

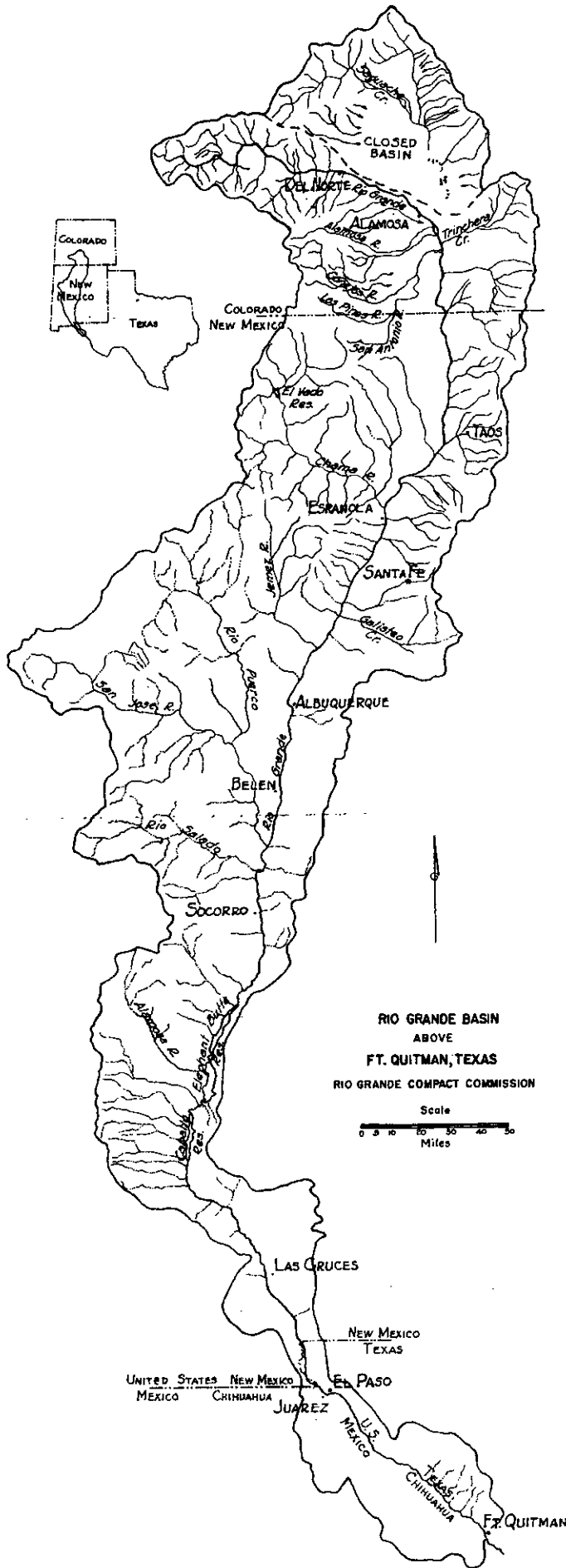
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Tenth Annual Report  
of the  
**RIO GRANDE COMPACT  
COMMISSION**

1948



TO THE GOVERNORS OF  
Colorado, New Mexico and Texas



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COLORADO  
M. C. WUNDERLIDER  
STATE ENGINEER  
DENVER, COLORADO

TEXAS  
J. E. QUAID  
316 CAPLES BLDG.  
EL PASO, TEXAS

## Rio Grande Compact Commission

NEW MEXICO  
JOHN H. BLISS  
STATE ENGINEER  
SANTA FE, NEW MEXICO

UNITED STATES  
BERKELEY JOHNSON, CHAIRMAN  
POST OFFICE BOX 277  
SANTA FE, NEW MEXICO

SECRETARY  
RIO GRANDE COMPACT COMMISSION  
POST OFFICE BOX 277  
SANTA FE, NEW MEXICO

Denver, Colorado  
February 16, 1949

His Excellency, Thomas J. Mabry  
Governor of the State of New Mexico,  
Santa Fe, New Mexico.

His Excellency, Beauford H. Jester,  
Governor of the State of Texas,  
Austin, Texas.

His Excellency, W. Lee Knous,  
Governor of the State of Colorado  
Denver, Colorado

Sirs:

The Tenth Annual Meeting of the Rio Grande Compact Commission was held in Denver, Colorado on February 14, 15 and 16th, 1949, at which time the Commission reviewed the records of stream flow at all Compact Index Stations and found that:

- (a) On January 1, 1948, Colorado had an accrued debit of 18,800 acre feet. In 1948, Colorado earned an annual credit of 148,900 acre feet, resulting in Colorado having an accrued credit of 130,100 acre feet on December 31, 1948.
- (b) On January 1, 1948, New Mexico had an accrued debit of 176,800 acre feet. In 1948, New Mexico incurred an annual debit of 114,400 acre feet by reason of increases in the amount of water stored in reservoirs. After required adjustments for evaporation losses, New Mexico had an accrued debit of 286,400 acre feet on December 31, 1948.
- (c) Prior to January 1, 1948, releases of usable water from Rio Grande Project Storage had amounted to 122,700 acre feet in excess of the normal release of 790,000 acre feet provided by the Compact. In 1948, the release of usable water from Project Storage was 742,900 acre feet. After correction of a minor error in the 1947 Report and after required adjustments for evaporation losses, the accrued excess release of usable water was 63,900 acre feet on December 31, 1948.

On February 24, 1948, at the Ninth Annual Meeting of the Commission, the following Resolution was adopted:

R E S O L U T I O N

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

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

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

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

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

Now, Therefore, Be it Resolved:

The Commission finds as follows:

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

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

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

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

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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
1000	621
1100	707
1200	800
1300	897
1400	996
1500	1095
1600	1195
1700	1295
1800	1395
1900	1495
2000	1595
2100	1695
2200	1795
2300	1895
2400	1995
2500	2095
2600	2195
2700	2295
2800	2395
2900	2495
3000	2595

(Continued)

Intermediate quantities shall  
be computed by proportional parts

- (5) The Otowi Index Supply is the recorded flow of the Rio Grande at the U.S.G.S. gaging station at Otowi Bridge near San Ildefonso (formerly station near Buckman) during the calendar year, corrected for the operation of reservoirs constructed after 1929 in the drainage basin of the Rio Grande between Lobatos and Otowi Bridge.
- (6) Elephant Butte Effective Index Supply is the recorded flow of the Rio Grande at the gaging station below Elephant Butte Dam during the calendar year plus the net gain in storage in Elephant Butte Reservoir during the same year or minus the net loss in storage in said reservoir, as the case may be.

The application of this schedule shall be subject to the provisions hereinafter set forth and appropriate adjustments shall be made for (a) any change in location of gaging stations;

(b) Depletion after 1929 in New Mexico of the natural runoff at Otowi bridge; and (c) any transmountain diversions into the Rio Grande between Lobatos and Elephant Butte Reservoir".

Be It Further Resolved:

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

Be It Further Resolved:

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

Pursuant to said Resolution, the opinions of the Attorneys General of the respective states were sought and received within the period of time specified by the Resolution. It having been concluded by each of the Attorneys General that the substitutions of stations and measurements of deliveries by New Mexico set forth in said Resolution were within the powers of the Commission, said substitutions of stations and measurements became effective on January 1, 1949.

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The expenses for administration of the Compact during the fiscal year ending June 30, 1948 were \$20,400, of which \$8,900 was borne by the United States and the balance of \$11,500 was borne equally by the three States.

Factual data and records bearing on the administration of the Compact are available in the files of the Commission.

Respectfully yours,

John H. Bliss  
John H. Bliss, Rio Grande Compact  
Commissioner for New Mexico

L. A. Scott  
L. A. Scott, Rio Grande Compact  
Commissioner for Texas

M. C. Hinderlider  
M. C. Hinderlider, Rio Grande  
Compact Commissioner for Colorado

Berkeley Johnson  
Berkeley Johnson, Chairman



## RIO GRANDE COMPACT

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

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

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

## ARTICLE I

- (a) The State of Colorado, the State of New Mexico, the State of Texas and the United States of America, are hereinafter designated "Colorado," "New Mexico," "Texas," and the "United States," respectively.
- (b) "The Commission" means the agency created by this Compact for the administration thereof.
- (c) The term "Rio Grande Basin" means all of the territory drained by the Rio Grande and its tributaries in Colorado, in New Mexico, and in Texas above Fort Quitman, including the Closed Basin in Colorado.
- (d) The "Closed Basin" means that part of the Rio Grande Basin in Colorado where the streams drain into the San Luis Lakes and adjacent territory, and do not normally contribute to the flow of the Rio Grande.
- (e) The term "tributary" means any stream which naturally contributes to the flow of the Rio Grande.
- (f) "Transmountain Diversion" is water imported into the drainage basin of the Rio Grande from any stream system outside of the Rio Grande Basin, exclusive of the Closed Basin.
- (g) "Annual Debits" are the amounts by which actual deliveries in any calendar year fall below scheduled deliveries.
- (h) "Annual Credits" are the amounts by which actual deliveries in any calendar year exceed scheduled deliveries.
- (i) "Accrued Debits" are the amounts by which the sum of all annual debits exceeds the sum of all annual credits over any common period of time.
- (j) "Accrued Credits" are the amounts by which the sum of all annual credits exceeds the sum of all annual debits over any common period of time.

