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First and Second Annual Reports
of the
**RIO GRANDE COMPACT
COMMISSION**

1939 and 1940



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TO THE GOVERNORS OF
Colorado, New Mexico and Texas

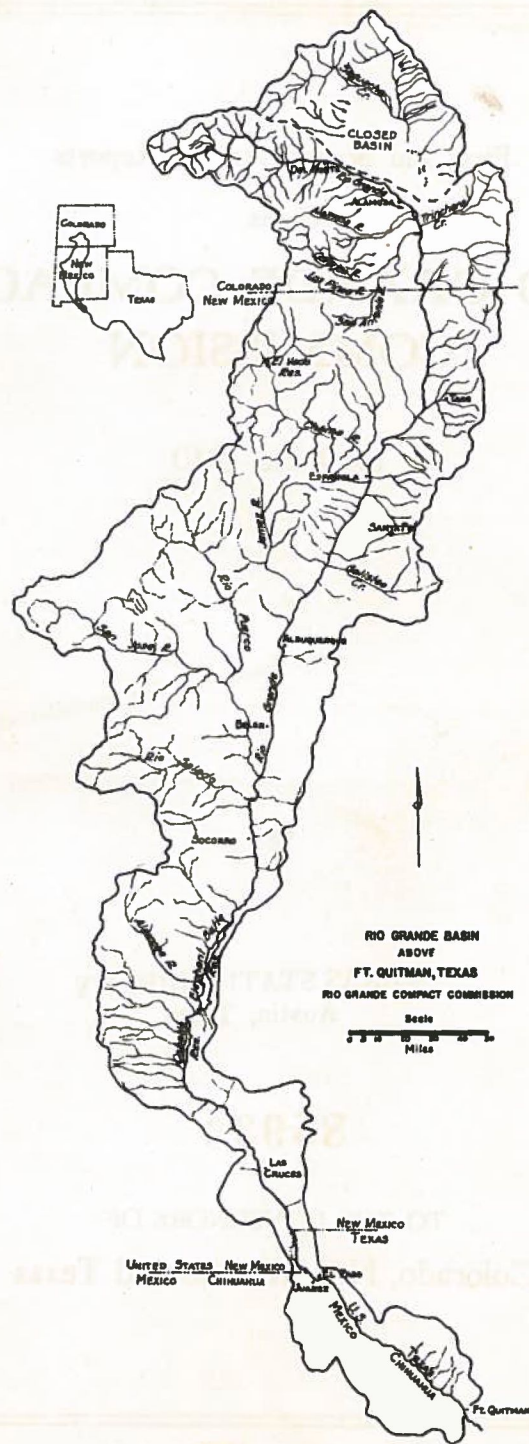


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HIS EXCELLENCY, RALPH L. CARR
Governor of the State of Colorado

HIS EXCELLENCY, JOHN E. MILES
Governor of the State of New Mexico

HIS EXCELLENCY, W. LEE O'DANIEL
Governor of the State of Texas

Pursuant to Article XII of the Rio Grande Compact, the Commission created by the terms of said Compact makes the following report for the calendar year 1939.

Said Compact became effective on the 31st day of May, 1939. In accordance with the provisions of Articles I and VI thereof scheduled deliveries of water and releases from storage have not been computed for the year 1939.

The Compact Commission held four (4) meetings in 1939 and adopted rules for the administration of the Compact, a copy of which is annexed to this report.

The Compact Commission, as provided by Article XII, has employed a secretary at an annual salary of \$2,600.00, together with necessary expenses, whose duties are to collect and correlate factual data for the Commission. The secretary, Mr. Paul H. Berg, began the performance of his duties January 1, 1940.

Respectfully submitted,

/s/ M. C. Hinderlider
M. C. HINDERLIDER, Rio Grande Compact
Commissioner for the State of Colorado

El Paso, Texas
February 28, 1940

/s/ Berkeley Johnson
BERKELEY JOHNSON, Chairman
Representative of the U. S.

/s/ Thomas M. McClure
THOMAS M. MCCLURE, Rio Grande Compact
Commissioner for the State of New Mexico

/s/ Julian P. Harrison
JULIAN P. HARRISON, Rio Grande Compact
Commissioner for the State of Texas

February 25, 1941

HIS EXCELLENCY, RALPH L. CARR
Governor of the State of Colorado

HIS EXCELLENCY, JOHN E. MILES
Governor of the State of New Mexico

HIS EXCELLENCY, W. LEE O'DANIEL
Governor of the State of Texas

Pursuant to Article XII of the Rio Grande Compact, the Commission created by the terms of said Compact makes the following report for the calendar year 1940.

The Compact Commission held three (3) meetings in 1940; the first was held at El Paso, Texas, in February; the second was held at Monte Vista, Colorado, in July; the third was held at Denver, Colorado, in November.

The Schedules of deliveries under the Compact became operative January 1, 1940. The Commission finds that under the provisions of Article III Colorado incurred a debit of 19,300 acre-feet; the Commission also finds that under provisions of Article IV New Mexico incurred a debit of 58,900 acre-feet.

The Commission likewise finds that the Accrued departure from project storage is 55,500 acre-feet less than normal.

The year 1940 was an abnormally dry year on the Rio Grande water shed.

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The expenses of the Commission for its fiscal year ending June 30, 1940 amounted to \$10,118.18, of which \$3,425.00 was borne by the United States, leaving a balance of \$6,693.18 borne equally by the respective States.

Respectfully submitted,

S/ M. C. Hinderlider
M. C. HINDERLIDER, Rio Grande Compact
Commissioner for the State of Colorado

S/ Thomas M. McClure
THOMAS M. McCLURE, RIO GRANDE COMPACT
Commissioner for the State of New Mexico

S/ Julian P. Harrison
JULIAN P. HARRISON, Rio Grande Compact
Commissioner for the State of Texas

Santa Fe, New Mexico
February 25, 1941

S/ Berkeley Johnson
BERKELEY JOHNSON, Chairman
Representative of the U. S.

RIO GRANDE COMPACT

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

For the State of Colorado - M. C. Hinderlider

For the State of New Mexico - Thomas M. McClure

For the State of Texas - Frank B. Clayton

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

ARTICLE I.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

ARTICLE II.

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

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

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

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

Such gaging stations shall be equipped, maintained and operated by the Commission directly or in cooperation with an appropriate Federal or State agency, and the equipment, method and frequency of measurement at such stations shall be such as to produce reliable records at all times.

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	186
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

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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 at Monte Vista, Colorado, and thereafter rotate alphabetically according to the states, the place in each state to be designated by the Commissioner from that state. Other meetings as may be deemed necessary shall be held at any time and place set by mutual agreement, for the consideration of data collected and for the transaction of any business consistent with its authority.

No action of the Commission shall be effective until approved by the Commissioner from each of the three signatory States.

(Signed) M. C. HINDERLIDER

M. C. Hinderlider
Commissioner for Colorado

(Signed) THOMAS M. McCLURE

Thomas M. McClure,
Commissioner for New Mexico

(Signed) JULIAN P. HARRISON

Julian P. Harrison
Commissioner for Texas

Adopted: December 19, 1939.

RECORDS OF DELIVERIES AND RELEASES

Schedules of deliveries by Colorado and New Mexico are set forth in Articles III and IV of the Compact. Normal release from project storage is fixed by the Compact at 790,000 acre-feet per year. In February of each year the Commission holds its annual meeting, at which time records of deliveries and releases for the previous calendar year are reviewed and adopted as official. The records adopted by the Commission for 1940 are shown on the following three pages.

Deliveries by Colorado at the Colorado-New Mexico state line produced an annual debit for 1940 of 19,300 acre-feet after adjustments provided for in the Compact were made. Since there were neither debits nor credits at the beginning of 1940, Colorado's accrued debit is also 19,300 acre-feet.

Deliveries by New Mexico at San Marcial resulted in an annual debit of 58,900 acre-feet after adjustments provided for in the Compact were made. Since there were neither debits nor credits at the beginning of 1940, New Mexico's accrued debit is also 58,900 acre-feet.

The annual departure from normal release of water from project storage for 1940 was less than normal by 55,500 acre-feet after adjustments were made for evaporation. By virtue of the fact that there was no departure from normal at the beginning of the year, the accrued departure from normal release is also 55,500 acre-feet less than normal.

Cooperation in supplying data necessary to making required adjustments to the schedules of deliveries and releases has been received from a number of agencies. This cooperation is gratefully acknowledged.

RIO GRANDE COMPACT
DELIVERIES BY COLORADO AT STATE LINE
YEAR 1940

Quantities in Thousands of Acre Feet to Nearest Hundred

M O N T H	MEASURED STREAM FLOW				CONEJOS INDEI SUPPLY		ADJUSTMENTS PER COMPACT		RIO GRANDE SUPPLY		STORAGE WATER		DELIVERIES AND CREDITS		
	CONEJOS RIVER AT MODOOTE	LOS PHOES RIVER NEAR ORTIZ	SAN ANTONIO RIVER AT ORTIZ	TOTAL MEASURED FLOW	CONEJOS INDEI SUPPLY	ADJUSTMENTS PER COMPACT	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 MONTHS END NEAR LOS SAUCES	TOTAL FLOW LESS CONEJOS RIVER	ACTUAL DELIVERY AT CONATOS GAGE	ADJUSTMENTS PER COMPACT
JAN	2.8	—	—	2.8	7	—	8	—	10	11	—	13	9.1	12.6	—
FEB	2.8	—	—	2.8	8.8	—	8.8	—	8.8	—	—	3.8	9.1	12.6	—
MAR	7.0	—	—	7.0	7.0	—	14.8	—	14.8	—	—	3.8	10.6	14.5	—
1ST QTR	12.6	—	—	12.6	12.6	—	31.0	—	31.0	—	—	11.2	32.5	16.6	—
APR	19.8	16.7	5.2	42.4	12.4	—	32.9	+0.2	32.9	+0.2	0.2	2.8	3.2	6.0	—
MAY	50.7	22.9	2.8	86.4	86.4	—	102.8	—	102.8	—	0.2	18.1	4.9	21.0	—
JUN	32.3	6.3	0.1	38.7	38.7	—	48.3	-0.1	48.2	-0.1	0.1	3.7	3.5	7.2	—
2ND QTR	112.8	45.9	8.8	167.5	167.5	—	188.0	-0.1	187.9	+0.1	—	21.6	11.6	36.2	—
JUL	7.4	1.4	0	8.8	8.8	—	16.7	-0.2	16.5	-0.1	0	0.1	0.6	0.7	—
AUG	4.9	1.2	0.1	6.2	6.2	—	12.6	-0.1	12.5	—	0	0	0.7	0.7	—
SEPT	6.0	0.9	0.1	7.0	7.0	—	18.1	—	18.1	—	0	0.6	1.0	1.6	—
3RD QTR	18.3	3.5	0.2	22.0	22.0	—	47.4	-0.3	47.1	-0.1	—	0.7	2.3	3.0	—
OCT	9.7	1.4	0.2	11.3	11.3	—	28.8	—	28.8	—	0	1.7	1.7	3.4	—
NOV	4.2	—	—	4.2	4.2	—	10.9	—	10.9	—	0	2.3	4.4	6.7	—
DEC	2.9	—	—	2.9	2.9	—	10.3	—	10.3	+0.1	0.1	3.9	8.8	12.7	—
4TH QTR	16.8	1.4	0.2	18.4	18.4	—	50.0	—	50.0	+0.1	—	7.9	14.9	22.8	—
YEAR	150.5	50.8	9.2	220.5	220.5	—	312.4	-0.4	312.0	+0.1	—	44.4	61.3	105.7	—

