR	9.6	3.9	1.8		15.3	3.3	0	+3	15.6	25.8	26.0	1.2	0			0	0	26.0	56.1	4.0	12.5	16.5	79.3	79.3
MAY	55.2	34.2	8.9		98.3	4.2	+9	+1	99.3	125.1	134.9	1.8	+6			+6	+6	135.5	191.6	24.4	25.6	50.0	129.3	129.3
JUN	85.9	20.1	.9		106.9	11.3	+7.1	+1	114.1	239.2	232.5	2.4	+6	b-4		+2	+2	232.7	424.3	25.6	59.6	85.2	214.5	214.5
JUL	25.5	4.4	.4		30.3	11.3	0	ct-1	30.4	269.6	92.4	2.4	0			+3	+3	92.7	517.0	5.5	16.5	22.0	236.5	236.5
AUG	29.3	6.0	.9		36.2	12.6	+1.3	0	37.5	307.1	77.1	2.4	0			0	0	77.1	594.1	21.4	23.0	44.4	280.9	280.9
SEPT	5.8	1.4	.1		7.3	12.6	0	+1	7.4	314.5	31.0	2.4	0			0	0	31.0	625.1	.2	6.2	6.4	287.3	287.3
OCT	4.4	1.2	.1		5.7	12.6	0	+1	5.8	320.3	19.0	2.4	0			0	0	19.0	644.1	.8	5.3	6.1	293.4	293.4
NOV	13.9				13.9	23.0	-9.6	0	4.3	324.6	13.4	2.4	0			0	0	13.4	657.5	12.7	9.2	21.9	315.3	315.3
DEC	3.2				3.2	23.0	0	0	3.2	327.8	12.1	1.8	-6			-6	-6	11.5	669.0	3.7	11.8	15.5	330.8	330.8
YEAR	243.0	71.2	13.1		327.3		0	+5	327.8		668.5		+6	-4	+3	+5	+5	669.0		116.7	214.1	330.8		

REMARKS: Storage in recreational reservoirs approved by Commission not included.
 a Estimated.
 b 678 acre-feet, minus 243 acre-feet, pre-compact.
 c Total evaporation loss from recreational reservoirs, Conejos basin.
 d Evaporation loss all reservoirs above Del Norte constructed after 1937.
 Contents of Big Meadows Reservoir as of Dec. 31, 1968
 Transmountain water 978 acre-feet
 Compact water 1,459 acre-feet
 Total 2,437 acre-feet

SUMMARY OF DEBITS AND CREDITS

ITEM	DEBIT	CREDIT	BALANCE
C1 Balance at Beginning of Year			Dr 944.4
C2 Scheduled Delivery from Conejos River	130.1		Dr 1,074.5
C3 Scheduled Delivery from Rio Grande	190.4		Dr 1,264.9
C4 Actual Delivery of Lobatos plus 10,000 Acre feet		340.8	Dr 924.1
C5 Reduction of Debits % Evaporation		.3	Dr 923.8
C6 Reduction of Credits % Evaporation	.1		Dr 923.9
C7 Reduction of Cr. a/c Big Meadows Res. 1967			Dr 923.9
C8 Balance at End of Year			Dr

RIO GRANDE COMPACT
RELEASE AND SPILL FROM PROJECT STORAGE

003491

YEAR 1968

Quantities in Thousands of Acre Feet to Nearest Hundred

MONTH	USABLE WATER IN STORAGE			CREDIT WATER IN STORAGE			FLOOD WATER IN STORAGE			TOTAL WATER IN PROJECT STORAGE AT END OF MONTH	RIO GRANDE BELOW CABALLO DAM							
	TOTAL PROJECT CAPACITY AVAILABLE AT END OF MONTH	ELPHANT BUTTE RESERVOIR	CABALLO RESERVOIR	TOTAL AT END OF MONTH	NEW MEXICO CREDIT WATER	COLORADO CREDIT WATER	TOTAL CABALLO RESERVOIR AT END OF MONTH	TOTAL PROJECT STORAGE AT END OF MONTH	MEASURED FLOW AT CABALLO GAGING STATION		INTERFERING DISPOSITIONS TO CANALS	TOTAL RELEASE AND SPILL	CABALLO FLOOD WATER	SPILL FROM STORAGE	USABLE RELEASE			
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
JAN	2,539.0	267.1	42.6	309.7	2,229.3	0	0	0	0	309.7	0.1	0	0.1	0	0	0	0.1	0.1
FEB	2,539.0	304.6	44.8	349.4	2,189.6	0	0	0	0	349.4	5.4	0	5.4	0	0	0	5.4	5.5
MAR	2,539.0	343.5	43.4	386.9	2,152.1	0	0	0	0	386.9	95.4	.1	95.5	0	0	0	95.5	101.0
APR	2,539.0	283.8	51.4	335.2	2,203.8	0	0	0	0	335.2	47.0	0	47.0	0	0	0	47.0	148.0
MAY	2,539.0	216.8	100.5	317.3	2,221.7	0	0	0	0	317.3	49.3	0	49.3	0	0	0	49.3	197.3
JUN	2,439.0	190.9	144.0	334.9	2,104.1	0	0	0	0	334.9	97.4	.1	97.4	0	0	0	97.4	294.7
JUL	2,439.0	136.8	127.9	264.7	2,174.3	0	0	0	0	264.7	84.2	.2	84.4	0	0	0	84.4	379.1
AUG	2,439.0	224.0	78.4	302.4	2,136.6	0	0	0	0	302.4	83.0	.1	83.1	0	0	0	83.1	462.2
SEPT	2,439.0	229.9	39.3	269.2	2,169.8	0	0	0	0	269.2	43.6	.1	43.7	0	0	0	43.7	505.9
OCT	2,539.0	236.0	41.5	277.5	2,261.5	0	0	0	0	277.5	.2	0	.2	0	0	0	.2	506.1
NOV	2,539.0	295.4	43.4	338.8	2,200.2	0	0	0	0	338.8	.1	0	.1	0	0	0	.1	506.2
DEC	2,539.0	333.6	44.9	378.5	2,160.5	0	0	0	0	378.5	.1	0	.1	0	0	0	.1	506.3
YEAR											505.7	.6	506.3	0	0	0	506.3	