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(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 Reservoir 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 Finos River near Ortiz;

(d) On the San Antonio River at Ortiz;

(e) On the Conejos River at its mouth 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 the Commission at page 17 ).

ARTICLE III

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

DISCHARGE OF CONEJOS RIVER

Quantities in thousands of acre feet

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

Intermediate quantities shall be computed by proportional parts.

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

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

DISCHARGE OF RIO GRANDE EXCLUSIVE OF  
CONEJOS RIVER

Quantities in thousands of acre feet

Rio Grande at Del Norte (3)	Rio Grande at Lobatos less Conejos at Mouths (4)
200	60
250	65
300	75
350	86
400	98
450	112
500	127
550	144
600	162
650	182
700	204
750	229
800	257
850	292
900	335
950	380
1,000	430
1,100	540
1,200	640
1,300	740
1,400	840

Intermediate quantities shall be computed by proportional parts.

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

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

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

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

ARTICLE IV

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

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

Quantities in thousands of acre feet

Otowí Index Supply (5)	San Marcial Index Supply (6)
100	0
200	65
300	141
400	219
500	300
600	383
700	469
800	557
900	648
1000	742
1100	839
1200	939
1300	1042
1400	1148
1500	1257
1600	1370
1700	1489
1800	1608
1900	1730
2000	1856
2100	1985
2200	2117
2300	2253

Intermediate quantities shall be computed by proportional parts.

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

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

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

Concurrent records shall be kept of the flow of the Rio Grande at San Marcial, near San Acacia, and of the release from Elephant Butte Reservoir to the end that the records at these three stations may be correlated. (Note: See Resolution of the Commission at page 17).

#### 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 others 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 the Commission at page 17).

#### ARTICLE VI

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

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

In the case of New Mexico, the accrued debit shall not exceed 200,000 acre feet at any time, except as such debit may be caused by holdover storage of water in reservoirs constructed after 1929 in the drainage basin of the Rio Grande between Lobatos and San Marcial. Within the physical limitations

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of storage capacity in such reservoirs, New Mexico shall retain water in storage at all times to the extent of its accrued debit. In computing the magnitude of accrued credits or debits, New Mexico shall not be charged with any greater debit in any one year than the sum of 150,000 acre feet and all gains in the quantity of water in storage in such year.

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

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

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

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

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

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

#### ARTICLE VII

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

## ARTICLE VIII

During the month of January of any year the Commissioner for Texas may demand of Colorado, and New Mexico, and the Commissioner for New Mexico may demand of Colorado, the release of water from storage reservoirs constructed after 1929 to the amount of the accrued debits of Colorado and New Mexico, respectively, and such releases shall be made by each at the greatest rate practicable under the conditions then prevailing, and in proportion to the total debit of each, and in amounts, limited by their accrued debits, sufficient to bring the quantity of usable water in project storage to 800,000 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 found from project storage in that year.

## ARTICLE IX

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

## ARTICLE X

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

## ARTICLE XI

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



## ARTICLE XII

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

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

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

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

## ARTICLE XIII

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

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ARTICLE XIV

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

ARTICLE XV

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

ARTICLE XVI

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

ARTICLE XVII

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

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

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

(Sgd.) M. C. HINDERLIDER,

(Sgd.) THOMAS M. McCLURE,

(Sgd.) FRANK B. CLAYTON.

APPROVED:

(Sgd.) S. O. HARFER.

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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.

RESOLUTION

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 Advisors 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 Advisors 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 Advisors' Report and all available evidence, information and material and is fully advised:

Now, Therefore, Be it Resolved:

The Commission finds as follows:

- (a) That because of change of physical conditions, reliable records of the amount of water passing San Marcial are no longer obtainable at the stream gaging station at San Marcial and that the same should be abandoned for Compact purposes.
- (b) That the need for concurrent records at San Marcial and San Acacia no longer exists and that the gaging station at San Acacia should be abandoned for Compact purposes.
- (c) That it is desirable and necessary that the obligations of New Mexico under the Compact to deliver water in the months of July, August, September should be scheduled.
- (d) That the change in gaging stations and substitution of the new measurements as hereinafter set forth will result in substantially the same results so far as the rights and obligations to deliver water are concerned, and would have existed if such substitution of stations and measurements had not been so made.

Be It Further Resolved:

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

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"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
1000	621
1100	707
1200	800
1300	897
1400	996
1500	1095
1600	1195
1700	1295
1800	1395
1900	1495
2000	1595
2100	1695
2200	1795
2300	1895
2400	1995
2500	2095
2600	2195
2700	2295
2800	2395
2900	2495
3000	2595

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

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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 trans-mountain diversions into the Rio Grande between Lobatos and Elephant Butte Reservoir."

Be it Further Resolved:

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

Be it Further Resolved:

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

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

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

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RULES AND REGULATIONS FOR  
ADMINISTRATION OF THE RIO GRANDE COMPACT

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

GAGING STATIONS

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 United States Geological Survey.

(b) Gaging stations on streams and reservoirs in the Rio Grande Basin below Lobatos and above San Marcial shall be equipped, maintained and operated by New Mexico in cooperation with the U. S. Geological Survey; the gaging station on the Rio Grande at San Marcial shall likewise be the responsibility of New Mexico to the extent that this station is not maintained and operated by the International Boundary Commission, or 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.

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

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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

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 records of flow of the Rio Grande at San Marcial, at San Acacia, and below Elephant Butte Reservoir may be correlated, 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.

#### EVAPORATION LOSSES

The Commission shall encourage the equipping, maintenance and operation, in cooperation with the United States 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.

#### ADJUSTMENTS 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 Com-

missioner specifically concerned to file with the Commission all available information pertaining thereto, and appropriate adjustments shall be made in accordance with the terms of the Compact; provided, however, that any such adjustments shall in no way increase the burden imposed upon Colorado or New Mexico under the schedules of deliveries established by the Compact.

#### TRANSMOUNTAIN DIVERSIONS

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

#### QUALITY OF WATER

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

#### SECRETARY a/

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

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



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- (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.

#### COSTS

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.

The Secretary shall present to each participating state through the Commissioner of such State, a certified statement of one-third of the cost of his salary, traveling expense, the expense incident to the maintenance of the offices of the Commission, and such Commissioner shall arrange for the prompt payment thereof by the appropriate agency of 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.

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MEETING OF COMMISSION

The Commission shall meet in 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. The annual meeting in 1940 shall be held at Monte Vista, Colorado, and thereafter rotate alphabetically according to the states, the place in each state to be designated by the Commissioner from that state. 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

In Accordance with Par. 14, Minutes of the Fourth Annual (Thirteenth) Meeting of the Rio Grande Compact Commission, held in Denver, Colorado, February 25 and 26, 1943, the following was made a part of the rules and regulations.

ACTUAL SPILL

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

(b) Excess releases from Elephant Butte Reservoir, as defined in (a) above, shall be added to the quantity of water actually in storage in that reservoir, and Actual Spill shall be deemed to have commenced when this sum equals the total physical capacity of that reservoir, to the level of the uncontrolled spillway i.e. -2,219,000 acre feet 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 feet 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.

CC1235

RECORDS OF DELIVERIES AND RELEASES

At the Annual Meeting of the Commission in February of each year, the records of actual and scheduled deliveries and releases and the computations of debits and credits for the previous year are examined and adopted as official. The records for 1946, as adopted by the Commission, are reproduced on the next three pages.

The obligation of Colorado to deliver water in the Rio Grande at the Colorado-New Mexico state line, computed as prescribed in Article III of the Compact, was 525,300 acre-feet; the actual adjusted delivery was 674,200 acre-feet, an excess over the obligation of 148,900 acre-feet. This surplus canceled the debit existing at the beginning of 1948 leaving a credit balance of 130,100 acre-feet.

The obligation of New Mexico to deliver water at San Marcial, computed as prescribed in Article IV, was 1,033,600 acre-feet but the actual adjusted delivery was 919,700 acre-feet, a deficit of 83,900 acre-feet, which increased the debit of 176,800 acre-feet at the beginning of the year to 286,400 acre-feet. At the end of the year El Vado Reservoir contained 142,700 acre-feet.

The Compact states that 790,000 acre-feet is normal release from Project Storage but during past years the withdrawal from storage has been at a greater rate; as of the beginning of the year the accumulated overdraft was 122,700 acre-feet. During 1948 releases from the reservoir totaled less than normal release thereby reducing the accrued debit to 63,900 acre-feet.

