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REPORT of the

# RIO GRANDE COMPACT COMMISSION

2002

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TO THE GOVERNORS OF Colorado, New Mexico and Texas





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# RIO GRANDE COMPACT COMMISSION COLORADO TEXAS NEW MEXICO

March 27, 2003

The Honorable Bill Richardson Governor of the State of New Mexico Santa Fe, New Mexico

The Honorable Rick Perry Governor of the State of Texas Austin, Texas

The Honorable Bill Owens Governor of the State of Colorado Denver, Colorado

Honorable Governors:

The 64th Annual Meeting of the Rio Grande Compact Commission was held in El Paso, Texas, on March 27, 2003.

The Commission reviewed its prior reports and the current reports of the Secretary and the Engineer Advisers relative to streamflow at Compact gaging stations and storage in reservoirs in 2002. The Commission found that:

- (a) Deliveries of water at the Colorado-New Mexico state line by Colorado amounted to 81,000 acre-feet in 2002 and the scheduled delivery for the year was 46,400 acre-feet.
- (b) Deliveries of water into Elephant Butte Reservoir by New Mexico, as measured by the Elephant Butte Effective Supply, amounted to 284,100 acre-feet in 2002 and the scheduled delivery for the year was 145,200 acre-feet.
- (c) The actual release of usable water from Project Storage was 802,400 acre-feet.

The Commission agreed to the accounting of accrued credits for 2002, as follows:

- (1) The Commissioners found that the accrued credit for deliveries by Colorado at the Colorado-New Mexico State Line was 42,800 acre-feet on January 1, 2003.
- (2) The Commissioners found that the accrued credit for deliveries by New Mexico at Elephant Butte Dam was 265,000 acre-feet on January 1, 2003.
- (3) The Commissioners found that the accrued departure from normal release from Project Storage as of January 1, 2003 was a credit of 65,500 acre-feet.

The Commission reviewed the cost of operation and found that the expenses of the administration of the Rio Grande Compact were \$175,494 in the fiscal year ending June 30, 2002. The United States bore \$59,753 of this total; the balance of \$115,741 was borne equally by the three States party to the Compact.

Respectfully.

John D'Antonio Jr., Commissioner for New Mexic

Hanson, Commissioner for Texas

Harold D. Simpson, Commissioner for Colorado

# **RIO GRANDE COMPACT**

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

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 negotilations 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, towit:

# ARTICLE 1

(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**

(I) "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;

(i) On the Rio Grande at San Marcial;

(k) On the Rio Grande below Elephant Butte Reservoir;

(I) On the Rio Grande below Caballo Reservoir.

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

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

#### ARTICLE III

The obligation of Colorado to deliver water in the Rio Grande at the Colorado-New Mexico State Line, measured at or near Lobatos, in each calendar year, shall be ten 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 Lobatos less Conejos at Mouths (4)
60
65
75
86
98
112
127
144
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 cf 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:

# 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 transmountain diversions into the Rio Grande between Lobatos and San Marcial.

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

#### **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.

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 diminiution in the delivery or loss of water to Mexico.

# ARTICLE XV

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

#### ARTICLE XVI

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

# ARTICLE XVII

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

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

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

(Sgd.) M. C. HINDERLIDER (Sgd.) THOMAS M. McCLURE (Sgd.) FRANK B. CLAYTON

#### **APPROVED:**

(Sgd.) S. O. 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:

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.

#### **RESOLUTION OF COMMISSION**

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

### Be it Further Resolved:

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

# Be it Further Resolved:

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

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

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

# RULES AND REGULATIONS FOR ADMINISTRATION OF THE RIO GRANDE COMPACT

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 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, /3, /4

(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 in storage in that reservoir, and Actual Spill shall be deemed to have commenced when this sum equals the total capacity of that reservoir to the level of the uncontrolled spillway less capacity reserved for flood control purposes, i.e., 1,998,400 acre-feet in the months of October through March, inclusive, and 1,973,400 acre-feet in the months of April through September, inclusive, as determined from the 1999 area-capacity table or successor area-capacity tables and flood control storage reservation of 50,000 acre-feet from April through September and 25,000 acre-feet from October through March.

(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 spill 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 /5

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.

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

/3 Amended September 9, 1998.

1/4 Amended March 22, 2001; made effective January 1, 2001.

/5 Adopted June 2, 1959; made effective January 1, 1952.

# EVAPORATION LOSSES /6, /7, /8

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 commingled.

/6 Amended at Tenth Annual Meeting, February 15, 1949.

/Z Amended at Twelfth Annual Meeting, February 24, 1951.

/8 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 /9

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 adviser 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.

(9) 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.

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, /10

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.

/10 Amended at Thirteenth Annual Meeting, February 25, 1952.

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# REPORT OF THE ENGINEER ADVISERS TO THE RIO GRANDE COMPACT COMMISSIONERS

February 21, 2003

# COMPACT ACCOUNTING

The Engineer Advisers to the Rio Grande Compact Commissioners have reviewed the streamflow and reservoir storage records and other pertinent data and have determined the scheduled and actual deliveries, and release of Usable Water during calendar year 2002. As determined by the Engineer Advisers, scheduled and actual deliveries, release of usable water for the year 2002, and balances as of January 1, 2003 are as follows:

(a) Deliveries by Colorado at the Stateline:

	Balance as of January 1, 2002 Scheduled delivery Actual delivery at Lobatos plus 10,000 acre-feet Reduction of credit on account of evaporation Accrued credit January 1, 2003	10,100 acre-feet 46,400 acre-feet 81,000 acre-feet 1,900 acre-feet 42,800 acre-feet
(b)	Deliveries by New Mexico at Elephant Butte Dam:	
	Balance as of January 1, 2002 Scheduled delivery Actual delivery Reduction of credit on account of evaporation Accrued credit January 1, 2003	155,700 acre-feet 145,200 acre-feet 284,100 acre-feet 29,600 acre-feet 265,000 acre-feet
(c)	Project Storage and Releases:	
	Accrued departure (credit) as of January 1, 2002 Actual release of usable water Accrued departure (credit) as of January 1, 2003	77,900 acre-feet 802,400 acre-feet 65,500 acre-feet

Streamflows throughout the upper portion of the basin in Colorado and New Mexico were the lowest in recorded history which resulted in the scheduled deliveries of Colorado and New Mexico being the lowest in the history of the Compact. New Mexico's calculations showed usable water in Project Storage dropped below 400,000 acre-feet on July 2, 2002 for the first time since 1979 and remained below that level for the remainder of the year.

The Engineers Advisers met in Santa Fe from February 17 through February 21 to prepare the 2002 Compact water accounting and to discuss continuing and new issues in preparation for the 2003 annual meeting of the Rio Grande Compact Commission (Commission). The Engineer Advisers requested and received the participation of U.S. Bureau of Reclamation (Reclamation), the U.S. Army Corps of Engineers (Corps), the International Boundary and Water Commission (IBWC) and the U.S. Fish and Wildlife Service (Service) in part of that meeting to discuss in detail their specific water-related activities in the basin. Bill Ruth, the newly appointed Federal Chairman of the Commission attended the meeting.

# CONTINUING ISSUES

This section of the report addresses issues previously addressed by the Engineer Advisers or the Commission. It reflects information obtained by the Engineer Advisers subsequent to the 2002 Commission meeting, including information obtained in the reports of federal agencies at the 2003 Engineer Advisers meeting.

# URGWOM Accounting Model (Nambe Falls)

The Commission approved a resolution in 2001 that provided approval for use by Reclamation of the Upper Rio Grande Water Operations Model (URGWOM) accounting module for Rio Grande Compact accounting, subject to several conditions that the Engineer Advisers found to be substantially fulfilled at their 2002 meeting. As of this date, the URGWOM accounting model does not include water accounting associated with Nambe Falls Reservoir and San Juan-Chama (SJC) Project water return flows from the Pojoaque Valley Irrigation District (PVID), which is still being performed by Reclamation's FORTRAN programs. At the February 2003 meeting of the Engineer Advisers, Reclamation distributed a technical memorandum that indicated that they had developed a separate RIVERWARE model to perform the Nambe Falls Reservoir/PVID computations. The memorandum summarizes the validation of the new model against the FORTRAN program that is currently being used to do the computations. Reclamation indicated that the RIVERWARE model for Nambe Falls produced the same results as the FORTRAN model. The URGWOM model team was asked to provide the current FORTRAN code used for the Nambe Falls Reservoir/PVID computations for review. As of the date of this report, the Engineer Advisers have not had sufficient time to review this model or its validation process.

# Upper Rio Grande Water Operations Model

The Engineer Adviser representative on the URGWOM team indicated that the RIVERWARE platform is undergoing changes that have not been approved by the Commission. These changes are taking the transparent "rules" developed for each module and rewriting them into proprietary "code". The Engineer Advisers are concerned that changes to the model are being made without any review by the Engineer Advisers or the Commission. The Engineer Advisers requested development of a review process to document and provide quality assurance for these changes. The Engineer Advisers requested that the URGWOM model team keep all members of the team and the Engineer Advisers completely informed as to all model developments and updates.

# Compact Accounting Documentation Project

At the 2002 meeting of the Commission, the Commissioners and Reclamation signed a Memorandum of Understanding (MOU) that formally describes the duties, roles, and responsibilities of each party in the water accounting, reporting, and documentation of the waters of the Rio Grande Basin above Fort Quitman, Texas, in accordance with the Compact. The MOU provides that the Engineer Advisers and Reclamation will prepare a manual describing the historic and current accounting procedures and that Reclamation and the Engineer Advisers will formally review the accounting and reporting procedures for potential modifications and enhancements every five years, or more frequently if necessary.

The goal of the Engineer Advisers and Reclamation was to complete this project and present the documentation manual to the Commission at its March 2003 regular meeting. While substantial progress has been made on the project, the Engineer Advisers and Reclamation were unable to meet that goal. It is anticipated that the documentation manual will be ready for presentation to the Commission at its March 2004 meeting.

Compliance by Federal Agencies with State Water Law and Regulations

The Commission approved resolutions in 2001 and 2002 that requested the Corps, Reclamation and Service comply with state law by obtaining permits from the appropriate state agencies for any water related actions that result in new or additional river depletions. In 2001, Federal agency representatives acknowledged the need to comply with applicable state laws regarding these projects. New Mexico reports that the Federal agencies have met with New Mexico regarding design of several habitat restoration projects but remain inconsistent in submitting applications for permits to comply with New Mexico's requirements to obtain permits for riparian and riverine habitat restoration projects that divert water from the river or increase consumption for water. The Corps and Reclamation projects within the Middle Rio Grande.

# Elephant Butte Pilot Channel Project

The Commission approved resolutions in 2000, 2001 and 2002 requesting Reclamation to continuously extend and maintain a constructed pilot channel from San Marcial through the sediment delta to the active reservoir pool in Elephant Butte Reservoir as the reservoir recedes. Reclamation has not succeeded in constructing and maintaining such a channel to the reservoir pool. The Engineer Advisers assert that maintaining an active river channel from San Marcial through the sediment delta to Elephant Butte Reservoir is important to New Mexico's ability to make Compact deliveries.

Reclamation's initial design of that portion of the pilot channel from the reservoir head to Nogal Canyon incorporated mitigation features resulting from ESA Section 7 consultation between Reclamation and the Service regarding the construction of the pilot channel. The pilot channel failed during the snowmelt runoff of 2001 at the location of one of these mitigation features. Reclamation and the New Mexico Interstate Stream Commission met during 2002 and cooperated on revising the design of the upper portion of the pilot channel to ensure that the channel would function as intended. The revised design still contains a number of environmental mitigation features that should not seriously impair deliveries to the active reservoir pool.

At the 2002 meeting of the Engineer Advisers, the New Mexico Engineer Adviser inquired of Reclamation what its response would be if New Mexico proposed to contract with a private sector construction firm to construct portions of the pilot channel. Reclamation's Albuquerque Area Office Manager said he would welcome such assistance. Reclamation and New Mexico later agreed that Reclamation would concentrate on constructing that portion of the pilot channel from the reservoir head to Nogal Canyon, and New Mexico would concentrate on a new phase of the pilot channel from Nogal Canyon to below the Narrows. During 2002 Reclamation successfully extended the pilot channel, at a partial design width, to Nogal Canyon, the originally planned and permitted project downstream terminus. By that time, due to extensive drought, the active pool of Elephant Butte Reservoir had receded to the lower portion of the reservoir below the Narrows. Reclamation and New Mexico worked cooperatively to complete required environmental permitting and clearances for the lower phase of the project. New Mexico's contractor commenced construction on the lower phase of the channel just prior to the 2003 meeting of the Engineer Advisers with a goal of completing the channel to the Narrows at its full design width in time for the 2003 snowmelt runoff.

# Closed Basin Project

Biofouling problems continue to plague the production wells of the Closed Basin Project. The total production of the project was only 15,574 AF in 2002 with 11,607 AF of that amount being delivered to the Rio Grande. Reclamation is replacing several of the wells that are most affected by the iron bacteria and is altering operational procedures to minimize bacterial growth. The new well design and operations show some promise to raising the production of the project.

# Low Flow Conveyance Channel Design, Construction, Operation and Maintenance

Reclamation staff again discussed its proposed project to relocate the river channel, and the adjacent Low Flow Conveyance Channel, to the west side of the valley floor downstream from San Marcial. Reclamation is continuing to propose the bottom-up realignment alternative with an initial Low Flow Conveyance Channel (LFCC) capacity of 500 cubic feet per second (cfs) with a three mile long uncontrolled section in the middle of this design for mitigation purposes related to the southwest willow flycatcher.

