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**REPORT
of the**

**RIO GRANDE COMPACT
COMMISSION
1993**



**TO THE GOVERNORS OF
Colorado, New Mexico and Texas**

**REPORT
of the**

**RIO GRANDE COMPACT
COMMISSION
1993**



**TO THE GOVERNORS OF
Colorado, New Mexico and Texas**



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RIO GRANDE COMPACT COMMISSION

COLORADO

TEXAS

NEW MEXICO

March 31, 1994

The Honorable Ann Richards
Governor of the State of Texas
Austin, Texas

The Honorable Roy Romer
Governor of the State of Colorado
Denver, Colorado

The Honorable Bruce King
Governor of the State of New Mexico
Santa Fe, New Mexico

Honorable Governors:

The 55th Annual Meeting of the Rio Grande Compact Commission was held in El Paso, Texas on March 31, 1994.

The Commission reviewed its prior reports and the current reports of the Secretary relative to streamflow at Compact gaging stations and storage in reservoirs for 1993. The Commission found that:

- (a) Deliveries of water at the Colorado-New Mexico state line by Colorado amounted to 399,700 acre-feet in 1993 and the scheduled delivery for the year was 398,200 acre-feet. The accrued credit of Colorado was 65,300 acre-feet on January 1, 1994. The increase in storage in 1993 in reservoirs in Colorado constructed after 1937 aggregated 17,400 acre-feet.
- (b) Deliveries of water into Elephant Butte Reservoir, as measured by the Elephant Butte Effective Supply, amounted to 1,100,200 acre-feet in 1993 and the scheduled delivery for the year was 1,084,500 acre-feet. The accrued credit of New Mexico was 164,900 acre-feet on January 1, 1994. Water stored in reservoirs in New Mexico above San Marcial totalled 38,200 acre-feet on December 31, 1993. The increase in storage in 1993 in reservoirs in New Mexico above San Marcial constructed after 1929 aggregated 35,900 acre-feet.
- (c) Releases of usable water in 1993 from Project Storage amounted to 823,800 acre-feet. The accrued departure from normal release on January 1, 1994 was 333,600 acre-feet.

The Commission reviewed the budget and found that the expenses of the administration of the Rio Grande Compact were \$119,963 in the fiscal year ending June 30, 1993. The United States bore \$38,695 of this total; the balance of \$81,268 was borne by the three States party to the Compact.

Respectfully,


Jack Hammond, Commissioner for Texas


Harold D. Simpson, Commissioner for Colorado


Eluid L. Martinez, Commissioner for New Mexico

RIO GRANDE COMPACT COMMISSION REPORT

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
For the State of New Mexico
For the State of Texas

M. C. Hinderlider
Thomas M. McClure
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.

RIO GRANDE COMPACT

(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.

RIO GRANDE COMPACT COMMISSION REPORT

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

ARTICLE III

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

DISCHARGE OF CONEJOS RIVER

Quantities in thousands of acre feet

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

Intermediate quantities shall be computed by proportional parts.

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

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

RIO GRANDE COMPACT

DISCHARGE OF RIO GRANDE EXCLUSIVE OF CONEJOS RIVER--Con.

Quantities in thousands of acre feet

Rio Grande at Del Norte (3)	Rio Grande at Lobatos less Conejos at Mouths (4)
650	182
700	204
750	229
800	257
850	292
900	335
950	380
1,000	430
1,100	540
1,200	640
1,300	740
1,400	840

Intermediate quantities shall be computed by proportional parts.

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

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

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

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

ARTICLE IV

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

RIO GRANDE COMPACT COMMISSION REPORT

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
1,000	742
1,100	839
1,200	939
1,300	1,042
1,400	1,148
1,500	1,257
1,600	1,370
1,700	1,489
1,800	1,608
1,900	1,730
2,000	1,856
2,100	1,985
2,200	2,117
2,300	2,253

Intermediate quantities shall be computed by proportional parts.

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

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

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

RIO GRANDE COMPACT

ARTICLE V

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

ARTICLE VI

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

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

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

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

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

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

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

RIO GRANDE COMPACT COMMISSION REPORT

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

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

ARTICLE VII

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

ARTICLE VIII

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

ARTICLE IX

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

ARTICLE X

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

ARTICLE XI

New Mexico and Texas agree that upon the effective date of this Compact all controversies between said States relative to the quantity or quality of the water of the Rio Grande are composed and settled; however, nothing herein shall be interpreted to prevent

RIO GRANDE COMPACT

recourse by a signatory state to the Supreme Court of the United States for redress should the character or quality of the water, at the point of delivery, be changed hereafter by one signatory state to the injury of another. Nothing herein shall be construed as an admission by any signatory state that the use of water for irrigation causes increase of salinity for which the user is responsible in law.

ARTICLE XII

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

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

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

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

ARTICLE XIII

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

ARTICLE XIV

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

RIO GRANDE COMPACT COMMISSION REPORT

ARTICLE XV

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

ARTICLE XVI

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

ARTICLE XVII

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

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

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

(Sgd.) M. C. HINDERLIDER

(Sgd.) THOMAS M. McCLURE

(Sgd.) FRANK B. CLAYTON

APPROVED:

(Sgd.) S. O. HARPER

RATIFIED BY:

Colorado, February 21, 1939

New Mexico, March 1, 1939

Texas, March 1, 1939

Passed Congress as Public Act No. 96, 76th Congress,

Approved by the President May 31, 1939

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

RESOLUTION

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

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

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

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

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

Now, Therefore, Be it Resolved:

The Commission finds as follows:

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

Be it Further Resolved:

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

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

RIO GRANDE COMPACT COMMISSION REPORT

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

Quantities in thousands of acre-feet

Otowi Index Supply (5)	Elephant Butte Effective Index Supply (6)
100	57
200	114
300	171
400	228
500	286
600	345
700	406
800	471
900	542
1,000	621
1,100	707
1,200	800
1,300	897
1,400	996
1,500	1,095
1,600	1,195
1,700	1,295
1,800	1,395
1,900	1,495
2,000	1,595
2,100	1,695
2,200	1,795
2,300	1,895
2,400	1,995
2,500	2,095
2,600	2,195
2,700	2,295
2,800	2,395
2,900	2,495
3,000	2,595

Intermediate quantities shall be computed by proportional parts.

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

The application of this schedule shall be subject to the provisions hereinafter set forth and appropriate adjustments shall be made for (a) any change in location of gaging stations; (b) depletion after 1929 in New Mexico of the natural runoff at Otowi Bridge; and (c) any transmountain diversions into the Rio

RESOLUTION OF COMMISSION

Grande between Lobatos and Elephant Butte Reservoir."

Be it Further Resolved:

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

Be it Further Resolved:

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

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

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

RIO GRANDE COMPACT COMMISSION REPORT
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 1

Responsibility for the equipping, maintenance and operation of the stream gaging stations and reservoir gaging stations required by the provisions of Article II of the Compact shall be divided among the signatory States as follows:

(a) Gaging stations on streams and reservoirs in the Rio Grande Basin above the Colorado-New Mexico boundary shall be equipped, maintained, and operated by Colorado in cooperation with the U.S. Geological Survey.

(b) Gaging stations on streams and reservoirs in the Rio Grande Basin below Lobatos and above Caballo Reservoir shall be equipped, maintained and operated by New Mexico in cooperation with the U.S. Geological Survey to the extent that such stations are not maintained and operated by some other Federal agency.

(c) Gaging stations on Elephant Butte Reservoir and on Caballo Reservoir, and the stream gaging stations on the Rio Grande below those reservoirs shall be equipped, maintained and operated by or on behalf of Texas through the agency of the U.S. Bureau of Reclamation.

The equipment, method and frequency of measurements at each gaging station shall be sufficient to obtain records at least equal in accuracy to those classified as "good" by the U.S. Geological Survey. Water-stage recorders on the reservoirs specifically named in Article II of the Compact shall have sufficient range below maximum reservoir level to record major fluctuations in storage. Staff gages may be used to determine fluctuations below the range of the water-stage recorders on these and other large reservoirs, and staff gages may be used upon approval of the Commission in lieu of water-stage recorders on small reservoirs, provided that the frequency of observation is sufficient in each case to establish any material changes in water levels in such reservoirs.

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

RULES AND REGULATIONS

RESERVOIR CAPACITIES 1

Colorado shall file with the Commission a table of areas and capacities for each reservoir in the Rio Grande Basin above Lobatos constructed after 1937; New Mexico shall file with the Commission a table of areas and capacities for each reservoir in the Rio Grande Basin between Lobatos and San Marcial constructed after 1929; and Texas shall file with the Commission tables of areas and capacities for Elephant Butte Reservoir and for all other reservoirs actually available for the storage of water between Elephant Butte and the first diversion to lands under the Rio Grande Project.

Whenever it shall appear that any table of areas and capacities is in error by more than five per cent, the Commission shall use its best efforts to have a re-survey made and a corrected table of areas and capacities to be substituted as soon as practicable. To the end that the Elephant Butte effective supply may be computed accurately, the Commission shall use its best efforts to have the rate of accumulation and the place of deposition of silt in Elephant Butte Reservoir checked at least every three years.

ACTUAL SPILL 2

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

(b) Excess releases from Elephant Butte Reservoir, as defined in (a) above, shall be added to the quantity of water actually in storage in that reservoir, and Actual Spill shall be deemed to have commenced when this sum equals the total physical capacity of that reservoir, to the level of the uncontrolled spillway, i.e. -2,219,000 acre-ft in 1942.

(c) All water actually spilled at Elephant Butte Reservoir, or released therefrom, in excess of Project requirements, which is currently passed through Caballo Reservoir, after the time of spill, shall be considered as Actual Spill, provided that the total quantity of water then in storage in Elephant Butte Reservoir exceeds the physical capacity of that reservoir at the level of the sill of the spillway gates, i.e. -1,830,000 acre-ft in 1942.

(d) Water released from Caballo Reservoir in excess of Project requirements and in excess of water currently released from Elephant Butte Reservoir, shall be deemed Usable Water released, excepting only flood water entering Caballo Reservoir from tributaries below Elephant Butte Reservoir.

DEPARTURES FROM NORMAL RELEASES 3

For the purpose of computing the time of Hypothetical Spill required by Article VI and for the purpose of the adjustment set forth in Article VII, no allowance shall be made for the difference between Actual and Hypothetical Evaporation, and any under-release of usable water from Project Storage in excess of 150,000 acre-ft in any year shall be taken as equal to that amount.

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

2 Adopted at Fourth Annual Meeting, February 24, 1943.

3 Adopted June 2, 1959; made effective January 1, 1952.

RIO GRANDE COMPACT COMMISSION REPORT

EVAPORATION LOSSES 4, 5, 6

The Commission shall encourage the equipping, maintenance and operation, in cooperation with the U.S. Weather Bureau or other appropriate agency, of evaporation stations at Elephant Butte Reservoir and at or near each major reservoir in the Rio Grande Basin within Colorado constructed after 1937 and in New Mexico constructed after 1929. The net loss by evaporation from a reservoir surface shall be taken as the difference between the actual evaporation loss and the evapo-transpiration losses which would have occurred naturally, prior to the construction of such reservoir. Changes in evapo-transpiration losses along stream channels below reservoirs may be disregarded.

Net losses by evaporation, as defined above, shall be used in correcting Index Supplies for the operation of reservoirs upstream from Index Gaging Stations as required by the provisions of Article III and Article IV of the Compact.