ACCUMULATED DEPARTURE FROM NORMAL RELEASE		
ITEM	DEBIT	CREDIT
P1	Accrued Departure at Beginning of Year	
P2	Actual Release during Year	
P3	Normal Release for Year	
P4	Actual Evaporation from Elephant Butte Reservoir	
P5	Evaporation loss if No Accrued Departure	
P6	Accrued Departure at End of Year	
		Did not occur

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 in violation 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 for entire year.

003492

COST OF OPERATION AND BUDGET

COST OF OPERATIONS, IN DOLLARS, FOR FISCAL YEAR ENDING JUNE 30, 1968

Adopted at the Thirtieth Annual Meeting

ITEM	Total Cost	Borne by United States	Borne by States		
			Colorado	New Mexico	Texas
GAGING STATIONS					
In Colorado	9, 100	4, 550			
In New Mexico, above Caballo Reservoir.	12, 850	8, 750	4, 550		
Caballo Reservoir and below	5, 450	450		4, 100	
Sub-total	27, 400	13, 750	4, 550	4, 550	4, 550
ADMINISTRATION					
U. S. G. S. Contract	5, 600	1, 400	1, 400	1, 400	1, 400
Other expense	279	0	93	93	93
Sub-total	5, 879	1, 400	1, 493	1, 493	1, 493
TOTAL	33, 279	15, 150	6, 043	6, 043	6, 043
EQUAL SHARES OF STATES			6, 043	6, 043	6, 043
CASH ADJUSTMENT BETWEEN STATES . .			0	0	0

BUDGET, IN DOLLARS, FOR FISCAL YEAR ENDING JUNE 30, 1970

Adopted at the Thirtieth Annual Meeting

ITEM	Total Cost	Borne by United States	Borne by States		
			Colorado	New Mexico	Texas
GAGING STATIONS					
In Colorado	9, 900	4, 950			
In New Mexico, above Caballo Reservoir.	14, 000	9, 400	4, 950		
Caballo Reservoir and below	5, 650	350		4, 600	
Sub-total	29, 550	14, 700	4, 950	4, 950	4, 950
ADMINISTRATION					
U. S. G. S. Contract	6, 000	1, 500	1, 500	1, 500	1, 500
Other expense	1, 200		400	400	400
Sub-total	7, 200	1, 500	1, 900	1, 900	1, 900
TOTAL	36, 750	16, 200	6, 850	6, 850	6, 850
EQUAL SHARES OF STATES			6, 850	6, 850	6, 850
CASH ADJUSTMENT BETWEEN STATES . .			0	0	0

003493

WATER SUPPLY

The recorded flow passing the gaging station on the Rio Grande near Del Norte, Colo. during the 1968 calendar year was 101 percent of the 79 year average. Similarly, the flow passing the station on Rio Grande at Otowi Bridge near San Ildefonso, N. Mex. was 78 percent of the 69 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 compiled 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.

Acknowledgments

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, Big Meadows, 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. Bureau of Reclamation, Albuquerque, N. Mex., furnished records of storage in El Vado Reservoir near Tierra Amarilla, N. Mex.

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ACKNOWLEDGMENTS

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

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

The 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.

RIO GRANDE COMPACT COMMISSION REPORT

STREAMFLOW

Rio Grande near Del Norte, Colo.

Location. -- Water-stage recorder, lat 37°41'20", long 106°27'30", in NW $\frac{1}{4}$ 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. -- 79 years (1890-1968), 909 cfs (658,100 acre-ft per year).

Extremes. -- 1889-1968 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	4,260	170	120	137	8,450
February	4,420	180	120	152	8,770
March	6,461	401	160	208	12,820
April	13,120	618	280	437	26,020
May	68,008	5,260	770	2,190	134,900
June	117,230	5,460	1,920	3,908	232,500
July	46,579	2,190	762	1,503	92,390
August	38,891	1,950	672	1,255	77,140
September	15,633	672	335	521	31,010
October	9,588	407	248	309	19,020
November	6,731	291	180	224	13,350
December	6,120	230	160	197	12,140
Calendar year 1968	337,041	5,460	120	921	668,500

Conejos River below Platoro Reservoir, Colo.

Location. -- Water-stage recorder and concrete control, lat 37°21'20", long 106°32'35", in NW $\frac{1}{4}$ NW $\frac{1}{4}$ 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. -- 16 years (1953-68), 88.7 cfs (64,210 acre-ft per year).