Reclamation informed the Engineer Advisers at its meeting on February 19 that the final Environmental Impact Statement for this project has not been completed and that consultation with the Service is ongoing. The Commission's March 22, 2002, resolution expressed their concern about this project. The Engineer Advisers and Reclamation agreed to meet on this issue to discuss the merits of Reclamation's current design and possible alternatives. Reclamation also stated that budget to construct this project is not currently available or planned.

# Water Resource Development Act Section 729 Comprehensive Planning Study

The Corps provided an update on the on-going Section 729 water resources investigation in the reach of the Rio Grande between San Acacia and Elephant Butte Reservoir. The study includes groundwater observations wells and surface water staff gages through the reach to characterize the interaction of shallow groundwater and surface water in this reach. New Mexico has entered into a cost sharing agreement with the Corps for the study. Graduate students from the New Mexico Institute of Mining and Technology are actively involved in the project. NMISC and the Corps have completed an Environmental Assessment, land access agreements and scopes of work for the project. Fieldwork on the project started in October 2002. The Corps also reported that there was Congressional and Federal interest in doing water resource investigations in the El Paso to Brownsville reach of the Rio Grande.

# YEAR 2002 OPERATIONS

# Middle Rio Grande Endangered Species Conservation Pool Operations

The Commission approved a resolution in 2001 that established the Middle Rio Grande Endangered Species Conservation Pool (Conservation Pool). By adoption of that Resolution, the Commission gave its advice and consent to a deviation from normal operations of the Corps Middle Rio Grande Project Reservoirs, as specified by the Flood Control Act of 1960 (Public Law 86-645), to allow for Conservation Pool operations for a term of not more than three years. The Resolution also reserved for the State of Texas the right to rescind its approval of the Resolution on March 21, 2002 and again on March 20, 2003, if Texas were to determine that it has been or will be harmed by the departure from normal operations of the reservoirs.

A total of 58,814 acre-feet was captured in the Conservation Pool during 2001, with 51,188 acre-feet captured in Abiquiu Reservoir and 7,627 acre-feet captured in Jemez Canyon Reservoir. The bulk of this storage was captured during the peak snowmelt runoff month of May. Releases from the Conservation Pool in 2001 totaled 25,624 acre-feet. Evaporative and unidentified losses totaled 6,246 acre-feet, leaving 26,945 acre-feet in storage at the end of 2001, all in Abiquiu

Reservoir. No additional storage was captured in 2002. Releases from the Conservation Pool in 2002 commenced on March 14 and ceased on May 29 with the complete draining of the pool and totaled 25,851 acre-feet. Evaporative and unidentified losses during 2002 totaled 1,095 acre-feet. No water remained in storage in the Conservation Pool at the end of the year.

The water accounting of the Conservation Pool was performed in accordance with the Rules and Regulations of the Compact.

# Supplemental Water Program Operations

Reclamation's supplemental water program is intended to provide additional water for endangered species needs. In 2002 Reclamation used a total of 76,209AF for its supplemental water program. Of this, 48,338 AF was SJC Project water and 25,851 AF was Conservation Pool water. SJC Project water leased for the program is released for diversion and use by the MRGCD which, in turn, allows an equivalent amount of native Rio Grande water (less conveyance losses) to remain undiverted pursuant to the July 3, 2001 Rio Grande Water Management Agreement between the United States and the MRGCD.

In 2002 Reclamation leased a total of 57,013 AF of SJC Project water from willing SJC Project contractors for use in the program. A total of 13,150 AF was either carried over from 2001 or leased early in 2002. Included in this amount is 2,990 AF of SJC Project water for which no contract had been executed to the satisfaction of the Secretary of the Interior as required by the authorizing legislation (PL 87-483). The New Mexico and Colorado Engineer Advisers continue to object to this release of uncontracted SJC Project water. Another 43,863 AF was leased in the middle of the year, of which 40,000 AF was leased from the City of Albuquerque. Of the total leased SJC Project water, 6,655 AF was released for use by the MRGCD in partial payback of the 20,900 acre-feet of water Reclamation owed to MRGCD as specified in the August 2, 2000 Agreed Order Resolving Plaintiffs' Motion for Preliminary Injunction in *Minnow v. Martinez* (now *Minnow v. Keys*). The remainder of the leased SJC Project water (48,338 AF) was released for the minnow in the supplemental program. Of the leased and available SJC Project water, 2,020 AF was not released.

Reclamation operated 17 diesel driven pumps at four locations during 2002 to pump an estimated (by Reclamation) 32,500 acre-feet of water from the LFCC to the Rio Grande. A fifth location was constructed but was not used due to lack of flows in the LFCC. Reclamation applied

for a permit and received an emergency authorization from the New Mexico Office of the State Engineer for this pumping operation. Discharge measurement and telemetry installations were completed at the four active locations using funding supplied by New Mexico.

Water leased by Reclamation as described above was released during the irrigation season to assist in meeting minimum and target flows below San Acacia Diversion Dam and at the San Marcial gaging station. Reclamation reported that they were in compliance with the June 29, 2001 Programmatic Biologic Opinion flow targets.

# **REPORTS OF THE FEDERAL AGENCIES**

Representatives of Reclamation, Corps, Service, and IBWC presented reports to the Engineer Advisers on February 19 and 20, 2003.

# San Juan-Chama Project Shortage Sharing

Reclamation discussed with the Engineer Advisers the possibility of the SJC Project sharing in shortage of water with demands on the mainstem of the San Juan River. These demands include endangered fish needs, priority water rights, the Navajo Indian Irrigation Project and other Reclamation contracts on the San Juan River and from Navajo Reservoir. It may not be possible tc satisfy the demands of both the San Juan River Basin and the SJC Project in 2003 based upon the current storage in Navajo Reservoir and snowpack conditions in the basin.

# Prior and Paramount Storage for the Six Middle Rio Grande Pueblos

Reclamation reported that they have been storing native water in El Vado Reservoir since November 1, 2002 to meet the needs of the six Middle Rio Grande Pueblos in 2003. Approximately 5,000 AF had been stored as of the date of the Engineer Adviser's meeting and Reclamation indicated that they might store as much as 30,000 AF during 2003. The Engineer Advisers met with Reclamation and the U.S. Bureau of Indian Affairs twice during the fall of 2002 to discuss their storage plans. The Engineer Advisers are concerned about the methodology used by Reclamation to determine the amount of storage required to meet the demands of the six middle Rio Grande Pueblos and have requested additional meetings with Reclamation to discuss the concerns. The Texas Engineer Adviser remains concerned about the storage of native water in El Vado Reservoir by Reclamation when the storage prohibitions of Article VII are in effect.

### Upper Rio Grande Basin Water Operations Review and EIS

Reclamation, Corps and NMISC signed a Memorandum of Agreement in January 2000 to conduct a review and EIS of water operations in the upper Rio Grande basin. This project is a fiveyear effort that is evaluating alternatives for more efficient operations of Federal water storage and flood control facilities under existing authorities to meet the increasing demands on the upper Rio Grande. Compliance with the National Environmental Policy Act (NEPA) and the ESA will be provided. After receiving comments from the public in 2002, the agencies have developed a set of alternatives that are being evaluated in the EIS. A draft EIS is anticipated to be produced in August 2003.

# Caballo Dam Structural Repairs

Reclamation informed the Engineer Advisers that repairs to Caballo Dam associated with concrete cracking of the spillway structure center pier and design deficiencies in the radial gate structures were completed in 2002. The temporary restriction, which resulted in a temporary reduction in Project Storage capacity of 93,244 acre-feet in Caballo Reservoir operating levels, was removed in May 2002.

# Rio Grande Project Storage Projections

Reclamation discussed their Rio Grande Project water allocations for 2003. At the time of the Engineer Adviser meeting, Reclamation indicated that the initial allocation was 11% of a full supply. This allocation is based on a 36% of average flow for San Marcial for the forecast period. This allocation also includes calculating evaporation against credit water in storage on a month-to-month basis and releasing the converted credit water for project operations. Reclamation advised the Engineer Advisers that they anticipate by the end of September 2003 the final allocation that will be available to Rio Grande Project water users will be 45% of a full water supply. The New Mexico Engineer Adviser expressed concern with this allocation procedure for including evaporation projections against credit water when the compact addresses only year-end accounting New Mexico believes that such a procedure could lead to misconceptions of the amount of available Project water available for release and suggests that this issue be considered by the Engineer Advisers in the discussions with Reclamation on the development of an appropriate methodology for determining the

annual allocation of usable water in project storage.

The IBWC reported that Mexico had been allocated 7,978 AF for diversion at International Dam. The IBWC reported that Mexico had been advised of the reduced allocation.

Reclamation presented projections of reservoir operations for Elephant Butte and Caballo Reservoirs based on February 1, 2003, snowmelt runoff forecasts for March-July 2003. They indicated that Elephant Butte Reservoir storage would be drawn down to approximately 247,000 acre-feet by the fall of 2003. The Colorado and New Mexico Engineer Advisers are concerned that this projection is less than the total amount of accrued credit water in storage at that time.

# Middle Rio Grande Project Channel Maintenance

Reclamation personnel provided a presentation regarding the status of Reclamation's channel maintenance program. In summary, Reclamation representatives said that 26 priority level sites remain of concern with eight of the sites considered low level public health and safety threats. Reclamation stated that they have initiated or completed temporary repairs at several of the priority sites and that they have plans to address multiple sites in 2003 if sufficient funding is received. Should funding not become available, priority sites that require maintenance will continue to grow in number.

The Engineer Advisers discussed with Reclamation the delays associated with ESA Section 7 consultation in addressing historic channel failures and current channel problems. Reclamation indicated that they have not yet entered into consultation with the Service on levee maintenance work that may be conducted in 2003 but will report to the Engineer Advisers on the results of those consultations. An uncontrolled breach of the levee system could potentially dewater a significant portion of the river channel resulting in mortality of the endangered Rio Grande silvery minnow.

# Los Lunas Habitat Restoration Project

This project consists of habitat restoration for the Rio Grande silvery minnow and the Southwestern willow flycatcher of approximately 40 acres near Los Lunas, New Mexico. The project was designed to provide for overbank flooding at flows above 2500 cfs and to create low velocity riverine habitat in side channels by removal of jetty jacks and lowering of the river banks in the area. The construction work on the project was substantially complete at the time of the Engineer

Advisers meeting. Overbank flooding was occurring on the site as constructed at 500 cfs, which was substantially below the project design criteria.

# Santa Ana Habitat Restoration Project

The Corps indicated they are planning to implement a large scale habitat restoration project on the Santa Ana Pueblo. The project will be similar to the one recently completed by Reclamation but larger in scope. The project will be located just south of the existing Reclamation project. The Corps project will involve realignment and widening of the river channel and stabilization of the river channel grade with two gradient restoration facilities.

# Rio Grande Silvery Minnow

Service staff reported briefly on monitoring of the Rio Grande silvery minnow status. Current monitoring shows decreased catch rates throughout the Middle Rio Grande that were among the lowest since monitoring was initiated in 1995. The Service also gave a report on silvery minnow rescue operations for 2002. There were several instances where the river flow became intermittent below San Acacia Dam and in the Isleta reach. The Service reported that a total take of 248 minnows was charged against the annual of 500 set by the Incidental Take Statement. In 2002, a total of 53,582 marked minnows reared in captive propagation facilities were released to the river. The Service also reported that the number of silvery minnows in captivity was 210,000 as of December 31, 2002. These populations are distributed between the Dexter National Fish Hatchery at Dexter, New Mexico, the USGS Biological Resources Division facility at New Mexico State University, and the Albuquerque Biological Park.

The Rio Grande silvery minnow recovery team met in December 2002. The team was advised that the Regional Director of the Service wanted the recovery plan revised to include specific objectives which would lead to the delisting of the species. The recovery team was advised that the original team would be divided into a technical team and a participation team. The Engineer Advisers are members of the participation team. The technical team is to meet monthly to develop the science needed to achieve the desired plan. The participation team is to meet quarterly to review the work of the technical team and provide comments. The Engineer Advisers expressed concern that the technical team had met in early 2003, but no information had been provided to the participation team of the results of that meeting. The Engineer Advisers requested that they be kept informed of

ongoing activities, the roles of all participants and any other activities regarding this effort. It is likely that the Service will recommend that to achieve delisting the species will need to be reintroduced in other locations of the Rio Grande and Pecos River.

# Designation of Critical Habitat for the Rio Grande Silvery Minnow

The final rule for designation of critical habitat for the Rio Grande silvery minnow was published by the Service in the February 19, 2003 issue of the Federal Register. Designated critical habitat extends from Cochiti Dam to the power lines just north of the conservation pool of Elephant Butte Reservoir, plus Jemez River from Jemez Canyon Dam to the boundary of Santa Ana Pueblo. Lands of most of the middle Rio Grande Pueblo were excluded from the designation. The Service indicated that the final EIS and Economic Analysis associated with this designation were also published on February 19.

# Vegetation Management at Elephant Butte and Caballo Reservoirs

Reclamation reported on the issue of vegetation encroaching into the exposed reservoir bottom of Elephant Butte Reservoir. Salt cedar and other phreatophytes have invaded and continue to grow within the reservoir area as the reservoir recedes. Reclamation is looking into herbicide application, biological control, and mowing within the reservoir area to address this issue. Reclamation expressed concern over their ability to refill the reservoir if this area is determined to be suitable habitat for the southwest willow flycatcher. Reclamation is looking into habitat conservation plans for this region as a means of averting this issue. Reclamation reported that Congressional action may be required for them to develop a habitat conservation plan.

