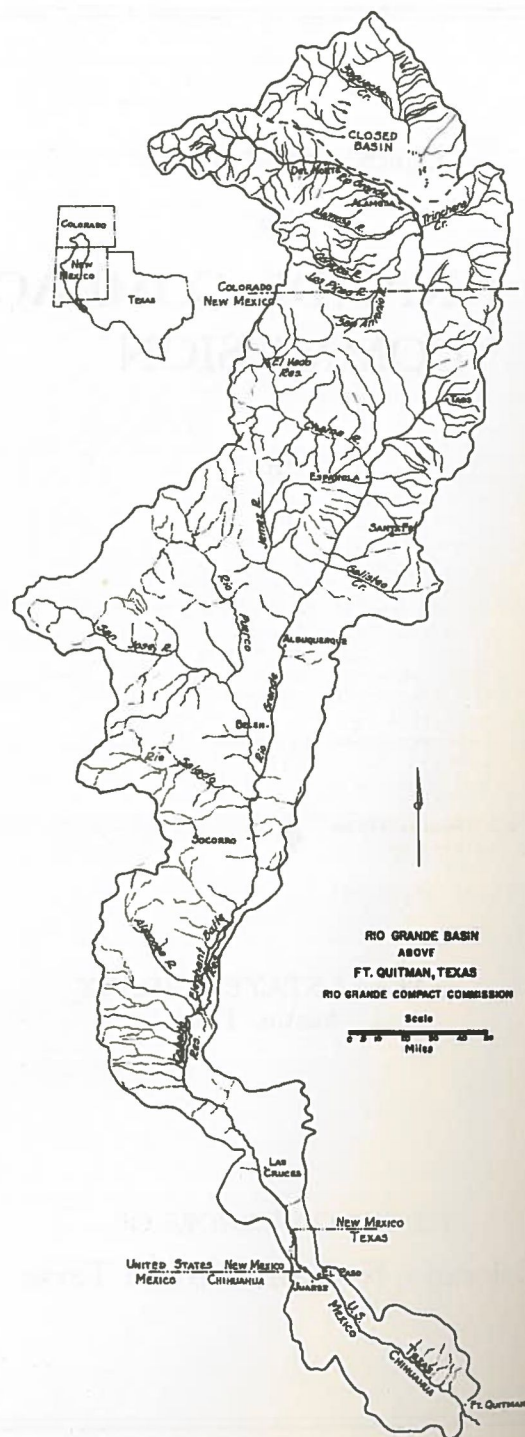


Eighth Annual Report  
of the  
**RIO GRANDE COMPACT  
COMMISSION**

1946



TO THE GOVERNORS OF  
Colorado, New Mexico and Texas



# TABLE OF CONTENTS

	Page
Frontispiece, Map, Rio Grande Basin above Ft. Quitman, Texas	
Eighth Annual Report to the Governors	3
Rio Grande Compact	5
Rules and Regulations	15
Records of deliveries and Releases	21
Deliveries by Colorado at State Line	22
Deliveries by New Mexico at San Marcial	23
Release and Spill from Project Storage	24
Water Supply	25
Rio Grande near Del Norte, Colorado	27
Rio Grande near Lobatos, Colorado	27
Rio Grande at Otowi Bridge, New Mexico	28
Rio Grande at San Acacia, New Mexico	28
Rio Grande at San Marcial, New Mexico	29
Rio Grande below Elephant Butte Dam, New Mexico	29
Rio Grande below Caballo Dam, New Mexico	30
Bonita Ditch below Caballo Dam, New Mexico	30
Conejos River near Mogote, Colorado	31
Conejos River near Los Sauces, Colorado	31
San Antonio River at Ortiz, Colorado	32
Los Pinos River near Ortiz, Colorado	32
Rio Chama near Tierra Amarilla, New Mexico	33
Santa Fe Creek near Santa Fe, New Mexico	33
Reservoir Storage	34
Transmountain Diversions	36
Evaporation and Precipitation	37
Tabulation of Records	38
Budget and Cost of Operations	39

COLORADO  
H. C. MINDERLIDER  
STATE ENGINEER  
DENVER, COLORADO

## Rio Grande Compact Commission

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

NEW MEXICO  
~~ROBERT M. MCGOWAN~~  
STATE ENGINEER  
SANTA FE, NEW MEXICO  
John H. Bliss

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

SECRETARY  
RUFUS M. CARTER, JR.  
~~3000 SPRING ST. N.W.~~  
~~WASHINGTON, D.C.~~  
February 21, 1947

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

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

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

Sirs:

The Eighth Annual Meeting of the Rio Grande Compact Commission was held in Santa Fe, New Mexico, on February 20 and 21, 1947.

The Commission reviewed records of stream flow at all compact index stations and found:

- (a) On January 1, 1946, Colorado had an accrued credit of 69,400 acre feet. In 1946, Colorado incurred an annual debit of 24,500 acre feet. After required adjustments for evaporation losses, Colorado had an accrued credit of 37,300 acre feet on December 31, 1946.
- (b) On January 1, 1946, New Mexico had an accrued debit of 148,900 acre feet. In 1946 New Mexico earned an annual credit of 39,000 acre feet. After required adjustments for evaporation losses, New Mexico had an accrued debit of 105,400 acre feet on December 31, 1946.

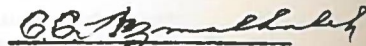


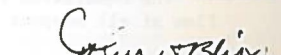
- (c) Prior to January 1, 1946, the release of usable water from Rio Grande Project Storage had amounted to 246,500 acre feet in excess of the normal release of 790,000 acre feet provided by the Compact. In 1946, the release of usable water from Project Storage was 766,000 acre feet after required adjustments for evaporation losses, the accrued excess release of usable water was 200,900 acre feet on December 31, 1946.

The expenses for administration of the Compact during the fiscal year ending June 30, 1946 were \$16,602.29 of which \$5,800. was borne by the United States and the balance of \$10,802.29 was borne by the three states in the amount of \$3600.76 each.

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

Respectfully yours,

  
C.C. Hesmer  
Acting Rio Grande Compact  
Commissioner for Colorado

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

  
J. E. Quaid, Rio Grande  
Compact Commissioner  
for Texas

## RIO GRANDE COMPACT

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

For the State of Colorado - M. C. Hinderlider

For the State of New Mexico - Thomas M. McClure

For the State of Texas - Frank B. Clayton

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

### ARTICLE I.

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

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

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

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

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

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

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

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

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



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

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

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

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

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

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

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

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

## ARTICLE II.

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

- (a) On the Rio Grande near Del Norte above the principal points of diversion to the San Luis Valley;
- (b) On the Conejos River near Mogote;
- (c) On the Los Pinos River near Ortiz;
- (d) On the San Antonio River at Ortiz;
- (e) On the Conejos River at its mouths near Los Sauces;

- (f) On the Rio Grande near Lobatos;
- (g) On the Rio Chama below El Vado Reservoir;
- (h) On the Rio Grande at Otowi Bridge near San Ildefonso;
- (i) On the Rio Grande near San Acacia;
- (j) On the Rio Grande at San Marcial;
- (k) On the Rio Grande below Elephant Butte Reservoir;
- (l) On the Rio Grande below Cabello 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.

## 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.

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 per cent of the total positive ions in that water when

the total dissolved solids in such water exceeds three hundred fifty parts per million.

#### ARTICLE IV.

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

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

Quantities in thousands of acre feet

Otowi Index Supply (5)	San Marcial Index Supply (6)
100	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 trans-mountain 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.

#### ARTICLE V .

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

#### ARTICLE VI.

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

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

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

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

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

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

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

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

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

#### ARTICLE VII.

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

#### ARTICLE VIII.

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



debts, sufficient to bring the quantity of usable water in project storage to 600,000 acre feet by March first and to maintain this quantity in storage until April thirtieth, to the end that a normal release of 790,000 acre feet may be made from project storage in that year.

#### ARTICLE IX.

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

#### ARTICLE X.

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

#### ARTICLE XI.

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

#### ARTICLE XII.

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

The salaries and personal expenses of the Rio Grande Compact Commissioners for the three States shall be paid by their respective States, and all other expenses incident to the administration of

this Compact, not borne by the United States, shall be borne equally by the three States.