Extremes. -- 1952-68: 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	263.5	-	-	8.5	523
February	243.6	-	-	8.4	483
March	257.3	-	-	8.3	510
April	252.0	-	-	8.4	500
May	5,770	518	12	186	11,440
June	13,011	760	96	434	25,810
July	4,160	316	30	134	8,250
August	4,034.0	382	3.0	130	8,000
September	371.7	23	6.5	12.4	737
October	375.6	14	9.6	12.1	745
November	5,357.6	597	8.6	179	10,630
December	266.6	-	-	8.6	529
Calendar year 1968	34,362.9	760	-	93.9	68,160

03486

STREAMFLOW

Conejos River near Mogote, Colo.

Location. --Water-stage recorder, lat 37°03'20", long 106°11'20", in SE $\frac{1}{4}$ 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 5 $\frac{1}{2}$ miles west of Mogote. Altitude of gage is 8,240 ft.

Drainage area. --282 sq mi.

Average discharge. --58 years (1904, 1912-68), 335 cfs (242,500 acre-ft per year).

Extremes. -- 1903-05, 1911-68: 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	1,368	50	38	44.1	2,710
February	1,473	57	45	50.8	2,920
March	2,322	170	53	74.9	4,610
April	4,861	236	94	162	9,640
May	27,824	1,970	338	898	55,190
June	43,308	2,030	665	1,444	85,900
July	12,874	882	180	415	25,540
August	14,770	1,010	166	476	29,300
September	2,897	170	75	96.6	5,750
October	2,191	102	59	70.7	4,350
November	7,024	680	40	234	13,930
December	1,590	64	40	51.3	3,150
Calendar year 1968	122,502	2,030	38	335	243,000

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. --28 years (1941-68), 25.7 cfs (18,610 acre-ft per year).

Extremes. --1920, 1925-68 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	62.0	-	-	2.0	123
February	101.5	-	-	3.5	201
March	256.0	19	-	8.26	508
April	893.8	65	7.8	29.8	1,770
May	4,510	225	51	145	8,940
June	439.5	46	.2	14.6	872
July	195.38	47	0	6.30	388
August	450.7	83	2.8	14.5	894
September	44.1	2.8	.9	1.47	87
October	83.1	4.4	2.0	2.68	165
November	86.6	4.4	1.5	2.89	172
December	62.0	-	-	2.0	123
Calendar year 1968	7,184.68	225	0	19.6	14,250

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RIO GRANDE COMPACT COMMISSION REPORT

Los Pinos River near Ortiz, Colo.

Location. --Water-stage recorder, lat 36° 58', long 106° 03', in New Mexico in N $\frac{1}{2}$ 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 2 $\frac{1}{2}$ miles upstream from mouth. Altitude of gage is 8,100 ft.

Drainage area. -- 167 sq mi.

Average discharge. --50 years (1915-20, 1925-68), 123 cfs (89,050 acre-ft per year).

Extremes. --1915-20, 1925-68: 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	434	-	-	14	861
February	464	-	-	16	920
March	716	44	-	23.1	1,420
April	1,978	155	29	65.9	3,920
May	17,243	984	240	556	34,200
June	10,140	628	99	338	20,110
July	2,193	174	33	70.7	4,350
August	3,034	238	37	97.9	6,020
September	725	38	17	24.2	1,440
October	606	30	16	19.5	1,200
November	553	34	12	18.4	1,100
December	465	-	-	15	922
Calendar year 1968	38,551	984	-	105	76,460

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 La 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. -- 47 years (1922-68), 187 cfs (135,400 acre-ft per year).

Extremes. --1921-68: Maximum discharge, 3,890 cfs May 15, 1941; no flow at times in 1934, 1948, 1950-51, 1953-56, 1958-64, 1966-67.

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	2,294	94	54	74.0	4,550
February	3,054	135	91	105	6,060
March	3,886	151	80	125	7,710
April	1,998	124	26	66.6	3,960
May	12,289	1,080	35	396	24,370
June	12,888	680	219	430	25,560
July	2,796.0	430	4.0	90.2	5,550
August	10,794	748	30	348	21,410
September	122.40	27	.60	4.08	243
October	412.0	26	1.2	13.3	817
November	6,424	616	37	214	12,740
December	1,892	74	49	61.0	3,750
Calendar year 1968	58,849.40	1,080	.60	161	116,700

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STREAMFLOW

Rio Grande near Lobatos, Colo.

Location. -- Water-stage recorder, lat 37°05', long 105°45', in sec. 22, T. 33N., 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. --69 years (1900-68), 606 cfs (438,700 acre-ft per year).

Extremes. --1899-1968: 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	7,570	280	220		
February	8,340	410	250	244	15,010
March	15,780	601	440	288	16,540
April	8,303	622	105	509	31,300
May	25,209	2,390	112	277	16,470
June	42,934	2,400	587	813	50,000
July	11,114	1,060	118	1,431	85,160
August	22,371	1,380	212	359	22,040
September	3,234	212	48	722	44,370
October	3,064	145	55	108	6,410
November	11,036	736	110	98.8	6,080
December	7,810	290	220	368	21,890
Calendar year 1968	166,765	2,400	48	252	15,490
				456	330,800

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; 33 years (1936-68) 373 cfs (270,000 acre-ft per year) subsequent to completion of El Vado Dam.

Extremes. --1914-16, 1920-24, 1936-68: Maximum discharge observed, 9,000 cfs May 22, 1920 (gage height, 12 ft); no flow Mar. 25, 26, 31, 1955.

