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61

Surface Water Records of New Mexico



UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Prepared in cooperation with the State of New Mexico and other agencies

United States Department of the Interior
Geological Survey - Water Resources Division

SURFACE WATER RECORDS
OF NEW MEXICO

1961

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U.S. BUREAU OF
RECLAMATION

Prepared under the direction of W. L. Heckler, District Engineer,
Surface Water Branch, in cooperation with the State of
New Mexico and other agencies

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CALENDAR FOR WATER YEAR 1961

OCTOBER 1960

S	M	T	W	T	F	S
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2	3	4	5	6	7	8
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NOVEMBER 1960

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JANUARY 1961

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FEBRUARY 1961

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MARCH 1961

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APRIL 1961

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MAY 1961

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JUNE 1961

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JULY 1961

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AUGUST 1961

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SEPTEMBER 1961

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SURFACE WATER RECORDS OF NEW MEXICO, 1961

INTRODUCTION

The surface-water records for the 1961 water year for gaging stations, partial-record stations, and miscellaneous sites within the State of New Mexico are given in this report. For convenience there are also included for a few pertinent gaging stations in bordering States. The records were collected and computed by the Water Resources Division of the U.S. Geological Survey, under the direction of W. L. Heckler, district engineer, Surface Water Branch.

This report marks the beginning of a new method of presenting, annually, basic data on surface-water records by States. Through September 30, 1960, the records of discharge and stage of streams and contents and stage of lakes or reservoirs were published in an annual series of U. S. Geological Survey water-supply papers entitled "Surface Water Supply of the United States." Since 1951 there has been 20 volumes in the series; each volume covered an area whose boundaries coincided with those of certain natural drainage areas. The records in New Mexico were contained in Parts 7, 8, and 9 of that series.

Beginning with the 1961 water year, streamflow records and related data will be released by the Geological Survey in annual reports on a State-boundary basis. Distribution of these basic-data reports will be limited and primarily for local needs. The records later will be published in Geological Survey water-supply paper at 5-year intervals. These 5-year water-supply papers will show daily discharge and will be compiled on the same geographical areas previously used for the annual series; however, some of the 14 parts of conterminous United States will be further subdivided.

The records for New Mexico will be published in water-supply papers covering Part 7 for stations in the Lower Mississippi River drainage, Part 8 for Western Gulf of Mexico drainage, and Part 9 for Colorado River drainage. For 1960 water year, the WSP Numbers for these parts were 1711, 1712, 1713 respectively. A compilation of records for these parts through 1950 water year is contained in WSP Nos. 1311, 1312, 1313 respectively; a 1951-60 compilation is currently being prepared, and WSP Nos. will be 1731, 1732, 1733.

COOPERATION

The first gaging station established by the Geological Survey in the United States was on the Rio Grande at Embudo Jan. 1, 1889. Cooperation with the Territory of New Mexico began about 1907, and Territory or State cooperation in varying amounts continued until 1915, the work being directed from the Denver office. From 1916 to 1930 the State conducted its own stream-gaging program. In 1931 a new State cooperative program was begun and a Geological Survey district office established in Santa Fe. Agreements have also existed with county, municipal, and private organizations, and with other Federal agencies. Organizations that supplied data are acknowledged in station descriptions. Organizations that assisted in the collection of data through cooperative agreements with the Survey are:

Office of the State Engineer, S. E. Reynolds; Interstate Stream Commission, S. E. Reynolds, secretary; Rio Grande Compact Commission, composed of Berkely Johnson, Federal representative and chairman, J. E. Whitten, commissioner for Colorado, S. E. Reynolds, commissioner for New Mexico, L. A. Scott, commissioner for Texas; Pecos River Commission, composed of Berkely Johnson, Federal representative and chairman, G. L. Reese, commissioner for New Mexico, J. C. Wilson, commissioner for Texas; Pecos Valley Artesian Conservancy District, Tom Vandiver, chairman, and State Highway Department, D. B. Dixon, State highway engineer.

Assistance in the form of funds or services was given by the Corps of Engineers, Department of the Army in collecting records for 19 gaging stations published in this report.

Assistance was also furnished by the Bureau of Indian Affairs of the United States Department of the Interior in the operation of gaging stations on the Indian Pueblo lands, by the Fish and Wildlife Service, the National Park Service, and the Bureau of Reclamation of the United States Department of the Interior, and the Soil Conservation Service of the United States Department of Agriculture.

The following organizations aided in collecting records: The cities of Ruidoso and Silver City; Carlsbad Irrigation District; Middle Rio Grande Conservancy District; Pecos Valley Artesian Conservancy District; Public Service Company of New Mexico; Weather Bureau of the United States Department of Commerce.

DEFINITIONS OF TERMS AND ABBREVIATIONS

The terms of streamflow and other hydrologic data, as used in this report, are defined as follows:

Gaging station is a particular site on a stream, canal, lake or reservoir where systematic observations of gage height or discharge are obtained. When used in connection with a discharge record, the term is applied only to those gaging stations where a continuous record of discharge is obtained.

Partial-record station is a particular site where limited streamflow data are collected systematically over a period of years for use in hydrologic analyses.

Cubic foot per second (cfs) is the rate of discharge of a stream whose channel is 1 square foot in cross-sectional area and whose average velocity is 1 foot per second.

Acre-foot (ac-ft) is the quantity of water required to cover an acre of the depth of 1 foot and is equivalent to 43,560 cubic feet.

Cfs-day is the volume of water represented by a flow of 1 cubic foot per second for 24 hours. It is equivalent to 86,400 cubic feet, 1.983471 acre-feet, or 646,317 gallons, and represents a runoff of 0.0372 inch from 1 square mile.

Stage-discharge relation is the relation between gage height and the amount of water flowing in a channel, expressed as volume per unit of time.

Control designates a feature downstream from the gage that determines the stage-discharge relation at the gage. This feature may be a natural constriction of the channel, a long reach of the channel, or an artificial structure.

Contents is the volume of water in a reservoir or lake. Unless otherwise indicated, volume is computed on the basis of a level pool and does not include bank storage.

Capacity, as applied to reservoirs, expresses space available for contents below a specific elevation or gage height; hence, capacity table.

The drainage area of a stream at a specified location is that area, measured in a horizontal plane, which is so enclosed by a topographic divide that direct surface runoff from precipitation normally would drain by gravity into the river above the specified point. Figures of drainage area given herein include all closed basins, or noncontributing areas, within the area unless otherwise noted.

WSP is used as an abbreviation for "Water-Supply Paper in references to previously published reports, or pending reports.

DOWNSTREAM ORDER AND STATION NUMBERS

Stations are listed in the same downstream order used in the water-supply papers. Records are listed in a downstream direction along the main stem with all stations on a tributary entering above a main-stem station listed before that station. If a tributary enters between two main-stem stations, it is listed between them. A similar order is followed listing stations on first rank, second rank, and other ranks of tributaries. To indicate the rank of any tributary on which a gaging station is situated and the stream to which it is immediately tributary, each indentation in the listing of gaging stations in the table of contents of this report represents one rank. This downstream order and system of indentation shows which gaging stations are on tributaries between any two stations on a main stem and the rank of the tributary on which each gaging station is situated.

As an added means of identification, each gaging station and partial-record station has been assigned a station number. The numbers have been assigned in the same downstream order used in the annual series of water-supply papers. In assigning station numbers, no distinction is made between partial-record stations and continuous-record gaging stations, so that the station number for a partial-record station indicates downstream order position in a list made up of both types of stations. Gaps are left in the numbers to allow for new stations that may be established; hence the numbers are not consecutive.

The complete number for each station, such as 09-3545.00, includes the part number "9" and a six digit station number. In this report, the part number and only the essential digits of the station number are shown. For example, the complete number 09-3545.00 would appear as 9-3545, just to the left of the station name. In this report, the records are listed in downstream order by parts. All records for a drainage basin encompassing more than one State could be arranged in downstream order by assembling pages from the various State reports by station number to include all records in the basin.

EXPLANATION OF DATA

The base data collected at gaging stations consist of records of stage and measurements of discharge. In addition, observations of factors affecting the stage-discharge relation, weather records, and other information are used to supplement base data in determining the daily flow. The records of stage are obtained either from a water-stage recorder that gives a continuous record of fluctuations or from direct readings on a nonrecording gage. Measurements of discharge are made with a current meter by the general methods adopted by the Geological Survey on the basis of experience in stream gaging since 1888. These methods are described in Water-Supply Paper 888 and are also outlined in standard textbooks on the measurement of stream discharge. Low-flow measurements may also be made by volumetric methods or by use of portable flumes or weirs of rated capacity.

Rating tables giving the discharge for any stage are prepared from stage-discharge relation curves defined by discharge measurements. If extensions to the rating curves are necessary to define the extremes of discharge, they are made on the basis of indirect measurements of peak discharge (such as slope-area or contracted-opening measurements, or computation of flow over dams or weirs), velocity-area studies, and logarithmic plotting. The application of the daily mean gage height to those rating tables gives the daily mean discharge, from which the monthly and the yearly mean discharge are computed. If the stage-discharge relation is subject to change because of frequent or continual change in the physical features that form the control, the daily mean discharge is determined by the shifting-control method, in which correction factors based on individual discharge measurements and notes by engineers and observers are used in applying the gage heights to the rating tables. If the stage-discharge relation for a station is temporarily changed by the presence of aquatic growth or debris on the control, the daily mean discharge is computed by what is in effect the shifting-control method.

At some gaging stations the stage-discharge relation is affected by ice during the winter, and it becomes impossible to compute the discharge in the usual manner. Discharge for periods of ice effect is computed on the basis of the gage-height record and occasional winter discharge measurements, consideration being given to the available information on temperature and precipitation, notes by gage observers and engineers, and comparable records of discharge for other stations in the same or nearby basins.

For some gaging stations there are periods when no gage-height record is obtained or the recorded gage height is so faulty that it cannot be used to compute the daily discharge. This happens when the recorder stops or otherwise fails to operate properly, intakes are plugged, float is frozen in the well, or for various other reasons. For such periods the daily discharges are estimated on the basis of recorded range in stage, adjoining good record, discharge measurements, weather records, and comparison with other station records from the same or nearby basins.

The data in this report generally comprise a description of the station, a skeleton rating table, and a table showing the daily discharge and monthly and yearly discharge of the stream. Records are published for the water year which begins on October 1 and ends on September 30. A calendar for the 1961 water year is shown on page II to facilitate finding the day of the week for any date.

The description of the station gives the location, drainage area, records available, type and history of gages, average discharge, extremes of discharge, and general remarks. The location of the gaging station and the drainage area are obtained from the most accurate maps available. Under "Records available" are given periods for which there are published records for the present station or for stations generally equivalent to the present one. Under "Gage" are given the type of gage currently in use and the datum of the gage above mean sea level, and a condensed history of the types, locations, and datums of previous gages used during the period of records available. The references to "datum of 1929" and adjustments of other years are to the datum and adjustments of the U.S. Coast and Geodetic Survey. Under "Average discharge" is given the average discharge for the number of years indicated. It is not given for stations having fewer than five complete years of record or for stations where changes in water development during the period of record cause the figure to have little significance. Under "Extremes" are given the maximum discharge and gage height; the minimum daily discharge, and the minimum gage height if it is significant. In the first paragraph, the data given are for the complete current water year unless otherwise specified. In the second paragraph, the data given are for the periods of record within the calendar year dates in the heading (not necessarily those for the complete years indicated by the heading dates). Reliable information concerning major floods that have occurred outside the period of record are given in the third or last paragraph under "Extremes." Unless otherwise qualified, the maximum discharge corresponds to the crest stage obtained by use of a water-stage recorder, a crest-stage indicator, or a nonrecording gage read at the time of the crest. If the maximum gage height did not occur at the same time as the maximum discharge, it is given separately. Information pertaining to the accuracy of the records and to conditions which affect the natural flow at the gaging station is given under "Remarks."

Skeleton rating tables are published for all stations except those for which the daily discharge for the greater part of the open-water period was determined by the shifting-control method, the slope method, the slope method, or other special methods involving an equivalent adjustment to the gage height of more than one-tenth foot. Skeleton rating tables generally are not published for canals, ditches, drains, or springs.

For stations equipped with water-stage recorders, except those on streams subject to sudden or rapid fluctuation, the daily table gives the discharge corresponding to the daily mean gage height. For stations subject to such a fluctuation, the daily mean gage height may not indicate the true daily mean discharge, which must be obtained by averaging the discharge for parts of the day or by using the discharge integrator, which is an instrument for obtaining the daily mean discharge from a continuous gage height graph and containing, as an essential element, a curve representing the stage-discharge relation at the station.

In the table of daily discharge, the figures for the maximum day and the minimum day for each month are underlined. If the figure is repeated, it is underlined only on the first day of its occurrence.

In the monthly summary below the daily table, the line headed "Total" gives the sum of the daily figures; it is the total cfs-days for the month. The line headed "Mean" gives the average flow in cubic feet per second during the month. Discharge for the month may be expressed in cubic feet per second per square mile (line headed "Cfsm"), or in inches (line headed "In."), or in acre-feet (line headed "Ac-ft"). Figures for cubic feet per second per square mile and runoff in inches are omitted if the drainage area includes large noncontributing areas, or if the average annual rainfall on the drainage basin is usually less than 20 inches.

In the yearly summary below the monthly summary, the figures of maximum are the maximum daily discharges, not the momentary discharges when the water was at crest stage. Likewise, the minimums in this summary are the minimum daily discharges.

Peak discharges and the times of their occurrence and corresponding gage heights for most stations are listed below the table of daily and monthly discharge. All independent peaks above the selected base are given. The base discharge, which is given in parentheses, is selected so that an average of about three peaks a year can be presented. Peak discharges are not published for any stream for which the peaks are subject to substantial control by man, unless they are meaningful.

Footnotes to the table of daily discharge indicate periods for which discharge was computed or estimated by unusual or special methods because of no gage-height record, ice effect, or other conditions that reduce the degree of accuracy of the records. The footnotes are either reference footnotes, with corresponding symbols used in the table of daily discharge to indicate the days included, or general footnotes, introduced by the word "Note," in which the days included are stated. The following footnotes and their corresponding symbols have been standardized for use throughout this report. The methods used in computing data for such footnoted periods have been explained in preceding paragraphs.

* Discharge measurement made on this day.--Used to indicate days on which discharge measurements were made at a gaging station unless they were made at frequent regular intervals, two or more times monthly, in which instance the general frequency of discharge measurements is given under "Remarks" in the station description.

** Field estimate made on this day.--Used to indicate days on which an estimate of the flow was made at the gaging station.

a No gage-height record.--Used to indicate periods when there was no gage-height record or the available record was such that it could not be used to compute the daily discharge. No mention is made of periods of no gage-height record if they are few and of short duration, no more than 4 days in succession and not more than 12 days distributed throughout the water year, and if the degree of accuracy of records for those days is not changed.

b Stage-discharge relation affected by ice.--Used to indicate periods when the stage-discharge relation is affected by ice forming on stream, control, or streambed. No mention is made of occasional days of ice effect if the degree of accuracy of daily records is not changed.

c Backwater from aquatic growth (or debris or other conditions).--Used only when records for the periods affected are rated down in accuracy.

e Uncertain stage-discharge relation.--Used for unstable periods when stage-discharge relation cannot be defined by normal methods.

d Doubtful gage-height record.--Used at times when substantial evidence indicates the recorded gage height is not reliable.

g Computed from graph based on once-daily (twice-daily, etc.) staff (or chain, wire-weight, etc.) gage readings.--Used only for recording stations for periods when the water-stage recorder graph was not used but readings of a nonrecording gage were used. The symbol is not used for periods of short duration if the degree of accuracy of records for the periods involved are not changed.

ACCURACY OF FIELD DATA AND COMPUTED RESULTS

For most gaging stations on lakes and reservoirs the data presented comprise a description of the station and a monthly summary table of stage and contents. A skeleton table of capacity at given stages is not published for reservoirs for which only monthly data are given.

The accuracy of streamflow data 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 of the records. "Excellent" indicates that, in general, the error in the daily records is believed

to be less than 5 percent; "good," less than 10 percent; "fair," less than 15 percent; and "poor," probably more than 15 percent. The records of monthly and yearly mean discharge and runoff are, in general, more nearly accurate than the daily records.

Discharge at some stations, as indicated by the monthly mean, may vary widely from natural runoff, owing to diversion, consumption, regulation by storage, increase or decrease in evaporation due to artificial causes, or to other factors. For such stations, figures of cubic feet per second per square mile and of runoff in inches are not published unless satisfactory adjustments can be made for diversions, for changes in contents of reservoirs, or for other changes incident to use and control. Evaporation from a reservoir is not included in the adjustments for changes in reservoir contents, unless it is so stated. Even at those stations where adjustments are made, large errors in computed runoff may occur when relatively large negative adjustments are made or when evaporation is large in comparison with the observed discharge.

SUPPLEMENTAL DATA

Data collected at partial-record stations and at miscellaneous sites are given at the end of each report. Data for partial-record stations are presented in two tables. The first is a table of discharge measurements at low-flow partial-record stations, and the second is a table of annual maximum stage and discharge at crest-stage stations (a summary of these results was published in WSP for 1958). Discharge measurements at miscellaneous sites are given in a third table.