The Commission gratefully acknowledges the cooperation of the following agencies for furnishing data necessary for the computations of debits and credits:

Colorado State Engineer  
United Pueblos Agency  
Forest Service

New Mexico State Engineer  
Soil Conservation Service  
Bureau of Land Management

RIO GRANDE COMPACT  
DELIVERIES BY COLORADO AT STATE LINE

YEAR 1946

Quantities in Thousands of Acre Feet to Nearest Hundred

M O N T H	CONEJOS INDEX SUPPLY						RIO GRANDE SUPPLY			STORED WATER			DELIVERIES AND CREDITS				
	MEASURED STREAM FLOW			ADJUSTMENTS PER COMPACT	CONEJOS INDEX SUPPLY	RECORDED FLOW NEAR DEL NORTE	RIO GRANDE INDEX SUPPLY	GAIN (+) OR LOSS (-) IN STORAGE	TOTAL QUANTITY IN STORAGE AT END OF MONTH	CONEJOS RIVER AT MOUTH NEAR LOS SUCIOS	TOTAL FLOW AT LOBATOS LESS CONEJOS RIVER	ACTUAL DELIVERY AT LOBATOS GAGE	ADJUSTMENTS PER COMPACT				
	CONEJOS RIVER AT MOCOTTE	LOS PINOS RIVER NEAR ORTIZ	SAN ANTONIO RIVER AT ORTIZ											TOTAL MEASURED FLOW	LOBATOS RIVER	LOBATOS GAGE	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
JAN	3.1				3.1	11.7	+0.1a/	11.8	0.4	3.4	15.1	18.5					
FEB	2.9				2.9	11.7	0	11.7		4.3	13.1	17.4					
MAR	3.8				3.8	13.9	0	13.9		8.4	26.2	34.6					
1ST QTR	9.8				9.8	37.3	+0.1a/	37.4		16.1	54.4	70.5					
APR	27.1	18.6	8.9		54.6	64.6	0	64.6	.6	30.1	53.8	83.9					
MAY	101.9	18.4	7.8		158.1	249.8	0	249.8	.6	84.1	120.5	204.6					
JUN	99.7	21.6	1.1		122.4	289.5	0	289.5	.6	62.9	186.1	249.0					
2ND QTR	228.7	88.6	17.8		335.1	613.9	0	613.9	+2	177.1	360.4	537.5					
JUL	24.1	3.0	0		27.1	123.0	- .1b/	122.9	.5	1.0	13.3	14.3					
AUG	6.9	1.2	0		8.1	68.7	- .1a/	68.6	.3	0	3.6	3.6					
SEPT	2.8	.8	0		3.6	22.4	0	22.4	.3	.1	2.2	2.3					
3RD QTR	32.8	5.0	0		38.8	214.1	- .2ab/	213.9		1.1	19.1	20.2					
OCT	3.5	1.0	.1		4.6	19.2	0	19.2	.3	.6	4.4	5.0					
NOV	3.1				3.1	12.3	0	12.3	0	1.5	12.9	14.4					
DEC	2.8				2.8	11.2	0	11.2	0	2.6	14.0	16.6					
4TH QTR	9.4	1.0	.1		10.5	12.7	0	12.7	0	4.7	31.3	36.0					
YEAR	261.7	94.6	17.9		394.2	908.0	- .1ab/	907.9	0	199.0	465.2	664.2					
SUMMARY OF DEBITS AND CREDITS																	
ITEM																	
DEBIT																	
CREDIT																	
BALANCE																	
C1	Balance of Beginning of Year															Dr	18.8
C2	Scheduled Delivery from Conejos River															Dr	202.0
C3	Scheduled Delivery from Rio Grande															Dr	54.1
C4	Actual Delivery of Lobatos, plus 10,000 acre feet															Dr	674.2
C5	Adjustments per Compact - Item 16															Cr	130.1
C6	Reduction of Credits per Article VI															Cr	130.1
C7	Reduction of Debits per Article VI															Cr	130.1
C8	Balance of End of Year															Cr	130.1

REMARKS: Storage in reservoirs constructed after 1937 only.

a/ Adjustment for operation of Squaw Lake and Fuchs Reservoirs.

b/ Adjustment for Squaw Pass and Treasure Pass Transmountain diversions.

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RIO GRANDE COMPACT  
DELIVERIES BY NEW MEXICO AT SAN MARCIAL

YEAR 1916

Quantities in Thousands of Acre Feet to Nearest Hundred

M O N T H	OTOWI INDEX SUPPLY					STORAGE OF WATER IN RESERVOIRS					DELIVERIES AND CREDITS				
	RECORDED FLOW AT OTOWI BRIDGE	ADJUSTMENTS ACCOUNT STORAGE ABOVE OTOWI	OTHER ADJUSTMENTS PER COMPACT	EQUIVALENT FLOW AT OTOWI UNDER 1929 CONDITIONS	OTOWI INDEX SUPPLY	LOBATOS TO OTOWI		OTOWI TO SAN MARCIAL		TOTAL IN STORAGE AT END OF MONTH	RECORDED FLOW AT SAN MARCIAL GAGE	ACTUAL DELIVERY DURING SCHEDULE MONTHS	ADJUSTMENTS ACCOUNT DEPLETION DURING JULY, AUGUST, SEPTEMBER		OTHER ADJUSTMENTS PER COMPACT
						GAIN (+) OR LOSS (-)	TOTAL AT END OF MONTH	GAIN (+) OR LOSS (-)	TOTAL AT END OF MONTH				LOBATOS TO OTOWI	TRIBUTARIES BELOW OTOWI	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
JAN	38.9	+ 0.3	+0.1	39.3	39.3	+ 0.3	5.8	+0.3	1.8	7.6	37.0	37.0	—	—	—
FEB	44.3	+ 1.4	+ 1	45.8	45.8	+ 1.4	7.2	+ 1	1.9	9.1	51.1	51.1	—	—	—
MAR	65.0	+ 13.9	+ 1	79.0	79.0	+ 13.9	21.1	+ 1	2.0	23.1	56.7	56.7	—	—	—
1ST QTR	148.2	+ 15.6	+ 3	164.1	164.1	+ 15.6	—	+ 5	—	—	144.8	144.8	—	—	—
APR	179.8	+ 73.8	+ 3	244.9	244.9	+ 73.8	94.9	+ 6	2.6	97.5	132.8	132.8	—	—	—
MAY	313.8	+ 106.3	+ 8	420.9	420.9	+ 106.3	201.2	+ 1.5	4.1	205.3	219.7	219.7	—	—	—
JUN	369.1	- 1.7	+0.1a/11.0	368.5	368.5	- 1.7	199.5	+ 2	4.3	203.8	361.2	361.2	—	—	—
2ND QTR	953.7	+ 179.4	+0.1a/2.1	1,034.3	1,034.3	+ 179.4	—	+ 2.3	—	—	713.7	713.7	—	—	—
JUL	55.3	- 18.0	+ 1.0	38.3	—	- 18.0	181.5	- 9	3.4	184.9	—	—	- 9.3a/	0	—
AUG	19.9	- 26.1	+ 6	24.4	—	- 26.1	155.4	0	3.4	158.8	4.3	—	0	- 0.1a/	—
SEPT	28.6	- 12.7	+ 5	16.4	—	- 12.7	142.7	- 2	3.2	145.9	1.4	—	0	- 0.1a/	—
3RD QTR	133.8	- 56.8	+ 2.1	79.1	—	- 56.8	—	- 1.1	—	—	13.8	—	0	- 0.2a/	—
OCT	24.7	- 3.4	+ 4	21.7	21.7	- 3.4	139.3	- 1	3.1	142.4	2.2	2.2	—	—	—
NOV	30.7	+ 1.6	+ 2	32.5	32.5	+ 1.6	140.9	- 2	2.9	143.8	23.1	23.1	—	—	—
DEC	37.3	+ 1.8	+ 1	39.2	39.2	+ 1.8	142.7	+ 1	3.0	145.7	35.9	35.9	—	—	—
4TH QTR	92.7	0.0	+ 7	93.4	93.4	0.0	—	- 2	—	—	61.2	61.2	—	—	—
YEAR	1,228.4	+ 137.2	+0.1a/5.2a/	1,370.9	1,291.8	+ 137.2	—	+ 1.5	—	—	933.5	919.7	- 0.3a/	- 0.2a/	—

REMARKS: Storage in reservoirs constructed after 1929 only.

a/ Depletion caused by stock tanks.  
b/ Net evapo-transpiration loss from reservoirs.  
c/ Increase in storage in El Yado Reservoir.