Remarks. --Records 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 daily	Minimum daily	Mean	Runoff in Acre-feet
January					
February	1,466	56	32		
March	1,856	97	50	47.3	2,910
April	3,716	315	78	64.0	3,680
May	8,253	496	163	120	7,370
June	48,862	3,970	258	275	16,370
July	20,768	1,780	131	1,576	96,920
August	3,588	429	31	692	41,190
September	13,652	1,740	69	116	7,120
October	1,548	90	38	440	27,080
November	1,538	73	38	51.6	3,070
December	11,960	1,010	37	49.6	3,050
	1,534	60	35	399	23,720
Calendar year 1968	118,741	3,970	31	49.5	3,040
				324	235,500

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RIO GRANDE COMPACT COMMISSION REPORT

Rio Chama below Abiquiu Dam, N. Mex.

Location. --Water-stage recorder, lat 36°14'10", long 106°25'00", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ 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. --7 years (1926-68), 363 cfs (262,800 acre-feet per year).

Extremes. --1961-68: Maximum discharge, 2,990 cfs July 1, 1965 (gage height, 6.69 ft); minimum about 0.5 cfs Mar. 17, 1966.

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	1,631	69	40	52.6	3,240
February	2,225	120	55	76.7	4,410
March	3,879	178	95	125	7,690
April	10,048	557	188	335	19,930
May	29,460	1,280	436	950	58,430
June	28,472	1,140	158	949	56,470
July	4,575	619	32	148	9,070
August	26,356	1,470	125	850	52,280
September	2,117	209	48	70.6	4,200
October	1,810	89	45	58.4	3,590
November	18,247	1,070	63	608	36,190
December	2,289	103	43	73.8	4,540
Calendar year 1968	131,109	1,470	32	358	260,100

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, 1 $\frac{1}{2}$ miles southwest of San Ildefonso Pueblo, 2 $\frac{1}{2}$ 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. -- 69 years (1896-1905, 1910-68) 1,533 cfs (1,110,000 acre-ft per year).

Extremes. --1895-1905, 1910-68: 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	19,499	714	565	629	38,680
February	20,291	846	622	700	40,250
March	28,854	1,050	846	931	57,230
April	31,168	1,320	778	1,039	61,820
May	82,455	4,240	938	2,660	163,500
June	86,860	4,360	1,440	2,895	172,300
July	23,671	1,590	339	764	46,950
August	65,984	3,300	664	2,129	130,900
September	11,730	804	261	391	23,270
October	10,975	412	278	354	21,770
November	36,651	1,570	408	1,222	72,700
December	18,396	701	460	593	36,490
Calendar year 1968	436,534	4,360	261	1,193	865,900

STREAMFLOW

Santa Fe River near Santa Fe, N. Mex.

Location. --Water-stage recorder and concrete control, lat 35°41'10", long 105°50'35", in NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 23, T. 17 N., R. 10 E., 0.4 mile downstream from McClure Dam, and 5 $\frac{1}{2}$ 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. --56 years (1913-68), 8.15 cfs (5,900 acre-ft per year).

Extremes. -- 1813-68: 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	45.3	1.5	1.4	1.43	90
February	42.04	1.7	.98	1.45	83
March	245.00	10	.98	7.90	486
April	267.9	9.4	8.4	8.93	531
May	318.2	11	9.4	10.3	631
June	378	13	11	12.6	750
July	342.9	13	6.4	11.1	680
August	78.62	6.4	.92	2.54	156
September	378.8	25	3.1	12.6	751
October	101.3	4.3	2.1	3.27	201
November	120.4	4.1	3.9	4.01	239
December	119.1	3.9	3.6	3.84	236
Calendar year 1968	2,437.56	25	.92	6.66	4,830

Jemez River below Jemez Canyon Dam, N. Mex.

Location. --Water-stage recorder, lat 35°23'10", long 106°31'45", in NE $\frac{1}{4}$ sec. 5, T. 13 N., R. 4 E., on right bank three-quarters of a mile downstream from Jemez Canyon Dam, 1 $\frac{1}{2}$ 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. --26 years (1937, 1944-68), 50.1 cfs (36,270 acre-ft per year).

Extremes. --1937, 1944-68: 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	886	50	18	28.6	1,760
February	810	68	14	27.9	1,610
March	1,386	132	23	44.7	2,750
April	7,414	628	79	247	14,710
May	9,475	580	155	306	18,790
June	1,359.02	124	0	45.3	2,700
July	416.14	165	0	13.4	825
August	3,377.64	710	0	109	6,700
September	12.33	5.0	0	.41	24
October	9.99	2.3	0	.32	20
November	563.9	34	2.3	18.8	1,120
December	533.8	26	1.0	17.2	1,060
Calendar year 1968	26,243.82	710	0	71.7	52,050

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RIO GRANDE COMPACT COMMISSION REPORT

Rio Grande below Elephant Butte Dam, N. Mex.

Location. --Water-stage recorder, lat 33°08'45", long 107°12'20", in SW $\frac{1}{4}$ sec. 25, T. 13 S., R. 4 W., (projected) in Pedro Armendariz Grant, on left bank 1.0 mile downstream from dam and 1 $\frac{1}{2}$ 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 (includes 2,940 sq mi in closed basin in San Luis Valley, Colo.).

Average discharge. --54 years (1915-68), 1,016 cfs (735,600 acre-ft per year).