New Mexico annually provides cooperative funding for a vegetation management program at Caballo Reservoir and a portion of Elephant Butte Reservoir. The program currently relies primarily on mowing, with the goal of reduction of non-beneficial consumption of water. New Mexico reports that the New Mexico Interstate Stream Commission recently approved an agreement with Reclamation that allows R eclamation to purchase a new mower to replace one that has reached the end of its service life. In addition Reclamation informed the Engineer Advisers that a 200-acre pilot herbicide treatment project was being implemented at Caballo Reservoir and that an Environmental Assessment would be prepared for a 1000-acre herbicide treatment in the exposed delta of Elephant

# Butte Reservoir.

# Jemez Canyon Reservoir Bulkhead Repairs

The Corps reported that the repairs to the Jemez Canyon Reservoir bulkhead guides for the gates had been completed.

# San Acacia Levee Project

The Corps is currently estimating revised schedules and costs for the San Acacia Levee project. This project would rehabilitate 55 miles of levee between San Acacia and Bosque Del Apache including raising or relocating the railroad bridge at San Marcial. Project costs are estimated to be \$71.2 million. The non-Federal sponsor for the project is the Middle Rio Grande Conservancy District. Federal funding for this project was not included in the FY04 budget. The Conservation Water Agreement requires New Mexico to share in the cost of relocation of the railroad bridge. The Corps could not assure that the project would be initiated before the Conservation Water Agreement expired. New Mexico reported that they have funding for the project in their FY04 budget request.

# Programmatic Biological Opinion

The Service and Reclamation reported on the Programmatic Biological Assessments and Biological Opinions that have been issued over the past several years. In August 2002 Reclamation reinitiated consultation with the Service on Middle Rio Grande operations due to the concern that the flow targets of the June 2001 Biological Opinion would not be met during the fall of 2002 due to drought. The June 2001 Programmatic Biological Opinion concluded in a jeopardy opinion for the silvery minnow and flycatcher, but also developed a Reasonable and Prudent Alternative to avoid jeopardy. In September 2002 the Service issued a Biological Opinion that also concluded in a jeopardy opinion but did not develop a reasonable and prudent alternative. The September Biological Opinion was declared arbitrary and capricious by the U.S. District Court for New Mexico. The ruling of the court required specific river flows that Reclamation must meet through 2002 and required Service and Reclamation to consult on 2003 operations. The ruling was subsequently stayed by the U.S. Court of Appeals for the Tenth Circuit. The Circuit Court was briefed and a hearing was held on January 14, 2003. A ruling is expected in March. Ironically cooler temperature and precipitation in September 2002 maintained river flow such that all the target flows of the 2001 Biological Opinion

have been met since the District Court ruling. Reclamation indicated that they continue to operate in compliance with the June 2001 Biological Opinion.

# Rio Grande Cutthroat Trout

The Service reported that on February 25, 1998 they received a petition to list the Rio Grande cutthroat trout as an endangered species. The Service subsequently concluded that the listing was not warranted. On June 9, 1999 a complaint was filed against the Service for this decision. On November 8, 2001, a settlement agreement was filed with the court stipulating that the Service would initiate a candidate status review for the trout. The Service completed that review on June 11, 2002 and again concluded that the listing was not warranted. On October 29, 2002 the Service received a notice of intent to sue the Secretary of Interior for not listing the trout as an endangered species. No suit has been filed to date.

# BUDGET

The Engineer Advisers reviewed the Cost of Operation for the year ending June 30, 2002 and the Budget for Fiscal Year ending June 30, 2004. The Engineer Advisers found that the expenses for the administration of the Rio Grande Compact for the year ending June 30, 2002 were \$175,494. The United States bore \$59,753 of this total, with the balance of \$115,741 borne equally by the three states. The proposed budget for the fiscal year ending June 30, 2004 indicates a total of \$168,068 will be spent for administration. The proposed contribution of the USGS for 2004 remained the same as that for 2003.

Steven E. Vandiver Engineer Adviser for Colorado

Estevan R. Lopez

Herman R. Settemeyer Engineer Adviser for Texas

# ADDENDUM TO THE

February 21, 2003

# **REPORT OF THE ENGINEER ADVISERS** TO THE RIO GRANDE COMPACT COMMISSIONERS

The Engineer Advisors recognized and discussed the fact that the index flow for the Rio Grande near Del Norte gage for calendar year 2002 was below the values on the delivery schedule in Article III. The Engineer Advisors recommend that a pro-rata decline in the index and delivery obligation from 200,000/60,000 acre-feet (AF) down to 0/0 AF be used to determine Colorado's Rio Grande mainstem delivery obligation for 2002 only.

Pursuant to this concept, the obligation for the Rio Grande mainstem in Colorado would be 46,400 AF based on a 154,200 AF index flow. The Engineer Advisors recommend to the Commission that they approve a resolution directing that this procedure be used to handle this anomaly that occurred in 2002.

/s/ Steven E. Vandiver

Steven E. Vandiver Engineer Adviser for Colorado

/s/ Estevan R. Lopez

Estevan R. Lopez Engineer Adviser for New Mexico

/s/ Herman R. Settemeyer

Herman R. Settemeyer Engineer Adviser for Texas

The foregoing text should have been in the "Compact Accounting" portion of the Rio Grande Compact Note: Commission Engineer Advisers report for the year 2002. It was inadvertently omitted from the report and is essential to understanding the situation that developed in the Colorado portion of the basin during the year.

TABLE 1 <sup>ª</sup> - LIST OF RAW COMPA	CT DATA AND RESPONSI	BLE AGENCY
		Responsible
Raw Data	Type	Agency
Streamfl	ow in Colorado	
Rio Grande near Del Norte	Stream Discharge	CDWB
Rio Conejos near Mogote	Stream Discharge	CDWB
Rio Los Pinos near Ortiz	Stream Discharge	CDWB
San Antonio River at Ortiz	Stream Discharge	CDWR
Conejos River near Lasauses	Stream Discharge	CDWR
Rio Grande near Lobatos	Stream Discharge	CDWR
Transmountain	Diversions in Colorado	
Don La Font No 1 & 2	Stream Discharge	CDWR
Pine River-Weminuche Pass	Stream Discharge	CDWR
Tabor	Stream Discharge	CDWR
Treasure Pass	Stream Discharge	CDWR
Weminuche Pass	Stream Discharge	CDWR
Williams Creek - Squaw Pass	Stream Discharge	CDWR
Beaver Park Reservoir Storage Release	Stream Discharge	CDWR
Reservoir S	torage in Colorado	
Alberta Park Reservoir	Reservoir Stage	CDWR
Big Meadows Reservoir	Reservoir Stage	CDWR
Hermit Lakes No. 3	Reservoir Stage	CDWR
Mill Creek Reservoir	Reservoir Stage	CDWR
Rito Hondo Reservoir	Reservoir Stage	CDWR
Shaw Lake Enlargement	Reservoir Stage	CDWR
Squaw Lake	Reservoir Stage	CDWR
Fuchs Reservoir	Reservoir Stage	CDWB
Platoro Reservoir	Beservoir Stage	CDWR
Trujillo Meadows Reservoir	Reservoir Stage	CDWB
Reservoir Evapora	ation Losses in Colorado	
	Pan Evaporation and	
Platoro Reservoir Weather Data	Precipitation	CWCD
Closed	Basin Project	
Miscellaneous flows and diversions	Stream/Canal Discharge	USBOR
Streamflo	w in New Mexico	
Willow Creek above Heron Reservoir	Stream Discharge	USBOR
Willow Creek below Heron Reservoir	Stream Discharge	USBOR
Rio Chama below El Vado Dam	Stream Discharge	USGS
Rio Chama above Abiguiu Reservoir	Stream Discharge	USGS
Rio Chama below Abiguiu Dam	Stream Discharge	USGS
Rio Grande at Otowi Bridge	Stream Discharge	USGS
Rio Grande below Elephant Butte Reservoir	Stream Discharge	USGS
Rio Grande below Caballo Dam	Stream Discharge	USBOR
Bonita Private Lateral Diversion	Stream Discharge	USBOR
Transmountain D	iversions in New Mexico	
San Juan-Chama Feeder Diversions	Stream Discharge	USBOR
Azotea Tunnel Outlet	Stream Discharge	USBOR
Transmountain I	Depletions above Otowi	000011
Nambe Falls Reservoir	Reservoir Stage	PVID
Nambe Falls Reservoir Inflow	Stream Discharge	PVID
	Pan Evaporation, Precipitation	
Nambe Falls Reservoir Weather Data	and Temperature	PVID
Nambe Falls Reservoir Ice Cover	Estimate	USBOR
Rio Nambe below Nambe Falls Dam	Stream Discharge	USGS

between the

and the United States Bureau of Reclamation Memorandum of Understanding between the Rio Grande Compact Commission and the United States Bureau of Reclamation

TABLE 1 <sup>a</sup> - LIST OF RAW COMPACT DATA AND RESPONSIBLE AGENCY										
		Responsible								
Raw Data	Type	Agency								
PVID and Pueblo (San Ildetonso, Pojoaque,										
Nambe) Diversions	Stream/Canal Discharge	PVID/USBIA								
PVID and Pueblo (San Ildefonso, Pojoaque,										
Nambe) Return Flows	Stream/Canal Discharge	PVID/USBIA								
Buckman Wellfield Pumping	Wellfield Discharge	CSF								
Miscellaneous SJC Contractors Well Pumping	Wellfield Discharge	Miscellaneous								
Reservoir Sto	brage in New Mexico									
Heron Reservoir	Reservoir Stage	USBOR								
El Vado Reservoir	Reservoir Stage	USBOR								
Abiquiu Reservoir	Reservoir Stage	USCOE								
McClure Reservoir	Reservoir Stage	CSF								
Nichols Reservoir	Reservoir Stage	CSF								
Cochili Reservoir	Reservoir Stage	USCOE								
Galisteo Reservoir	Reservoir Stage	USCOE								
Jemez Canyon Reservoir	Reservoir Stage	USCOE								
Seama Reservoir	Reservoir Stage	BIA								
Elephant Butte Reservoir	Reservoir Stage	USBOR								
Caballo Reservoir	Reservoir Stage	USBOR								
Reservoir Evaporat	tion Losses in New Mexico									
	Pan Evaporation, Precipitation,									
Heron Reservoir Weather and Ice Cover Data	Temperature and Ice Cover	USBOR								
	Pan Evaporation, Precipitation,									
El Vado Reservoir Weather and Ice Cover Data	Temperature and Ice Cover	USBOR								
	Pan Evaporation, Precipitation,									
Abiquiu Reservoir Weather and Ice Cover Data	Temperature and Ice Cover	USCOE								
	Pan Evaporation, Precipitation,									
Cochill Reservoir Weather and Ice Cover Data	Temperature and Ice Cover	USCOE								
Jemez Canyon Reservoir Weather and Ice Cover	Pan Evaporation, Precipitation,									
Data	Temperature and Ice Cover	USCÓE								
	Pan Evaporation, Precipitation,									
Elephant Butte Reservoir Weather Data	Temperature and Ice Cover	USBOR								
	Pan Evaporation, Precipitation,									
Caballo Reservoir Weather Data	Temperature and Ice Cover	USBOR								

<sup>a</sup>Table 1 omitted from MOU published in the 2001 Report of the Rio Grande Compact Commission CDWR = Colorado Division of Water Resources

CWCD = Conejos Water Conservation District

USBOR = U.S. Bureau of Reclamation

USGS = U.S. Geological Survey

EBID = Elephant Butte Irrigation District

PVID = Pojoaque Valley Irrigation District

USBIA = U.S. Bureau of Indian Affairs

CSF = City of Santa Fe

### Resolution

# of the Rio Grande Compact Commission Concerning the Article III Delivery Schedule of the Rio Grande in 2002

# March 27, 2003 El Paso, Texas

WHEREAS, the stream flows in the Upper Rio Grande Basin in 2002 were among the lowest in recorded history;

WHEREAS, Article III of the Rio Grande Compact contains separate delivery schedules for the Rio Grande and the Conejos River in Colorado;

WHEREAS, the schedule of deliveries contained in Article III of the Compact were derived from the inflow-outflow relationship determined from the Rio Grande Joint Investigation using 1928-1937 data and during that period there were no years with index flows as low as those of 2002;

WHEREAS, the Article III schedule of deliveries for the Rio Grande in Colorado starts with a scheduled delivery of 60,000 acre feet for a Del Norte Index flow of 200,000 acre feet and is silent as to scheduled deliveries when Del Norte Index flows are less than 200,000 acre feet;

WHEREAS, the comparable Article III delivery schedule for the Conejos River prescribes zero delivery on indexed flows of 100,000 acre feet or less;

WHEREAS, the absence of a lower limit on the Rio Grande's Article III delivery schedule does not allow for proportioning of intermediate parts;

WHEREAS, the Commissioners for Colorado, New Mexico and Texas, and their engineer advisers, are aware of no factual basis on which to predict what the relationship between inflow and outflow for purposes of the Rio Grande's separate Article III delivery schedule would have been had such flows occurred during the Compact study period and therefore have no factual basis upon which to determine whether the Rio Grande's Article III delivery schedule should extend below 200,000 acre feet;

WHEREAS, the Commissioners from Colorado, New Mexico and Texas desire to reach a compromise and agreement on accounting for the Rio Grande's separate Article III delivery schedule in 2002

NOW, THEREFORE, BE IT RESOLVED by the Rio Grande Compact Commission that for purpose of accounting for the Rio Grande's separate Article III delivery schedule in

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2002, the indexed flow at Del Norte was 154,600 acre feet, and the Rio Grande's scheduled delivery for 2002 is 46,400 acre feet; and

BE IT FURTHER RESOLVED that this agreed upon delivery is for purposes of the Rio Grande Compact accounting for 2002 only, does not waive the right of the Commission or any state to use a different method for such accounting should conditions similar to 2002 reoccur in the future, and is not a precedent binding on the Compact Commission or on the States of Colorado, New Mexico, or Texas for any purpose at any time hereafter.