SUMMARY OF DEBITS AND CREDITS		
ITEM	DEBIT	CREDIT
G1 Balance of Beginning of Year	—	—
G2 Scheduled Delivery from Conejos River	57.3	—
G3 Actual Delivery from Rio Grande	—	77.7
G4 Actual Delivery of Lobos plus 10,000 acre feet	—	135.0
G5 Adjustments per Compact - Item 16	—	115.7
G6 Reduction of Credits per Article VI	—	—
G7 Retention of Debits per Article VI	—	—
G8 Balance of End of Year	—	19.3

Remarks: Storage in reservoirs constructed after 1937 only.
(1) Transmittal diversions.

RIO GRANDE COMPACT
DELIVERIES BY NEW MEXICO AT SAN MARCIAL

YEAR 1960

Quantities in Thousands of Acre Feet to Nearest Hundred

M O N T H	OTOWI INDEX SUPPLY				STORAGE OF WATER IN RESERVOIRS				DELIVERIES AND CREDITS						
	RECORDED FLOW AT OTOWI BRIDGE	ADJUSTMENTS STORAGE ABOVE OTOWI	OTHER ADJUSTMENTS PER COMPACT	EQUIVALENT FLOW AT OTOWI UNDER 1929 CONDITIONS	OTOWI INDEX SUPPLY	LOBATOS TO OTOWI		TOTAL IN STORAGE AT END OF MONTH		RECORDED FLOW AT SAN MARCIAL	ACTUAL DELIVERY DURING MONTHS		ADJUSTMENTS ACCOUNT DEPLETION DURING JULY, AUGUST, SEPTEMBER		OTHER ADJUSTMENTS PER COMPACT
						GAIN (+) OR LOSS (-)	TOTAL AT END OF MONTH	GAIN (+) OR LOSS (-)	TOTAL AT END OF MONTH		LOBATOS TO OTOWI	TRIBUTARIES BELOW OTOWI	TO OTOWI		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
JUN	30.2	2.1	32.3	32.3	2.1	21.9	0.1	22.0	36.5	36.5	36.5				
JUL	33.2	3.4	36.6	36.6	3.4	25.3	0.1	25.5	37.7	37.7	37.7				
MAR	46.3	27.8	74.1	74.1	27.7	53.0	0	53.2	38.9	38.9	38.9				
1ST QTR	109.7	33.3	143.0	143.0	33.2		0.2		113.1	113.1	113.1				
APR	54.7	59.0	113.7	113.7	58.7	111.7	0	0.2	111.9	18.0	18.0				
MAY	78.8	67.5	146.5	146.5	66.9	178.6	0.1	0.1	178.7	40.2	40.2				
JUN	68.8	59.2	128.0	128.0	30.0	148.6	0	0.1	148.7	9.0	9.0				
2ND QTR	202.3	97.3	299.8	299.8	98.6		0.1			67.2	67.2			(1)	0.4
JUL	67.4	54.5	121.9	121.9	55.1	93.5	0	0.1	93.6	19.8	19.8				
AUG	47.5	32.3	79.8	79.8	32.7	60.8	0.1	0	60.8	38.6	38.6				
SEPT	52.5	32.4	84.9	84.9	32.6	28.2	0	0	28.2	34.4	34.4				
3RD QTR	167.4	119.2	286.6	286.6	120.4		0.1			92.8	92.8				
OCT	36.1	9.9	46.0	46.0	10.0	18.2	0	0	18.2	22.7	22.7				
NOV	32.5	0.7	33.2	33.2	31.8	17.5	0.1	0.1	17.6	27.5	27.5				
DEC	36.5	4.4	40.9	40.9	4.4	21.9	0.1	0.2	22.1	45.7	45.7				
4TH QTR	105.1	6.2	111.3	111.3	6.3		0.2			95.9	95.9				
YEAR	584.5	5.2	589.7	589.7	511.7		0.2			369.0	276.2	0.1	0.4		

Remarks: Storage in reservoirs constructed after 1929 only.
(1): Depletion by stock tanks (estimated).

SUMMARY OF DEBITS AND CREDITS

ITEM	DEBIT	CREDIT	BALANCE
IM Balance of Beginning of Year			Dr 351.6
IM Scheduled Delivery Schedule Months			Dr 58.1
IM Other Adjustments - Item 16			Dr 58.9
IM Other Adjustments - Item 16			Dr 58.9
IM Reduction of Debits per Article VI			Dr 58.9
IM Reduction of Debits per Article VI			Dr 58.9
IM Reduction of Debits per Article VI			Dr 58.9

RIO GRANDE COMPACT
RELEASE AND SPILL FROM PROJECT STORAGE

YEAR 1960

Quantities in Thousands of Acre Feet to Nearest Hundred

M O N T H	USABLE WATER				CREDIT WATER				FLOOD WATER				RELEASE AND SPILL			
	TOTAL PROJECT STORAGE CAPACITY AVAILABLE AT END OF MONTH	STORAGE IN RESERVOIR	STORAGE IN CADRILLO	TOTAL STORAGE AT END OF MONTH	COLORADO CREDIT WATER IN STORAGE	NEW MEXICO CREDIT WATER IN STORAGE	TOTAL IN STORAGE AT END OF MONTH	DEAD STORAGE AT END OF MONTH	TOTAL WATER IN PROJECT STORAGE AT END OF MONTH	RECORDED FLOW OF OTOWI	RELEASE OF USABLE BUTTE	SPILL OF CREDIT WATER	ACTUAL SPILL OF USABLE WATER	TOTAL RECORDED	OTHER ADJUSTMENTS	
																RECORDED FLOW OF OTOWI
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
JUN	8931.7	880.9	80.1	919.3					919.3	7.0	0.1			0.1		
JUL	8931.7	874.7	70.7	945.4					945.4	1.0	12.8			12.8		
MAR	8931.7	886.7	12.1	898.8					898.8	25.0	84.4			84.4		
1ST QTR										25.0	97.3			97.3		
APR	8931.7	799.7	17.4	817.1					817.1	117.0	110.6			110.6		
MAY	8931.7	732.7	18.5	751.0					751.0	97.3	91.7			91.7		
JUN	8931.7	685.4	24.1	649.5					649.5	122.9	114.5			114.5		
2ND QTR										337.2	316.8			316.8		
JUL	8931.7	522.3	16.3	538.6					538.6	128.1	129.3			129.3		
AUG	8931.7	451.0	16.7	467.7					467.7	114.4	114.4			114.4		
SEPT	8931.7	459.9	9.2	439.1					439.1	57.7	66.9			66.9		
3RD QTR										300.2	312.6			312.6		
OCT	8931.7	447.5	12.9	460.4					460.4	4.7	2.9			2.9		
NOV	8931.7	470.1	16.4	486.5					486.5	5.2	3.4			3.4		
DEC	8931.7	488.5	48.1	536.6					536.6	29.0	0.1			0.1		
4TH QTR										38.9	6.4			6.4		
YEAR										701.3	733.1			733.1		

Remarks: (1) Capacity estimated from 1940 partial survey.

ITEM	DEBIT	CREDIT	BALANCE
PI Actual Departure of Beginning of Year			Dr 733.1
PI Actual Release During Year			Dr 733.1
PI Normal Release for Year			Dr 733.1
PI Actual Net Evaporation Loss in Year			Dr 55.0
PI Evaporation Loss if No Departures			Dr 55.0
PI Actual Capacity of End of Year			Dr 55.0

TIME OF HYPOTHETICAL SPILL

WATER SUPPLY

Generally precipitation for 1940 was somewhat above average. Precipitation in the Rio Grande Basin was normal to somewhat above. This and other factors contributed to the general condition of the stream throughout the year.

Accuracy of Records

The Rules and Regulations of the Compact Commission state that the equipment, method and frequency of measurements at each gaging station shall be sufficient to obtain records at least equal in accuracy to those classified as "good" by the U. S. Geological Survey. Within the physical limitations of stream gaging the agencies obtaining records at Compact gaging stations have complied with these regulations.

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

Acknowledgements

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

The office of the State Engineer of Colorado furnished records of discharge of 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 and Fuchs Reservoirs were supplied by the Colorado Special Deputy State Engineer at Monte Vista, Colorado.

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

Discharge of Rio Grande at Otowi Bridge, New Mexico
Discharge of Rio Grande at San Acacia, New Mexico
Discharge of Rio Chama near Tierra Amarilla, New Mexico
Storage in San Mateo Reservoir

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

The United States Section of the International Boundary Commission furnished the record of discharge of Rio Grande at San Marcial, New Mexico.

The United States Bureau of Reclamation furnished the following records:

Discharge of Rio Grande below Elephant Butte Reservoir
Discharge of Rio Grande below Caballo Reservoir
Storage in Elephant Butte Reservoir
Storage in Caballo Reservoir.

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

RIO GRANDE CONTACT COMMISSION
RIO GRANDE NEAR DEL NORTE, COLORADO

Location.- Water stage recorder in Sec. 30, T. 40 N., R. 5 E., 6 miles west of Del Norte at State Bridge. From 1889 to September 1907, station was maintained 4 miles below present stations. Records are comparable.

Drainage Area.- 1,320 square miles. Zero of gage is 7,982.21 feet above mean sea level.

Records Available.- October 11, 1889 to December 31, 1940.

Maximum Discharge.- Observed during period 1889 to 1940; about 18,000 second feet (revised), October 5, 1911. Gage height 4.80 feet from rating curve extended above 6,000 second feet. Year 1940, 2,810 second feet, May 15, 1940. Gage height 3.18 feet.

Accuracy.- Records considered excellent except for periods of ice effect January 1 to March 15, 1940, Nov. 11 to Dec. 31, 1940, which were computed on the basis of 7 discharge measurements and weather reports, which are good.