Extremes. --1915-68: 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	394	16	8.5	12.7	781
February	395	18	11	13.6	783
March	55,290	1,810	1,680	1,784	109,700
April	52,460	1,770	1,710	1,749	104,100
May	53,510	1,790	1,150	1,726	106,100
June	53,480	1,810	1,760	1,783	103,100
July	37,925	1,800	495	1,223	75,220
August	16,919	647	14	546	33,560
September	298.5	50	5.6	9.95	592
October	230.2	13	5.1	7.43	457
November	189.8	8.0	5.1	6.34	376
December	195.9	7.0	5.1	6.32	389
Calendar year 1968	271,287.4	1,810	5.1	741	538,100

Rio Grande below Caballo Dam, N. Mex.

Location. --Water-stage recorder, lat 32°53'05", long 107°17'30", in NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 30, T. 16 S., 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 December 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. --31 years (1938-68) 887 cfs (642,200 acre-ft per year).

Extremes. --1938-68: 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	37.2	1.2	1.2	1.2	74
February	2,747.2	1,140	1.2	94.7	5,450
March	48,080	2,200	1,080	1,551	95,370
April	23,705	2,200	400	790	47,020
May	24,838	1,010	625	801	49,270
June	49,040	2,140	1,100	1,635	97,270
July	42,444	2,470	37	1,369	84,190
August	41,877	2,460	370	1,351	83,060
September	21,995.1	2,000	3.3	733	43,330
October	95.0	3.3	1.5	3.1	188
November	38.6	1.8	.8	1.3	77
December	46.2	1.8	.8	1.5	92
Calendar year 1968	254,943.3	2,470	.8	697	505,700

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STREAMFLOW

41

Bonito ditch below Caballo Dam, N. Mex.

Records available. -- January 1938 to December 1968. Published as supplementary 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 in Acre-feet
January	0	0	0	0	0
February	0	0	0	0	0
March	40.6	9.0	0	0	0
April	11.8	3.8	0	1.31	81
May	21.8	8.3	0	.39	23
June	65.8	11.6	0	.70	43
July	101.9	19.0	0	2.19	131
August	47.3	8.2	0	3.28	202
September	30.3	8.2	0	1.53	94
October	0	0	0	1.01	60
November	0	0	0	0	0
December	0	0	0	0	0
Calendar year 1968	319.5	19.0	0	.87	634

003504

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	6.2	6.7	7.3	8.0	8.0	8.0	0.3	0.3	0.3	0.3	1.1	1.8	-
Contents	149	163	179	198	198	198	7	7	7	7	25	41	-
Change	+16	+14	+16	+19	0	0	-191	0	0	0	+18	+16	-92

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

Big Meadows Reservoir.--In NW $\frac{1}{4}$ sec. 17, T. 38 N., R. 2 E., on South Fork about 0.9 mile upstream from Hope Creek. Completed in 1967; capacity, 2,437 acre-ft. Capacity table based on elevation above outlet. Water is used for fish culture. Includes 140 acre-ft of transmountain water, by exchange, in 1967 and 838 acre-ft, by exchange in 1968.

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

Date	Gage height	Contents	Change in contents
December 31, 1967	29.5	931	0
January 31, 1968	29.5	931	0
February 29	29.5	931	0
March 31	29.5	931	0
April 30	29.5	931	0
May 31	38.0	931	0
June 30	45.0	1,683	+752
July 31	45.0	2,437	+754
August 31	45.0	2,437	0
September 30	45.0	2,437	0
October 31	45.0	2,437	0
November 30	45.0	2,437	0
December 31	45.0	2,437	0
Calendar year 1968	-	-	+1,506

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. Includes 244 acre-feet transmountain water, imported in 1963.

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-feet by 1916 decree; enlarged in 1955 to 681 acre-feet. Only the storage in excess of 638 acre-feet 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	7.9	10.8	13.5	16.4	16.4	16.4	12.1	13.1	12.9	11.8	13.4	14.6	-
Contents	196	294	397	516	516	516	345	380	375	333	392	440	-
Change	+104	+98	+103	+119	0	0	-171	+35	-5	-42	+59	+48	+348

STORAGE IN RESERVOIRS

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

Platoro Reservoir. -- Water-stage recorder in NW $\frac{1}{4}$ SW $\frac{1}{4}$ 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.

Date	Month-end elevation, in feet, and contents, in acre-feet		
	Elevation	Contents	Change in contents
December 31, 1967	-	a 3,000	-
January 31, 1968	-	a 3,000	0
February 29	-	a 3,000	0
March 31	-	a 3,000	0
April 30	-	a 3,300	+300
May 31	9,946.6	4,200	+900
June 30	9,966.0	11,300	+7,100
July 31	9,966.0	11,300	0
August 31	9,968.7	12,600	+1,300
September 30	9,968.7	12,600	0
October 31	9,968.7	12,600	0
November 30	-	a 3,000	-9,600
December 31	-	a 3,000	0
Calendar year 1968	-	-	0
a Estimated	-	-	0

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. Storage affects Conejos Index Supply. Storage removed from debit status by exchange of transmountain water. (See minutes of meeting Feb. 19, 1960.)

Month	Month-end gage height, in feet, and contents, in acre-feet												
	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 and surface follower, lat 36°34'45", long 106°43'55", on Rio Chama. Storage began in January 1935. Capacity, 196,500 acre-feet at gage height 6,902.0 feet (crest of spillway), as determined by survey in 1966. Datum of gage is 8.21 feet above mean sea level, datum of 1929.