Hal D. Simpson, Commissioner for Colorado

hn R. D'Antonio, Jr., Commissioner for New Mexico فلر

Jee G. Hanson, Commissioner for Texas

# RESOLUTION OF THE RIO GRANDE COMPACT COMMISSION

# REGARDING NEED FOR THE U.S. BUREAU OF RECLAMATION TO DESIGN, CONSTRUCT, OPERATE, AND MAINTAIN THE LOW FLOW CONVEYANCE CHANNEL FROM SAN ACACIA TO THE ACTIVE RESERVOIR POOL IN ELEPHANT BUTTE RESERVOIR AT THE 2000 CFS OPERATIONAL DESIGN

March 27, 2003 El Paso, Texas

WHEREAS, the states of Colorado, New Mexico, and Texas entered into the Rio Grande Compact, signed in 1938, regarding the waters above Fort Quitman Texas; and

WHEREAS, Article VI of the Rio Grande Compact provides for annual computation of all credits and debits of Colorado and New Mexico; and

WHEREAS, New Mexico reports that operation and maintenance of federal water conveyance facilities including the Low Flow Conveyance Channel are important to New Mexico's compliance with its Rio Grande Compact delivery obligations; and

WHEREAS, the U.S. Bureau of Reclamation (Reclamation) on February 19, 2003 reported to the Engineer Advisers on the status of their Low Flow Conveyance Channel (LFCC) Modification project; and

WHEREAS, Reclamation continues to propose, primarily because of Endangered Species concerns, to reconstruct the LFCC from San Marcial to Elephant Butte Reservoir using the Bottom Up Realignment alternative at the 500 cfs design capacity; and

WHEREAS, Reclamation also proposes to discharge the waters of the reconstructed LFCC into a marsh area currently occupied by Southwestern willow flycatchers well before the logical terminus of the LFCC and then re-gather the discharged water; and

WHEREAS, Reclamation's proposal directly conflicts with the April 11, 2001 and March 21, 2002 Resolutions of the Rio Grande Compact Commission; and

WH! REAS, the Rio Grande Compact Commission concurs that Reclamation's proposal, if implemented, would effectively negate operation of the LFCC, and could negatively impact the ability of the Low Flow Conveyance Channel to effectively drain and efficiently transport the waters of the Rio Grande to Elephant Butte Reservoir; and

NOW, THEREFORE, BE IT RESOLVED that the Rio Grande Compact Commission recommends and requests Reclamation design, construct, operate, and maintain the reconstructed LFCC from San BE IT FURTHER RESOLVED that the Rio Grande Compact Commission supports full funding for modifications to the Low Flow Conveyance Channel only if implemented as described herein; and

BE IT FURTHER RESOLVED that the Rio Grande Compact Commission requests that Reclamation promptly inform the Rio Grande Compact Commission through the Engineer Advisers of any additional difficulties in implementing the project and that Reclamation provide the Engineer Advisers a quarterly update on project activities, problems, and results; and

BE IT FURTHER RESOLVED that the Secretary of the Rio Grande Compact Commission transmit copies of this resolution to the Secretary of the Interior, and the Commissioner, Regional Director, and Albuquerque Area Office Manager of Reclamation.

Hal D. Simpson

Commissioner for Colorado

ohn R. D'Antonio Jr

Commissioner for New Mexico

Joe G. Hanson Commissioner for Texas

# RIO GRANDE COMPACT COMMISSION REPORT RECORDS OF DELIVERIES AND RELEASES

At the annual meeting of the Compact Commission on March 27, 2003, the records of deliveries and releases and computations of debits and credits for calendar year 2002 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 by the Resolution of the Rio Grande Compact concerning the Article III Delivery Schedule of the Rio Grande in 2002, dated March 27, 2003. The resolution prescribed that the indexed flow at Del Norte was 154,600 acre-feet, and the Rio Grande's scheduled delivery for 2002 is 46,400 acre feet. The resolution was to apply only to the accounting for 2002.

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 2002 the Commissioners found that the actual release of usable water was 802,400 acre-feet. This resulted in an accrued credit of 65,500 acre-feet as of January 1, 2003.

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RIÓ GRANDE COMPACT - DELIVERIES BY NEW MEXICO AT ELEPHANT BUTTE YEAR 2002

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_				ADJUS	TMENTS			INDEX	SUPPLY		STORAGE I	IN ELEPHANT		Effective	Supply
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<u>er u. a</u>	ecorded Ipw I Otown Bridge	Siorage End of Month <sup>a</sup>	Change in Storage	Reservoir Evaporation	Other Adjustments	Trans-mountain Diversions	Ket Adjustments	During Month	Accumulated	Total Weter Stored in New Meatice Above San Marchal at End of Month "	End of Month <sup>a</sup>	Change Gain (+) Loss (-)	Recorded Flow Below Elephant Butta Dam	North	Accumulated
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$\rightarrow$	56.2	5.1	-10.6	00		10.5	-51.5	5.1	170.5	5.0	0.905	-92.2	115,31	23.1	176.7
-	35.9	2.1	-30	0.2		-14.2	17.0	18.9	189.4	1.9	298.7	-39.3	70.5	31.2	207.9
+	2.52	2.1	0.0	0.1		.7 4	5.7.	15.9	205.3	2.0	261.2	-15.5	30.0	14 S	222.4
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PL	12 do not inclue	le transmountain	r weier.				NM2	Scheduled Delive	my at Eleptrant Bu	utte			145.2		Cr 10.5
							CIMN	Actual Elephant	Butte Effective St.	Adda				2841	Cr 294 6
							NM4	<b>Reduction</b> of Deb	vits o/c Eveporatic	5					
							NMS	Reduction of Cree	dits of Evaporation	on and Spill			29.6		Cr 265 D
							NMG								
							N&A7								
	and the second s						NMB	Balance at End o.	4 Year						Cr 265.0

RIO GRANDE COMPACT - DELIVERIES BY COLORADO AT STATE LINE YEAR 2002

43

44

Number in the second			_		_	_	_	_	_		_	_	_	_	_	-	_	_								_		-	_
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Tears Character Ch		RID GR		Tolal Release and Spill	14		0.2	169	92.0	92.8	6 B01	141.8	125.6	121.5	7.77	24.5	0,1	•	802.4	UED DEPART	W	ng of Year						four	E OF HYPOTH
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Teal Clanifies and transfer and transfer and transfer and transfer and transfer and transfer and transfer and transfer an	1			Measured Flow al Cabalio Gaging Station	12		0.1	16.5	91.9	52.7	108.5	141.8	125.5	121.4	77.4	24.7	0.1	0.0	800.9			Accrued Depar	Actual Release	Vormal Releas				Accrued Depart	
Tearline Carentines in theorem Tearline   MONTH ** Total UISABLE WATER IN STORAGE Cuentines in theorem Cuentines in theorem Cuentines in theorem Endot Water   MONTH Floring Endot UISABLE WATER IN STORAGE Cuentines Cuentines Floring Cuentines Floring Cuentines <td>In manual have</td> <td></td> <td></td> <td>Total Water in Project Storage at End of Month,</td> <td>11</td> <td>913.6</td> <td>854.3</td> <td>965,2</td> <td>890.8</td> <td>605.4</td> <td>706.4</td> <td>571.8</td> <td>466.5</td> <td>364.2</td> <td>9.020</td> <td>314.9</td> <td>342.9</td> <td>E.87E</td> <td> </td> <td></td> <td></td> <td>P1 /</td> <td>P2</td> <td>P3</td> <td>P4</td> <td>PS</td> <td>P6</td> <td>P7 1</td> <td></td>	In manual have			Total Water in Project Storage at End of Month,	11	913.6	854.3	965,2	890.8	605.4	706.4	571.8	466.5	364.2	9.020	314.9	342.9	E.87E				P1 /	P2	P3	P4	PS	P6	P7 1	
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MONTH **roial **roial UISABLE WATER IN STORAGE CREDIT WATER IN S Cabredo Cabredo Now Maxima   MONTH Errori Error Train Train Train Cabredo Now Maxima   Propect Error Amm Strainste a S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S	antine in the state	TORAGE		Total al End of Month	6	<sup>b</sup> 165.8	164.7	163.6	161.1	157.6	153,5	148.4	144.7	140.7	138.1	136.0	134.8	134.3	I		a france for the state	1'2 DOE L'ANDIE	18 Resolution o	re-feat from Ap					
MONTH **roal Froat UISABLE WATER IN STORAGE CREDIT V   MONTH **roal Etephnni Etephnni Lusalied CREDIT V   MONTH Erepting Etephnni Etephnni Calovado Project Etephnni   MONTH Erepting Etrin Reservoir Reservoir Month Eredit Water   Anno 2,131.8 741.0 73.3 5 P.47.3 1,1840 Celovado   AM 2,131.8 741.0 46 7.3 9 6 7   AM 2,131.8 741.0 723.5 P.47.3 1,1840 Celovado   AM 2,131.8 741.0 46 723.6 1,342.2 100   AM 2,131.8 771.0 46 7.3 6 7 9   AM 2,106.8 455.4 723 45.0 1,342.2 100   AM 2,108.8 53.4 53.9 1,342.2 100 9   AM 2,108.8	č	NATER IN S		New Mexico Credil Water	8	b155.7	154.7	153.6	151.3	148.0	144.1	139.4	135.9	132.1	129.7	127.7	126.6	126.1				andac to independent	otember 9, 195	hr of 50,000 ac					
<sup>1</sup> Total <sup>1</sup> Loai USABLE WATER IN STORAGE   MONTH <sup>1</sup> Total <sup>1</sup> Total Unfilled   Storage st Storage st Capacity of Unfilled   Storage st Storage st Month Enda Unfilled   Total Capacity Reservoir Reservoir Month Enda   Lipschy Reservoir Reservoir Reservoir Month End of Month   Lipschy Reservoir Reservoir Reservoir Month End of Month   Lin Z 3 3 S S B B   Lin Z S S S S S S S   Lin Z S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S		CREDIT	-	Colorado Cradit Water	7	b10.1	10.0	10.0	9.6	96	9.4	9.0	8.8	2.5	8.4	6.3	8.2	82			1	o, roo acre-juu	ized by the Se	Butte Reservo					
Total LISABLE WATER IN STORAGE   MONTH **noit **noit Total   Storets Burds Burds Total   Storets Burds Resarroit Resarroit Ac   ANN Zinglis Resarroit Resarroit Monh   Zinglis Resarroit Resarroit Monh   Ann Zinglis Resarroit Sige Sige   Ann Zinglis Sige Sige Sige   Ann Zinglis				Untilled Capacity of Project Storage at End of Month	9	1,184.0	1,342.2	1,330.2	1,402.1	1,459.0	1,553,9	1.776.6	1,878.1	1,976.5	2,014.2	2,046.1	2.016.9	1 980 0			101 5 -1 5005	y such Floring A.	rch) as recoor	on at Elephant					
<sup>a</sup> Tolat <sup>a</sup> Tolat USABLE WATER IN 9   MONTH <sup>a</sup> Tolat Elephani eabelio   Sproject Elephani Cabalio eabelio   Indiat Elephani Cabalio eabelio   Project Elephani Cabalio eabelio   Indiat Elephani Cabalio eabelio   Availati Elephani Resarroir eabelio   Ama 2,131.8 720.5 80.8   AM 2,131.8 730.5 38.4   AM 2,131.8 730.5 38.5   AM 2,101.8 65.4 97.5   AM 2,101.8 65.4 97.5   AM 2,101.8 730.5 38.6   AUL 2,200.0 733.5 38.5   AUL 2,200.0 733.5 37.6   AUL 2,200.0 172.7 37.4   AUL 2,200.0 172.7 37.4   AUL 2,200.0 172.7 37.4		STORAGE		Total al End of Month	5	B747.8	789.6	801.6	729.7	647.8	552.9	1 621	321.9	223.5	185,6	178.9	208.1	245 0			To the second black	and included and	(October to Ma	orage reservati	through March				
MONTH <sup>a</sup> Tolat MONTH <sup>a</sup> Tolat Project Elephani Srotest Elephani Srotest Elephani Availatest and Amin Availatest and Amin Amin 2,131,8 741,0 FEB 2,131,8 741,0 FEB 2,131,8 741,0 Amin 2,131,8 750,0 Amin 2,131,8 750,0 Amin 2,130,0 145,3 Aut 2,225,0 145,3 Aut 2,22		WATER IN S		Caballo Reservoir	4	25.5	48 6	80.8	75.3	72.1	67.5	38.6	38.4	282	27.2	7.66	35.4	37.4	1		of and and a set of a	i uecemeer zu	D30 acre-feet	lood control ste	from October	"1 and MM1)	· forma and ·		
<sup>a</sup> Tolati MONTH <sup>a</sup> Tolati Stores Stores Available at Available at Av		USABLE		Eiephani Butte Reservoir	0	E.227 <sup>d</sup>	741.D	720 8	654.4	575.7	485.4	384.6	283.5	195.3	158.5	145.2	172.7	207.6			Consolin Consolin	the state in some	ber) and 2.255	Imission with I	5,000 scre-feet	nine of Year (	in the Room		
MONTH MONTH MMR MMR MMR MNR MNR MNR MNR MNR				<sup>a</sup> Tolat Project Slorage Capacity Avaitable at End of Month	2	2,131,8	2,131.8	2.131.6	2,131.6	2,106.8	2,106.8	2,200.0	2,200.0	2,200.0	2,200.0	2,225 0	2,225,0	2 225 0			and a second	Totaler to fler	Vorial to Septern	+ Compact Con	plember and 2	starres at Ranie			
				MONTH	-		NAL	FEB	MAR	APR	MAY	NUL	JU.	AUG	SEPT	OCT	NON	DEC	YEAR		R T	and the first of	acre-feel (A	Rio Grande	Ihrough Sa	b Baced no B.			