In the application of the provisions of the last unnumbered paragraph of Article VI of the Compact:

(a) Evaporation losses for which accrued credits shall be reduced shall be taken as the difference between the gross evaporation from the water surface of Elephant Butte Reservoir and rainfall on the same surface.

(b) Evaporation losses for which accrued debits shall be reduced shall be taken as the net loss by evaporation as defined in the first paragraph.

ADJUSTMENT OF RECORDS

The Commission shall keep a record of the location, and description of each gaging station and evaporation station, and, in the event of change in location of any stream gaging station for any reason, it shall ascertain the increment in flow or decrease in flow between such locations for all stages. Wherever practicable, concurrent records shall be obtained for one year before abandonment of the previous station.

NEW OR INCREASED DEPLETIONS

In the event any works are constructed which alter or may be expected to alter the flow at any of the Index Gaging Stations mentioned in the Compact, or which may otherwise necessitate adjustments in the application of the schedules set forth in the Compact, it shall be the duty of the Commissioner specifically concerned to file with the Commission all available information pertaining thereto, and appropriate adjustments shall be made in accordance with the terms of the Compact; provided, however, that any such adjustments shall in no way increase the burden imposed upon Colorado or New Mexico under the schedules of deliveries established by the Compact.

TRANSMOUNTAIN DIVERSIONS

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

4 Amended at Tenth Annual Meeting, February 15, 1949.

5 Amended at Twelfth Annual Meeting, February 24, 1951.

6 Amended June 2, 1959.

RULES AND REGULATIONS

QUALITY OF WATER

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

SECRETARY 7

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

(1) Collect and correlate all factual data and other records having a material bearing on the administration of the Compact and keep each Commissioner advised thereof.

(2) Inspect all gaging stations required for administration of the Compact and make recommendations to the Commission as to any changes or improvements in methods of measurement or facilities for measurement which may be needed to insure that reliable records be obtained.

(3) Report to each Commissioner by letter on or before the fifteenth day of each month, except January, a summary of all hydrographic data then available for the current year - on forms prescribed by the Commission - pertaining to:

- (a) Deliveries by Colorado
- (b) Deliveries by New Mexico
- (c) Operation of Project Storage

(4) Make such investigations as may be requested by the Commission in aid of its administration of the Compact.

(5) Act as Secretary to the Commission and submit to the Commission at its regular meeting in February a report on its activities and a summary of all data needed for determination of debits and credits and other matters pertaining to administration of the Compact.

COSTS 1

In February of each year, the Commission shall adopt a budget for the ensuing fiscal year beginning July first.

Such budget shall set forth the total cost of maintenance and operating of gaging stations, of evaporation stations, the cost of engineering and clerical aid, and all other necessary expenses excepting the salaries and personal expenses of the Rio Grande Compact Commissioners.

Contributions made directly by the United States and the cost of services rendered by the United States without cost shall be deducted from the total budget amount; the remainder shall then be allocated equally to Colorado, New Mexico and Texas.

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

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

RIO GRANDE COMPACT COMMISSION REPORT

Expenditures made directly by any State for purposes set forth in the budget shall be credited to that State; contributions in cash or in services by any State under a cooperative agreement with any federal agency shall be credited to such State, but the amount of the federal contribution shall not so be credited; in event any State, through contractual relationships, causes work to be done in the interest of the Commission, such State shall be credited with the cost thereof, unless such cost is borne by the United States.

Costs incurred by the Commission under any cooperative agreement between the Commission and any U.S. Government Agency, not borne by the United States, shall be apportioned equally to each State, and each Commissioner shall arrange for the prompt payment of one-third thereof by his State.

The Commissioner of each State shall report at the annual meeting each year the amount of money expended during the year by the State which he represents, as well as the portion thereof contributed by all cooperating federal agencies, and the Commission shall arrange for such proper reimbursement in cash or credits between States as may be necessary to equalize the contributions made by each State in the equipment, maintenance and operation of all gaging stations authorized by the Commission and established under the terms of the Compact.

It shall be the duty of each Commissioner to endeavor to secure from the Legislature of his State an appropriation of sufficient funds with which to meet the obligations of his State, as provided by the Compact.

MEETING OF COMMISSION 1, 8

The Commission shall meet in Santa Fe, New Mexico, on the third Thursday of February of each year for the consideration and adoption of the annual report for the calendar year preceding, and for the transaction of any other business consistent with its authority; provided that the Commission may agree to meet elsewhere. Other meetings as may be deemed necessary shall be held at any time and place set by mutual agreement, for the consideration of data collected and for the transaction of any business consistent with its authority.

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

(Signed) M. C. HINDERLIDER

M. C. Hinderlider

Commissioner for Colorado

(Signed) THOMAS M. MCCLURE

Thomas M. McClure

Commissioner for New Mexico

(Signed) JULIAN P. HARRISON

Julian P. Harrison

Commissioner for Texas

Adopted December 19, 1939.

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

8 Amended at Thirteenth Annual Meeting, February 25, 1952.

RIO GRANDE COMPACT COMMISSION REPORT RECORDS OF DELIVERIES AND RELEASES

At the annual meeting of the Compact Commission on March 31, 1994, the records of deliveries and releases and computations of debits and credits for calendar year 1993 were reported. The records and computations as approved by the Commission are reproduced on the next three pages.

The delivery of water in the Rio Grande at the Colorado-New Mexico State line was obtained from the record of streamflow near Lobatos, Colorado; the scheduled delivery was computed as prescribed in Article III.

The delivery of water by New Mexico to Elephant Butte was computed from the record of streamflow below Elephant Butte Dam and the record of operation of Elephant Butte Reservoir; the scheduled delivery was computed as prescribed in the Resolution of the Commission adopted at the Ninth Annual Meeting held February 22-24, 1948, and published in this report.

The actual release from Project Storage during the year was measured at gaging stations below Caballo Dam. During 1993 the actual release of usable water exceeded the normal release of 790,000 acre-feet. The cumulative departure from normal release was computed from the time of actual spill in 1988. The actual release of usable water from 1989 through 1992 totalled 2,792,600 acre-feet after adjustment for the under-release in excess of 150,000 acre-feet for the year 1991. The accrued departure from normal release on December 31, 1992, was 367,400 acre-feet.

RIO GRANDE COMPACT: DELIVERIES BY COLORADO AT STATE LINE YEAR 1993

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Quantities in Thousands of Acre Feet to Nearest Hundred

Month	CONEJO INDEX SUPPLY										RIO GRANDE INDEX SUPPLY										DELIVERIES				
	MEASURED FLOW					ADJUSTMENTS					SUPPLY		ADJUSTMENTS							SUPPLY			Conchos River at Mojito near Los Sauces	Rio Grande Loss at Lobatos	Accumulated Total
	Conchos at Mojito	Los Pinos near Ortiz	San Antonio at Ortiz	Total	Storage at end of Month	Change in Storage	Other Adjustments	Net Adjustments	Supply in Month	Accumulated Total	Recorded Flow near Del Norte	Storage at end of Month	Change in Storage	Transfers to Diversion	Other Adjustments	Net Adjustment	Supply in Month	Accumulated Total							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
					21.7					0.0		0.0						0.0							
Jan	3.1			3.1	22.2	0.5		0.5	3.6	3.6	9.7	0.0	0.0			0.0	9.7	9.7	3.5	13.7	17.2	17.2			
Feb	2.7			2.7	22.7	0.5		0.5	3.2	6.8	8.5	0.0	0.0			0.0	8.5	18.2	4.1	14.1	18.2	35.4			
Mar	5.1			5.1	23.0	0.3		0.3	5.4	12.2	15.4	0.0	0.0			0.0	15.4	33.6	9.5	27.8	37.3	72.7			
Apr	15.6	10.0	7.5	33.1	21.2	-1.8	0.2 ^a	-1.6	31.5	43.7	30.9	0.0	0.0			0.0	30.9	64.5	24.2	15.5	39.7	112.4			
May	69.1	61.0	21.4	151.5	32.2	11.0	0.2 ^a	11.2	162.7	206.4	171.0	0.0	0.0			0.0	171.0	235.5	67.1	36.3	103.4	215.8			
Jun	89.8	35.3	2.5	127.6	50.8	18.6	0.2 ^a	18.8	146.4	352.8	200.8	0.0	0.0			0.0	200.8	436.3	51.1	35.9	87.0	302.8			
Jul	40.0	5.8	0.0	45.8	45.2	-5.6	0.2 ^a	-5.4	40.4	393.2	98.0	0.0	0.0	-0.8 ^b	0.3 ^a	-0.5	97.5	533.8	8.0	12.0	20.0	322.8			
Aug	19.0	2.6	0.1	21.7	43.2	-2.0		-2.0	19.7	412.9	40.1	0.0	0.0			0.0	40.1	573.9	4.4	6.2	10.6	333.4			
Sep	15.0	1.8	0.1	16.9	39.9	-3.3		-3.3	13.6	426.5	37.1	0.0	0.0			0.0	37.1	611.0	11.1	10.4	21.5	354.9			
Oct	6.5	1.4	0.2	8.1	38.8	-1.1		-1.1	7.0	433.5	20.9	0.0	0.0			0.0	20.9	631.9	1.0	7.6	8.6	363.5			
Nov	3.8			3.8	39.0	0.2		0.2	4.0	437.5	12.4	0.0	0.0			0.0	12.4	644.3	3.2	12.3	15.5	379.0			
Dec	3.3			3.3	39.1	0.1		0.1	3.4	440.9	10.8	0.0	0.0			0.0	10.8	655.1	4.1	16.6	20.7	399.7			
Year	273.0	117.9	31.8	422.7		17.4	0.8	18.2	440.9		655.6		0.0	-0.8	0.3	-0.5	655.1		191.3	208.4	399.7 ^c				

SUMMARY OF DEBITS AND CREDITS			
ITEM	Debit	Credit	Balance
C1	Balance at Beginning of Year		Cy 70.9
C2	Scheduled Delivery from Conchos River	224.0	Dr 153.1
C3	Scheduled Delivery from Rio Grande	184.2	Dr 337.3
C4	Actual Delivery at Lobatos plus 10,000 Acre Feet		Cy 72.4
C5	Reduction of Debits due Evaporation		
C6	Reduction of Credits due Evaporation	7.1	
C7			Cy 63.3
C8	Balance at End of Year		Cy 63.3

Remarks:
Col. 6 does not include transmountain water.

a Evaporation loss from post-compact reservoir; report of Eng. Adv. for Colorado

b 1,093 ac-ft minus 243 ac-ft pre-compact; report of Eng. Adv. for Colorado

c All Closed Basin Project deliveries were creditable (31,380 ac-ft)

Remarks:

Col. 6 does not include transmountain water.