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

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

#### ARTICLE XIII.

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

#### ARTICLE XIV.

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

S/ M. C. Hinderlider  
M. C. HINDERLIDER

S/ Thomas M. McClure  
THOMAS M. McCLURE

S/ Frank B. Clayton  
FRANK B. CLAYTON

APPROVED:

S/ S. O. Harper  
S. O. HARPER

RATIFIED BY:

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

Passed Congress as Public Act No. 96, 76th Congress  
Approved by the President, May 31, 1939

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 State 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 be used upon approval of the Commission in lieu of water stage recorders on small reservoirs, provided that the frequency of observations 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 Commissioner specifically concerned to file with the Commission all available information pertaining thereto, and appropriate adjustments shall be made in accordance with the terms of the Compact; provided, however, that any such adjustments shall in no way increase the burden imposed upon Colorado or New Mexico under the schedules of deliveries established by the Compact.

## TRANS-MOUNTAIN 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 allowance shall be made for losses in transit from such points to the Index Gaging Station on the stream with which the imported waters are commingled.

## 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

The Commission shall employ a secretary who shall be a registered professional engineer, or a Corporate Member of the American Society of Civil Engineers, experienced in irrigation, agricultural or hydraulic engineering. The period of employment of the secretary shall be at the pleasure of the Commission but not exceeding one year, at the end of which period his services shall automatically terminate; provided, however, that the Commission, upon unanimous agreement, may extend his employment for a period not exceeding one year following the year within which his employment has been automatically terminated, or may employ another individual under like conditions with respect to period of employment, it being the intent and purpose of the Commission to limit the term of employment of any such appointee so that any re-appointment, or the appointment of any successor, can be made for a period of but one year, and then only by the unanimous action of the Commission.

The salary of the secretary shall be determined by the Commission. He shall be reimbursed for his necessary traveling expenses incurred in performing his official duties, as may be determined by the Commission.

Each of the respective states, at its own expense, shall provide adequate office facilities for the use of the secretary of the Commission.

It shall be the duty of the secretary to collect and correlate all factual data and other records having a bearing upon the administration of the Compact, and to keep each Commissioner advised thereof. It shall be the further duty of the secretary to inspect all gaging stations maintained by the Commission, and to make recommendations to the Commission as to any changes or improvements to existing stations, and for the addition of new stations, to the end that reliable records may be had for the proper carrying out of the provisions of the Compact.

The secretary shall 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 at State Line;
- (b) Deliveries by New Mexico at San Marcial; and
- (c) Release and Spill from Project Storage.



He shall also compile a complete report covering his secretarial activities, and a summary of all factual data required by the Compact during the preceding calendar year, and submit the same to the Commission at its regular meeting in February, first following the calendar year covered by such report.

The secretary shall carry on such other duties as the Commission may assign to him from time to time, and shall devote his entire time to the duties of his office. He shall execute and deliver a surety bond satisfactory to the Commission, conditioned upon the faithful performance of the duties of his office.

#### 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 operation 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 each 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.

#### MEETINGS 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 in 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. McCURE

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 24 and 25, 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 1.1.-1,830,00 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.

## 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 computations of debits and credits for the previous calendar year are examined and adopted as official. The records adopted by the Commission for 1946 are reproduced on the following three pages.

In 1946 the obligation of Colorado to deliver water in the Rio Grande at the Colorado-New Mexico state line, computed as prescribed in Article IV of the Compact, was 157,300 acre-feet; actual delivery, however, was 125,200 acre-feet a deficit of 32,100 acre-feet. This deficit or indebtedness reduced the credit of 69,400 acre-feet that had been earned at the end of 1945 to a net credit of 37,300 acre-feet at the end of 1946.

The obligation of New Mexico to deliver water in the Rio Grande at San Marcial, computed in accordance with the terms of Article IV, was 222,400 acre-feet; the amount actually delivered was 265,900 acre-feet and thereby New Mexico earned a credit of 43,500 acre-feet. As there was a debit balance of 148,900 acre-feet at the end of last year, the credit earned this year reduced the total debit to 105,400 acre-feet.

At the end of 1945 the accrued excess of actual releases over normal or average releases was 246,500 acre-feet. Releases during the year, after adjustments for reservoir evaporation, totaled 744,400 acre-feet, 45,600 acre-feet less than the normal. This credit of 45,600 acre-feet served to reduce the overdraft to 200,900 acre-feet at the end of 1946.

The Commission gratefully acknowledges the cooperation of the following agencies in furnishing data necessary for the computation of the required adjustments:

Colorado State Engineer  
United Pueblos Agency  
Forest Service  
Farm Security Administration  
Range Development Service

New Mexico State Engineer  
Soil Conservation Service  
Grazing Service  
International Boundary and Water  
Commission, U. S. Section



# 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	ADJUSTMENTS PER COMPACT	RIO GRANDE SUPPLY	GAIN (+) OR LOSS (-) IN STORAGE	TOTAL QUANTITY IN STORAGE AT END OF MONTH	CONEJOS RIVER AT MOUTHS LOS SAUCLES	TOTAL FLOW AT LOS SAUCLES	ACTUAL DELIVERY AT LOS SAUCLES	ADJUSTMENTS PER COMPACT				
	LOS PINOS RIVER AT MOCOTE	LOS PINOS RIVER NEAR ORTIZ	SAN ANTONIO RIVER AT ORTIZ												TOTAL MEASURED FLOW			
JAN	2.5	—	—	2.5	—	2.5	8.2	0	8.2	0	0.5	2.8	10.8	13.6	—			
FEB	2.8	—	—	2.8	—	2.8	9.0	0	9.0	0	0.5	2.9	10.5	13.4	—			
MAR	4.4	—	—	4.4	—	4.4	13.3	0	13.3	0	0.5	3.5	11.3	14.8	—			
1ST QTR	9.7	—	—	9.7	—	9.7	30.5	0	30.5	0	—	9.2	32.6	41.8	—			
APR	23.1	17.1	5.5	45.7	—	45.7	61.2	0	61.2	0	0.5	6.1	4.0	10.1	—			
MAY	41.3	12.2	1.1	54.6	—	54.6	85.8	0	85.8	0	0.5	3.6	4.5	8.1	—			
JUN	38.8	3.5	0	42.3	—	42.3	119.4	0	119.4	0	0.5	0.5	4.2	4.7	—			
2ND QTR	112.9	32.8	6.6	152.3	—	152.3	237.0	0	236.9	0	—	19.4	45.3	64.7	—			
JUL	7.0	1.4	0	8.4	—	8.4	37.2	0	37.1	-0.1	0.4	0.1	1.7	1.8	—			
AUG	7.1	1.8	0.3	9.2	—	9.2	25.6	0	25.6	-0.1	0.3	0.2	1.8	2.0	—			
SEPT	7.2	1.7	0.1	9.0	—	9.0	18.4	0	18.3	-0.1	0.2	0.4	2.6	3.0	—			
3RD QTR	134.2	37.7	7.0	178.9	—	178.9	378.2	-0.3	377.9	-0.3	—	20.1	51.4	71.5	—			
OCT	6.7	2.2	0.2	9.1	—	9.1	21.2	0	21.2	0	0.2	1.3	2.8	4.1	—			
NOV	—	—	—	—	—	—	16.5	0	16.5	0	0.2	3.0	17.8	20.8	—			
DEC	1.4	—	—	1.4	—	1.4	12.7	0	12.7	0	0.2	3.2	15.6	18.8	—			
4TH QTR	39.9	7.2	197.7	197.7	—	197.7	428.6	-0.3	428.3	-0.3	—	27.6	87.6	115.2	—			
YEAR	159.6	39.9	7.2	197.7	—	197.7	428.6	-0.3	428.3	-0.3	—	27.6	87.6	115.2	—			

Remarks: Storage in reservoirs constructed after 1937 only.

a. Adjustment for change in storage above Del Norte  
b. Adjustment for transmountain diversion

SUMMARY OF DEBITS AND CREDITS		ITEM		DEBIT		CREDIT		BALANCE	
1		2		3		4		5	
G1		Balance at Beginning of Year		—		—		Dr	
G2		Scheduled Delivery from Compact River		13.8		—		Dr	
G3		Actual Delivery from Rio Grande		105.9		—		Dr	
G4		Actual Delivery of Lobos plus 10,000 acre feet		—		125.2		Cr	
G5		Adjustments per Compact - Item 16		—		—		Dr	
G6		Reduction of Credits per Article VI		7.6		—		Dr	
G7		Reduction of Credits per Article VI		—		—		Dr	
G8		Balance at End of Year		—		—		Dr	