Seepage investigations are presented following measurements at miscellaneous sites. These consist of text and tabulations summarizing data derived primarily from associated series of discharge measurements and observations made within a short time period along a given reach of channel, preferably during a period of relatively stable conditions. The objectives may vary, but usually include the study of seepage gains or losses, surface inflow, diversion (including pumps), areas of springs, water temperatures, low-flow characteristics of the area, and chemical quality (not published herein). These investigations may be repeated periodically or at random intervals for some reaches of certain channels. Indicated gains and/or losses as shown may be substantially affected by small inaccuracies of open channel measurements. Small differences between large measurements will have a lower degree of accuracy than the same differences between smaller measurements.

Information of a more detailed nature than that published for most of the gaging stations is on file in the district office. About half the gaging-station records in the state (through 1954 for Part 9, 1958 for Parts 7 and 8) have been analyzed by electronic computer to give: (1) the number of days in each year that the daily discharge was between selected limits (duration tables); (2) the lowest mean discharge for selected numbers of consecutive days in each year; and (3) the highest mean discharge for selected numbers of consecutive days in each year. Information on these analyses and other unpublished data concerning the gaging-station records may generally be obtained from the district office.

ARKANSAS RIVER BASIN

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7-1535. Cimarron River near Guy, N. Mex.

Location.--Lat 36°59'15", long 103°25'25", in SE $\frac{1}{4}$ sec.21, T.32 N., R.33 E., on right bank 1.5 miles upstream from Baker dam-site, 1.7 miles northwest of Valley filling station, 12 miles north of Guy, and 27 miles northwest of Kenton, Okla.

Drainage area.--545 sq mi.

Records available.--April 1942 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 4,900 ft (from topographic map). Prior to Oct. 1, 1943, at datum 0.44 ft higher.

Average discharge.--19 years, 11.5 cfs (8,330 acre-ft per year).

Extremes.--Maximum discharge during year, 4,920 cfs July 6 (gage height, 14.04 ft); minimum daily, 0.6 cfs Apr. 30, May 7, 13.
1942-61: Maximum discharge, 8,500 cfs Oct. 5, 1954 (gage height, 20.5 ft), from rating curve extended above 3,000 cfs on basis of velocity-area study and logarithmic plotting; no flow at times.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of about 6,500 acres above station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.3	0.4	1.2	29
.4	1.2	1.6	62
.5	2.4	2.0	110
.6	4.2	2.5	200
.8	9.5	3.0	325
1.0	18	3.5	460

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.0	4.4	b 3.5	b 3.5	b 4	4.9	3.8	0.8	1.2	1.6	2.9	3.3
2	2.0	4.4	* 5.8	b 3.5	b 4	4.7	3.7	.9	1.3	1.4	6.0	2.4
3	2.1	4.7	6.0	b 3	b 4	4.7	3.3	.7	3.5	1.3	7.8	2.6
4	2.2	4.7	1.4	b 3.5	b 3	4.7	2.8	1.0	1.7	1.1	3.8	3.5
5	2.1	4.9	6.0	b 3.5	b 2	4.7	3.2	1.7	5.4	1.0	2.8	3.2
6	2.0	4.9	b 1	* b 3.5	b 2	4.7	3.7	1.6	1.0	3.93	2.3	2.8
7	2.1	* 5.1	b 4	b 4	b 2	4.4	3.0	.6	1.54	2.69	3.0	* 2.3
8	2.4	4.7	b 5	b 4	b 2	4.4	3.3	.9	1.2	2.4	3.0	2.2
9	3.7	4.9	b 5	b 4	b 2.5	4.4	3.2	* 1.4	4.7	1.0	3.0	2.2
10	3.7	5.1	b 4	b 4	b 3	4.2	2.8	1.3	3.2	8.3	2.8	2.2
11	* 3.2	4.9	b 5	b 4	b 4	4.4	* 2.4	1.2	2.6	3.7	6.8	2.2
12	3.2	4.7	b 5	b 4	6.3	4.4	2.3	1.0	3.5	5.8	4.5	3.2
13	2.6	4.7	b 4	b 4	* 6.0	4.4	1.4	.6	2.3	* 2.4	5.7	2.2
14	2.6	4.4	b 3	b 4	6.0	* 4.9	1.7	.9	* 3.2	1.0	2.7	2.3
15	4.0	4.7	b 3	b 4	5.4	4.7	1.2	1.4	5.4	9.2	8.0	2.0
16	5.8	4.4	b 3	b 4	5.1	3.7	1.3	1.6	4.0	3.2	4.9	1.7
17	6.8	4.9	b 3	b 4	4.4	3.7	1.3	1.3	3.3	2.6	* 3.8	1.4
18	1.8	5.1	b 3.5	b 4	4.4	5.1	1.0	1.2	2.3	2.2	3.8	1.6
19	8.6	5.1	b 4	b 3	4.4	4.4	1.8	1.2	2.0	2.0	3.8	4.05
20	6.3	5.8	b 3	b 3	4.7	4.9	1.8	1.2	2.0	2.1	4.2	3.9
21	6.3	5.8	b 2.5	b 3	4.7	4.4	1.8	5.6	2.1	3.2	3.8	2.3
22	5.8	5.8	b 3	b 3.5	4.9	4.0	2.1	2.2	1.7	3.3	4.0	9.2
23	6.3	5.6	b 4	b 4	4.9	3.5	1.8	1.8	1.4	2.6	3.8	5.6
24	6.3	5.8	b 4	b 3.5	b 4	2.6	1.7	1.7	1.4	1.8	3.7	3.7
25	5.8	6.0	b 4	b 3.5	b 4	2.3	2.0	1.6	1.4	1.6	3.7	3.3
26	5.1	6.0	b 4	b 3	4.9	2.3	2.1	2.0	2.5	1.3	3.7	2.8
27	4.7	5.6	b 3	b 2	5.4	3.2	2.2	1.8	1.1	1.1	3.7	2.4
28	4.4	5.1	b 2.5	b 2	5.1	2.4	2.1	1.6	2.1	1.1	3.3	2.4
29	4.2	b 3.5	b 3.5	b 3	-	3.2	2.2	1.7	1.3	1.0	3.0	2.2
30	4.0	b 3.5	b 3.5	b 4	-----	3.7	-----	1.2	1.0	-----	2.6	2.0
31	4.2	-----	b 3.5	b 4	-----	3.8	-----	1.2	-----	3.1	2.6	-----
Total	142.5	149.2	128.3	110.0	117.1	125.8	67.6	55.7	322.8	909.9	389.9	558.3
Mean	4.60	4.97	4.14	3.55	4.18	4.06	2.25	1.80	10.8	29.4	12.6	18.6
Ac-ft	283	296	254	218	232	250	134	110	640	1,800	773	1,110

Calendar year 1960: Max 337 Min 0.1 Mean 7.11 Ac-ft 5,160
Water year 1960-61: Max 405 Min 0.6 Mean 8.43 Ac-ft 6,100

Peak discharge (base, 1,000 cfs)

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
7-6	7p.m.	14.04	4,920	9-19	4:30a.m.	5.16	1,010
8-2	11:15p.m.	6.10	1,370				

ARKANSAS RIVER BASIN

7-1545. Cimarron River near Kenton, Okla.

Location.--Lat 36°56', long 102°57', in SE $\frac{1}{4}$ sec.4, T.5 N., R.1 E., near right bank on downstream side of pier of highway bridge, 1.5 miles upstream from Carrizo Creek, 1.7 miles northeast of Kenton, 2.2 miles downstream from Carrizozo Creek, and at mile 594.0.

Drainage area.--1,106 sq mi, of which 68 sq mi is probably noncontributing.

Records available.--April 1904 to July 1905 (gage heights only), October 1950 to September 1961.

Gage.--Water-stage recorder. Datum of gage is 4,267.08 ft above mean sea level, datum of 1929 (levels by Oklahoma State Highway Commission). April 1904 to July 1905 staff gage at site 0.9 mile upstream at different datum.

Average discharge.--11 years, 22.4 cfs (16,220 acre-ft per year).

Extremes.--Maximum discharge during year, 10,000 cfs June 3 (gage height, 9.43 ft); no flow May 12-14.

1950-61: Maximum discharge, 26,300 cfs July 6, 1958 (gage height, 13.67 ft), from rating curve extended above 6,000 cfs by logarithmic plotting; no flow at times in most years.

Remarks.--Records fair except those for periods of no gage-height record or ice effect, which are poor. Diversions for irrigation of about 7,400 acres above station.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.6	1.0	1.7	b1.2	1.9	2.1	2.2	0.2	1.2	0.8	a1.5	
2	.6	1.0	1.7	b1.4	1.9	2.1	2.1	.4	1.2	.6	a3.0	
3	.6	1.0	1.7	*b1.4	b1.4	2.1	2.2	.9	6.65	.6	a7.0	
4	.5	1.0	2.2	b1.4	b1.2	2.2	2.1	1.2	*52.6	.5	*2.4	
5	.5	1.1	2.1	b1.6	b1.2	2.2	2.7	.8	*1.3	.4	1.1	
6	.4	1.1	2.2	2.0	b1.2	2.2	2.7	.5	8.0	1.80	7.5	a3.6
7	.4	1.3	2.2	2.1	b1.1	2.2	*2.8	.4	25	*1.050	6.6	
8	.4	1.3	*2.5	2.1	b1.2	2.1	2.9	.3	37	1.15	6.4	
9	.4	1.3	2.5	2.1	b1.6	2.1	2.9	*.3		a1.5	6.4	
10	.4	*1.3	b2.4	1.8	b1.8	2.1	2.9	.2		36.5	6.1	
11	.4	1.3	b2.2	1.9	2.0	2.4	2.7	.1	a2.8	*32.5	6.9	
12	.4	1.3	2.4	1.9	2.0	2.4	2.1	0		44.9	1.30	3.4
13	*.4	1.3	2.4	1.8	2.0	2.4	1.6	0		a7.0	7.4	*4.4
14	.4	1.3	2.4	1.9	2.0	2.4	1.1	0		20.2	3.8	3.4
15	1.0	1.3	2.1	1.8	2.0	2.7	1.1	.5	3.9	a1.5		2.9
16	1.6	1.3	b1.8	1.6	2.0	2.8	1.0	.8				2.8
17	1.7	1.3	b1.6	1.6	*1.8	3.1	.8	.8				2.4
18	3.1	1.3	1.7	1.6	1.4	3.1	.8	.7				2.7
19	2.1	1.4	1.8	b1.4	1.4	3.1	.8	*.8				1.94
20	1.7	1.4	1.7	b1.4	1.4	*3.1	.5	.6			a5	2.27
21	1.4	1.4	1.7	b1.4	1.4	2.9	*.4	3.3	a1.5			3.6
22	1.1	1.6	1.7	b1.4	1.6	2.8	.3	4.9				a2.0
23	1.1	1.6	1.6	b1.2	1.8	2.7	.1	3.7		a2		
24	1.0	1.6	1.7	b1.2	2.1	2.7	.5	3.1				
25	.9	1.7	1.4	b1	1.9	2.7	1.3	2.7			3.0	a8
26	.9	1.6	1.4	b.9	1.9	2.5	1.3	2.4	*8.7		1.61	
27	.9	1.6	1.4	b1	2.1	2.8	.8	2.0	1.7			*5.8
28	.9	1.7	b1.2	b1	2.1	2.7	.6	1.8	2.4			4.9
29	.9	1.7	b1.1	b1.4	-	2.5	.4	1.7	1.8			4.4
30	.9	1.7	b1	1.9	-----	2.5	.2	1.4	1.0			3.7
31	.9	-----	b1.1	*1.9	-----	2.7	-----	1.3	-----			-----
Total	28.5	40.8	56.6	48.3	47.4	78.4	43.9	67.5	1343.0	2820.9	760.0	620.0
Mean	0.92	1.36	1.83	1.56	1.69	2.53	1.46	2.18	44.8	91.0	24.5	20.7
Ac-ft	57	81	112	96	94	156	87	134	2,660	5,600	1,510	1,230

Calendar year 1960: Max 1,150 Min 0 Mean 6.04 Ac-ft 4,380
 Water year 1960-61: Max 1,050 Min 0 Mean 16.3 Ac-ft 11,820

Peak discharge (base, 3,000 cfs)

* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

Date	Time	Gage Height	Discharge	Date	Time	Gage Height	Discharge
6-3	10 p.m.	9.43	10,000	7-10	8:30 p.m.	6.80	4,310
7-7	7 a.m.	5.98	3,100				

7-1990. Canadian River near Hebron, N. Mex.

Location.--Lat 36°47'10", long 104°27'45", in Maxwell Grant, near right bank at downstream end of bridge pier on U. S. Highways 64 and 85, 3¼ miles north of Hebron, 5 miles upstream from Chicorica Creek, and 8 miles south of Raton.

Drainage area.--229 sq mi.

Records available.--June 1946 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 6,250 ft (from topographic map).

June 1, 1946, to Sept. 30, 1952, on bridge pier 150 ft upstream and Oct. 1, 1952, to July 13, 1955, on bridge pier 200 ft upstream, both at datum 1 ft higher.

Average discharge.--15 years, 5.64 cfs (4,080 acre-ft per year).

Extremes.--Maximum discharge during year, 772 cfs Aug. 23 (gage height, 4.12 ft), from rating curve extended above 116 cfs on basis of logarithmic plotting and shape of curves at former site 200 ft upstream; no flow for many days.

1946-61: Maximum discharge, 6,860 cfs May 19, 1955; maximum gage height, 11.6 ft Aug. 24, 1951 (backwater from temporary dam downstream); no flow at times.

Flood in 1942 reached a stage of about 26 ft, at site 150 ft upstream, datum 1 ft higher, from information by local residents.

Remarks.--Records poor. Diversions above station for irrigation of a few hundred acres. Part or all of low flow can be diverted to left bank a few hundred yards above station for stock water, off-channel storage and irrigation.

Rating tables, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to July 6

July 6 to Sept. 30

1.84	0.0	2.3	17	2.02	0.0	2.6	66
1.9	.2	2.4	30	2.1	.6	2.7	102
2.0	1.1	2.5	48	2.2	4		
2.1	3.6	2.6	72	2.3	12		
2.2	8.4	2.8	138	2.5	45		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	a 7	b 2	b 0.6	b 1	b 0.6	6.0	0.8	0.1	0.1	3.0	2.3
2	0	a 6.5	* b 2	b 5	b 1	* b 8	2.4	.8	.1	.1	1.6	.9
3	0	a 5.5	b 1.6	b 5	b 1	b 8	.6	.7	.1	0	5.0	2.5
4	0	* 5.0	b 1.2	b 5	b .6	b 8	3.6	3.0	.1	0	* 5.8	5.6
5	0	3.4	b .8	* b .8	b .4	.6	1.8	6.1	.1	.1	6.4	* 5.6
6	0	1.6	b .5	b .8	b .4	b .4	1.4	7.9	.1	1.9	1.5	3.3
7	0	5.0	b .5	b .8	b .4	b .4	1.4	6.0	.1	1.4	2.4	2.3
8	0	4.6	b .5	b .8	b .4	b .6	1.4	6.5	.2	1.3	2.0	2.0
9	0	4.6	b .5	b .8	b .6	b .8	7.9	* 6.5	.1	2.7	.5	1.6
10	0	4.1	b .5	b .8	b 1	b 1	6.0	6.5	.1	* .4	0	.4
11	0	b 3	b 1	b .8	b 1	b 1	* 9.9	6.5	.1	1.3	2.5	0
12	0	b 2.5	b 1	b .8	b 1	b 1	4.8	5.0	* .1	2.6	7.4	.2
13	0	2.1	b 1	b .8	* b 1	b 1	8.7	5.0	.1	4.0	6.2	0
14	0	* 1.6	b 1	b .8	b 1	b 1	7.2	5.0	.7	1.2	5.6	0
15	0	1.1	b .8	b .8	b 1	b 1	6.0	4.6	.9	4.8	3.1	0
16	1.9	b 1	b .6	b .8	b 1	7.4	6.0	2.6	.5	2.6	2.7	0
17	6.8	b .9	b .6	b .8	b 1	1.0	5.5	.3	.2	.3	a 1.5	0
18	1.10	b .9	b 1	b .8	b 1	b 1.0	6.0	.2	.1	0	a 1.5	4.5
19	5.0	b .8	b 1	b .6	b 1	b .8	5.5	* .2	.1	0	a 2.0	4.7
20	5.0	b .8	b 1	b .6	b 1	b .6	5.8	.2	.1	0	a 1.2	6.7
21	5.3	b .8	b .5	b .6	b 1	7.4	4.6	.1	.1	5.9	a .8	3.8
22	5.0	b 1	b .5	b 1	b 1	7.9	4.3	.3	1.4	a .6	a .6	.6
23	4.4	b 1	b 1	b 1	b 1	8.4	3.5	.2	.9	a .2	4.7	.6
24	a 3.5	b 1.5	b 1	b 1	b 1	* 1.1	a 2.1	.2	0	* .1	3.7	.6
25	a 3.0	b 2.2	b 1	b .8	b .8	1.2	* 2.1	.1	0	0	4.1	.6
26	a 2.5	2.6	b 1	b .5	b .6	8.4	1.7	.1	0	0	1.8	.5
27	a 2.0	b 2.2	b .8	b .2	b .6	7.0	5.5	.1	0	0	6.3	.5
28	a 1.5	b 2	b .8	b .2	b .6	6.5	2.8	.1	.4	0	3.6	.4
29	a 1.3	b 2	b .8	b .6	-	b .6	2.1	.1	.1	0	8.8	.2
30	a 1.0	b 2	b .8	b 1	-----	b .6	1.1	.1	.1	.3	4.8	.2
31	a .9	-----	b .8	b 1	-----	b 5.5	-----	.1	-----	0	3.0	-----
Total	60.1	79.3	28.1	22.4	23.4	144.3	975.0	103.8	7.0	238.0	813.1	50.6
Mean	19.4	2.64	0.91	0.72	0.84	4.65	32.5	3.35	0.23	7.68	26.2	1.69
Ac-ft	1,190	157	56	44	46	286	1,930	206	14	472	1,610	100

Calendar year 1960: Max 110 Min 0 Mean 4.63 Ac-ft 3,360

Water year 1960-61: Max 110 Min 0 Mean 8.45 Ac-ft 6,110

Peak discharge (base, 1,000 cfs).--No peak above base.

* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

ARKANSAS RIVER BASIN

7-2030. Vermejo River near Dawson, N. Mex.

Location.--Lat 36°40'50", long 104°47'05", T.28 N., R.20 E., on left bank in Maxwell Grant, 1½ miles north of Dawson.

Drainage area.--301 sq mi.

Records available.--October 1915 to July 1918, April 1919 to May 1921, January 1927 to September 1961. Monthly discharge only for some periods, published in WSP 1311.

Gage.--Water-stage recorder. Altitude of gage is 6,540 ft (from topographic map). Prior to Sept. 17, 1921, staff gage and Sept. 17, 1921, to May 31, 1923, water-stage recorder, at sites 1 mile upstream at different datums. Feb. 25, 1927, to Sept. 23, 1953, water-stage recorder at several sites about three-quarters of a mile upstream at datums 8 to 12 ft higher.

Average discharge.--37 years (1915-17, 1919-20, 1927-61), 20.1 cfs (14,560 acre-ft per year).

Extremes.--Maximum discharge during year, 1,060 cfs July 31 (gage height, 5.30 ft); minimum daily, 1.0 cfs Oct. 9.

1927-61: Maximum discharge, about 9,000 cfs Aug. 6, 1940 (gage height, 11.88 ft, site and datum then in use, from flood-mark in well), from rating curve extended above 360 cfs on basis of slope-area measurements of 3,250 and 5,000 cfs at later site; no flow at times.

A major flood occurred Aug. 2, 1921, when discharge probably exceeded 10,000 cfs.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of small acreage and mountain meadows above station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.7	2.0	2.2	17	2.8	84
1.8	3.4	2.4	32	3.0	122
2.0	8.3	2.6	54	3.2	170

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.3	9.9	*b5.5	b3.5	b4.5	b4	9.5	*50	42	47	a100	36
2	1.3	8.7	b5.5	b3.5	b4	b4	9.9	55	35	a40	158	31
3	1.3	8.7	b5.5	b3.5	b4	b5	8.7	58	52	a35	127	38
4	1.3	*9.1	b5	b3.5	b4	b6	10	62	53	a35	123	46
5	1.3	7.2	b4	*b3.5	b3.5	b6	16	70	45	a35	87	38
6	1.2	6.1	b4.5	b3.5	b3	b5	16	64	29	a35	44	*33
7	*1.1	5.5	4.9	b3.5	b3	b4.5	22	58	25	a130	*30	30
8	1.1	5.8	5.5	b3.5	b3	b4.5	21	54	24	a80	21	26
9	1.0	6.9	5.5	b3.5	b3	b5	17	47	28	a50	35	24
10	1.1	6.9	5.8	b3.5	b4	b5	*20	46	29	*37	14	22
11	1.4	b5	6.3	b3.5	b6	b5.5	39	49	35	48	104	27
12	1.2	b5	8.7	b3.5	b7	b6	36	53	*30	83	94	32
13	1.1	7.2	b5	b3.5	b7	b6	63	61	19	68	151	21
14	5.4	7.2	b6	b3.5	*b6	b7	62	61	30	81	138	22
15	9.9	6.9	b5	b3.5	b5	*8.0	44	61	57	64	82	37
16	2.9	b5	*b6	b3.5	b5	8.0	53	55	67	30	75	24
17	1.17	b5	b5	b3.5	b5	9.5	48	49	88	24	62	29
18	15.8	b5	b4	b3	b5	10	52	49	58	21	66	21
19	6.8	b5	b4	b3	b4.5	8.7	60	52	48	19	58	25
20	4.4	b5	b4	b3.5	b4	b6	74	55	43	16	43	25
21	4.2	b5	b4	b3.5	b4	8.3	70	67	41	21	36	22
22	3.6	b5	b4	b3.5	b4	8.3	62	67	33	32	38	19
23	3.5	b5	b4	*b3.5	b3.5	8.0	60	65	40	17	55	19
24	3.3	b5	b4	b3	b3.5	*8.7	55	61	38	a13	*64	18
25	2.7	b6	b4	b3	b4	11	47	*53	37	a12	89	18
26	2.3	8.3	b4	b2.5	b3.5	11	47	67	34	a9.9	81	17
27	2.0	7.7	b4	b2.5	b4	9.9	42	74	48	a9.6	88	17
28	*1.6	b5	b3.5	b3.5	b4	9.1	40	81	36	a16	106	17
29	1.7	b4	b3.5	b5	-	9.9	43	68	35	a9.5	54	14
30	1.5	b4.5	b3.5	b5	-----	11	47	47	37	a8.0	47	11
31	1.3	-----	b3.5	b4.5	-----	9.9	-----	47	-----	108	42	-----
Total	724.0	186.6	147.7	108.5	121.0	228.8	1194.1	1806	1216	1234.0	2312	759
Mean	23.4	6.22	4.76	3.50	4.32	7.38	39.8	58.3	40.5	39.8	74.6	25.3
Ac-ft	1,440	370	293	215	240	454	2,370	3,580	2,410	2,450	4,590	1,510

Calendar year 1960: Max 158 Min 1.0 Mean 10.0 Ac-ft 7,270
 Water year 1960-61: Max 158 Min 1.0 Mean 27.5 Ac-ft 19,920

Peak discharge (base, 800 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
7-31	5:15 p.m.	5.30	1,060	8-11	9:20 p.m.	5.25	1,040
8-2	8:50 p.m.	5.23	1,020				

* Discharge measurement made on this day

a No gage-height record.

b Stage-discharge relation affected by ice.

7-2050. Six Mile Creek near Eagle Nest, N. Mex.

Location.--Lat 36°31'10", long 105°16'15", on left upstream wingwall of concrete control, in Maxwell Grant, 600 ft downstream from highway bridge, a quarter of a mile upstream from high-water line of Eagle Nest Reservoir, and 3 miles southwest of Eagle Nest, Colfax County.

Drainage area.--11 sq mi.

Records available.--April 1928 to September 1955, July 1958 to September 1961. No winter records 1928-31, 1933-55. Prior to October 1930 monthly discharge only, published in WSP 1311. Records for December 1930 to March 1931 have been found to be unreliable and should not be used. Published as "near Therma" 1928-34.

Gage.--Water-stage recorder. Concrete control Sept. 11, 1931, to May 1933, and since Sept. 13, 1934. Datum of gage is 8,195.0 ft above mean sea level, datum of 1929. Prior to May 18, 1928, staff gage 88 ft upstream at datum 0.98 ft higher. May 18, 1928, to Sept. 11, 1938, water-stage recorder at site 88 ft upstream at datum 0.43 ft higher.

Extremes.--Maximum discharge during year, 28 cfs Aug. 22 (gage height, 1.82 ft); minimum daily, 0.1 cfs Jan. 26-29, Feb. 26-28, 1930-55, 1958-61: Maximum discharge not determined, occurred Apr. 11, 1937 (discharge probably exceeded 125 cfs); maximum gage height recorded, 3.38 ft Apr. 2, 1937 (ice jam), site and datum then in use; no flow at times.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 300 acres above station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.6	0.2	1.0	5.1
.7	.7	1.4	15.7
.8	1.8	1.8	28
.9	3.2		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.6	b 0.5	b 0.4	b 0.3	a 0.2	b 0.2	b 3	2 2	5.6	2.4	1.4	2.4
2	.6	.6	b.4	b.3	a.3	b.5	b.3	2 5	5.4	2.3	2.0	2.3
3	.6	.5	b.4	*b.3	*b.4	b.8	*b.3	2 4	5.1	*2.1	2.4	4.9
4	.6	.5	b.4	b.3	b.4	b.2	b.3.5	2 3	4.4	2.0	1.6	5.4
5	.6	.5	b.3	b.4	b.2	b.1.5	b.3.5	2 2	4.1	1.8	1.5	4.9
6	.5	.5	b.2	a.4	b.2	*1.9	b.3	1 8	3.7	1.9	1.4	4.7
7	.6	b.5	b.2	a.4	a.2	1.6	b.3	1 6	3.3	2.7	1.3	4.2
8	.6	b.4	b.2	a.4	a.2	1.3	b.3	*1 3	3.3	2.8	*1.2	*4.1
9	.6	b.4	b.2	a.4	a.2	1.3	b.3	1 1	*3.3	2.5	1.4	3.9
10	*.6	b.5	b.4	a.4	a.2	1.5	b.3.5	1 2	3.2	2.1	1.5	3.3
11	.6	b.6	b.6	a.4	a.6	2.1	b.4	1 4	3.0	1.9	1.9	3.2
12	.5	b.7	b.6	a.4	a.8	2.4	*b.5.5	1 6	2.7	2.0	2.7	3.0
13	.4	b.6	b.6	a.4	a.8	3.3	b.5.5	1 7	2.3	1.8	3.2	3.0
14	.4	b.6	b.8	a.4	a.5	5.1	b.5	1 4	2.1	1.8	3.0	3.2
15	.6	b.7	*b.8	a.4	a.5	8.9	b.5	1 2	2.8	2.4	3.2	2.8
16	1.1	b.4	b.5	a.4	a.5	9.2	b.5	1 1	4.4	2.7	2.8	2.7
17	2.3	b.4	b.5	a.4	a.5	*5.8	b.6	1 1	4.7	2.3	2.5	2.5
18	1.6	b.4	b.5	a.4	a.5	3.7	b.9	1 1	3.2	2.1	2.7	2.8
19	1.3	b.7	b.5	a.3	a.5	2.5	1 5	1 1	3.2	2.1	2.4	4.2
20	1.2	b.6	b.5	a.3	a.5	b.2.5	2 1	1 1	3.2	2.1	2.1	3.7
21	1.2	*b.6	b.3	a.3	a.6	b.3	*2 2	1 0	2.7	*2.3	2.1	3.0
22	1.2	b.6	b.3	a.4	a.8	b.4	2 2	1 0	2.5	2.0	5.5	2.7
23	1.4	b.6	b.3	a.4	*b.8	b.4	2 2	9.9	2.4	1.3	5.3	2.7
24	1.5	b.7	b.3	a.4	b.5	b.4	2 2	*9.4	2.3	1.2	6.6	2.4
25	1.1	b.8	b.3	a.3	b.2	b.3.5	1 9	9.9	2.4	1.3	4.4	2.4
26	.8	b.8	b.3	a.1	b.1	b.3	1 6	9.7	2.3	1.6	3.9	2.4
27	*.9	b.6	b.3	a.1	b.1	b.3	1 4	7.9	2.3	1.5	3.7	2.4
28	.9	b.5	b.3	a.1	b.1	b.2.5	1 5	7.6	2.3	1.3	3.5	2.3
29	.8	b.4	b.3	a.1	-	b.3	1 9	7.1	2.5	1.1	3.2	2.3
30	b.5	b.4	b.3	a.2	-----	b.3	2 0	6.6	2.7	1.2	2.7	2.1
31	b.5	-----	b.3	a.2	-----	b.3	-----	6.1	-----	1.2	2.5	-----
Total	26.7	16.6	12.3	10.0	11.4	93.3	303.5	408.2	97.4	59.8	85.6	95.9
Mean	0.86	0.55	0.40	0.32	0.41	3.01	10.1	13.2	3.25	1.93	2.76	3.20
Ac-ft	53	33	24	20	23	185	602	810	193	119	170	190

Calendar year 1960: Max 9.9 Min 0 Mean 1.65 Ac-ft 1,200
 Water year 1960-61: Max 25 Min 0.1 Mean 3.34 Ac-ft 2,420

Peak discharge (base, 15 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
3-15	5:30 p.m.	1.52	19	8-22	6 p.m.	1.82	28
5-2	8 p.m.	1.73	25				

* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

ARKANSAS RIVER BASIN

7-2055. Eagle Nest Reservoir near Eagle Nest, N. Mex.

Location.--Lat 36°32'05", long 105°14'00", about sec.26, T.27 N., R.16 E. (projected), in Maxwell Grant, at upstream face of Eagle Nest Dam on Cimarron Creek, 2 miles southeast of Eagle Nest and 6¼ miles west of Ute Park.

Drainage area.--167 sq mi.

Records available.--December 1927 to December 1944 (month-end contents only, published in WSP 1311), May 1950 to September 1961.

Gage.--Wire-weight gage since May 1950 read 1 to 4 times a month (at random intervals). Datum of gage is at mean sea level, datum of 1929. Prior to 1950, nonrecording gage (type unknown) at same site and datum.

Extremes.--Maximum contents during year, 23,080 acre-ft (estimated) May 31; minimum observed, 9,425 acre-ft Oct. 17 (elevation, 8,088.55 ft).

1927-44, 1950-61: Maximum contents observed, 78,800 acre-ft May 31, 1942 (elevation, 8,136.9 ft); minimum observed, 635 acre-ft Dec. 14, 1954 (elevation, 8,061.33 ft).

Remarks.--Reservoir is formed by concrete dam with spillway cut in natural rock; completed June 30, 1918; storage began in June 1917. Capacity, 79,120 acre-ft between elevations 8,035.0 (sill of outlet gate) and 8,137.0 ft (crest of ungated spillway). Dead storage negligible. Records given herein represent usable contents. Water released is used for irrigation. Lake is recreational area. Diversions for irrigation of about 2,500 acres above reservoir.

Cooperation.--Elevation readings furnished by employee of Springer Land and Cattle Co. or by Cimarron Creek watermaster.

Month-end elevation and contents, water year October 1960 to September 1961

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	-	a10,400	-
Oct. 31.....	-	a9,870	-530
Nov. 30.....	-	a10,180	+310
Dec. 31.....	-	a10,560	+380
Calendar year 1960.....	-	-	-6,510
Jan. 31.....	-	a10,780	+220
Feb. 28.....	-	a11,010	+230
Mar. 31.....	-	a13,930	+2,920
Apr. 30.....	-	a19,500	+5,570
May 31.....	-	a23,080	+3,580
June 30.....	-	a22,100	-980
July 31.....	-	a21,150	-950
Aug. 31.....	-	a21,310	+160
Sept. 30.....	-	a21,720	+410
Water year 1960-61.....	-	-	+11,320

a No gage-height record; contents estimated or interpolated from a total of 52 observations during year and outflow records (Cimarron Creek below Eagle Nest Dam, see following page).

7-2060. Cimarron Creek below Eagle Nest Dam, N. Mex.

Location.--Lat 36°32'05", long 105°13'55", about sec.26, T.27 N., R.16 E. (projected), in Maxwell Grant, on left bank 300 ft downstream from Eagle Nest Dam, 2 miles southeast of Eagle Nest, and 6¼ miles west of Ute Park.

Drainage area.--167 sq mi.

Records available.--May 1950 to September 1961. Prior to October 1952, published as Cimarron River below Eagle Nest Dam.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 8,000 ft (from topographic map). Prior to May 15, 1951, at datum 0.81 ft higher.

Average discharge.--11 years, 12.1 cfs (8,760 acre-ft per year).

Extremes.--Maximum discharge during year, 45 cfs Aug. 3 (gage height, 1.07 ft); no flow at times.

1950-61: Maximum discharge, 205 cfs June 14, 1955 (gage height, 2.79 ft); no flow at times.

Remarks.--Records good. Flow regulated by Eagle Nest Reservoir (see preceding page). Diversions for irrigation of about 2,500 acres above station.

Rating table (gage height, in feet, and discharge,
in cubic feet per second)

0.05	0.0
.1	.9
.2	3.0
.4	9.1
.7	22
1.1	46

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	21		(*)					0	7.3	12	4.2	7.7
2	21							0	7.3	7.0	4.4	7.7
3	21						(*)	5.1	7.3	*6.7	4.3	7.7
4	22	(*)						8.0	19	17	3.3	7.7
5	22							8.0	25	20	2.1	7.7
6	22							8.0	25	20	2.0	*7.7
7	22					(*)		8.4	35	19	2.1	7.7
8	19							*8.4	4.3	9.9	*2.7	7.7
9	18							11	*4.3	23	2.9	7.7
10	*18				(*)			14	28	32	2.5	7.0
11	33							14	31	34	2.4	7.0
12	41							14	42	32	1.9	7.3
13	40							10	39	20	1.7	7.3
14	40							16	38	13	1.3	7.3
15	41							20	38	10	8.4	3.7
16	41							20	38	7.7	8.4	1.9
17	17							20	20	20	8.4	1.9
18	0							20	24	26	8.4	1.9
19	0							20	30	26	8.4	2.1
20	0							15	30	26	8.4	2.1
21	0							21	30	26	8.4	2.1
22	0							24	37	26	8.4	2.1
23	0							21	39	26	8.0	2.1
24	0							18	21	26	8.0	2.1
25	0							14	20	26	8.0	2.1
26	0							9.8	24	19	8.0	2.1
27	0							8.0	24	12	8.0	2.1
28	0							7.7	24	12	8.0	2.1
29	0							7.7	24	12	8.0	2.1
30	0							7.7	24	30	8.0	2.1
31	0							7.7	-----	39	8.0	-----
Total	459	0	0	0	0	0	0	386.5	836.9	635.3	517.2	139.8
Mean	14.8	0	0	0	0	0	0	12.5	27.9	20.5	16.7	4.66
Ac-ft	910	0	0	0	0	0	0	767	1,660	1,260	1,030	277

Calendar year 1960: Max 155 Min 0 Mean 20.3 Ac-ft 14,760

Water year 1960-61: Max 44 Min 0 Mean 8.15 Ac-ft 5,900

* Discharge measurement or observation of no flow made on this day.

