

RGC 1.1/2006  
c. 2

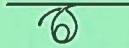
COLORADO STATE PUBLICATIONS LIBRARY



3 1799 00145 2903

**REPORT  
of the**

**RIO GRANDE COMPACT  
COMMISSION  
2006**



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

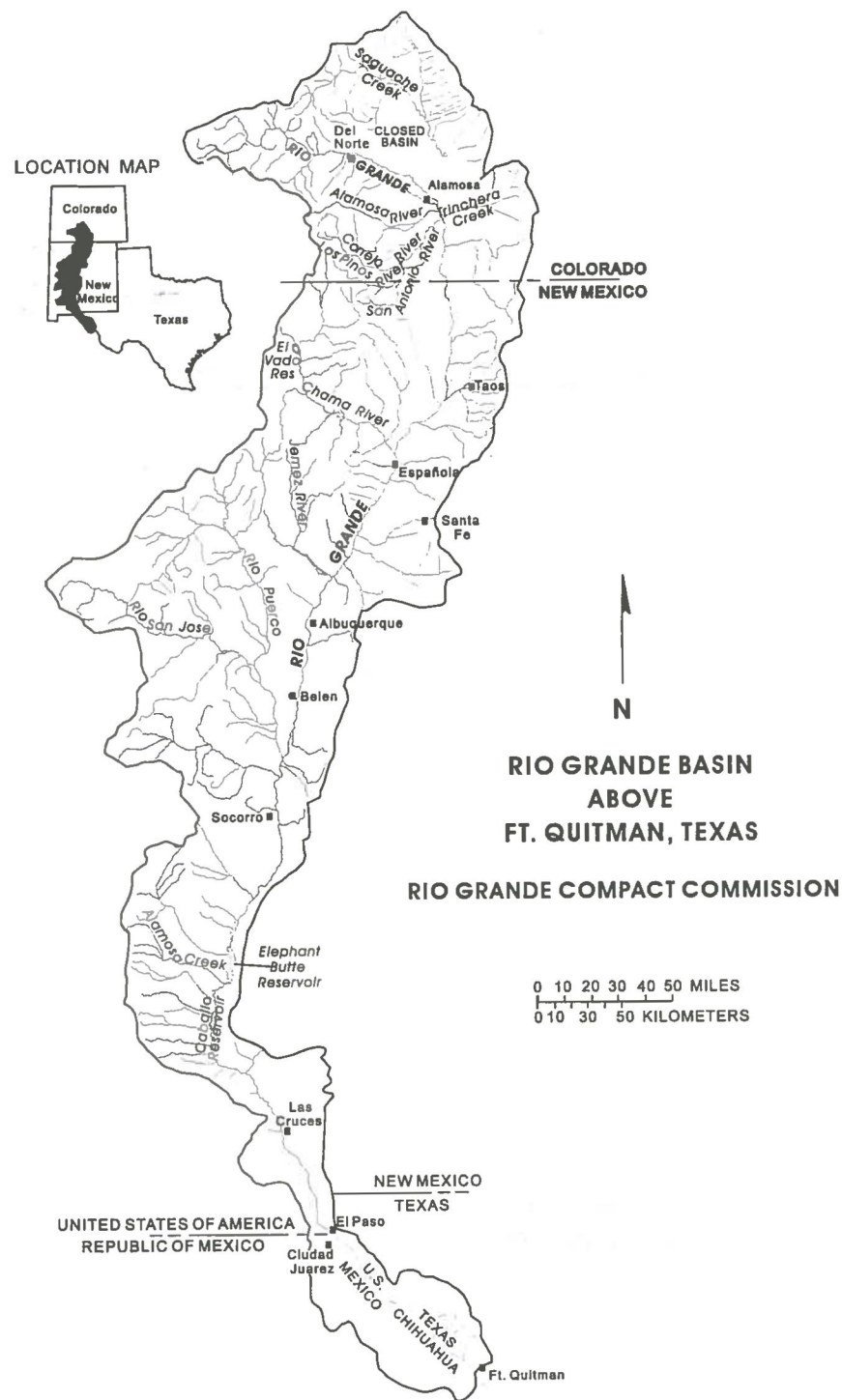
**REPORT  
of the**

**RIO GRANDE COMPACT  
COMMISSION**

**2006**



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



## CONTENTS

	Page
Sixty-eighth Annual Report to Governors.....	1
Rio Grande Compact .....	3
1948 Resolution of the Commission .....	12
Rules and Regulations .....	15
Report of the Engineer Advisers .....	20
Records of Deliveries and Releases .....	38
Deliveries by Colorado at State Line .....	39
Deliveries by New Mexico at Elephant Butte .....	40
Release and Spill from Project Storage .....	41
Cost of Operation and Budget .....	42
Acknowledgments .....	43
Accuracy of Records .....	44
Streamflow .....	45-55
Storage in Reservoirs .....	56-65
Transmountain Diversions .....	66
Evaporation and Precipitation .....	67-68

## ILLUSTRATIONS

Map, Rio Grande Basin above Ft. Quitman, Texas .....	Frontispiece
Map, Rio Grande Basin above Bernalillo, New Mexico .....	70-71

**RIO GRANDE COMPACT COMMISSION  
COLORADO TEXAS NEW MEXICO**

March 22, 2007

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 Ritter  
Governor of the State of Colorado  
Denver, Colorado

Honorable Governors:

The 68<sup>th</sup> Annual Meeting of the Rio Grande Compact Commission was held in Alamosa, Colorado on March 22, 2007.

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 2006. The Commission found that:

- (a) Deliveries of water at the Colorado-New Mexico state line by Colorado amounted to 237,100 acre-feet in 2006 and the scheduled delivery for the year was 225,000 acre-feet.
- (b) Deliveries of water into Elephant Butte Reservoir by New Mexico, as measured by the Elephant Butte Effective Supply, amounted to 572,900 acre-feet in 2006 and the scheduled delivery for the year was 329,900 acre-feet.
- (c) The actual release of usable water from Project Storage was 435,100 acre-feet.
- (d) Colorado relinquished 400 acre-feet of credit water to Texas on March 31, 2006.

The Commission agreed to the accounting of accrued credits for 2007, as follows:

- (1) The Commissioners found that the accrued credit for deliveries by Colorado at the Colorado-New Mexico State Line was 15,500 acre-feet on January 1, 2007.
- (2) The Commissioners found that the accrued credit for deliveries by New Mexico at Elephant Butte Dam was 180,100 acre-feet on January 1, 2007.



## RIO GRANDE COMPACT COMMISSION REPORT

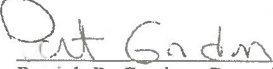
The Honorable Bill Richardson  
 The Honorable Rick Perry  
 The Honorable Bill Ritter  
 March 22, 2007  
 Page 2

- (3) The Commissioners found that the accrued departure from normal release from Project Storage as of January 1, 2007 was a credit of 628,400 acre-feet.

The Commission reviewed the cost of operation and found that the expenses of the administration of the Rio Grande Compact were \$175,658 in the fiscal year ending June 30, 2006. The United States bore \$54,430 of this total; the balance of \$121,228 was borne equally by the three States party to the Compact.

Respectfully,

  
 John R. D'Antonio Jr., Commissioner for New Mexico

  
 Patrick R. Gordon, 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 Commissioners:

For the State of Colorado  
 For the State of New Mexico  
 For the State of Texas

M. C. Hinderlider  
 Thomas M. McClure  
 Frank B. Clayton

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

## ARTICLE I

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

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

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

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

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

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

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

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

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

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

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

## RIO GRANDE COMPACT COMMISSION REPORT

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

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

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

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

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

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

## ARTICLE II

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

- Valley;
- (a) On the Rio Grande near Del Norte above the principal points of diversion to the San Luis
  - (b) On the Conejos River near Mogote;
  - (c) On the Los Pinos River near Ortiz;
  - (d) On the San Antonio River at Ortiz;
  - (e) On the Conejos River at its mouths near Los Sauces;
  - (f) On the Rio Grande near Lobatos;
  - (g) On the Rio Chama below El Vado Reservoir;
  - (h) On the Rio Grande at Otowi Bridge near San Ildefonso;
  - (i) On the Rio Grande near San Acacia;
  - (j) On the Rio Grande at San Marcial;
  - (k) On the Rio Grande below Elephant Butte Reservoir;
  - (l) On the Rio Grande below Caballo Reservoir.

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

## RIO GRANDE COMPACT

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

## ARTICLE III

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

## DISCHARGE OF CONEJOS RIVER

Quantities in thousands of acre feet

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

Intermediate quantities shall be computed by proportional parts.

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

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

## DISCHARGE OF RIO GRANDE EXCLUSIVE OF CONEJOS RIVER

Quantities in thousands of acre feet

Rio Grande at Del Norte (3)	Rio Grande at Lobatos less Conejos at Mouths (4)
200	60
250	65
300	75
350	86
400	98
450	112
500	127
550	144
600	162

RIO GRANDE COMPACT COMMISSION REPORT  
DISCHARGE OF RIO GRANDE EXCLUSIVE OF CONEJOS RIVER--Con.  
Quantities in thousands of acre feet

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

Intermediate quantities shall be computed by proportional parts.

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

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

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

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

#### ARTICLE IV

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

RIO GRANDE COMPACT  
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 COMMISSION REPORT

## ARTICLE V

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

## ARTICLE VI

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

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

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

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

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

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

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

## RIO GRANDE COMPACT

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 COMMISSION REPORT

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

## ARTICLE XII

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

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

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

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

## ARTICLE XIII

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

## ARTICLE XIV

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

## RIO GRANDE COMPACT

## 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:

RESOLUTION

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.

## RIO GRANDE COMPACT COMMISSION REPORT

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

RULES AND REGULATIONS FOR ADMINISTRATION OF  
THE RIO GRANDE COMPACT

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

## GAGING STATIONS /1

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

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

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

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

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

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



## RIO GRANDE COMPACT COMMISSION REPORT

## 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 actually 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 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 sill of the spillway gates, i.e. -1,830,000 acre-ft in 1942.

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

## DEPARTURES FROM NORMAL RELEASES /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.

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

/3 Amended September 9, 1998.

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

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

## RULES AND REGULATIONS

## 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 comingled.

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

/7 Amended at Twelfth Annual Meeting, February 24, 1951.

/8 Amended June 2, 1959.

## RIO GRANDE COMPACT COMMISSION REPORT

## 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 /8

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

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

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

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

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

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

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

## COSTS /1

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

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

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

/8 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.

## RULES AND REGULATIONS

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.



REPORT OF THE ENGINEER ADVISERS  
TO THE RIO GRANDE COMPACT COMMISSIONERS

March 2, 2007

**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 2006. As determined by the Engineer Advisers, scheduled and actual deliveries, release of Usable Water for the year 2006, and balances as of January 1, 2007 are as follows:

(a) Deliveries by Colorado at the Stateline:

Balance as of January 1, 2006	4,600 acre-feet
Scheduled delivery	225,000 acre-feet
Actual delivery at Lobatos plus 10,000 acre-feet	237,100 acre-feet
Reduction of credit on account of evaporation	800 acre-feet
Accrued credits relinquishment to Project Storage on March 31, 2006	400 acre-feet
Accrued credit January 1, 2007	15,500 acre-feet

(b) Deliveries by New Mexico at Elephant Butte Dam:

Balance as of January 1, 2006	37,100 acre-feet
Scheduled delivery	329,800 acre-feet
Actual delivery	572,900 acre-feet
Reduction of credit on account of evaporation	7,000 acre-feet
Reduction of credits due to Article VI	93,100 acre-feet
Accrued credit January 1, 2007	180,100 acre-feet

(c) Project Storage and Releases:

Accrued departure (credit) as of January 1, 2006	478,400 acre-feet
Actual release of Usable Water	435,100 acre-feet
Normal release for year	790,000 acre-feet
Under release in excess of 150,000	204,900 acre-feet
Accrued departure (credit) as of January 1, 2007	628,400 acre-feet

There was significant deterioration in stream flow levels in 2006 from 2005 due to very low snowmelt runoff in Colorado and New Mexico. Through March 2006, snowpack conditions were worse than in 2002 (one of the worst years on record) with almost no snowpack in the Sangre de Cristo Mountain Range. San Juan-Chama Project diversions through Azotea Tunnel totaled 78,794 acre-feet in 2006. Usable Water in Project Storage dropped below 400,000 acre-feet on April 14, 2006

REPORT OF THE ENGINEER ADVISERS

triggering the Compact Article VII storage restriction and rose above that level on November 6, 2006. Consequently, the upstream storage restrictions of Article VII of the Compact were in effect for most of the year.