# RIO GRANDE COMPACT DELIVERIES BY NEW MEXICO AT SAN MARCIAL

YEAR 1946

Quantities in Thousands of Acre Feet to Nearest Hundred

M O N T H	OTOMI INDEX SUPPLY					STORAGE OF WATER IN RESERVOIRS					DELIVERIES AND CREDITS				
	RECORDED FLOW AT OTOMI BRIDGE	ADJUSTMENTS ACCOUNT STORAGE ABOVE OTOMI	OTHER ADJUSTMENTS PER COMPACT	EQUIVALENT FLOW AT OTOMI UNDER 1929 CONDITIONS	OTOMI INDEX SUPPLY	LOBATOS TO OTOMI		OTOMI TO SAN MARCIAL		TOTAL STORAGE AT END OF MONTH	RECORDED FLOW AT SAN MARCIAL GAUGE	ACTUAL DELIVERY DURING SCHEDULE MONTHS	ADJUSTMENTS ACCOUNT DEPLETION DURING		OTHER ADJUSTMENTS PER COMPACT
						GAIN (+) OR LOSS (-)	TOTAL AT END OF MONTH	GAIN (+) OR LOSS (-)	TOTAL AT END OF MONTH				JULY, AUGUST, SEPTEMBER TO OTOMI	THIRTEENTH MONTH TO OTOMI	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
JAN	35.2	+2.3	+0.1 b	37.6	37.6	+2.3	86.9	+0.2	0.5	87.4	41.3	41.3	—	—	—
FEB	34.6	+2.5	+0.3 b	37.4	37.4	+2.5	89.4	+0.1	0.4	89.8	34.0	34.0	—	—	—
MAR	39.3	+5.8	+0.6 b	45.7	45.7	+5.8	95.2	+0.7	1.1	96.3	32.0	32.0	—	—	—
1ST QTR	109.1	+10.6	+1.0 b	120.7	120.7	+10.6	—	+0.4	—	—	107.3	107.3	—	—	—
APR	47.4	+50.2	+0.7 b	98.3	98.3	+50.2	115.4	+0.1	1.2	116.6	3.0	3.0	—	—	—
MAY	48.2	+0.6	+3.2 b	48.8	48.8	+0.6	144.8	+0.3	0.9	145.7	5.1	5.1	—	—	—
JUN	58.7	+12.6	+1.3 b	71.4	71.4	+12.6	182.2	+0.4	0.5	182.7	0	0	—	—	—
2ND QTR	263.4	+17.6	+4.2 b	285.2	285.2	+17.6	—	+0.2	—	—	116.3	116.3	—	—	—
JUL	30.5	+11.8	+0.5 b	42.2	42.2	+11.8	90.4	+0.1	0.4	90.8	0.5	—	0.1 a	—	—
AUG	28.4	+3.3	0	31.7	31.7	+3.3	93.7	+1.3	1.7	95.4	15.0	—	3.3 d	0.7 a	—
3RD QTR	18.8	+2.5	+0.4 b	21.7	21.7	+2.5	96.2	+0.4	1.3	97.5	6.8	—	2.5 d	—	—
SEP	34.1	+11.6	+5.1 b	50.8	50.8	+11.6	—	+0.6	—	—	139.5	—	5.9 ad	0.7 a	—
OCT	26.0	+5.4	+0.2 b	32.7	32.7	+5.4	101.6	+0.1	1.4	103.0	10.2	10.2	—	—	—
NOV	77.6	+38.2	+0.2 b	115.8	115.8	+38.2	63.4	+0.3	1.7	65.3	47.0	47.0	—	—	—
DEC	88.4	+14.4	+0.1 b	102.8	102.8	+14.4	19.0	+0.2	1.9	20.9	92.4	92.4	—	—	—
4TH QTR	534.0	+55.6	+5.8 b	589.6	589.6	+55.6	—	+1.2	—	—	289.1	289.1	—	—	—
YEAR	534.0	+55.6	+5.8 b	589.6	589.6	+55.6	—	+1.2	—	—	289.1	289.1	5.9 ad	0.7 a	—

Remarks: Storage in reservoirs constructed after 1929 only.

a. Adjustment for stock tanks  
b. Adjustment, net evaporation, Lobatos to Otomi.  
c. Does not include San Marcos Reservoir, which capacity during 1946 was 50 acre feet.  
d. Gain in El Tado during non-scheduled months.

SUMMARY OF DEBITS AND CREDITS		ITEM		DEBIT		CREDIT		BALANCE	
1		2		3		4		5	
G1		Balance at Beginning of Year		—		—		Dr	
G2		Scheduled Delivery from Compact River		220.3		—		Dr	
G3		Actual Delivery in Schedule Months		—		265.9		Cr	
G4		Actual Delivery of Lobos plus 10,000 acre feet		—		—		Dr	
G5		Other Adjustments - Item 16		6.6		—		Dr	
G6		Reduction of Credits per Article VI		—		—		Dr	
G7		Reduction of Credits per Article VI		—		—		Dr	
G8		Balance at End of Year		—		—		Dr	



# RIO GRANDE COMPACT RELEASE AND SPILL FROM PROJECT STORAGE

YEAR 1946

Quantities in Thousands of Acre Feet to Nearest Hundred

Quantities in Thousands of Acre Feet to Nearest Hundredth																											
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 DEAD STORAGE AT END OF MONTH				TOTAL WATER IN PROJECT STORAGE AT END OF MONTH				RELEASE AND SPILL			
				STORING IN ELPHANT BUTTE RESERVOIR	STORING IN CADALLO RESERVOIR	TOTAL IN STORAGE	COLORADO CREDIT WATER IN STORAGE	NEW MEXICO CREDIT WATER IN STORAGE	TOTAL STORAGE AT END OF MONTH	STORING IN ELPHANT BUTTE RESERVOIR	STORING IN CADALLO RESERVOIR	TOTAL STORAGE AT END OF MONTH	STORING IN ELPHANT BUTTE RESERVOIR	STORING IN CADALLO RESERVOIR	TOTAL STORAGE AT END OF MONTH	STORING IN ELPHANT BUTTE RESERVOIR	STORING IN CADALLO RESERVOIR	TOTAL STORAGE AT END OF MONTH	RECORDED FLOW OF RIO GRANDE AT ELPHANT BUTTE	RELEASE OF USABLE WATER	SPILL OF FLOOD OR CREDIT WATER	ACTUAL SPILL OF USABLE WATER	TOTAL RECORDED FLOW				
JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	YEAR		
2,100.0	2,100.0	2,100.0	2,100.0	2,100.0	2,100.0	2,100.0	2,100.0	2,100.0	2,100.0	2,100.0	2,100.0	2,100.0	2,100.0	2,100.0	2,100.0	2,100.0	2,100.0	2,100.0	2,100.0	2,100.0	2,100.0	2,100.0	2,100.0	2,100.0	2,100.0		
1031.2	1002.3	961.5	859.0	898.1	760.6	690.7	611.3	556.0	501.3	474.9	511.9		69.1	69.1	69.1	69.1	69.1	69.1	69.1	69.1	69.1	69.1	69.1	69.1	69.1		
227.8	261.3	251.0	200.2	169.8	120.0	59.1	25.7	59.9	111.3	156.9	204.5		0	0	0	0	0	0	0	0	0	0	0	0	0		
1269.0	1263.6	1212.5	1159.0	1028.9	880.6	749.8	637.0	615.9	612.6	631.8	716.4		69.1	69.1	69.1	69.1	69.1	69.1	69.1	69.1	69.1	69.1	69.1	69.1	69.1		
1229.0	1221.1	1215.5	1118.0	1029.1	1607.1	1718.2	1851.0	1872.1	1872.1	1856.2	1769.6		0	0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0		
1328.1	1335.0	1281.9	1169.6	1087.9	950.0	819.2	706.1	685.3	650.5	627.6	701.2		72.7	62.4	73.3	208.1	71.0	73.0	69.4	121.8	72.7	88.0	69.0	830.3	830.3		
0.3	18.3	82.5	101.1	119.1	97.6	138.0	130.7	31.6	711.7	10.8	7.5		0	0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0		
0.3	18.3	82.5	101.1	119.1	97.6	138.0	130.7	31.6	711.7	10.8	7.5		0	0	0	0	0	0	0	0	0	0	0	0	0		
766.0	766.0	766.0	766.0	766.0	766.0	766.0	766.0	766.0	766.0	766.0	766.0	766.0	766.0	766.0	766.0	766.0	766.0	766.0	766.0	766.0	766.0	766.0	766.0	766.0	766.0		
ACCUMULATED DEPARTURE FROM NORMAL RELEASE														830.3	766.0	0	0	766.0	766.0								
ITEM														DEBIT				CREDIT				BALANCE					
P1 Actual Departure of Engineering of Year																						Dr- 246.5					
P2 Actual Release of Year																						Dr- 1012.5					
P3 Actual Release of Year																						Dr- 222.5					
P4 Actual Net Accumulated Loss in Year																						Dr- 231.5					
P5 Deposition Loss if No Depositions																						Dr- 200.0					
P6 Deposition Loss if No Depositions																						Dr- 200.0					
P7 Deposition Loss if No Depositions																						Dr- 200.0					
P8 Deposition Loss if No Depositions																						Dr- 200.0					
P9 Deposition Loss if No Depositions																						Dr- 200.0					
P10 Deposition Loss if No Depositions																						Dr- 200.0					