Date	Month-end gage-height, in feet, and contents, in acre-feet		
	Gage height	Contents	Change in contents
December 31, 1967	6,775.2	1,100	-
January 31, 1968	6,775.5	1,140	+40
February 29	6,775.6	1,160	+20
March 31	6,776.6	1,330	+170
April 30	6,790.6	6,820	+5,490
May 31	6,811.8	21,270	+14,450
June 30	6,811.7	21,180	-90
July 31	6,812.0	21,450	+270
August 31	6,811.7	21,180	-270
September 30	6,811.7	21,180	0
October 31	6,811.7	21,180	0
November 30	6,811.7	1,060	-20,120
December 31	6,775.0	1,060	0
Calendar year 1968	-	-	-40

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RIO GRANDE COMPACT COMMISSION REPORT

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

Abiquiu Reservoir. --Water-stage recorder in SW $\frac{1}{4}$ 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, 1967	-	0	-
January 31, 1968	-	0	0
February 29	6, 074. 60	34	+34
March 31	6, 089. 10	689	+655
April 30	6, 093. 38	1, 190	+501
May 31	6, 164. 30	50, 030	+48, 840
June 30	6, 152. 00	* 33, 870	-16, 160
July 31	6, 151. 40	29, 440	-620
August 31	6, 131. 31	13, 960	-15, 480
September 30	6, 131. 10	13, 840	-120
October 31	6, 130. 88	13, 710	-130
November 30	6, 100. 59	1, 960	-11, 750
December 31	6, 101. 04	2, 050	+90
Calendar year 1968	-	-	+2, 050

* 30, 060 acre-feet by new table put into use July 1, 1968

McClure (Granite Point) Reservoir. --Water-stage recorder in NE $\frac{1}{4}$ SW $\frac{1}{4}$ 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, 1967	83. 5	1, 750	-
January 31, 1968	83. 8	1, 770	+20
February 29	84. 3	1, 800	+30
March 31	81. 0	1, 610	-190
April 30	82. 3	1, 680	+70
May 31	91. 4	2, 250	+570
June 30	93. 9	2, 420	+170
July 31	88. 6	2, 070	-350
August 31	101. 3	2, 960	+890
September 30	96. 7	2, 620	-340
October 31	95. 8	2, 560	-60
November 30	94. 0	2, 430	-130
December 31	92. 3	2, 310	-120
Calendar year 1968	-	-	+560

Nichols Reservoir. -- Water-stage recorder in E $\frac{1}{2}$ NE $\frac{1}{4}$ sec. 21, T. 17 N., R. 10 E., on Santa Fe River. Completed in 1942; capacity, 796 acre-ft. Water is for municipal use in Santa Fe.

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

Date	Gage height	Contents	Change in contents
December 31, 1967	151. 9	542	-
January 31, 1968	156. 7	414	-128
February 29	148. 1	250	-164
March 31	158. 9	465	+215
April 30	162. 2	550	+85
May 31	159. 3	475	-75
June 30	154. 3	362	-113
July 31	166. 6	673	+311
August 31	153. 8	352	-321
September 30	156. 7	414	+62
October 31	150. 7	292	-122
November 30	151. 2	302	+10
December 31	151. 3	304	+2
Calendar year 1968	-	-	-238

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STORAGE IN RESERVOIRS

Reservoirs in Rio Grande Basin in New Mexico

San Gregorio Reservoir. -- Staff gage in SW $\frac{1}{4}$ NE $\frac{1}{4}$ 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-feet at elevation 9,408.0 feet (crest of spillway).

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	a250	a250	a260	a270	a290	a210	a170	a160	a170	a150	a140	a150	-
Change	0	0	+10	+10	+20	-80	-40	-10	+10	-20	-10	+10	-100

a Contents estimated on basis of five observations made during year.

Jemez Canyon Reservoir. -- Water-stage recorder in SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 32, T. 14 N., R. 4 E., on Jemez River $2\frac{1}{2}$ miles above mouth. Completed in 1953; capacity, 183,900 acre-feet at elevation of 5,252.3 feet. Capacity at elevation 5,232.0 feet (crest of spillway), 113,900 acre-feet 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, 1967	-	0	-
January 31, 1968	-	0	-
February 29	-	0	0
March 31	-	0	0
April 30	5,146.72	439	+439
May 31	5,150.03	1,020	+581
June 30	5,146.98	473	-547
July 31	-	0	-473
August 31	5,141.70	49	+49
September 30	-	0	-49
October 31	-	0	0
November 30	-	0	0
December 31	-	0	0
Calendar year 1968	-	0	0

Acoma Reservoir. -- Staff gage in SE $\frac{1}{4}$ sec. 29, T. 10 N., R. 7 W., on San Fidel Arroyo; water for reservoirs is diverted from Rio San Jose. Completed in 1938; original capacity, 850 acre-feet; present capacity 650 acre-feet 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

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal. yr.
Gage height	-	-	-	-	-	-	-	-	-	-	-	-	-
Contents	645	645	645	600	494	345	244	426	480	595	640	645	-
Change	+20	0	0	-45	-106	-149	-101	+182	+54	+115	+45	+5	0