ARKANSAS RIVER BASIN

7-2070. Cimarron Creek near Cimarron, N. Mex.

Location.--Lat 36°31'00", long 104°58'35", about sec.6,T.26 N., R.19 E. (projected), in Maxwell Grant, on right bank 3.8 miles west of Cimarron.

Drainage area.--294 sq mi.

Records available.--May 1950 to September 1961. Prior to October 1952, published as Cimarron River near Cimarron.

Gage.--Water-stage recorder. Datum of gage is 6,599.58 ft above mean sea level, datum of 1929.

Average discharge.--11 years, 19.4 cfs (14,050 acre-ft per year).

Extremes.--Maximum discharge during year, 160 cfs Oct. 17 (gage height, 1.90 ft); minimum daily, 1.5 cfs Jan. 27-30.
1950-61: Maximum discharge, 580 cfs June 6, 1958 (gage height, 3.10 ft); no flow Sept. 14-30, Oct. 1-10, 1956.

Remarks.--Records good except those for periods of ice effect, which are poor. Flow regulated by Eagle Nest Reservoir (capacity, 79,120 acre-ft). Diversions above station for irrigation of about 3,500 acres, part of which is below station. Cimarroncito ditch (locally known as Philmont ditch) diverts from left bank $1\frac{1}{2}$ miles above station, flumes under creek $\frac{3}{4}$ mile above and bypasses station for off-channel storage and irrigation below. See table below for diversion by this ditch.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.4	2.6
.5	3.9
.6	6.0
.7	10
.9	23
1.3	61
1.6	104

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	23	20	*b6	b3	b2	b3.8	10	62	59	37	36	20
2	23	18	b7	b2.5	*b2	*4.3	9.6	68	54	30	47	18
3	23	*17	7.2	b2.5	b2	4.1	*9.6	74	51	29	49	20
4	24	16	8.4	*b3	b2	4.3	11	80	51	27	43	20
5	24	15	b7	b3	b2	4.5	18	82	59	30	34	20
6	24	15	b6	b3.5	b2	b4	20	77	56	29	22	*20
7	*24	15	b5	b3.5	b2	b4	25	70	53	31	*22	19
8	23	18	b5	b3.5	b2	b4	25	65	66	30	22	18
9	20	17	b5	b3.5	b2.3	b4	25	58	69	23	20	18
10	20	17	b4	b3.5	b2.6	b4.5	37	58	62	39	19	17
11	22	16	b4	b3.5	3.2	5.4	40	*62	52	*40	26	17
12	36	15	b6	b3.5	3.3	5.4	40	70	*64	43	45	16
13	38	15	b6	b3.5	3.2	5.6	52	74	60	37	38	15
14	43	15	b6	b3.5	*b2.7	5.4	47	71	59	25	37	15
15	46	15	b6	b3.5	b2.7	*5.8	41	71	64	25	31	15
16	54	b13	b4.5	b3.5	b2.8	6.8	40	66	64	21	28	14
17	101	14	b4.5	b3.5	3.0	8.4	42	65	60	17	25	11
18	74	b13	b5	b3	b2.8	8.4	47	68	46	29	25	10
19	38	12	b5	b2.5	b2.7	8.4	52	69	57	31	25	12
20	36	12	b4	b2.5	b2.9	b7	70	74	59	29	22	12
21	*34	b11	b3.5	b2.5	b3	7.2	74	75	58	29	23	11
22	36	11	b3.5	b3	b3	6.8	71	80	58	29	34	10
23	38	b10	b4	b3	b3	7.2	71	75	60	28	31	9.6
24	40	b10	b5	b3	b2.5	8.0	73	71	51	26	28	9.6
25	41	10	b5	b2.5	b3.5	9.2	*68	*68	36	26	28	8.8
26	38	9.6	b5	b2	b3.5	9.6	61	69	40	25	25	8.4
27	39	10	b4	b1.5	b3	*9.2	53	68	39	18	25	8.0
28	36	b10	b3	b1.5	b3.5	10	51	66	38	15	25	8.0
29	31	b8	b3	b1.5	-	11	51	65	40	14	23	6.8
30	27	b7	b3	b1.5	-----	11	56	64	38	16	22	6.4
31	23	-----	b3	b2	-----	9.6	-----	62	-----	33	21	-----
Total	1,099	404.6	153.6	88.0	75.2	206.9	1,290.2	2,147	1,623	861	901	413.6
Mean	35.5	13.5	4.95	2.84	2.69	6.67	43.0	69.3	54.1	27.8	29.1	13.8
Ac-ft	2,180	803	305	175	149	410	2,560	4,260	3,220	1,710	1,790	820
(†)	0	0	0	0	0	0	0	0	58	254	89	0

Calendar year 1960: Max 151 Min 0.4 Mean 25.8 Ac-ft 18,690

Water year 1960-61: Max 101 Min 1.5 Mean 25.4 Ac-ft 18,380

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

† Diversion, in acre-feet, by Cimarroncito ditch which bypasses station.

7-2075. Ponil Creek near Cimarron, N. Mex.

Location.-- Lat 36°34'35", long 104°56'55", about sec.8, T.27 N., R.19 E. (projected), on left bank 1½ miles downstream from confluence of Middle and North Ponil Creeks and 5 miles northwest of Cimarron.

Drainage area.--171 sq mi.

Records available.--November 1915 to June 1919, August 1919 to July 1925, September 1925, September 1927 to July 1929, May 1950 to September 1961. Prior to May 1950 monthly discharge only, published in WSP 1311.

Gage.--Water-stage recorder. Altitude of gage is 6,670 ft (from topographic map). Prior to May 8, 1922, at site about an eighth of a mile downstream at different datum. May 8, 1922, to Aug. 8, 1929, at site about three-eighths of a mile upstream at different datum.

Average discharge.--22 years (1915-25, 1927-28, 1950-61), 13.4 cfs (9,700 acre-ft per year).

Extremes.--Maximum discharge during year, 1,460 cfs Aug. 22, from rating curve extended above 150 cfs on basis of slope-area measurements at gage heights 4.55, 5.80, and 7.15 ft; maximum gage height, 5.90 ft July 7; minimum daily discharge, 0.3 cfs Oct. 2-3, 7-10.

1915-29, 1950-61: Maximum discharge, about 5,200 cfs (estimate by State engineer) Aug. 8, 1929, when gage was washed out; no flow at times.

Flood in September 1948 reached a stage of about 7 ft, from floodmarks (discharge, about 1,900 cfs).

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of 200 to 300 acres above station. Diversions 1,000 ft below station for irrigation of about 300 acres (about 1,200 acres total irrigated from Ponil Creek).

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 11 to May 30, July 7 to Sept. 30)

1.5	0.3	1.7	2.2	1.9	7.5	2.2	26	3.0	135
1.6	.9	1.8	4.3	2.0	12	2.5	57	3.5	235

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		25	*7.2	b2.5	a4	b3	9.8	*122	40	25	86	33
2	0.4	22	6.9	b2	a4	*3.9	9.3	137	37	17	47	29
3	3	*20	4.6	b2	a4	4.1	13	141	35	12	52	36
4	3	18	4.9	*b2	a3	4.1	24	139	34	12	42	38
5	4	17	b4	b2	a2	4.1	44	130	30	9.3	35	36
6	4	17	b3	b2.5	a2	b3	45	110	29	8.4	24	*33
7	*3	18	b3	b2.5	a2	b3	49	98	26	122	*17	30
8	3	23	b3	b2.5	a2	b3	43	84	24	78	15	27
9	3	21	b3	b2.5	a2	b3	34	71	26	35	15	27
10	3	18	b3	b2.5	*a3	b3.5	*46	69	23	*20	12	24
11	4	16	b4	b2.5	b4	b4	56	*80	22	20	96	24
12	4	14	b4	b2.5	b3	4.9	51	95	*20	19	77	22
13	4	13	b4	b2.5	b1.5	5.3	81	103	17	16	64	20
14	7.6	12	b4	b2.5	b1	5.9	80	92	17	20	58	20
15	3.7	10	b4	b2.5	b1.5	*7.2	69	76	29	18	53	31
16	15	7.5	*b3.5	b2.5	b2	9.3	73	64	30	16	56	24
17	65	7.2	b3.5	b2.5	b2	10	94	60	47	10	50	20
18	85	6.9	b4	b2.5	b2	9.3	117	60	30	12	113	20
19	36	7.2	b4.5	b2	b2	7.5	144	64	24	12	90	25
20	28	6.2	b3.5	b2	b2	6.9	194	67	27	9.3	61	23
21	*23	6.2	b3	b2	b2	7.5	182	69	25	22	46	20
22	32	5.3	b3	b2.5	b2	6.5	166	65	18	15	158	17
23	42	5.3	b3	b2.5	b2	7.5	160	62	21	8.4	105	17
24	50	7.2	b4	b2.5	b1.5	9.8	148	58	21	6.5	*62	16
25	51	5.3	b4	b2	b2	13	*124	*55	19	5.6	76	15
26	49	5.3	b3.5	b1	b2	13	108	62	16	4.6	60	14
27	55	4.9	b3	a.5	b1.5	*11	90	62	14	8.7	94	13
28	56	4.6	b2.5	a.5	b2	13	84	56	12	8.0	80	13
29	49	4.9	b2.5	a.5	b2	8.8	92	53	12	4.6	52	12
30	37	7.2	b2.5	a1.5	-----	11	107	49	11	3.9	42	12
31	30	-----	b2.5	a2.5	-----	8.4	-----	44	-----	12	38	-----
Total	718.9	355.2	115.1	65.0	64.0	214.5	2537.1	2497	736	590.3	1798.6	691
Mean	23.2	11.8	3.71	2.10	2.29	6.92	84.6	80.5	24.5	19.0	58.0	23.0
Ac-ft	1,430	705	228	129	127	425	5,030	4,950	1,460	1,170	3,570	1,370

Calendar year 1960: Max 85 Min 0 Mean 7.26 Ac-ft 5,280
Water year 1960-61: Max 194 Min 0.3 Mean 28.4 Ac-ft 20,590

Peak discharge (base, 200 cfs, revised)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
4-20	10p.m.	3.62	208	8-18	3:15p.m.	4.00	483
7-7	3:30p.m.	5.90	1,220	8-22	8p.m.	5.83	1,460
8-2	5p.m.	3.22	246	8-27	8:15p.m.	3.40	263
8-11	7:10p.m.	5.65	1,310				

* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

7-2085. Rayado Creek at Sauble Ranch, near Cimarron, N. Mex.

Location.--Lat 36°22', long 104°58', in sec.30, T.25 N., R.19 E. (projected), in Maxwell Grant, on left bank at Sauble Ranch, 10 miles southwest of Cimarron and 16 miles upstream from mouth.

Drainage area.--65 sq mi.

Records available.--June to October 1908 (discharge measurements only), January 1909 to January 1910, July and August 1910, May 1911 to May 1913, July 1913 to February 1915, October 1915 to September 1918, March 1919 to September 1920, June 1923 to September 1924, March to May 1927, August 1927 to September 1961. Monthly discharge only for some periods, published in WSP 1311. Records for April and May 1910, as published in WSP 287, are unreliable and should not be used. Published as "at," "near," or "above Abreu's Ranch near Cimarron" prior to October 1925 and as Rayado River at Sauble Ranch, near Cimarron, October 1925 to September 1952.

Gage.--Water-stage recorder. Altitude of gage is 6,880 ft (from topographic map). Prior to May 4, 1911, chain or staff gage at site about 2 miles downstream at different datum, May 4, 1911, to Sept. 8, 1925, water-stage recorder about 3 miles upstream at 2 sites within 100 ft at 3 different datums. Sept. 9, 1925, to July 16, 1934, water-stage recorder at site 700 ft upstream at different datum.

Average discharge.--42 years (1911-12, 1913-14, 1915-20, 1923-24, 1927-61), 14.3 cfs (10,350 acre-ft per year).

Extremes.--Maximum discharge during year, 409 cfs Apr. 19 (gage height, 4.08 ft); minimum daily, 2 cfs Jan. 26-28.

1909-12, 1913-61: Maximum discharge, about 850 cfs Apr. 23, 1942 (gage height, 4.94 ft), from rating curve extended above 190 cfs by logarithmic plotting; minimum daily, 0.4 cfs Nov. 16, 1956.

The major flood of June 10, 1913, destroyed the gage (maximum stage or discharge not determined). Another major flood probably occurred Sept. 29 or 30, 1904.

Remarks.--Records fair except those for periods of ice effect, which are poor.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 4

Apr. 4 to Sept. 30

Note.--Same as preceding table below 2.2

1.8	1.8	2.0	7.5	2.2	19	2.2	18	2.9	90
1.9	4.1	2.1	12	2.4	38	2.5	42	3.3	166

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.2	1.6	b7	*b3	b4	b3	1.0	84	31	11	6.8	24
2	3.0	1.4	b7	b3	b4	3.4	1.1	90	28	11	21	20
3	3.0	1.2	5.8	b3	b4	3.6	1.7	89	27	14	26	27
4	3.0	1.2	b5	b3.5	b4	4.1	4.7	93	26	9.8	22	35
5	3.0	1.2	b4.5	b4	b3	3.9	3.7	87	24	8.8	20	34
6	2.8	1.2	b3.5	b4	b3	b3.5	2.9	7.9	2.2	1.2	2.0	24
7	2.8	1.6	b3.5	b4	b3	b3.5	2.9	7.4	2.2	2.6	1.4	20
8	2.8	1.6	b3.5	b4	b3	b3.5	2.3	6.8	2.0	1.9	1.1	17
9	3.0	1.4	b3.5	*b4	b3	b3.5	2.3	5.9	2.0	2.3	1.1	16
10	3.0	1.2	b4	b4	b3.5	b4	*2.4	5.4	1.9	*1.7	9.8	17
11	3.0	1.0	b5	b4	4.1	4.8	2.4	*5.6	1.8	1.5	3.1	17
12	*2.8	1.0	5.8	b4	4.1	5.1	2.5	6.0	1.7	1.3	5.0	18
13	2.8	9.5	b5.5	b4	4.1	5.5	2.8	6.8	*1.6	1.1	5.7	14
14	3.0	*9.0	*5.5	b4	*b3.5	6.8	2.7	7.2	1.5	1.0	5.7	13
15	4.4	7.5	b5.5	b4	b3.5	*8.5	2.7	6.5	1.7	1.1	8.0	12
16	5.5	5.8	b4.5	b4	b3.5	1.1	2.7	5.3	1.9	1.3	*9.8	17
17	1.1	7.5	b4.5	b4	b3.5	1.0	3.7	5.0	2.3	9.8	11.9	14
18	1.4	6.8	b4.5	b4	b3.5	b8	7.0	5.0	1.7	9.3	11.5	16
19	1.2	6.8	4.8	b3.5	b3.5	b6	16.4	4.9	1.5	8.8	7.0	5.0
20	1.2	6.5	b4.5	b3.5	b3.5	b6	14.8	5.0	1.7	8.4	5.0	3.1
21	*1.3	6.5	b3.5	b3.5	b3.5	6.5	*12.5	5.0	1.5	8.4	4.1	*2.2
22	1.6	5.5	b3.5	b4	b3.5	7.5	12.9	5.0	1.3	8.0	4.6	1.8
23	1.9	6.8	b3.5	b4	b3.5	1.1	13.3	4.8	1.3	7.2	7.3	1.9
24	2.2	5.8	b4	b3	b3	*2.1	11.9	4.6	1.2	6.8	9.0	1.7
25	2.5	5.8	4.1	b2.5	b4	2.3	9.5	4.4	1.2	6.5	6.2	1.6
26	2.6	6.1	b4	b2	b4	1.5	8.2	*5.0	1.2	6.1	6.2	1.5
27	2.8	5.8	*b3.5	b2	b3.5	1.1	6.9	4.3	1.1	6.8	5.6	1.5
28	*2.9	b4.5	b3	b2	*b3	1.2	*7.0	3.8	1.1	8.0	4.5	1.4
29	2.5	b4	b3	b2.5	-	1.2	7.4	3.6	1.0	6.1	3.6	*1.4
30	2.1	*b6	b3	b3.5	-----	1.2	7.9	3.4	*9.8	6.1	3.1	1.3
31	1.8	-----	b3	*b4	-----	*1.3	-----	3.2	-----	*6.1	*2.8	-----
Total	342.1	272.2	135.5	108.5	99.3	251.7	180.2	182.1	531.8	337.0	1458.6	599
Mean	11.0	9.07	4.37	3.50	3.55	8.12	60.1	58.7	17.7	10.9	47.1	20.0
Ac-ft	679	540	269	215	197	499	3,570	3,610	1,050	668	2,890	1,190

Calendar year 1960: Max 42 Min 2 Mean 9.18 Ac-ft 6,650
 Water year 1960-61: Max 164 Min 2 Mean 21.3 Ac-ft 15,380

Peak discharge (base, 100 cfs)

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
4-19	7:30 p.m.	4.08	409	8-17	5:05 p.m.	3.41	186
8-11	8:45 p.m.	3.28	159	8-23	9 p.m.	3.51	215

ARKANSAS RIVER BASIN

19

7-2110. Cimarron Creek at Springer, N. Mex.