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

Mean Daily Discharge in Second Feet, January 1 to December 31, 1940

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	112	135	185	342	570	1,660	453	225	211	682	270	141
2	112	140	160	318	556	1,590	378	207	211	604	261	140
3	116	140	160	300	734	1,480	322	207	218	556	274	141
4	115	140	155	291	1,170	1,380	304	197	222	503	267	150
5	113	140	150	309	1,440	1,290	296	188	211	543	244	150
6	112	140	155	309	1,550	1,220	291	222	191	1,100	229	160
7	114	140	150	287	1,620	1,120	278	229	185	838	249	164
8	121	143	155	287	1,740	1,050	270	200	188	711	240	160
9	128	143	175	282	1,630	900	265	182	182	653	244	154
10	131	143	200	278	1,840	797	261	166	176	590	240	164
11	131	143	214	285	2,120	749	253	166	179	543	169	170
12	138	144	198	257	2,120	704	249	166	182	497	158	174
13	130	148	180	274	2,220	726	235	159	182	465	137	170
14	132	148	175	327	2,410	772	244	155	185	447	137	165
15	137	152	191	383	2,570	772	296	148	188	417	159	160
16	159	155	200	394	2,570	772	296	148	182	400	170	160
17	143	150	211	408	2,570	749	274	148	188	378	149	150
18	143	148	211	408	2,590	711	249	157	225	367	140	168
19	143	160	214	459	1,990	638	229	173	653	342	154	170
20	139	162	218	570	1,530	610	222	197	689	352	178	188
21	159	160	249	719	1,330	576	229	278	530	322	118	170
22	135	163	274	805	1,280	576	229	225	447	327	144	174
23	152	166	318	993	1,280	563	218	218	459	327	170	178
24	134	168	337	1,100	1,390	503	214	236	428	327	149	181
25	141	165	352	1,190	1,420	459	222	267	389	313	133	180
26	155	175	378	1,200	1,490	428	240	278	372	304	117	192
27	135	175	352	1,270	1,590	400	300	270	378	367	158	186
28	135	175	347	1,020	1,650	367	322	236	352	337	154	185
29	135	170	313	854	1,620	347	278	222	367	304	158	180
30	135	304	674	1,600	1,600	417	261	229	543	318	135	180
31	135	318	1,650	1,650	1,650	249	218	218	318	318	135	180

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in Acre-feet
January	4,038	143	112	130	8,010
February	4,428	175	135	153	8,780
March	7,179	378	150	232	14,240
April	16,569	1,270	257	592	31,860
May	51,840	2,590	566	1,572	102,530
June	24,328	1,660	347	811	48,250
July	6,428	453	214	272	16,780
August	6,337	287	148	204	12,670
September	9,113	689	176	304	18,080
October	14,532	1,100	304	489	29,800
November	5,515	287	117	184	10,940
December	5,196	193	140	163	10,330
Year	167,501	2,590	112	430	311,600

RIO GRANDE CONTACT COMMISSION
RIO GRANDE NEAR LOBATOS, COLORADO

Location.- Water-stage recorder in Sec. 22, T. 35 N., R. 11 E., 6 miles north of Colorado-New Mexico line at highway bridge and 10 miles east of Lobatos, Colorado.

Drainage area.- 7,700 square miles (includes 2,940 square miles in closed basin). Zero of gage is 7,425.79 feet above mean sea level.

Records available.- June 28, 1899 to December 31, 1940.

Maximum Discharge.- Observed during period 1899 to 1940; 13,100 second feet June 8, 1905. Year 1940; 1,190 second feet, May 19, 1940. Gage height 2.89 feet.

Accuracy.- Record considered excellent except for periods of ice effect January 1 to February 5, March 1 - 5, November 20 - 22, December 13 - 31, which were computed on the basis of 5 discharge measurements and weather records and are fair.

Remarks.- Diversions for irrigation above station.

Mean Daily Discharge in Second Feet, January 1 to December 31, 1940

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	212	230	350	93	99	705	18	5.5	19	35	46	185
2	210	240	350	90	90	642	17	5.5	16	39	51	185
3	205	235	350	79	79	530	16	5.5	16	42	46	180
4	204	240	380	79	76	376	15	5.0	17	44	49	180
5	201	240	420	74	103	232	15	5.6	17	58	42	185
6	197	240	427	79	123	168	13	7.5	16	58	49	190
7	190	240	408	79	120	127	12	9.5	16	93	51	195
8	192	247	402	74	127	96	12	10	16	74	49	198
9	196	233	395	68	168	76	12	10	13	66	44	205
10	199	233	376	63	159	66	11	10	19	61	44	220
11	204	237	370	56	123	61	10	9.0	17	58	39	224
12	207	239	341	54	116	56	10	12	21	61	46	224
13	201	225	335	54	134	49	10	13	25	61	66	220
14	197	237	271	51	181	44	9.0	14	25	61	71	210
15	194	248	252	51	228	41	9.5	13	25	58	85	195
16	194	244	257	99	256	38	10	9.5	25	61	79	200
17	190	235	282	147	308	36	9.0	8.6	28	58	79	195
18	190	242	247	123	690	33	9.5	10	33	58	85	200
19	190	250	232	90	1,100	31	10	11	38	56	79	220
20	200	254	216	58	614	28	10	10	34	51	99	225
21	210	246	209	46	673	27	12	9.0	31	54	166	215
22	210	270	204	51	481	25	12	10	30	56	215	200
23	210	258	172	103	481	25	11	15	30	54	220	210
24	210	254	143	159	561	22	12	15	31	46	237	220
25	210	254	158	209	558	20	9.0	18	33	44	241	225
26	210	258	120	209	637	18	8.5	20	54	45	253	215
27	210	290	120	186	558	18	9.5	20	39	54	252	210
28	210	300	164	204	619	17	8.5	27	38	54	219	205
29	210	340	155	177	690	16	8.5	20	36	66	185	220
30	210	350	150	120	705	16	8.0	18	38	51	181	225
31	210	350	110	120	722	16	8.0	17	42	42	180	230

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in Acre-feet
January	6,328	225	190	204	12,550
February	7,329	340	225	253	14,540
March	8,368	427	110	271	16,640
April	3,025	209	45	101	5,000
May	11,580	1,100	78	374	22,970
June	3,643	706	16	121	7,230
July	345.0	18	8.0	11.1	684
August	373.0	27	5.0	12.0	740
September	765	54	13	26.5	1,580
October	1,713	83	36	55.3	3,400
November	3,368	252	39	112	6,650
December	6,411	230	180	207	12,720
Year	53,298.0	1,100	5.0	146	105,734

RIO GRANDE COMPACT COMMISSION

RIO GRANDE AT OTOWI BRIDGE, NEAR SAN ILDEFONSO, NEW MEXICO

Location.- Water-stage recorder, Lat. 36°52' N., Long. 106°04' W., at Denver & Rio Grande Western R.R. bridge in San Ildefonso Pueblo Grant, 2 miles southwest of San Ildefonso, Santa Fe County, and 3 miles downstream from Rio Pecos. Datum of gage is 5,468.48 feet above mean sea level (general adjustment of 1929).

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

Records available.- February 1895 to December 1905, June 1909 to December 1914, October 1930 to September 1940 in reports of Geological Survey. February 1895 to December 1905, June 1909 to December 1931 in reports of State engineer. January 1940 to December 1940 in report of Rio Grande Compact Commission.

Average discharge.- 13 years (1927-40), 1,422 second feet.

Extremes.- Maximum discharge during year, 2,330 second feet August 22 (gage height, 7.34 feet); minimum daily, 317 second feet August 29. For period 1930-40: Maximum discharge, 21,900 second feet August 20, 1935 (gage height, 12.01 feet), from rating curve extended above 7,500 second-feet by logarithmic plotting; minimum daily, 128 second feet June 21, 1934.

Remarks.- Records good except those for periods of ice effect and days of doubtful or no gage-height record, which are fair. Flow partially regulated by El Vado Reservoir on upper Rio Chama, which stores water for irrigation. Diversions above station for irrigation.

Mean Daily Discharge in Second Feet, January 1 to December 31, 1940

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	490	545	799	738	778	1,220	1,010	1,050	978	656	480	978
2	485	578	799	808	687	1,360	862	1,030	1,100	550	475	535
3	485	584	778	806	729	1,480	792	994	808	455	475	551
4	490	590	799	701	856	1,150	908	914	694	425	406	540
5	510	590	827	668	1,410	994	1,050	656	632	440	398	872
6	500	550	813	687	1,400	848	982	662	816	460	392	968
7	485	550	803	662	1,230	880	876	614	1,260	470	388	871
8	475	566	820	856	1,130	906	970	460	1,280	470	388	872
9	510	536	799	844	1,320	1,240	1,030	370	1,250	475	388	868
10	505	545	813	668	1,110	1,560	1,110	610	1,220	475	398	884
11	485	560	841	662	1,050	1,610	1,070	986	1,610	475	383	611
12	500	572	813	644	1,100	1,610	1,120	1,000	1,330	485	387	871
13	510	565	760	680	1,050	1,510	1,300	954	1,210	460	357	687
14	475	525	687	1,140	970	1,410	1,510	1,050	1,070	460	341	874
15	445	545	638	1,510	994	1,180	1,460	883	456	353	400	800
16	398	540	644	1,510	1,040	1,090	1,400	1,130	701	460	378	400
17	480	530	660	1,180	1,190	1,050	1,310	1,030	722	435	401	388
18	475	525	687	922	1,510	708	1,340	1,000	680	425	670	614
19	485	540	701	785	1,610	620	1,380	1,060	785	426	1,020	588
20	475	540	660	885	2,200	1,120	1,160	978	760	954	1,180	500
21	505	560	650	1,080	1,950	1,320	1,030	1,120	715	984	982	510
22	490	555	650	1,080	1,720	1,460	978	891	820	906	602	600
23	470	566	682	1,060	1,660	1,190	930	815	708	862	578	546
24	500	602	701	1,060	1,660	1,030	970	520	694	722	668	630
25	510	650	729	1,010	1,510	785	1,240	460	644	701	687	874
26	520	532	785	1,060	1,510	1,170	1,060	390	684	701	662	600
27	530	538	848	1,160	1,410	1,120	954	357	694	722	674	600
28	525	694	841	1,200	1,300	1,110	978	333	602	813	618	600
29	505	792	792	1,040	1,290	1,290	1,090	317	696	736	656	600
30	515	745	745	906	1,280	1,180	1,140	556	650	540	608	600
31	540	715	715	1,280	1,040	1,040	784	784	610	610	610	600

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in Acre-feet
January	16,241	540	396	492	30,150
February	16,744	792	525	577	30,750
March	22,337	883	338	753	46,750
April	27,978	1,510	644	919	54,750
May	39,733	2,200	687	1,232	74,750
June	34,691	1,560	620	1,156	67,400
July	33,998	1,510	792	1,097	67,400
August	23,930	1,250	317	772	50,400
September	25,484	1,610	584	683	50,400
October	19,177	1,180	425	546	35,400
November	16,369	1,180	341	546	35,400
December	18,598	687	480	553	34,400
Year	294,677	2,200	317	806	554,400

RIO GRANDE AT SAN ACACIA, NEW MEXICO

RIO GRANDE AT SAN ACACIA, NEW MEXICO

Location.- Water-stage recorders on right and left banks, Lat. 34°15' N., Long. 108°53' W., in NE 1/4 Sec. 1, T. 1 S., R. 1 W., (partly tested survey) 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 gages is 4,662.56 feet above mean sea level (general adjustment 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 September 1940 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. January to December 1940 in report of Rio Grande Compact Commission.