Average to above average summer thunderstorm activity in the northern part of the basin and significantly above average activity in the southern part resulted in significantly above average main stem flow during the summer and early fall of 2006. The flows in the northern portion of the basin resulted in Colorado modifying its diversion operations on a number of occasions in order to meet the annual downstream delivery requirement. The flows in the middle valley, as well as reduced irrigation demand, resulted in a highly unusual, but welcome, increase in Rio Grande Project storage every month after July. New Mexico accrued a significant compact credit in 2006. Usable water in project storage increased to the point that an average snowmelt runoff in 2007 will be sufficient to provide a full Rio Grande Project irrigation release. Reservoir flood control operations did not occur during 2007 but flooding problems arose on a number of arroyos tributary to the Rio Grande, especially in the middle and lower Rio Grande valleys. In some parts of El Paso, precipitation of over 15 inches in August caused significant runoff and flooding.

The Engineers Advisers met in Santa Fe from February 26 through March 2, 2007 to prepare the 2006 Compact water accounting and to discuss continuing and new issues in preparation for the 2007 annual meeting of the Rio Grande Compact Commission (Commission). The Engineer Advisers requested and received the participation of the U.S. Geological Survey (USGS), the U.S. Bureau of Reclamation (Reclamation), the U.S. Army Corps of Engineers (Corps), the U.S. Bureau of Indian Affairs (BIA) and the U.S. Fish and Wildlife Service (Service) to discuss in detail their specific water-related activities in the basin. The Engineer Advisers requested participation of the International Boundary and Water Commission (IBWC). The IBWC was not able to attend but did send a report. Bill Ruth, the Federal Chairman of the Commission attended the water accounting and federal agency presentation portions of the meeting.

**2003 New Mexico – Texas Relinquishment Agreement**

In 2003 New Mexico offered and Texas accepted a phased relinquishment of a portion of New Mexico's accrued credits then held in Project Storage in Elephant Butte Reservoir. The relinquishment totaled 175,500 acre-feet. The relinquishment allowed the storage of a like amount of water in post-



1929 reservoirs in New Mexico upstream of Elephant Butte Reservoir over as many years as necessary when the storage prohibition of Article VII is in effect.

A total of 8,081 acre-feet was stored in 2006, for a total of 154,224 acre-feet stored since 2003. This leaves a balance of 21,276 acre-feet to be captured in future years. At the end of 2006, 10,893 acre-feet of relinquished water remained in storage, all in El Vado Reservoir.

#### **2006 Colorado – Texas Relinquishment Agreement (Colorado/Texas)**

Colorado began 2006 with 4,600 acre-feet of accrued credit. Because the release from Platoro Reservoir was reduced for normal winter operations, native water was unavoidably stored in the post-Compact reservoir, despite the storage prohibition of Article VII of the Compact. This storage occurred in November and December of 2005. The maximum release possible through the bypass valves under the reservoir head conditions at that time was approximately eight cubic feet per second (cfs). The inflow to the reservoir exceeded this release resulting in a gain of approximately 400 acre-feet before usable water in Project Storage rose above the 400,000 acre-feet Compact Article VII trigger level on December 27, 2005. Colorado relinquished 400 acre-feet to Project Storage making a like amount of water in Platoro Reservoir available to meet irrigation demand on the Conejos River.

#### **CONTINUING ISSUES**

This section of the report summarizes issues previously addressed by the Engineer Advisers or the Commission. It reflects information obtained by the Engineer Advisers subsequent to the 2006 Commission meeting, including information obtained in the reports of the federal agencies at the 2007 Engineer Advisers meeting.

#### **Gaging Station Review**

Mike Roark from the USGS presented to the Engineer Advisers the findings of a technical review of the streamflow data collection at the Rio Grande below Elephant Butte Reservoir and the Rio Grande below Caballo Reservoir gaging stations. The technical review team was comprised of Mike Roark; Secretary of the Compact Commission Robert Gold; and Craig Cotten from the Colorado Division of Water Resources. The Rio Grande Compact Commissioners had expressed concern with the apparent discrepancy in the mass balance of Caballo Reservoir and with the accuracy of stream

#### **REPORT OF THE ENGINEER ADVISERS**

gages below Elephant Butte and Caballo Dams, and directed the Secretary to inspect those stations and provide recommendations to the Engineer Advisers at their 2007 meeting.

The review team recommended that a new metering system be employed at the Rio Grande below Caballo Reservoir gaging station due to the problem of variable backwater at the site. Specifically, the team recommended that an acoustic doppler velocity meter be installed at this location. It was also recommended that the methods of data collection and compilation used by the Bureau of Reclamation be documented and that the records from this site be subjected to a rigorous review prior to being made final.

There continues to be a discrepancy between the flow as measured at the gaging station below Elephant Butte Reservoir and the inflow to Caballo Reservoir. In light of this, and in accordance with the Rules and Regulations for Administration of the Rio Grande Compact, the Engineer Advisers recommend that the Commission direct the Secretary, in coordination with the Engineer Advisers, to investigate the water balance between Elephant Butte and Caballo Reservoirs.

#### **Federal Agency Efforts towards a New Middle Rio Grande Biological Opinion**

Reclamation indicated they, the Corps, and the Service began efforts to develop a new Biological Opinion for Middle Rio Grande water operations in 2006. They stated that their goal is to develop sustainable water operations that alleviate jeopardy to the silver minnow by 2009. The focus in 2007 will be to utilize experimental river system operations to build scientific support for future water operations changes. Specific projects in 2007 include compiling and evaluating the large amounts of information gathered regarding water operations and silvery minnow since 2003; conducting a population and habitat viability assessment; documenting what happens to silvery minnow in isolated pools or outfalls; and looking at changes to operations at some reservoirs to aid in providing recruitment flows and meeting flow targets. The agencies stated they hope the approach will help identify an ecological baseline for the silvery minnow, identify and develop additional non-federal participation, and lead to a defensible Biological Opinion based on the principle of adaptive management.

The Engineer Advisers are concerned about the prolonged timeline for development of the new Biological Opinion. Reclamation indicated, based upon the favorable February 1 runoff projections, they will be able to meet flow targets in both 2007 and 2008 with the supplemental water supplies they have currently procured. The Engineer Advisers remain concerned because the February 1 runoff projection may not materialize. The Engineer Advisers encourage the federal

agencies to develop a specific and aggressive schedule for this effort with set milestones and develop a contingency plan should the hoped for runoff conditions not materialize in 2007.

#### **Compact Accounting Documentation Project**

During 2006, the Engineer Advisers circulated, reviewed, and discussed revised draft sections of the Compact accounting documentation report. The report describes the duties, roles, and responsibilities of each party in the accounting, reporting, and documentation of the waters of the Rio Grande Basin above Fort Quitman, Texas, in accordance with the Compact. Given the complexity of the accounting as documented in the original draft report, the Engineer Advisers decided the document should be revised to more clearly describe how, why and by whom the accounting is conducted. New Mexico procured the services of a technical writer in 2006 to aid in those efforts and the efforts remain on-going. The Engineer Advisers will update the draft in 2007 to incorporate information from Reclamation's February 2007 report "Water Accounting Reports Projects: 2006 Update Report to the Engineer Advisers to the Rio Grande Compact Commission".

#### **Lower Rio Grande Salinity Issues**

At the 2006 Rio Grande Compact Commission Meeting, the New Mexico Commissioner discussed the findings of recent research that established natural sources as the principal contributor to observed salinity increases in the Rio Grande. In response, the Engineer Advisers are working with the New Mexico Environment Department to schedule a workshop on Rio Grande Project salinity in El Paso on May 21 and 22, 2007 to be hosted by the Rio Grande Compact Commission. This workshop is being planned with the involvement of water managers, users and researchers in the Lower Rio Grande. The workshop is designed to present the current level of understanding of the sources of salinity to the Rio Grande, the socioeconomic implications of increasing salinity, and to explore the next-steps for evaluating the feasibility of salinity capture and treatment in the Rio Grande Project region.

#### **Closed Basin Project**

The total production of the Closed Basin Project in 2006 was 17,935 acre-feet with 14,304 acre-feet of that amount delivered to the Rio Grande. The Bureau of Reclamation continues to address problems of biofouling in the production wells of the Closed Basin Project. Reclamation

### REPORT OF THE ENGINEER ADVISERS

replaced ten wells in 2006 that were most affected by the iron bacteria. To date, 41 of 150 wells have been replaced. The new wells and change in operation of all project wells are helping to restore the production of the project. Wells will continue to be replaced as budgetary constraints allow. The Closed Basin Operating Committee continues to monitor groundwater levels and groundwater production and adjust project operations pursuant to the enabling legislation.

#### **URGWOM Accounting Model - Nambe Falls**

Reclamation continued to use the Nambe Falls accounting model during 2006. Final documentation of that model was delivered during the 2007 meeting of the Engineer Advisers. Reclamation is in the process of adding Nambe Falls reservoir to the Upper Rio Grande Water Operations Model (URGWOM) and finalizing that documentation. Reclamation is planning to complete this process prior to the 2008 meeting of the Engineer Advisers.

#### **URGWOM Accounting Module and Hydrologic Data-Base**

The Corps presented the latest developments and updates to URGWOM, including updates to the physical model, which have resulted in significant improvement of model performance. In addition, the URGWOM team used a new approach for modeling surface water-groundwater interaction using RiverWare. The new modeling of the reach from Cochiti Reservoir to Central Avenue in Albuquerque is complete and work is in progress for the rest of the Middle Valley. These changes do not impact the URGWOM accounting module.

Reclamation reported that they continued the process of implementing a generalized relational database management system (Hydrologic Database, or HDB) during 2006. Water accounting data output from URGWOM will eventually be imported directly into HDB using an automated data loader. Reclamation is also planning on using Excel and Crystal Reports to automatically generate reports. In addition Reclamation is investigating developing the water accounting report tables within the URGWOM model to eliminate data transfer errors.

The Engineer Advisers continue to be concerned with the potential for Compact accounting changes to occur from the transition to new databases and report generators. The Engineer Advisers encourage Reclamation and the Corps to coordinate so that all Compact accounting is conducted using one database.



#### Compliance by Federal and State Agencies with State Water Law and Regulations

The Commission previously approved resolutions that requested the Corps, Reclamation and Service comply with state law by obtaining permits from the appropriate state agencies for any water related actions, including habitat restoration, that result in new or additional river depletions. Federal agency representatives have acknowledged the need to comply with applicable state laws regarding these projects.

New Mexico reported that the New Mexico Interstate Stream Commission (NMISC) submitted plans for Phase I and Phase II of its Albuquerque Reach Habitat Restoration project to the Office of the State Engineer for review of permit requirements or depletion offsets. Neither a permit nor offset of depletions was required because the projects are located within the active channel of the Rio Grande where no additional water depletions are expected to occur.

New Mexico further reported the NMISC, Corps, and Reclamation are negotiating an agreement for offset of depletions for a Corps habitat restoration project in the Middle Rio Grande Bosque near the Rio Grande Nature Center. The total annual net depletions for the project are estimated to be less than six acre-feet.

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

Reclamation again discussed its proposed project to relocate the river channel, and the adjacent Low Flow Conveyance Channel (LFCC), to the west side of the valley floor downstream from San Marcial. Reclamation indicated that the project is still on hold due to lack of funding and because they are waiting for completion of the Upper Rio Grande Water Operations Review and EIS.

#### Elephant Butte Pilot Channel Project

Reclamation maintained the upper portion of the constructed pilot channel and the NMISC contractor maintained the lower portion of the channel prior to Spring 2006 runoff. During most of 2006, the active pool of the reservoir remained about a mile below the reservoir Narrows. However, an exceptional monsoon season raised the level of the active reservoir pool to the lower end of the Narrows by the end of 2006. Without construction of the pilot channel little or no defined river channel would exist.

Reclamation and New Mexico have independently estimated that between 8,000 and 17,000 acre-feet of water is saved annually when the pilot channel is open. Additionally, New Mexico reported

that the open pilot channel and Reclamation's maintenance of levees in the San Marcial area have been instrumental in delivering water to the reservoir in recent years. The improved delivery efficiency due to the pilot channel has contributed to minimizing the amount of time Article VII storage restriction have been in effect, resulting in the storage of significant amounts of native water in post-1929 reservoirs. The New Mexico Engineer Adviser indicated New Mexico has spent more than \$9 million since 2000 to construct and maintain the channel.

#### New Mexico Lower Rio Grande Active Water Resource Management

The New Mexico Office of the State Engineer initiated its Active Water Resource Management initiative in New Mexico's Lower Rio Grande Basin (from Elephant Butte Dam to the Texas State Line) in late 2004. Progress to date has included: 1) Declaring the Lower Rio Grande Water Master District; 2) hiring a District Water Master; 3) issuing an order requiring meters on all wells in the Basin (except single-family domestic and small stock wells); and 4) drafting District-specific rules and regulations for implementation of priority administration in the District. The District-specific rules and regulations were released for general public comment in November 2006. Due to the significant number of public comments, the comment period has been extended through May 31, 2007. The Office of the State Engineer is continuing with public outreach and public meetings to gather and address concerns about the rules and regulations, and is working with local water-right owners to develop alternative administrative mechanisms that may avoid some of the severe effects of strict priority administration.