Location.--Lat 36°21'30", long 104°35'50", in southeast corner of Maxwell Grant, on left bank at Springer, Colfax County, 270 ft downstream from highway bridge, 6 miles downstream from Rayado Creek, and 6 miles upstream from mouth.

Drainage area.--1,032 sq mi.

Records available.--August 1907 to December 1909, January 1921 to February 1922, October 1924 to January 1926, September 1926 to September 1961. Prior to October 1952, published as Cimarron River at Springer.

Gage.--Water-stage recorder. Concrete control since Nov. 5, 1954. Altitude of gage is 5,770 ft (from nearby level line). July 13, 1907, to Dec. 31, 1909, staff gage and Dec. 20, 1919, to Feb. 8, 1930, chain gages at site 270 ft upstream at various datums to Nov. 19, 1924, and thereafter at datum 3.34 ft higher than present datum. Feb. 9, 1930, to July 12, 1934, water-stage recorder at site 270 ft upstream at datum 3.66 ft higher. July 13, 1934, to Apr. 13, 1942, water-stage recorder at site 30 ft downstream at different datum. May 8 to July 16, 1942, water-stage recorder at site 270 ft upstream at datum 3.33 ft lower.

Average discharge.--37 years (1920-21, 1924-25, 1926-61), 18.1 cfs (13,100 acre-ft per year).

Extremes.--Maximum discharge during year, 796 cfs Aug. 23 (gage height, 6.22 ft); minimum daily, 1.8 cfs Oct. 12-14.

1930-61: Maximum discharge, 6,250 cfs June 6, 1958 (gage height, 10.55 ft), from rating curve extended above 1,300 cfs on basis of slope-area measurement of peak flow; no flow at times in 1954, 1956-57.

Maximum stage known, about 22 ft Sept. 29, 1904 (backwater from debris on railroad bridge). Another major flood occurred June 11, 1913. Maximum discharge of these floods probably exceeded 10,000 cfs.

Remarks.--Records good except those for periods of ice effect, which are poor. Flow partly regulated by Eagle Nest Reservoir (see p. 14). Diversions for irrigation of about 23,000 acres above station and a few hundred acres between station and mouth.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

3.4	1.7	3.7	17	4.5	157
3.5	4.5	3.9	40	5.0	290
3.6	9.7	4.2	90	5.5	456

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.5	5.4	3.8	b2.5	b4	9.2	7.4	*193	14	4.1	5.4	107
2	3.8	*4.9	4.1	b2.5	b4	*9.7	6.8	143	12	3.8	6.8	94
3	4.1	4.9	4.1	b2.5	b4	9.7	6.3	192	9.7	3.4	6.3	92
4	4.5	5.4	4.5	b2.5	b4.5	9.2	5.8	220	10	3.1	*6.3	105
5	4.1	4.9	b4	*b2.5	b4	8.5	9.2	276	13	2.8	6.8	*111
6	3.1	4.9	b3.5	b3	b3	7.4	12	204	10	3.1	5.8	105
7	2.8	4.9	b3.5	b3.5	b2.5	6.8	21	202	9.2	4.1	4.1	84
8	2.3	4.9	b3.5	b3.5	b2.5	5.4	25	167	9.7	5.5	3.4	77
9	2.0	4.9	b3.5	b3.5	b3	6.3	22	138	8.5	17	3.4	69
10	2.0	4.9	b3	b3.5	b3.5	6.3	18	105	7.4	6.3	3.4	69
11	2.0	4.9	b4.5	b3.5	b6	6.3	22	90	8.5	40	5.1	69
12	1.8	4.9	7.4	b3.5	b10	6.3	27	33	7.4	*36	8.0	69
13	1.8	4.5	*7.4	b3.5	b20	5.8	27	36	*5.8	20	9.7	63
14	1.8	4.5	b7	b3.5	b20	5.8	32	95	5.8	13	14	58
15	4.9	4.5	b5.5	b3.5	*b20	5.4	33	94	10	12	20	59
16	16	4.9	b4	b3.5	b20	6.3	32	73	12	6.8	22	59
17	86	6.3	b3	b3.5	b20	7.4	*32	42	17	4.5	36	52
18	353	4.9	b4.5	b3.5	b15	8.5	36	24	16	3.8	111	47
19	56	4.5	b4.5	b3.5	b11	8.5	65	25	14	3.1	64	63
20	23	4.5	b4.5	b3.5	b9.5	8.5	114	24	11	3.4	48	73
21	15	4.5	b4	b4	b9.5	8.0	172	23	8.5	8.0	44	50
22	11	4.9	b4	b4	9.7	8.0	349	24	6.8	9.7	96	50
23	9.2	4.9	b4	b4	9.2	8.0	352	38	6.3	7.4	*406	52
24	8.5	4.9	b4	b4	b8.5	8.5	*346	30	6.3	5.4	192	52
25	8.5	4.9	b4	b3.5	b8	8.0	302	25	8.5	3.4	182	48
26	8.0	4.9	b4	b3.5	9.7	6.8	247	25	8.0	2.8	200	41
27	6.8	4.9	b3	b3.5	b8	5.8	194	25	5.4	2.5	170	36
28	6.3	4.5	3	b3	b7	5.8	140	23	4.9	2.3	174	25
29	6.8	4.1	3	b3	-	6.8	107	23	5.8	2.0	172	17
30	6.3	4.5	b3	b3	-----	8.0	157	20	4.5	2.0	131	15
31	5.8	-----	b3	b3.5	-----	*8.0	-----	17	-----	2.0	115	-----
Total	669.7	145.4	128.8	103.5	256.1	229.0	2919.5	2649	276.0	243.3	2271.5	1911
Mean	21.6	4.85	4.15	3.34	9.15	7.39	97.3	85.5	9.20	7.85	73.3	63.7
Ac-ft	1,330	288	255	205	508	454	5,790	5,250	547	483	4,510	3,790

Calendar year 1960: Max 353 Min 1.1 Mean 5.08 Ac-ft 3,690

Water year 1960-61: Max 406 Min 1.8 Mean 32.3 Ac-ft 23,410

Peak discharge (base, 500 cfs). --Oct. 18 (2:45 a.m.) 547 cfs (5.73 ft); Aug. 23 (6:45 a.m.) 796 cfs (6.22 ft).

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

ARKANSAS RIVER BASIN

7-2140. Canadian River near Roy, N. Mex.

Location.--Lat 35°55'10", long 104°21'10", in E $\frac{1}{2}$ sec.35, T.20 N., R.24 E., on right bank 1,080 ft upstream from bridge on State Highway 120 and 9 miles west of Roy.

Drainage area.--4,066 sq mi, of which 107 sq mi is probably noncontributing.

Records available.--April 1936 to September 1961. Monthly discharge only for April 1936, published in WSP 1311.

Gage.--Water-stage recorder. Datum of gage is 4,892.55 ft above mean sea level (levels by Corps of Engineers). Prior to Oct. 9, 1942, Jan. 5, 1943, to Jan. 20, 1945, and Aug. 6, 1945, to Apr. 30, 1946, at site 1,080 ft downstream at datum 0.39 ft higher. Oct. 10, 1942, to Jan. 4, 1943, Jan. 21 to Aug. 5, 1945, and May 1, 1946, to Sept. 30, 1958, at present site at datum 1.00 ft higher.

Average discharge.--25 years, 136 cfs (98,460 acre-ft per year).

Extremes.--Maximum discharge during year, 4,170 cfs July 21 (gage height, 7.37 ft); minimum daily, 4.9 cfs Oct. 13-14.
1936-61: Maximum discharge, 63,800 cfs Apr. 23, 1942 (gage height, 14.22 ft, former site and datum); no flow at times.
Maximum flood known occurred Sept. 29 or 30, 1904, when peak near Taylor Springs was computed as 91,100 cfs (see WSP 842, 847).

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of about 30,000 acres above station.

Rating tables, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Feb. 13

Feb. 13 to Sept. 30

1.0	3.5	1.6	53	0.9	3.5	1.2	17	2.5	233	5.0	1,540
1.1	7.0	2.0	119	1.0	6.5	1.5	45	3.0	383	6.0	2,460
1.3	21			1.1	11	2.0	119	4.0	850		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12	45	20	b10	b10	79	39	166	23	5.6	9.6	163
2	24	42	20	b9	b10	110	37	199	20	5.6	304	141
3	31	40	24	b9	b10	378	33	163	17	8.3	822	123
4	23	38	29	b9	b10	173	30	192	15	12	394	119
5	17	34	34	b10	b9	87	31	216	*13	28	352	146
6	14	32	b25	b10	b8	68	*34	273	29	16	278	143
7	12	32	b20	b10	b8	57	52	216	20	*12	135	135
8	10	32	b15	b10	b8	50	77	209	17	231	84	115
9	9.0	32	b12	b10	b10	44	99	187	16	154	67	103
10	7.6	31	b10	b10	b15	39	87	*161	13	397	60	95
11	6.6	31	b15	b10	b20	38	75	131	16	325	53	214
12	5.6	32	b20	b10	b30	35	81	115	11	258	60	474
13	*4.9	31	b30	b10	293	35	139	74	9.2	615	178	172
14	4.9	29	b30	b10	863	34	117	51	8.8	436	250	110
15	14	28	b25	b10	732	34	152	64	41	234	1,080	88
16	97	26	b25	b10	903	33	141	121	74	131	4+4	78
17	1,430	25	b20	b10	*1,250	36	125	91	56	77	195	74
18	1,840	22	b20	b10	816	42	137	81	39	68	257	78
19	834	24	b15	b9	695	50	110	53	32	63	772	334
20	322	24	b15	b9	309	51	119	45	25	55	366	*365
21	173	23	*b15	b9	313	47	192	41	*19	695	200	163
22	133	24	b15	b10	401	43	268	40	15	942	180	121
23	114	24	b15	b10	375	39	420	46	12	232	*210	84
24	99	24	b15	b10	129	33	405	42	18	115	452	74
25	*89	*22	b13	b10	71	32	*383	52	14	90	284	67
26	79	25	b10	b8	85	29	334	49	9.2	60	345	63
27	73	26	b10	*b7	108	27	273	42	13	*31	284	58
28	65	26	b10	b7	*85	27	221	41	14	21	605	52
29	58	25	b10	b8	-	30	178	40	11	15	413	49
30	52	21	b10	b9	-----	34	135	36	7.4	11	259	40
31	47	-----	b10	b10	-----	37	-----	31	-----	9.2	192	-----
Total	5,700.6	870	557	293	7,576	1,851	4,524	3,268	6,276	5,352.7	9,584.6	4,041
Mean	184	29.0	18.0	9.5	271	59.7	151	105	20.9	173	309	135
Ac-ft	11,310	1,730	1,100	581	15,030	3,670	8,970	6,480	1,240	10,620	19,010	8,020

Calendar year 1960: Max 1,920 Min 0.3 Mean 64.5 Ac-ft 46,810

Water year 1960-61: Max 1,840 Min 4.9 Mean 121 Ac-ft 87,760

Peak discharge (base, 4,000 cfs). --July 21 (8:30 p.m.) 4,170 cfs (7.37 ft).

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

7-2145. Rio Agua Negra near Holman, N. Mex.

Location.--Lat 36°07'00", long 105°22'35", on right bank 150 ft upstream from bridge, 2½ miles south of Chacon, 4½ miles downstream from confluence of Luna and Lujan Creeks, 5.0 miles north of Holman, and 8½ miles southwest of Guadalupita, Mora County.

Drainage area.--57 sq mi.

Records available.--January 1953 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 7,876 ft (by barometer).

Average discharge.--8 years, 13.4 cfs (9,700 acre-ft per year).

Extremes.--Maximum discharge during year, 2,000 cfs Aug. 24 (gage height, 4.83 ft), from rating curve extended above 300 cfs as explained below; minimum daily, 1.4 cfs Oct. 2, 6.

1953-61: Maximum discharge, 4,700 cfs July 22, 1954 (gage height, 6.10 ft), from rating curve extended above 300 cfs on basis of slope-area measurement of peak flow; minimum daily, 0.1 cfs July 18, 1954, Sept. 21, 1956.

Remarks.--Records good except those for periods of ice effect or doubtful or no gage-height record, which are poor. Diversions for irrigation of about 1,600 acres above station.

Rating tables, except periods of ice effect or doubtful gage-height record (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Jan. 28

Jan. 29 to Sept. 30

0.9	1.1	1.2	12	0.9	3.6	1.3	21	2.0	113
1.0	3.3	1.3	18	1.0	6.3	1.5	39	2.5	225
1.1	7.1			1.1	10	1.7	65	3.0	390

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.3	1.1	b5	b8	b6	b6	1.4	8.9	2.9	1.4	3.1	5.7
2	1.4	1.1	6.7	b7	b6	b8	1.4	9.2	2.8	2.1	*3.5	5.0
3	1.6	1.0	7.1	b7	b5	9.3	1.6	*9.5	2.7	1.7	4.1	6.4
4	*2.0	9.7	b5	b7	b5	9.3	2.0	9.0	2.6	1.3	3.2	5.8
5	2.3	1.0	b4	b6	b5	8.2	*2.8	8.5	2.4	1.2	3.1	4.7
6	1.4	1.0	b3.5	b5	b5	b8	2.6	7.2	2.2	*1.3	2.6	4.1
7	1.8	1.1	*b4	b5	b5	b8	d2.5	6.5	2.2	2.1	2.1	3.6
8	2.3	1.1	a4	b5	*b5	*b1.0	d2.4	5.8	*2.1	1.6	2.0	3.2
9	2.8	1.0	a4	b5	b5	b1.0	d2.5	4.9	2.0	1.6	2.0	3.1
10	3.0	a9	a4	b4	b5	b1.0	d2.7	4.5	1.9	1.4	2.1	2.8
11	3.0	a8	a5	*b5	b6	1.0	d2.8	4.6	1.8	1.3	2.1	2.7
12	2.8	a7	a6	b5	b6	1.0	d2.7	5.2	1.7	1.3	2.7	*2.6
13	3.0	a6	a6	b5	b6	1.1	d3.3	5.7	1.6	1.3	3.1	2.3
14	4.1	a6	a6	b5	b6	1.1	d3.2	5.0	1.5	1.2	5.2	2.2
15	7.1	a5.5	a6	b5	b6	1.2	d2.9	4.3	1.7	1.3	7.1	2.7
16	7.1	*b5	a6	b5	b6	1.2	d3.2	3.7	1.8	1.2	7.8	2.3
17	9.2	b5	a6	b5	b6	1.2	d3.7	3.5	1.7	1.2	10.0	2.1
18	9.7	b5	a6	b5	b6	1.1	d4.7	3.4	2.4	1.1	12.8	2.3
19	*9.2	b5	a6	b5	b6	1.0	*6.5	3.3	2.7	*1.1	11.1	3.6
20	9.2	b5	a6	b5.5	*b6	9.7	8.9	3.5	2.5	1.1	8.9	3.5
21	9.7	b5	a6	b5.5	b6	9.7	9.5	3.6	2.2	1.1	11.1	2.7
22	1.1	b5	a7	b5.5	b6	*1.1	10.2	3.6	2.0	9.3	*13.0	2.3
23	1.2	b5	a8	b5.5	6.3	1.2	11.3	*3.5	1.9	9.7	17.4	2.3
24	1.4	b5	*b8	b5.5	b6	1.4	11.5	3.5	1.8	9.7	3.0	2.0
25	1.4	b5	b8	*b5.5	b6	1.4	10.6	3.5	1.6	9.3	23.0	2.0
26	1.4	b5	b9	b5	b6	1.3	9.0	3.7	1.5	9.0	16.8	*1.9
27	1.4	b4	b9	b5	b6	1.2	7.9	3.5	1.4	9.7	12.9	1.8
28	1.5	b4	b9	b5	b6	1.4	7.5	3.4	1.4	9.7	10.4	1.7
29	1.4	b5	b9	b5	-	1.4	7.6	3.4	1.3	9.0	8.5	1.7
30	1.2	b5	b9	b6	-----	1.4	8.4	3.3	1.3	8.6	7.5	1.5
31	1.1	-----	b9	b6	-----	1.3	-----	3.1	-----	1.0	6.6	-----
Total	226.0	208.2	197.3	169.0	160.3	336.2	157.3	154.3	59.6	383.0	258.8	90.6
Mean	7.29	6.94	6.36	5.45	5.72	10.8	52.4	49.8	19.9	12.4	83.5	30.2
Ac-ft	448	413	391	335	318	667	3,120	3,060	1,180	760	5,130	1,800

Calendar year 1960: Max 63 Min 1.4 Mean 9.51 Ac-ft 6,900
 Water year 1960-61: Max 330 Min 1.4 Mean 24.3 Ac-ft 17,620

Peak discharge (base, 150 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
8-2	12:45p.m.	2.49	225	8-21	8:45p.m.	2.73	297
8-14	7p.m.	2.19	153	8-24	3:45p.m.	4.83	2,000
8-18	2p.m.	2.63	267				

* Discharge measurement made on this day.
 a No gage-height record.
 b Stage-discharge relation affected by ice.
 d Doubtful gage-height record.

ARKANSAS RIVER BASIN

7-2146. Vigil Canyon near Holman, N. Mex.

Location.--Lat 36°02'50", long 105°24'10", in Mora Grant, on right bank 1½ miles northwest of Holman, Mora County.Drainage area.--2.8 sq mi.Records available.--May 1956 to September 1961.Gage.--Water-stage recorder. Concrete control since September 1956. Altitude of gage is 7,840 ft (by barometer).Average discharge.--5 years, 2.02 cfs (14,620 acre-ft per year).Extremes.--Maximum discharge during year, 26 cfs Aug. 18 (gage height, 2.98 ft); minimum daily, 0.1 cfs for many days.