RIO GRANDE COMPACT COMMISSION REPORT

STORAGE IN RESERVOIRS

Reservoirs in Rio Grande Basin in New Mexico

Elephant Butte Reservoir. --Water-stage recorder in NW $\frac{1}{4}$ 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, 1967	4, 312.00	267, 100	-
January 31, 1968	4, 315.93	304, 600	+37, 500
February 29	4, 319.70	343, 500	+38, 900
March 31	4, 313.79	283, 800	-59, 700
April 30	4, 306.19	216, 800	-67, 000
May 31	4, 304.25	201, 200	-15, 600
June 30	4, 302.92	190, 900	-10, 300
July 31	4, 295.27	136, 800	-54, 100
August 31	4, 307.05	224, 000	+87, 200
September 30	4, 307.76	229, 900	+5, 900
October 31	4, 308.48	236, 000	+6, 100
November 30	4, 314.99	295, 400	+59, 400
December 31	4, 318.77	333, 600	+38, 200
Calendar year 1968	-	-	+66, 500

Caballo Reservoir. --Water-stage recorder in SE $\frac{1}{4}$ SW $\frac{1}{4}$ 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, 1967	4, 140.89	42, 580	-
January 31, 1968	4, 141.35	44, 800	+2, 220
February 29	4, 140.93	43, 360	-1, 440
March 31	4, 143.19	51, 360	+8, 000
April 30	4, 153.70	100, 500	+49, 140
May 31	4, 160.75	147, 100	+46, 600
June 30	4, 160.32	144, 000	-3, 100
July 31	4, 158.03	127, 900	-16, 100
August 31	4, 149.51	78, 400	-49, 500
September 30	4, 139.67	39, 280	-39, 120
October 31	4, 140.37	41, 530	+2, 250
November 30	4, 140.95	43, 430	+1, 900
December 31	4, 141.39	44, 930	+1, 500
Calendar year 1968	-	-	+2, 350

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
December 31, 1967	-	309, 700	-
January 31, 1968	-	349, 400	+39, 700
February 29	-	386, 900	+37, 500
March 31	-	335, 200	-51, 700
April 30	-	317, 300	-17, 900
May 31	-	348, 300	+31, 000
June 30	-	334, 900	-13, 400
July 31	-	264, 700	-70, 200
August 31	-	302, 400	+37, 700
September 30	-	269, 200	-33, 200
October 31	-	277, 500	+8, 300
November 30	-	338, 800	+61, 300
December 31	-	378, 500	+39, 700

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TRANSMOUNTAIN DIVERSIONS

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

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, 1968

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	276	873	0	0	0	0
June	148	515	0	118	0	0
July	0	0	12	446	0	6
August	0	0	124	98	0	160
September	0	0	0	185	0	28
October	0	0	0	70	0	0
November	0	0	0	14	0	0
December	0	0	0	0	0	0
December	0	0	0	0	0	0
Calendar year	424	1,388	136	931	0	194

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RIO GRANDE COMPACT COMMISSION REPORT

EVAPORATION AND PRECIPITATION

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

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

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

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

Records for the evaporation stations at the State University, Elephant Butte Dam and El Vado Dam antedated the creation of the Commission; the 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.

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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 gages 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.

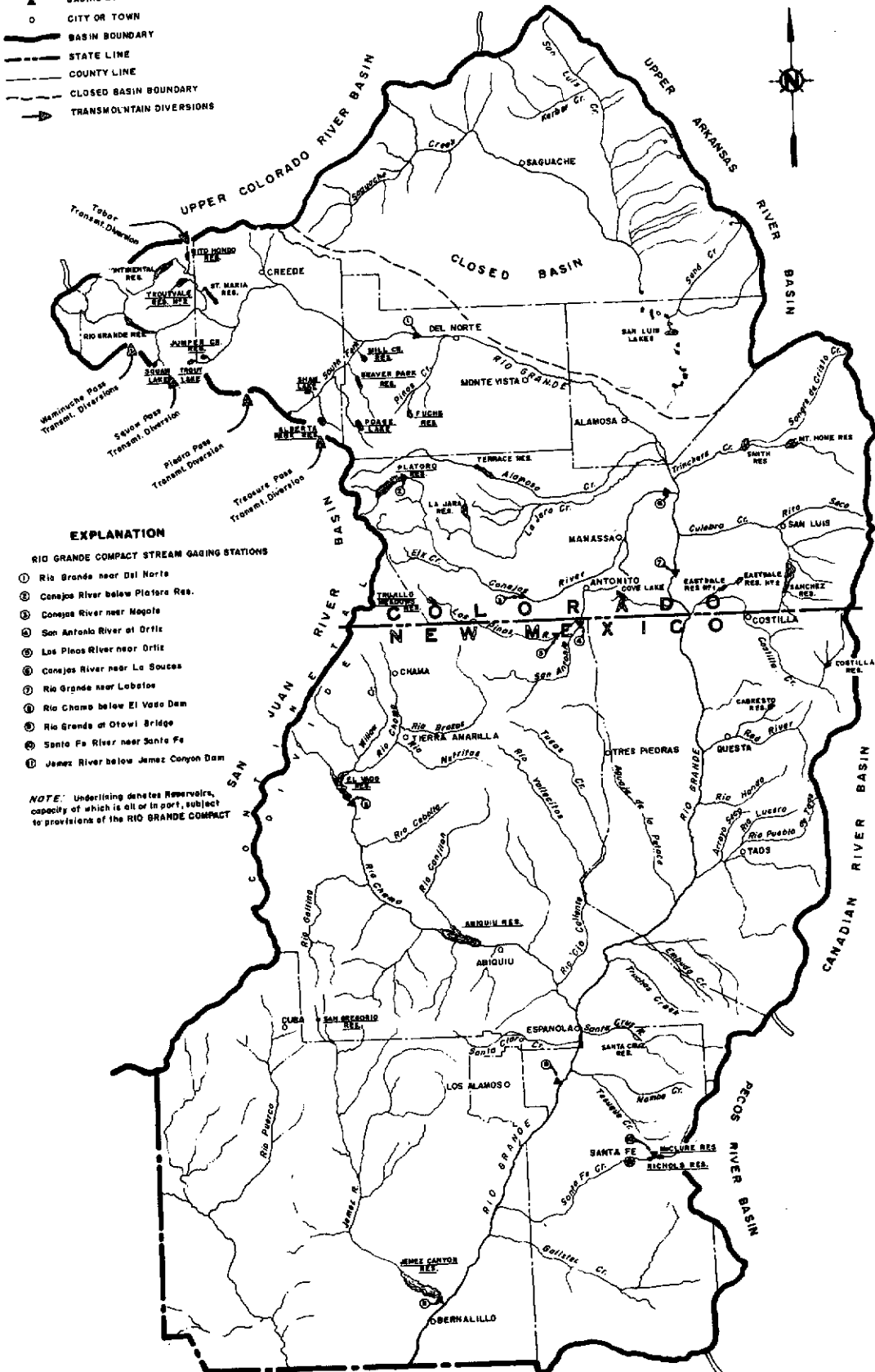
Caballo Dam.--Lat 32°54', long 107°18', in Sierra County at Caballo Dam, N. Mex. Standard class A pan, anemometer, maximum and minimum thermometers, standard 8-inch and recording rain gages at elevation 4,190 ft.