#### **YEAR 2006 OPERATIONS**

##### Flood Operations

The 2005-2006 snowpack was well below average throughout the basin resulting in low streamflows during the runoff period. There were no Corps' reservoir flood control operations during this runoff period. However, several very high precipitation events during the late summer monsoon period caused significant flooding on some tributaries of the Rio Grande. Reclamation modified and ceased releases from Caballo Reservoir several times to lower the pressure on the river system below the reservoir. Significant flooding occurred in Escondida, Hatch, and El Paso due to high precipitation events on tributary arroyos.

**Platoro Reservoir Operations for 2006**

Platoro Reservoir, located near the headwaters of the Conejos River in Southern Colorado, is a post-Compact reservoir subject to the storage prohibition of Article VII. Platoro Reservoir was operated under the restrictions of Article VII during portions of 2006. Article VII restrictions went into effect on April 14, 2006, and were lifted on November 6, 2006.

For dam safety reasons, the main gate valve in the dam is normally closed during the winter. This allows the downstream butterfly valves on the end of the outlets to be left open and not operated during the winter. Spray from the outlet will freeze and totally encase the operating arms of these valves risking damage if they are operated during the winter. The bypass valve passes water around the main slidegate for winter operation.

**Emergency Drought Water Agreement (EDWA) Operations**

EDWA operations in 2006 consisted of the capture of 8,081 acre-feet of storage in El Vado Reservoir. A balance of 21,276 acre-feet of the original 175,500 acre-feet of relinquishment remains to be captured in future years.

**Supplemental Water Program Operations**

Reclamation's supplemental water program is intended to provide additional water, primarily through the voluntary leasing of San Juan-Chama (SJC) Project water, for endangered species needs and compliance with the 2003 Biological Opinion (BO). In 2006, Reclamation released a total of 40,451 acre-feet of leased SJC Project water (24,744 acre-feet) and EDWA water (15,707 acre-feet) for its supplemental water program. Supplemental water releases were made only during the spring, beginning in March and ending in June. No releases were necessary the latter part of the year because of the extraordinary monsoon season.

SJC 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. Reclamation continued to operate portable diesel driven pumps at four locations in the San Acacia reach during 2006 to pump an estimated (by Reclamation) 16,784 acre-feet of water from the LFCC to the Rio Grande under a permit issued by the New Mexico Office of the State Engineer. Reclamation reported that they were in compliance with the BO during 2006.

## REPORT OF THE ENGINEER ADVISERS

**REPORTS OF THE FEDERAL AGENCIES**

Representatives of Reclamation, the Corps, the Service, and the BIA presented reports to the Engineer Advisers on February 27 and 28, 2007.

**Middle Rio Grande Project Channel Maintenance**

Reclamation personnel provided a presentation regarding the status of their Middle Rio Grande river channel maintenance program. Since 2003, Reclamation has implemented long-term fixes at seven priority sites, implemented interim fixes at five priority sites, and also performed recurring work at four sites due to sediment accumulation.

In 2006, Reclamation completed work at two priority sites. Priority site work conducted to date has primarily been at locations where the river was encroaching upon the levees. Additional work was done to repair areas along the river that were damaged during the high flows from the monsoon season. Work at a priority site immediately below San Acacia diversion dam consisted of moving the levee and LFCC approximately 1,500 feet to the west. During the monsoon season, emergency streambank repairs performed in prior years at this location were eroded and the toe of the old levee breached, indicating the importance of implementing permanent fixes at the priority sites. In 2007, Reclamation plans to complete work at four additional sites, reducing the total number of sites from 26 to 22.

**Middle Rio Grande River Maintenance Plan**

Reclamation reported that they are developing a long-term river maintenance plan that will serve as a technical guide for future river maintenance activities, while meeting the original project authorization purposes and environmental compliance needs. A draft of the first phase of the plan is scheduled for completion in April 2007 and will be submitted to the Engineer Advisers for review.

**Tiffany Sediment Plug**

In 2005, a sediment plug formed in the river in the Tiffany area during the snowmelt runoff. The blockage was fixed by excavating a pilot channel through the sediment plug. A long-term solution to sedimentation problems is currently being sought for the Tiffany reach. In 2006, Reclamation collected design data and is currently in the study phase, including development of a model to aid in the prediction of sediment plugs which is being funded jointly by Reclamation and the NMISC. In the interim, all permits are in place for excavating pilot channels through sediment plugs in the Tiffany



reach as they occur.

#### **Corps Middle Rio Grande Flood Protection Projects**

The Corps reported on a number flood protection and watershed feasibility studies underway in the Upper Rio Grande basin. They indicated that two levees in the middle Rio Grande, previously constructed by the Corps, do not meet current Corps design standards. As a result, some property owners in the valley may be required to obtain flood insurance. Through discussion with the Engineer Advisers, the Corps indicated their evaluations do not include all of the levees within the middle Rio Grande. New Mexico requested a map from the Corps showing all of the areas the Corps is evaluating.

#### **Cochiti Reservoir Baseline Study**

The Corps reported on an ongoing study of Cochiti Reservoir operations. The completion of the study is contingent upon available funding. The Corps reported that no additional work was completed on the study in 2006 and they no longer have an anticipated date of completion for the study. The Engineer Advisers continue to be concerned with the delays in completing this study.

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

Reclamation, the 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 multi-year 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 Endangered Species Act (ESA) will be provided. The draft EIS was released for public comment in January 2006. The release of the final document is anticipated by April 2007.

Reclamation stated that their Record of Decision (ROD) will include extension of SJC project water waivers for release from Heron Reservoir until September of any calendar year; and operation of the LFCC at diversions from 0 to 2000 cfs when physical capability exists. It is anticipated the LFCC will continue to function as a drain for the irrigated lands of the Socorro valley for the foreseeable future. Active operation and diversion to the LFCC would require completion of additional NEPA compliance activities and ESA Section 7

#### **REPORT OF THE ENGINEER ADVISERS**

consultation.

The Corps stated that their ROD would express their intent to work toward achieving the objectives, within the Corps authorities, of the EIS Preferred alternative. Specifically with regard to the Corps, the preferred alternative includes storage of native Rio Grande water in Abiquiu Reservoir, and increasing the channel capacity below Cochiti Reservoir. Both the Corps and Reclamation indicated intent to continue to improve interagency coordination and communication.

The New Mexico Engineer Adviser is concerned that, as a result of the Corps decision, Abiquiu Reservoir cannot be used in the near future to store and release native water as a normal operation to aid in compliance with the 2003 Biological Opinion flow targets. He is also concerned that the Albuquerque Bernalillo County Water Utility Authority and environmental groups will not be able to store native water in Abiquiu Reservoir as contemplated in their silvery minnow lawsuit settlement.

#### **San Acacia Levee Project**

The San Acacia Levee project would rehabilitate 45 miles of levee between San Acacia and the San Marcial Railroad Bridge by removing the existing spoil bank levee and replacing it with an engineered levee. The project also would include acquisition of about 2,000 acres of land at Tiffany for use as a sediment control basin and either raising or relocating the railroad bridge at San Marcial. The Corps had previously identified the San Marcial portion of the project as the Albuquerque District's highest priority. The Corps initiated a Limited Reevaluation study in 2005 with a plan of beginning construction in 2008 to meet a requirement of the 2003 Biological Opinion. Unfortunately, that timeline is no longer valid. The current goal of the Corps is to initiate construction of the project by 2010. However, recent technical analyses have indicated that the levee project could be constructed to pass the 100-year flood event with minimal potential for damaging the bridge. Thus, it appears that if the levee is constructed to pass the 100-year flood event there may be no need to relocate the railroad bridge in order to allow for increased flood control releases from Cochiti and Jemez Canyon reservoirs. Therefore, if the levee is constructed, the 2003 Biological Opinion requirement to move the bridge may not be necessary.

The Engineer Advisers are concerned the Corps may not be able to comply with the railroad bridge relocation requirement in the 2003 Biological Opinion. Given the results of the Corps technical analyses, the Engineer Advisers encourage the Corps to confer with the Service on the need to move the bridge. Additionally, New Mexico indicated the need for the Corps and the NMISC to meet to discuss the local cost-share. Funding previously secured by the NMISC will not be available for use on



the project after June 30, 2007.

#### **March 17, 2003 Middle Rio Grande Programmatic Biological Opinion**

The Service reported that the action agencies (Reclamation and Corps) remain in compliance with the 2003 Biological Opinion. They indicated that the Biological Opinion was modified in 2006 to:

- 1) incorporate the designation of southwestern willow flycatcher critical habitat,
- 2) remove the cap on silvery minnow take,
- 3) allow for up to eight miles per day of river drying in either the San Acacia or Isleta reaches; and
- 4) address the early drying of a small stretch of river in the San Acacia reach.

Other than the short period of drying, the action agencies met all the flow targets for the remainder of the year. Additionally, the Service reported on other required biological opinion elements. They indicated that:

- silvery minnow take has not been exceeded,
- about 480 acres of habitat restoration has been conducted towards the 1,600-acre requirement,
- captive propagation requirements are being met, and
- two additional refugia, the San Acacia fish passage, and the San Marcial railroad bridge projects continue to move forward.

#### **Rio Grande Silvery Minnow**

Rio Grande silvery minnow salvage operations were conducted from March through May with a total salvage in 2006 of 69,889 minnows. Rescue activities were not necessary from July 27 to September 19 due to monsoonal rains and runoff events. Incidental take as a result of the water operations in the Middle Rio Grande numbered 2,400, which was within the take limit. Approximately 46 miles of the Rio Grande went dry in 2006 south of the Isleta diversion dam with the primary drying occurring within the San Acacia reach.

The Service continues to propagate silvery minnow at the Dexter National Fish Hatchery and the City of Albuquerque Biopark to augment the population. Over 980,000 silvery minnow have been released since 2000. In 2006, releases were 418,551. Dexter is currently holding 139,000 silvery

#### **REPORT OF THE ENGINEER ADVISERS**

minnow of 2006-year class and the Biopark is holding about 71,000. About 100,000 will be retained for reintroduction into Big Bend, Texas in early 2008.

The Service indicated the 2005 catch rate was equivalent to catch rates experienced at the time the silvery minnow was listed as endangered in 1994. However, the Service warned that catch rates fell markedly for the silvery minnow in October 2006. The success of the 2004 and 2005 recruitment was due to increased rearing habitat as a result of elevated and extended snowmelt runoff.

The Service reported on sampling activities for silvery minnow within Elephant Butte Reservoir and the pilot channel. Both of these areas are located outside of the designated critical habitat for the species. Silvery minnow have been found in the pilot channel and therefore a consultation and biological opinion will be required for compliance with Section 7 of the ESA.

#### **Silvery Minnow Reintroduction**

The Service has continued planning and environmental compliance work for reintroduction of silvery minnow in the Big Bend area. The Environmental Assessment for reintroduction as an ESA Section 10(j) experimental, non-essential population will be released for public review in May 2007. If these segments are designated per Section 10(j), they cannot be designated as critical habitat for the minnow. Reintroduction could occur in 2008.

#### **Rio Grande Silvery Minnow Recovery Plan**

In 2006, the Service completed the process necessary to submit the draft revised Recovery Plan for public review. The draft revised Recovery Plan provides criteria for downlisting and delisting and recovery actions. Peer review will be conducted concurrently with the 90-day public review period. The public review period ends April 19, 2007.

#### **Silvery Minnow Spawning and Recruitment/Proposed 2007 Experimental Operations:**

The Service indicated they documented spawning of silvery minnow from mid-May through mid-July 2006, a significantly longer spawning window than previously documented. However, they also reported a lack of young-of-year minnow during the fall of 2006 collection implying recruitment of silvery minnow from the 2006 spawn was low. The Service hypothesized the high magnitude but low duration summer flows did not provide sufficient habitat for successful recruitment. The Service also indicated they now believe, based upon available data, that a 7-to-10 day stable flow during mid-to-late May exceeding 2,000 to 2,500 cfs could improve silvery minnow recruitment in the middle valley.

Reclamation indicated they have spoken with the Corps, Cochiti Pueblo, and Service about

conducting experimental operations to provide spawning and recruitment flows using Corps flood control reservoirs in 2008 to re-regulate the flow entering the reservoirs without releases of supplemental water or reduction of deliveries to Elephant Butte Reservoir. The Engineer Advisers, in their roles on the Rio Grande silvery minnow recovery team, have made similar recommendations to the Corps annually for the past several years.

The Corps indicated they do not have authority to conduct such an operation on the long-term basis. The Engineer Advisers believe the proposed operation could be conducted in 2007 as a deviation from normal operations, if needed. By letter, the Engineer Advisers requested that the Corps deviate from its normal operations during 2007 to provide a stable flow greater than 2,000 cfs from the natural flow of the Rio Grande for between 7-to-10 days with two caveats: that the re-regulation occur from native flow of the Rio Grande only if sufficient native flow is available in excess of middle valley diversion demand and that deliveries of water to Elephant Butte Reservoir will not be reduced by the operation. The Engineer Advisers believe the Commission would be open to authorizing such a deviation at their March 2007 meeting.