^a Evaporation loss from post-compact reservoir; report of Eng. Adv. for Colorado

^b 1,093 ac-ft minus 243 ac-ft pre-compact; report of Eng. Adv. for Colorado

^c All Closed Basin Project deliveries were creditable (31,380 ac-ft)

ITEM		Debit	Credit	Balance
C1	Balance at Beginning of Year			Cr 70.9
C2	Scheduled Delivery from Conchos River	224.0		Dr 153.1
C3	Scheduled Delivery from Rio Grande	184.2		Dr 337.3
C4	Actual Delivery at Lobatos plus 10,000 Acre Feet		409.7	Cr 72.4
C5	Reduction of Debits due to Evaporation			
C6	Reduction of Credits due to Evaporation	7.1		Cr 63.3
C7				
C8	Balance at End of Year			Cr 63.3

SUMMARY OF DEBITS AND CREDITS

RIO GRANDE COMPACT: DELIVERIES BY NEW MEXICO AT ELEPHANT BUTTE YEAR 1993

Quantities in Thousands of Acre Feet to Nearest Hundred

Month	OTOWI INDEX SUPPLY										ELEPHANT BUTTE EFFECTIVE SUPPLY									
	ADJUSTMENTS					INDEX SUPPLY					STORAGE IN ELEPHANT BUTTE RESERVOIR					Effective Supply				
	RESERVOIRS: LOBATOS to OTOWI					Total water Stored in New Mexico Above San Marcial at End of Month					Recorded Flow Below Elephant Butte Dam					Accumulated Total				
	Storage End of Month	Change in Storage	Reservoir Evaporation	Other Adjustments	Trans- mountain Diversion	Net Adjustments	During Month				End of Month	Change Gain(+) Loss(-)	During Month				During Month			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16					
Jan	55.4	0.5	0.0			-2.6	-2.6	52.8	52.8	2.3	1813.2									
Feb	63.3	0.6	0.1			-0.3	-0.3	63.0	115.8	4.8	1868.0	-8.9	63.3	54.4	118.6					
Mar	95.9	35.9	35.3	0.1		-1.9	33.5	129.4	245.2	38.1	1836.6	-31.4	117.5	86.1	204.7					
Apr	184.5	47.0	11.1	0.3		0.3	11.7	196.2	441.4	50.7	1846.3	9.7	139.2	148.9	353.6					
May	339.3	163.1	116.1	0.7		0.4	117.2	456.5	897.9	207.9	1923.2	76.9	145.0	221.9	575.5					
Jun	286.0	152.7	-10.4	2.2		0.0	-8.2	277.8	1175.7	159.6	1968.0	44.8	203.9	248.7	824.2					
Jul	100.2	119.5	-33.2	1.8		-9.1	-40.5	59.7	1235.4	119.7	1872.3	-95.7	148.3	52.6	876.8					
Aug	74.6	99.6	-19.9	0.4		-5.4	-24.9	49.7	1285.1	101.0	1775.4	-96.9	144.3	47.4	924.2					
Sep	79.0	91.5	-8.1	0.8		-4.5	-11.8	67.2	1352.3	92.0	1725.5	-49.9	85.0	35.1	959.3					
Oct	51.4	82.8	-8.7	0.6		-10.7	-18.8	32.6	1384.9	83.1	1734.9	9.4	0.5	9.9	969.2					
Nov	74.9	58.2	-24.6	0.3		-0.3	-24.6	50.3	1455.2	58.7	1794.9	60.0	0.4	60.4	1029.6					
Dec	76.5	37.8	-20.4	0.1		-2.0	-22.3	54.2	1489.4	38.2	1865.4	70.5	0.1	70.6	1100.2					
Year	1481.0		37.3	7.4		-36.3	8.4	1489.4				52.2	1048.0	1100.2						

REMARKS:

Storage in recreational reservoirs not included

Cols. 3, 11, and 12 do not include transmountain water

SUMMARY OF DEBITS AND CREDITS

ITEM		Debit	Credit	Balance
NM1	Balance at Beginning of Year			Cr 165.7
NM2	Scheduled Delivery at Elephant Butte	1084.5		Dr 918.8
NM3	Actual Elephant Butte Effective Supply		1100.2	Cr 131.4
NM4	Reduction of Debits due to Evaporation			
NM5	Reduction of Credits due to Evaporation	16.3		Cr 164.9
NM6				
NM7	Balance at End of Year			Cr 164.9

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RIO GRANDE COMPACT- RELEASE AND SPILL FROM PROJECT STORAGE YEAR 1993

Quantities in Thousands of Acre Feet to Nearest Hundred

Month	Total Project Storage Capacity Available as of Month				Unusable Water in Storage		Unfilled Capacity of Project Storage as of Month	Credit Water in Storage			Flood Water in Storage in Caballo Reservoir at end of Month	Total Water in Project Storage at end of Month		Rio Grande below Caballo Dam			
	1	2	3	4	5	6		Colorado Credit Water	New Mexico Credit Water	Total at end of Month				Measured Flow at Caballo Gaging Station	Intervening Diversion to Canals	Total Release and Spill	Spill from Storage
Jan		a	1742.7	34.6	1777.3		21.0	49.5	70.5		10	11	1847.8	—	—	—	19
Feb			1640.7	36.2	1676.9		70.8	165.4	236.2			1913.1	5.9	5.9	0.0	5.9	5.9
Mar			1632.7	67.1	1699.8		70.5	164.8	235.3			1935.1	29.7	29.7	0.0	29.7	29.7
Apr			1603.2	64.4	1667.6		69.9	163.5	233.4			1901.0	117.8	117.8	0.1	117.9	117.9
May			1616.0	95.3	1711.3		69.0	161.3	230.3			1941.6	102.6	102.6	0.0	102.6	102.6
Jun			1696.2	122.2	1818.4		68.0	159.0	227.0			2045.4	106.8	106.8	0.1	106.9	106.9
Jul			1745.1	177.6	1922.7		66.8	156.1	222.9			2145.6	126.7	126.7	0.1	126.8	126.8
Aug			1652.8	190.8	1843.6		65.8	153.7	219.5			2063.1	123.3	123.3	0.1	123.4	123.4
Sep			1556.9	222.0	1778.9		65.5	153.0	218.5			1997.4	108.7	108.7	0.0	108.7	108.7
Oct			1509.3	230.7	1740.0		64.8	151.4	216.2			1956.2	73.7	73.7	0.1	73.8	73.8
Nov			1520.3	201.6	1721.9		64.3	150.3	214.6			1936.5	27.0	27.0	0.0	27.0	27.0
Dec			1581.3	200.3	1781.6		64.0	149.6	213.6			1995.2	0.6	0.6	0.0	0.6	0.6
Year			1652.4	199.9	1852.3		63.8	149.2	213.0			2065.3	0.5	0.5	0.0	0.5	0.5
													823.3		0.5	823.8	823.8

REMARKS:	
a	Determination of project storage capacity not made, see Engineer Advisor's report
b	Refer to report of Engineer Advisor for 1993 for computation used to determine accrued departure at beginning of year

Accrued Departure from Normal Release	
ITEM	Balance
P1	Accrued Departure at Beginning of Year
P2	Actual Release during Year
P3	Normal Release for Year
P4	Actual Evaporation from Elephant Butte Reservoir
P5	Evaporation Loss if No Accrued Departure
P6	
P7	Accrued Departure at End of Year
	Time of Hypothetical Spill - Did not occur

COST OF OPERATION FOR FISCAL YEAR ENDING JUNE 30, 1993

Item	Total Cost	Borne by United States	Borne by		
			Colorado	New Mexico	Texas
GAGING STATIONS					
In Colorado	\$37,700	\$4,550	\$33,150		
In New Mexico, above Caballo Reservoir	\$46,830	\$27,380		\$19,450	
In New Mexico, Caballo Reservoir and below	\$13,520	\$2,120		\$1,400	\$10,000
Subtotal	\$98,050	\$34,050	\$33,150	\$20,850	\$10,000
ADMINISTRATION					
U.S.G.S. Contract	\$18,580	\$4,645	\$4,645	\$4,645	\$4,645
Other expense	\$3,333		\$1,111	\$1,111	\$1,111
Subtotal	\$21,913	\$4,645	\$5,756	\$5,756	\$5,756
GRAND TOTAL	\$119,963	\$38,695	\$38,906	\$26,606	\$15,756
EQUAL SHARES			\$27,089	\$27,089	\$27,089

BUDGET FOR FISCAL YEAR ENDING JUNE 30, 1995

Item	Total Cost	Borne by United States	Borne by		
			Colorado	New Mexico	Texas
GAGING STATIONS					
In Colorado	\$46,067	\$5,050	\$41,017		
In New Mexico, above Caballo Reservoir	\$51,630	\$29,720		\$21,910	
In New Mexico, Caballo Reservoir and below	\$18,314	\$2,753		\$1,580	\$13,981
Subtotal	\$116,011	\$37,523	\$41,017	\$23,490	\$13,981
ADMINISTRATION					
U.S.G.S. Contract	\$20,489	\$4,880	\$5,203	\$5,203	\$5,203
Other expense	\$1,950		\$650	\$650	\$650
Subtotal	\$22,439	\$4,880	\$5,853	\$5,853	\$5,853
GRAND TOTAL	\$138,450	\$42,403	\$46,870	\$29,343	\$19,834
EQUAL SHARES			\$32,016	\$32,016	\$32,016

ACKNOWLEDGMENTS

This report was prepared by the U.S. Geological Survey, secretary to the Rio Grande Compact Commission. The water-supply data contained in this report have been provided by various Federal and State agencies.

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

- Rio Grande near Del Norte, Colo.
- Conejos River below Platoro Reservoir, Colo.
- Conejos River near Mogote, Colo.
- San Antonio River at Ortiz, Colo.
- Los Pinos River near Ortiz, Colo.
- Conejos River near Lasauces, Colo.
- Rio Grande near Lobatos, Colo.

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

The U.S. Bureau of Reclamation, Albuquerque, N. Mex., provided the following records:

- Storage in Platoro Reservoir at Platoro, Colo.
- Azotea tunnel at outlet, near Chama, N. Mex.
- Willow Creek above Heron Res., near Los Ojos, N. Mex.
- Horse Lake Creek above Heron Res., near Los Ojos, N. Mex.
- Storage in Heron Reservoir near Los Ojos, N. Mex.
- Willow Creek below Heron Dam, N. Mex.
- Storage in El Vado Reservoir near Tierra Amarilla, N. Mex.
- Storage in Nambe Falls Reservoir near Nambe, N. Mex.
- Rio Nambe below Nambe Falls Dam, near Nambe, N. Mex.

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

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

The U.S. Geological Survey, in cooperation with the Corps of Engineers, Albuquerque, N. Mex., also provided the following records:

- Rio Chama below Abiquiu Dam, N. Mex.
- Rio Grande below Cochiti Dam, N. Mex.
- Galisteo Creek below Galisteo Dam, N. Mex.
- Jemez River below Jemez Canyon Dam, N. Mex.

The Corps of Engineers, Albuquerque, N. Mex., provided the records of storage in Abiquiu, Galisteo, and Jemez Canyon Reservoirs and in Cochiti Lake.

The Southern Pueblos Agency, Bureau of Indian Affairs, Albuquerque, N. Mex., supplied the records of storage in Acomita Reservoir.

The Laguna Agency, Bureau of Indian Affairs, Laguna, N. Mex., supplied the records of storage in Seama Reservoir.

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

- Storage in Elephant Butte Reservoir at Elephant Butte, N. Mex.
- Storage in Caballo Reservoir near Arrey, N. Mex.
- Rio Grande below Caballo Dam, N. Mex.
- Bonito ditch below Caballo Dam, N. Mex.

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

RIO GRANDE COMPACT COMMISSION REPORT ACCURACY OF RECORDS

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

The accuracy of streamflow records depends primarily on (1) the stability of the stage-discharge relation or, if the control is unstable, the frequency of discharge measurements, and (2) the accuracy of observations of stage, measurements of discharge, and interpretation of records.