REMARKS:

## WATER SUPPLY IN 1946

The prolonged dry period of 1945 was broken briefly in December by considerable precipitation which, although it increased snow storage in the head water areas of the Rio Grande, nevertheless, was below normal at the beginning of 1946. The drouth continued throughout January and February adding little to the snow storage and at the end of March very little snow remained. The consequent low spring run-off, together with subnormal precipitation during the remainder of the year, resulted in the second lowest discharge at Otowi Bridge since 1895. It was the fifth consecutive year of subnormal precipitation.

### Accuracy of Records

The Rules and Regulations of the Commission provide 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 limitations imposed by the physical conditions existing at the various sites the Agencies obtaining records at the Compact gaging stations have complied with those regulations.

### Acknowledgements

The water supply data published herein have been obtained from various sources.

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 Squaw Lake, Troutvale No. 2 and Fuchs Reservoirs were furnished by the Colorado Special Deputy State Engineer at Monte Vista, Colorado, with the cooperation of the respective owners, viz: Craton Sanderson, Earl Brown and Fred Fuchs. The same Colorado Special Deputy Engineer also supplied records of transmountain diversions with the cooperation of Craton Sanderson, the Underwood Estate, George and Harley Fuchs, Leon Raber and Frank Loehr.

The following discharge records were furnished by the U. S. Geological Survey in cooperation with the New Mexico Interstate Stream Commission:

Rio Grande at Otowi Bridge near San Ildefonso, New Mexico  
Rio Grande at San Acacia, New Mexico  
Rio Grande at San Marcial, New Mexico, July to December  
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, also 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 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. Section of the International Boundary Commission, El Paso, Texas furnished the record of discharge of Rio Grande at San Marcial, New Mexico, January to June.

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  
Discharge of Bonita Ditch below Caballo Dam  
Storage in Elephant Butte Reservoir  
Storage in Caballo Reservoir

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

# RIO GRANDE COMPACT COMMISSION

## 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.

Drainage area - 1,520 square miles. Zero of gage is 7,982.21 feet above mean sea level, datum of 1929.

Records available - October 11, 1889 to December 31, 1946.

Extremes - Maximum discharge during year, 3,860 second-feet June 7; minimum daily discharge 120 second-feet January 15.  
1889-1946: Maximum discharge 18,000 second-feet October 5, 1911 (from rating curve extended above 5000 second-feet); minimum daily, 88 second-feet Dec. 20, 1945.

Remarks - Records considered excellent except those for periods of ice effect, Jan. 1-13, 17-30, Feb. 3-28, March 1-14 which were computed on basis of 7 discharge measurements, weather records and recorded gage heights and are fair. Flow regulated by 3 large reservoirs (total capacity, 117,600 acre feet) and by several smaller ones. Diversions for irrigation above station.

Month		Second-foot-days	Maximum	Minimum	Mean	Run-off in Acre-feet
January	-	4,157	141	120	134	8,250
February	-	4,534	240	130	182	8,990
March	-	6,707	392	141	216	13,300
April	-	30,843	2,430	358	1,028	61,180
May	-	45,266	2,000	834	1,396	85,620
June	-	60,232	3,190	834	2,008	119,500
July	-	18,782	826	454	505	37,250
August	-	12,688	547	308	418	26,560
September	-	9,291	468	225	310	18,430
October	-	10,703	674	225	346	21,230
November	-	8,320	374	210	277	16,500
December	-	6,383	265	175	206	12,660
Year	1946	216,106	3,190	120	592	428,700

### RIO GRANDE NEAR LOBATOS, COLORADO

Location - Water stage recorder 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.

Drainage area - 7,700 square miles (includes 2,940 square miles in closed basin). Zero of gage is 7,426.79 feet above mean sea level, datum of 1929.

Records available - June 1899 to September 1913 and October 1933 to December 1946 in reports of Geological Survey. June 1899 to December 1946 in reports of State Engineer.

Extremes - Maximum discharge during year, 671 second-feet Nov. 8 (gage height, 2.07 feet) minimum daily discharge, 11 second-feet Aug. 8.  
1899-1946: 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 Aug. 4, 1940.

Remarks - Records good except those during periods of ice effect Jan. 1 to Mar. 3, Dec. 12-31, which are fair. Diversions above station for irrigation. Flow regulated by many reservoirs on headwaters.

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in Acre-feet	
January	6,840	287	140	22	13,570	
February	6,729	315	206	240	13,350	
March	7,445	366	142	240	14,770	
April	5,101	424	57	170	10,120	
May	4,081	245	48	132	8,090	
June	2,854	142	37	78.5	4,670	
July	921	48	12	29.7	1,830	
August	1,031	57	11	33.3	2,040	
September	1,504	79	37	50.1	2,980	
October	2,089	85	39	67.4	4,140	
November	10,468	522	95	349	20,760	
December	9,473	410	228	306	18,790	
Year	1946	58,086	522	11	169	115,100



RIO GRANDE COMPACT COMMISSION

MONTHLY SUMMARY OF DISCHARGE

RIO GRANDE AT OTOWI BRIDGE NEAR SAN ILDEFONSO, NEW MEXICO

Location.-- Water stage recorder, lat. 35°52'28", long. 106°08'36", in San Ildefonso Pueblo Grant, 100 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 5,488.46 feet above mean sea level, datum of 1929.

Drainage area.-- 14,500 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 1914, and October, 1930 to December 1946 in reports of Geological Survey. February 1895 to December 1905 and June 1909 to December 1931 in reports of State Engineer.

Extremes.-- Maximum discharge during year, 2,610 second-feet July 8 (gage-height 4.45 feet); minimum daily discharge, 166 second-feet July 28.

1930-46: Maximum discharge 22,500 second-feet May 18, 1941; maximum gage-height 13.70 feet May 14, 1941; minimum daily discharge, 128 second-feet June 21, 1934.

Remarks.--Records good. Flow partly regulated by operation of El Vado reservoir on upper Rio Chama which stores water for irrigation. Diversions above station for irrigation.

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in acre-feet
January	17,754	618	500	573	35,210
February	17,458	830	525	624	34,630
March	19,829	824	525	640	39,330
April	23,875	1,090	555	796	47,360
May	24,288	1,090	530	783	48,170
June	22,592	1,250	759	966	58,090
July	16,396	1,240	166	497	30,540
August	14,323	1,360	206	462	26,410
September	9,490	535	257	316	18,060
October	13,552	1,030	270	437	26,860
November	39,124	2,110	420	1,304	77,600
December	44,642	2,000	555	1,437	88,360
Year 1946	269,223	2,110	166	738	534,000

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 mile downstream from San Acacia diversion dam, half a mile east of San Acacia and 2 miles downstream from Rio Salado. Datum of gage is 4,660.16 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 1946 in reports of Geological Survey. February to December 1925, January 1926 to September 1927 (gage-heights and discharge measurements only) in reports of State Engineer.

Extremes.--Maximum discharge during year, 3,900 second-feet August 11 (gage-height, 7.33 feet); no flow June 22 to July 7.

1936-46: Maximum discharge, 27,400 second-feet August 5, 1936 (gage-height 8.35 feet; datum of gage 4,662.56 feet), from rating curve extended above 18,000 second-feet by logarithmic plotting; no flow June 22 to July 7, 1946.