#### Southwestern Willow Flycatcher

Reclamation and the Service indicated the number of southwestern willow flycatcher territories in the Middle Rio Grande valley increased within the recovery unit, with 183 known territories in 2006 compared to 147 in 2005.

The Engineer Advisers recognize that an issue may exist related to the filling of the Elephant Butte Reservoir pool and the effect of such filling on the flycatchers in the pool area. The Engineer Advisers have met with Reclamation and the Service periodically to assess the issue. In 2006, all known flycatcher territories in the reservoir delta were located within the top seven feet of the reservoir pool.

#### Vegetation Management at Elephant Butte and Caballo Reservoirs

Salt cedar and other phreatophytes continue to grow within the exposed reservoir areas. Reclamation continued vegetation management efforts in 2006 through a Cooperative Agreement funded by the NMISC. A total of 3,189 acres were treated in 2006 at both reservoirs under the program. A total of 2,645 acres were treated by mowing, and 544 acres were treated with herbicides.

### REPORT OF THE ENGINEER ADVISERS

#### 2006 Rio Grande Project Operations and Storage Projections

Reclamation reported a final allocation of 472,426 acre-feet, or 50.7% of a full supply, for all three Rio Grande Project water users: Elephant Butte Irrigation District (EBID), El Paso County Water Improvement District No. 1 (EP No. 1), and Mexico. Reclamation reported that EBID requested and diverted 210,139 acre-feet and EP No. 1 requested and diverted 154,746 acre-feet. These values reflect the operations proposal by EBID. Mexico requested and diverted 28,532 acre-feet. City of El Paso diversions for 2006 were 42,948 acre-feet.

Reclamation reported Usable Water rose above the 400,000 acre-feet Article VII storage restriction value on December 27, 2005. According to Reclamation, Usable Water dropped below 400,000 acre-feet again on April 14, 2006, and hit its lowest point on July 28, 2006, with 183,875 acre-feet in storage. Due to an exceptionally wet summer monsoon season and late-year inflows, Usable Water rose above 400,000 acre-feet again on November 6, 2006. Storage at Elephant Butte Reservoir peaked at 514,029 acre-feet on December 31, 2006 and storage at Caballo Reservoir peaked at 71,623 acre-feet on August 26, 2006. End-of-Year storage at Caballo Reservoir was 43,137 acre-feet.

#### Reclamation's Rio Grande Project Operations Plan to 2007

Reclamation discussed their Rio Grande Project water allocations for 2007. At the time of the Engineer Advisers meeting, Reclamation indicated that the current allocation of 369,466 acre-feet is 40 percent of a full allocation. Reclamation is allowing each district to carryover 50% of the unused 2006 diversion allocation (623 acre-feet for EBID and 36,200 acre-feet for EP No. 1) in order to promote conservation. Reclamation's most probable forecast for 2007 indicates an allocation of 85.6% of a full allocation.

Reclamation's most probable estimate predicts that Elephant Butte Reservoir could reach a low storage level near 293,000 acre-feet in October 2007. Reclamation expects to begin Project releases for the 2007 irrigation season March 5, 2007, with releases from Caballo to begin March 7, 2007. The date for the start of Mexico diversions is contingent upon completion of repair of flood damage to Mexico's system, and is estimated by Reclamation to be roughly two weeks after the start of Caballo releases.

Reclamation reported that project operations for this year, as in 2006, will incorporate EBID's March 2006 operations proposal. Reclamation is still in the process of drafting its accounting procedures. The EA's are awaiting the draft documentation of Reclamation's proposed operations and will evaluate it to ensure all Rio Grande Compact states are kept whole.



**Water Resource Development Act Section 729 Comprehensive Planning Study**

The Corps of Engineers began a feasibility study, with the Texas Commission on Environmental Quality as the local sponsor, in the Forgotten River Reach from Fort Quitman to Presidio, Texas in 2005. The study is investigating invasive species removal and ecosystem restoration alternatives. The study, originally scheduled for delivery in 2007, will be completed in 2008.

**2006 Six Middle Rio Grande Pueblos Prior and Paramount Operations**

The BIA Designated Engineer and Reclamation provided details on 2006 Prior and Paramount storage and release activities. Reclamation reported they stored 27,000 acre-feet in El Vado Reservoir for delivery of irrigation water to the Prior and Paramount lands of the six Middle Rio Grande Pueblos in 2006 in the event that natural flows were insufficient. These are lands recognized as being senior to other lands of the MRGCD. Of that amount, 2,890 acre-feet was stored prior to Article VII storage restrictions going into effect and the balance, 24,110 acre-feet, was stored while the storage restrictions of Article VII were in effect.

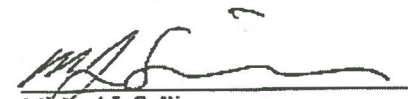
A total of 3,015 acre-feet of Prior and Paramount storage was released to meet demand, in late June and during July. The remaining Prior and Paramount storage that was captured while Article VII was in effect was released in November and December for delivery to Elephant Butte Reservoir before the end of the calendar year. The Prior and Paramount water stored before Article VII became effective remained in storage and was reallocated as normal Rio Grande storage available for release to satisfy future MRGCD irrigation demand.

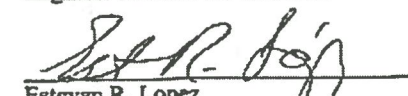
The Texas Engineer Adviser remains concerned about the storage of native Rio Grande water in El Vado Reservoir by Reclamation when Article VII storage prohibition is in effect.

**BUDGET**

The Engineer Advisers reviewed the Cost of Operation for the year ending June 30, 2006 and the Budget for Fiscal Year ending June 30, 2008. The Engineer Advisers found that the expenses for gaging stations and administration of the Rio Grande Compact for the year ending June 30, 2006 were \$175,658. The United States bore \$54,430 of this total, with the balance of \$121,228 borne equally by the three states. The proposed budget for the fiscal year ending June

30, 2008 indicates a total of \$188,755 will be spent for gaging stations and administration. The proposed contribution by the United States for fiscal year 2008 is \$62,564.

  
Michael J. Sullivan  
Engineer Adviser for Colorado

  
Estevan R. Lopez  
Engineer Adviser for New Mexico

  
Herman R. Senemeyer  
Engineer Adviser for Texas

## RIO GRANDE COMPACT COMMISSION REPORT

## RECORDS OF DELIVERIES AND RELEASES

At the annual meeting of the Compact Commission on March 22, 2007, the records of deliveries and releases and computations of debits and credits for calendar year 2006 were reported. The records and computations as approved by the Commission are reproduced on the next three pages.

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

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

The actual release from Project Storage during the year was measured at gaging stations below Caballo Dam. During 2006 the Commissioners found that the actual release of usable water was 435,100 acre-feet. This resulted in an accrued credit of 628,400 acre-feet as of January 1, 2007.

RIO GRANDE COMPACT - DELIVERIES BY COLORADO AT STATE LINE  
YEAR 2006

Quantities in thousands of acre feet to nearest hundred

Quantities in thousands of acre feet to nearest hundred																												
MONTH	CONEJOS INDEX SUPPLY										RIO GRANDE INDEX SUPPLY										DELIVERIES							
	MEASURED FLOW					ADJUSTMENTS					SUPPLY					ADJUSTMENTS					SUPPLY					DELIVERIES		
	CONEJOS AT MODOOTE	LOS PINOS NEAR ORTIZ	SAN ANTONIO AT ORTIZ	TOTAL	STORAGE AT END OF MONTH	CHANGE IN STORAGE	OTHER ADJUSTMENTS	NET ADJUSTMENTS	SUPPLY IN MONTH	ACCUMULATED TOTAL	RECORDED FLOW NEAR DEL NORTE	STORAGE AT END OF MONTH	CHANGE IN STORAGE	TRANSFERRALS	OTHER ADJUSTMENTS	NET ADJUSTMENTS	SUPPLY IN MONTH	ACCUMULATED TOTAL	CONEJOS RIVER AT MOUTH NEAR LASAUCOS	RIO GRANDE LESS CONEJOS RIVER	RIO GRANDE AT LOBATOS	ACCUMULATED TOTAL AT LOBATOS						
1	2	3	4	5	6	7 <sup>a</sup>	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23						
JAN	27	—	—	—	—	4.5	—	—	—	—	0.0	0.2	—	—	—	—	—	—	—	—	—	0.0						
FEB	27	—	—	—	—	2.7	4.7	0.1	0.1	2.8	2.8	10.5	0.2	0.0	—	—	—	10.5	10.5	3.3	13.6	16.9						
MAR	39	—	—	—	—	2.7	4.7	0.1	0.1	2.8	5.6	9.3	0.2	0.0	—	—	—	9.3	19.8	3.4	12.1	16.5						
APR	18.9	12.3	3.1	34.3	5.0	0.0	—	—	0.0	34.3	44.1	59.3	0.2	0.0	—	—	—	13.0	32.8	2.3	15.3	17.6						
MAY	52.9	17.6	1.0	71.5	12.7	7.7	0.1	7.8	79.3	123.4	148.7	0.2	0.0	—	—	—	—	148.7	238.6	3.9	11.2	15.1						
JUN	31.7	2.8	0.0	34.5	11.8	-0.9	0.1	-0.8	33.7	157.1	84.3	0.2	0.0	—	0.1 <sup>b</sup>	0.2 <sup>b</sup>	0.1	84.3	323.1	3.9	10.8	14.7						
JUL	15.2	1.5	0.0	16.7	9.0	-2.8	0.1	-2.7	14.0	171.1	38.9	0.2	0.0	-0.1 <sup>b</sup>	—	—	—	37.0	360.1	2.1	8.1	10.2						
AUG	15.9	3.3	0.4	19.6	8.2	-0.8	—	-0.8	18.8	189.9	50.4	0.2	0.0	—	—	—	—	50.4	410.5	6.2	9.7	15.9						
SEPT	14.2	3.0	0.2	17.4	6.9	-1.3	—	-1.3	18.1	208.0	34.1	0.2	0.0	—	—	—	—	34.1	444.6	7.9	7.1	15.0						
OCT	25.9	8.5	0.4	32.8	5.1	-1.8	—	-1.8	31.0	237.0	89.1	0.2	0.0	—	—	—	—	89.1	533.7	15.1	17.5	32.6						
NOV	6.6	—	—	6.6	0.7	—	—	—	7.3	244.3	23.1	0.2	0.0	—	—	—	—	23.1	559.8	9.3	29.9	39.2						
DEC	3.1	—	—	3.1	8.3	0.5	—	—	3.6	247.9	13.5	0.2	0.0	—	—	—	—	13.5	570.3	6.5	17.7	23.2						
YEAR	957.7	47.0	5.1	245.8	—	1.8	0.3	2.1	247.9	—	570.2	—	—	0.0	-0.1	0.2	0.1	570.3	—	65.7	181.4	227.1						
SUMMARY OF DEBITS AND CREDITS																												
ITEM																												
C1 Balance at Beginning of Year																												
C2 Scheduled Delivery from Conejos River																												
C3 Scheduled Delivery from Rio Grande																												
C4 Actual Delivery at Lobatos plus 10,000 Acre Feet																												
C5 Reduction of Debits due Evaporation																												
C6 Reduction of Credits due Evaporation and Spill																												
C7 Accrued credit calculated to proper storage as March 31, 2006																												
C8 Balance at End of Year																												

Remarks: Cols. 6 and 13 do not include transmountain water.

<sup>a</sup> Evaporation loss post-compacted reservoirs; report of the Engineer Adviser for Colorado.

<sup>b</sup> 374 ac-ft minus 243 ac-ft pre-compacted; report of the Engineer Adviser for Colorado.

<sup>c</sup> See Engineer Adviser report in regards to change of storage

Remarks: Cols. 6 and 13 do not include transmountain water.

\* Evaporation less post-compact reservoirs, report of the Engineer Adviser for Colorado.

b 374 ac-ft minus 243 ac-ft pre-compact, report of the Engineer Adviser for Colorado.

c See Engineer Adviser report in regards to change of storage.