Date: 2 18 03 Tuxas 185 ð Achtear indiana in :Dale: 2/18/03 2/18/03 Date: SEV APPROVED: Engineer Adviser for Colorado

# BUDGET FOR FISCAL YEAR ENDING JUNE 30, 2002

			E	Borne by			8	ome by	
item	T	otal Cost	Uni	ited States	C	Colorado	Ne	w Mexico	Texas
GAGING STATIONS	Γ								
In Colorado	\$	57,562	\$	6,710	\$	50,852			
In New Mexico, above Caballo Reservoir	\$	67,090	\$	40,975			\$	26,115	
In New Mexico, Caballo Reservoir and below	\$	21,190	\$	5,330			\$	1,820	\$ 14,040
Subtota	\$	145,842	\$	53,015	5	50,852	\$	27,935	\$ 14,040
ADMINISTRATION									
U.S.G.S. Contract	\$	26,952	\$	6,738	\$	6,738	\$	6,738	\$ 6,738
Other expenses	\$	2,700			\$	900	\$	900	\$ 900
Subtota	\$	29,652	\$	6,738	\$	7,638	\$	7,638	\$ 7,638
GRAND TOTAL	\$	175,494	\$	59,753	\$	58,490	\$	35,573	\$ 21,678
EQUAL SHARES					\$	38,580	\$	38,580	\$ 38,580

# BUDGET FOR FISCAL YEAR ENDING JUNE 30, 2004

		Borne by		Borne by	
Item	Total Cost	United States	Colorado	New Mexico	Texas
GAGING STATIONS					
In Colorado	\$60,037	\$7,119	\$52,918		
In New Mexico, above Caballo Reservoir	\$50 coo	000 505			
In New Marian Call II	\$25,630	\$33,595		\$19,095	
Reservoir and below	\$22,960	\$6,390		\$2,070	\$14,500
Subtotal	\$135,687	\$47,104	\$52,918	\$21,165	\$14,500
ADMINISTRATION					
U.S.G.S. Contract	\$29,432	\$7,007	\$7,475	\$7,475	\$7,475
Other expenses	\$2,949		\$983	\$983	\$983
Subtotal	\$32,381	\$7,007	\$8,458	\$8,458	\$8,458
GRAND TOTAL	\$168,068	\$54,111	\$61,376	\$29,623	\$22,958
EQUAL SHARES			\$37,986	\$37,986	\$37,986

RIO GRANDE COMPACT - RELEASE AND SPILL FROM PROJECT STORAGE

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### 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 Olfice 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 Lasauses, Colo. Rio Grande near Lobatos, Colo.

Records of six transmountain diversions and of storage in Platoro, 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: 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. The U.S. Geological Survey, in cooperation with the U.S. Bureau of Reclamation, Albuquerque, N. Mex., provided the following records: 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 Cochili 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 Laguna Agency, Bureau of Indian Alfairs, 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 the agencies listed above.

# 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 stagedischarge 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.

#### 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 mi west of Del Norte, and 18 mi 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 mi downstream. Records are equivalent.

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

Average discharge .- 113 years (1890-2002), 898 ft<sup>3</sup>/s (650,700 acre-ft per year).

Extremes.-1889-2002: Maximum discharge, 18,000 ft<sup>3</sup>/s Oct. 5, 1911 (gage height, 6.80 ft), from rating curve extended above 12,900 ft<sup>3</sup>/s; minimum daily, 69 ft<sup>3</sup>/s Aug. 21, 1902.

<u>Remarks</u>—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	4,980	180	140	161	9,880
February	4.360	180	140	156	8,650
March	6.067	280	140	196	12,030
April	13.044	562	277	435	25,870
May	15.663	671	315	505	31,070
lune	6.661	449	134	222	13,210
Tuly	4.405	190	107	142	8,740
August	3.637	178	88	117	7,210
Sentember	5,351	377	96	178	10,610
October	6.673	321	154	215	13,240
November	3,803	176	88	127	7,540
December	3.075	114	90	99.2	6,100
Calendar year 2002	77,719	671	88	212	154,200

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 mi 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 .-- 50 years (1890-2002), 92.0 ft3/s (66,660 acre-ft per year).

Extremes -1952-2002: Maximum discharge, 1,160 ft<sup>3</sup>/s Nov. 1, 1957; maximum gage height, 4.29 ft June 15, 1958; no flow Oct. 16-20, 1955.

<u>Remarks.</u>-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
lanuary	773	7.3	7.1	7.18	442
February	208	7.5	7.3	7.42	412
March	241	10	7.5	7.78	478
April	1.785	114	10	59.5	3,540
May	4.771	231	48	154	9,460
lune	2.782	202	13	92.7	5,520
Tulv	576	37	4.8	18.6	1,140
August	121	15	.60	3.90	240
September	279	51	3.7	9.31	554
October	396	31	5.4	12.8	785
November	216	7.2	7.2	7.20	428
December	223	7.2	7.2	7.20	443
Calandar year 2002	11 821 0	231	0.60	32.4	23,450

#### 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 mi downstream from Fox Creek, and 5.3 mi west of Mogote. Datum of gage is 8,271.54 ft above mean sea level.

Drainage area.-282 sq mi.

Average discharge .- 92 years (1904, 1912-2002), 324 ft<sup>3</sup>/s (234,900 acre-ft per year).

Extremes.-1903-05, 1911-2002: Maximum discharge, 9,000 ft<sup>2</sup>/s Oct. 5, 1911 (gage height, 8.50 ft), from rating curve extended above 3,100 ft<sup>3</sup>/s; minimum daily determined, 10 ft<sup>3</sup>/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	y and	yearly	discharge,	in	cubic	feet	per	second

Month	Second- foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	1.121	38	22	36.7	2 220
February	956	37	31	30.2	2,220
March	1,542	92	29	497	3,060
April	5,110	270	100	170	10 140
May	8,737	409	144	282	17 330
June	4,409	299	51	147	8 750
July	1,149	55	24	37.1	2 280
August	530	34	10	17.1	1.050
September	958	61	13	31.9	1,900
October	1,481	74	34	47.8	2.940
November	1,120	48	28	37.3	2,220
December	778	30	22	25.1	1.540
Calendar year 2002	27,891	409	10	76.4	55,320

#### 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 mi southeast of Ortiz, and 0.4 mi upstream from Los Pinos River. Altitude of gage is 7,970 ft.

Drainage area.-110 sq mi.

Average discharge .- 62 years (1941-2002), 25.2 ft<sup>3</sup>/s (18,280 acre-ft per year).

Extremes.-1920, 1925-2002: Maximum discharge, 1,750 ft<sup>3</sup>/s Apr. 15, 1937 (gage height, 5.38 ft), from rating curve extended above 1,100 ft<sup>3</sup>/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

10. Contract (10. Contract)			the second s		
Month	Second- foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	63.2	23	1.8	2.04	105
February	71.2	3.3	1.0	2.0%	141
March	207	17	29	6.66	410
April	245	18	3.3	8.15	485
May	28.1	2.9	.00	.91	56
June	.00	.00	.00	.00	00
July	.00	.00	.00	.00	.00
August	.00	.00	.00	.00	.00
September	43.3	11	.00	1.44	86
October	84.4	4.8	1.7	2.72	167
November	115	8.6	2.6	3.85	229
December	38.7	2.8	.80	1.25	77
Calendar year 2002	895.46	18	.00	2.45	1,780

#### 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 ml south of New Mexico-Colorado State line, 2.1 mi southwest of Ortiz, and 2.9 ml upstream from mouth. Altitude of gage is 8,040 ft.

Drainage area.-167 sq mi.

Average discharge.-84 years (1915-20, 1925-2002), 118 ft<sup>3</sup>/s (85,760 acre-ft per year).

Extremes.--1915-20, 1925-2002: Maximum discharge, 3,160 ft<sup>3</sup>/s May 12, 1941 (gage height, 5.77 ft, site and datum then in use), from rating curve extended above 1,600 ft<sup>3</sup>/s; minimum observed, 4.0 ft<sup>3</sup>/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	348	13	9.0	11.2	690
February	298	12	9.0	10.6	591
March	479	40	10	15.4	950
April	2.467	130	53	82.2	4,890
Mav	1.049	53	17	33.8	2,080
lune	247	19	3.9	8.22	489
hilv	160	9.3	2.9	5.17	318
August	116	7.1	1.7	3.75	231
Sentember	299	36	2.1	10.0	593
October	360	18	8.5	11.6	714
November	471	24	11	15.7	934
December	267	14	7.0	8.61	530
Calendar year 2002	6.561.1	130	1.7	18.0	13,010

#### Conejos River near Lasauses, 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 ft downstream from bridge on State Highway 158 and on left bank of secondary channel 230 ft upstream from bridge, 1.0 mi upstream from mouth, and 2.1 mi north of Lasauses. 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 .-- 81 years (1922-2002), 179 ft3/s (129,700 acre-ft per year).

Extremes.-1921-2002: Maximum discharge, 3,890 ft<sup>3</sup>/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	1,182	45	33	38.1	2,340
February	1,463	72	37	52.2	2,900
March	1,038	78	.76	33.5	2,060
April	44.0	2.2	.59	1.47	87
May	8.18	.60	.00	.26	16
Типе	.00	.00	.00	.00	.00
luly	.00	.00	.00	.00	.00
August	.00	.00	.00	.00	.00
September	.00	.00	.00	.00	.00
October	.00	.00	.00	.00	.00
November	73.5	13	• .00	2.4	146
December	478	19	12	15.4	948
Calendar year 2002	4,286.56	78	.00	11.7	8,500

#### **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 mi north of Colorado-New Mexico State line, 10 mi east of Lobatos, and 14 mi 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 ft<sup>3</sup>/s (612,900 acre-ft per year); 72 years (1931-2002) 444 ft<sup>3</sup>/s (321,400 acre-ft per year).

Extremes.--1899-2002: Maximum discharge observed, 13,200 ft<sup>3</sup>/s June 8, 1905 (gage height, 9.1 ft), from rating curve extended above 8,000 ft<sup>3</sup>/s; no flow at times in 1950-51, 1956.

<u>Remarks</u>.--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	l yearly	discharge,	in cubic	feet pe	r second
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Month	Second- foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
lanuary	7 575	260	235	244	15.030
February	7.120	300	220	254	14,120
March	9,549	391	200	308	18,940
April	2,414	297	33	80.5	4,790
May	966	42	24	31.2	1,920
June	659	25	19	22.0	1,310
July	311	17	4.7	10.0	617
August	240	13	4.3	7.74	476
September	392	25	7.6	13.1	777
October	617	28	13	19.9	1,220
November	2,213	145	23	73.8	4,390
December	3,745	155	100	121	7,430
Calendar year 2002	35,800.9	391	4.3	98.1	71,010

# 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 mi downstream from Iron Spring Creek, 3.3 mi west of Los Ojos, and at mi 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 ft<sup>3</sup>/s (8,330 acre-ft per year) prior to completion of Azotea tunnel; 33 years (1970-2002), 133 ft<sup>3</sup>/s (96,410 acre-ft per year) subsequent to completion of Azotea tunnel.

Extremes -- 1962-2002: Maximum discharge, 1,610 ft<sup>3</sup>/s Mar. 12, 1985 (gage height, 6.65 ft); no flow at times.

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	0.00	0.00	0.00	0.00	0.00
February	.00	.00	.00	.00	.00
March	293	105	.00	9.44	580
April	2,074	136	15	69.1	4,110
May	334	26	.50	10.8	662
June	94.1	12	.00	3.14	187
July	.00	.00	.00	.00	.00
August	.00	.00	.00	.00	.00
September	.00	.00	.00	.00	.00
Octuber	.00	.00	.00	.00	.00
November	.00	.00	.00	.00	.00
December	.00	.00	.00	.00	.00
Calendar year 2002	2,794.50	136	.00	7.66	2,794

# 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 mi northwest of Heron Dam, 7.8 mi downstream from Horse Lake, and 9.9 mi 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, 1986), 1.17 ft<sup>3</sup>/s (848 acre-ft per year).