SUMMARY OF DEBITS AND CREDITS

ITEM	DEBIT	CREDIT	BALANCE
WM1 Balance of Beginning of Year	—	—	Dr. 176.8
WM2 Scheduled Delivery at San Marcial	1,033.6	—	Dr. 1210.4
WM3 Actual Delivery in Schedule Months	—	919.7	Dr. 280.7
WM4 Adjustments Account Depletion in July, Aug., Sept.	0.5	—	Dr. 291.2
WM5 Other Adjustments - Item 16	—	0	Dr. 291.2
WM6 Reduction of Credits per Article VI	—	—	Dr. 291.2
WM7 Reduction of Debits per Article VI	—	—	Dr. 286.4
WM8 Balance of End of Year	—	—	Dr. 286.4

RIO GRANDE COMPACT  
RELEASE AND SPILL FROM PROJECT STORAGE

YEAR 1948

Quantities in Thousands of Acre Feet to Nearest Hundred

M O N T H	TOTAL PROJECT STORAGE CAPACITY AVAILABLE AT END OF MONTH			USABLE WATER		UNFILLED CAPACITY OF PROJECT STORAGE AT END OF MONTH	CREDIT WATER		FLOOD WATER IN STORAGE AND DEAD STORAGE AT END OF MONTH	TOTAL WATER IN PROJECT STORAGE AT END OF MONTH	RELEASE AND SPILL				TOTAL RECORDED FLOW * AT END OF MONTH		
	2	3	4	STORIED IN ELEPHANT RESERVOIR	STORIED IN CADALLO RESERVOIR		5	6			7	8	9	10		11	12
JAN	2,543.5	135.6	88.5	524.1	2,019.4	0	0	0	0	524.1	12.8	0.1	0	0	0	0	0.1
FEB	2,543.5	117.3	154.2	571.5	1,972.0	0	0	0	0	571.5	74.6	.1	0	0	0	0	.1
MAR	2,543.5	395.2	173.6	568.8	1,974.7	0	0	0	0	568.8	85.3	68.1	0	0	0	0	62.1
1ST QTR											202.7	62.3	0	0	0	0	62.3
APR	2,543.5	109.3	151.9	561.2	1,982.3	0	0	0	0	561.2	132.5	120.0	0	0	0	0	120.0
MAY	2,543.5	184.3	162.6	646.9	1,926.6	0	0	0	0	646.9	95.6	78.5	0	0	0	0	78.5
JUN	2,543.5	761.8	132.5	894.3	1,649.2	0	0	0	0	894.3	85.5	113.9	0	0	0	0	113.9
2ND QTR											283.6	312.4	0	0	0	0	312.4
JUL	2,543.5	673.5	70.3	743.8	1,799.7	0	0	0	0	743.8	95.4	152.4	0	0	0	0	152.4
AUG	2,543.5	588.6	26.5	615.1	1,928.4	0	0	0	0	615.1	88.2	145.2	0	0	0	0	145.2
SEPT	2,543.5	512.9	23.7	566.6	1,976.9	0	0	0	0	566.6	12.9	50.8	0	0	0	0	50.8
3RD QTR											226.5	318.4	0	0	0	0	318.4
OCT	2,543.5	506.8	53.3	560.1	1,983.4	0	0	0	0	560.1	32.1	7.4	0	0	0	0	7.4
NOV	2,543.5	483.3	71.5	564.8	1,978.7	0	0	0	0	564.8	28.5	7.1	0	0	0	0	7.1
DEC	2,543.5	482.0	92.5	591.5	1,952.0	0	0	0	0	591.5	35.9	5.3	0	0	0	0	5.3
4TH QTR											101.5	19.8	0	0	0	0	19.8
YEAR											614.3	742.9	0	0	0	0	742.9

REMARKS: \* Includes release to Bonita Ditch

NOTE: Indicated accrued departure at end of year  
Correction in reported discharge of Bonita Ditch  
in 1947

65,600 acre feet  
- 1,700  
63,900 acre feet

ACCRUED DEPARTURE FROM NORMAL RELEASE			
ITEM	DEBIT	CREDIT	BALANCE
P1 Accrued Departure of Beginning of Year			Dr. 122.7
P2 Actual Release during Year	742.9		
P3 Normal Release for Year		790.0	Dr. 667.6
P4 Actual Net Evaporation Loss in Year	113.0		Dr. 75.6
P5 Evaporation Loss if No Departures		153.0	Dr. 218.6
P6 Accrued Departure of End of Year (see note a)			Dr. 65.6
			Dr. 63.9

TIME OF HYPOTHETICAL SPILL Did not occur

662100

## WATER SUPPLY

The water supply for the Rio Grande Basin above San Marcial was somewhat above the ten year average. The snow cover in the headwater areas in Colorado was unusually heavy and the subsequent run-off was large enough to more than offset the deficiencies in run-off of the Rio Chama and other tributaries originating in New Mexico.

Precipitation for the year was below normal, the greatest departure occurring during the July-September period when summer storms usually occur.

### Accuracy of Records.

The Rules and Regulations of the Commission state that 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. Within the physical limitations of stream gaging the agencies obtaining records at Compact gaging stations have complied with these regulations.

Each station description includes a statement in regard to the accuracy of the records. "Excellent" indicates that, in general, the daily records are accurate within 5 per cent; "good", within 10 per cent; "fair", within 15 per cent; "poor", 16 or greater per cent. These standards of accuracy are the same as those followed by the U. S. Geological Survey.

### Acknowledgements.

Water supply data contained in the following pages of this report have been supplied by Federal and State agencies, and by several individuals.

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

- Rio Grande near Del Norte, Colorado.
- Rio Grande near Lobatos, Colorado.
- Conejos River near Mogote, Colorado.
- Conejos River near Los Sauces, Colorado.
- San Antonio River at Ortiz, Colorado.
- Los Pinos River near Ortiz, Colorado.

Records of storage in Troutvale Reservoir No. 2, Squaw Lake and Fuchs Reservoirs were supplied by the Colorado Special Deputy State Engineer at Monte Vista, Colorado with the cooperation of the respective owners viz: Earl Brown, Craton Sanderson and Fred Fuchs.

Records of Transmountain Diversions were supplied by the Colorado Special Deputy State Engineer at Monte Vista, Colorado with the cooperation of the owners, viz: Craton Sanderson, the Underwood Estate, George and Harley Fuchs, Leon Raber and Frank Lohr.

The U. S. Geological Survey in cooperation with the New Mexico Interstate Streams Commission furnished the following records:



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Rio Grande at Otowi Bridge near San Ildefonso, New Mexico.  
Rio Grande at San Acacia, New Mexico.  
Rio Chama below El Vado Dam near Tierra Amarilla, New Mexico.  
Storage in Carson Reservoir near Stong, New Mexico.  
Storage in Nichols Reservoir near Santa Fe, New Mexico.

The U. S. Geological Survey in cooperation with the New Mexico Interstate Streams Commission and the Middle Rio Grande Conservancy District furnished the record of storage in El Vado Reservoir near Tierra Amarilla, New Mexico.

The New Mexico Power Company at Santa Fe, New Mexico furnished the record of storage in McClure (Granite Point) Reservoir near Santa Fe, New Mexico.

The United Pueblos Agency, Albuquerque, New Mexico, furnished the records of storage in:

Acomita Reservoir near San Fidel, New Mexico.  
New Laguna Reservoir at Laguna, New Mexico.  
Paguete Reservoir near Laguna, New Mexico

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

Discharge of Rio Grande below Elephant Butte Dam, New Mexico.  
Discharge of Rio Grande below Caballo Dam, New Mexico.  
Storage in Elephant Butte Reservoir.  
Storage in Caballo Reservoir.

The Rio Grande Compact Commission acknowledges the cooperation received from these agencies and individuals.

001241

MONTHLY SUMMARY OF DISCHARGE

RIO GRANDE NEAR DEL NORTE, COLORADO

Location - Water-stage recorder in Sec. 29, T. 40 N., R. 5 E., 5 miles upstream from Pinos Creek and 6 miles west of Del Norte at State Bridge. From 1889 to September, 1907, station maintained at site four miles downstream, records are comparable. Zero of gage is 7,982.21 feet above mean sea level, datum of 1929.

Drainage area - 1,320 square miles.

Records available - October 11, 1889 to December 31, 1948.

Extremes - Maximum discharge during year, 8,840 second-feet May 22 (gage height, 5.81 feet); minimum daily, 130 second-feet November 19.

1889-1948: Maximum discharge, 18,000 second-feet October 5, 1911 (gage height, 6.80 feet), from rating curve extended above 6,000 second-feet; minimum daily 88 second-feet December 20, 1945.

Accuracy - Records considered excellent except those for periods of ice effect, January 1, 1948 to March 23 and November 19 to December 31, 1948, which are fair.

Remarks - Diversions for irrigation above station. Flow regulated by three reservoirs above station, total capacity 117,600 acre feet, and by several smaller ones.

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in Acre-feet
January	5,906	240	135	191	11,710
February	5,900	248	172	203	11,700
March	7,000	314	150	226	13,880
April	32,595	1,840	285	1,086	64,650
May	125,920	8,290	1,640	4,062	249,800
June	151,000	7,850	2,080	5,033	299,500
July	62,020	2,770	1,460	2,001	123,000
August	34,633	1,520	533	1,117	68,690
September	11,271	547	285	376	22,360
October	9,680	392	265	312	19,200
November	6,219	338	130	207	12,340
December	5,666	220	140	183	11,240
Year 1948	157,810	8,290	130	1,251	908,100

RIO GRANDE NEAR LOBATOS, COLORADO

Location - Water-stage recorder, Lat. 39°19', Long. 105°45', in Sec. 22, T. 33 N., R. 11 E., 6 miles north of Colorado-New Mexico State line, 7 miles downstream from Culebra Creek, at highway bridge 10 miles east of Lobatos. Zero of gage is 7,426.79 feet above mean sea level, datum of 1929.

Drainage area - 7,700 square miles (includes 2,940 square miles in closed basin).

Records available - June 28, 1899 to December 31, 1948.

Extremes - Maximum discharge during year, 8,600 second-feet June 7 (gage height 7.46 feet); minimum daily discharge, 33 second-feet September 8, 9, 12-17.

1899-1948: Maximum daily discharge 13,100 second-feet June 8, 1905 from rating curve extended above 8,000 second-feet; minimum daily discharge, 5.0 second-feet August 4, 1940.