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in acre-feet
January	22,978	837	555	741	49,380
February	18,022	781	509	644	39,750
March	14,080	804	110	484	27,880
April	1,792	309	18	59.7	3,800
May	2,135	276	13	64.5	4,300
June	204	40	0	31.4	1,000
July	973	408	0	411	25,870
August	12,739	1,490	14	130	7,700
September	3,891	811	6	184	11,340
October	5,715	822	64	1,078	24,180
November	32,330	2,200	64	1,562	99,000
December	46,437	2,110	634		
Year 1946	163,296	2,200	0	447	535,900

RIO GRANDE COMPACT COMMISSION

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 Atchiam, Topeka and Santa Fe Railway bridge, 11 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 1946 in reports of Geological Survey. Prior to January 1922 at site 0.3 mile upstream; January 1922 to February 1932 at highway bridge half a mile northeast of San Marcial and 1.8 miles above present site.

Extremes.--Maximum daily discharge during year, 1,930 second-feet November 30, December 1; no flow at times.

1895-1946: Maximum discharge, about 50,000 second-feet Oct. 11, 1904; no flow at times.

Remarks.-- Records good. Many diversions above station for irrigation.

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in acre-feet
January	20,837	775	525	672	41,330
February	17,168	708	510	615	34,060
March	16,137	756	188	521	32,010
April	1,985	156	27	66.2	3,940
May	2,566.5	243	3.0	82.8	5,090
June	16.5	2.6	0	.65	33
July	254	101	0	8.2	504
August	8,017	672	0	259	15,000
September	3,450	539	15	115	6,940
October	8,146	519	12	166	10,210
November	23,697	1,930	94	790	47,000
December	46,586	1,950	800	1,503	92,400
Year 1946	145,856.0	1,930	0	400	289,300

RIO GRANDE BELOW ELEPHANT BUTTE DAM, NEW MEXICO

Location.-- Water-stage recorder, lat. 33°09'08", long. 107°12'10", in NE 1/4 sec. 26, 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 1946.

Extremes.-- Maximum daily discharge during year, 1,820 second-feet August 14; minimum daily discharge 535 second-feet November 17.

1916-46: Maximum daily discharge, 6,220 second-feet May 22, 1942; no flow at times.

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

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in acre-feet
January	36,667	1,450	967	1,163	72,730
February	31,439	1,310	776	1,123	62,360
March	36,972	1,480	805	1,193	75,330
April	35,801	1,350	944	1,193	71,010
May	36,792	1,370	918	1,187	72,980
June	34,975	1,380	816	1,166	69,370
July	36,577	1,480	811	1,183	72,750
August	44,572	1,820	969	1,431	88,010
September	34,256	1,400	760	1,142	67,960
October	34,084	1,300	751	1,099	67,600
November	26,804	1,180	535	893	53,160
December	29,744	1,140	641	959	59,000
Year 1946	418,583	1,820	535	1,147	830,200



RIO GRANDE COMPACT COMMISSION  
MONTHLY SUMMARY OF DISCHARGE

RIO GRANDE BELOW CABALLO DAM, NEW MEXICO

Location - Water-stage recorder, Lat. 32°53'05", Long. 107°17'50", in NE 1/4 Sec. 30, T. 16S. R. 4W., 600 feet upstream from Bojarcas bridge, 4,200 feet downstream from Caballo Dam, 1-1/3 miles upstream from Percha Diversion Dam, 3 miles northeast of Arroyo, and 5 miles south of Cabello. Datum of gage is 4,146.9 feet above mean sea level.

Records available - January 1938 to December 1946.

Extremes - Maximum daily discharge during year, 2,730 second feet April 1, minimum daily discharge 1.5 second feet January 12.  
1938-1946: Maximum daily discharge, 7,650 second feet May 20, 1942; minimum daily discharge 1.3 second feet Nov. 18-21, Dec. 12-27, 1940.

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

Note - The total release from Project Storage is the sum of the discharge at this station and the discharge in Bonita ditch which diverts directly from the reservoir.

North		Second-foot-days	Maximum	Minimum	Mean	Run-off in Acre-Feet
January	—	127.8	9.2	1.5	4.12	253
February	—	9,196.3	1,110	7.2	328	18,240
March	—	41,493.5	2,720	16.2	1,339	82,300
April	—	59,840	2,730	1,200	1,995	116,690
May	—	49,010	1,970	1,000	1,591	97,210
June	—	60,640	2,630	1,620	2,021	120,280
July	—	69,370	2,710	1,760	2,238	137,490
August	—	65,710	2,660	1,570	2,120	130,130
September	—	17,375.2	1,770	3.2	579	54,460
October	—	5,477.6	870	3.4	177	10,860
November	—	3,794.9	888	3.2	128	7,830
December	—	3,022.3	836	3.8	97.5	5,990
Year	—	385,056.6	2,730	1.5	1,066	763,700

BONITA DITCH BELOW CABALLO DAM, NEW MEXICO

Location - The ditch diverts directly from the reservoir to irrigate 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	-	-	-	-	37
March	-	-	-	-	168
April	-	-	-	-	269
May	-	-	-	-	272
June	-	-	-	-	374
July	-	-	-	-	399
August	-	-	-	-	247
September	-	-	-	-	136
October	-	-	-	-	6
November	-	-	-	-	6
December	-	-	-	-	6
Year	1946	-	-	-	2,002

RIO GRANDE COMPACT COMMISSION  
MONTHLY SUMMARY OF DISCHARGE

CONJOS RIVER NEAR MOGOTE, COLORADO

Location - Water-stage recorder, Lat. 37°03', Long. 106°, in SE 1/4 Sec. 34, T. 33 N., R. 7 E., three quarters of a mile downstream from Fox Creek and 5 1/2 miles west of Mogote.

Drainage area - 282 square miles.

Records available - September 1899 to March 1900, April 1903 to September 1913 and October 1933 to December 1946 in reports of Geological Survey. September 1899 to March 1900 and April 1903 to December 1946 in reports of State Engineer.

Extremes - Maximum discharge during year, 1,860 second-feet June 7 (gage height, 4.07 feet); minimum daily discharge 24 second-feet December 13.  
1899-1900, 1903-1946: Maximum discharge, 9,000 second feet Oct 5, 1911 (gage height, 9.50 feet, site and datum then in use), from rating curve extended above 3,500 second-feet; minimum discharge 18 second-feet (discharge measurement) December 19, 1939.

Remarks - Records good except those for period of ice effect, Nov. 29 to March 10, which are fair. No diversion or regulation.

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in acre-feet	
January	1,261	46	35	40.7	2,500	
February	1,432	67	35	51.1	2,840	
March	2,202	99	47	71.0	4,570	
April	11,634	1,010	94	388	23,080	
May	20,829	989	390	672	41,310	
June	19,565	1,490	142	652	38,810	
July	3,648	142	86	114	7,030	
August	3,674	217	67	115	7,090	
September	3,616	286	71	121	7,170	
October	3,370	178	71	109	6,680	
November	2,666	127	67	88.9	5,290	
December	2,191	86	43	70.7	4,360	
Year	1946	75,885	1,490	35	208	150,500

CONJOS RIVER NEAR LOS SAUCES, COLORADO

Location - Two water stage recorders (two channels), lat. 37°23', long. 106°45', in Sec. 2, T. 35 N., R. 11E., half a mile upstream from mouth and 2 miles north of Los Sauces. Datum of gage (north channel) is 7,495.02 feet above mean sea level (Colorado State Highway Department bench mark).

Drainage - 887 square miles.

Records available - October 1933 to December 1946 in reports of Geological Survey. March 1921 to September 1946 in reports of State Engineer.

Extremes - Maximum discharge during year, 456 second-feet Apr. 23; minimum daily discharge, 0.5 second-feet Apr. 4-10.  
1921-1946: Maximum discharge 3,890 second-feet May 15, 1941; no flow July 21 to Sept. 8, 1934.

Remarks - Records good except those for periods of ice effect or no gage height record on main channel, and those below 10 second-feet, which are fair. Diversions above station for irrigation.

Month		Second-foot-days	Maximum	Minimum	Mean	Run-off in acre-feet
January		1,410	55	40	45.5	2,800
February		1,463	69	44	52.2	2,900
March		1,769	73	38	57.1	3,510
April		3,055.1	318	3.7	102	6,060
May		1,795.0	182	5.4	57.9	3,560
June		227.5	44	1.1	7.58	461
July		45.4	2.5	.6	1.40	86
August		118.3	8.3	.6	3.85	235
September		220.4	8.5	5.3	7.35	437
October		670.7	42	8.2	21.6	1,330
November		1,513	66	43	50.4	3,000
December		1,639	62	42	52.9	3,250
Year	1946	13,924.4	348	.5	38.1	27,620



RIO GRANDE COMPACT COMMISSION  
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., a quarter of a mile south of Colorado-New Mexico State line, half a mile south of Ortiz and half a mile upstream from Los Pinos Creek.