Extremes.-1963-2002: Maximum discharge, 3,960 ft<sup>3</sup>/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

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Month	Second- foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	_	_	_	-	
February	-	-			
March				_	-
April	.00	.00	.00	.00	.00
May	.00	.00	.00	.00	.00
June	.00	.00	.00	.00	.00
July	.00	.00	.00	.00	.00
August	.00.	.00	.00	.00	.00
September	1.20	1.2	.00	.04	2.4
October			-		
November				-	-
December	-	-	-	-	
Calendar year 2002	_	-	-	-	

#### 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 mi upstream from Rio Chama, 5.1 mi northeast of El Vado Dam, and 8.7 mi southwest of Los Ojos. Drainage area.-193 sq mi.

Average discharge .- 32 years (1971-2002), 127 ft<sup>3</sup>/s (92,090 acre-ft per year).

Extremes -- 1971-2002: Maximum daily discharge, 2,780 ft<sup>3</sup>/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
lanuary	5 735	185	185	185	11 380
February	5.555	200	185	198	11,020
March	6,200	200	200	200	12,300
April	6,673	700	.00	222	13,240
May	344	344	.00	11.1	682
June	14,909	920	.00	497	29,570
July	14,492	800	375	467	28,740
August	6,381	500	.00	206	12,660
September	976	40	.00	32.5	1,940
October	1,240	40	40	40.0	2,460
November	1,200	40	40	40.0	2,380
December	852	40	15	27.5	1,690
Calendar year 2002	64,557.00	920	.00	177	128,000

#### **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 mi downstream from El Vado Dam, 2.8 mi upstream from Rio Nutrias, and 13 mi 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 mi upstream and October 1935 to September 1938, at site 1.1 mi upstream at different datums.

Drainage area.-877 sq mi, of which about 100 sq ml is probably noncontributing.

- Average discharge -4 years (1914, 1921-23), 444 ft<sup>3</sup>/s (321,700 acre-ft per year), prior to completion of El Vado Dam; 35 years (1936-70), 372 ft<sup>3</sup>/s (269,500 acre-ft per year), prior to release of transmountain water; 32 years (1971-2002) 475 ft<sup>3</sup>/s (344,200 acre-ft per year).
- Extremes --1914-16, 1920-24, 1936-2002: Maximum discharge observed, 9,000 ft<sup>3</sup>/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

Second- foot-days	Maximum daily	n Minimum daily	Mean	Runoff in acre-feet
6,562	227	198	212	13,020
5,562	204	197	199	11,030
6,116	199	195	197	12,130
10,360	816	200	345	20,550
23,618	910	313	762	46,850
28,508	1,030	762	950	56,550
22,329	892	671	720	44,290
12,393	716	174	400	24,580
3,413	384	29	114	6,770
2,142	90	61	69.1	4,250
1,905	70	60	63.5	3,780
1,614	61	36	52.1	3,200
124,522	1,030	29	341	247,000
	Second- foot-days 6,562 5,552 6,116 10,360 23,618 28,508 22,329 12,393 3,413 2,142 1,905 1,614 124,522	Second- foot-days Maximun daily   6,562 227   5,562 204   6,116 199   10,360 816   23,618 910   28,508 1,030   22,329 892   12,393 716   3,413 384   2,142 90   1,905 70   1,614 61   124,522 1,030	Second- foot-days Maximum daily Minimum daily   6,562 227 198   5,562 204 197   6,116 199 195   10,360 816 200   23,618 910 313   28,508 1,030 762   22,329 892 671   12,393 716 174   3,413 384 29   2,142 90 61   1,905 70 60   1,614 61 36   124,522 1,030 29	Second- foot-days Maximum daily Minimum daily Mean   6,562 227 198 212   5,562 204 197 199   6,116 199 195 197   10,360 816 200 345   23,618 910 313 762   28,508 1,030 762 950   22,329 892 671 720   12,393 716 174 400   3,413 384 29 114   2,142 90 61 69.1   1,905 70 60 63.5   1,614 61 36 52.1   124,522 1,030 29 341

#### 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 mi downstream from Abiquiu Dam and 5.9 mi 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 ft<sup>3</sup>/s (272,400 acre-ft per year), prior to release of transmountain water; 32 years (1971-2002), 534 ft<sup>3</sup>/s (387,000 acre-ft per year).

Extremes.-1961-2002: Maximum discharge, 2,990 ft<sup>3</sup>/s July 1, 1965 (gage height, 6.69 ft); minimum, about 0.5 ft<sup>3</sup>/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
Incurrent	1 220	45	26	42.0	2 640
Tahuary	1,329	40	30	44.7	2,040
rebruary	760	36	25	27.1	1,510
March	4,268	427	25	138	8,470
April	21,820	960	384	727	43,280
May	33,491	1,540	910	1,080	66,430
June	32,823	1,280	687	1,094	65,100
July	26,237	1,010	561	846	52,040
August	25,994	1,100	331	839	51,560
September	11,108	871	90	370	22,030
October	5,374	295	43	173	10,660
November	1,449	50	47	48.3	2,870
December	1,487	49	47	48.0	2,950
Calendar year 2002	166,140	1,540	25	455	329,500

#### 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 ft upstream from Nambe Falls, 2.6 mi upstream from confluence of Rio Nambe and Rio En Medio, 4.4 mi southeast of Nambe Pueblo, and 5.4 mi southeast of Nambe.

Drainage area.--34.1 sq mi.

Average discharge .- 24 years (1979-2002), 14.3 ft<sup>3</sup>/s (10,330 acre-ft per year).

Extremes.-1979-2002: Maximum discharge, 312 (t<sup>3</sup>/s June 9, 1979 (gage height, 1.96 ft), at site 1,100 ft downstream; no flow December 31, 1994.

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

#### Monthly and yearly discharge, in cubic feet per second

N	Second-	Maximum	Minimum		Runoff in
Month	toot-days	daily	daily	Mean	acre-teet
January	31.8	1.1	.94	1.03	63
February	31.5	1.2	1.1	1.12	62
March	35.9	1.3	1.1	1.16	71
April	41.9	1.5	1.2	1.40	83
May	422	21	1.5	13.6	837
June	57.7	5.0	.91	1.92	114
July	63.2	4.4	.91	2.04	125
August	161	16	2.4	5.18	319
September	104	9.4	1.4	3.45	205
October	87.8	4.2	2.1	2.83	174
November	142	8.0	.87	4.73	281
December	18.3	.90	.51	.59	36
Calendar year 2002	1,196.18	21	.51	3.28	2,370

#### 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 mi southwest of San Ildefonso Pueblo, 2.5 mi downstream from Pojoaque River, and 6.8 mi 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 .-- 103 years (1896-1905, 1910-2002), 1,525 ft3/s (1,105,000 acre-ft per year).

Extremes.-1895-1905, 1910-2002: Maximum discharge, 24,400 ft<sup>3</sup>/s May 23, 1920 (gage height, 14.1 ft); minimum daily, 60 ft<sup>3</sup>/s July 4, 5, 1902.

<u>Remarks</u>.-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	17,584	605	544	567	34,880
February	15,416	607	526	551	30,580
March	21,784	902	497	703	43,210
April	29,749	1,140	881	992	59,010
May	38,190	1,710	1,060	1,232	75,750
June	37,480	1,530	925	1,249	74,340
July	29,646	1,170	645	956	58,800
August	28,315	1,150	486	913	56,160
September	18,105	1,410	315	604	35,910
October	11,686	469	264	377	23,180
November	11.028	475	308	368	21,870
December	13,191	495	356	426	26,160
Calendar year 2002	272,174	1,710	264	746	539,900

#### 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 mi downstream from McClure Dam, and 5.3 mi east of Santa Fe. Altitude of gage is 7,718 ft. Prior to Nov. 4, 1930, at site 1.5 mi downstream, and Apr. 11, 1931 to Sept. 30, 1947, at site 0.3 mi upstream, each at different datum.

Drainage area.-18.2 sq mi.

Average discharge.-90 years (1913-2002), 8.08 ft<sup>3</sup>/s (5,856 acre-ft per year).

Extremes.--1913-2002: Maximum discharge, 1,500 ft<sup>3</sup>/s Aug. 14, 1921; minimum, no flow Aug. 2-10, 2000.

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

Monthly and	l yearly discharge,	in cubic feet	per second
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and the second se					
Month	Second- foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	3.60	0.24	0.02	0.12	71
February	3.26	.63	0.02	.12	6.5
March	161	15	.02	5.18	318
April	.47	.09	.00	.02	.9
May	143	6.5	.00	4.62	284
June	35.9	5.7	.00	1.20	71
July	7.85	3.0	.00	.25	16
August	1.01	.12	.00	.03	2.0
September	1.41	.15	.02	.05	2.8
October	2.12	.24	.02	.07	4.2
November	1.43	.19	.00	.05	2.8
December	.72	.04	.00	.02	1.4
Calendar year 2002	361.50	15	.00	.99	717

#### 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 ft upstream from bridge on State Highway 22, 700 ft downstream from Cochiti Dam, and 1.4 mi 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 --- 32 years (1971-2002), 1,382 ft<sup>3</sup>/s (1,001,000 acre-ft per year).

Extremes. –1971-2002: Maximum discharge, 10,300 ft<sup>3</sup>/s July 26, 1971, at site 2.4 mi downstream prior to closure of Cochiti Dam; minimum discharge, 0.51 ft<sup>3</sup>/s Aug. 3-5, 1977, Aug. 27-28, 1978.

<u>Remarks</u>.-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
lanuary	17 729	834	304	572	35 170
February	14 692	613	450	525	29 140
March	17,817	678	473	575	35,340
April	23,534	913	674	784	46,680
May	31,484	1,650	918	1,016	62,450
June	29,812	1,100	806	994	59,130
July	23,176	849	629	748	45,970
August	23,169	850	495	747	45,960
September	14,965	795	300	499	29,680
October	9,385	393	190	303	18,620
November	10,538	462	256	351	20,900
December	13,229	505	389	427	26,240
Calendar year 2002	229,530	1,650	190	629	455,300

#### 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 mi downstream from Galisteo Dam, and 5.5 mi northwest of Cerrillos. Altitude of gage is 5,450 ft.

Drainage area.--597 sq mi.

Average discharge.-32 years (1971-2002), 5.84 ft<sup>3</sup>/s (4,232 acre-ft per year).

Extremes.-1970-2002: Maximum discharge, 2,000 ft<sup>3</sup>/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 ft<sup>3</sup>/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	
lanuary	0.00	0.00	0.00	0.00	0.00	
February	.00	.00	.00	.00	.00	
March	.00	.00	.00	.00	.00	
April	.00	.00	.00	.00	.00	
May	.00	.00	.00	.00	.00	
June	6.13	6.0	.00	.20	12	
July	.00	.00	.00	.00	.00	
August	.00	.00	.00	.00	.00	
September	34.8	28	.00	1.16	69	
October	3.49	1.7	.00	.11	6.9	
November	.00	.00	.00	.00	.00	
December	.00	.00	.00	.00	.00	
Calendar year 2002	44.42	28	.00	0.12	88	

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 mi downstream from Jemez Canyon Dam, 2.0 mi upstream from mouth, and 6 mi 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 mi 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.--60 years (1937, 1944-2002), 61.9 ft<sup>3</sup>/s (44,820 acre-ft per year).

Extremes.-1937, 1944-2002: Maximum discharge, 16,300 (t<sup>3</sup>/s Aug. 29, 1943 (gage height, 5.62 ft); no flow at times.

Remarka.-Records good. Flow regulated by Jennez Canyon Dam since October 1953. Diversions for irrigation of about 3,000 acres above station.

Monthly and yearly discharge, in cubic feet per second

	Second-	Maximum	Minimum		Runoff in
Month	foot-days	daily	daily	Mean	acre-feet
lanuary	824	53	5.6	26.6	1.630
February	113	16	.44	4.04	224
March	241	17	2.0	7.77	478
April	61.2	5.3	.26	2.04	121
May	214	16	.09	6.89	424
June	125	51	.16	4.17	2.18
July	45.5	12	.09	1.47	90
August	220	96	.18	7.10	437
September	1,314	621	.14	43.8	2,610
October	315	234	.08	10.1	624
November	318	34	4.0	10.6	631
December	994	88	6.3	32.1	1,970
Calendar year 2002	4,784.17	621	0.08	13.1	9,490

#### **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 mi downstream from dam and 1.5 mi 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.).

Extremes.-1915-2002: Maximum daily discharge, 8,220 (t<sup>3</sup>/s May 22, 1942; no flow at times prior to 1929 and March 2-4, 1979. <u>Remarks</u>.-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	11,538	720	11	372	22,890
February	27,835	1,480	· 28	994	55,210
March	48,820	1,670	1,310	1,575	96,830
April	50,930	1,740	1,620	1,698	101,000
May	52,320	2,130	1,010	1,688	103,800
June	54,440	2,220	1,370	1,815	108,000
July	63,430	2,450	1,440	2,046	125,800
August	58,130	2,290	1,390	1,875	115,300
September	35,523	1,990	217	1,184	70,460
October	15,112	1,850	14	487	29,970
November	309	14	8.1	10.3	613
December	214	8.0	4.7	6.92	425
Calendar year 2002	418,601.3	2,450	4.7	1,147	830,300

#### 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 mi upstream from Percha diversion dam, and 3 mi 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 .- 65 years (1938-2002) 943 ft<sup>3</sup>/s (683,400 acre-ft per year).