APPROVED: RRR Date: 3/1/07 Engineer Adviser for New Mexico  
RRR Date: 3/1/07 Engineer Adviser for Texas  
RRR Date: 3/1/07

## RIO GRANDE COMPACT COMMISSION REPORT

## RIO GRANDE COMPACT - DELIVERIES BY NEW MEXICO AT ELEPHANT BUTTE

YEAR 2006

Quantities in thousands of acre feet to nearest hundred

MONTH	OTOWI INDEX SUPPLY										ELEPHANT BUTTE EFFECTIVE SUPPLY			
	ADJUSTMENTS										STORAGE IN ELEPHANT BUTTE RESERVOIR		Effective Supply	
	Recorded Flow at Olow Bridge	Storage Change in Storage	Reservoir Evaporation	Other Adjustments	Trans-mountain Diversions	Net Adjustments	During Month	Accumulated Total	Total Water Stored in New San Marcial at End of Month <sup>a, b</sup>	Change in Gas (+) or Loss (-)	Recorded Flow Below Elephant Butte Dam	During Month	Accumulated Total	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
JAN	40.1	100.9	1.1	0.1	-1.8	-0.6	38.5	38.5	101.2	423.5	40.1	0.2	40.3	40.3
FEB	32.5	104.1	2.1	0.1	-0.7	1.5	34.0	73.5	104.0	483.7	30.1	0.6	30.9	71.2
MAR	41.4	104.2	0.1	0.3	-3.8	-3.4	38.0	111.5	104.0	447.8	45.9	7.1	25.4	96.6
APR	53.3	120.0	15.8	0.5	-8.6	8.7	68.0	179.5	120.8	380.7	40.1	89.1	22.0	118.6
MAY	66.4	114.5	-5.5	0.8	-6.4	-11.0	65.4	244.9	114.8	300.1	40.8	94.7	14.1	132.7
JUN	77.3	73.5	-41.0	0.7	-8.6	-48.9	27.4	262.3	73.3	213.2	40.9	100.5	13.6	146.3
JUL	52.5	54.4	-19.1	0.2	-1.5	-20.4	32.1	294.4	54.4	184.2	20.0	83.6	84.6	210.9
AUG	59.0	55.1	0.7	0.2	0.1	1.0	60.0	354.4	85.1	328.6	142.8	33.2	175.8	386.7
SEPT	44.5	51.4	-3.7	0.2	-1.4	-5.0	39.5	393.9	51.5	347.2	20.4	1.6	22.0	408.7
OCT	58.0	56.2	7.8	0.2	0.0	8.0	60.0	453.9	59.2	393.0	45.8	1.1	46.9	455.8
NOV	72.7	50.3	-8.6	0.1	0.2	-8.6	64.1	518.0	50.6	455.8	82.6	0.4	83.2	518.8
DEC	55.5	48.5	-3.8	0.1	-1.5	-5.2	50.3	574.3	48.6	509.5	53.7	0.4	54.1	572.9
YEAR	558.2	---	-54.4	3.6	---	-33.0	43.0	574.4	---	---	488.9	---	---	---

Remarks: Storage in recreational reservoirs not included.  
Cols. 3 and 11 reflect implementation of revised area-capacity tables for Abiquia, Cochiti, and Jemez Canyon Reservoirs, effective January 1, 1999.

<sup>a</sup> Cols. 3, 11, and 12 do not include transmountain water.  
<sup>b</sup> Note: Storage in Abiquia, El Vado, McChure and Nichols Reservoirs under the April 23, 2003 agreement for relinquishment of accrued credits aggregated 0.081 acre-feet in 2006. Storage of relinquished credit to date aggregated 154,224 acre-feet; balance remaining is 21,270 acre-feet.

<sup>c</sup> Adjusted pursuant to Article VI Cap on maximum annual credit of 150,000 acre-feet.

APPROVED  
Engineer Adviser for Colorado LM Date 3/1/07 Engineer Adviser for New Mexico RRK Date 3/1/07 Engineer Adviser for Texas HS Date 3/1/07

RIO GRANDE COMPACT - RELEASE AND SPILL FROM PROJECT STORAGE  
YEAR 2006

Quantities in thousands of acre feet to nearest hundred

MONTH	USABLE WATER IN STORAGE					CREDIT WATER IN STORAGE <sup>a</sup>					RIO GRANDE BELOW CABALLO DAM				
	Total Project Storage Capacity Available at End of Month	Elephant Butte Reservoir	Caballo Reservoir	Total at End of Month	Unified Capacity of Project Storage at End of Month	Colorado Credit Water	New Mexico Credit Water	Total at End of Month	Flood Water in Storage in Caballo Reservoir at End of Month	Total Water in Project Storage at End of Month	Measured Flow in Project Storage at Gaging Station	Intermittent Diversions to Canals	Total Release and Spill	Caballo Flood Water	Usable Water
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
JAN	2,225.0	361.8	15.9	377.4	1,827.0	1,827.0	4.6	37.1	41.7	439.1	439.1	0.1	0.1	439.1	439.1
FEB	2,225.0	421.0	18.8	439.7	1,785.3	1,785.3	4.6	37.1	41.7	480.4	480.4	0.1	0.1	480.4	480.4
MAR	2,225.0	452.0	18.3	470.3	1,754.7	1,754.7	4.8	37.1	41.7	512.0	512.0	0.1	0.1	512.0	512.0
APR	2,200.0	408.1	21.0	429.1	1,770.9	1,770.9	4.8	37.1	41.7	468.8	468.8	0.1	0.1	468.8	468.8
MAY	2,200.0	339.4	35.4	374.8	1,825.2	1,825.2	4.2	37.1	41.3	418.1	418.1	0.1	0.1	418.1	418.1
JUN	2,200.0	258.8	53.1	311.9	1,888.1	1,888.1	4.2	37.1	41.3	353.2	353.2	0.1	0.1	353.2	353.2
JUL	2,200.0	171.8	47.8	219.7	1,980.3	1,980.3	4.2	37.1	41.3	281.0	281.0	0.1	0.1	281.0	281.0
AUG	2,200.0	142.9	45.5	188.4	2,011.6	2,011.6	4.2	37.1	41.3	229.7	229.7	0.1	0.1	229.7	229.7
SEPT	2,200.0	285.5	64.3	349.8	1,850.2	1,850.2	4.2	37.1	41.3	381.1	381.1	0.1	0.1	381.1	381.1
OCT	2,225.0	305.9	46.1	352.0	1,873.0	1,873.0	4.2	37.1	41.3	393.3	393.3	0.1	0.1	393.3	393.3
NOV	2,225.0	351.7	30.4	382.1	1,842.9	1,842.9	4.2	37.1	41.3	432.4	432.4	0.0	0.0	432.4	432.4
DEC	2,225.0	415.5	41.0	456.5	1,768.5	1,768.5	4.2	37.1	41.3	490.8	490.8	0.1	0.1	490.8	490.8
YEAR	---	488.2	43.1	531.3	1,713.7	1,713.7	4.2	37.1	41.3	532.8	532.8	0.1	0.1	532.8	532.8

<sup>a</sup> Project Storage Capacity is 2,200,000 acre-feet (April to September) and 2,225,000 acre-feet (October to March) as recognized by the September 9, 1994 Resolution of the Rio Grande Compact Commission with flood control storage reservation at Elephant Butte Reservoir of 50,000 acre-feet from April through September and 25,000 acre-feet from October through March.

<sup>b</sup> Based on Balance at Beginning of Year (C1 and N41).

<sup>c</sup> Credit water held constant per direction of Compact Commission in March 2006. Evaporation for credit water is accounted at end of calendar year.

<sup>d</sup> Adjustment pursuant to section entitled "Departure from Normal Releases" of the "Rules and Regulations for Administration of the Rio Grande Compact."

APPROVED  
Engineer Adviser for Colorado LM Date 3/1/07 Engineer Adviser for New Mexico RRK Date 3/1/07 Engineer Adviser for Texas HS Date 3/1/07

## RECORDS OF DELIVERIES AND RELEASES



## RIO GRANDE COMPACT COMMISSION REPORT

## COST OF OPERATION AND BUDGET

## BUDGET FOR FISCAL YEAR ENDING JUNE 30, 2006

Item	Total Cost	Borne by United States	Borne by		
			Colorado	New Mexico	Texas
GAGING STATIONS					
In Colorado	\$62,556	\$7,848	\$54,708		
In New Mexico, above Caballo Reservoir	\$56,740	\$34,375		\$22,365	
In New Mexico, Caballo Reservoir and below	\$20,840	\$5,200		\$2,440	\$13,200
Subtotal	\$140,136	\$47,423	\$54,708	\$24,805	\$13,200
ADMINISTRATION					
U.S.G.S. Contract	\$32,447	\$7,007	\$8,480	\$8,480	\$8,480
Other expenses	\$3,075		\$1,025	\$1,025	\$1,025
Subtotal	\$35,522	\$7,007	\$9,505	\$9,505	\$9,505
GRAND TOTAL	\$175,658	\$54,430	\$64,213	\$34,310	\$22,705
EQUAL SHARES			\$40,409	\$40,409	\$40,409

## BUDGET FOR FISCAL YEAR ENDING JUNE 30, 2008

Item	Total Cost	Borne by	Borne by		
		United States	Colorado	New Mexico	Texas
GAGING STATIONS					
In Colorado	\$66,351	\$8,652	\$57,699		
In New Mexico, above Caballo					
Reservoir	\$63,190	\$40,415		\$22,775	
In New Mexico, Caballo					
Reservoir and below	\$21,760	\$5,680		\$2,480	\$13,600
Subtotal	\$151,301	\$54,747	\$57,699	\$25,255	\$13,600
ADMINISTRATION					
U.S.G.S. Contract	\$34,062	\$7,817	\$8,748	\$8,748	\$8,748
Other expenses	\$3,392		\$1,131	\$1,131	\$1,131
Subtotal	\$37,454	\$7,817	\$9,879	\$9,879	\$9,879
GRAND TOTAL	\$188,755	\$62,564	\$67,578	\$35,134	\$23,479
EQUAL SHARES			\$42,064	\$42,064	\$42,064

## ACKNOWLEDGMENTS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

## RIO GRANDE COMPACT COMMISSION REPORT

## ACCURACY OF RECORDS

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

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

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

## STREAMFLOW

## Rio Grande near Del Norte, Colo

**Location.** -- Water-stage recorder, lat 37°41'22", long 106°27'38", in NW 1/4 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.** -- 117 years (1890-2006), 894 ft<sup>3</sup>/s (647,300 acre-ft per year).

**Extremes.** -- 1889-2006: 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.

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

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

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	5,320	200	140	172	10,550
February	4,680	220	140	167	9,280
March	6,529	528	165	211	12,950
April	28,378	1,560	434	946	56,290
May	75,460	3,440	1,280	2,434	149,700
June	42,526	2,780	452	1,418	84,350
July	18,591	1,220	421	600	36,880
August	25,404	1,290	533	819	50,390
September	17,181	727	433	573	34,080
October	44,941	2,920	524	1,450	89,140
November	11,663	684	160	389	23,130
December	6,790	260	160	219	13,470
Calendar year 2006	287,463	3,440	140	788	570,200

## Conejos River below Platoro Reservoir, Colo.

**Location.** -- Water-stage recorder and concrete control, lat 37°21'18", long 106°32'37", in NW 1/4NW 1/4 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.** -- 54 years (1890-2006), 92.1 ft<sup>3</sup>/s (66,690 acre-ft per year).

**Extremes.** -- 1952-2006: 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.

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

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

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	218	7.2	7.0	7.0	432
February	196	7.0	7.0	7.0	389
March	217	7.0	7.0	7.0	430
April	2,015	224	7.0	67.2	4,000
May	7,164	532	87	231	14,210
June	6,997	481	102	233	13,880
July	3,353	295	48	108	6,650
August	2,662	142	32	85.9	5,280
September	2,852	130	71	95.1	5,660
October	4,734	290	71	153	9,390
November	503	86	7.5	16.8	998
December	233	7.5	7.5	7.5	461
Calendar year 2006	31,100	532	7.0	85.3	61,770



## RIO GRANDE COMPACT COMMISSION REPORT

## Conejos River near Mogote, Colo

**Location.** -- Water-stage recorder, lat 37°03'14", long 106°11'13", in SE 1/4SE 1/4 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.** -- 96 years (1904, 1912-2006), 322 ft<sup>3</sup>/s (233,600 acre-ft per year).

**Extremes.** -- 1903-05, 1911-2006: Maximum discharge, 9,000 ft<sup>3</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 and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	1,365	56	33	44.0	2,710
February	1,364	58	40	48.7	2,710
March	1,953	75	45	63	3,870
April	9,532	563	78	318	18,910
May	26,686	1,570	427	861	52,930
June	15,989	1,060	240	533	31,710
July	7,637	610	123	246	15,150
August	8,020	409	109	259	15,910
September	7,173	323	170	239	14,230
October	13,059	735	223	421	25,900
November	3,297	219	42	110	6,540
December	1,560	60	43	50.3	3,090
Calendar year 2006	97,635	1,570	33	267	193,700

## 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.** -- 66 years (1941-2006), 24.8 ft<sup>3</sup>/s (17,970 acre-ft per year).