The station description states the degree of accuracy attributed to the records. "Excellent" means that about 95 percent of the daily discharges are within 5 percent of the true value; "good" within 10 percent; and "fair" within 15 percent. Records that do not meet the criteria mentioned are rated "poor." Different accuracies may be attributed to different parts of a given record. The probable error in a monthly or annual mean discharge depends more on the distribution of the daily errors between the limits than it does on the limits themselves. For this reason, monthly and annual records are more accurate than most daily records.

STREAMFLOW

Rio Grande near Del Norte, Colo.

Location.—Water-stage recorder, lat 37°41'22", long 106°27'38", in NW1/4 sec. 29, T. 40 N., R. 5 E., on right bank, 20 ft downstream from county highway bridge, 6 miles west of Del Norte, and 18 miles upstream from Pinos Creek. Datum of gage is 7,980.25 ft above mean sea level, datum of 1929. Prior to May 16, 1908, staff gage at site 4 miles downstream. Records are equivalent.

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

Average discharge.—104 years (1890-1993), 903 ft³/s (654,200 acre-ft per year).

Extremes.—1889-1993: Maximum discharge, 18,000 ft³/s Oct. 5, 1911 (gage height, 6.80 ft), from rating curve extended above 12,900 ft³/s; minimum daily, 69 ft³/s Aug. 21, 1902.

Remarks.—Records good except those for winter months, which are fair. Flow regulated by four reservoirs, total capacity 126,100 acre-ft, and by several smaller ones. Six transmountain diversions import water into basin above station.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	4,910	190	120	158	9,740
February	4,280	180	130	153	8,490
March	7,779	428	150	251	15,430
April	15,560	1,440	267	519	30,860
May	86,209	5,140	999	2,781	171,000
June	101,240	4,430	2,470	3,375	200,800
July	49,391	2,730	721	1,593	97,970
August	20,213	2,450	336	652	40,090
September	18,706	1,230	314	624	37,100
October	10,529	417	284	340	20,880
November	6,266	362	115	209	12,430
December	5,450	240	120	176	10,810
Calendar year 1993	330,533	5,140	115	906	655,600

Conejos River below Platoro Reservoir, Colo.

Location.—Water-stage recorder and concrete control, lat 37°21'18", long 106°32'37", in NW1/4NW1/4 sec. 22, T. 36 N., R. 4 E., on left bank 1,100 ft downstream from valve house for Platoro Reservoir, and 0.7 mile northwest of Platoro. Datum of gage is 9,866.60 ft above mean sea level (levels by Bureau of Reclamation).

Drainage area.—40 sq mi, approximately.

Average discharge.—41 years (1890-1993), 92.7 ft³/s (67,160 acre-ft per year).

Extremes.—1952-93: Maximum discharge, 1,160 ft³/s Nov. 1, 1957; maximum gage height, 4.29 ft June 15, 1958; no flow Oct. 16-20, 1955.

Remarks.—Records good except those for winter months, which are fair. No diversions above station. Flow completely regulated by Platoro Reservoir (capacity, 59,570 acre-ft).

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	168.5	5.5	5.4	5.44	334
February	155.7	5.6	5.5	5.56	309
March	176.6	5.8	5.6	5.70	350
April	1,887.4	299	5.8	62.9	3,740
May	4,021	297	40	130	7,980
June	9,742	772	29	325	19,320
July	10,508	792	219	339	20,840
August	4,510	453	80	145	8,950
September	3,476	625	20	116	6,890
October	1,269	56	24	40.9	2,520
November	252.1	21	5.8	8.40	500
December	294.5	9.5	9.5	9.50	584
Calendar year 1993	36,460.8	792	5.4	99.9	72,320

RIO GRANDE COMPACT COMMISSION REPORT

Conejos River near Mogote, Colo.

Location.—Water-stage recorder, lat 37°03'14", long 106°11'13", in SE1/4SE1/4 sec. 34, T. 33 N., R. 7 E., on right bank 25 ft upstream from bridge on State Highway 174, 0.4 mile downstream from Fox Creek, and 5.3 miles west of Mogote. Datum of gage is 8,271.54 ft above mean sea level.

Drainage area.—282 sq mi.

Average discharge.—83 years (1904, 1912-93), 330 ft³/s (239,100 acre-ft per year).

Extremes.—1903-05, 1911-93: Maximum discharge, 9,000 ft³/s Oct. 5, 1911 (gage height, 8.50 ft), from rating curve extended above 3,100 ft³/s; minimum daily determined, 10 ft³/s July 18, 1904.

Remarks.—Records good except those for winter months, which are fair. Diversions above station for irrigation of about 500 acres. Since 1951 flow partly regulated by Platoro Reservoir.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	1,548	58	41	49.9	3,070
February	1,379	58	42	49.2	2,740
March	2,553	148	48	82.4	5,060
April	7,857	827	95	262	15,580
May	34,823	2,070	450	1,123	69,070
June	45,298	1,890	924	1,510	89,850
July	20,171	1,600	340	651	40,010
August	9,568	817	175	309	18,980
September	7,541	897	93	251	14,960
October	3,259	117	83	105	6,460
November	1,933	102	32	64.4	3,830
December	1,688	70	32	54.5	3,350
Calendar year 1993	137,618	2,070	32	377	273,000

San Antonio River at Ortiz, Colo.

Location.—Water-stage recorder, lat 36°59'35", long 106°02'17", in New Mexico in NE1/4SE1/4, sec. 24, T. 32 N., R. 8 E., on left bank 800 ft south of New Mexico-Colorado State line, 0.4 mile southeast of Ortiz, and 0.4 mile upstream from Los Pinos River. Altitude of gage is 7,970 ft.

Drainage area.—110 sq mi.

Average discharge.—53 years (1941-93), 25.9 ft³/s (18,760 acre-ft per year).

Extremes.—1920, 1925-93: Maximum discharge, 1,750 ft³/s Apr. 15, 1937 (gage height, 5.38 ft), from rating curve extended above 1,100 ft³/s; no flow at times.

Remarks.—Records good except those for winter months, which are fair. A few small diversions above station for irrigation.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	145.9	5.6	3.2	4.71	289
February	115.6	5.6	3.0	4.13	229
March	325.6	21	3.7	10.5	646
April	3,775	428	18	126	7,490
May	10,807	618	154	349	21,440
June	1,239.0	142	4.7	41.3	2,460
July	24.32	3.8	.00	.78	48
August	46.86	14	.00	1.51	93
September	37.63	5.4	.15	1.25	75
October	76.6	5.7	1.0	2.47	152
November	109.3	7.1	1.4	3.64	217
December	78.6	3.2	1.7	2.54	156
Calendar year 1993	16,781.41	618	.00	46.0	33,290

STREAMFLOW

Los Pinos River near Ortiz, Colo.

Location.—Water-stage recorder, lat 36°58'56", long 106°04'23", in New Mexico on line between secs. 26 and 27, T. 32 N., R. 8 E., on left bank 0.9 mile south of New Mexico-Colorado State line, 2.1 miles southwest of Ortiz, and 2.9 miles upstream from mouth. Altitude of gage is 8,040 ft.

Drainage area.—167 sq mi.

Average discharge.—75 years (1915-20, 1925-93), 121 ft³/s (87,660 acre-ft per year).

Extremes.—1915-20, 1925-93: Maximum discharge, 3,160 ft³/s May 12, 1941 (gage height, 5.77 ft, site and datum then in use), from rating curve extended above 1,600 ft³/s; minimum observed, 4.0 ft³/s Dec. 17, 1945.

Remarks.—Records good except those for winter months, which are fair. Diversions above station for irrigation.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	499	19	12	16.1	990
February	486	21	13	17.4	964
March	1,317	88	19	42.5	2,610
April	5,034	604	45	168	9,980
May	30,786	1,570	356	993	61,060
June	17,820	1,190	307	594	35,350
July	2,905	268	26	93.7	5,760
August	1,308	220	20	42.2	2,590
September	903	71	18	30.1	1,790
October	693	30	17	22.4	1,370
November	720	31	14	24.0	1,430
December	569	22	14	18.4	1,130
Calendar year 1993	63,040	1,570	12	173	125,000

Conejos River near Lasauces, Colo.

Location.—Water-stage recorders, lat 37°18'01", long 105°44'47", in secs. 2 and 11 (two channels), T. 35 N., R. 11 E., on left bank of main channel 125 feet downstream from bridge on State Highway 158 and on left bank of secondary channel 230 ft upstream from bridge, 1.0 mile upstream from mouth, and 2.1 miles north of Lasauces. Datum of gage on main channel is 7,495.02 ft and on secondary (south) channel is 7,496.89 ft above mean sea level (levels by Bureau of Reclamation).

Drainage area.—887 sq mi.

Average discharge.—72 years (1922-93), 185 ft³/s (134,000 acre-ft per year).

Extremes.—1921-93: Maximum discharge, 3,890 ft³/s May 15, 1941; no flow at times in some years.

Remarks.—Records good except those for winter months, which are fair. Diversions for irrigation of about 75,000 acres above station.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	1,780	72	49	57.4	3,530
February	2,046	87	62	73.1	4,060
March	4,787	283	89	154	9,500
April	12,215	1,180	183	407	24,230
May	33,850	2,110	271	1,092	67,140
June	25,773	1,610	375	859	51,120
July	4,060	748	14	131	8,050
August	2,200.5	495	9.5	71.0	4,360
September	5,579	647	13	186	11,070
October	480	22	12	15.5	952
November	1,603	82	30	53.4	3,180
December	2,065	77	60	66.6	4,100
Calendar year 1993	96,438.5	2,110	9.5	264	191,300

RIO GRANDE COMPACT COMMISSION REPORT

Rio Grande near Lobatos, Colo.

Location.—Water-stage recorder, lat 37°04'42", long 105°45'22", in sec. 22, T. 33 N., R. 11 E., on right bank at highway bridge, 6 miles north of Colorado-New Mexico State line, 10 miles east of Lobatos, and 14 miles east of Antonito. Datum of gage is 7,427.63 ft above mean sea level, datum of 1929.

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

Average discharge.—31 years (1900-30), 846 ft³/s (612,900 acre-ft per year); 63 years (1931-93) 448 ft³/s (324,600 acre-ft per year).

Extremes.—1899-1993: Maximum discharge observed, 13,200 ft³/s June 8, 1905 (gage height, 9.1 ft), from rating curve extended above 8,000 ft³/s; no flow at times in 1950-51, 1956.

Remarks.—Records good except those for winter months, which are fair. Natural flow of stream affected by transmountain diversions, storage reservoirs, ground-water withdrawals and diversions for irrigation, and return flow from irrigated areas.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	8,670	310	250	280	17,200
February	9,180	360	290	328	18,210
March	18,788	919	370	606	37,270
April	19,999	1,300	458	667	39,670
May	52,109	3,850	583	1,681	103,400
June	43,889	2,770	846	1,463	87,050
July	10,069	1,170	100	325	19,970
August	5,362	945	85	173	10,640
September	10,835	1,180	125	361	21,490
October	4,343	223	101	140	8,610
November	7,812	374	204	260	15,500
December	10,460	430	300	337	20,750
Calendar year 1993	201,516	3,850	85	552	399,700

Willow Creek above Heron Reservoir, near Los Ojos, N. Mex.

Location.—Water-stage recorder, lat 36°44'33", long 106°37'34", in Tierra Amarilla Grant, on right bank 200 ft downstream from bridge, 0.2 mile downstream from Iron Spring Creek, 3.3 miles west of Los Ojos, and at mile 9.7. Datum of gage is 7,196.29 ft above mean sea level. Prior to Apr. 1, 1971, at site 900 ft downstream.