Extremes.-1938-2002: Maximum daily discharge, 7,650 ft<sup>3</sup>/s May 20, 1942; minimum daily, 0.1 ft<sup>3</sup>/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	64.8	4.8	1.8	2.09	129
February	8,491	1,090	4.8	303	16,840
March	46,353	2,060	758	1,495	91,940
April	46,720	1,890	1,340	1,557	92,670
May	54,680	2,030	1,460	1,764	108,500
June	71,490	2,600	1,200	2,383	141,800
July	63,290	2,490	1,510	2,042	125,500
August	61,180	2,320	1,730	1,974	121,400
September	39,042	1,920	895	1,301	77,440
October	12,428	1,420	.50	401	24,650
November	36.8	1.7	.50	1.23	73
December	16.9	2.9	.20	.55	34
Calendar year 2002	403,793.4	2.600	.20	1,106	800,900

#### Bonito ditch below Caballo Dam, N. Mex.

Records available.--January 1938 to December 2002. Published as supplementary data with Rio Grande below Caballo Dam in USGS Water-Supply Papers and Water-Data Reports beginning with October 1947.

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

70.5	
99.2	
126.0	
135.9	
358.3	
126.6	
126.6	
52.6	
257.5	
72.9	
29.9	
0.0	
	70.5 99.2 126.0 135.9 358.3 126.6 126.6 52.6 257.5 72.9 29.9 0.0

#### Calendar year 2001 1,456.0

#### RIO GRANDE COMPACT COMMISSION REPORT

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

Squaw Lake.--Staff gage in sec. 12, T. 39 N., R. 4 W., on tributary to Squaw Creek. Completed in 1938; capacity, 162 acre-ft by 1953 survey. Water is used for irrigation below gaging station on Rio Grande near Del Norte.

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

#### Calendar Year 2002

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Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal.yr.
Gage height	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	-
Contents	162	162	162	162	162	162	162	162	162	162	162	162	-
Change	0	0	0	0	D	0	0	0	0	0	0	0	0

Rito Hondo Reservoir.-Staff gage in sec. 22, T. 42 N., R. 3 W., on Rito Hondo (Deep Creek) tributary to Clear Creek. Completed in 1957; capacity, 561 acre-ft. Originally filled during May and June 1958 with transmountain water; storage is not in debit status. Water is used for fish culture.

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

#### Calendar Year 2002

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal.yr.
Gage height	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	-
Contents	561	561	561	561	561	561	561	561	561	561	561	561	-
Change	0	0	0	0	0	0	0	0	0	0	0	0	0

Hermit Lakes Reservoir No. 3.—In sec. 25, T. 41 N., R. 4 W., on South Clear Creek. Completed prior to 1960; capacity, 192 acre-ft. Capacity table based on elevation above bottom of outlet. Water is used for fish culture. Includes 169 acre-ft of transmountain water by exchange in 1984 and 23 acre-ft of transmountain water by exchange in 1985.

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

#### Calendar Year 2002

Month	Jan.	Feb.	Mar.	Apr.	May	Juņe	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal.yr.
Gage height	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	-
Contents	192	192	192	192	192	192	192	192	192	192	192	192	-
Change	0	0	0	0	0	0	0	0	0	0	0	0	0

<u>Troutvale No. 2 Reservoir</u>—Staff gage in E1/2 sec. 10, T. 41 N., R. 3 W., on South Clear Creek. Completed in 1940; capacity, 435 acre-ft. Condition of spillway limited storage to 168 acre-ft after May 1942. Repairs to spillway in 1947 increased capacity to 257 acre-ft. Water is used for fish culture with only occasional sale for irrigation. Storage omitted from accounting by action of Commission on Feb. 15, 1962.

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

#### Calendar Year 2002

trans													
Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal.yr.
Gage height	6.9	6.9	6.9	6.9	6.9	6.9	4.0	3.9	6.9	6.9	6.9	6.9	-
Contents	213	213	213	213	213	213	74	69	213	213	213	213	-
Change	0	0	0	0	0	0	-139	-5	+144	0	0	0	0

#### STORAGE IN RESERVOIRS

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

<u>Jumper Creek Reservoir</u>.–In sec. 5, T. 39 N., R. 2 W., on Jumper Creek, tributary to Trout Creek. Completed in 1951; capacity, 38 acre-ft. Capacity table based on elevation above bottom of outlet. Storage omitted from accounting by action of Commission on Feb. 15, 1962.

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

# Calendar Year 2002

Month	Jan.	Feb.	Mar.	Apr.	May	June	Iuly	Aug.	Sept.	Oct.	Nov.	Dec.	Cal.vr.
					,		1-1	0.					
Gage height	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	-
Contents	38	38	38	38	38	38	38	38	38	38	38	38	-
Change	0	0	0	0	.0	0	0	0	0	0	0	0	0

<u>Big Meadows Reservoir</u>.—In NW1/4 sec. 17, T. 38 N., R. 2 E., on South Fork about 0.9 mi upstream from Hope Creek. Completed in 1967; capacity, 2,437 acre-ft. Capacity table based on elevation above outlet. Water is used for fish culture. Includes 140 acreft of transmountain water, by exchange, in 1967; 838 acre-ft, by exchange, in 1968; 347 acre-ft, by exchange, in 1969; and 1,112 acre-ft. by exchange, in 1983, for a total of 2,437 acre-ft.

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

#### Calendar Year 2002

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal.yr.
Gage heigh	t 45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	
Contents	2,437	2,437	2,437	2,437	2,437	2,437	2,437	2,437	2,437	2,437	2,437	2,437	
Change	0	0	0	0	0	0	0	0	0	0	0	0	0

Alberta Park Reservoir.—In sec. 34, T. 38 N., R. 2 E., on Pass Creek. Completed in 1953; capacity, 598 acre-ft. Capacity table based on elevation above bottom of outlet. Storage prior to June 30, 1983 included 244 acre-ft of transmountain water imported in 1963. By a 1983 resolution of the Rio Grande Compact Commission, the reservoir was drained for repairs in July 1983; recovery was completed in 1984. The reservoir also contains 100 acre-ft of transmountain water stored by exchange in 1983 and 254 acre-ft of transmountain water stored in 1984.

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

Calendar Year 2002

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal.yr.
Gage height	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	
Contents	598	598	598	598	598	598	598	598	598	598	598	598	-
Change	0	0	0	0	0	0	0	0	0	0	0	0	0

Shaw Lake Enlargement.—In sec. 5, T. 38 N., R. 2 E., on tributary to Lake Creek. Capacity, 638 acre-ft by 1916 decree; enlarged in 1955 to 681 acre-ft. Only the storage in excess of 638 acre-ft is subject to terms of Rio Grande Compact. Includes 42 acre-ft of transmountain water imported in 1965.

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

Calendar Year 2002

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Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal.yr.
Gage height	-	-	-	-	-	-		-	-	-	-	-	-
Contents	42	42	42	42	42	42	42	42	42	42	42	42	
Change	0	0	0	0	0	0	0	0	0	0	0	0	0

# **RIO GRANDE COMPACT COMMISSION**

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

Mill Creek Reservoir. --In sec. 16, T. 39 N., R. 3 E., on Mill Creek. Completed in 1953; capacity, 43 acre-ft. Capacity based on elevation above bottom of outlet. Includes 43 acre-ft of transmountain water, by exchange, in 1976.

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

#### Calendar Year 2002

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Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal.yr.
Gage height	13.3	13.3	13.3	14.9	14.9	14.9	11.9	10.4	0.0	0.0	0.0	0.0	-
Contents	35	35	35	43	43	43	29	23	0	0	0	0	-
Change	0	0	0	+8	0	0	-14	-6	-23	0	0	0	-35

Fuchs Reservoir.-Staff gage in sec. 2, T. 37 N., R. 4 E., on East Pinos Creek. Completed in 1939; capacity, 237 acre-ft with 2 ft of flash boards in spillway. Prior to calendar year 1999, contents reported as 238 acre-ft were actually 237 acre-ft. Pinos Creek enters Rio Grande below station near Del Norte.

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

Calendar Year 2002

								and the owner where the party of the party o					
Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal.yr.
Gage height	17.2	17.2	17.2	17.2	8.5	0.0	0.0	0.0	0.0	0.0	5.1	7.8	-
Contents	237	237	237	237	72	0	0	0	0	0	30	61	-
Change	0	0	0	0	-165	-72	0	0	0	0	+30	+31	-176

Platoro Reservoir.--Water-stage recorder in NW1/4 sec. 22, T. 36 N., R. 4 E., on Conejos River. Completed in 1951; capacity, 59,570 acre-ft at crest of spillway. Reservoir is used for irrigation and flood control. Storage affects Conejos Index Supply. Contents include 3,000 acre-ft of transmountain water stored by exchange in April 1985 on behalf of the Colorado Division of Wildlife.

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

Date	Elevation	Contents	Change in contents
December 31, 2001	9,977.7	17,113	-
January 31, 2002	9,977.6	17,051	-62
February 28	9,977.4	16,925	-126
March 31	9,977.2	16,818	-107
April 30	9,977.1	16,790	-28
May 31	9,975.3	15,852	-938
June 30	9,968.5	12,524	-3,328
Ju y 31	9,965.6	11,195	-1,329
August 31	9,964.5	10,680	-515
September 30	9,964.1	10,521	-159
October 31	9,964.1	10,479	-12
November 30	9,964.4	10,653	+174
ecember 31	9,964.7	10,774	+121
Calendar year 2002		-	-6,339

<u>Trujillo Meadows Reservoir</u>.-In sec. 5, T. 32 N., R. 5 E., on Los Pinos River. Completed in 1957; capacity, 869 acre-ft, effective Jan. 1, 1999. Water is used for fish culture. Storage is transmountain water, by exchange, in 1959.

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

Calendar Year 2002

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal.yr.
Gage height	31.0	31.0	31.0	31.0	31.0	31.0	31.0	31.0	31.0	31.0	31.0	31.0	
Contents	869	869	869	869	869	869	869	869	869	869	869	869	-
Change	0	0	Ð	0	0	0	0	0	0	0	0	0	0

#### 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, 2001	7.165.76	291.420	
January 31, 2002	7.163.38	279.837	-11.583
February 28	7,161.05	268,750	-11,087
March 31	7,158.57	257,220	-11,530
April 30	7,156.48	247,730	-9,490
May 31	7,156.05	245,802	-1,928
June 30	7,148.47	213,290	-32,512
July 31	7,140.82	183,255	-30,035
August 31	7,136.99	169,295	-13,960
September 30	7,136.52	167,632	-1,663
October 31	7,135.70	164,763	-2,869
November 30	7,135.05	162,508	-2,255
December 31	7,134.54	160,759	-1,749
Calendar year 2002	-	-	-130,661

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 ft (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 ft 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	Transmountain water
December 21, 2001	6 860 57	00.120		36 300
December 31, 2001	0,009.37	99,120	- 260	30,300
January 51, 2002	0,809.74	99,480	+360	34,000
February 28	6,870.40	100,870	+1,390	34,510
March 31	6,871.74	103,760	+2,890	34,470
April 30	6,872.66	105,770	+2,010	26,560
May 31	6,847.94	60,520	-45,250	7,290
June 30	6,829.72	36,000	-24,520	6,520
July 31	6,816.34	22,190	-13,810	6,470
August 31	6,801.76	10,920	-11,270	5,840
September 30	6,796.89	7,960	-2,960	5,870
October 31	6,797.12	8,090	+130	6,090
November 30	6,800.88	10,360	+2,270	6,090
December 31	6,802.18	11,200	+840	6,100
Calendar year 2002	-	-	-87,920	-

#### 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, 1,192,800 acre-ft at elevation 6,350 ft (crest of spillway) by 1998 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	Flevation	Contents	Change in contents	Transmountain water
Dute	LIGITUTION			
December 31, 2001	6,205.83	131,160	-	103,260
anuary 31, 2002	6,208.80	141,600	+10,440	114,080
February 28	6,211.47	151,260	+9,660	123,840
March 31	6,212.37	154,570	+3,310	130,930
April 30	6,205.78	130,980	-23,590	110,490
May 31	6,199.53	110,260	-20,720	109,420
une 30	6,195.67	98,310	-11,950	97,570
uly 31	6,192.75	89,700	-8,610	88,920
August 31	6,181.53	60,480	-29,220	59,700
September 30	6,174.78	47,220	-13,260	46,440
October 31	6,171.48	41,730	-5,490	40,860
November 30	6,172.32	43,060	+1,330	42,280
December 31	6,172.74	43,740	+680	42,960
Calendar year 2002		-	-87,420	

<u>Nambe Falls Reservoir</u>.--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 ft (crest of spillway), dead storage 121 acre-ft at elevation 6,760.9 ft. 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, 2001	6,807.83	1,110	-
January 31, 2002	6,810.91	1,241	+131
February 28	6,813.26	1,340	+99
March 31	6,815.54	1,446	+106
April 30	6,819.25	1,624	+178
May 31	6,802.98	935	-689
June 30	6,801.88	900	-35
July 31	6,804.36	983	+83
August 31	6,797.72	769	-214
September 30	6,797.14	753	-16
October 31	6,797.87	774	+21
November 30	6,795.56	708	-66
December 31	6,799.10	810	+102
Calendar year 2002	-	-	-300

### **RIO GRANDE COMPACT COMMISSION REPORT**

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

McClure (Granite Point) Reservoir.-Water-stage recorder in NE1/4SW1/4 sec. 24, T. 17 N., R. 10 E., on Santa Fe River. Original reservoir completed in 1926, capacity, 561 acre-ft; in 1935, permanent flash boards were installed in spillway, increasing capacity to 650 acre-ft; in 1947 both dam and spillway were reconstructed, increasing capacity to 2,615 acre-ft (gage height, 9,788.4 ft, crest of spillway). In 1953 spillway was equipped with radial gates that opened automatically, increasing capacity to 2,615 acre-ft. In 1977, radial gates were removed, decreasing capacity to 2,615 acre-ft. In 1988, modifications to the dam and spillway increased capacity to 2,813 acre-ft. In 1995, modifications to the dam and spillway increased capacity to 3,257 acre-ft. No dead storage. Altitude of gage is 7,790 ft. Water is for municipal use in Santa Fe. Storage includes both Rio Grande water and transmountain water by exchange. Capacity includes 561 acre-ft for pre-Compact storage and additional capacity as may be available to accommodate up to a total of 1,061 acre-ft of pre-Compact storage in McClure and Nichols Reservoirs combined.