**Extremes.** -- 1920, 1925-2006: 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

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	33.5	1.6	0.6	1.1	66
February	52.3	3.4	0.9	1.9	104
March	179	14	3	5.8	355
April	1,540	94	12	51.3	3,050
May	487.7	40	2.2	15.7	967
June	21.5	2.5	0.0	0.7	43
July	16.6	2.7	0.0	0.5	33
August	200.1	18	0.8	6.5	397
September	103.2	8.1	1.4	3.4	205
October	181.3	9.1	3.2	5.9	360
November	102.4	4.7	1.6	3.4	203
December	71.5	2.8	1.6	2.3	142
Calendar year 2006	2,990	94	0.0	8.2	5,930

## STREAMFLOW

## Los Pinos River near Ortiz, Colo

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

**Drainage area.** -- 167 sq mi.

**Average discharge.** -- 88 years (1915-20, 1925-2006), 117 ft<sup>3</sup>/s (85,010 acre-ft per year).

**Extremes.** -- 1915-20, 1925-2006: 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	411	13.3	16	11	815
February	387	13.8	19	11	768
March	622	20.1	23	17	1,230
April	6,225	208	416	25	12,350
May	8,892	287	448	112	17,640
June	1,401	46.7	105	19	2,780
July	749	24.2	56	16	1,490
August	1,648	53.2	149	20	3,270
September	1,507	50.2	123	23	2,990
October	3,278	106	161	57	6,500
November	1,210	40.3	62	26	2,400
December	754	24.3	29	21	1,500
Calendar year 2006	27,084	74.2	448	11	53,720

## Conejos River near Lasasues, Colo

**Location.** -- Water-stage recorder, 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 Lasasues. Datum of gage on main channel is 7,495.02 ft and on secondary (south) channel is 7,496.89 ft above main sea level (levels by Bureau of Reclamation).

**Drainage area.** -- 887 sq mi.

**Average discharge.** -- 85 years (1922-2006), 176 ft<sup>3</sup>/s (127,600 acre-ft per year).

**Extremes.** -- 1921-2006: 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 above station 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	1,673	54	71	40	3,320
February	1,709	61	76	54	3,390
March	1,170.8	37.8	104	3.1	2,320
April	1,395.6	46.5	130	4.4	2,770
May	1,937	62.5	212	12	3,840
June	1,979	66	158	19	3,930
July	1,077	34.7	81	17	2,140
August	3,095	99.8	237	32	6,140
September	3,999	133	204	65	7,930
October	7,608	245	542	132	15,090
November	4,703	157	264	93	9,330
December	2,785	89.8	102	77	5,520
Calendar year 2006	33,131.4	90.8	542	3.1	65,720

## 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); 76 years (1931-2006) 438 ft<sup>3</sup>/s (317,200 acre-ft per year).

**Extremes.** -- 1899-2006: 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 1950-51-51, 1956.

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

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	8,520	275	320	240	16,900
February	7,823	279	364	235	15,520
March	8,889	287	395	134	17,630
April	5,671	189	284	103	11,250
May	7,591	245	408	149	15,060
June	7,404	247	480	133	14,690
July	5,117	165	338	97	10,150
August	8,020	259	368	104	15,910
September	7,584	253	341	156	15,040
October	16,415	530	975	276	32,560
November	19,755	658	990	350	39,180
December	11,685	377	460	270	23,180
Calendar year 2006	114,474	314	990	97	227,100

## 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; 37 years (1970-2006) 133 ft<sup>3</sup>/s (96,670 acre-ft per year) subsequent to completion of Azotea tunnel.

**Extremes.** -- 1962-2006: 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	0.0	0.0	0.0	0.0	0.0
February	0.0	0.0	0.0	0.0	0.0
March	380	36	1.0	12	276,530
April	8,860	496	16	295	6,418,130
May	13,040	641	223	421	9,445,500
June	3,920	328	8.6	131	2,841,800
July	1984	348	0.0	64	1,437,370
August	2,760	193	8.6	89	1,997,740
September	3060	327	8.1	99	2,217,210
October	6,690	529	0.0	223	4,846,390
November	0.0	0.0	0.0	0.0	0.0
December	0.0	0.0	0.0	0.0	0.0
Calendar year 2006	40,690	641	0.0	111	29,480,690

## STREAMFLOW

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

**Location.** -- Water-stage recorder, lat 36°42'24", long 106°44'42", in Tierra Amarilla Grant, on right bank 3.7 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 National Geodetic Vertical Datum of 1929. 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.** -- 1963-2005: 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

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	---	---	---	---	---
February	---	---	---	---	---
March	---	---	---	---	---
April	0.0	0.0	0.0	0.0	0.0
May	0.0	0.0	0.0	0.0	0.0
June	0.0	0.0	0.0	0.0	0.0
July	0.0	0.0	0.0	0.0	0.0
August	220	95	0.0	7.1	437
September	76	45	0.0	2.5	151
October	---	---	---	---	---
November	---	---	---	---	---
December	---	---	---	---	---
Calendar year 2006	---	---	---	---	---

## 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.** -- 36 years (1971-2006), 127 ft<sup>3</sup>/s (91,960 acre-ft per year).

**Extremes.** -- 1971-2006: 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
January	7,750	250	250	250	5,614,880
February	7,000	250	250	250	5,071,500
March	7,750	250	250	250	5,614,880
April	4,600	250	0.0	153	3,335,600
May	0.0	0.0	0.0	0.0	0.0
June	0.0	0.0	0.0	0.0	0.0
July	1,890	450	0.0	60	1,368,580
August	2,490	450	0.0	80	1,806,900
September	0.0	0.0	0.0	0.0	0.0
October	324	205	0.0	10	234,740
November	6,250	209	205	208	4,528,120
December	7,810	360	205	252	5,659,790
Calendar year 2006	45,870	450	0.0	126	33,235,710



## RIO GRANDE COMPACT COMMISSION REPORT

## Rio Chama below El Vado Dam, N. Mex.

**Location.** — Water-stage recorder with satellite telemetry, 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 National Geodetic Vertical 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 mi 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-feet per year), prior to release of transmountain water; 36 years (1971-2006) 464 ft<sup>3</sup>/s (336,300 acre-feet per year).

**Extremes.** — 1914-16, 1920-24, 1936-2006; 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

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	7,093	270	219	229	14,070
February	7,587	306	195	271	15,050
March	10,097	576	259	326	20,030
April	16,771	780	416	559	33,270
May	17,262	712	370	557	34,240
June	23,557	1,160	249	785	46,730
July	12,461	731	59	402	24,720
August	5,387	457	33	174	10,690
September	5,441	442	77	181	10,790
October	4,649	460	54	150	9,220
November	7,977	732	204	266	15,820
December	6,485	214	206	209	12,860
Calendar year 2006	124,767	1,160	33	342	247,500

## Rio Chama below Abiquiu Dam, N. Mex.

**Location.** — Water-stage recorder with satellite telemetry, 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 above National Geodetic Vertical Datum of 1929 (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; 36 years (1971-2006), 512 ft<sup>3</sup>/s (371,100 acre-feet per year).

**Extremes.** — 1961-2006; 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
January	1,477	190	21	48	2,930
February	607	24	21	22	1,200
March	3,801	411	23	123	7,540
April	14,561	691	263	485	28,880
May	19,726	928	374	636	39,130
June	27,620	1,220	286	921	54,780
July	13,589	783	91	438	26,950
August	7,523	634	97	243	14,920
September	7,553	551	118	252	14,980
October	4,549	472	26	147	9,020
November	7,872	711	169	262	15,610
December	4,795	213	47	155	9,510
Calendar year 2006	113,673	1,220	21	311	225,500

## STREAMFLOW

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

**Location.** — Water-stage recorder with satellite telemetry, 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. Datum of gage is 6,840 ft above National Geodetic Vertical Datum of 1929, from topographic map.

**Drainage area.** — 34.1 sq mi.

**Average discharge.** — 28 years (1979-2006), 13.5 ft<sup>3</sup>/s (9,810 acre-feet per year).

**Extremes.** — 1979-2006; Maximum discharge, 312 ft<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

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	134.5	4.8	3.1	4.3	267
February	89.8	3.4	3	3.2	178
March	106.8	4.7	2.1	3.4	212
April	208.7	21	3.6	7.0	414
May	442.8	22	3.2	14.3	878
June	285.6	28	1.9	9.5	566
July	63.6	4.2	1.1	2.0	126
August	525	28	3.2	16.9	1,040
September	282.5	15	6.5	9.4	560
October	135.9	6.5	0.6	4.4	270
November	20.3	0.7	0.6	0.7	40
December	19.7	0.7	0.6	0.6	39
Calendar year 2006	2,315.2	28	0.6	6.3	4,590

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

**Location.** — Water-stage recorder with satellite telemetry, lat 35°52'29", long 106°08'30", in SW1/4SW1/4 sec. 18, T. 19 N., R. 8 E., in San Ildefonso Pueblo Grant, 400 downstream from bridge on State Highway 502, 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 National Geodetic Vertical 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.** — 107 years (1896-1905, 1910-2006), 1,508 ft<sup>3</sup>/s (1,093,000 acre-feet per year).

**Extremes.** — 1895-1905, 1910-2006; 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.

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

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	20,221	837	565	652	40,110
February	16,370	653	523	585	32,470
March	20,886	909	531	674	41,430
April	29,384	1,320	652	979	58,280
May	33,465	1,370	812	1,080	66,380
June	38,969	1,610	580	1,299	77,300
July	26,500	1,290	489	855	52,560
August	29,736	1,710	483	959	58,980
September	22,434	1,090	570	748	44,500
October	29,240	1,810	659	943	58,000
November	36,646	2,010	796	1,222	72,690
December	27,968	1,080	706	902	55,470
Calendar year 2006	331,819	2,010	483	909	658,200

## RIO GRANDE COMPACT COMMISSION REPORT

Santa Fe River near Santa Fe, N. Mex.

**Location.** -- Water-stage recorder with satellite telemetry 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 7,720 ft above National Geodetic Vertical Datum of 1929, from topographic map. 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.** -- 94 years (1913-2006), 8.0 ft<sup>3</sup>/s (5,800 acre-feet per year).

**Extremes.** -- 1913-2006; Maximum discharge, 1,500 ft<sup>3</sup>/s Aug. 14, 1921 (gage height, 5.17 ft); from rating curve extended above 150 ft<sup>3</sup>/s; 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 yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	2.0	0.1	0.03	0.1	3.9
February	1.2	0.06	0.03	0.04	2.4
March	3.5	0.2	0.05	0.1	7.0
April	44.3	7.1	0.1	1.5	88
May	108.4	6.8	0.1	3.5	215
June	117.2	4.1	3.7	3.9	232
July	122.4	4.1	3.9	4.0	243
August	448.3	44	3.9	14.5	889
September	305.9	29	2.8	10.2	607
October	97.6	3.3	2.9	3.2	194
November	91.1	3.1	2.9	3.0	181
December	89.8	2.9	2.8	2.9	178
Calendar year 2006	1,431.7	44	0.03	3.9	2,840

Rio Grande below Cochiti Dam, N. Mex.

**Location.** -- Water-stage recorder with satellite telemetry, 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 National Geodetic Vertical Datum of 1929. Prior to Nov. 14, 1973, at site 2.4 mi downstream at altitude 5,210 ft, from topographic map. 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.** -- 36 years (1971-2006), 1,336 ft<sup>3</sup>/s (968,000 acre-feet per year).

**Extremes.** -- 1971-2006; Maximum discharge, 10,300 ft<sup>3</sup>/s July 26, 1971 (gage height, 7.90 ft) at site 2.4 mi downstream prior to closure of Cochiti Dam; from rating curve extended above 2,600 ft<sup>3</sup>/s; minimum discharge 0.51 ft<sup>3</sup>/s Aug. 3-5, 1977, Aug. 27-28, 1978.

**Remarks.** -- Records good. Since Nov. 12, 1973, flow completely regulated by Cochiti Dam. Cochiti Eastside Main Canal on left bank and Sili Main Canal on right bank bypass station.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	19,274	864	527	622	38,230
February	16,555	652	517	591	32,840
March	17,514	664	511	565	34,740
April	24,139	908	619	805	47,880
May	27,707	1,010	830	894	54,960
June	32,026	1,160	726	1,068	63,520
July	21,576	859	475	696	42,800
August	22,648	1,250	332	731	44,920
September	16,602	642	394	553	32,930
October	24,085	1,340	477	777	47,770
November	34,121	1,870	738	1,137	67,680
December	24,585	935	495	793	48,760
Calendar year 2006	280,832	1,870	332	769	557,000

## STREAMFLOW

Galisteo Creek below Galisteo Dam, N. Mex.

**Location.** -- Water-stage recorder with satellite telemetry, lat 35°27'53", long 106°12'49", in NE1/4NE1/4 sec. 8, T. 14 N., R. 7 E., in Mesita de Juana Lopez Grant, on right bank 0.4 mi downstream from Galisteo Dam, 5.3 mi northwest of Cerrillos, and at mile 11.4. Elevation of gage is 5,450 ft above National Geodetic Vertical Datum of 1929, from topographic map. Prior to Dec. 21, 1981, at site 1,200 ft downstream at different datum.