Drainage area.—112 sq mi.

Average discharge.—7 years (1963-69), 11.5 ft³/s (8,330 acre-ft per year) prior to completion of Azotea tunnel; 24 years (1970-93), 138 ft³/s (100,000 acre-ft per year) subsequent to completion of Azotea tunnel.

Extremes.—1962-93: Maximum discharge, 1,610 ft³/s Mar. 12, 1985 (gage height, 6.65 ft); no flow at times prior to 1971.

Remarks.—Records good except those for winter months, which are fair. Subsequent to Nov. 16, 1970, flow affected by transmountain diversions through Azotea tunnel. Flow in Rutheron Drain included prior to Apr. 1, 1971.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	54.0	3.5	.50	1.74	107
February	172.9	15	2.5	6.17	343
March	5,677	488	12	183	11,260
April	8,864	802	82	295	17,580
May	22,722	1,000	302	733	45,070
June	18,271	851	155	609	36,240
July	1,505	125	19	48.5	2,990
August	1,631.5	620	.00	52.6	3,240
September	943.0	263	.00	31.4	1,870
October	3.0	.50	.00	.097	6.0
November	37.82	10	.25	1.26	75
December	11.30	.50	.00	.36	22
Calendar year 1993	59,892.52	1,000	.00	164	118,800

STREAMFLOW

Horse Lake Creek above Heron Reservoir, near Los Ojos, N. Mex.

Location.—Water-stage recorder, lat 36°42'24", long 106°44'42", in Tierra Amarilla Grant, on right bank 3.7 miles northwest of Heron Dam, 7.8 miles downstream from Horse Lake, and 9.9 miles west of Los Ojos. Datum of gage is 7,188.85 ft above mean sea level. Prior to July 1, 1971, at site 1,100 ft upstream.

Drainage area.—45 sq mi, approximately.

Average discharge.—12 years (1963-73, 86), 1.17 ft³/s (848 acre-ft per year).

Extremes.—1963-93: Maximum discharge, 3,960 ft³/s July 30, 1968 (gage height, 4.9 ft); no flow most of time.

Remarks.—Records good. Diversions above station for irrigation of meadows and for off-channel stock tanks.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	—	—	—	—	—
February	—	—	—	—	—
March	—	—	—	—	—
April	777.3	66	4.5	25.9	1,540
May	99.9	7.4	1.2	3.22	198
June	6.53	1.0	.00	.22	13
July	0.00	.00	.00	.000	.00
August	1.01	1.0	.00	.033	2.0
September	1.43	1.4	.00	.048	2.8
October	0.00	.00	.00	.000	.00
November	—	—	—	—	—
December	—	—	—	—	—
Calendar year 1993	886.17	66	.00	4.16	1,760

Willow Creek below Heron Dam, N. Mex.

Location.—Totalizing flowmeters, lat 36°39'56", long 106°42'12", in Tierra Amarilla Grant, in outlet conduits at Heron Dam, 0.2 mile upstream from Rio Chama, 5.1 miles northeast of El Vado Dam, and 8.7 miles southwest of Los Ojos.

Drainage area.—193 sq mi.

Average discharge.—23 years (1971-93) 115 ft³/s (83,320 acre-ft per year).

Extremes.—1971-93: Maximum daily discharge, 2,780 ft³/s Dec. 18, 19, 1982; no flow at times each year.

Remarks.—Records excellent. Flow completely regulated by Heron Dam.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	0.00	.00	.00	.000	.00
February	664.00	56	.00	23.7	1,320
March	32,364.00	1,500	.00	1,044	64,190
April	19,474.00	1,430	.00	649	38,630
May	0.00	.00	.00	.000	.00
June	0.00	.00	.00	.000	.00
July	1,728.00	337	.00	55.7	3,430
August	4,336.00	506	.00	140	8,600
September	1,242.00	502	.00	41.4	2,460
October	0.00	.00	.00	.000	.00
November	269.00	.00	.00	.000	.00
December	0.00	.00	.00	.000	.00
Calendar year 1993	59,808.00	1,500	.00	164	118,600

RIO GRANDE COMPACT COMMISSION REPORT

Rio Chama below El Vado Dam, N. Mex.

Location.—Water-stage recorder, lat 36°34'48", long 106°43'24", in Tierra Amarilla Grant, on left bank 1.5 miles downstream from El Vado Dam, 2.8 miles upstream from Rio Nutrias, and 13 miles southwest of Tierra Amarilla. Datum of gage is 6,696.12 ft above mean sea level, datum of 1929. Prior to October 1935, at site 1.5 miles upstream and October 1935 to September 1938, at site 1.1 miles upstream at different datums.

Drainage area.—877 sq mi of which about 100 sq mi is probably noncontributing.

Average discharge.—4 years (1914, 1921-23), 444 ft³/s (321,700 acre-ft per year) prior to completion of El Vado Dam; 35 years (1936-70), 372 ft³/s (269,500 acre-ft per year), prior to release of transmountain water; 23 years (1971-93) 479 ft³/s (347,000 acre-ft per year).

Extremes.—1914-16, 1920-24, 1936-93: Maximum discharge observed, 9,000 ft³/s May 22, 1920 (gage height, 12 ft); no flow Mar. 25, 26, 31, 1955.

Remarks.—Records good. Diversions above station for irrigation of about 10,600 acres. Since 1935 flow regulated by El Vado Reservoir and since October 1970 flow partly regulated by Heron Reservoir. Subsequent to May 1971 flow affected by releases of transmountain water from Heron Reservoir.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	7,550	307	186	244	14,980
February	8,510	332	271	304	16,880
March	13,990	981	256	451	27,750
April	45,618	2,190	705	1,521	90,480
May	74,147	3,870	828	2,392	147,100
June	41,680	2,870	713	1,389	82,670
July	17,756	991	266	573	35,220
August	19,956	1,010	430	644	39,580
September	8,897	490	236	297	17,650
October	5,965	236	176	192	11,830
November	5,800	214	176	193	11,500
December	6,409	218	190	207	12,710
Calendar year 1993	256,278	3,870	176	702	508,300

Rio Chama below Abiquiu Dam, N. Mex.

Location.—Water-stage recorder, lat 36°14'12", long 106°24'59", in SE1/4SE1/4 sec. 8, T. 23 N., R. 5 E., on right bank 0.8 mile downstream from Abiquiu Dam and 5.9 miles northwest of Abiquiu. Altitude of gage is 6,040 ft (from river-profile map and topographic map).

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

Average discharge.—9 years (1962-70), 376 ft³/s (272,400 acre-ft per year), prior to release of transmountain water; 23 years (1971-93), 533 ft³/s (386,200 acre-ft per year).

Extremes.—1961-93: Maximum discharge, 2,990 ft³/s July 1, 1965 (gage height, 6.69 ft); minimum, about 0.5 ft³/s Mar. 17, 1966, Jan. 28, 1972.

Remarks.—Records good. Flow regulated by Heron, El Vado, and Abiquiu Reservoirs. Diversions above station for irrigation of about 17,600 acres. Subsequent to May 1971 flow affected by the release of transmountain water from Heron Reservoir.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	6,258	366	120	202	12,410
February	6,281	632	117	224	12,460
March	7,275	672	75	235	14,430
April	42,363	1,840	186	1,412	84,030
May	51,334	1,780	650	1,656	101,800
June	52,890	1,870	1,700	1,763	104,900
July	26,685	1,790	310	861	52,930
August	18,174	867	104	586	36,050
September	9,843	438	208	328	19,520
October	11,596	601	212	374	23,000
November	14,976	530	446	499	29,700
December	13,849	585	150	447	27,470
Calendar year 1993	261,524	1,870	75	717	518,700

STREAMFLOW

Rio Nambe below Nambe Falls Dam, near Nambe, N. Mex.

Location.—Totalizing flowmeters, lat 35°50'46", long 105°54'17", in NE1/4SW1/4 sec. 29, T.19 N., R.10 E., in Nambe Indian Reservation, in outlet conduits at Nambe Falls Dam, 300 feet upstream from Nambe Falls, 2.6 miles upstream from confluence of Rio Nambe and Rio En Medio, 4.4 miles southeast of Nambe Pueblo, and 5.4 miles southeast of Nambe.

Drainage area.—34.1 sq mi.

Average discharge.—15 years (1979-93), 16.2 ft³/s (11,740 acre-feet per year).

Extremes.—1979-93: Maximum discharge, 312 ft³/s June 9, 1979 (gage height, 1.96 feet), at site 1,100 feet downstream; no flow December 31, 1993.

Remarks.—Records good. Flow completely regulated by Nambe Falls Reservoir.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	92.2	4.6	1.7	2.97	183
February	130.0	5.0	4.6	4.64	258
March	438.2	23	4.6	15.6	958
April	647	42	14	21.6	1,280
May	1,262.0	101	2.0	40.7	2,500
June	1,684	104	37	56.1	3,340
July	740	33	16	23.9	1,470
August	235.9	25	1.0	7.61	468
September	244.8	12	1.9	8.16	486
October	403.5	17	8.5	13.0	800
November	81.60	7.1	.80	2.72	162
December	64.90	3.5	.00	2.09	129
Calendar year 1993	6,069.10	104	.00	16.6	12,040

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

Location.—Water-stage recorder, lat 35°52'29", long 106°08'30", in San Ildefonso Pueblo Grant, 400 ft downstream from bridge on State Highway 4, 1.8 miles southwest of San Ildefonso Pueblo, 2.5 miles downstream from Pojoaque River, and 6.8 miles west of Pojoaque. Datum of gage is 5,488.48 ft above mean sea level, datum of 1929. Prior to May 19, 1904, and July 25 to Oct. 1, 1904, staff gage at site 180 ft upstream at datum 2.02 ft lower.

Drainage area.—14,300 sq mi, approximately (includes 2,940 sq mi in closed basin in San Luis Valley, Colo.).

Average discharge.—94 years (1896-1905, 1910-93), 1,537 ft³/s (1,114,000 acre-ft per year).

Extremes.—1895-1905, 1910-93: Maximum discharge, 24,400 ft³/s May 23, 1920 (gage height, 14.1 ft); minimum daily, 60 ft³/s July 4, 5, 1902.

Remarks.—Records good. Flow partly regulated by Heron, El Vado, and Abiquiu Reservoirs. Diversions above station for irrigation of about 620,000 acres in Colorado and 75,000 acres in New Mexico. Subsequent to May 1971 flow affected by releases of transmountain water from Heron Reservoir.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	27,914	1,230	751	900	55,370
February	31,930	2,690	816	1,140	63,330
March	48,335	2,840	975	1,559	95,870
April	93,030	4,490	1,900	3,101	184,500
May	171,070	7,990	3,050	5,518	339,300
June	144,190	7,330	3,790	4,806	286,000
July	50,512	3,690	752	1,629	100,200
August	37,607	2,170	503	1,213	74,590
September	39,830	2,460	807	1,328	79,000
October	25,925	1,150	592	836	51,420
November	37,760	1,510	750	1,259	74,900
December	38,534	1,440	804	1,243	76,430
Calendar year 1993	746,637	7,990	503	2,046	1,481,000

RIO GRANDE COMPACT COMMISSION REPORT

Santa Fe River near Santa Fe, N. Mex.