Accuracy - Records considered good except those for period of ice effect, January 1, 1948 to March 24 and November 18 to December 31, 1948, which are fair.

Remarks - Diversions for irrigation above station. Flow regulated by many reservoirs on headwaters.

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in Acre-feet
January	9,330	365	220	301	18,510
February	8,775	385	230	303	17,400
March	17,466	925	335	563	34,600
April	42,289	3,080	760	1,410	83,880
May	103,132	8,040	791	3,327	204,600
June	125,561	8,510	597	4,185	249,000
July	7,230	649	55	233	14,340
August	1,837	85	38	59.3	3,640
September	1,160	53	33	38.7	2,300
October	2,533	117	55	81.7	5,020
November	7,247	349	117	242	14,370
December	8,365	330	220	270	16,590
Year 1948	334,925	8,510	33	915	664,200

001242

MONTHLY SUMMARY OF DISCHARGE

RIO GRANDE AT OTOWI BRIDGE NEAR SAN ILDEFONSO, NEW MEXICO

Location - Water-stage recorder, Lat. 35°52'25", Long. 108°02'35", in San Ildefonso Pueblo Grant, 200 feet downstream from highway bridge, 1 3/4 miles southwest of San Ildefonso Pueblo, 2 1/2 miles downstream from Rio Pojoaque and 7 miles west of Pojoaque. Datum of gage is 5,488.48 feet above mean sea level, datum of 1929.

Drainage area - 14,300 square miles (includes 2,940 square miles in closed basin in northern part of San Luis Valley, Colorado).

Records available - February 1895 to December 1905, June 1909 to December 1948.

Extremes - Maximum discharge during year, 12,400 second-feet May 28 (gage height 9.34 feet); minimum daily, 240 second-feet (estimated) September 21, 22.

1930-48: Maximum discharge, 22,500 second-feet May 16, 1941; maximum gage height 13.70 feet May 14, 1941; minimum daily discharge, 128 second-feet June 21, 1934.

Remarks - Records good except those for periods of no gage-height record, which are poor. Flow partially regulated by El Vado reservoir. Diversions above station for irrigation.

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in Acre-feet
January	19,269	693	486	633	38,930
February	22,339	1,260	515	770	44,310
March	32,782	1,580	645	1,057	65,020
April	86,100	5,160	1,340	2,870	170,800
May	158,200	11,800	1,840	5,103	313,800
June	186,070	11,800	1,380	6,202	369,100
July	27,863	1,420	365	899	55,270
August	25,161	1,280	544	812	49,910
September	14,394	1,240	240	480	28,550
October	12,434	819	290	401	21,660
November	15,493	647	388	516	30,730
December	18,796	697	539	606	37,280
Year 1948	619,261	11,800	240	1,662	1,228,000

RIO GRANDE AT SAN ACACIA, NEW MEXICO

Location - Water-stage recorder, Lat. 34°15'20", Long. 106°53'30", in NE 1/4 Sec. 1, T. 1 S., R. 1 W., 0.2 miles downstream from San Acacia diversion dam, 1/2 mile east of San Acacia, and 2 miles downstream from Rio Salado. Datum of gage is 4660.16 feet above mean sea level, datum of 1929.

Drainage area - 26,770 square miles (includes 2,940 square miles in closed basin in northern part of San Luis Valley, Colorado).

Records available - April 1936 to December 1948.

Extremes - Maximum discharge during year, 11,000 second-feet May 28 (gage height 6.25 feet); minimum daily, 1 second-foot August 2, 3, 5, 6, September 11, 14, 17, 18, 21-25.

1936-48: Maximum discharge, 27,400 second-feet August 5, 1936 (gage height 8.35 feet, datum of gage 4662.56), from rating curve extended above 18,000 second-feet by logarithmic plotting; no flow June 22 to July 7, 1946.

Remarks - Records good between 100 and 1,000 second-feet, others fair. Diversions above station for irrigation.

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in Acre-feet
January	21,812	884	250	704	13,260
February	27,169	1,710	350	937	53,890
March	30,754	1,350	642	992	61,000
April	69,819	4,970	920	2,327	138,500
May	124,650	10,700	860	4,021	247,200
June	173,338	10,300	603	5,778	343,800
July	4,324	555	13	139	8,580
August	2,746	792	1	88.6	5,450
September	1,907	705	1	63.6	3,780
October	1,098	191	8	35.4	2,180
November	18,005	1,140	346	600	35,710
December	21,656	849	613	659	42,950
Year 1948	497,278	10,700	1	1,359	986,300

001243

MONTHLY SUMMARY OF DISCHARGE

RIO GRANDE AT SAN MARCIAL, NEW MEXICO

Location - Water-stage recorder, Lat. 33°40'50", Long. 106°59'15", in Pedro Armendaris Grant 33, at Atchison, Topeka and Santa Fe Railway Bridge, 1.1 miles downstream from San Marcial, Socorro County. Datum of gage is 4,455.38 feet above mean sea level. (Levels by International Boundary Commission.)

Drainage area - 27,700 square miles (including 2,940 square miles in closed basin in northern part of San Luis Valley, Colorado).

Records available - January 1895 to December 1948.

Extremes - Maximum discharge during year, 11,700 second-feet, May 31, Maximum gage height, 16.80 feet June 12; no flow October 8-10.

1895-1948: Maximum discharge about 50,000 second-feet October 11, 1904; no flow at times.

Remarks - Records good except those for periods of ice effect or no gage-height record which are poor. Diversions above station for irrigation.

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in Acre-feet
January	18,645	828	130	601	36,980
February	25,772	1,930	154	889	51,120
March	28,607	1,260	631	923	56,740
April	66,964	5,370	839	2,232	132,800
May	110,750	11,000	784	3,573	219,700
June	182,110	11,000	950	6,070	361,200
July	4,089	660	33	132	8,110
August	2,185	250	15	70.5	4,330
September	719	245	1	24.0	1,430
October	1,083	78	7	34.9	2,150
November	11,624	570	117	387	23,060
December	18,108	730	450	584	35,920
Year 1948	470,656	11,000	1	1,286	933,500

RIO GRANDE BELOW ELEPHANT BUTTE DAM, NEW MEXICO

Location - Water-stage recorder, Lat. 33°09'05", Long. 107°12'10" in N $\frac{1}{2}$  Sec. 25, T. 13 S., R. 4 W., (projected), 3,800 feet downstream from Elephant Butte Dam, in Pedro Armendaris Grant.

Records available - October 1916 to December 1948.

Extremes - Maximum daily discharge during year, 1,900 second-feet March 24, April 8, 13; minimum daily discharge, 89 second-feet November 7.

1916-48: Maximum daily discharge, 8,220 second-feet May 22, 1942; no flow at times.

Remarks - Records good. Many diversions above station for irrigation. Flow regulated by Elephant Butte Reservoir.

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in Acre-feet
January	21,579	1,290	94	696	42,800
February	37,595	1,580	925	1,296	74,570
March	43,012	1,900	897	1,387	85,310
April	51,670	1,900	1,350	1,722	102,500
May	48,206	1,750	986	1,555	95,620
June	43,090	1,660	1,050	1,436	85,470
July	48,110	1,740	920	1,552	95,420
August	44,480	1,880	890	1,435	88,220
September	21,643	1,780	313	721	42,930
October	18,727	1,060	122	604	37,140
November	44,368	730	89	479	28,500
December	18,103	841	119	584	35,910
Year 1948	440,583	1,900	89	1,122	844,400

001244

MONTHLY SUMMARY OF DISCHARGE

RIO GRANDE BELOW CABALLO DAM, NEW MEXICO

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 feet upstream from Bojarques bridge, 4,200 feet downstream from Caballo Dam, 1 1/3 miles upstream from Percha diversion dam, 3 miles northeast of Arrey and 5 miles south of Caballo. Datum of gage is 4,140.9 feet above mean sea level. Prior to January 1, 1946 at datum 5.00 feet higher.

Records available - January 1938 to December 1948.

Extremes - Maximum daily discharge during year, 3,030 second-feet June 24; Minimum daily discharge, 1.4 second-feet January 26.

1938-48: Maximum daily discharge, 7,650 second-feet May 20, 1942; minimum daily discharge 1.3 second-feet November 18-21, December 12-27, 1940.

Remarks - Records good. Considerable diversion above station for irrigation. Flow regulated by Caballo Reservoir.

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in Acre-feet
January	57.9	2.1	1.4	1.9	110
February	67.1	2.6	2.0	2.3	130
March	31,192.5	2,660	2.4	1,006	61,870
April	60,440	2,850	1,050	2,015	119,880
May	39,518	1,530	978	1,275	78,380
June	57,265	3,030	613	1,909	113,580
July	76,670	2,850	1,660	2,473	152,070
August	73,060	2,830	1,870	2,357	144,910
September	25,458.7	1,970	2.4	849	50,500
October	3,720.9	803	1.7	120	7,380
November	3,575.6	863	1.1	119	7,090
December	2,649.6	597	2.2	85	5,260
Year 1948	373,675.3	3,030	1.1	1,018	741,200

BOHITA DITCH BELOW CABALLO DAM, NEW MEXICO

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

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in Acre-feet
January					0
February					0
March					195
April					136
May					156
June					306
July					388
August					245
September					310
October					26
November					18
December					0
Year 1948					1,780

001245

MONTHLY SUMMARY OF DISCHARGE

CONEJOS RIVER NEAR MOGOTE, COLORADO

Location - Water-stage recorder lat. 37°03', Long. 106°11', in SE $\frac{1}{4}$  Sec. 34, T. 33 N., R. 7 E.,  $\frac{3}{4}$  mile downstream from Fox Creek,  $\frac{5}{8}$  miles northwest of Mogote at Broyles Bridge, 12 miles west of Antonito.