**Drainage area.** -- 597 sq mi.

**Average discharge.** -- 36 years (1971-2006), 5.5 ft<sup>3</sup>/s (3,982 acre-feet per year).

**Extremes.** -- 1970-2006; Maximum discharge, 3,460 ft<sup>3</sup>/s Aug. 24, 1997 (gage height, 5.57 ft); 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
January	0	0	0	0	0
February	0	0	0	0	0
March	0	0	0	0	0
April	0	0	0	0	0
May	15	9.4	0	0.49	30
June	127	68	0	4.2	252
July	713	269	0	23	1420
August	501	183	0	16	996
September	8.1	7.6	0	0.27	16
October	42	21	0	1.4	83
November	0	0	0	0	0
December	0	0	0	0	0
Calendar year 2006	1,406	269	0	3.8	2,797

Jemez River below Jemez Canyon Dam, N. Mex.

**Location.** -- Water-stage recorder with satellite telemetry, 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 National Geodetic Vertical 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.** -- 64 years (1937, 1944-2006), 61.2 ft<sup>3</sup>/s (44,330 acre-feet per year).

**Extremes.** -- 1937, 1944-2006; Maximum discharge, 16,300 ft<sup>3</sup>/s Aug. 29, 1943 (gage height, 5.62 ft); no flow at times.

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

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	320	16	2.9	10	635
February	433	20	12	16	859
March	417	25	0.57	14	828
April	377	40	0.0	13	748
May	0.0	0.0	0.0	0.0	0.0
June	174	73	0.0	5.8	345
July	857	117	0.0	28	1,700
August	2,830	253	12	91	5,620
September	7,280	65	0.0	240	1,440
October	7.0	4.0	0.0	0.23	5,070
November	0.0	0.0	0.0	0.0	0.0
December	613	217	0.0	20	1,220
Calendar year 2006	13,300	253	0.0	36	18,500



## RIO GRANDE COMPACT COMMISSION REPORT

## Rio Grande below Elephant Butte Dam, N. Mex.

**Location.** -- Water-stage recorder with satellite telemetry, 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 4,241.09 ft above national Geodetic Vertical Datum of 1929. Prior to April 23, 1942, at several different sites and datums.

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

**Average discharge.** -- 92 years (1915-2006), 999 ft<sup>3</sup>/s (723,500 acre-feet per year).

**Extremes.** -- 1915-2006; Maximum daily discharge, 8,220 ft<sup>3</sup>/s May 22, 1942; no flow at times prior to 1929 and March 2-4, 1979.

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

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

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	79	3.0	2.0	2.5	157
February	414	150	3.1	14.8	822
March	35,968	1,480	13	1,160	71,340
April	44,910	1,540	1,480	1,497	89,080
May	47,760	1,580	1,490	1,541	94,730
June	50,670	2,000	1,410	1,689	100,500
July	47,159	1,940	48	1,521	93,540
August	16,708	1,360	15	539	33,140
September	781	31	20	26	1,550
October	558	41	8.0	18	1,110
November	224	8.3	6.8	7.5	445
December	219	8.1	6.5	7.1	434
Calendar year 2006	245,452	2,000	2.0	672	486,900

## 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 National Geodetic Vertical 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.** -- 69 years (1938-2006), 926 ft<sup>3</sup>/s (670,900 acre-feet per year).

**Extremes.** -- 1938-2006; 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 Reservoir 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	31	1.0	1.0	1.0	61
February	48	2.0	1.0	1.7	95
March	29,300	1,940	2.0	947	58,200
April	32,700	1,320	868	1,090	64,800
May	31,300	1,200	708	1,010	62,000
June	45,700	1,770	1,300	1,520	90,600
July	39,500	1,730	776	1,270	78,300
August	16,300	1,050	5.0	526	32,300
September	17,400	898	5.0	581	34,600
October	6,470	871	3.0	209	12,800
November	75	3.0	2.0	2.5	149
December	62	2.0	2.0	2.0	123
Calendar year 2006	219,000	1,940	1.0	600	434,000

## STREAMFLOW

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

**Records available.** -- January 1938 to current year. Published as supplementary data with Rio Grande below Caballo Dam in U.S.G.S. 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.

## Diversion, in acre-ft

January	0.0
February	255.8
March	103.3
April	85.6
May	106.9
June	151.9
July	73.5
August	73.5
September	73.5
October	55.1
November	0.0
December	0.0
Calendar year 2006	979.1

## RIO GRANDE COMPACT COMMISSION REPORT

### STORAGE IN RESERVOIRS

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 2006

[illegible]

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 page height, in feet, and contents, in acre-feet

Calendar Year 2006

[illegible]

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-feet of transmountain water by exchange in 1984 and 23 acre-ft of transmountain water by exchange in 1985.

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

Calendar Year 2006

[illegible]

Troutvale No. 2 Reservoir. - 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 2006

[illegible]

### STORAGE IN RESERVOIRS

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

Jumper Creek Reservoir. - 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 2006

[illegible]

Big Meadows Reservoir. - 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 acre-ft 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 2006

[illegible]

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 2006

[illegible]

**Shaw Lake Enlargement.** — 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 2006

[illegible]



## RIO GRANDE COMPACT COMMISSION REPORT

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 2006

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal. Yr.
Gage height	0.0	0.0	6.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	-
Contents	0.0	0.0	10	41	41	41	41	41	41	41	41	41	-
Change	0	+10	+31	0	0	0	0	0	0	0	0	0	+41

**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 2006

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	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2	-
Contents	237	237	237	237	237	237	237	237	237	237	237	237	-
Change	0	0	0	0	0	0	0	0	0	0	0	0	0

**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, 2005	9,956.85	7,504	-
January 31, 2006	9,957.22	7,651	+147
February 28	9,957.33	7,692	+41
March 31	9,958.06	7,980	+288
April 30	9,958.09	7,994	+14
May 31	9,975.02	15,706	+7,712
June 30	9,973.19	14,784	-922
July 31	9,967.46	12,036	-2,784
August 31	9,965.65	11,211	-825
September 30	9,962.79	9,947	-1,264
October 31	9,958.46	8,142	-1,805
November 30	9,960.11	8,814	+672
December 31, 2006	9,961.42	9,360	+546
Calendar year 2006	-	-	+1,856

**Trujillo Meadows Reservoir.** – 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 2006

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal. Yr.
Gage height	29.5	29.5	29.5	29.5	30.2	29.7	29.7	29.9	29.3	29.5	29.5	29.5	-
Contents	770	770	770	770	816	783	783	796	757	770	770	770	-
Change	0	0	0	0	+46	-33	0	+13	-39	+13	0	0	0

## STORAGE IN RESERVOIRS

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

**Heron Reservoir.** – Water-stage recorder with satellite telemetry, 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. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Used for storage of transmountain water.

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

Date	Elevation	Contents	Change in contents
December 31, 2005	7,144.85	198,729	-
January 31, 2006	7,140.63	182,547	-16,182
February 28	7,136.75	168,444	-14,103
March 31	7,132.42	153,624	-14,820
April 30	7,134.80	161,650	+8,026
May 31	7,141.60	186,191	+24,541
June 30	7,143.26	192,532	+6,341
July 31	7,143.20	192,300	-232
August 31	7,143.48	193,382	+1,082
September 30	7,144.81	198,571	+5,189
October 31	7,147.86	210,791	+12,220
November 30	7,144.69	198,099	-12,692
December 31, 2006	7,140.76	183,032	-15,067
Calendar year 2006	-	-	-15,697

**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 National Geodetic Vertical 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 31, 2005	6,872.96	106,437	-	6,196
January 31, 2006	6,874.39	109,651	+3,214	7,607
February 28	6,874.68	110,311	+660	6,559
March 31	6,874.57	110,060	-251	6,178
April 30	6,880.92	125,324	+15,264	5,636
May 31	6,878.67	119,736	-5,588	5,594
June 30	6,857.85	76,702	-43,034	3,092
July 31	6,845.22	56,423	-20,279	1,866
August 31	6,845.30	56,541	+118	1,861
September 30	6,842.77	52,863	-3,678	1,859
October 31	6,848.53	61,429	+8,566	2,500
November 30	6,850.22	64,074	+2,645	14,037
December 31, 2006	6,854.03	70,233	+6,159	23,749
Calendar year 2006	-	-	-36,204	-

## RIO GRANDE COMPACT COMMISSION REPORT

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 feet (crest of spillway) by 1998 survey. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Reservoir is operated by Corps of Engineers for flood control and sediment storage. A resolution granting permission to store transmountain waters was approved by Rio Grande Compact Commission on May 3, 1974. Storage includes both Rio Grande and transmountain water.

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

Date	Elevation	Contents	Change in contents	Transmountain water
December 31, 2005	6,206.68	134,119	-	131,732
January 31, 2006	6,209.80	145,185	+11,066	143,409
February 28	6,213.60	159,125	+13,940	157,088
March 31	6,216.41	169,749	+10,624	167,721
April 30	6,216.80	171,253	+1,504	169,167
May 31	6,214.57	162,747	-8,506	160,603
June 30	6,211.98	153,129	-9,618	151,384
July 31	6,212.46	154,899	+1,770	153,186
August 31	6,213.22	157,714	+2,815	155,376
September 30	6,212.55	155,230	-2,484	152,998
October 31	6,212.27	154,198	-1,032	152,115
November 30	6,212.15	153,755	-443	151,615
December 31, 2006	6,213.13	157,378	+3,623	155,464
Calendar year 2006	-	-	+23,259	-

**Nambe Falls Reservoir.** — Water-stage recorder, lat 35°50'46", long 105°54'17", in NE1/4SW1/4 sec. 29, T. 19 N., R. 10 E in Nambe Indian Reservation, on Rio Nambe. Completed in 1976; capacity 1,920 acre-ft at elevation 6,826.6 feet (crest of spillway) by 2004 survey, dead storage 121 acre-ft at elevation 6,760.9 ft. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by Bureau of Reclamation). 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, 2005	6,825.79	1,873	-
January 31, 2006	6,825.76	1,871	-2
February 28	6,826.21	1,897	+26
March 31	6,826.56	1,917	+20
April 30	6,823.96	1,772	-145
May 31	6,811.53	1,178	-594
June 30	6,799.53	750	-428
July 31	6,803.05	862	112
August 31	6,802.67	849	-13
September 30	6,802.84	855	+6
October 31	6,806.00	964	+109
November 30	6,811.65	1,183	+219
December 31, 2006	6,816.46	1,394	+211
Calendar year 2006	-	-	-479

## STORAGE IN RESERVOIRS

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

**McClure (Granite Point) Reservoir.** — Water-stage recorder, lat 35°41'18", long 105°50'06", 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, 96.6 ft, crest of spillway). In 1953 spillway was equipped with radial gates that opened automatically, increasing capacity to over 3,000 acre-ft. In 1972, radial gates were removed decreasing capacity to 2,615 acre-ft. In 1989, modifications to the dam and spillway increased capacity to 2,813 acre-ft. In 1995, modification to the dam and spillway increased capacity to 3,257 acre-ft. No dead storage. Elevation of gage is 7,790 ft above National Geodetic Vertical Datum of 1929, from topographic map. 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-feet 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	Transmountain water
December 31, 2005	7,868.07	1,990	-	0	1,990
January 31, 2006	7,869.02	2,050	+60	0	2,050
February 28	7,869.71	2,100	+50	0	2,088
March 31	7,870.54	2,150	+50	0	2,088
April 30	7,870.34	2,140	-10	6	2,088
May 31	7,868.03	1,990	-150	0	1,990
June 30	7,865.23	1,810	-180	0	1,810
July 31	7,866.26	1,880	+70	0	1,880
August 31	7,880.68	3,160	+1,280	379	2,781
September 30	7,881.18	2,950	-210	169	2,781
October 31	7,881.31	2,980	+30	199	2,781
November 30	7,879.64	2,920	-60	139	2,781
December 31, 2006	7,880.60	2,880	-40	99	2,781
Calendar year 2006	-	-	+890	-	-

**Nichols Reservoir.** — Water-stage recorder, lat 35°41'24", long 105°52'46", 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 feet (crest of spillway), dead storage, 14 acre-ft at gage height 121.1 feet. Datum of gage is 7,313.2 feet above National Geodetic Vertical 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, 2005	145.00	202	-	4	198
January 31, 2006	145.18	205	+3	2	138
February 28	145.18	205	0	0	100
March 31	145.33	207	+2	0	100
April 30	148.88	262	+55	20	100
May 31	150.72	293	+31	0	198
June 30	152.02	318	+25	10	308
July 31	151.00	298	-20	60	238
August 31	167.17	685	+387	585	100
September 30	163.44	583	-102	483	100
October 31	155.29	382	-201	282	100
November 30	159.65	483	+101	383	100
December 31, 2006	154.82	371	-112	271	100
Calendar year 2006	-	-	+169	-	-



## RIO GRANDE COMPACT COMMISSION REPORT

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

Cochiti Lake. – Water-stage recorder with satellite telemetry, lat 35°37'01", long 106°18'58", in NW1/4SW1/4 sec. 16, T. 1 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 from 1998 survey. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by the U.S. Army Corps of Engineers). A 50,000 acre-foot 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

Date	Elevation	Contents	Change in contents	Transmountain water
December 31, 2005	5,339.58	48,655	-	45,660
January 31, 2006	5,341.08	50,453	+1,798	47,205
February 28	5,341.42	50,876	+423	47,768
March 31	5,341.56	51,053	+177	48,038
April 30	5,341.34	50,776	-277	47,431
May 31	5,340.50	49,743	-1,033	46,768
June 30	5,339.55	48,620	-1,123	46,056
July 31	5,339.40	48,448	-172	45,670
August 31	5,339.16	48,176	-272	45,478
September 30	5,339.71	48,805	+629	45,833
October 31	5,339.52	48,586	-219	45,688
November 30	5,339.58	48,655	+69	45,508
December 31, 2006	5,339.54	48,609	-46	45,675
Calendar year 2006	-	-	-46	-

Galisteo Reservoir. – Water-stage recorder above elevation 5,500.3 ft, nonrecording below, lat 35°27'44", long 106°12'30" in NW1/4 sec. 9, T. 14 N., R. 7 E., on Galisteo Creek. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Storage records begin in October 1970. Capacity 88,990 acre-ft 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 2006

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)

Jemez Canyon Reservoir. – Water-stage recorder, lat 35°23'40", long 106°32'50", 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. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). 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, 2005	5,155.00	0	-	0
January 31, 2006	5,155.00	0	0	0
February 28	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, 2006	5,155.00	0	0	0
Calendar year 2006	-	-	0	-

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 2006

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

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 2006.