**Drainage area** - 110 square miles.

**Records available** - October 1933 to December 1946 in reports of Geological Survey. January to October 1915, May 1919 to October 1920 and October 1924 to December 1946 in reports of State Engineer (No winter records most years.)

**Extremes** - Maximum discharge during year, 359 second-feet Apr. 22 (gage height, 2.67 feet); no flow June 10 to July 12, July 27, Aug. 6-14, Sept. 29 to Oct. 4.  
1915, 1919-20, 1924-46: Maximum discharge 1,750 second-feet Apr. 15, 1937 (gage height 5.38 feet), from rating curve extended above 1,100 second-feet; no flow at times in most years.

**Remarks** - Records fair. A few small diversions above station for irrigation.

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in acre-feet
January	6.2	-	-	0.2	12
February	14	-	-	.5	28
March	248	-	-	8.0	492
April	2,764	220	29	92.1	5,480
May	552.3	54	1.5	17.2	1,060
June	8.7	2.0	0	.22	13
July	19.3	5.7	0	.62	38
August	176.1	34	0	5.68	349
September	48.2	10	0	1.61	96
October	96.0	14	0	3.10	190
November	118.4	11	1.3	3.95	235
December	111.8	8.5	1.2	3.61	222
1946	4,141.0	220	0	11.3	8,220

LOS PINOS RIVER NEAR ORTIZ, COLORADO

**Location** - Water-stage recorder, lat. 36°58', long. 106°03', in New Mexico, in NW 1/4 Sec. 34, T. 32 N., R. 8 E., 1 mile south of Colorado-New Mexico State line, 2 miles southwest of Ortiz and 2 1/2 miles upstream from mouth.

**Drainage area** - 167 square miles.

**Records available** - October 1933 to December 1946 in reports of Geological Survey. January 1914 to November 1920 and October 1924 to September 1945 in reports of State Engineer. (No winter records most years.)

**Extremes** - Maximum discharge during year, 1,090 second-feet May 10 (gage height, 3.98 feet), minimum daily discharge recorded, 11 second-feet November 24.  
1914-1923, 1924-46: Maximum discharge, 3,160 second-feet May 12, 1941 (gage height 5.77 feet) from rating curve extended above 1,600 second-feet; minimum daily discharge, 5 second-feet Aug. 11, September 19, 1934.

**Remarks** - Records good except those for period of ice effect or no gage height records, which are fair. Diversions above station for irrigation.

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in acre-feet	
January	341	-	-	11	678	
February	392	-	-	14	772	
March	682	38	14	22.0	1,390	
April	8,601	671	52	287	17,040	
May	6,162	373	86	199	12,220	
June	1,772	109	16	59.1	3,610	
July	696	52	12	22.6	1,280	
August	890	68	15	28.7	1,770	
September	841	96	16	28.0	1,670	
October	1,096	107	18	38.4	2,170	
November	897	69	11	29.9	1,780	
December	880	44	12	28.4	1,780	
Year	1946	23,250	671	-	65.7	46,110

RIO GRANDE COMPACT COMMISSION  
MONTHLY SUMMARY OF DISCHARGE

RIO CHAMA NEAR TIERRA AMARILLA, NEW MEXICO

**Location** - Water stage recorder, lat. 36°34'50", long. 106°43'30", in NW 1/4 Sec. 15, T. 27 N., R. 2 E., (projected), 15 miles downstream from El Vado Dam, 2.7 miles upstream from Rio Mescal, and 15 miles southwest of Tierra Amarilla.

**Records available** - October 1935 to December 1946 in reports of Geological Survey. October 1913 to November 1916 at site 1.6 miles upstream (records of unregulated flow) published as Rio Chama near El Vado and Tierra Amarilla in reports of Geological Survey. October 1913 to September 1916 and February 1920 to December 1924 in reports of State Engineer.

**Extremes (regulated)** - Maximum discharge during year, 1,340 second feet Nov. 15-17-20 (gage height 368 feet); minimum daily discharge 0.9 second feet Dec. 30.  
1935-46: 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, that of Dec. 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	252.6	9.3	6.8	8.15	501	
February	242.6	12	7.6	8.67	482	
March	263.2	9.3	7.6	8.49	522	
April	468.6	42	8.4	15.3	910	
May	10,946	786	19	353	21,710	
June	23,919	1,140	551	797	47,440	
July	6,037	735	15	195	11,970	
August	541	42	15	17.6	1,070	
September	461	19	14	15.4	914	
October	523	21	13	16.9	1,040	
November	21,679	1,340	16	723	45,000	
December	22,513.1	1,270	.9	726	44,650	
Year	1946	87,836.3	1,340	.9	241	174,200

SANTA FE CREEK NEAR SANTA FE, NEW MEXICO

**Location** - Water-stage recorder and sharp-crested concrete control, lat. 35°41'15", long. 105°50'10" in NW 1/4 Sec. 24, T. 17 N., R. 10 E., 300 feet downstream from Granite Point Dam and 6 miles east of Santa Fe.

**Records available** - May to June 1910 (at site 3 miles downstream) April 1913 to December 1914 (at site 2 miles downstream), and October 1930 to December 1946 in reports of Geological Survey. January 1913 to November 1930 (at site 2 miles downstream) and November 1930 to December 1931 in reports of State Engineer.

**Extremes** - Maximum discharge during year, 40 second-feet July 10 (gage height 1.11 feet); minimum daily discharge 1.3 second-feet February 20-26.  
1931-46: Maximum discharge, 418 second-feet April 23, 1942 (gage height, 3.51 feet), from rating curve extended above 150 second-feet, minimum daily 0.2 second-feet December 3-14, 15-29, 1945.

**Remarks** - Records good except those for periods of ice effect, which are fair. Flow regulated by Granite Point Reservoir (capacity 650 acre-feet). No diversions above station.

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in acre-feet
January	49.8	1.8	1.6	1.61	99
February	39.1	1.6	1.3	1.40	78
March	80.3	2.5	1.4	1.62	100
April	237.6	17	2.6	7.92	471
May	245.1	13	3.6	7.91	486
June	127.8	7.6	2.1	4.26	253
July	163.5	10	1.4	5.27	324
August	326.3	20	3.9	10.5	647
September	132.2	8.6	2.5	4.41	282
October	118.2	8.2	2.1	3.61	234
November	117.6	4.4	3.4	3.92	233
December	89.9	4.1	1.9	2.90	178
Year	1946	1,697.3	20	4.65	3,360



RIO GRANDE COMPACT COMMISSION

RESERVOIR STORAGE

1946

**SQUAW LAKE RESERVOIR.** Dam and adjacent 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.

**THROUTVALE NO. 2 RESERVOIR.** Dam and adjacent staff gage located in Sec. 10, T. 41 N., R. 5 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.

**PUCES RESERVOIR.** Dam and adjacent 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			THROUTVALE NO. 2			PUCES					
	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.			
Jan.												
Feb.												
Mar.												
Apr.	8.0	140	0	7.0	219	0	17.15	237	0			
May	8.0	140	0	7.0	219	0	17.15	237	0			
June	8.0	140	0	7.0	219	0	17.15	237	0			
July	8.0	140	0	7.0	219	0		126	-111			
Aug.		70	-70	7.0	219	0		3.5	15	-111		
Sept.	0	0	-70	7.0	219	0		3.5	15	0		
Oct.	0	0	0	7.0	219	0		3.5	15	0		
Nov.	0	0	0	7.0	219	0		3.5	15	0		
Dec.												
Year												

RESERVOIRS IN NEW MEXICO

**CARSON RESERVOIR.** Dam and water-stage recorder located in SW $\frac{1}{4}$  Sec. 12, T. 25 N., R. 10 E., N. M. P. M., on Aguaje de la Petaca. Total capacity of reservoir, 5,454 acre-feet as determined by survey of 1941. Water used for irrigation of lands of the Carson Reclamation District. Construction completed in 1940.

**EL VADO RESERVOIR.** Dam and water-stage recorder (staff gage used below elevation 6,875.0) location in SE $\frac{1}{4}$  Sec. 4, T. 27 N., R. 2 E., N. M. P. M., on Rio Chama. Total capacity of reservoir, 200,340 acre-feet as determined by original survey in 1927. Water used for irrigation of lands in Middle Rio Grande Conservancy District. Construction completed in 1935.