Drainage area - 282 square miles.

Records available - September 1, 1899 to March 31, 1900, April 17, 1903 to October 31, 1905, at a point one mile downstream from present site, from March 21, 1907 to October 5, 1911, at site three miles upstream, from January 1, 1912 to December 31, 1948 at present site.

Extremes - Maximum discharge during year, 3,530 second-feet June 4 (gage height, 5.22 feet); minimum daily discharge, 32 second-feet January 28, November 19.

1899-1900, 1903-1948: Maximum discharge, 9,000 second-feet October 5, 1911, from rating curve extended above 3,500 second-feet; minimum daily discharge, 18 second-feet (discharge measurement) December 19, 1939.

Accuracy - Records considered good except those during periods of ice effect from January 1 to March 29, and December 1 to December 31, 1948, which are fair.

Remarks - No diversions or regulations above station.

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in Acre-feet
January	1,563	64	32	50.4	3,100
February	1,481	62	36	51.1	2,940
March	1,892	123	43	61.0	3,750
April	13,662	1,100	105	455	27,100
May	51,399	2,910	712	1,658	101,900
June	50,288	3,050	680	1,676	99,740
July	12,167	882	146	392	24,130
August	3,486	246	56	112	6,910
September	1,427	77	38	47.6	2,830
October	1,747	70	46	56.4	3,470
November	1,577	78	32	52.6	3,130
December	1,394	53	30	45.0	3,760
Year 1948	142,083	3,050	30	388	281,800

CONEJOS RIVER NEAR LOS SAUCES, COLORADO

Location - Water-stage recorders, Lat 37°23', Long: 105°45', on two channels in Sec. 2, T. 35 N., R. 11 E.,  $\frac{1}{2}$  mile upstream from mouth, and 2 miles north of Los Sauces. Stream enters Rio Grande River through two channels and published record is combined flow. Zero of gage (north channel) is 7,495.02 feet above mean sea level.

Drainage area - 887 square miles.

Extremes - Maximum discharge during year 2,430 second-feet June 5; no flow at times.

1921-1948: Maximum discharge 3,890 second-feet May 15, 1941; no flow July 21 to September 8, 1934.

Accuracy - Records considered good.

Remarks - Diversions for irrigation above station.

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in Acre-feet
January	1,729	70	33	55.8	3,430
February	2,160	137	50	74.5	4,280
March	4,211	254	83	136	8,350
April	15,185	1,510	145	506	30,120
May	42,443	2,270	396	1,368	84,120
June	31,720	2,380	126	1,057	62,920
July	482.0	93	0	15.5	956
August	5.8	.6	0	.19	12
September	64.3	5.1	0	2.14	128
October	296.1	19	15.0	9.55	587
November	757	42	17	25.2	1,500
December	1,331	47	38	42.9	2,640
Year 1948	100,354.2	2,380	0	274	199,000

1246

MONTHLY SUMMARY OF DISCHARGE

SAN ANTONIO RIVER AT ORTIZ, COLORADO

Location - Water-stage recorder, Lat. 37°00', Long. 106°02', in New Mexico in Sec. 19, T. 32 N., R. 9 E.,  $\frac{1}{2}$  mile south of Colorado-New Mexico State line,  $\frac{1}{2}$  mile south of Ortiz, and  $\frac{1}{2}$  mile upstream from Los Pinos Creek.

Drainage area - 110 square miles.

Records available - January 1 to October 31, 1915, May 1, 1919 to October 31, 1920, October 1, 1924 to December 31, 1948.

Extremes - Maximum discharge during year, 395 second-feet April 30 (gage height 3.04 feet); no flow at times.

1915, 1919-20, 1924-48: Maximum discharge, 1,750 second-feet April 15, 1937 (gage height, 5.38 feet), from rating curve extended above 1,100 second feet; no flow at times.

Accuracy - Records considered good. During winter periods records estimated based on discharge measurements and weather records.

Remarks - Small diversions for irrigation above station.

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in Acre-feet
January	31.0	-	-	1.0	61
February	43.5	-	-	1.5	86
March	77.5	-	-	2.5	154
April	4,466	352	8	149	8,860
May	3,916	309	33	126	7,770
June	534.7	65	3.5	17.8	1,000
July	12.2	2.4	0	.39	24
August	1.6	1.0	0	.05	3.2
September	1.0	.2	0	.03	2.0
October	36.5	7	0	1.18	72
November	100.3	7	1	3.34	199
December	40.3	-	-	1.3	80
Year 1948	9,260.6	352	0	25.3	18,370

LOS PINOS RIVER NEAR ORTIZ, COLORADO

Location - Water-stage recorder, Lat. 36°58', Long. 106°03', in New Mexico in  $\frac{1}{2}$  Sec. 34, T. 32 N., R. 8 E., 1 mile south of Colorado-New Mexico State line, 2 miles southwest of Ortiz, and  $2\frac{1}{2}$  miles upstream from mouth.

Drainage area - 167 square miles.

Records available - January 1, 1915 to November 30, 1920, October 1, 1924 to December 31, 1948.

Extremes - Maximum discharge during year, 1,660 second-feet May 20 (gage height 4.67 feet); minimum daily discharge, 10 second-feet September 23, 24.

1914-20, 1924-48: Maximum discharge 3,160 second-feet May 12, 1941 (gage height 5.77 feet); minimum daily discharge 5 second-feet August 11, September 19, 1934.

Accuracy - Records considered excellent except those below 50 second feet, which are good and those during periods of ice effect which are fair.

Remarks - Diversions for irrigation above station.

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in Acre-feet
January	465	-	-	15	922
February	493	-	-	17	978
March	775	-	-	25	1,540
April	9,393	894	39	313	18,630
May	24,386	1,230	380	787	48,370
June	10,881	795	120	363	21,580
July	1,537	116	23	49.6	3,050
August	630	45	12	20.3	1,250
September	384	20	10	12.8	762
October	527	24	14	17.0	1,050
November	652	34	13	21.7	1,290
December	403	-	-	13.0	799
Year 1948	50,526	1,230	380	138	100,200

001247

MONTHLY SUMMARY OF DISCHARGE

RIO CHAMA BELOW EL VADO DAM, NEW MEXICO

Location - Water-stage recorder, Lat. 36°34'50", Long. 106°43'30", in NW¼ Sec. 15, T. 27 N., R. 2 E., (projected), 1.5 miles downstream from El Vado Dam, 2.7 miles upstream from Rio Nutreas, and 13 miles southwest of Tierra Amarilla.

Records available - October 1935 to December 1948.

Extremes - Maximum discharge during year, 2,140 second-feet May 26 (gage height 4.60 feet); minimum daily discharge 3.3 second-feet January 13-16.

1935-48: Maximum discharge, 6,010 second-feet May 17, 1941 (gage height 6.89 feet); maximum gage height 9.63 feet May 30, 1937, site and datum then in use; minimum daily discharge, 0.9 second-feet December 30, 1946.

Remarks - Records excellent. Diversions above station for irrigation. Flow regulated by El Vado Reservoir.

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in Acre-feet
January	132.4	5.2	3.3	4.27	263
February	137.8	6.5	4.0	4.75	273
March	197.5	8.1	5.6	6.37	392
April	3,364.8	484	6.5	112	6,670
May	8,064	1,810	13	260	15,990
June	25,819	1,530	266	861	51,210
July	11,999	1,230	89	386	23,720
August	14,991	1,120	326	484	29,730
September	6,681	1,090	22	223	13,250
October	2,704	983	13	87.2	5,360
November	362	13	11	12.1	718
December	363	13	10	11.7	720
Year 1948	74,775.5	1,810	3.3	204	148,300

SANTA FE CREEK NEAR SANTA FE, NEW MEXICO

Location - Water-stage recorder and concrete control, Lat. 35°41'15", Long. 105°50'35", in NE¼SE¼ Sec. 23, T. 17 N., R. 16 E., about 0.4 mile downstream from McClure Dam (name changed) and 5½ miles east of Santa Fe. Prior to October 1, 1947 at site 0.3 mile upstream at different datum.

Records available - May to June 1910 at site 3 miles downstream. January 1913 to December 1948.

Extremes - Maximum daily discharge during year, 54 second-feet June 7; minimum daily discharge, 0.3 second-feet October 15-23.

1930-48: Maximum discharge, 418 second-feet April 23, 1942 (gage height 3.51 feet, site and datum then in use); from rating curve extended above 150 second-feet; minimum daily discharge 0.2 second-foot December 3-14, 16-29, 1943.