Location.—Water-stage recorder and concrete control, lat 35°41'12", long 105°50'35", in NE1/4SE1/4 sec. 23, T. 17 N., R. 10 E., 0.4 mile downstream from McClure Dam, and 5.3 miles east of Santa Fe. Altitude of gage is 7,718 ft. Prior to Nov. 4, 1930, at site 1.5 miles downstream, and Apr. 11, 1931 to Sept. 30, 1947, at site 0.3 mile upstream, each at different datum.

Drainage area.—18.2 sq mi.

Average discharge.—81 years (1913-93), 8.20 ft³/s (5,940 acre-ft per year).

Extremes.—1913-93: Maximum discharge, 1,500 ft³/s Aug. 14, 1921; minimum, 0.05 ft³/s Apr. 7, 8, 1981.

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

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	26.05	1.2	.67	.84	52
February	228.62	12	.81	8.16	453
March	174.3	11	2.5	5.62	346
April	714.9	46	2.5	23.8	1,420
May	1,586	85	21	51.2	3,150
June	1,055	77	12	35.2	2,090
July	375.4	16	5.2	12.1	745
August	252.3	16	2.9	8.14	500
September	93.3	3.3	3.1	3.11	185
October	324.1	15	3.3	10.5	643
November	55.3	6.0	1.7	1.84	110
December	52.8	1.8	1.7	1.70	105
Calendar year 1993	4,938.07	85	.67	13.5	9,790

Rio Grande below Cochiti Dam, N. Mex.

Location.—Water-stage recorder, lat 35°37'05", long 106°19'24", in SW1/4NE1/4 sec. 17, T. 16 N., R. 6 E., in Pueblo de Cochiti Grant, 320 feet upstream from bridge on State Highway 22, 700 feet downstream from Cochiti Dam, and 1.4 miles northeast of Cochiti Pueblo. Datum of gage is 5,226.08 ft above mean sea level, datum of 1929. Prior to Nov. 14, 1973, at site 2.4 mi downstream at altitude 5,210 ft. Nov. 14, 1973 to Jan. 8, 1976, at site 320 ft downstream at datum 1.79 ft lower.

Drainage area.—14,900 sq mi, approximately (includes 2,940 sq mi in closed basin in San Luis Valley, Colo.).

Average discharge.—23 years (1971-93) 1,417 ft³/s (1,027,000 acre-ft per year).

Extremes.—1971-93: Maximum discharge, 10,300 ft³/s July 26, 1971, at site 2.4 miles downstream prior to closure of Cochiti Dam; minimum discharge, 0.51 ft³/s Aug. 3-5, 1977, Aug. 27-28, 1978.

Remarks.—Records good. Since Nov. 12, 1973, flow completely regulated by Cochiti Dam. Cochiti eastside main canal on left bank and Sili main canal on right bank bypass station.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	27,934	1,150	610	901	55,410
February	28,963	2,050	289	1,034	57,450
March	47,252	3,010	812	1,524	93,720
April	95,640	4,710	1,890	3,188	189,700
May	156,240	6,850	2,780	5,040	309,900
June	154,690	7,230	2,710	5,156	306,800
July	49,776	3,860	706	1,606	98,730
August	32,967	2,570	744	1,063	65,390
September	34,857	2,590	571	1,162	69,140
October	18,419	736	457	594	36,530
November	32,868	1,270	600	1,096	65,190
December	35,800	1,400	726	1,155	71,010
Calendar year 1993	715,406	7,230	289	1,960	1,419,000

STREAMFLOW

Galisteo Creek below Galisteo Dam, N. Mex.

Location.—Water-stage recorder, lat 35°27'56", long 106°12'57", in SE1/4SE1/4 sec. 5, T. 14 N., R. 7 E., 0.6 mile downstream from Galisteo Dam, and 5.5 miles northwest of Cerrillos. Altitude of gage is 5,450 ft.

Drainage area.—597 sq mi.

Average discharge.—23 years (1971-93), 6.12 ft³/s (4,430 acre-ft per year).

Extremes.—1970-93: Maximum discharge, 2,000 ft³/s July 27, 1971 (gage height, 7.00 ft); maximum gage height, 7.33 ft July 20, 1971; no flow many days each year.

Remarks.—Records poor. Flow partly regulated by uncontrolled outlet in Galisteo Dam. Capacity of outlet, 5,000 ft³/s when reservoir is full. Diversions for irrigation of about 50 acres above reservoir.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	193.80	18	.60	6.25	384
February	325.0	30	5.9	11.6	645
March	615	29	12	19.8	1,220
April	153.1	10	2.4	5.10	304
May	98.69	9.0	.19	3.18	196
June	17.80	17	.00	.59	35
July	176.12	124	.00	5.68	349
August	360.44	86	.00	11.6	715
September	59.70	17	.00	1.99	118
October	0.00	.00	.00	.000	.00
November	115.80	12	.00	3.86	230
December	26.70	2.0	.00	.86	53
Calendar year 1993	2,142.15	124	.00	5.87	4,250

Jemez River below Jemez Canyon Dam, N. Mex.

Location.—Water-stage recorder, lat 35°23'24", long 106°32'03", in NE1/4 sec. 5, T. 13 N., R. 4 E., 0.8 mile downstream from Jemez Canyon Dam, 2.0 miles upstream from mouth, and 6 miles north of Bernalillo. Datum of gage is 5,095.60 ft above mean sea level, datum of 1929. Prior to April 24, 1951, at site three-quarters of a mile upstream at datum 24.51 ft higher. April 24, 1951 to June 25, 1958, at site 37 ft upstream at datum 4.40 ft higher.

Drainage area.—1,038 sq mi.

Average discharge.—51 years (1937, 1944-93), 63.7 ft³/s (46,150 acre-ft per year).

Extremes.—1937, 1944-93: Maximum discharge, 16,300 ft³/s Aug. 29, 1943 (gage height, 5.62 ft); no flow at times.

Remarks.—Records good. Flow regulated by Jemez Canyon Dam since October 1953. Diversions for irrigation of about 3,000 acres above station.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	1,739.5	158	6.2	56.1	3,450
February	1,371.1	151	1.8	49.0	2,720
March	6,012	593	43	194	11,920
April	14,533	767	251	484	28,830
May	5,139	252	54	166	10,190
June	5,534.3	457	6.6	184	10,980
July	602.5	66	4.9	19.4	1,200
August	175.02	66	.13	5.65	347
September	937.9	272	2.8	31.3	1,860
October	185.0	31	1.6	5.97	367
November	886.1	107	7.3	29.5	1,760
December	803.8	38	8.8	25.9	1,590
Calendar year 1993	37,919.22	767	.13	104	75,210

RIO GRANDE COMPACT COMMISSION REPORT

Rio Grande below Elephant Butte Dam, N. Mex.

Location.—Water-stage recorder, lat 33°08'54", long 107°12'22", in SW1/4 sec. 25, T. 13 S., R. 4 W., (projected) in Pedro Armendariz Grant, 1.0 mile downstream from dam and 1.5 miles upstream from Cuchillo Negro River. Datum of gage is 4,242.09 ft above mean sea level, datum of 1929. Prior to April 23, 1942, at several different sites and datums.

Drainage area.—29,450 sq mi, approximately (includes 2,940 sq mi in closed basin in San Luis Valley, Colo.).

Average discharge.—79 years (1915-93), 1,000 ft³/s (724,500 acre-ft per year).

Extremes.—1915-93: Maximum daily discharge, 8,220 ft³/s May 22, 1942; no flow at times prior to 1929 and March 2-4, 1979.

Remarks.—Records good. Flow regulated by Elephant Butte Reservoir. Diversions for irrigation of about 800,000 acres above station.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	252.8	9.5	7.7	8.15	501
February	31,953	1,530	121	1,141	63,380
March	59,270	2,410	1,520	1,912	117,600
April	70,170	2,390	2,290	2,339	139,200
May	73,090	2,390	2,270	2,358	145,000
June	102,810	4,240	2,440	3,427	203,900
July	74,790	2,460	2,190	2,413	148,300
August	72,810	2,370	2,330	2,349	144,400
September	42,917.6	2,340	9.2	1,431	85,130
October	269.8	9.7	7.5	8.70	535
November	224.7	13	2.8	7.49	446
December	42.90	2.8	.90	1.38	85
Calendar year 1993	528,600.80	4,240	.90	1,448	1,048,000

Rio Grande below Caballo Dam, N. Mex.

Location.—Water-stage recorder, lat 32°53'05", long 107°17'31", in NE1/4SW1/4 sec. 30, T. 16 S., R. 4 W., 2,000 ft upstream from Interstate Highway 25, 4,200 ft downstream from Caballo Dam, 1.3 miles upstream from Percha diversion dam, and 3 miles northeast of Arrey. Datum of gage is 4,140.90 ft above mean sea level, datum of 1929. October 13, 1938 to December 31, 1945, at datum 5.0 ft higher.

Drainage area.—30,700 sq mi, approximately (includes 2,940 sq mi in closed basin in San Luis Valley, Colo.).

Average discharge.—56 years (1938-93) 911 ft³/s (660,000 acre-ft per year).

Extremes.—1938-93: Maximum daily discharge, 7,650 ft³/s May 20, 1942; minimum daily, 0.1 ft³/s Oct. 31 to Nov. 14, 1954, Nov. 7 to Dec. 31, 1955, Feb. 15-29, 1972.

Remarks.—Records good. Flow regulated by Elephant Butte and Caballo Reservoirs. Diversions for irrigation of about 800,000 acres above station.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	2,947.0	150	2.0	95.1	5,850
February	14,956	1,440	152	534	29,670
March	59,350	2,280	1,440	1,915	117,700
April	51,690	2,250	1,160	1,723	102,500
May	53,840	1,950	1,440	1,737	106,800
June	63,850	2,530	1,520	2,128	126,600
July	62,170	2,480	1,570	2,005	123,300
August	54,810	2,320	1,280	1,768	108,700
September	37,171	1,890	942	1,239	73,730
October	13,611.0	1,130	9.0	439	27,000
November	300	10	10	10.0	595
December	277.0	11	8.0	8.94	549
Calendar Year 1993	414,972.0	2,530	2.0	1,137	823,100

STORAGE IN RESERVOIRS

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

Heron Reservoir.--Water-stage recorder, lat 36°39'56", long 106°42'13", on Willow Creek. Storage began in October 1970. Capacity, 401,300 acre-ft at elevation 7,186.1 ft (low point on crest of spillway); dead storage, 1,340 acre-ft at elevation 7,003.0 ft. Used for storage of transmountain water.

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

Date	Elevation	Contents	Change in Contents
December 31, 1992	7,182.23	378,850	-
January 31, 1993	7,182.41	379,880	+1,030
February 28	7,182.60	380,970	+1,090
March 31	7,174.65	336,960	-44,010
April 30	7,171.17	318,680	-18,280
May 31	7,179.92	365,780	+47,100
June 30	7,185.94	400,390	+34,610
July 31	7,185.40	397,210	-3,180
August 31	7,184.65	392,820	-4,390
September 30	7,184.19	390,140	-2,680
October 31	7,183.99	388,980	-1,160
November 30	7,183.93	388,640	-340
December 31	7,183.79	387,820	-820
Calendar year 1993	-	-	+8,970

El Vado Reservoir.--Water-stage recorder and surface follower, lat 36°35'39", long 106°44'00", on Rio Chama. Storage began in January 1935. Capacity, 186,250 acre-ft at gage height 6,902.0 feet (crest of spillway); dead storage, 480 acre-ft, below gage height 6,775.0 ft (invert of outlet works), as determined by survey in 1984. Datum of gage is 8.21 feet above mean sea level, datum of 1929. Storage includes both Rio Grande and transmountain water.