1956-61: Maximum discharge, 87 cfs June 6, 1958 (gage height, 3.43 ft), from rating curve extended above 13 cfs by logarithmic plotting; no flow at times.

Remarks.--Records good except those for periods of ice effect, which are poor. Large percentage of flow is transmountain diversion from Rio Pueblo. Little natural flow except during local storms or snowmelt.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.5	0.1	2.0	4.5
1.6	.3	2.2	8.4
1.7	.8	2.6	17
1.8	1.7		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.2	1.3	b.5	b.6	0.1	0.1	1.1	1.8	3.6	7.0	3.9	5.8
2	.2	1.3	.5	b.4	.1	.1	1.1	1.7	5.1	7.4	*4.3	5.3
3	.1	1.3	.3	b.4	.1	.2	1.4	*1.7	1.2	6.8	6.2	6.0
4	*.1	1.2	.1	b.5	.1	.2	1.6	1.7	1.0	6.0	5.1	5.8
5	.1	1.2	b.1	b.5	.1	.1	*1.9	1.6	1.0	5.3	5.1	5.4
6	.1	1.2	b.1	.4	.1	.1	2.2	1.6	.9	*5.3	3.7	4.7
7	.1	1.4	b.1	.2	.1	.1	2.2	1.6	1.7	8.4	3.1	4.5
8	.1	1.4	*.3	.1	*.1	*.1	1.9	2.5	*5.8	8.6	2.8	4.2
9	.1	1.2	.3	.2	.1	.2	1.9	4.9	6.0	7.6	2.4	4.0
10	.1	1.0	.3	.2	.1	.3	2.6	5.3	7.0	6.6	2.0	4.0
11	.1	1.0	.4	*.1	.1	.3	2.6	6.6	7.6	5.8	2.0	3.7
12	.1	1.0	.3	.1	.1	.3	2.7	9.4	7.4	5.6	2.2	*3.6
13	.1	1.0	.3	.1	.1	.3	2.8	10	7.0	5.1	2.0	3.1
14	.2	.9	.3	.1	.1	.4	2.7	9.2	8.4	4.2	3.0	2.8
15	.9	b.6	.3	.1	.2	.5	2.6	8.6	10	3.9	4.2	2.7
16	2.3	* b.4	.4	.1	.2	.5	2.7	8.2	11	3.3	6.6	2.7
17	4.5	b.4	.5	.1	.2	.5	2.8	8.8	9.0	3.0	1.1	2.4
18	3.1	b.4	.5	.1	.2	.5	3.3	8.6	8.6	2.8	1.5	2.6
19	.6	b.4	.5	.1	.2	.5	*4.9	8.8	8.2	*2.7	1.4	3.4
20	.7	b.4	.5	.1	*.1	.4	7.9	9.8	8.0	2.6	1.3	3.6
21	.8	b.4	.5	.1	.2	.5	8.0	11	8.4	3.0	1.1	3.1
22	.8	b.4	.5	.1	.2	*.5	8.8	11	10	2.5	*9.2	2.7
23	.9	b.4	*.4	.1	.1	.5	9.2	*9.0	9.6	1.0	1.3	2.4
24	1.3	b.4	.3	.1	.1	.7	9.0	5.6	8.8	.8	1.1	2.3
25	1.0	b.4	.3	*.1	.2	.7	8.2	3.7	8.8	.6	1.0	2.3
26	1.2	b.3	.3	.1	.1	.8	5.4	3.7	7.6	.6	1.0	*2.0
27	1.6	b.2	.4	.1	.1	.7	2.7	3.6	7.0	3.8	9.8	1.9
28	1.8	b.2	.4	.1	.1	.8	2.4	3.6	6.8	3.4	6.8	1.8
29	1.8	b.3	.5	.1	-	.9	2.2	3.1	6.8	2.0	6.2	1.8
30	1.4	b.4	.5	.1	-----	.9	2.0	3.1	6.6	2.0	6.2	1.7
31	1.5	-----	.6	.1	-----	.9	-----	3.3	-----	2.2	6.2	-----
Total	27.9	22.4	11.3	5.6	3.6	13.6	110.8	173.1	198.9	129.9	211.0	102.3
Mean	0.90	0.75	0.36	0.18	0.13	0.44	3.69	5.58	6.63	4.19	6.81	3.41
Ac-ft	55	44	22	11	7.1	27	220	343	395	258	419	203

Calendar year 1960: Max 14 Min 0.1 Mean 2.30 Ac-ft 1,670

Water year 1960-61: Max 15 Min 0.1 Mean 2.77 Ac-ft 2,000

Peak discharge (base, 25 cfs).--Aug. 18 (2 p.m.) 26 cfs (2.98 ft).

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

ARKANSAS RIVER BASIN

23

7-2147. Agua Fria Creek near Holman, N. Mex.

Location.--Lat 36°01'25", long 105°24'35", in Mora Grant, on left bank 1 $\frac{3}{4}$ miles southwest of Holman, Mora County.

Drainage area.--9.2 sq mi.

Records available.--May 1956 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 7,850 ft (from topographic map).

Average discharge.--5 years, 6.50 cfs (4,710 acre-ft per year).

Extremes.--Maximum discharge during year, 65 cfs Aug. 18 (gage height, 1.87 ft); minimum daily, 0.6 cfs Jan. 28, 29; stream dry at times above transmountain diversion.

1956-61: Maximum discharge, 138 cfs Aug. 6, 1959; maximum gage height, that of Aug. 18, 1961; minimum daily discharge, 0.1 cfs several days in 1956, 1959-60.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Discharge measurements generally made twice a month. Natural flow is supplemented by transmountain diversion which may, at times, supply entire flow. This supplementary flow not otherwise gaged.

Rating tables, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 18-23)

Oct. 1 to Aug. 18

Aug. 19 to Sept. 30

0.8	0.6	1.1	3.4	1.4	12	0.9	2.9	1.2	10	1.5	26
.9	1.2	1.2	5.4	1.6	24	1.0	4.7	1.3	14		
1.0	2.1	1.3	8.2	1.8	46	1.1	7.0	1.4	19		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.3	4.4	b2.1	a1.5	b1.2	b1.0	5.0	26	40	7.6	6.0	1.1
2	1.1	4.4	2.1	a1.5	b1.2	b1.2	5.0	28	41	7.6	7.4	10
3	1.0	4.4	2.0	a1.5	b1.0	b1.2	5.7	27	34	7.6	9.7	10
4	.9	4.4	a1.6	a1.5	b1.0	b1.2	6.8	25	31	6.8	8.6	9.4
5	.8	4.4	a1.4	a1.5	b.8	b1.0	7.6	25	29	6.5	7.8	9.7
6	.8	4.4	a1.2	a1.5	b.8	b1.0	8.6	21	25	6.5	6.2	9.4
7	.7	4.8	a1.2	a1.5	b1.0	b1.0	10	18	17	8.6	5.2	8.8
8	.7	5.0	b1.5	a1.5	b1.1	b1.0	9.7	16	16	8.6	4.8	8.2
9	.7	5.0	b1.5	a1.5	1.2	b1.5	10	12	16	7.6	4.6	8.2
10	.8	4.4	b1.5	a1.5	1.2	b1.5	11	14	16	7.4	4.6	7.6
11	.8	4.2	b1.5	a1.5	1.2	b1.5	12	16	15	6.5	5.0	7.9
12	.8	3.8	b1.5	a1.5	1.2	2.1	12	20	14	6.5	7.9	8.2
13	.8	3.8	b1.5	a1.5	1.2	2.2	12	23	14	6.0	7.1	7.9
14	1.2	4.0	b1.5	a1.5	1.2	2.4	12	18	14	5.4	8.2	7.3
15	1.7	3.6	b1.5	a1.5	b1.0	2.6	12	16	16	5.0	10	6.8
16	1.3	b3.5	b1.5	a1.4	b1.0	2.8	12	14	20	4.8	16	6.8
17	2.5	3.1	b1.5	a1.2	b1.0	2.8	12	15	17	4.4	22	6.5
18	2.4	b3.0	b1.5	a1.2	b1.0	2.8	14	23	16	4.4	26	6.3
19	1.9	2.8	b1.5	a1.0	b.8	2.9	15	36	15	4.0	20	6.8
20	2.2	2.8	b1.5	a1.0	b.8	3.0	23	38	14	3.8	18	7.0
21	2.9	b2.7	b1.5	a1.0	b.8	3.1	33	33	13	3.8	16	6.3
22	4.0	2.6	b1.5	a1.2	b.8	3.3	32	39	12	4.1	16	5.8
23	3.8	b2.5	b1.5	a1.2	b.8	3.4	36	41	11	5.7	21	5.6
24	4.0	2.5	b1.5	a1.0	b.8	3.8	39	40	10	5.4	20	4.9
25	4.2	2.5	b1.5	b1.0	b1.0	4.0	38	38	10	5.0	18	4.9
26	4.4	2.4	b1.5	b.8	b1.0	4.2	36	35	9.3	4.8	18	4.9
27	5.2	2.4	b1.5	b.8	b1.0	4.0	29	33	8.6	6.2	19	4.7
28	5.4	b2.2	b1.5	b.6	b1.0	4.2	22	34	8.2	6.8	14	4.7
29	5.4	b2.1	b1.5	b.6	-	4.6	23	35	7.6	5.2	13	4.5
30	5.0	2.1	b1.5	b.8	-----	4.6	24	38	7.4	5.0	12	4.3
31	4.4	-----	b1.5	b1.0	-----	4.8	-----	41	-----	5.0	11	-----
Total	73.1	104.2	47.6	38.3	28.1	80.7	527.4	838	517.1	182.6	383.1	214.4
Mean	2.36	3.47	1.54	1.24	1.00	2.60	17.6	27.0	17.2	5.89	12.4	7.15
Ac-ft	145	207	94	76	56	160	1,050	1,660	1,030	362	760	425

Calendar year 1960: Max 37 Min 0.1 Mean 5.73 Ac-ft 4,160
Water year 1960-61: Max 41 Min 0.6 Mean 8.31 Ac-ft 6,020

Peak discharge (base, 20 cfs)

a No gage-height record.
b Stage-discharge relation affected by ice.

Date	Time	Gage Height	Discharge	Date	Time	Gage Height	Discharge
4-24	8 a.m.	1.72	40	8-18	1:10 p.m.	1.87	65
5-23	8 p.m.	1.75	46	8-23	1 p.m.	1.54	27
6-15	11 p.m.	1.56	23	8-27	2:30 p.m.	1.71	47
8-5	4 p.m.	1.55	20				

ARKANSAS RIVER BASIN

7-2148. Rio de la Casa near Cleveland, N. Mex.

Location.--Lat 35°58'30", long 105°23'10", in Mora Grant, on left bank 1½ miles southwest of Cleveland.Drainage area.--23 sq mi.Records available.--May 1956 to September 1961.Gage.--Water-stage recorder. Altitude of gage is 7,625 ft (by barometer).Average discharge.--5 years, 17.5 cfs (12,670 acre-ft per year).Extremes.--Maximum discharge during year, 160 cfs Aug. 18 (gage height, 3.20 ft); minimum daily, 3 cfs Jan. 27-30, Feb. 4-10.

1956-61: Maximum discharge, 2,260 cfs Aug. 6, 1959 (gage height, 6.0 ft), from rating curve extended above 200 cfs on basis of slope-area measurement of peak flow; minimum daily, 0.2 cfs Sept. 21, 22, 1956.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Discharge measurements generally made twice a month. Diversions for irrigation of about 100 acres above station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.7	1.4
1.8	3.1
1.9	5.6
2.0	8.9
2.2	18
2.4	32
2.7	64
3.1	134

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.6	20	6.3	b4.5	a3.5	b4	11	49	92	29	11	a35
2	4.1	19	6.3	b4	a3.5	4.6	11	53	91	26	20	a30
3	4.1	19	b6	a4	a3.5	5.1	13	57	84	29	32	a40
4	4.1	19	b6	a4	a3	5.1	18	58	78	23	23	a40
5	3.8	18	b5.5	a4	a3	5.6	26	53	75	22	19	a30
6	3.8	19	b5	a3.5	a3	b5.4	25	44	74	23	16	a25
7	3.6	22	b4.5	a3.5	a3	b5	26	39	72	36	13	a22
8	3.6	22	b4.5	a3.5	a3	b5	22	34	70	32	11	a21
9	3.6	18	b4	a3.5	a3	b5.4	22	34	71	30	10	a20
10	4.4	16	b4	a3.5	a3	5.9	25	40	75	28	11	a19
11	3.8	14	b5	a3.5	a3.5	b5.9	24	53	77	25	17	a18
12	3.8	13	b5	a3.5	a3.5	6.6	22	64	77	25	29	a17
13	3.6	12	b5	a3.5	a3.5	6.6	23	64	78	23	23	15
14	4.1	12	b5	a3.5	a3.5	7.2	20	54	75	21	28	16
15	11	11	b5	a3.5	a3.5	8.9	18	48	99	19	35	16
16	11	9.7	b5	a3.5	a3.5	10	18	46	121	16	64	16
17	16	9.3	b5	a3.5	a3.5	9.7	20	49	94	15	91	14
18	18	8.9	b5	a3.5	a3.5	b7.8	24	54	92	14	71	14
19	16	8.6	b5	a3.5	a3.5	b7.8	32	65	81	14	62	17
20	16	8.6	b5	a3.5	b3.5	b7.8	45	77	75	13	52	16
21	20	7.9	b5	a3.5	b3.5	8.9	46	80	65	13	44	14
22	24	7.9	b5	a3.5	b3.5	10	46	80	59	13	42	13
23	30	b7	b5	a3.5	b3.5	12	47	83	54	11	a90	13
24	38	7.2	b5	a3.5	b3.5	14	45	84	49	10	a110	12
25	39	7.2	b5	a3.5	b3.5	14	39	84	46	10	a100	12
26	40	6.9	b5	a3.5	b3.5	13	34	81	42	9.7	a80	11
27	43	6.9	b5	a3	b3.5	12	30	78	37	10	a70	10
28	40	b6.2	b5	a3	b3.5	11	31	80	34	12	a60	10
29	33	b7	b5	a3	-	11	38	83	31	9.3	a50	10
30	26	b6.2	b5	a3	-----	11	45	88	29	8.6	a45	10
31	22	-----	b5	a3.5	-----	9.8	-----	92	-----	9.7	a40	-----
Total	498.0	369.5	157.1	109.5	94.5	256.1	846	1948	2097	579.3	1369	556
Mean	16.1	12.3	5.07	3.53	3.38	8.26	28.2	62.8	69.9	18.7	44.2	18.5
Ac-ft	988	733	312	217	187	508	1,680	3,860	4,160	1,150	2,720	1,100

Calendar year 1960: Max 179 Min 1.9 Mean 17.8 Ac-ft 12,930
 Water year 1960-61: Max 121 Min 3 Mean 24.3 Ac-ft 17,620

Peak discharge (base, 60 cfs)

a No gage-height record.

b Stage-discharge relation affected by ice.

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
6-15	11:30p.m.	3.19	157	8-24	Unknown	2.89	92
8-18	2:15p.m.	3.20	160				

7-2151. La Cueva Canal below La Cueva, N. Mex.

Location.--Lat 35°56'20", long 105°15'05", in Mora Grant, on right bank 500 ft downstream from head and half a mile west of La Cueva, Mora County.

Records available.--June 1956 to September 1961.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 7,031 ft (by barometer).

Extremes.--1956-61: Maximum daily discharge, 32 cfs Aug. 21, 1957; no flow at times in each year.

Remarks.--Records good except those for December, January, February and August, which are poor. During 1961 a total of 27 discharge measurements and 4 observations of no flow were made on diversion and wasteway. Canal diverts water from left bank of Mora River for irrigation and off-channel storage below La Cueva. Published record represents flow below wasteway half a mile downstream from head of canal. Flow shown is total diversion less flow in wasteway.

Monthly discharge, in cubic feet per second, water year October 1960 to September 1961

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	12	4.3	8.99	553
November.....	13	5.5	10.3	615
December.....	5.7	3.0	3.95	243
Calendar year 1960.....	17	0	5.25	3,820
January.....	5.4	2.1	4.23	260
February.....	3.2	2.2	2.70	150
March.....	2.8	.3	1.47	90
April.....	5.6	0	2.10	125
May.....	12	2.8	7.84	482
June.....	12	.6	8.44	502
July.....	7.7	1.2	5.16	317
August.....	6.4	0	1.55	95
September.....	0	0	0	0
Water year 1960-61.....	13	0	4.77	3,430

Note.--Composite (diversion less wasteway flow).

ARKANSAS RIVER BASIN

7-2155. Mora River at La Cueva, N. Mex.

Location.--Lat 35°56'15", long 105°15'05", in Mora Grant, on right downstream wingwall of highway bridge at La Cueva, Mora County, a quarter of a mile downstream from Las Vegas-Mora highway bridge and half a mile downstream from La Cueva damsite.

Drainage area.--173 sq mi.

Records available.--August 1903 to April 1905 (gage heights and discharge measurements only), May 1905 to July 1911, April 1931 to September 1961. Monthly discharge only for some periods, published in WSP 1311. Figures of daily discharge for February to April 1905 have been found to be unreliable and should not be used.

Gage.--Water-stage recorder. Altitude of gage is 7,015 ft (by barometer). Aug. 25, 1903, to Sept. 29, 1904, staff gage at different datum (destroyed by flood of Sept. 29, 1904). Feb. 22, 1905, to July 31, 1911, staff gages at different datums.