Extremes.- Maximum discharge during year, 10,600 second feet August 24 (gage height, left bank gage, 5.62 feet); minimum daily, 9 second feet July 26. For period 1936-40: Maximum discharge, 27,400 second feet August 5, 1936 (gage height, 8.35 feet), from rating curve extended above 18,000 second feet by logarithmic plotting; minimum daily, 1 second foot June 23, 1939.

Remarks.- Records good except those for periods of ice effect, January 18-21, which are fair. Socorro main canal north diverts 0.7 mile above gage. Diversion above station for irrigation. This record differs from the manuscript originally furnished the Commission due to revisions in December.

Mean Daily Discharge in Second Feet, January 1 to December 31, 1940

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	452	605	700	452	298	485	656	230	65	797	463	700
2	496	854	745	496	230	373	618	138	28	608	354	775
3	507	905	973	420	142	312	354	210	10	430	411	775
4	760	888	1,010	364	100	420	206	411	16	507	275	685
5	592	939	922	290	52	236	739	452	122	392	430	592
6	592	730	905	312	27	224	106	744	130	441	360	745
7	890	715	671	328	96	134	212	786	175	364	155	700
8	775	670	775	275	175	97	100	956	160	320	116	888
9	710	670	837	392	138	156	230	463	145	306	110	715
10	700	671	888	126	306	52	76	290	320	288	156	605
11	631	871	805	62	474	58	46	190	670	282	114	775
12	846	618	688	30	402	60	21	118	1,190	190	254	990
13	818	631	775	32	364	106	79	72	854	186	218	922
14	484	685	700	78	566	212	382	170	790	206	160	1,080
15	598	715	631	73	306	312	69	190	692	195	112	973
16	518	670	679	18	275	242	138	260	654	230	118	775
17	608	618	563	441	275	224	206	268	657	155	82	790
18	480	529	496	780	275	254	518	275	312	110	92	888
19	800	644	807	430	605	100	715	239	212	96	190	760
20	800	670	535	246	1,390	24	745	335	170	110	254	790
21	800	618	384	180	1,170	27	563	467	1,060	106	1,110	805
22	607	644	402	118	2,650	111	402	2,120	2,640	138	1,330	805
23	484	631	402	344	2,060	134	354	1,980	1,960	195	1,120	760
24	608	687	582	382	1,980	706	118	3,880	1,290	335	1,030	657
25	618	718	535	474	1,390	335	9	3,330	775	382	1,100	745
26	720	780	840	392	1,330	130	54	2,400	820	402	700	854
27	790	670	664	260	1,440	82	29	2,000	441	354	760	905
28	600	658	682	224	1,010	36	932	507	382	402	775	956
29	748	653	496	290	973	88	2,210	260	392	618	730	884
30	644	653	482	748	748	474	1,040	212	607	730	745	760
31	631	652	452	458	553	692	110	692	618	618	745	775

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in Acre-feet
January	18,889	820	452	609	37,470
February	20,351	939	28	702	40,370
March	19,627	1,010	335	633	38,930
April	8,844	780	18	296	17,540
May	21,705	2,590	27	700	45,050
June	6,203	706	24	207	12,300
July	12,528	9	9	404	24,850
August	24,281	3,880	72	783	46,150
September	17,737	2,840	10	591	35,180
October	10,281	797	96	332	20,390
November	13,725	1,330	82	458	27,220
December	24,799	1,080	692	800	49,190
Year	198,970	3,880	9	544	394,650

RIO GRANDE COMPACT COMMISSION
RIO GRANDE AT SAN MARCIAL, NEW MEXICO

Description.- Water-stage recorder and cable with sit-down car and winch located at railroad bridge about one mile below San Marcial, New Mexico. The recorder is on the upstream end of the first bridge pier from the south abutment of the bridge. The zero of the gage is 4,456.38 feet, United States Coast and Geodetic Survey sea level datum.

Records.- Based upon 198 meter measurements, by wading, and from cable about 1,000 feet above railroad bridge (122 measurements by I. B. C. and 76 by U. S. G. S.). Computations by shifting channel methods. 1940 records good. Records available, January 1895 to December 1940.

Remarks.- For gage history 1895 to 1938 International Boundary Commission Water Bulletins Nos. 4, 7 and 8. During 1940 the river continued to flow through the Val Verde area. El Vado and smaller reservoirs and many irrigation diversions and drainage returns above this station in Colorado and New Mexico modify the river flow.

Comparative Flows from Records.- Momentary peak: Max., Oct. 11, 1904, 50,000 sec. ft. with water surface level of 4,459.5 ft. on U.S.C.G.S. datum about 0.25 mile above the present station gage. This is the greatest flood peak flow in at least the past 112 years, or since 1828. Min., sometimes dry. See International Boundary Commission Water Bulletin No. 6, page 79, for all large peak flows since 1828 and their average frequency. Daily: Max., Oct. 11, 1904, 33,000 sec. ft. average. Min., sometimes dry. Monthly: Max., May 1905, 15,649 sec. ft. average. Min., sometimes dry. Yearly: Max., 1905, 3,350 sec. ft. average. Min., 1902, 277 sec. ft. average. Ten Successive Years: Max., 1905 and 1906, 2,750 sec. ft. average. Min., 1899 and 1900, 487 sec. ft. average. Three Successive Years: Max., 1905 to 1907, 2,830 sec. ft. average. Min., 1899 to 1902, 835 sec. ft. average. Five Successive Years: Max., 1905 to 1909, 2,260 sec. ft. average. Min., 1896 to 1902, 697 sec. ft. average. Ten Successive Years: Max., 1903 to 1912, 1,980 sec. ft. average. Min., 1925 to 1934, 1,170 sec. ft. average. Forty-Six Year average: 1,510 sec. ft.

Remarks.- This record differs from the manuscript originally furnished the Commissioners in that all decimals have been dropped from values between 10 and 99. This in no way affects computations.

Mean Daily Discharge in Second Feet, January 1 to December 31, 1940

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	550	640	563	404	569	613	249	703	140	702	562	748
2	499	839	590	403	325	423	399	288	135	836	486	678
3	470	1,010	572	828	240	364	509	201	108	599	329	813
4	515	966	800	481	166	270	374	332	92	475	274	763
5	682	892	941	466	146	333	261	367	73	558	234	709
6	683	740	1,000	406	113	174	476	380	103	513	348	662
7	656	760	845	387	71	167	187	639	174	461	360	539
8	710	716	884	412	56	117	207	649	211	547	316	622
9	704	671	787	350	61	84	120	859	195	316	218	738
10	679	642	690	343	134	73	108	379	131	316	172	727
11	642	620	756	264	145	77	107	265	315	251	159	656
12	580	646	740	163	310	56	82	201	662	251	161	686
13	566	569	832	118	423	50	55	177	1,040	274	169	763
14	642	566	752	92	334	48	50	158	892	280	348	748
15	586	548	749	76	366	46	66	137	971	246	249	944
16	621	637	721	71	296	53	74	160	761	261	187	677
17	653	603	638	72	225	128	69	223	834	301	175	616
18	571	560	569	104	216	122	146	245	646	237	187	618
19	244	567	522	495	240	128	419	236	420	211	178	713
20	312	567	604	619	386	107	619	290	279	176	172	690
21	413	568	448	317	1,090	64	561	268	610	167	261	704
22	642	569	404	239	1,290	69	411	289	1,070	159	825	804
23	588	562	448	171	1,880	57	336	1,150	1,730	205	1,150	743
24	667	569	478	250	2,700	80	268	1,450	1,850	234	1,030	714
25	598	590	463	298	2,100	162	144	3,300	933	374	917	679
26	571	583	351	354	1,400	250	82	2,490	697	416	1,080	680
27	611	552	426	369	1,320	162	76	2,170	714	376	691	779
28	672	599	501	315	1,300	99	127	1,400	572	378	841	661
29	776	538	494	284	934	116	561	658	567	365	771	800
30	793	510	610	276	782	146	1,700	295	526	508	800	817
31	649	583	656	276	656	1,180	202	667	667	667	714	764

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in Acre-feet
January	18,425	793	244	594	36,100
February	18,999	1,010	538	655	37,000
March	19,611	1,000	351	533	37,000
April	9,095	619	71	503	19,000
May	20,268	2,700	56	654	60,000
June	4,528	513	45	181	7,000
July	9,997	1,700	50	322	16,000
August	19,443	2,490	137	627	34,000
September	17,360	1,880	78	368	31,000
October	11,420	636	169	279	27,000
November	13,849	1,150	187	462	31,000
December	23,011	950	669	743	46,000
Year	186,002	2,700	45	508	367,000

RIO GRANDE COMPACT COMMISSION

RIO GRANDE BELOW ELEPHANT BUTTE DAM, NEW MEXICO

Location.- N¹/₂ Sec. 25, T. 13 S., R. 4 W., approximately 1900 feet down stream from Elephant Butte Dam outlets.

Metering Equipment.- 3/4" diameter tramway cable - approximately 177 feet between wooden "A" frames equipped with sit down car and reel.

River Section.- Section under cable regular gravel-sand bottom. Flow approaches cable at right angle at all stages. Channel dredged winter of 1938-1939 connection power plant construction.

Control.- No permanent control now exists - during rainy season backwater from arroyo inflow below gage affects rating. Does not affect accuracy of records as time of all shifts easily determined from gage records and gate operation at dam. However, sensitivity good.

Regulation.- Flow is completely regulated by storage in Elephant Butte Reservoir. Varying river flow depending entirely upon gate changes at the dam.

Accuracy.- Records very good to excellent.