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

Station		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
Wagon Wheel Gap	Evap.	-	-	-	-	-	9.72	7.11	5.63	5.61	-	-	-	-
	Precip.	0.30	0.27	0.36	1.02	0.35	.08	3.62	2.72	.57	0.34	0.45	0.87	10.95
Alamosa Airport	Evap.	-	-	-	6.02	8.81	10.91	9.12	7.40	-	-	-	-	-
	Precip.	.04	.42	.21	.27	.20	.06	3.50	2.22	.41	.11	.28	.38	8.10
Platoro Dam	Evap.	-	-	-	-	5.01	8.22	5.37	4.68	4.94	4.44	-	-	-
	Precip.	-	-	-	-	1.33	.21	6.82	6.04	.97	.75	-	-	-
El Vado Dam	Evap.	-	-	-	5.01	7.38	8.12	7.21	6.43	4.59	-	-	-	-
	Precip.	.59	1.44	.92	.84	1.45	.42	1.45	3.74	.05	0.58	.88	.53	12.89
Abiquiu Dam	Evap.	-	-	-	7.04	10.37	13.54	11.41	8.28	9.07	6.34	-	-	-
	Precip.	.11	.38	.38	.42	1.25	.11	2.68	2.20	.15	.19	.55	.13	8.55
Santa Fe	Evap.	-	-	-	-	-	14.68	10.52	6.42	7.81	6.48	2.82	-	-
	Precip.	.24	.71	.53	.84	.51	.26	6.11	3.90	.18	.24	1.01	.66	15.19
Jemez Dam	Evap.	-	-	-	9.01	12.49	14.57	12.97	10.12	10.50	7.59	-	-	-
	Precip.	.09	.62	1.50	.37	.86	.01	.80	3.17	.05	.39	.35	.19	8.40
Bosque del Apache	Evap.	-	-	-	9.61	12.15	13.42	10.82	9.67	8.43	6.30	3.78	-	-
	Precip.	.40	.92	1.12	.12	.44	.00	1.68	1.87	.27	.25	.72	.29	8.08
Elephant Butte Dam	Evap.	2.64	4.28	6.61	11.30	14.44	16.76	13.32	11.22	10.24	8.35	4.56	3.09	106.81
	Precip.	.33	.34	.48	.02	.07	.05	1.82	2.38	.36	.11	.90	.02	6.88
Caballo Dam	Evap.	4.38	6.40	6.94	10.26	13.99	14.95	14.17	10.44	9.17	7.91	4.96	4.02	107.59
	Precip.	.38	.49	.66	.14	.05	.00	1.86	1.74	.89	.31	.82	.15	7.49
Elephant Butte University	Evap.	2.68	4.93	5.64	10.22	13.79	14.63	11.11	9.77	8.89	7.04	4.96	4.02	107.59
	Precip.	.52	.84	1.09	.27	.03	.15	2.55	3.89	1.28	.38	1.75	.42	95.48

- 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 Nogata
 - ④ San Antonio River at Ortiz
 - ⑤ Los Pinos River near Ortiz
 - ⑥ Conejos River near La Souzas
 - ⑦ Rio Grande near Lobatos
 - ⑧ Rio Grande below El Vado Dam
 - ⑨ Rio Grande at Otowi Bridge
 - ⑩ Santa Fe River near Santa Fe
 - ⑪ James River below James Canyon Dam
- NOTE:** Underlining denotes Reservoirs, capacity of which is all or in part, subject to provisions of the RIO GRANDE COMPACT

RIO GRANDE BASIN ABOVE BERNALILLO, NEW MEXICO

0 10 20 30 40 50

SCALE IN MILES