**GRANITE POINT RESERVOIR ENLARGEMENT.** Dam and staff gage located in SW $\frac{1}{4}$  Sec. 24, T. 17 N., R. 10 E., N. M. P. M., in Santiago Ramirez Grant, on Santa Fe Creek. Capacity of original reservoir, completed in 1925, 561 acre-feet; capacity increased 89 acre-feet by enlargement completed in 1935.

**NICHOLS RESERVOIR.** Dam, staff gage and water-stage recorder located in NE $\frac{1}{4}$  Sec. 21, T. 17 N., R. 10 E., N. M. P. M., on Santa Fe Creek. Total capacity of reservoir, 796 acre-feet as determined by original survey in 1942. Water is for municipal use in the City of Santa Fe, New Mexico. Construction completed in 1945.

Last Day of	CARSON			EL VADO			GRANITE POINT (Enlarg.)			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.
Jan.												
Feb.												
Mar.												
Apr.												
May												
June												
July												
Aug.												
Sept.												
Oct.												
Nov.												
Dec.												
Year												

RIO GRANDE COMPACT COMMISSION

RESERVOIR STORAGE

1946

**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 the Acoma and Laguna Indian Reservations. 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 the 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, 978 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.			
Jan.												
Feb.												
Mar.												
Apr.												
May												
June												
July												
Aug.												
Sept.												
Oct.												
Nov.												
Dec.												
Year												

**ELPHANT 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, 2,219,000 acre-feet as determined by partial survey and estimate in 1940. 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, 345,872 acre-feet as determined by original survey. Water is used to irrigate lands in New Mexico and Texas.

**PROJECT STORAGE.** The combined storage in Elephant Butte and Caballo Reservoirs. Total Project Storage capacity, 2,564,872 acre-feet of which 100,000 acre-feet in Caballo is for flood control.

Last Day of	ELPHANT 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.			
Jan.												
Feb.												
Mar.												
Apr.												
May												
June												
July												
Aug.												
Sept.												
Oct.												
Nov.												
Dec.												
Year												



RIO GRANDE COMPACT COMMISSION  
TRANSMOUNTAIN DIVERSIONS  
1946

WENMUCHO PASS (EAST DITCH) FUCHS													WENMUCHO PASS (WEST DITCH) RABER-LOHR													TADOR																																							
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 Wenmucho 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 originates on left bank of Rincon La Vaca Creek, a tributary to the Rio de los Pinos in the San Juan River Basin; empties into Wenmucho Creek, a tributary of the Rio Grande. 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°41' 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.																																							
Period of record June 6 to Sept. 16													Period of record June 6 to Sept. 16													Period of record May 11 to Sept. 16																																							
Sec-Ft. Days	May	June	July	Aug.	Sept.	May	June	July	Aug.	Sept.	May	June	July	Aug.	Sept.	May	June	July	Aug.	Sept.	May	June	July	Aug.	Sept.	May	June	July	Aug.	Sept.	May	June	July	Aug.	Sept.	May	June	July	Aug.	Sept.																									
Mean		431.8	52.5	60.7	14.1		310.5	224.4	152.5	80.2		2.2	114.2	67.9	67.9		2.2	114.2	67.9	67.9		2.2	114.2	67.9	67.9		2.2	114.2	67.9	67.9		2.2	114.2	67.9	67.9		2.2	114.2	67.9	67.9																									
Acres-foot		17.2	1.69	1.64	.88		11.9	7.24	4.27	5.01		2.2	3.81	2.16	2.16		2.2	3.81	2.16	2.16		2.2	3.81	2.16	2.16		2.2	3.81	2.16	2.16		2.2	3.81	2.16	2.16		2.2	3.81	2.16	2.16																									
Maximum Day		886	104	101	28		618	448	263	169		4.4	227	128	128		4.4	227	128	128		4.4	227	128	128		4.4	227	128	128		4.4	227	128	128		4.4	227	128	128																									
Minimum Day		13	3.1	2.6	1.6		22	10	6.9	5.6		2.2	6.0	2.7	2.6		2.2	6.0	2.7	2.6		2.2	6.0	2.7	2.6		2.2	6.0	2.7	2.6		2.2	6.0	2.7	2.6		2.2	6.0	2.7	2.6																									
		1.9	.6	.9	.6		11	5.2	3.1	4.3		2.2	1.4	1.4	1.8		2.2	1.4	1.4	1.8		2.2	1.4	1.4	1.8		2.2	1.4	1.4	1.8		2.2	1.4	1.4	1.8		2.2	1.4	1.4	1.8																									
SUMMARY													SUMMARY													SUMMARY																																							
Sec-Ft. Days	548.8					747.6					274.4					274.4					274.4					274.4					274.4					274.4					274.4					274.4					274.4					274.4									
Mean	5.83					7.19					2.54					2.54					2.54					2.54					2.54					2.54					2.54					2.54					2.54					2.54									
Acres-foot	1090					1480					548					548					548					548					548					548					548					548					548					548					548				
Maximum Day	13					18.7					6.0					6.0					6.0					6.0					6.0					6.0					6.0					6.0					6.0					6.0					6.0				
Minimum Day	.6					3.1					1.8					1.8					1.8					1.8					1.8					1.8					1.8					1.8					1.8					1.8					1.8				

SQUAW PASS													TREASURE PASS													PIEDRA PASS																																		
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.													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 wooden Parshall flume. Ditch crosses Continental Divide at Lat. 37°33' 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.																																		
Period of record June 12 to July 23													Period of record June 11 - 28													Period of record June 12 to July 1																																		
Sec-Ft. Days	May	June	July	Aug.	Sept.	May	June	July	Aug.	Sept.	May	June	July	Aug.	Sept.	May	June	July	Aug.	Sept.	May	June	July	Aug.	Sept.	May	June	July	Aug.	Sept.	May	June	July	Aug.	Sept.	May	June	July	Aug.	Sept.																				
Mean		74.2	48.6	3.91	2.11		39.3	39.3	2.62	78		30.6	0.7	1.62	.7		30.6	0.7	1.62	.7		30.6	0.7	1.62	.7		30.6	0.7	1.62	.7		30.6	0.7	1.62	.7		30.6	0.7	1.62	.7																				
Acres-foot		147	96	3.2	3.2		78	78	5.7	.3		1.62	.7	1.62	.7		1.62	.7	1.62	.7		1.62	.7	1.62	.7		1.62	.7	1.62	.7		1.62	.7	1.62	.7		1.62	.7	1.62	.7																				
Maximum Day		5.2	3.2	3.2	3.2		5.7	5.7	5.7	.3		1.62	.7	1.62	.7		1.62	.7	1.62	.7		1.62	.7	1.62	.7		1.62	.7	1.62	.7		1.62	.7	1.62	.7		1.62	.7	1.62	.7																				
Minimum Day		.5	.3	.3	.3		.3	.3	.3	.3		.3	.3	.3	.3		.3	.3	.3	.3		.3	.3	.3	.3		.3	.3	.3	.3		.3	.3	.3	.3		.3	.3	.3	.3																				
SUMMARY													SUMMARY													SUMMARY																																		
Sec-Ft. Days	122.8					39.3					31.3					31.3					31.3					31.3					31.3					31.3					31.3					31.3					31.3									
Mean	2.92					2.62					1.06					1.06					1.06					1.06					1.06					1.06					1.06					1.06					1.06									
Acres-foot	248					78					28					28					28					28					28					28					28					28					28					28				
Maximum Day	5.2					5.7					1.62					1.62					1.62					1.62					1.62					1.62					1.62					1.62					1.62									
Minimum Day	.3					.3					.3					.3					.3					.3					.3					.3					.3					.3					.3					.3				

SQUAW PASS					TREASURE PASS					PIEDRA PASS					
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.					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°28' N., Long. 107°00' W., in Sec. 4, T. 38 N., R. 1 W., (projected Survey), 30 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.					
Period of record June 12 to July 23					Period of record June 11 - 25					Period of record June 11 to July 1					
Sec-Ft. Days	May	June	July	Aug.	Sept.	May	June	July	Aug.	Sept.	May	June	July	Aug.	Sept.
Mean		74.2	48.6				39.3					30.6	0.7		
Acres-foot		3.91	2.11				2.62					1.61	.7		
Maximum Day		147	96				78					61	1.3		
Minimum Day		5.2	3.2				5.7					2.5	.7		
		.5	.3				.3					.7	.7		
SUMMARY					SUMMARY					SUMMARY					
Sec-Ft. Days	122.8					39.3					31.3				
Mean	2.92					2.62					1.66				
Acres-foot	248					78					62				
Maximum Day	147					78					61				
Minimum Day	.5					.3					.7				

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 in 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. At some of the stations it was not possible to obtain continuous evaporation records throughout the winter period.