Remarks - Records good except those for ice effect and no gage-height record, which are fair. Flow regulated by McClure Reservoir. No diversion above station.

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in Acre-feet
January	45.2	2.0	1.2	1.46	90
February	59.5	4.4	1.2	2.05	118
March	168.9	9.4	4.2	5.45	335
April	282.2	13	1.4	9.41	560
May	177.8	8.0	5.0	5.74	353
June	270.0	54	1.7	9.00	536
July	142.0	6.9	3.7	4.58	282
August	187.8	31	1.8	6.06	372
September	217.8	9.0	7.7	8.26	492
October	135.4	8.0	1.6	4.37	269
November	51.1	1.8	1.7	1.70	101
December	52.7	1.7	1.7	1.70	105
Year 1948	1,820.4	54	1.2	4.97	3,610



001248

STORAGE IN RESERVOIRS

1948

**SQUAW LAKE RESERVOIR** - Dam and staff gage located in approximate Sec. 12, T. 39 N., R. 4 W., N.M.P.M., on Squaw Lake. Total capacity of reservoir, 158 acre-feet as determined by original survey. Water used for irrigation of lands below the Del Norte gaging station.

**TROUTVALE NO. 2 RESERVOIR** - Dam and staff gage located in Sec. 10, T. 41 N., R. 3 W., N.M.P.M., on South Clear Creek. Total capacity of reservoir, 435 acre-feet as determined by original survey. Water is used for fish culture with only occasional sale for irrigation.

**FUCHS RESERVOIR** - Dam and staff gage located in Secs. 2 and 11, T. 37 N., R. 4 E., N.M.P.M., on Pinos Creek. Total capacity of reservoir, approximately 249 acre-feet. Water used for irrigation of lands adjacent to Pinos Creek.

Last Day of	SQUAW LAKE			TROUTVALE NO. 2			FUCHS		
	Gage Height Ft.	Contents Ac.-Ft.	Change Ac.-Ft.	Gage Height Ft.	Contents Ac.-Ft.	Change Ac.-Ft.	Gage Height Ft.	Contents Ac.-Ft.	Change Ac.-Ft.
Dec. 47	5.5	95		7.6	257		9.1	80	
Jan. 48									
Feb.									
Mar.						0	17.1	237	+157
Apr.	8.0	140	+45	7.6	257	0	17.1	237	0
May	8.0	140	0	7.6	257	0	17.1	237	0
June	8.0	140	0	7.6	257	0	9.6	88	-149
July	6.7	116	-24	7.6	257	0	0	0	-88
Aug.	1.2	20	-96	7.6	257	0	0	0	0
Sept.	1.2	20	0	7.6	257	0	0	0	0
Oct.	1.2	20	0	7.6	257	0	0	0	0
Nov.									
Dec.									
Year			+20			0			0

**CARSON RESERVOIR** - Dam and water-stage recorder located in NW $\frac{1}{4}$  Sec. 12, T. 25 N., R. 10 E., on Aguaje de la Petaca. Total capacity of reservoir 5,684 acre-feet as determined by survey of 1941. Water used for irrigation of lands of the Carson Reclamation District. Completed 1940.

**EL VADO RESERVOIR** - Dam and water-stage recorder (staff gage only below elevation 6,878.0 feet) located in SE $\frac{1}{4}$  Sec. 4, T. 27 N., R. 2 E., on Rio Chama. Total capacity of reservoir, 197,530 acre-feet at elevation 6,902.0 feet (top of spillway gates) as determined by survey of 1944.

**McCLURE (formerly GRANITE POINT) RESERVOIR ENLARGEMENTS** - Dam and staff gage in SW $\frac{1}{4}$  Sec. 24, T. 17 N., R. 10 E., in Santiago Ramire, Grant, on Santa Fe Creek. Original reservoir, capacity 561 acre-feet, was completed in 1926 and is not subject to Compact administration; in 1935 permanent flash boards were installed in spillway increasing capacity to 650 acre-feet; in 1947 both dam and spillway were raised increasing total capacity to 2,614 acre-feet.

**NICHOLS RESERVOIR** - Dam, staff gage and water-stage recorder located in NE $\frac{1}{4}$  Sec. 21, T. 17 N., R. 10 E., on Santa Fe Creek. Total capacity of reservoir, 796 acre-feet as determined by original survey in 1942. Water is for municipal use in Santa Fe. Completed 1942.

Last Day of	CARSON			EL VADO			McCLURE (GRANITE POINT) 1935 and 1947 enlargements			NICHOLS		
	Gage Height Ft.	Contents Ac.-Ft.	Change Ac.-Ft.	Gage Height Ft.	Contents Ac.-Ft.	Change Ac.-Ft.	Gage Height Ft.	Contents Ac.-Ft.	Change Ac.-Ft.	Gage Height Ft.	Contents Ac.-Ft.	Change Ac.-Ft.
Dec. 47		0	0	6777.5	5,480		37.5	167		123.9	22	
Jan. 48		0	0	6778.3	5,820	+340	37.6	168	+1	-	17	-5
Feb.	9.8	24	+24		7,110	+1,320	38.6	183	+15	123.9	22	+5
Mar.	16.4	313	+289	6883.5	20,750	+13,610	42.7	250	+67	139.6	135	+113
Apr.	20.8	695	+382	6861.4	94,200	+73,450	69.3	1,030	+780	163.2	577	+442
May		0	-695	6903.1	201,200	+107,000	93.5	2,410	+1,380	166.3	664	+87
June		0	0	6902.6	199,500	-1,700	97.2	2,670	+260	168.9	743	+79
July		0	0	6896.9	181,500	-18,000	96.3	2,610	-60	160.9	515	-228
Aug.		0	0	6888.0	155,400	-26,100	92.8	2,360	-250	160.5	504	-11
Sept.		0	0	6883.3	142,700	-12,700	86.1	1,920	-440	163.0	571	+67
Oct.		0	0	6882.0	139,500	-3,400	83.0	1,740	-180	163.5	585	+14
Nov.		0	0	6882.6	140,900	+1,600	82.2	1,690	-50	-	512	-73
Dec.		0	0	6883.3	142,700	+1,800	81.3	1,640	-50	-	531	+19
Year			0			+137,220			+1,473			+509

001249

STORAGE IN RESERVOIRS

1948

ACOMITA RESERVOIR - Dam and staff gage located in SE $\frac{1}{4}$  Sec. 29, T. 10 N., R. 7 W., on San Fidel Arroyo; water for reservoir is diverted from Rio San Jose. Total capacity of reservoir, 850 acre-feet as determined by original survey in 1937. Water is used for irrigation of lands on Acoma and Laguna Indian Reservation. Completed 1938.

NEW LAGUNA RESERVOIR - Dam and staff gage located in SW $\frac{1}{4}$  Sec. 1, T. 9 N., R. 6 W., on Rio San Jose. Total capacity of reservoir, 683 acre-feet as determined by survey in 1938. Water used for irrigation of lands on Laguna Indian Reservation. Completed 1934.

PAGUATE RESERVOIR - Dam and staff gage located in NE $\frac{1}{4}$  Sec. 26, T. 10 N., R. 5 W., on Paguate Creek. Total capacity of reservoir, 976 acre-feet as determined by original survey. Water used for irrigation of lands on Laguna Indian Reservation. Completed 1938.

Last Day of	ACOMITA			NEW LAGUNA			PAGUATE		
	Gage Height Ft.	Contents Ac.-Ft.	Change Ac.-Ft.	Gage Height Ft.	Contents Ac.-Ft.	Change Ac.-Ft.	Gage Height Ft.	Contents Ac.-Ft.	Change Ac.-Ft.
Dec. 47		800			230			700	
Jan. 48		780	-20		230	0		840	+140
Feb.		830	+50		230	0		890	+50
Mar.		780	-50		210	-20		840	-50
Apr.		720	-60		130	-80		750	-90
May		520	-200		180	+50		870	+120
June		430	-90		150	-30		820	-50
July		240	-190		160	+10		560	-260
Aug.		0	-240		190	+30		940	+380
Sept.		70	+70		230	+40		950	+10
Oct.		130	+60		230	0		960	+10
Nov.		210	+80		170	-60		910	-50
Dec.		230	+20		230	+60		730	-180
Year			-570			0			+30

ELEPHANT BUTTE RESERVOIR - Dam and gages located in NW $\frac{1}{4}$  Sec. 30, T. 13 S., R. 3 W., on Rio Grande. Total Capacity of reservoir, 2,197,600 acre-feet as determined by survey in 1946. Water is used for power development and irrigation in New Mexico and Texas.

CABALLO RESERVOIR - Dam and gages located in SW $\frac{1}{4}$  Sec. 19, T. 16 S., R. 4 W., on Rio Grande. Total capacity of reservoir, 345,870 acre-feet as determined by original survey. Water is used to irrigate lands in New Mexico and Texas.

PROJECT STORAGE - The combined storage of Elephant Butte and Caballo Reservoirs. Total Project Storage capacity, 2,543,470 acre-feet of which 100,000 acre-feet in Caballo Reservoir is for flood control.