Average discharge.--34 years (1906-10, 1931-61), 29.0 cfs (21,000 acre-ft per year).

Extremes.--Maximum discharge during year, 1,030 cfs Aug. 18 (gage height, 6.26 ft); minimum daily, 6.5 cfs Oct. 14.

1931-61: Maximum discharge, 1,530 cfs Sept. 23, 1941, from rating curve extended above 400 cfs by logarithmic plotting; maximum gage height, 7.62 ft Aug. 5, 1940; no flow at times.

Flood of Sept. 29, 1904, may have exceeded 20,000 cfs; another major flood occurred June 11, 1913, but is believed less than that of 1904.

Remarks.--Records good except those for periods of ice effect and those above 250 cfs, which are poor. Diversions above station for irrigation of about 7,000 acres, part of which is below station. This record plus La Cueva Canal below La Cueva (see preceding page) equals total flow in valley cross section.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

(Shifting-control method used Aug. 14-27)

0.7 4.6 1.0 20 1.5 76 2.5 285
.8 8.4 1.2 38 2.0 170 3.3 469

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12	36	19	b13	15	14	35	118	96	73	52	140
2	10	35	20	b12	14	15	32	114	101	72	71	122
3	9.4	34	22	b15	13	17	35	124	96	97	*78	149
4	10	32	23	b14	14	16	34	*122	89	75	72	150
5	*11	29	16	b14	14	17	52	105	68	73	62	126
6	11	30	16	b14	b12	15	*58	90	54	65	60	110
7	11	33	18	b13	b10	16	68	78	57	*99	44	101
8	10	35	19	b13	b12	13	72	72	*58	103	36	92
9	9.4	32	20	b12	*12	*14	70	52	69	94	27	92
10	8.9	28	b18	10	14	17	84	37	72	84	24	87
11	7.6	28	b16	11	15	16	81	29	82	68	31	86
12	7.3	25	19	14	14	16	76	35	86	66	60	84
13	7.3	22	20	*12	14	15	78	43	79	65	68	*76
14	6.5	20	22	12	13	14	73	39	86	54	130	75
15	12	18	b21	12	14	13	69	42	121	51	186	76
16	28	*17	b19	13	14	17	66	37	214	44	193	75
17	68	18	b20	13	14	17	68	33	169	36	448	66
18	84	17	19	13	13	17	76	32	154	32	433	65
19	58	17	21	14	14	22	90	37	156	26	*372	78
20	*49	18	20	16	13	19	*142	52	154	*21	264	75
21	42	18	b17	17	*13	18	175	58	132	22	204	69
22	50	19	*b16	16	14	19	188	66	128	23	278	62
23	60	17	13	14	15	*22	202	76	114	22	382	62
24	63	19	16	14	13	26	207	*89	108	20	351	60
25	65	19	19	15	13	29	186	94	97	20	431	58
26	62	17	19	*13	14	28	160	96	87	17	277	52
27	58	16	19	b12	14	27	136	101	87	16	237	*52
28	60	17	19	b10	14	29	128	106	81	39	246	51
29	55	16	b17	b10	-	31	120	108	76	29	198	50
30	45	20	15	16	-----	36	118	97	75	19	175	42
31	42	-----	b14	14	-----	36	-----	94	-----	16	156	-----
Total	1,032.4	702	572	411	378	621	2,979	2,276	3,046	1,541	5,646	2,483
Mean	33.3	23.4	18.5	13.3	13.5	20.0	99.3	73.4	102	49.7	182	82.8
Ac-ft	2,050	1,390	1,130	815	750	1,230	5,910	4,510	6,040	3,060	11,200	4,920

Calendar year 1960: Max 258 Min 6.5 Mean 27.6 Ac-ft 20,020
Water year 1960-61: Max 448 Min 6.5 Mean 59.4 Ac-ft 43,000

Peak discharge (base, 300 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
8-14	9 p.m.	3.70	458	8-25	12:45 p.m.	4.28	577
8-18	2:15 p.m.	6.26	1,030				

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

7-2156. Cebolla River near Golondrinas, N. Mex.

Location.--Lat 35°53'15", long 105°13'45", in Mora Grant, on right bank about 50 ft downstream from ford on State Highway 160 and 2¼ miles west of Golondrinas, Mora County.

Drainage area.--64 sq mi.

Records available.--June 1956 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 6,690 ft (by barometer).

Average discharge.--5 years, 7.10 cfs (5,140 acre-ft per year).

Extremes.--Maximum discharge during year, 1,050 cfs Aug. 18 (gage height, 6.35 ft); minimum daily, 0.5 cfs May 21.

1956-61: Maximum discharge, 1,390 cfs Oct. 19, 1957, from rating curve extended above 150 cfs on basis of contracted-opening measurement at gage height 5.30 ft; maximum gage height, that of Aug. 18, 1961, minimum daily discharge, 0.3 cfs at times in 1956, 1958.

A major flood probably occurred in August 1952; discharge, about 9,300 cfs (gage height, about 11.8 ft, from old flood-mark), by slope-area measurement of June 1956.

Remarks.--Records fair except those for periods of ice effect and those below 1 cfs, which are poor. Diversions for irrigation of about 3,200 acres above station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-16, Apr. 1-9, Aug. 3-11)

1.2	0.6	1.9	6.8	3.5	84
1.3	.8	2.1	10	4.0	146
1.5	2.0	2.5	21	4.5	242
1.7	4.0	3.0	44	5.0	380

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		1.4	b3	b4.5	b5	b4	1.2	1.2	1.8	8.0	1.6	35
2	0.7	1.3	b3	b4	b5	b4.5	1.1	1.5	1.8	4.4	3.3	31
3	.6	1.2	3.7	b4	5.4	4.9	1.2	1.5	1.2	4.5	*2.2	38
4	.7	1.1	b3.5	b4.5	5.0	4.6	*1.3	1.4	1.2	4.1	9.8	4.8
5	.6	9.3	b2.5	b4.5	b3.5	4.9	1.9	*1.1	1.1	3.3	8.0	3.4
6	*6	8.3	b2	b4	b3.5	b4	2.4	9.3	1.1	2.8	7.6	2.7
7	.6	8.3	b2.5	b4.5	*b3.5	b4	3.4	8.3	*1.0	*1.3	5.8	2.3
8	.6	1.0	3.9	b4	b3.5	b3.5	3.6	8.5	2.6	10.3	4.6	2.0
9	.6	8.9	b3.5	b4	b3.5	*b4	3.6	8.0	2.1	3.1	4.6	1.7
10	.6	*8.3	b3	b4.5	b4	b4	4.5	8.9	1.1	2.3	6.4	1.6
11	.6	8.0	b4	b4	b7	b4	4.3	8.3	1.1	1.7	6.3	1.5
12	.6	7.3	4.8	*b4	b7.5	4.6	3.5	6.5	1.2	1.5	11.5	1.9
13	.6	6.8	4.8	3.1	b6.5	b4	3.4	5.6	.9	1.3	7.8	*1.4
14	.7	6.4	4.9	b3	b5.5	5.2	2.9	4.8	.9	9.3	5.6	1.3
15	1.0	5.9	b4	3.2	b5.5	5.4	2.5	4.8	2.2	1.6	9.7	1.5
16	4.7	*b5	b4	3.3	b5.5	6.8	2.2	3.9	1.3	8.0	11.3	1.4
17	2.4	b5	b4	b3	b5	7.1	2.1	3.3	1.1	6.8	26.5	1.2
18	3.9	b4.5	4.4	b3.5	b4.5	7.0	2.1	3.0	8.2	5.6	*26.1	1.4
19	4.0	b4.5	4.3	b3	b4	6.6	2.0	2.9	8.2	5.0	*11.7	1.6
20	4.0	b5	b4	b3.5	b4	7.0	*2.1	1.8	1.0	4.8	7.5	1.2
21	4.1	b4.5	*b4	b3.5	b3.5	9.6	2.1	.5	7.3	4.0	6.3	1.1
22	3.9	b4.5	b4	b3.5	b4	8.3	2.0	.6	7.7	3.8	6.9	1.0
23	4.0	b4	4.1	b3.5	4.4	*8.9	1.8	.8	8.3	3.1	8.3	9.3
24	3.5	b4	b4	4.3	b4	9.4	1.6	1.5	5.6	2.5	6.8	8.9
25	2.8	b4	b4	4.1	b3.5	9.6	1.6	1.9	4.5	2.1	5.8	8.5
26	2.5	4.3	b4.5	*4.1	b4	8.7	1.5	1.9	4.4	1.9	7.2	8.3
27	2.4	4.0	b5	b3.5	b4	7.6	1.5	1.8	4.8	1.7	8.3	*7.8
28	2.5	b3	4.3	b4	b4	7.6	1.4	1.6	3.9	1.7	7.2	7.5
29	2.2	b3	b4	b4	-	7.8	1.4	1.4	3.1	1.5	5.6	7.3
30	1.7	b3.5	b5	b4	-----	9.4	1.3	1.5	4.4	1.4	4.8	7.0
31	1.6	-----	b4	b4.5	-----	1.0	-----	1.5	-----	1.3	4.2	-----
Total	469.4	200.3	120.7	119.1	128.3	197.0	67.5	169.9	125.7	322.6	205.7	518.6
Mean	15.1	6.68	3.89	3.84	4.58	6.35	22.5	5.48	4.19	10.4	66.4	17.3
Ac-ft	931	397	239	236	254	391	1,340	337	249	640	4,080	1,030

Calendar year 1960: Max 41 Min 0.4 Mean 4.36 Ac-ft 3,170
Water year 1960-61: Max 265 Min 0.5 Mean 14.0 Ac-ft 10,120

Peak discharge (base, 100 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
7-8	5 p.m.	5.47	538	8-11	7:30 p.m.	5.10	384
7-15	4 p.m.	3.95	129	8-18	6 p.m.	6.35	1,050
8-2	7:10 p.m.	3.95	126	8-27	4:45 p.m.	4.55	256

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

ARKANSAS RIVER BASIN

7-2165. Mora River near Golondrinas, N. Mex.

Location.--Lat 35°53'40", long 105°09'30", in Mora Grant, at downstream end of left abutment of highway bridge, 1.2 miles upstream from Coyote Creek, 2 miles east of Golondrinas, Mora County, and 4 miles downstream from Cebolla River.

Drainage area.--267 sq mi.

Records available.--March 1915 to May 1921, October 1921 to March 1922, May, August to September 1922, July 1923 to July 1924, December 1924 to September 1961. Monthly discharge only 1915-30, published in WSP 1311.

Gage.--Water-stage recorder. Altitude of gage is 6,730 ft (from topographic map). Mar. 10, 1915, to June 4, 1921, water-stage recorder at site $3\frac{1}{2}$ miles upstream at different datum. July 6, 1921, to Jan. 5, 1929, staff gage or water-stage recorder at present site at datum 1.0 ft higher.

Average discharge.--44 years (1915-20, 1921-22, 1923-61), 36.2 cfs (26,210 acre-ft per year).

Extremes.--Maximum discharge during year, 1,990 cfs Aug. 18 (gage height, 7.58 ft), from rating curve extended above 700 cfs as explained below; minimum daily, 8.0 cfs Oct. 15.

1915-61: Maximum discharge, 14,000 cfs Aug. 22, 1952 (gage height, 14.4 ft), from rating curve extended above 700 cfs on basis of slope-area measurement of peak flow; no flow at times.

Floods of Sept. 29, 1904, and June 11, 1913, probably exceeded 25,000 cfs.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 12,000 acres above station.

Rating table, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

(Shifting-control method used Oct. 18 to Nov. 10, April 5 to July 8)

1.8	8.0	2.6	42	4.0	240	5.5	750
2.0	13	3.0	76	4.5	370	6.1	1,020
2.3	24	3.5	142	5.0	550		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		51	24	b21	b25	b18	43	132	99	88	*28	196
2	12	48	24	b20	b25	21	39	125	106	77	73	174
3	11	47	25	b19	28	21	38	134	105	106	115	192
4	11	45	*27	b19	28	22	40	132	99	81	75	224
5	12	38	b21	b20	b25	21	59	*113	80	*80	62	178
6	*12	38	b19	b20	b22	20	74	98	51	69	59	155
7	12	39	a21	b20	*b22	20	*101	86	*53	106	43	142
8	12	*46	a22	b21	b22	18	107	73	56	276	33	128
9	11	42	a22	b21	b22	18	109	54	75	173	25	123
10	10	38	a22	b20	b23	*18	155	46	71	128	23	118
11	10	36	a21	b20	b24	19	151	36	77	90	86	*111
12	9.2	35	a22	b21	26	19	125	33	96	84	280	118
13	9.0	33	a23	b22	25	19	122	41	75	82	149	99
14	8.5	30	a25	b21	23	20	111	39	86	64	144	93
15	8.0	29	b24	b21	23	19	96	35	106	67	445	93
16	23	26	a23	*b21	24	20	95	34	242	51	392	90
17	130	*25	a22	b21	23	23	87	25	224	42	925	78
18	157	22	b23	b21	22	22	*93	23	186	38	991	74
19	118	21	b25	b22	21	26	106	28	192	30	708	93
20	92	23	b26	b23	21	26	174	37	206	25	409	82
21	92	23	*b23	b23	20	*28	204	44	168	22	308	73
22	84	23	b22	b23	21	26	222	53	149	25	405	65
23	104	22	b21	b22	22	28	232	66	149	22	562	60
24	104	23	b22	b22	b18	30	234	82	131	20	538	57
25	98	23	b23	b23	b18	36	220	93	118	16	602	55
26	90	23	b23	b25	21	34	194	98	106	13	514	50
27	84	20	b23	b24	b20	32	164	105	101	11	412	47
28	88	b20	b23	b23	b18	31	146	105	93	20	367	45
29	81	b18	b23	b21	-	34	142	107	84	23	272	43
30	65	24	b21	b23	-----	38	131	100	71	16	240	41
31	57	-----	b21	b25	-----	43	-----	92	-----	11	218	-----
Total	1,626.7	931	706	668	632	770	3,814	2,269	3,455	1,956	9,503	3,097
Mean	52.5	31.0	22.8	21.5	22.6	24.8	127	73.2	115	63.1	307	103
Ac-ft	3,230	1,850	1,400	1,320	1,250	1,530	7,560	4,500	6,850	3,880	18,850	6,140

Calendar year 1960: Max 318 Min 1.7 Mean 31.2 Ac-ft 22,620
 Water year 1960-61: Max 991 Min 8.0 Mean 80.6 Ac-ft 58,360

Peak discharge (base, 400 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
7-8	7:10 a.m.	6.16	996	8-18	8:30 p.m.	7.58	1,990
8-12	2:30 a.m.	5.16	602	8-26	12:10 a.m.	5.55	766
8-15	12:30 a.m.	5.58	770				

* Discharge measurement made on this day

a No gage-height record.

b Stage-discharge relation affected by ice.

7-2170. Coyote Creek below Black Lake, N. Mex.

Location.--Lat 36°16'20", long 105°14'50", in NW $\frac{1}{4}$ sec.33, T.14 N., R.16 E., on right bank 150 ft downstream from road crossing, a quarter of a mile downstream from Black Lake, 2 miles south of Black Lake Village, and 12 miles south of Agua Fria.

Drainage area.--48 sq mi.

Records available.--December 1952 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 8,450 ft (from topographic map).

Average discharge.--8 years (1953-61), 4.30 cfs (3,110 acre-ft per year).

Extremes.--Maximum discharge during year, 65 cfs Aug. 24 (gage height, 3.01 ft); minimum daily, 0.5 cfs Dec. 10, Feb. 25-28. 1953-61: Maximum discharge, 913 cfs June 6, 1958 (gage height, 4.70 ft), from rating curve extended above 110 cfs on basis of slope-area measurement of peak flow; no flow at times.