Evaporation and precipitation records from stations in Colorado and New Mexico are tabulated on the following page.

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.

The records of evaporation and precipitation at Elephant Butte Dam and El Vado Dam, and the records of precipitation at Caballo Dam, Pankey Ranch, Farmington and Santa Fe antedate the effective date of the Compact. The stations near Wagon Wheel Gap, near Conejos and at Summitville and the evaporation station at Caballo Dam were established by the U. S. Weather Bureau at the request of the Commission. The Evaporimeter at San Marcial was discontinued by the International Boundary Commission, U. S. Section.

The Rio Grande Compact Commission gratefully acknowledges the cooperation of the U. S. Weather Bureau in furnishing the evaporation and precipitation records contained in this report.



RIO GRANDE COMPACT COMMISSION  
EVAPORATION AND PRECIPITATION RECORDS

1946

WAGNER WHEEL DAM, COLORADO.- In Mineral County, elevation 8,500 feet, lat. 37° 16', long. 106° 10', near Nevada, Colo. Standard Class "A" pan, anemometer, maximum and minimum thermometers, standard 8-inch rain gage and recording rain gage.

COMBES DAM, COLORADO.- In Conejos County, elevation 8,500 feet, lat. 37° 01', long. 106° 16', 15 miles west of Antonito, Colo. Standard Class "A" pan, anemometer, maximum and minimum thermometers, and standard 8-inch rain gage.

SAN LUIS LAKES, COLORADO.- In Alamosa County, elevation 7,550 feet, lat. 37° 39', long. 105° 48', Standard Class "A" pan, anemometer, maximum and minimum thermometers, and standard 8-inch rain gage.

EL VADO DAM, NEW MEXICO.- In Rio Arriba County, elevation 6,756 feet, lat. 36° 36', long. 106° 14', at El Vado Dam near Lordsburg, N. Mex. Standard Class "A" pan, anemometer, maximum and minimum thermometers, standard 8-inch rain gage, and recording rain gage.

ELEPHANT BUTTE DAM, NEW MEXICO.- In Sierra County, elevation 4,576 feet, lat. 33° 02', long. 107° 11', at Elephant Butte, N. Mex. Standard Class "A" pan, anemometer, maximum and minimum thermometers, and standard 8-inch rain gage.

CABALLO DAM, NEW MEXICO.- In Sierra County, elevation 4,190 feet, lat. 32° 54', long. 107° 18', at Caballo Dam near Chubb, N. Mex. Standard Class "A" pan, anemometer, maximum and minimum thermometers, standard 8-inch rain gage, and recording rain gage.

FARMINGTON, NEW MEXICO.- In San Juan County, elevation 5,300 feet, lat. 35° 13', long. 108° 12', near Azules River Bridge near Farmington. Floating pan, anemometer and 8-inch rain gage.

AGRICULTURAL COLLEGE, NEW MEXICO.- In Dona Ana County, elevation 3,000 feet, lat. 32° 17', N. 107° 15', at State College. Standard Class "A" pan, anemometer, maximum and minimum thermometers and standard 8-inch rain gage.

PLACE	EVAPORATION IN INCHES												PRECIPITATION IN INCHES													
	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTAL	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTAL
Wagon Wheel Dam, Colo.	-	-	-	-	-	9.36	6.31	5.15	5.58	-	-	-	26.40	0.21	0.25	1.17	1.23	0.57	7	2.18	0.57	0.10	1.01	0.04	0.30	10.11
Conejos Dam Site, "	-	-	-	-	9.20	10.20	7.60	7.70	8.75	-	-	-	43.15	.19	.15	.53	.81	.39	0	2.28	.99	.26	1.57	.19	.01	7.68
San Luis Lakes, "	-	-	-	-	-	11.05	9.87	7.76	7.21	6.61	-	-	44.23	-	-	-	-	-	-	.02	.83	1.28	.11	1.27	.08	7.69
El Vado Dam, N. Mex.	2.99	5.18	9.14	11.34	16.89	17.26	14.56	12.19	9.10	8.71	4.73	4.07	116.70	.96	.04	7	1.50	.12	.16	2.21	1.25	1.18	1.65	.70	.21	13.50
Caballo Dam, "	3.48	5.23	9.45	11.47	16.44	16.50	14.05	11.62	9.12	7.74	4.71	5.47	113.28	.66	.02	7	.98	.12	.16	.66	1.70	1.08	.71	.16	.04	8.44
Farmington, "	-	1.93	4.10	6.59	7.70	6.76	7.07	5.90	4.86	3.70	1.60	1.58	53.49	.07	.17	.39	.14	.15	.05	1.12	1.13	.91	.62	.84	.31	5.57
Agricultural College "	2.55	5.04	8.60	10.70	13.93	13.99	12.72	10.24	7.52	6.17	3.05	2.69	98.32	.82	.05	.00	.01	.56	.89	.14	2.16	2.12	.12	.15	.64	7.14

RIO GRANDE COMPACT COMMISSION

BUDGET

FOR FISCAL YEAR ENDING JUNE 30, 1947

ADOPTED AT THE SEVENTH ANNUAL (SEVENTEENTH) MEETING OF THE COMMISSION

DENVER, COLORADO, FEBRUARY 25-27, 1946

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 below San Marcial	7,100 2,500	4,100		\$3,000	\$2,500
SUB-TOTAL	13,100	5,800	1,800	3,000	2,500
ADMINISTRATION	6,500		2,166	2,167	2,167
TOTAL COST	19,600	\$5,800	3,966	5,167	4,667
NET TO STATES	13,800		3,966	5,167	4,667
CASH ADJUSTMENT			Dr 634	Cr 567	Cr 67
ADJUSTED NET TO STATES	\$13,800		\$4,600	\$4,600	\$4,600

COST OF OPERATION

FOR FISCAL YEAR ENDING JUNE 30, 1946

ITEM	TOTAL COST	BORNE BY UNITED STATES	BORNE BY COMPACTING STATES		
			COLORADO	NEW MEXICO	TEXAS
GAGING STATIONS					
In Colorado	\$3,500.00	\$1,700.00	\$1,800.00		
In New Mexico above Elephant Butte below San Marcial	7,100.00 2,500.00	4,100.00		\$3,000.00	\$2,500.00
SUB-TOTAL	13,100.00	5,800.00	1,800.00	3,000.00	2,500.00
ADMINISTRATION	3,502.29			3,502.29	
TOTAL	16,602.29	\$5,800.00	1,800.00	6,502.29	2,500.00
BORNE BY THE STATES	\$10,802.29		1,800.00	6,502.29	2,500.00
EQUAL SHARE OF EACH			3,600.76	3,600.77	3,600.76



TABLE I					
Summary of the results of the experiments on the effect of the concentration of the solution on the rate of the reaction					
Concentration of the solution (M)	Time (min)	Volume of gas evolved (ml)	Rate of reaction (ml/min)	Initial concentration (M)	Final concentration (M)
0.1	10	10	1.0	0.1	0.1
0.2	10	20	2.0	0.2	0.2
0.3	10	30	3.0	0.3	0.3
0.4	10	40	4.0	0.4	0.4
0.5	10	50	5.0	0.5	0.5
0.6	10	60	6.0	0.6	0.6
0.7	10	70	7.0	0.7	0.7
0.8	10	80	8.0	0.8	0.8
0.9	10	90	9.0	0.9	0.9
1.0	10	100	10.0	1.0	1.0
TABLE II					
Summary of the results of the experiments on the effect of the temperature on the rate of the reaction					
Temperature (°C)	Time (min)	Volume of gas evolved (ml)	Rate of reaction (ml/min)	Initial concentration (M)	Final concentration (M)
10	10	10	1.0	0.1	0.1
20	10	20	2.0	0.2	0.2
30	10	30	3.0	0.3	0.3
40	10	40	4.0	0.4	0.4
50	10	50	5.0	0.5	0.5
60	10	60	6.0	0.6	0.6
70	10	70	7.0	0.7	0.7
80	10	80	8.0	0.8	0.8
90	10	90	9.0	0.9	0.9
100	10	100	10.0	1.0	1.0