Last Day of	ELEPHANT BUTTE			CABALLO			PROJECT STORAGE		
	Gage Height Ft.	Contents Ac.-Ft.	Change Ac.-Ft.	Gage Height Ft.	Contents Ac.-Ft.	Change Ac.-Ft.	Gage Height Ft.	Contents Ac.-Ft.	Change Ac.-Ft.
Dec. 47	4325.11	435,500		444.58	51,410			486,910	
Jan. 48	25.12	435,600	+ 100	50.59	88,460	+37,050		524,060	+37,150
Feb.	23.51	417,300	- 18,300	61.20	154,200	+65,740		571,500	+47,440
Mar.	21.51	395,200	- 22,100	63.74	173,600	+19,400		568,800	- 2,700
Apr.	22.79	409,300	+ 14,100	60.89	151,910	-21,690		561,210	- 7,590
May	29.23	484,300	+ 75,000	62.31	162,590	+10,680		646,890	+85,680
June	49.19	761,800	+277,500	58.10	132,460	-30,110		894,280	+247,390
July	43.39	673,500	+ 88,300	48.47	78,270	-54,210		751,770	-142,510
Aug.	37.34	588,600	- 84,900	32.79	26,500	-51,770		615,100	-136,670
Sept.	33.89	542,900	- 45,700	31.61	23,700	- 2,800		566,600	- 48,500
Oct.	31.05	506,800	- 36,100	42.13	53,270	+29,570		560,070	- 6,530
Nov.	29.97	493,300	- 13,500	46.88	71,510	+18,240		564,810	+ 4,740
Dec.	29.86	492,000	- 1,300	52.70	99,480	+27,970		591,480	+ 26,670
Year			+ 56,500			+48,070			+104,570

001250

TRANSMOUNTAIN DIVERSIONS

1948

TRANSMOUNTAIN DIVERSIONS										
1948										
WEMINUCHE PASS (East Ditch) FUCES						WEMINUCHE PASS (West Ditch) RABER-LOHR				
Bristol 8-day recorder and 3-foot wooden Parshall flume. Ditch crosses Continental Divide at Lat. 37°41' N., Long. 107°19' W., in Sec. 4, T. 39 N., R. 4 W., (projected survey), 25 miles southwest of Creede, Colorado. Diversion originates on North Fork of the Rio de los Pinos, a tributary to the San Juan River; empties into Weminuche Creek, a tributary of the Rio Grande. Diversion is from Rio Grande above the Del Norte gaging station.						Bristol 8-day recorder and 3-foot wooden Parshall flume. Ditch crosses Continental Divide at Lat. 37°41' N., Long. 107° 19' W., in Sec. 4 T. 39 N., R. 4 W., (projected survey), 25 miles southwest of Creede, Colorado. Diversion originated on left bank of Rincon La Vaca Creek, a tributary of the Rio de los Pinos in the San Juan River Basin; emptied into Weminuche Creek, a tributary of the Rio Grande. Diversion is from Rio Grande above the Del Norte Gaging Station.				
Month	Second-foot-days	Maximum	Minimum	Mean	Discharge in acre-feet	Second-foot-days	Maximum	Minimum	Mean	Discharge in acre-feet
May	0				0	0				36
June	0				0	18.4	12	0	0.61	704
July	91.1	5.2	0	2.94	181	354.9	14	7.5	11.4	565
August	48.4	2.8	1.0	1.56	96	285.1	13	6.7	9.20	288
September	21.3	1.0	0	.71	42	145.1	6.9	0	4.54	
Total	160.8	5.2	0	-	319		14	0	-	1593
TABOR						SQUAW PASS				
Bristol 8-day recorder and 2-foot wooden Parshall flume. Ditch crosses Continental Divide at Lat. 37°56' N., Long. 107°11' W., in Sec. 34, T. 43 N., R. 3 W., (projected survey), adjacent to Colorado State Highway No. 149, 14 miles northwest of Creede, Colorado. Diversion originates from right bank of Cebolla Creek, a tributary to the Gunnison River; empties into Deep Creek, a tributary to Clear Creek in the Rio Grande Basin. Diversion is from Rio Grande above the Del Norte gaging station.						Bristol 8-day recorder and 2-foot wooden Parshall flume. Ditch crosses Continental Divide at Lat. 37°36' N., Long. 107°13' W., 24 miles southwest of Creede, Colorado. Diversion intercepts headwaters of Williams Creek, a tributary of Huerto Creek in the San Juan Basin; empties into Squaw Creek, a tributary of the Rio Grande above the Del Norte gaging station. Diversion is from Rio Grande below the Del Norte gaging station.				
Month	Second-foot-days	Maximum	Minimum	Mean	Discharge in acre-feet	Second-foot-days	Maximum	Minimum	Mean	Discharge in acre-feet
May	0				0	0				0
June	0				0	0				0
July	69.4	4.6	0	2.24	138	48.9	3.4	0	2.33	97
August	12.7	1.7	0	1.59	25	24.2	2.1	0	1.86	48
September	0				0	0				0
Total	82.1	4.6	0		163	73.1	3.4	0	-	145
TREASURE PASS						PIEDRA PASS				
Bristol 8-day recorder and 2-foot wooden Parshall flume. Ditch crosses Continental Divide at Lat. 37°29' N., Long. 106°48' W., in Sec. 32, T. 38 N., R. 2 E., (projected survey), adjacent to U. S. Highway No. 160 on the summit of Wolf Creek Pass, 17 miles southwest of South Fork, Colorado. Diversion originates on Wolf Creek, a tributary to the San Juan River; empties into Middle Creek, a tributary to South Fork in the Rio Grande Basin. Diversion is from the Rio Grande below the Del Norte gaging station.						Bristol 8-day recorder and 2-foot metal Parshall flume. Ditch crosses Continental Divide at Lat. 37°35' N., Long. 107°00' W., in Sec. 4, T. 38 N., R. 1 W., (projected survey), 20 miles south of Creede, Colorado. Diversion originates on the headwaters of the Piedra River, a tributary to the West Fork of the San Juan River in the San Juan Basin; empties into South River, a tributary to the Rio Grande. Diversion is from the Rio Grande above the Del Norte gaging station.				
Month	Second-foot-days	Maximum	Minimum	Mean	Discharge in acre-feet	Second-foot-days	Maximum	Minimum	Mean	Discharge in acre-feet
May	0				0					
June	0				0					
July	14.7	3.2	0	0.47	29	No flow during year				
August	0				0					
September	0				0					
Total	14.7	3.2	0	-	29					

001251

## 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 as well as at other selected locations.

Evaporation and precipitation records from stations in Colorado and New Mexico are tabulated on the following page. At some of the stations in the higher elevations 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 stations by recording rain gages. For both evaporation and precipitation the unit of measure is the inch.

Records for the evaporation stations at Agricultural College, Elephant Butte Dam and El Vado Dam antedated the creation of the Commission; the station at Bosque del Apache was installed for the U. S. Fish and Wildlife Service. 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 for furnishing the evaporation and precipitation records contained in this report.



001253

BUDGET  
FOR THE FISCAL YEAR ENDING  
JUNE 30, 1950

Adopted at the Tenth Annual (Twentieth) Meeting of the Rio Grande Compact Commission  
at Denver, Colorado, February 14, 1949.

ITEM	TOTAL COST	BORNE BY UNITED STATES	BORNE BY COMPACTING STATES		
			COLORADO	NEW MEXICO	TEXAS
GAGING STATIONS					
IN COLORADO	\$3,500	\$1,700	\$1,800		
IN NEW MEXICO ABOVE ELEPHANT BUTTE	4,800	2,400		\$2,400	
IN NEW MEXICO BELOW SAN MARCIAL	3,500	500		600	\$2,400
SUB-TOTAL	\$11,800	\$4,600	\$1,800	\$3,000	\$2,400
ADMINISTRATION	4,900	400	1,500	1,500	1,500
TOTAL	\$16,700	\$5,000	\$3,300	\$4,500	\$3,900
NET TO STATES	\$11,700		\$3,900	\$3,900	\$3,900
ESTIMATED CASH ADJUSTMENT BY STATES			Dr. 600	Cr. 600	0

COST OF OPERATION  
FOR THE FISCAL YEAR ENDING  
JUNE 30, 1948

ITEM	TOTAL COST	BORNE BY UNITED STATES	BORNE BY COMPACTING STATES		
			COLORADO	NEW MEXICO	TEXAS
GAGING STATIONS					
IN COLORADO	\$3,500	\$1,700	\$1,800		
IN NEW MEXICO ABOVE ELEPHANT BUTTE	10,400	6,800		\$3,600	
IN NEW MEXICO BELOW SAN MARCIAL	2,500				\$2,500
SUB-TOTAL	\$16,400	\$8,500	\$1,800	\$3,600	\$2,500
ADMINISTRATION	4,000	400	1,200	1,200	1,200(a)
TOTAL	\$20,400	\$8,900	\$3,000	\$4,800	\$3,700
BORNE BY UNITED STATES	8,900	8,900			
NET TO STATES	\$11,500				
SHARE OF EACH STATE CASH ADJUSTMENT			\$3,833 Dr. 833	\$3,834 Cr. 966	\$3,833 Dr. 133

NOTE: (a) Share of Texas unpaid account to U. S. G. S.