Remarks.- This record differs from the manuscript originally furnished the Commissioners in that all decimals have been dropped from daily values between 10 and 100. This in no way affects computations.

Mean Daily Discharge in Second Feet, January 1 to December 31, 1940

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	18	18	18	2,190	1,610	2,180	1,780	1,440	1,690	70	83	101
2	14	19	18	2,180	1,610	2,170	1,780	1,620	1,680	67	77	101
3	15	17	18	2,190	1,610	2,160	1,780	2,010	1,640	72	75	101
4	16	14	17	2,210	1,610	2,150	1,780	2,010	1,680	75	76	104
5	16	15	17	2,210	1,350	2,130	1,270	1,860	1,580	61	74	118
6	15	18	18	2,210	1,900	2,140	2,100	941	1,570	76	89	116
7	14	18	17	2,200	1,910	2,140	2,160	1,730	1,560	77	99	98
8	15	18	18	2,170	1,910	2,130	2,200	1,730	1,490	75	82	98
9	16	17	19	2,140	1,920	2,110	2,310	1,860	1,250	78	78	104
10	15	18	19	2,150	1,910	2,100	2,370	2,070	1,320	73	61	98
11	15	18	17	2,150	1,910	1,940	2,440	2,080	1,060	71	79	89
12	16	17	17	2,140	1,910	2,100	2,620	2,110	1,050	76	80	87
13	16	18	17	2,160	1,900	2,100	2,640	2,110	1,000	69	86	100
14	16	18	17	2,160	1,760	2,090	2,640	2,100	1,110	71	82	84
15	17	18	18	2,170	1,600	2,060	2,920	1,930	1,480	73	75	613
16	16	17	18	2,160	1,600	2,060	2,760	2,080	882	75	81	733
17	16	17	18	2,160	1,410	2,060	2,680	2,060	997	73	78	682
18	17	17	18	1,790	1,610	2,050	2,560	2,070	1,070	74	78	664
19	17	18	18	1,980	1,610	2,050	2,560	2,070	930	85	78	666
20	16	19	18	2,120	1,610	2,040	2,390	2,020	822	90	86	766
21	16	19	18	2,110	1,620	2,050	2,280	1,910	840	84	90	704
22	16	18	18	2,160	1,480	2,140	1,940	1,860	1,090	74	85	540
23	17	19	19	1,910	1,390	2,130	2,110	1,960	422	72	86	611
24	16	19	18	1,650	1,070	2,130	2,020	1,960	458	72	92	552
25	16	20	20	1,420	1,070	2,130	1,600	1,860	256	72	98	663
26	16	19	1,400	1,440	1,070	2,130	1,770	1,950	79	72	117	882
27	16	19	1,710	1,450	1,070	2,130	1,660	1,780	76	72	117	811
28	16	19	1,940	1,460	1,070	2,120	1,940	1,700	76	72	111	893
29	16	19	1,940	1,460	1,120	1,250	1,560	1,700	72	94	110	748
30	16	19	1,980	1,460	1,070	1,780	1,800	1,710	70	81	106	963
31	16	19	1,900	1,460	1,980	1,620	1,690	1,690	80	80	106	1,070

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in Acre-feet
January	512	20	13	16.5	1,020
February	618	20	14	17.9	1,030
March	11,876	2,000	1,453	373	22,960
April	58,970	1,960	1,070	1,966	116,970
May	49,030	1,960	1,260	1,562	97,250
June	61,960	2,180	1,070	2,065	122,900
July	64,800	2,920	870	2,064	128,130
August	67,701	2,110	941	1,881	114,460
September	59,085	1,690	70	970	87,690
October	2,634	117	67	76.5	4,690
November	14,619	1,070	87	87.8	5,250
December	14,619	1,070	87	472	29,000
Year	353,570	2,920	13	966	701,310

RIO GRANDE CONTACT COMMISSION

RIO GRANDE BELOW CABALLO DAM, NEW MEXICO

Location.- In the NE 1/4 of the SW 1/4 Sec. 30, T. 16 S., R. 4 W., N.M.P.M., approximately 4200 feet below Caballo Dam in Sierra County, New Mexico; and about 20 miles south of Hot Springs, New Mexico and approximately 102 miles northwest of El Paso, Texas. Reached by car over U. S. Highway 85 from El Paso, Texas, or Hot Springs, New Mexico.

Control.- No permanent control exists in the immediate vicinity of gage. A long range control is located 7000 feet below the gage. This control is Percha Diversion Dam. In the immediate vicinity of the gage the Bojorquez bridge, 600 feet below the gage, and an old semi-permanent delta of Percha Arroyo below the highway bridge acts as partial control. Moving sand causes discharge-gage relationship to be of a shifting nature. Shifts, however, are moderate. Sensitivity is good.

Discharge Measurements.- Discharge measurements are made from a cable with sit-down ear equipped with reel. Measuring section is good. Angle flow is always at right angles to the cable. Infrequently during the summer months moving sand causes considerable bottom disturbances and check measurements are made from a cable located about 3/4 mile below Percha Dam and approximately 2 miles below Caballo station; to this check measurement is added a measurement of the flow of the Arroyo Canal which diverts at Percha Dam. The sum of these two measurements is a check of the measurement made at the Caballo gage at times of moving sand. Wading measurements are made when the flow is less than 100 second feet. Velocity is high enough at extreme low flow to insure good measurements. 150 to 200 meter measurements are made annually. Each gate change at Caballo Dam is followed by a measurement.

Regulation.- The flow is regulated by storage in the Caballo Dam 4200 feet upstream from the station. A small arroyo enters the River from the east side approximately 1600 feet above the gage. This arroyo contributes momentary flood peaks 100-300 c.f.s. once or twice a year during the rainy season. However, this volume of water is relatively small.

Records Available.- Records began at station February 8, 1938 but prior to this date discharge records are available for the Rio Grande at Percha Dam since 1922. Percha Dam is a diversion weir located about 2 miles below Caballo Dam.

Accuracy.- Excellent.

Remarks.- This record differs from the manuscript originally furnished the Commissioners in that all decimals have been dropped from daily values between 10 and 100. This in no way affects computations.

Mean Daily Discharge in Second Feet, January 1 to December 31, 1940

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.6	2.5	1,080	2,110	1,520	2,100	1,670	1,500	1,800	433	1.9	1.4
2	3.4	2.6	1,070	2,120	1,550	2,140	1,560	1,440	1,750	40	1.9	1.4
3	3.2	2.4	1,070	2,190	1,660	2,090	1,930	1,660	1,630	35	1.9	1.4
4	2.8	2.4	1,010	2,130	1,660	2,060	1,770	1,750	1,540	29	1.9	1.4
5	2.7	2.0	1,030	2,080	1,660	2,020	1,860	1,750	1,540	16	1.9	1.4
6	2.7	2.0	853	2,180	1,730	2,000	2,000	1,690	1,540	2.3	1.9	1.4
7	2.7	2.0	853	2,180	1,690	2,050	2,040	1,780	1,490	2.3	1.9	1.4
8	2.7	2.0	967	2,180	1,530	2,070	1,990	1,820	1,480	2.3	1.9	1.4
9	2.7	1.63	1,150	2,100	1,450	2,140	2,260	1,900	1,460	2.2	1.9	1.4
10	2.3	334	1,030	2,010	1,390	2,090	2,360	2,130	1,420	2.2	1.8	1.4
11	2.3	399	771	2,020	1,450	2,040	2,440	2,140	1,320	2.1	1.7	1.4
12	2.5	261	844	2,030	1,450	1,920	2,430	1,920	1,240	2.0	1.7	1.4
13	2.1	273	1,110	2,030	1,460	1,860	2,380	1,850	1,240	2.0	1.6	1.4
14	2.1	735	1,110	2,030	1,410	1,800	2,560	1,790	1,300	1.7	1.6	1.4
15	2.0	888	1,180	2,000	1,490	1,900	2,460	1,770	1,300	1.7	1.6	1.4
16	2.1	898	1,400	1,890	1,610	1,900	2,450	1,840	1,290	1.7	1.4	1.4
17	2.1	821	1,400	1,810	1,450	1,910	2,400	1,970	1,180	1.7	1.4	1.4
18	2.1	798	1,390	1,750	1,490	1,930	2,410	2,240	1,050	1.7	1.4	1.4
19	2.1	446	1,440	1,780	1,450	2,020	2,380	2,160	988	1.7	1.4	1.4
20	2.1	3.9	1,620	1,770	1,410	2,060	2,280	2,060	865	1.7	1.4	1.4
21	2.1	3.9	1,620	1,770	1,360	2,140	2,200	1,900	663	1.7	1.3	1.4
22	2.2	3.9	1,670	1,770	1,270	2,060	1,830	1,720	620	1.7	378	1.4
23	2.2	3.9	1,630	1,620	925	1,890	1,960	1,850	620	1.7	658	1.4
24	2.2	3.2	1,820	1,480	1,010	1,910	1,960	1,860	660	1.7	498	1.4
25	2.2	3.2	1,630	1,430	1,220	1,600	1,910	1,990	699	2.69	188	1.4
26	2.2	3.2	1,640	1,430	1,370	1,710	1,920	1,960	677	377	5.2	1.4
27	2.1	33	1,900	1,430	1,460	1,710	1,940	1,980	731	188	2.0	1.4
28	2.1	60	1,840	1,430	1,630	1,720	1,950	1,700	890	2.3	1.7	1.4
29	2.1	253	1,640	1,440	1,690	1,640	1,970	1,710	890	2.1	1.6	1.4
30	2.1		2,120	1,480	1,890	1,600	1,950	1,850	973	2.0	1.6	1.4
31	2.1		2,120	2,020	1,750	1,800	1,750	1,800	973	2.0	1.6	1.4
Month	TOTAL RELEASE Includes Bonita Ditch Acres Feet		Second- foot-days	Maximum	Minimum	Mean	Run-off in Acres-Feet					
January	12,751	73.6	888	3.5	2.0	2.27	146					
February	12,751	6,414.9	888	3.5	2.0	2.21	11,700					
March	84,380	42,488	2,120	771	1,571	3,512	94,200					
April	110,884	58,650	2,190	1,430	1,858	3,612	110,200					
May	81,878	46,145	2,020	825	1,469	3,004	91,800					
June	114,514	57,630	2,140	1,500	1,921	3,021	114,200					
July	129,319	66,110	2,560	1,560	2,100	3,300	129,200					
August	114,597	57,610	2,240	1,440	1,859	2,449	114,200					
September	69,939	34,686	1,800	620	1,156	3,705	69,900					
October	2,862	1,429.4	438	1.7	46.1	2,449	2,860					
November	5,600	1,715.0	636	1.3	87.2	3,035	5,600					
December	53	42.0	1.6	1.3	1.35	4,914	53					
Year	733,060	368,993.9	2,560	1.3	1,008	2,124	733,060					

RIO GRANDE CONTACT COMMISSION

COEJOS RIVER NEAR MOGOTE, COLORADO

Location.- Water-stage recorder in Sec. 34, T. 33 N., R. 7 E., 12 miles west of Antonito, Colorado at Broyles bridge and 1/2 miles northwest of Mogote, Colorado.