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

Date	Gage height	Contents	Change in contents	Pre-Compact water	Transmountair water
December 31, 2001	7.843.91	777	-	373	404
January 31, 2002	7,829.27	830	+53	426	404
February 28	7,846.29	874	+44	470	404
March 31	7,858.20	596	-278	192	404
April 30	7,856.91	684	+88	280	404
May 31	7,834.72	450	-234	46	40-1
June 30	7,830.20	384	-66	7	377
July 31	7,832.29	433	+49	56	377
August 31	7,833.70	469	+36	92	377
September 30	7,835.28	510	+41	133	377
October 31	7,837.41	568	+58	191	377
November 30	7,841.38	691	+123	314	377
December 31	7,843.33	757	+66	380	377
Calendar year 2002	-	-	-20	-	-

Nichols Reservoir.--Water-stage recorder in SE1/4NE1/4 sec. 21, T. 17 N., R. 10 E., on Santa Fe River. Completed in 1942; capacity, 685 acre-ft at gage height 167.0 ft (crest of spillway), dead storage, 14 acre-ft at gage height 121.1 ft. Datum of gage is 7,313.2 ft above mean sea level, datum of 1929. Water is for municipal use in Santa Fe. Storage includes both Rio Grande water and transmountain water by exchange. Capacity may include pre-Compact storage such that total pre-Compact storage in McClure and Nichols Reservoirs combined does not exceed 1,061 acre-ft.

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

Date	Gage height	Contents	Change in contents	Pre-Compact water	Transmountain water
December 31, 2001	158.44	455	_	295	160
January 31, 2002	155.36	383	-72	223	160
February 28	152.72	331	-52	171	160
March 31	159.88	488	+157	328	160
April 30	154.56	367	-121	207	160
May 31	159.46	478	+111	318	160
June 30	156.10	401	-77	214	187
July 31	154.31	362	-39	175	187
August 31	152.51	327	-35	140	187
September 30	151.75	313	-14	126	187
October 31	151.14	301	-12	114	187
November 30	151.20	302	+1	115	187
December 31	151.32	304	+2	117	187
Calendar year 2002	-	-	-151		187

#### STORAGE IN RESERVOIRS

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

Cochiti Lake.-Water-stage recorder and manometer in NW1/4SW1/4 sec. 16, T. 16 N., R. 6 E., in Pueblo de Cochiti Grant, on Rio Grande. Completed in 1975; capacity 491,259 acre-ft at elevation 5,450.0 ft (crest of service spillway); zero storage at elevation 5,255.0 ft, from 1998 survey. A 50,000-acre-ft permanent pool was authorized by Public Law 88-293, 88th Congress, March 26, 1964. Reservoir is operated by Corps of Engineers for flood control, sediment storage, and recreation. Storage began Nov. 12, 1973.

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

AND				
Date	Elevation	Contents	Change in contents	Transmountain water
December 31, 2001	5,340.84	50,160	-	49,010
January 31, 2002	5,341.52	51,000	+840	50,930
February 29	5,343.54	53,720	+2,720	51,870
March 31	5,342.83	52,730	-990	51,780
April 30	5,342.46	52,220	-510	51,050
May 31	5,341.77	51,320	-900	50,180
June 30	5,340.95	50,300	-1,020	49,270
July 31	5,340.61	49,880	-420	48,600
August 31	5,340.23	49,420	-460	47,960
September 30	5,339.82	48,930	-190	47,610
October 31	5,339.75	48,850	-80	47,420
November 30	5,339.83	48,940	+90	47,510
December 31	5,339.71	48,800	-140	47,710
Calendar year 2002			-1.360	-

Galisteo Reservoir. --Water-stage recorder and manometer in NW1/4 sec. 9, T. 14 N., R. 7 E., on Galisteo Creek. Storage records begin in October 1970. Capacity 88,990 acre-(t at elevation 5,608.0 ft (crest of spillway). No dead storage. Reservoir is operated by Corps of Engineers for flood control and sediment storage.

Month-end contents, in acre-feet

#### Calendar Year 2002

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	-
Change	0	0	0	0	0	0	0	0	0	0	0	0	0

#### STORAGE IN RESERVOIRS

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

<u>Iemez Canyon Reservoir</u>.—Water-stage recorder in SW1/4SW1/4 sec. 32, T. 14 N., R. 4 E., on Jemez River. Completed in 1953; capacity, 259,423 acre-ft at elevation 5,271.20 ft. Maximum controlled capacity at elevation 5,232.0 ft (floor of spillway) is 97,425 acre-ft by 1998 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	Transmountain water
December 31, 2001	5,155.00	0		0
January 31, 2002	5,155.00	0	0	0
February 29	5,155.00	0	0	0
March 31	5,155.00	0	0	0
April 30	5,155.00	0	0	0
May 31	5,155.00	0	0	0
June 30	5,155.00	0	0	0
July 31	5,155.00	0	0	0
August 31	5,155.00	0	0	0
September 30	5,155.00	0	0	0
October 31	5,155.00	0	0	0
November 30	5,155.00	0	0	0
December 31	5,155.00	0	0	0
Calendar year 2002		-	a	-

Acomita 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 Indian Reservation. Storage omitted from accounting by action of Commission on March 23, 2000.

#### Month-end contents, in acre-feet

#### Calendar Year 2002

		_									_	_	
Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal. yr.
Contents	-	-	-	-	-	-	-	-	-	-	-	-	-
Change	1040	-	-	12		2		12	1	1	-	-	

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 2002.

# 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, 2,023,400 acre-ft at gage height 4,407.0 ft (crest of spillway), by survey of 1999 with flood control storage reservation of 50,000 acre-ft from April through September and 25,000 acre-ft from October through March in accordance with the Sept. 9, 1998, resolution of the Rio Grande Compact Commission. 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	Transmountain water		
December 31, 2001	4,364.92	897,630	_	9,490		
January 31, 2002	4,365.82	915,110	+17,480	9,450		
February 29	4,364.72	893,790	-21,320	9,400		
March 31	4,361.02	824,770	-69,020	9,300		
April 30	4,356.28	742,460	-82,310	9,150		
May 31	4,350.28	647,890	-94,570	8,970		
June 30	4,342.80	541,800	-106,090	8,830		
July 31	4,334.60	436,880	-104,920	8,720		
August 31	4,326.42	344,560	-92,320	8,610		
September 30	4,322.60	305,260	-39,300	8,540		
October 31	4,321.00	289,500	-15,760	8,260		
November 30	4,323.64	315,730	+26,230	8,220		
December 31	4,326.94	350,090	+34,360	8,210		
Calendar year 2002	-	-	-547,540	-		

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, 326,700 acre-ft (by 1999 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, 2001	4,138.44	25,490			
January 31, 2002	4,145.76	48,600	+23,110		
February 29	4,152.66	80,810	+32,210		
March 31	4,151.62	75,310	-5,500		
April 30	4,151.00	72,130	-3,180		
May 31	4,150.06	67,460	-4,670		
June 30	4,143.06	38,840	-28,620		
July 31	4,142.92	38,370	-470		
August 31	4,139.50	28,230	-10,140		
September 30	4,139.10	27,180	-1,050		
October 31	4,141.44	33,690	+6,510		
November 30	4,141.98	35,350	+1,660		
December 31	4,142.64	37,450	+2,100		
Calendar year 2002	-	-	+11,960		

#### 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, 2001	923.100	-
January 31, 2002	963,700	+40,600
February 29	974,600	+10,900
March 31	900,100	-74,500
April 30	814,600	-85,500
May 31	715,400	-99,200
June 30	580,600	-134,800
July 31	475,200	-105,400
August 31	372,800	-102,400
September 30	332,400	-40,400
October 31	323,200	-9,200
November 30	351,100	+27,900
December 31	387,500	+36,400
Calendar year 2002		-535,600

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

#### TRANSMOUNTAIN DIVERSIONS

- <u>Pine River Weminuche Pass ditch (Euchs ditch)</u>.--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.
- <u>Treasure Pass diversion ditch.</u>—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°40'16", 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, 2002

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
January	0	0	0	0	0	0	0
February	0	0	0	0	0	0	0
March	0	0	0	0	0	0	740
April	0	0	1	7	0	0	4,500
May	0	0	66	27	0	0	860
June	0	0	13	21	0	0	200
July	0	0	0	10	0	0	0
August	0	0	0	9	0	0	0
September	0	0	11	0	0	0	0
October	0	0	0	0	0	0	0
November	0	0	0	0	0	0	0
December	0	0	0	0	0	0	0
Calendar yea	εΟ	0	91	74	0	0	6,300

#### **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.
- <u>Platoro Dam</u>.—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.
- <u>El Vado Dam</u>.-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.
- <u>Cochiti Dam</u>.-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 2002

Evaporation and precipitation, in inches

Station		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
Alamosa	Evap.	-	-	-	-	-	-	-	-	-	-	-	-	-
Airport	Precip.	0.50	0.23	0.07	0.15	0.04	0.02	0.84	0.34	1.38	0.57	0.06	0.24	4.44
Platoro Dam	Evap. Precip.	-	-	-	-	5.36 0.19	9.63 0.45	7.10 2.12	9.19 0.81	4.43 1.58	0.21 1.45	-	Ę	-
Heron Dam	Evap. Precip.	- 0.59	- 0.17	0.59	6.41 0.38	9.82 0.00	11.37 0.09	9.65 1.91	9.36 1.58	6.03 4.74	3.50 1.83	- 1.39	- 1.00	14.27
El Vado Dam	Evap. Precip.	- 0.36	- 0.12	- 0.25	7.51 0.37	10.20 0.00	11.67 0.23	9.42 2.06	8.73 1.39	5.72 3.22	3.56 1.45	0.25	0.83	- 10.53
Abiquiu	Evap.	-	-	-	8.98	12.23	12.49	11.63	11.27	6.97	5.16	0.74	-	-
Dam	Precip.	0.26	0.20	0.07	0.34	0.00	0.51	0.55	0.90	1.92	1.54		0.79	7.82
Nambe	Evap.	-	-	0.0	7.89	10.62	11.2 <b>7</b>	8.47	8.97	5.37	4.34	-	-	-
Falls Dam	Precip.	0.75	0.82		0.76	0.0	0. <b>73</b>	3.01	0.84	2.80	1.89	0.0	0.60	12.20
Cochiti	Evap.	~	-	-	11.15	14.02	15.37	11.90	12.89	8.18	5.98	-	-	-
Dam	Precip.	0.52	0.02	0.01	0.14	0.01	0.12	0.33	1.13	1.41	2.05	0.78	0.60	7.12
Jemez	Evap.	-	-	-	9.53	12.62	14.33	13.88	14.66	8.97	5.35	0.11	-	-
Canyon Dan	1 Precip.	0.0	0.0	0.07	0.10	0.0	0.24	0.50	0.98	1.79	1.06		0.06	4.91
Elephant	Evap.	5.40	5.98	11.53	15.75	19.36	21.38	15.62	15.33	11.53	8.80	5.02	3.13	138.83
Butte Dam	Precip.	0.15	0.40	0.0	0.0	0.65	0.0	0.71	0.59	1.71	0.63	0.32	0.77	5.93
Caballo	Evap.	4.47	5.04	10.68	13.01	15.19	16.56	12.6	13.07	10.05	7.27	4.8	2.69	115.43
Dam	Precip.	0.15	0.56	0.0	0.0	0.05	0.0	1.83	0.35	1.78	0.66	0.36	0.98	6.72
State Univer.	Évap. Precip.	4.03 0.37	- 0.92	10.37 0.0	9.86 0.0	12.75 0.10	13.64 0.01	11.76 1.90	10.90 1.45	9.76 0.22	6.06 1.07	- 0.02	-	-

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- Horse Lake Creek above Heron Reservoir (**0**)
- Willow Creek below Heron Reservoir, near Parkview .
  - Rio Chama below El Vado Dam (**?**)
- Rio Chama below Abiquiu Dam (**P**)
  - **Rio Grande at Otowi Bridge** •
- Santa Fe River near Santa Fe
- Rio Grande below Cochiti Dam  $(\widehat{\mathbf{1}}, \widehat{\mathbf{0}}, \widehat{\mathbf{0}})$
- Galisteo Creek below Galisteo Dam
- Jemez River below Jemez Canyon Dam (9)

NOTE: Screened areas denote reservoirs, whose capacity is all or in part

subject to provisions of the

**Rio Grande Compact** 

BASIN Revised March 1989 GRANDE R O

BERNALILLO, NEW MEXICO ABOVE

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