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

Date	Gage height	Contents	Change in contents	TM Water
December 31, 1992	6,861.10	82,500	-	82,020
January 31, 1993	6,854.93	71,730	-10,770	71,250
February 28	6,848.56	61,480	-10,250	61,000
March 31	6,877.98	118,060	+56,580	82,170
April 30	6,880.19	123,490	+5,430	88,340
May 31	6,898.50	175,130	+51,640	88,060
June 30	6,900.06	180,040	+4,910	87,480
July 31	6,893.48	159,800	-20,240	85,680
August 31	6,885.49	137,190	-22,610	83,500
September 30	6,881.85	127,680	-9,510	81,570
October 31	6,878.46	119,220	-8,460	81,440
November 30	6,875.36	111,690	-7,530	73,870
December 31	6,871.57	103,390	-8,300	65,600
Calendar year 1993	-	-	+20,890	-

STORAGE IN RESERVOIRS

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

Abiquiu Reservoir.--Water-stage recorder, lat 36°14'24", long 106°25'44", on Rio Chama. Completed in February 1963; capacity, 1,201,200 acre-ft at elevation 6,350 feet (crest of spillway) by 1984 survey. Reservoir is operated by Corps of Engineers for flood control and sediment storage. A resolution granting permission to store transmountain waters was approved by Rio Grande Compact Commission on May 3, 1974. Storage includes both Rio Grande and transmountain water.

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

Date	Elevation	Contents	Change in contents	TM water
December 31, 1992	6,203.45	126,890	-	124,290
January 31, 1993	6,205.75	134,940	+8,050	132,260
February 28	6,208.42	144,530	+9,590	141,680
March 31	6,214.25	166,420	+21,890	163,560
April 30	6,220.47	191,240	+24,820	176,280
May 31	6,234.75	254,380	+63,140	175,030
June 30	6,231.07	237,060	-17,320	173,520
July 31	6,226.34	215,970	-21,090	166,950
August 31	6,227.54	221,200	+5,230	171,250
September 30	6,226.84	218,140	-3,060	168,630
October 31	6,224.11	206,440	-11,700	157,220
November 30	6,219.90	188,900	-17,540	164,210
December 31	6,216.27	174,300	-14,600	170,010
Calendar year 1993	-	-	+47,410	-

Nambe Falls Reservoir.--Water-stage recorder in NE1/4SW1/4 sec. 29, T. 19 N., R. 10 E., in Nambe Indian Reservation, on Rio Nambe. Completed in 1976; capacity 2,023 acre-ft at elevation 6,826.6 feet (crest of spillway); dead storage 121 acre-ft at elevation 6,760.9 feet. Storage is transmountain water by exchange (see resolution adopted March 27, 1975).

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

Date	Elevation	Contents	Change in contents
December 31, 1992	6,821.82	1,760	-
January 31, 1993	6,824.47	1,900	+140
February 28	6,824.89	1,920	+20
March 31	6,821.30	1,730	-190
April 30	6,819.97	1,660	-68
May 31	6,826.93	2,040	+382
June 30	6,826.75	2,030	-10
July 31	6,820.51	1,690	-340
August 31	6,825.05	1,930	+240
September 30	6,826.30	2,000	+70
October 31	6,818.20	1,570	-430
November 30	6,819.15	1,620	+50
December 31	6,820.85	1,700	+80
Calendar year 1993	-	-	-56

STORAGE IN RESERVOIRS

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

Jemez Canyon Reservoir.—Water-stage recorder in SW1/4SW1/4 sec. 32, T. 14 N., R. 4 E., on Jemez River. Completed in 1953; capacity, 172,800 acre-ft at elevation 5,252.3 ft. Maximum controlled capacity at elevation 5,232.0 ft (floor of spillway) is 102,700 acre-ft by 1983 survey. Reservoir is operated by Corps of Engineers for flood control and sediment storage. A sediment pool of about 2,000 acre-ft of transmountain water has been maintained since August 1979.

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

Date	Elevation	Contents	Change in contents	TM Water
December 31, 1992	5,193.23	22,830	-	20,540
January 31, 1993	5,193.29	22,900	+70	20,550
February 29	5,193.26	22,870	-30	20,410
March 31	5,192.64	22,080	-790	20,090
April 30	5,192.68	22,130	+50	19,340
May 31	5,200.79	33,260	+11,130	18,860
June 30	5,195.20	25,410	-7,850	18,270
July 31	5,193.76	23,510	-1,900	22,520
August 31	5,194.19	24,070	+560	21,760
September 30	5,192.67	22,120	-1,950	21,000
October 31	5,192.40	21,780	-340	20,440
November 30	5,192.22	21,560	-220	20,260
December 31	5,192.19	21,520	-40	20,140
Calendar year 1993	-	-	-1,310	-

Acoma Reservoir.—Staff gage in SE1/4 sec. 29, T. 10 N., R. 7 W., on San Fidel Arroyo; water for reservoir is diverted from Rio San Jose. Completed in 1938; original capacity, 850 acre-ft; present capacity 650 acre-ft on basis of 1956 sediment survey. Water is used for irrigation on Acoma and Laguna Indian Reservations.

Month-end contents, in acre-feet

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal. yr.
Contents	0	0	0	0	0	0	0	0	0	0	0	0	0
Change	0	0	0	0	0	0	0	0	0	0	0	0	0

Seama Reservoir.—In sec. 36, T. 10 N., R. 7 W., off channel from Rio San Jose. Completed in October 1980; capacity approximately 400 acre-ft. Water is used for irrigation on Laguna Indian Reservation.

No storage during 1993.

RIO GRANDE COMPACT COMMISSION REPORT

Reservoirs in Rio Grande Basin in New Mexico
(Project storage)

Elephant Butte Reservoir.—Water-stage recorder in NW1/4 sec. 30, T. 13 S., R. 3 W., on Rio Grande. Storage began Jan. 6, 1915; capacity, 2,065,000 acre-ft at gage height 4,407.0 ft (crest of spillway), by survey of 1988. Datum of gage is 43.3 ft above mean sea level, datum of 1929. Water is used for power development and irrigation in New Mexico and Texas. Records furnished by Bureau of Reclamation. Delivery of transmountain water for minimum recreation pool was initiated in December 1975. Beginning Jan. 1, 1977 gage readings are midnight readings.

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

Date	Gage height	Contents	Change in contents	TM water
December 31, 1992	4,401.05	1,855,100	-	41,850
January 31, 1993	4,402.98	1,921,410	+66,310	44,480
February 29	4,402.74	1,913,070	-8,340	45,040
March 31	4,401.82	1,881,350	-31,720	44,780
April 30	4,402.09	1,890,620	+9,270	44,340
May 31	4,404.28	1,967,040	+76,420	43,870
June 30	4,405.52	2,011,280	+44,240	43,290
July 31	4,402.80	1,915,150	-96,130	42,830
August 31	4,399.95	1,818,070	-97,080	42,700
September 30	4,398.43	1,767,840	-50,230	42,360
October 31	4,398.71	1,777,010	+9,170	42,110
November 30	4,400.51	1,836,860	+59,850	41,950
December 31	4,402.58	1,907,530	+70,670	42,160
Calendar year 1993	-	-	+52,430	-

Caballo Reservoir.—Water-stage recorder in SE1/4SW1/4 sec. 19, T. 16 S., R. 4 W., on Rio Grande. Storage began Feb. 8, 1938; capacity, 331,500 acre-ft (by 1981 resurvey), at gage height 4,182.0 ft (above which spillway gates open automatically). Datum of gage is 43.3 ft above mean sea level, datum of 1929. 100,000 acre-ft of storage reserved for flood control. Records furnished by Bureau of Reclamation. Beginning Jan. 1, 1977, gage readings are midnight readings.

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

Date	Gage height	Contents	Change in contents
December 31, 1992	4,140.30	34,620	-
January 31, 1993	4,140.85	36,230	+1,610
February 29	4,149.02	67,130	+30,900
March 31	4,148.43	64,420	-2,710
April 30	4,154.40	95,290	+30,870
May 31	4,158.69	122,190	+26,900
June 30	4,166.21	177,620	+55,430
July 31	4,167.83	190,830	+13,210
August 31	4,171.42	222,050	+31,220
September 30	4,172.36	230,720	+8,670
October 31	4,169.11	201,640	-29,080
November 30	4,168.95	200,270	-1,370
December 31	4,168.91	199,930	-340
Calendar year 1993	-	-	+165,310

STORAGE IN RESERVOIRS

Reservoirs in Rio Grande Basin in New Mexico
(Project storage)

Project Storage.—The combined usable storage in Elephant Butte and Caballo Reservoirs.

Month-end contents, in acre-feet

Date	Contents	Change in contents
December 31, 1992	1,777,300	-
January 31, 1993	1,676,900	-100,400
February 29	1,699,800	+22,900
March 31	1,667,600	-32,200
April 30	1,711,300	+43,700
May 31	1,818,400	+107,100
June 30	1,922,700	+104,300
July 31	1,843,600	-79,100
August 31	1,778,900	-64,700
September 30	1,740,000	-38,900
October 31	1,721,900	-18,100
November 30	1,781,600	+59,700
December 31	1,852,300	+70,700
Calendar year 1993	-	+75,000

NOTE.—Values of combined contents may not agree with sum of individual values because of rounding.

TRANSMOUNTAIN DIVERSIONS

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

Weminuche Pass ditch (Raber-Lohr ditch).—Water-stage recorder and 4-ft rectangular flume in sec. 33, T. 40 N., R. 4 W., at Weminuche Pass in Colorado. Diversion is from Rincon la Vaca Creek in San Juan River Basin into Weminuche Creek in Rio Grande Basin. Second enlargement was completed in 1936. Diversion for irrigation is from Rio Grande above the Del Norte gaging station.

Williams Creek - Squaw Pass ditch.—Water-stage recorder and 2-ft Parshall flume in sec. 21, T. 39 N., R. 3 W., at Squaw Pass in Colorado. Diversion is from Williams Creek in San Juan River Basin into Squaw Creek in Rio Grande Basin. Constructed in 1938. Diversion for irrigation is from Rio Grande below Del Norte gaging station.

Tabor ditch.—Water-stage recorder and 3-ft Parshall flume in sec. 35, T. 43 N., R. 3 W., at Spring Creek Pass in Colorado. Diversion is from Cebolla Creek in Gunnison River Basin into tributary of Clear Creek in Rio Grande Basin. Completed in 1910 or 1911. Diversion for irrigation is from Rio Grande below Del Norte gaging station.

Don La Font No. 1 & 2 ditches (Piedra Pass ditch).—Water-stage recorder and 2-ft Parshall flume in sec. 4, T. 38 N., R. 1 W., at Piedra Pass in Colorado. Diversion is from tributaries of Piedra River in San Juan River Basin to South River in Rio Grande Basin. Original ditch completed in 1938, first enlargement completed in 1940. Water is imported by Colorado Game and Fish Department, beginning in 1959, to offset losses from fish culture reservoirs.