Drainage area.- 282 square miles. Altitude 8,300 feet above mean sea level.

Records available.- September 1, 1899 to March 31, 1900 and April 17, 1903 to October 31, 1905 at a point 1 mile below present station. March 21, 1907 to October 5, 1911, 3 miles above present station; January 1, 1912 to December 31, 1940 at present station.

Maximum discharge observed during period 1899-1900; 1903-40; 6,000 second feet (estimated), October 5, 1911. Year 1940; 1,650 second feet, May 17. Gage height 3.72 feet.

Accuracy.- Records considered excellent except for ice periods January 1 to March 17 and November 13 to December 31 which were computed on the basis of 8 discharge measurements and weather records, and are good.

Remarks.- No diversions or regulation above station.

Mean Daily Discharge in Second Feet, January 1 to December 31, 1940

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	37	58	50	202	341	1,310	209	69	61	194	78	54
2	36	54	44	187	410	1,210	187	65	73	173	83	52
3	38	52	45	144	564	1,090	170	64	81	173	84	50
4	37	50	43	147	784	990	160	57	76	173	84	50
5	37	50	48	157	800	938	163	53	71	198	85	50
6	36	46	50	144	676	876	173	63	64	548	78	52
7	33	50	44	141	948	809	141	78	62	367	78	51
8	38	50	48	136	980	727	141	79	62	297	79	51
9	39	50	50	150	828	700	127	66	69	266	78	52
10	40	50	52	150	958	572	124	56	65	232	76	53
11	39	48	48	157	1,030	648	121	64	71	202	50	54
12	39	48	48	173	1,020	491	111	50	76	180	64	53
13	43	40	44	216	1,160	464	144	47	83	163	66	50
14	38	42	35	306	1,220	470	124	44	88	147	67	48
15	39	42	44	353	1,310	477	109	43	76	136	76	48
16	43	44	45	346	1,420	440	109	44	73	124	69	44
17	44	43	65	298	1,440	399	104	49	71	116	71	42
18	45	43	79	257	1,210	368	93	46	127	109	80	46
19	45	46	86	297	1,220	367	92	44	194	102	88	47
20	46	48	86	372	876	341	90	65	187	95	67	46
21	46	48	107	498	809	331	86	69	150	92	66	44
22	46	48	141	548	638	316	95	69	144	86	69	42
23	48	48	183	644	866	288	92	102	138	83	69	42
24	48	48	220	709	948	284	78	163	124	61	77	44
25	48	48	254	636	948	288	72	175	127	78	74	45
26	47	47	284	636	1,000	266	72	133	127	76	59	46
27	46	46	341	676	1,140	240	150	141	116	90	63	46
28	46	46	366	506	1,220	228	104	114	107	76	67	44
29	46	47	309	422	1,260	224	90	109	109	78	60	45
30	46	46	190	367	1,270	228	95	97	133	95	60	48
31	46	46	189	367	1,250	228	84	84	133	84	60	48
Month	Second- foot-days		Maximum	Minimum	Mean	Run-off in Acres-Feet						
January	1,384	67	33	44.6	2,760							
February	1,389	58	40	47.9	2,760							
March	3,512	341	36	113	6,370							
April	10,004	709	138	333	19,840							
May	30,921	1,440	341	988	60,740							
June	16,300	1,310	224	543	32,330							
July	2,449	173	43	120	7,360							
August	2,449	173	43	79.0	4,860							
September	3,035	194	62	101	6,020							
October	4,914	548	76	169	9,760							
November	2,124	84	50	70.8	4,210							
December	1,486	54	42	47.9	2,950							
Year	80,923	1,440	33	221	160,630							

RIO GRANDE CONTACT COMMISSION
 CORAJOS RIVER NEAR LOS SAUCES, COLORADO

Location.- Two water-stage recorders in Sec. 2, T. 35 N., R. 11 E., 2 miles north of Las Sauces and $\frac{1}{2}$ mile above mouth. Stream enters Rio Grande through two channels and combined record is published.

Drainage area.- 887 square miles. North channel zero of gage is 7,496.02 feet above mean sea level.

Records available.- March 29, 1921 to December 31, 1940.

Maximum Daily Discharge observed during period 1921-40, 3,850 second feet May 24, 1932. Year 1940, 1,106 second feet May 19.

Accuracy.- Records are excellent for 1940 except those for ice effect January 14-17, 19-20, 23-24, and the period December 18-19, 20-21, which are good.

Remarks.- Diversions for irrigation above station. This record differs from the manuscript originally furnished the Commissioners due to revisions in December. No adjustments were made to accrued debits or credits due to Actual Spill in 1942.

Mean Daily Discharge in Second Feet, January 1 to December 31, 1940

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	54	71	89	32	36	563	3.6	1.2	0.1	18	32	66
2	53	71	84	28	26	458	3.6	1.4	0.1	16	27	58
3	52	70	82	18	30	351	3.4	1.6	0.4	14	27	58
4	52	69	80	17	45	106	2.8	1.4	0.4	13	27	56
5	52	72	78	18	65	91	2.7	1.6	0.2	13	29	58
6	56	69	67	19	57	50	3.8	2.6	0.2	14	30	59
7	54	70	62	17	58	23	2.9	1.4	0.2	19	28	57
8	54	70	68	16	76	14	2.1	0.3	0.6	27	22	61
9	52	66	68	7.9	90	12	1.6	0.1	1.0	29	23	58
10	52	66	66	3.1	56	10	1.4	0.2	1.0	32	26	60
11	53	66	66	2.8	45	8.0	1.4	0.3	1.0	30	24	64
12	56	67	67	2.4	51	5.1	1.2	0.7	1.4	35	27	62
13	60	65	63	3.7	78	4.5	0.6	0.7	5.7	33	28	65
14	54	65	65	4.6	128	4.3	0.6	0.3	1.4	38	40	68
15	51	65	63	3.2	144	4.2	0.4	0.3	1.8	32	38	64
16	54	64	63	65	184	4.2	0.6	0.3	1.8	33	39	68
17	61	61	61	69	276	4.5	0.4	0.3	1.8	33	40	68
18	68	61	59	80	902	4.5	0.4	0.3	1.8	31	42	68
19	56	61	59	22	856	4.7	0.4	0.3	1.8	31	42	68
20	61	61	59	18	569	4.7	0.4	0.5	1.6	32	42	68
21	65	61	60	18	378	4.7	0.3	0.9	1.8	34	40	68
22	60	61	58	61	366	4.4	0.3	0.5	1.6	35	40	64
23	54	60	44	101	433	4.4	0.2	0.6	1.6	28	45	64
24	54	63	43	135	451	3.8	0.2	1.2	1.7	29	51	68
25	60	64	41	168	441	3.6	0.2	1.2	1.8	31	53	68
26	58	66	33	120	440	3.5	0.2	0.6	1.7	34	53	68
27	61	71	62	129	506	3.4	0.2	0.3	1.7	36	55	68
28	63	77	92	119	553	3.6	0.2	0.3	1.7	36	55	68
29	64	84	62	74	588	3.8	0.2	0.3	1.7	34	57	68
30	64	84	45	46	694	3.8	0.3	0.3	1.7	28	58	68
31	68	87	57	27	821	3.8	0.2	0.2	1.8	27	57	68

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in Acre-feet
January	1,778	68	31	57.5	3,300
February	1,959	64	30	64.9	3,300
March	1,939	92	33	62.5	2,800
April	1,414.6	168	2.4	47.2	18,000
May	9,117	902	26	294	1,000
June	1,845.2	563	3.5	51.5	700
July	38.2	3.6	0.2	1.23	40
August	22.1	2.5	0.1	0.71	40
September	298.5	18	0.1	9.67	1,700
October	889	38	1.8	29.0	2,300
November	1,177	57	2.2	39.2	2,300
December	1,923	74	5.4	52.0	2,300
Year	22,348.5	902	0.1	61.1	64,200

RIO GRANDE CONTACT COMMISSION
 SAN ANTONIO RIVER AT ORTIZ, COLORADO

Location.- Water-stage recorder in Sec. 19, T. 32 N., R. 9 E., $\frac{1}{2}$ mile south of Ortiz, just across state line and $\frac{1}{2}$ mile above mouth of Los Pinos River.

Drainage area.- 110 square miles.

Records available.- January 1 to October 31, 1918; May 1, 1919 to October 31, 1920; October 1, 1924 to December 31, 1940.

Maximum Discharge observed during period 1918, 1919-20, 1924-40; 1,780 second feet, April 15, 1937, gage height 5.36 feet. Year 1940, 218 second feet April 21, 1940, gage height 2.13 feet.

Accuracy.- Records considered good except those estimated during January 1 to March 28, May 6-8 and November 2 to December 31. No records January 1 to March 28.

Remarks.- Small diversions for irrigation above station. This record differs from the manuscript originally submitted to the Commissioners in that the record for November and December has been included.