## RIO GRANDE COMPACT COMMISSION REPORT

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

Elephant Butte Reservoir. – Water-stage recorder, lat 33°09'15", long 107°11'28", 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 Sept. 9, 1998 resolution of the Rio Grande Compact Commission. Datum of gage is 43.3 ft above National Geodetic Vertical 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, 2005	4,333.92	428,739	-	5,220
January 31, 2006	4,337.20	468,797	+40,058	5,169
February 28	4,339.56	498,869	+30,072	5,134
March 31	4,335.92	452,925	-47,944	5,084
April 30	4,330.20	385,753	-67,172	5,011
May 31	4,322.58	305,064	-80,689	4,921
June 30	4,312.98	217,970	-87,094	4,816
July 31	4,309.20	188,968	-29,002	4,744
August 31	4,325.18	331,547	+142,579	4,741
September 30	4,327.10	351,801	+20,254	4,567
October 31	4,331.24	397,509	+45,708	4,551
November 30	4,336.52	460,327	+62,818	4,527
December 31, 2006	4,340.72	514,029	+53,702	4,517
Calendar year 2006	-	-	+85,290	-

Caballo Reservoir. – Water-stage recorder, lat 32°53'47", long 107°17'30", 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 National Geodetic Vertical Datum of 1929.

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

Date	Gage height	Contents	Change in contents
December 31, 2005	4,133.94	15,650	-
January 31, 2006	4,134.56	16,790	+1,140
February 28	4,135.30	18,300	+1,510
March 31	4,136.56	21,020	+2,720
April 30	4,141.98	35,350	+14,330
May 31	4,146.88	53,120	+17,770
June 30	4,145.56	47,830	-5,290
July 31	4,144.94	45,480	-2,350
August 31	4,149.40	64,300	+18,820
September 30	4,145.10	46,070	-18,230
October 31	4,143.24	39,440	-6,630
November 30	4,143.68	40,950	+1,510
December 31, 2006	4,144.30	43,140	+2,190
Calendar year 2006	-	-	+27,490

## STORAGE IN RESERVOIRS

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

Project storage. – The combined total storage in Elephant Butte and Caballo Reservoirs.

Month-end contents, in acre-feet

Date	Contents	Change in contents
December 31, 2005	444,389	-
January 31, 2006	485,587	+41,198
February 28	517,169	+31,582
March 31	473,945	-43,224
April 30	421,103	-52,842
May 31	358,184	-62,919
June 30	265,800	-92,384
July 31	234,448	-31,352
August 31	395,847	+161,399
September 30	397,871	+2,024
October 31	436,949	+39,078
November 30	501,277	+64,328
December 31, 2006	557,169	+55,892
Calendar year 2006	-	+112,780

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



## RIO GRANDE COMPACT COMMISSION REPORT

## TRANSMOUNTAIN DIVERSIONS

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

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

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

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

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

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

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

Imported quantities, in acre-feet, 2006

Month	Pine River- Weminuche Pass ditch	Weminuche Pass ditch	Williams Creek- Squaw Pass ditch	Tabor ditch	Don La Font ditches	Treasure Pass diversion ditch	Azotea tunnel
January	0	0	0	0	0	0	0
February	0	0	0	0	0	0	0
March	0	0	0	0	0	0	706
April	0	0	0	9	0	0	17,799
May	160	33	17	264	0	6	25,674
June	129	209	157	130	0	66	7,600
July	0	0	58	107	0	0	3,785
August	25	0	74	158	0	0	4,868
September	57	0	53	100	0	0	5,567
October	90	0	0	67	0	0	12,795
November	0	0	0	0	0	0	0
December	0	0	0	0	0	0	0
Calendar year	461	242	359	835	0	72	78,794

## EVAPORATION AND PRECIPITATION

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

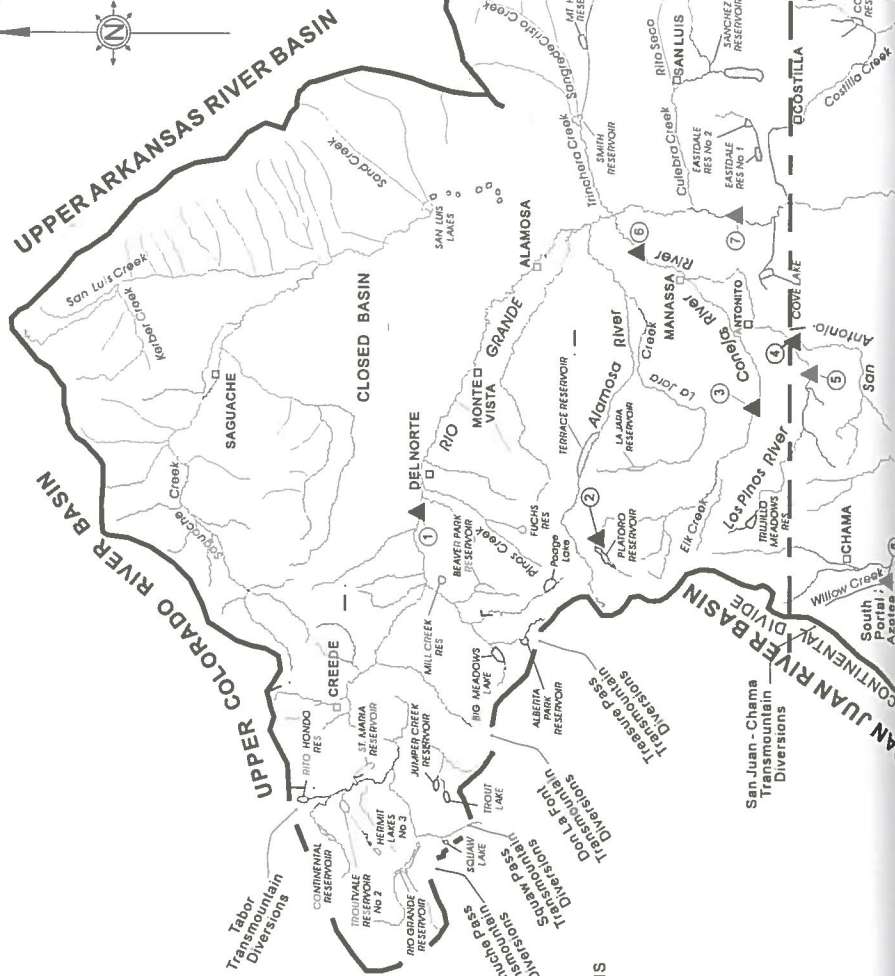
## RIO GRANDE COMPACT COMMISSION REPORT

## EVAPORATION AND PRECIPITATION

Evaporation and precipitation, in inches  
2006

Station		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
Alamosa Airport	Evap.	-	-	-	-	-	-	-	-	-	-	-	-	-
	Precip.	0.17	0.02	0.57	0.36	0.18	0.15	2.94	1.08	0.60	1.59	0.15	0.61	8.43
Platoro Dam	Evap.	-	-	-	-	2.88	5.52	4.08	2.76	2.40	1.32	0.84	-	-
	Precip.	-	-	-	-	0.74	0.84	4.35	6.92	2.82	3.33	-	-	-
Heron Dam	Evap.	-	-	-	5.75	8.75	10.49	9.49	7.15	4.65	3.18	-	-	-
	Precip.	0.48	0.06	0.96	1.02	0.62	0.51	2.19	5.60	2.00	1.98	0.11	0.83	16.36
El Vado Dam	Evap.	-	-	-	6.06	9.65	10.33	7.82	6.98	5.12	3.74	-	-	-
	Precip.	0.25	0.25	1.27	0.93	0.37	0.45	3.27	3.98	2.31	1.64	0.11	0.53	15.36
Abiquiu Dam	Evap.	-	-	-	7.92	10.34	10.79	9.48	8.16	7.04	5.60	-	-	-
	Precip.	0.08	0.00	0.28	0.89	0.19	0.54	2.04	3.12	1.62	1.20	0.08	1.99	12.03
Nambe Canyon Dam	Evap.	-	-	-	8.07	10.34	11.81	9.09	6.40	5.89	4.79	-	-	-
	Precip.	0.00	0.00	0.28	0.69	0.35	0.40	0.93	4.32	0.80	1.17	0.00	1.98	10.92
Cochiti Dam	Evap.	-	-	-	10.53	11.90	13.79	11.32	7.32	7.53	6.03	-	-	-
	Precip.	0.03	0.00	0.16	0.02	0.15	0.67	3.19	2.88	0.88	1.65	0.13	1.92	11.68
Jemez Canyon Dam	Evap.	-	-	-	10.38	15.09	16.80	10.73	8.50	7.81	6.82	-	-	-
	Precip.	0.02	0.00	0.27	0.26	0.00	0.90	3.56	4.38	1.37	1.48	0.19	0.14	12.57
Elephant Butte Dam	Evap.	6.50	7.87	11.53	15.50	20.40	17.77	17.36	9.16	9.21	7.04	5.65	3.30	131.29
	Precip.	0.07	0.09	0.01	0.07	0.00	0.80	4.96	5.91	1.73	2.14	0.00	0.48	16.26
Caballo Dam	Evap.	5.74	6.15	9.83	13.20	16.19	15.36	13.52	8.92	7.55	6.75	5.76	3.81	112.78
	Precip.	0.16	0.50	0.0	0.35	0.04	0.53	2.61	5.87	1.65	2.40	0.0	0.34	14.45
State University	Evap.	-	-	8.78	12.24	13.59	14.10	12.31	9.17	8.34	6.77	4.99	-	-
	Precip.	0.02	0.16	0.0	0.04	0.36	0.23	1.28	5.01	4.39	2.40	0.17	0.12	14.18





### LEGEND

- ▲ STREAM-GAGING STATION
- CITY OR TOWN
- BASIN BOUNDARY
- COUNTY LINE
- CLOSED BASIN BOUNDARY
- TABOR TRANSMOUNTAIN DIVERSION

### EXPLANATION

#### RIO GRANDE COMPACT STREAM-GAGING STATIONS

- 1 Rio Grande near Del Norte
- 2 Conejos River below Platoro Reservoir
- 3 Conejos River near Mogote
- 4 San Antonio River at Ortiz
- 5 Los Pinos River near Ortiz
- 6 Conejos River near Lasauzes
- 7 Rio Grande near Lobatos
- 8 Azulea Tunnel at South Portal

- 9 Willow Creek above Heron Reservoir
- 10 Horse Lake Creek above Heron Reservoir
- 11 Willow Creek below Heron Reservoir, near Parkview
- 12 Rio Chama below El Vado Dam
- 13 Rio Chama below Abiquiu Dam
- 14 Rio Grande at Otowi Bridge
- 15 Santa Fe River near Santa Fe
- 16 Rio Grande below Cochiti Dam
- 17 Galisteo Creek below Galisteo Dam
- 18 Jemez River below Jemez Canyon Dam

NOTE: Screened areas denote reservoirs, whose capacity is all or in part subject to provisions of the

### Rio Grande Compact

Revised March 1989

## RIO GRANDE BASIN ABOVE BERNALILLO, NEW MEXICO