Treasure Pass diversion ditch.—Water-stage recorder and 2-ft Parshall flume in sec. 31, T. 38 N., R. 2 E., at Wolf Creek Pass in Colorado. Diversion is from Wolf Creek in San Juan River Basin to a tributary of South Fork Rio Grande. Completed in 1923 or 1924. Water is diverted for irrigation from Rio Grande above the Del Norte gaging station, beginning in 1959. Prior to 1959 it was diverted below gaging station.

Azotea tunnel.—Water-stage recorder and 10-ft Parshall flume, lat 36°51'12", long 106°40'18", at south portal of Azotea tunnel, San Juan-Chama Project. Diversion is from Rio Blanco, Little Navajo River, and Navajo River in Colorado and discharge is into Azotea Creek in New Mexico. Construction completed in 1970.

Imported quantities, in acre-feet, 1993

Month	Pine River- Weminuche Pass ditch	Weminuche Pass ditch	Williams Creek- Squaw Pass ditch	Tabor ditch	Don La Font ditches	Treasure Pass diversion ditch	Azotea tunnel
January	0	0	0	0	0	0	0
February	0	0	0	0	0	0	0
March	0	0	0	0	0	0	0
April	0	0	0	0	0	0	7,430
May	0	0	0	308	0	0	46,160
June	115	0	209	462	0	93	37,050
July	95	0	188	130	0	20	3,050
August	0	0	44	67	0	0	3,430
September	36	0	0	65	0	0	1,670
October	0	0	0	24	0	0	10
November	0	0	0	0	0	0	0
December	0	0	0	0	0	0	0
Cal. year	246	0	441	1,056	0	113	98,800

RIO GRANDE COMPACT COMMISSION REPORT

EVAPORATION AND PRECIPITATION

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

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

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

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

Records for the evaporation stations at the State University, Elephant Butte Dam, and El Vado Dam antedated the creation of the Commission; the stations at Abiquiu Dam, Cochiti Dam, and Jemez Canyon Dam were established by the Corps of Engineers. All others were established at the request of the Commission.

The Rio Grande Compact Commission gratefully acknowledges the cooperation of the National Oceanic and Atmospheric Administration, U.S. Army Corps of Engineers, and U.S. Bureau of Reclamation for furnishing the climatological records contained in this report.

Alamosa Airport.—Lat 37°27', long 105°52', in Alamosa County at airport near Alamosa, Colo. Standard class A pan, anemometer, maximum and minimum thermometers, standard 8-inch and recording rain gages at elevation 7,536 ft.

Platoro Dam.—Lat 37°21', long 106°30', in Conejos County near Platoro, Colo. Standard class A pan, anemometer, maximum and minimum thermometers, fan type psychrometer, standard 8-inch and recording rain gages at elevation 9,826 ft.

Heron Dam.—Lat 36°40', long 106°42', in Rio Arriba County about 4 mi. northeast of Heron Dam near Tierra Amarilla, N. Mex. Standard class A pan, maximum and minimum thermometers, and standard 8-inch rain gage at elevation 7,310 ft.

El Vado Dam.—Lat 36°36', long 106°44', in Rio Arriba County at El Vado Dam near Tierra Amarilla, N. Mex. Standard class A pan, anemometer, maximum and minimum thermometers, standard 8-inch and recording rain gages at elevation 6,750 ft.

Abiquiu Dam.—Lat 36°14', long 106°26', in Rio Arriba County at Abiquiu Dam near Abiquiu, N. Mex. Standard class A pan, maximum and minimum thermometers, standard 8-inch and recording rain gages at elevation 6,380 ft.

Nambe Falls Dam.—Lat 35°51', long 105°54', in Santa Fe County at Nambe Falls Dam, N. Mex. Standard class A pan, maximum and minimum thermometers, recording thermograph, standard 8-inch and recording rain gages at elevation 6,840 ft.

Cochiti Dam.—Lat 35°38', long 106°19', in Sandoval County at operations building, at Cochiti Dam, N. Mex. Standard class A pan, anemometer, maximum and minimum thermometers, standard 8-inch and recording rain gages at elevation 5,560 ft.

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

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

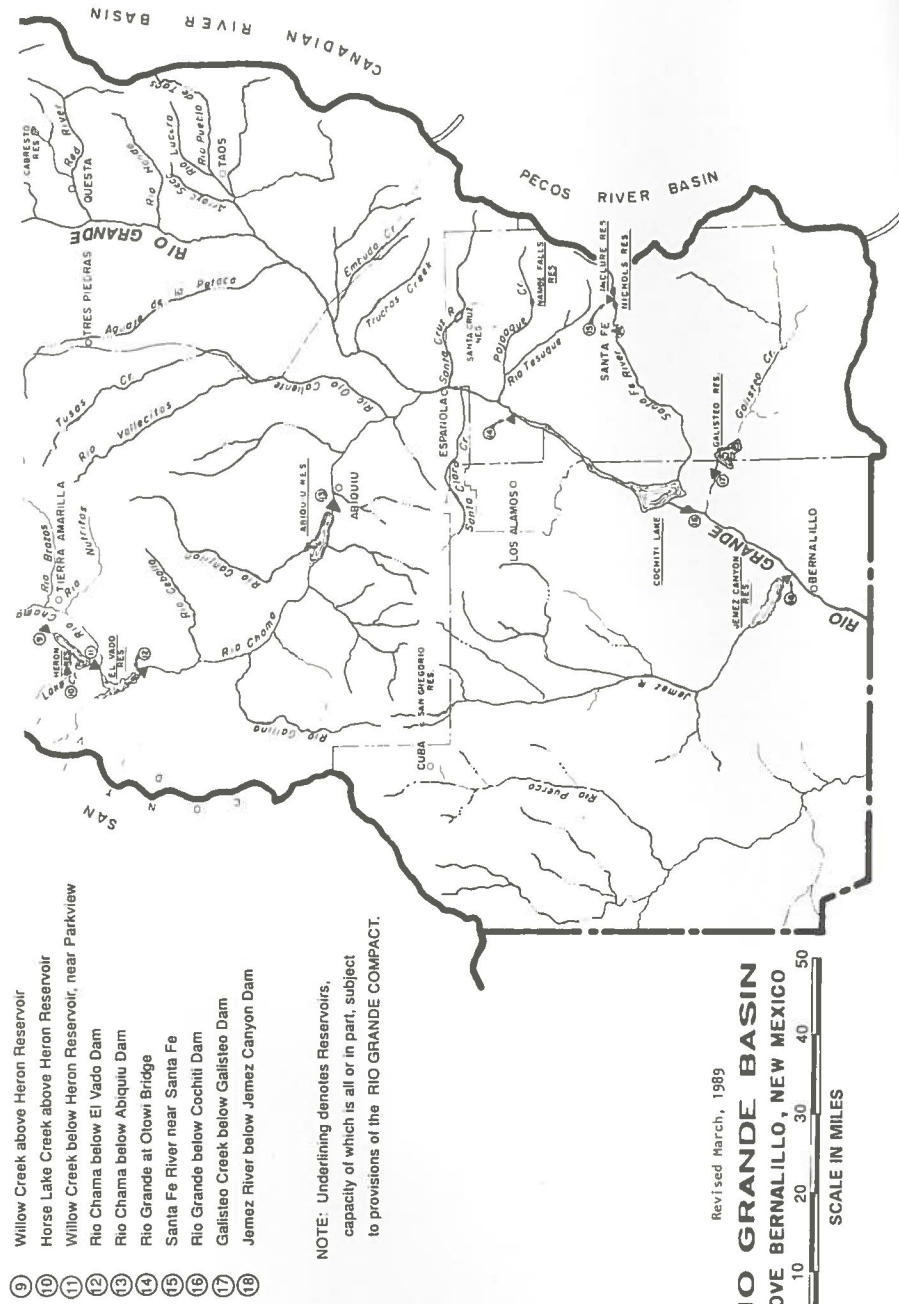
Caballo Dam.—Lat 32°54', long 107°18', in Sierra County at Caballo Dam, N. Mex. Standard class A pan, anemometer, maximum and minimum thermometers, standard 8-inch and recording rain gages at elevation 4,190 ft.

New Mexico State University.—Lat 32°17', long 106°45', in Doña Ana County at University Park, N. Mex. Standard class A pan, anemometer, maximum and minimum thermometers, standard 8-inch and recording rain gages at elevation 3,881 ft.

EVAPORATION AND PRECIPITATION
1993

Evaporation and precipitation, in inches

Station		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
Alamosa Airport	Evap.	-	-	-	-	-	9.14	10.26	4.46	6.37	-	-	-	-
	Precip.	-	-	0.68	0.42	0.93	0.14	0.33	5.40	0.58	0.32	0.35	0.10	-
Platoro Dam	Evap.	-	-	-	-	-	8.18	9.25	4.34	6.80	-	-	-	-
	Precip.	-	-	-	-	-	.31	0.03	4.22	4.86	1.70	-	-	-
Heron Dam	Evap.	-	-	-	4.65	5.34	7.43	9.31	6.21	5.20	3.12	-	-	-
	Precip.	2.76	2.57	1.16	0.51	2.07	0.33	0.00	4.02	1.16	1.92	2.02	0.52	19.04
El Vado Dam	Evap.	-	-	-	5.74	6.30	9.25	10.70	6.75	6.14	3.83	-	-	-
	Precip.	2.07	1.37	0.56	0.29	1.85	0.49	0.20	3.49	0.85	1.38	1.78	0.33	14.66
Abiquiu Dam	Evap.	-	-	-	7.97	8.15	12.04	12.73	7.64	7.51	4.77	-	-	-
	Precip.	0.94	0.60	0.68	0.07	0.69	0.22	0.25	4.46	0.43	0.54	0.49	0.02	9.39
Nambe Falls Dam	Evap.	-	-	-	7.29	8.42	11.02	11.07	8.26	6.92	4.56	-	-	-
	Precip.	2.00	1.03	1.50	0.09	1.63	0.15	0.93	3.83	0.76	1.17	.81	.44	14.34
Cochiti Dam	Evap.	-	-	-	8.75	9.68	13.88	15.91	9.86	9.86	6.70	-	-	-
	Precip.	2.29	0.99	0.69	0.03	0.76	0.24	3.22	2.18	0.28	0.53	0.81	0.05	12.07
Jemez Canyon Dam	Evap.	-	-	-	11.40	11.97	15.90	16.19	10.96	10.85	7.26	-	-	-
	Precip.	1.32	0.75	0.69	0.01	0.32	0.34	1.82	2.84	1.02	0.55	0.88	0.02	10.56
Elephant Butte Dam	Evap.	2.79	4.22	7.91	12.25	13.96	17.79	15.33	10.68	10.08	7.53	4.73	3.16	110.43
	Precip.	0.89	0.39	0.29	0.00	0.05	0.15	1.02	4.56	0.44	0.44	0.15	0.24	8.62
Caballo Dam	Evap.	2.96	4.48	8.30	11.67	13.26	15.65	14.24	10.28	9.46	6.38	4.57	3.28	104.53
	Precip.	1.58	0.40	0.03	0.00	0.31	0.14	1.11	3.46	0.52	0.47	0.26	0.38	8.66
State Univer.	Evap.	-	-	-	9.16	10.79	13.03	11.63	10.34	8.41	6.06	3.73	-	-
	Precip.	1.82	0.19	0.20	0.02	0.02	0.40	2.28	2.55	0.28	0.73	0.34	0.77	9.60



Revised March, 1989

RIO GRANDE BASIN **ABOVE BERNALILLO, NEW MEXICO**

0 5 10 20 30 40 50

SCALE IN MILES