Mean Daily Discharge in Second Feet, January 1 to December 31, 1940

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1				85	52	10		0	0.2	3.4	4.7	
2				88	21	3.0		0	2.0	4.7	2.1	
3				64	88	6.9		0	1.4	2.0	2.1	
4				50	91	6.3		0	1.7	2.6	2.1	
5				55	73	6.3		0	0.9	3.8	2.0	
6				45	75	5.9		0	0.6	6.9	2.1	
7				56	78	5.1		0	0.5	7.4	2.4	
8				47	60	4.2		13	0.4	4.2	2.5	
9				59	51	3.8		5.9	0.4	3.0	2.5	
10				77	47	2.6		1.9	0.4	2.6	2.4	
11				81	45	2.6		1.1	3.0	2.0	2.3	
12				77	50	2.6		0.5	6.9	1.9	2.2	
13				95	51	2.5		0.4	5.1	1.9	2.0	
14				134	43	2.2		0.3	2.2	2.0	2.0	
15				159	36	1.6		0.2	1.4	2.0	2.0	
16				139	32	1.4		0.1	1.2	2.0	2.0	
17				98	34	1.1		0.1	0.9	1.9	2.0	2.6
18				78	37	0.6		0.1	1.7	1.9	2.0	
19				85	35	0.5		0	4.2	1.6	2.0	
20				117	31	0.4		0	3.8	1.6	3.0	
21				159	33	0.3		0	2.6	1.7	3.5	
22				189	40	0.2		0	3.0	1.9	4.0	
23				167	43	0.1		0	5.5	1.9	4.0	
24				160	45	0		1.6	5.4	1.9	3.8	
25				139	37	0		1.2	2.6	2.0	3.8	
26				150	30	0		1.1	2.2	1.1	3.5	
27				143	25	0		0.6	2.6	1.9	3.5	
28				98	22	0		0.4	2.6	7.4	3.5	
29				83	19	0		0	0.2	2.0	5.9	
30				63	15	0		0.2	2.0	3.8	3.5	
31				64	18	0		0.1	2.0	2.6	3.5	

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in Acre-feet
January	-	-	-	-	-
February	-	-	-	-	-
March	-	-	-	-	-
April	-	-	-	-	-
May	2,089	169	45	99.5	5,930
June	1,411	91	13	48.5	2,800
July	76.3	10	0	2.51	149
August	0	0	0	0	0
September	29.0	0	0	0	0
October	67.4	6.9	0.2	0.94	58
November	94.4	7.4	1.1	3.05	187
December	83.0	4.7	2.0	2.77	165
Year	77.5	-	-	2.5	154

RIO GRANDE CONTACT COMMISSION
LOS PINOS RIVER NEAR ORTIZ, COLORADO

Location.- Water-stage recorder in Sec. 34, T. 32 N., R. 8 E., 2 miles southwest of Ortiz, Colorado and 1 mile south state line.
Drainage area.- 167 square miles. Altitude 8,100 feet above mean sea level.

Records available.- January 1, 1914 to November 30, 1920 and October 1, 1924 to December 31, 1940.

Maximum discharge observed during period 1914-20 and 1924-40; 2,770 second feet May 9, 1937. Year 1940, 867 second feet April 25. Gage height 3.40.

Accuracy.- Records good.

Remarks.- Diversion for irrigation above station.
This record differs from the manuscript originally submitted to the Commissioners in that the record for November and December has been included.

Mean Daily Discharge in Second Feet, January 1 to December 31, 1940

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1				142	228	253	34	15	13	37	19	
2				137	368	240	32	14	14	30		
3				102	473	222	50	15	20	28		
4				102	486	251	27	14	17	36		
5				107	484	193	42	15	15	27		
6				92	440	179	42	16	14	71		
7				100	456	160	31	19	13	37		
8				98	408	147	27	22	13	27		
9				112	370	154	25	25	13	24		
10				140	416	122	24	19	15	24		
11				150	424	112	24	16	15	21		
12				171	440	102	21	15	16	20		
13				244	644	98	22	13	15	19		
14				379	424	94	21	12	15	19		
15				452	408	90	20	12	14	17		
16				334	412	85	19	12	13	17		
17				234	461	81	19	13	13	17	18	14
18				198	428	78	18	12	18	16		
19				237	331	66	18	11	19	16		
20				368	290	60	19	16	20	16		
21				486	283	58	19	20	17	16		
22				516	317	58	21	17	16	16		
23				658	378	53	19	20	16	16		
24				683	363	53	17	26	14	16		
25				680	324	46	16	24	14	15		
26				683	310	42	16	24	16	15		
27				507	320	37	30	20	14	17		
28				320	303	38	19	17	13	16		
29			117	286	293	37	17	16	13	20		
30			110	226	273	37	17	16	17	25		
31			124	283	283	36	18	13	21	21		

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in Acre-feet
January	-	-	-	-	-
February	-	-	-	-	-
March	-	-	-	-	16,750
April	9,425	553	92	372	22,800
May	11,538	486	223	106	6,000
June	3,171	253	37	106	1,000
July	722	42	16	25.3	1,000
August	578	62	11	18.6	1,000
September	455	20	13	19.2	1,000
October	709	71	15	22.8	1,000
November	841	-	-	-	1,000
December	496	-	-	-	1,000
Year	-	-	-	-	-

RIO GRANDE CONTACT COMMISSION
RIO CHAMA NEAR TIERRA AMARILLA, NEW MEXICO

Location.- Water-stage recorder, Lat. 36°34' N., Long. 106°43' W., in NW 1/4 Sec. 15, T. 27 N., R. 2 E., (projected survey), 1.6 miles downstream from El Vado Dam, 2.7 miles upstream from Rio Nutrias, and 15 miles southwest of Tierra Amarilla, New Mexico.

Records available.- October 1935 to September 1940. October 1913 to November 1916 at site 1.5 miles upstream (records of unregulated flow, published as Rio Chama near El Vado and Near Tierra Amarilla) in reports of Geological Survey, October 1913 to September 1916, February 1920 to December 1924 in reports of State engineer. January 1940 to December 1940 in reports of Rio Grande Compact Commission.

Extremes.- Maximum discharge during year, 2,020 second feet June 14 (gage height, 4.70 feet); minimum daily 1.3 second feet November 25. For period 1935-40 (regulated): Maximum discharge, 4,330 second feet May 30, 1937 (gage height, 9.63 feet) site and datum then in use; minimum daily, 1.2 second feet December 3, 1939. During period of unregulated flow there was a peak of 4,860 second feet May 10, 1916, site and datum then in use.

Remarks.- Records good except those for period of ice effect, December 11-13, 17, 22-23, 28, 30-31, which are fair. Flow regulated by El Vado Reservoir (capacity, 200,842 acre-feet at gage height of 6,902.0 feet, which is top of spillway gate). Several diversions above station for irrigation.

Mean Daily Discharge in Second Feet, January 1 to December 31, 1940

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.7	4.0	6.8	8.2	14	361	708	866	723	69	97	3.0
2	3.7	4.0	6.0	8.7	16	313	670	856	486	69	18	3.0
3	3.7	4.3	6.0	8.2	299	82	785	719	486	69	19	3.0
4	3.4	4.3	7.0	8.7	825	69	638	503	481	69	18	3.0
5	3.4	4.0	5.4	8.7	530	61	752	503	698	69	18	3.0
6	3.1	4.3	4.8	9.8	222	286	688	332	1,130	67	18	3.0
7	3.4	4.0	4.8	8.7	17	460	793	233	1,130	69	18	3.0
8	3.1	3.7	4.8	9.2	18	857	898	233	1,090	69	19	3.0
9	3.1	4.0	6.0	8.7	19	1,130	965	801	1,050	69	20	3.0
10	3.1	3.7	6.0	9.2	19	1,130	965	849	980	69	19	3.3
11	3.1	3.7	4.8	9.2	18	1,090	1,020	849	891	69	15	3.3
12	3.4	3.4	3.7	11.6	15	1,090	1,170	842	828	69	5.2	3.3
13	3.4	4.0	3.1	460	18	1,020	1,250	980	821	69	5.7	3.3
14	3.4	3.7	4.0	468	19	850	1,250	1,130	833	71	5.7	3.3
15	3.4	4.0	4.0	408	19	746	1,210	980	470	71	5.7	3.3
16	3.7	4.0	4.0	405	20	888	1,170	928	470	71	128	3.3
17	3.7	4.0	3.7	14	20	396	1,170	828	470	73	460	3.3
18	3.4	3.7	4.0	14	20	524	1,170	739	485	319	445	3.3
19	3.7	3.4	4.0	14	20	928	1,010	732	410	694	445	3.3
20	4.0	3.4	4.3	14	21	1,120	821	586	325	682	190	3.3
21	3.7	4.0	4.0	14	22	1,130	821	263	325	676	26	3.3
22	3.7	4.0	4.3	15	22	849	814	124	325	517	26	3.3
23	4.0	4.3	4.8	15	24	608	814	124	325	415	26	3.3
24	3.7	4.3	6.0	15	22	617	814	124	289	410	26	3.3
25	3.7	4.3	6.5	15	24	928	809	124	282	410	18	3.3
26	3.7	6.3	7.0	15	24	905	384	124	252	410	1.3	3.0
27	3.7	7.6	8.2	14	24	877	462	124	252	408	2.8	3.0
28	4.0	6.8	8.2	13	24	942	870	248	228	325	3.0	3.0
29	3.7	7.0	7.0	13	24	864	863	470	248	126	3.0	3.0
30	3.7	7.6	7.6	14	25	758	863	657	204	126	3.0	3.0
31	3.7	7.6	7.6	14	25	149	863	788	126	126	3.0	3.0

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in Acre-feet
January	110.2	4.0	3.1	3.55	219
February	126.6	7.6	3.4	4.37	251
March	1,177.6	8.2	3.1	5.41	332
April	2,147.3	465	8.2	71.6	4,290
May	2,255	630	14	72.7	4,470
June	21,688	1,130	61	72.7	43,020
July	27,746	1,250	396	698	58,030
August	17,496	1,130	124	564	24,700
September	16,737	1,130	204	588	33,200
October	6,728	694	67	217	13,340
November	3,094.4	450	1.3	69.8	4,150
December	103.0	3.8	3.0	3.32	204
Year	97,597.1	1,250	1.3	256	193,176

RIO GRANDE COMPACT COMMISSION
Reservoirs in Colorado and New Mexico

SQUAW LAKE RESERVOIR. Dam and adjacent staff gage located in approximate Sec. 12, T. 39 N., R. 4 W., on Squaw Lake. Total capacity of reservoir, 122 acre-feet as determined by original survey. Water used for irrigation of lands below the Del Norte gaging station.

FUCHS RESERVOIR. Dam and adjacent staff gage in Secs. 2 and 11, T. 37 N., R. 4 E., on Pinos Creek. Total capacity of reservoir, 211 acre-feet as determined by original survey. Water used for irrigation of lands adjacent to Pinos Creek.

EL VADO RESERVOIR. Dam and water-stage recorder (records above spillway floor only) and slope gage in SE $\frac{1}{4}$ Sec. 4, T. 27 N., R. 2 E., (project survey), on Rio Chama. Total capacity of reservoir, 200,340 acre feet as determined by original survey in 1927. Water is used for irrigation in Middle Rio Grande Conservancy District.

SAN MATEO RESERVOIR. Dam, water-stage recorder and staff gage located in SE $\frac{1}{4}$ Sec. 25, T. 15 N., R. 8 W., on San Mateo Creek. Compact computations for 1940 were based on estimated total capacity in the reservoir of 200 acre-feet. The figures represent water in storage during 1940 based on the 1941 survey of the reservoir. Water is used for irrigation of lands in the vicinity of San Mateo, New Mexico.

Last day of	SQUAW LAKE (Colorado)			FUCHS (Colorado)			EL VADO (New Mexico)			SAN MATEO (New Mexico)		
	Gage Height Feet	Contents Acre-feet	Change Acre-feet	Gage Height Feet	Contents Acre-feet	Change Acre-feet	Gage Height Feet	Contents Acre-feet	Change Acre-feet	Gage Height Feet	Contents Acre-feet	Change Acre-feet
Jan.							8805.7	21,870	+2,290	33.5	22	+11
Feb.							8809.7	25,250	+3,380	34.8	58	+24
Mar.		105		109			8835.0	52,950	+27,700	34.8	58	0
Apr.							8869.7	111,700	+58,750	33.3	51	-7
May							8895.2	178,500	+66,800	29.8	38	-15
June							8894.9	148,600	-30,000	28.4	20	-18
July		0		0			8860.6	93,500	-55,100	20.6	9	-11
Aug.		0		0			8840.7	50,820	-42,680	15.5	1	-4
Sept.		0		0			8812.9	28,150	-22,670	20.2	8	+7
Oct.		0		0			8801.0	18,240	-9,910	22.6	12	+4
Nov.							8799.9	17,450	-790	29.5	35	+23
Dec.							8806.0	21,850	+4,400	34.6	57	+21
Year									+2,270			+23

ELEPHANT BUTTE RESERVOIR. Dam and gages located in NW $\frac{1}{4}$ Sec. 30, T. 13 S., R. 3 W., on Rio Grande. Total capacity of reservoir, 2,219,000 acre-feet as determined by partial survey and estimate of 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 348,872 acre-feet as determined by original survey. Water is used for irrigation of 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	ELEPHANT BUTTE (New Mexico)			CABALLO (New Mexico)			PROJECT STORAGE (New Mexico)		
	Gage Height Feet	Contents Acre-feet	Change Acre-feet	Gage Height Feet	Contents Acre-feet	Change Acre-feet	Total Contents Acre-feet	Change Acre-feet	
Jan.	4353.44	889,200	+17,300	4146.89	80,120	+840	919,320	+18,140	
Feb.	4356.47	874,700	+38,800	4146.89	70,730	-9,390	945,430	+26,110	
Mar.	4356.22	886,700	+12,000	4128.74	12,080	-8,680	898,700	-46,880	
Apr.	4350.40	799,700	-87,000	4128.64	17,380	+5,300	817,080	-81,700	
May	4348.53	732,700	-67,000	4129.11	18,320	+840	781,020	-36,060	
June	4339.64	625,400	-107,300	4131.80	24,140	+6,820	649,540	-101,480	
July	4331.32	522,300	-103,100	4128.12	16,840	-7,800	538,640	-110,900	
Aug.	4325.97	481,000	-41,300	4128.28	16,660	+320	487,660	-70,980	
Sept.	4324.23	429,900	-51,100	4123.90	9,180	-7,480	439,080	-48,580	
Oct.	4328.74	447,500	+17,600	4128.24	12,910	+3,730	460,410	+21,330	
Nov.	4327.61	470,100	+22,600	4128.13	16,260	+3,350	486,460	+26,050	
Dec.	4329.12	488,500	+18,400	4138.62	42,100	+25,740	530,600	+44,140	
Year			-333,400			-37,180		-379,580	

EVAPORATION AND PRECIPITATION

Evaporation records from five stations, three in Colorado and two in New Mexico, and precipitation records from eight stations, three in Colorado and five in New Mexico, are shown on the following page.

In each case the unit of measure is the inch.

Measurements of evaporation are made in accordance with standard practice for the various pans in use.

Precipitation measurements are made in standard 8-inch rain gages and, in some places, with recording rain gages.

The evaporation and precipitation stations at Elephant Butte Dam and El Vado Dam and the precipitation stations at Caballo Dam, Pankey Ranch and San Marcial were in operation prior to the effective date of the Compact. The stations near Wagon Wheel Gap, near Conejos and at Summitville were installed by the U. S. Weather Bureau at the request of the Compact Commission.

The Rio Grande Compact Commission wishes to acknowledge the cooperation of the Weather Bureau in furnishing the records of evaporation and precipitation contained in this report.

RIO GRANDE COMPACT COMMISSION
EVAPORATION AND PRECIPITATION, RIO GRANDE BASIN
COLORADO

MAJOS WHEEL GAP (near) - In Mineral county, elevation 8,500 feet. Lat. 37°47' N., Long. 106°19' W., 11 miles SE of Creeds, Colorado. Standard land pan, anemometer, maximum and minimum thermometers, standard 8-inch rain gage and recording rain gage.
 CORAJOS (near) - In Conejos county, elevation 8,500 feet. Lat. 37°04' N., Long. 106°16' W., 15 miles W of Antonito, Colorado. Standard land pan, anemometer, maximum and minimum thermometers and standard 8-inch rain gage.
 SUMMITVILLE - In Rio Grande county, elevation 11,510 feet. Lat. 37°26' N., Long. 106°36' W., 1/2 mile S of Summitville, Colorado. Cylindrical evaporation pan, anemometer, maximum and minimum thermometers, standard 8-inch rain gage, recording rain gage and three snow gages.

PLACE	EVAPORATION												PRECIPITATION													
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Maños Wheel Gap (near)	-	-	-	2.94	7.01	8.46	7.36	6.98	4.17	4.11	-	-	-	-	-	-	-	0.08	0.75	0.44	0.71	1.43	1.38	0.79	0.83	0.69
Coraños (near)	-	-	-	-	7.05	7.19	6.14	3.61	2.45	-	-	-	-	-	-	-	-	-	0.10	0.55	2.25	0.65	0.66	1.16	1.15	
Summitville	-	-	-	-	-	5.63	-	-	-	-	-	-	-	2.03	3.61	1.50	2.05	2.13	1.27	2.66	2.64	2.58	3.54	3.06	3.40	

x Partial month.

NEW MEXICO

EL VINDO DAM - In Rio Arriba county, elevation 6,424 feet. Lat. 36°27' N., Long. 106°47' W., 17 miles SE of Sierra Amrillo, New Mexico. Standard land pan except stilling well and hook gage from Huff Co., anemometer, maximum and minimum thermometers, standard 8-inch rain gage and recording rain gage.
 SAN MARCIAL - In Socorro county, elevation 4,430 feet. Lat. 33°42' N., Long. 106°59' W., 1/2 mile SE San Marcial, New Mexico. Maximum and minimum thermometers and standard 8-inch rain gage.
 PANEY RANCH - In Sierra county, elevation 5,000 feet. Lat. 33°28' N., Long. 107°15' W., 26 miles N of Hot Springs, New Mexico. Standard 8-inch rain gage.
 ELEPHANT BUTTE DAM - In Sierra county, elevation 4,576 feet. Lat. 33°08' N., Long. 107°10' W., 9 miles NE of Hot Springs, New Mexico. Standard land pan, anemometer, maximum and minimum thermometers and standard 8-inch rain gage.
 CABALLO DAM - In Sierra county, elevation 4,190 feet. Lat. 32°54' N., Long. 107°18' W., at Caballo Dam. Standard 8-inch rain gage, and maximum and minimum thermometers.

PLACE	EVAPORATION												PRECIPITATION													
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Elephant Butte Dam	2.73	4.22	8.78	11.04	13.29	14.25	13.52	11.13	8.16	7.53	4.28	1.18	109.54	0.02	0.92	0.00	0.67	0.66	1.67	1.50	1.24	1.46	0.35	0.65	0.15	9.36
El Vindo Dam	-	-	-	5.54	8.13	9.22	10.12	8.19	5.04	4.86	-	-	-	0.04	0.04	0.56	0.90	0.79	1.23	1.23	0.57	0.56	1.06	2.28	2.05	10.50
Caballo Dam	-	-	-	-	-	-	-	-	-	-	-	-	-	0.10	1.20	0.00	0.00	1.34	2.15	0.00	1.80	1.31	0.25	0.57	0.05	6.97
San Marcial	-	-	-	-	-	-	-	-	-	-	-	-	-	0.14	0.14	0.31	2.64	1.84	1.38	1.16	2.10	0.85	1.00	-	-	-

RIO GRANDE COMPACT COMMISSION

BUDGET

At the First Annual (Fifth) Meeting of the Rio Grande Compact Commission held in El Paso, Texas on February 28 and 29, 1940 the following budget for the operation of gaging stations and administration of the Compact was adopted for the fiscal year ending June 30, 1941.

Item	Total Cost	Borne by United States		Borne by Compact States		
		U. S. G. S.	I. B. C.	Colorado	New Mexico	Texas
GAGING STATIONS: In Colorado	\$ 3,600.00					
In New Mexico above Elephant Butte below San Marcial	7,100.00 2,800.00	\$ 1,700.00 2,800.00	\$ 1,200.00	\$ 1,800.00	\$ 3,000.00	\$ 2,800.00
Subtotal	\$ 13,100.00	\$ 4,600.00	\$ 1,200.00	\$ 1,800.00	\$ 3,000.00	\$ 2,800.00
Administration	6,600.00			2,166.00	2,167.00	2,167.00
Total Cost	\$ 19,600.00	\$ 4,600.00	\$ 1,200.00	\$ 3,966.00	\$ 5,167.00	\$ 4,967.00
Net to States	\$ 15,800.00			\$ 3,966.00	\$ 5,167.00	\$ 4,967.00
Each adjustment				Dr. 684.00	Cr. 867.00	Cr. 67.00
Adjusted net to States	\$ 15,800.00			\$ 4,600.00	\$ 4,600.00	\$ 4,600.00

COST OF OPERATION

For the Fiscal Period Ending June 30, 1940

Item	Total Cost	Borne by United States		Borne by Competing States		
		U. S. G. S.	I. B. C.	Colorado	New Mexico	Texas
GAGING STATIONS: In Colorado	\$ 1,760.00	\$ 870.00		\$ 880.00		
In New Mexico above Elephant Butte below San Marcial	2,480.00 1,260.00		\$ 600.00		\$ 1,975.00	\$ 1,260.00
Subtotal	\$ 7,580.00	\$ 2,825.00	\$ 600.00	\$ 880.00	\$ 1,975.00	\$ 1,260.00
ADMINISTRATION:	\$ 2,689.18			\$ 882.73	\$ 882.73	\$ 882.72
Subtotal	\$ 2,689.18			\$ 882.73	\$ 882.73	\$ 882.72
Total	\$ 10,118.18	\$ 2,825.00	\$ 600.00	\$ 1,742.73	\$ 2,837.73	\$ 2,112.72
Share of each	\$ 6,896.18			\$ 1,742.73	\$ 2,837.73	\$ 2,112.72
Each adjustment	6,689.18			Dr. 251.06	Cr. 251.06	Dr. 251.06
				Dr. \$ 688.33	Cr. \$ 606.67	Dr. \$ 116.34