Remarks.--Records fair except those for periods of ice effect or doubtful or no gage-height record, which are poor. Small amount of regulation possible at open flume in outlet from Black Lake. Diversions for irrigation of several hundred acres above station. Surface waste from one small ditch may enter stream between station and Black Lake.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 8 to May 25; Aug. 23 to Sept. 30)

0.8	0.6	1.2	4.0	2.0	21
.9	1.1	1.4	6.8	2.4	35
1.0	1.9	1.6	10	2.8	57

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.9	4.8	2.0	b1	b1.2	b1	9.2	19	9.0	2.0	3.7	7.0
2	.9	4.0	2.1	b1	b1.2	b2	8.8	21	7.9	2.0	6.5	5.8
3	.8	3.3	2.3	*b1	*b1.2	b2.5	8.2	27	6.8	*3.8	1.3	6.5
4	.8	2.8	b1	d1	b1.2	b2.5	8.6	35	6.1	6.8	1.4	10
5	.8	2.6	b.8	d1	b1.2	b2.5	10	36	5.9	5.9	1.3	15
6	.7	2.4	b.6	d1	a1	b2.5	12	35	5.5	4.8	10	16
7	.7	2.5	b.8	d1	a.6	b2.5	11	33	4.5	6.8	7.5	12
8	.7	3.0	b.8	d1.5	a.6	3.8	12	*31	3.9	6.5	*5.6	*9.2
9	.8	3.4	b.8	d1.5	a.8	4.7	b1.2	30	*3.2	8.1	4.3	7.5
10	*.8	3.7	b.5	d1.5	a1	5.6	10	26	2.8	8.2	3.7	6.5
11	.8	3.7	b1	d1.5	a1.5	8.2	17	21	2.8	6.8	4.1	6.4
12	.8	3.3	b2	d1.5	a2	10	*17	18	2.8	5.9	4.7	6.8
13	.8	3.1	b2	d1.5	a2.5	9.2	14	16	2.8	4.7	5.9	6.5
14	.9	2.8	b2	d1.5	a2.5	10	b1.2	16	2.8	3.8	7.0	5.9
15	1.1	2.8	*b2	d1.5	a2.5	14	9.9	20	3.1	3.4	14	5.8
16	1.3	2.6	b2	d1.5	a2.5	1.5	9.2	20	3.3	2.8	2.3	6.4
17	2.0	2.4	b2	d1.5	a2.5	*14	8.4	18	3.9	2.3	2.7	6.2
18	7.7	2.4	b2	d1.5	a2	12	9.2	15	5.2	2.0	2.1	6.3
19	9.7	2.3	b2	d1.5	a1.5	b7	9.7	14	6.1	1.7	1.6	11
20	9.0	2.4	b2	d1.5	a1.5	b6	11	12	6.7	1.5	1.2	17
21	7.9	*2.4	b2	d1.5	a1.5	6.5	11	12	6.4	*1.4	9.9	18
22	7.2	2.4	b2	d1.5	a2	6.2	12	10	5.4	1.3	9.6	12
23	6.8	2.4	b2	d1.5	*b2.5	7.0	14	9.9	4.7	1.1	1.6	8.6
24	6.1	2.4	b2	d1.5	b2	8.4	15	9.7	4.1	.9	5.6	6.7
25	6.4	2.4	b2	d1.5	b.5	9.6	16	14	3.4	.8	3.5	5.6
26	8.1	2.4	b2	d1.5	b.5	9.7	18	23	2.8	.7	2.2	4.9
27	*9.0	b2	b2	d1.5	b.5	b8.5	20	28	2.4	.9	1.5	4.3
28	9.7	b2	b2	d1	b.5	8.1	18	20	2.0	1.1	1.2	4.0
29	10	1.9	b1.5	d1	-	6.7	18	16	1.7	1.0	1.1	3.8
30	8.2	1.9	b1.5	d1	-----	7.5	18	13	1.6	1.3	1.1	3.8
31	6.1	-----	b1.5	d1	-----	9.0	-----	11	-----	1.7	8.8	-----
Total	127.5	82.5	51.2	41.0	41.0	222.2	379.2	629.6	129.6	102.0	422.3	245.5
Mean	4.11	2.75	1.65	1.32	1.46	7.17	12.6	20.3	4.32	3.29	13.6	8.18
Ac-ft	253	164	102	81	81	441	752	1,250	257	202	838	487

Calendar year 1960: Max 16 Min 0 Mean 2.25 Ac-ft 1,630
Water year 1960:61: Max 56 Min 0.5 Mean 6.78 Ac-ft 4,910

Peak discharge (base, 15 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
3-15	3:35 p.m.	1.61	16	8-17	4 a.m.	2.31	29
4-9	2:25 a.m.	2.06	29	8-24	5:30 a.m.	3.01	65
5-5	4 a.m.	2.26	38	9-6	3 a.m.	2.02	17
5-27	5 a.m.	2.21	30	9-20	11 p.m.	2.19	21

* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

d Doubtful gage-height record.

ARKANSAS RIVER BASIN

7-2171. Coyote Creek above Guadalupita, N. Mex.

Location.--Lat 36°10'30", long 105°13'35", in Mora Grant, on right bank 1½ miles north of Guadalupita, Mora County.Drainage area.--71 sq mi.Records available.--May 1956 to September 1961.Gage.--Water-stage recorder. Altitude of gage is 7,700 ft (from topographic map).Average discharge.--5 years, 10.8 cfs (7,820 acre-ft per year).Extremes.--Maximum discharge during year, 217 cfs Aug. 21 (gage height, 3.44 ft); minimum daily, 1 cfs Dec. 6.

1956-61: Maximum discharge, 1,390 cfs June 6, 1958 (gage height, 6.08 ft), from rating curve extended above 150 cfs by logarithmic plotting; minimum daily, 0.2 cfs June 19, 20, 1956.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of about 2,000 acres above station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.4	0.6	1.8	13
1.5	1.7	2.0	25
1.6	4.0	2.5	66
1.7	7.8	3.0	126

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.7	11	3.8	b2.5	b2.5	b2	9.9	23	12	3.1	13	20
2	1.7	9.4	3.8	b2.5	b2.5	b2.5	9.9	24	11	4.4	*17	18
3	1.7	8.3	b4	b2.5	b2.5	b3	9.9	*29	9.9	5.1	45	20
4	1.9	7.4	b3.5	b2.5	b2.5	b3	10	35	9.4	6.7	33	21
5	*1.7	7.0	b2.5	b2.5	b2	b3	*1.4	37	8.3	7.0	28	22
6	1.7	6.3	b1	b2.5	b2	b3	15	34	7.8	*6.3	23	23
7	1.5	6.7	b1.5	b2.5	b2	b3	18	33	7.4	7.8	18	21
8	1.5	7.0	b2	b2.5	*b2	*b3.5	18	31	6.7	12	15	18
9	1.7	*7.0	b2	b2.5	b2	b4	17	30	*5.9	10	13	16
10	1.9	6.7	b1.5	b2.5	b2.5	b5	23	27	5.1	9.9	12	14
11	1.7	6.7	b2.5	*b2.5	b3	b7	28	23	4.8	8.8	39	14
12	1.9	6.3	b2.5	b2.5	b3	b9	28	21	4.8	7.8	75	*14
13	2.2	5.9	b2.5	b2.5	b3	11	26	20	4.4	7.0	60	13
14	2.4	5.9	b2.5	b2.5	b3	12	23	20	4.8	6.3	59	12
15	4.0	5.5	b2.5	b2.5	b3	16	18	21	5.5	6.7	120	12
16	5.5	4.0	b2.5	b2.5	b3	18	17	21	6.3	5.1	90	12
17	7.0	4.8	b2.5	b2.5	b3	18	15	20	6.3	4.0	83	11
18	9.9	*4.4	b2.5	b2.5	b2.5	16	15	18	6.7	3.8	70	11
19	*1.4	4.0	b2.5	b2.5	b2.5	13	*1.7	17	7.4	3.1	*53	16
20	1.4	4.4	b2.5	b2.5	b2.5	10	21	15	8.3	3.3	41	18
21	1.6	4.0	b2.5	b2.5	*b2.5	9.4	20	15	7.8	*3.1	48	20
22	1.9	4.4	*b2.5	b2.5	b3	*8.8	20	14	7.0	2.8	66	17
23	1.8	4.0	b2.5	b2.5	b3	9.4	21	*13	6.3	2.6	72	14
24	1.7	3.8	b3	b2.5	b3	10	23	12	5.9	2.4	87	12
25	1.5	4.4	b3	b2.5	b2.5	12	23	14	5.5	2.2	66	11
26	1.5	4.4	b3	*b2.5	b2	12	23	23	4.8	1.7	48	*9.9
27	1.6	4.4	b3	b2	b2	10	24	26	4.0	12	38	9.4
28	1.7	3.3	b3	b2	b2	9.9	23	23	3.5	6.3	31	8.3
29	1.7	3.3	b3	b2	-	8.8	21	20	3.3	4.0	26	8.3
30	1.5	4.0	b3	b2	-----	8.8	22	17	3.1	4.4	24	7.8
31	1.2	-----	b3	b2	-----	9.9	-----	14	-----	5.1	22	-----
Total	255.6	168.7	82.1	75.0	71.0	271.0	572.7	690	194.0	174.8	143.5	443.7
Mean	8.25	5.62	2.65	2.42	2.54	8.74	19.1	22.3	6.47	5.64	46.3	14.8
Ac-ft	507	335	163	149	141	538	1,140	1,370	385	347	2,850	880

Calendar year 1960: Max 23 Min 0.6 Mean 4.32 Ac-ft 3,130
 Water year 1960-61: Max 120 Min 1 Mean 12.1 Ac-ft 8,800

Peak discharge (base, 100 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
7-27	3:30 p.m.	2.82	106	8-15	1:30 p.m.	3.22	170
8-11	7 p.m.	3.19	162	8-21	6 p.m.	3.44	217

* Discharge measurement made on this day.
 b Stage-discharge relation affected by ice.

ARKANSAS RIVER BASIN

31

7-2180. Coyote Creek near Golondrinas, N. Mex.

Location.--Lat 35°54'40", long 105°09'50", in Mora Grant, on left bank a third of a mile downstream from Coyote Creek damsite, 2 miles upstream from mouth, and 2 miles northeast of Golondrinas.

Drainage area.--215 sq mi.

Records available.--April 1928 to September 1961. Prior to October 1930 monthly discharge only, published in WSP 1311.

Gage.--Water-stage recorder. Altitude of gage is 6,820 ft (from topographic map). Prior to Apr. 26, 1938, at site 0.4 mile downstream at different datum (staff gage prior to Apr. 20, 1929). Apr. 26, 1938, to Sept. 25, 1946, at site 139 ft downstream at same datum.

Average discharge.--33 years, 12.1 cfs (8,760 acre-ft per year).

Extremes.--Maximum discharge during year, 4,050 cfs Aug. 17 (gage height, 9.60 ft), from rating curve extended above 245 cfs on basis of slope-area measurements at gage heights 5.54, 7.74, and 9.60 ft; minimum daily, 0.4 cfs July 26.

1928-61: Maximum discharge, that of Aug. 17, 1961; maximum gage height, 10.1 ft Aug. 30, 1936 (site and datum then in use); no flow Aug. 4, 1945, Apr. 10, May 9, 10, 1956.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions (including off-channel storage) for irrigation of about 4,000 acres above station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 3-17, Sept. 13-30)

1.4	0.4	1.8	7.2	2.6	42	4.0	265
1.5	1.2	2.0	13	3.0	78	4.5	460
1.6	2.8	2.3	25	3.5	150	5.0	700

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.0	12	b4.5	b7	b8	b6	8.6	26	2.5	5.8	7.2	46
2	2.3	11	b4.5	b7	b8	b6	12	22	2.3	5.0	12	41
3	2.0	11	b4.5	b7	b8	6.0	11	22	1.8	134	*48	51
4	1.8	10	b5	b7	b8	5.8	11	*24	3.4	23	34	55
5	*2.0	9.4	b4.5	b7	b7	7.0	12	28	2.8	*14	35	44
6	2.0	8.9	b4.5	b7	b7	6.2	17	30	2.5	12	30	40
7	2.8	8.9	b4	b7	*b7	b5	*22	30	*2.5	16	20	38
8	4.4	*8.9	b4.5	b7	b7	b5	26	30	2.5	13	15	37
9	4.4	8.9	b4.5	b7	b8	b5	30	21	2.2	22	12	35
10	4.4	8.9	b4	b7	b9	*b5	38	21	1.8	13	9.4	34
11	4.2	8.9	b5	b7	b11	4.6	38	17	2.2	12	36	*35
12	3.4	8.9	b6	b7	b9.5	5.0	38	13	2.3	9.4	163	35
13	1.5	9.2	b6	*b7	b9.5	6.2	36	12	1.1	83	167	30
14	1.2	8.6	b7	b7	b9	6.7	32	14	.7	53	124	28
15	1.7	8.0	b7	b7	b8	6.5	29	11	3.2	5.5	388	28
16	13	7.2	b7	b7	b8	8.9	27	11	6.7	10	399	26
17	62	7.5	b7	b7	b8	10	25	11	20	5.8	692	25
18	40	*8.3	b7	b7	b7.5	11	24	10	11	4.2	222	25
19	24	8.3	b7	b7	b6.5	10	26	9.2	6.2	2.5	150	30
20	19	7.0	b7	b7	b6.5	8.9	29	7.8	9.2	*1.0	108	28
21	18	7.2	*b7	b7	b6	*7.0	32	9.4	7.8	1.1	90	29
22	18	6.7	b7	b7	b6	5.5	32	6.2	6.2	1.1	198	28
23	19	8.3	b7	b7	b6	6.2	32	6.5	6.0	1.2	*241	25
24	19	6.5	b8	b7	b6	5.5	33	4.2	5.0	1.4	275	23
25	18	6.2	b8	b7	b6	6.7	33	3.0	8.0	2.0	200	21
26	17	6.0	b8	b7	b6.5	6.7	32	6.0	4.6	.4	134	20
27	16	6.0	b8	b6	b6	7.8	31	9.4	3.6	1.4	106	18
28	15	6.7	b8	b6	b6	8.6	30	14	3.4	6.9	90	18
29	18	7.2	b6	b6	-	9.7	28	8.6	3.4	2.0	69	17
30	17	4.6	b8	b7	-----	8.3	27	5.8	3.2	1.1	61	17
31	15	-----	b8	b8	-----	8.6	-----	3.0	-----	1.4	60	-----
Total	389.1	245.2	193.5	215	209.0	215.4	801.6	446.1	138.1	341.8	4,195.6	927
Mean	12.6	8.17	6.24	6.9	7.46	6.95	26.7	14.4	4.60	11.0	135	30.9
Ac-ft	772	486	384	426	415	427	1,590	885	274	678	8,320	1,840

Calendar year 1960: Max 62 Min 0.7 Mean 5.35 Ac-ft 3,880
Water year 1960-61: Max 692 Min 0.4 Mean 22.8 Ac-ft 16,500

Peak discharge (base, 180 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
7-3	5 a.m.	5.30	845	8-17	3 p.m.	9.60	4,050
8-12	10 p.m.	4.48	442				

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

7-2181. Mora River near Watrous, N. Mex.

Location.--Lat 35°50'15", long 105°02'40", in Mora Grant, on right bank $4\frac{1}{2}$ miles northwest of Watrous, Mora County, 5 miles upstream from Sapello River.

Drainage area.--521 sq mi.

Records available.--August 1956 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 6,480 ft (from topographic map).

Average discharge.--5 years, 62.4 cfs (45,180 acre-ft per year).

Extremes.--Maximum discharge during year, 2,980 cfs Aug. 17 (gage height, 7.36 ft), from rating curve extended above 700 cfs on basis of slope-area measurement of peak flow; minimum daily, 9.7 cfs Oct. 14.

1956-61: Maximum discharge, that of Aug. 17, 1961; no flow at times.

Floods of Sept. 29, 1904, and June 11, 1913, probably exceeded 25,000 cfs.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 17,000 acres above station.

Rating table, except periods of ice effect (gage-height, in feet, and discharge, in cubic feet per second)

1.6	5.6	2.1	58	3.4	397
1.7	12	2.4	107	4.0	625
1.8	20	2.8	205	5.0	1,160

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	13	a70	b35	b30	b40	b25	59	a167	86	a75	*15	220
2	14	a64	37	b25	b40	29	61	a165	92	a69	67	194
3	12	a58	37	b25	b40	29	59	a163	86	202	148	180
4	11	a52	42	b25	b35	32	61	a155	86	111	114	235
5	12	a52	38	b27	b30	32	69	*a146	77	*80	101	205
6	*14	a54	27	b30	*b30	33	96	122	*57	80	94	177
7	15	a58	b35	b30	b30	29	127	114	53	96	72	167
8	16	*64	b35	b30	b30	29	146	101	53	188	59	155
9	17	58	b35	b30	b35	27	143	80	62	203	48	151
10	16	a57	b27	b30	b35	*28	202	66	64	111	39	151
11	15	a54	b35	b27	b45	28	194	54	69	90	91	*143
12	12	a52	b40	b27	b42	27	175	47	86	82	432	153
13	11	a50	b40	b30	39	29	165	46	72	77	372	127
14	9.7	a47	b35	b30	34	30	155	54	77	a66	214	118
15	11	a45	b30	b30	33	30	141	48	85	a59	620	118
16	25	a43	b30	*b30	34	29	129	44	190	a62	593	116
17	212	*42	b30	b33	33	38	120	38	208	a47	*1,130	105
18	a250	38	b35	b33	32	38	*120	33	163	42	922	99
19	a180	36	b40	b33	30	42	131	32	151	36	720	120
20	a140	37	*b40	b30	29	44	167	37	a139	29	455	120
21	a110	38	b35	b28	28	38	217	47	a125	34	*373	107
22	a110	37	b30	b28	29	36	235	56	a109	29	419	96
23	a130	37	b30	b30	29	38	241	70	a111	26	553	88
24	a130	37	b35	b30	b25	39	244	75	a98	26	530	85
25	a120	38	b40	b25	b25	47	229	82	a88	19	530	83
26	a110	38	b40	b25	29	49	208	88	a82	14	507	78
27	a100	36	b40	b25	29	49	a188	101	a77	10	404	74
28	a110	b33	b35	b25	b25	49	a177	105	a74	16	401	72
29	a100	b30	b30	b25	-	56	a172	109	a69	27	323	71
30	a90	b33	b30	b30	-----	57	a172	99	a65	20	275	69
31	a78	-----	b30	b35	-----	59	-----	88	-----	14	247	-----
Total	2,193.7	1,388	1,078	891	915	1,145	4,603	2,632	2,854	2,040	10,868	3,877
Mean	70.8	46.3	34.8	28.7	32.7	36.9	153	84.9	95.1	65.8	351	129
Ac-ft	4,350	2,750	2,140	1,770	1,810	2,270	9,130	5,220	5,660	4,050	21,560	7,690

Calendar year 1960: Max 336 Min 1.5 Mean 37.0 Ac-ft 26,900

Water year 1960-61: Max 1,130 Min 9.7 Mean 94.5 Ac-ft 68,400

Peak discharge (base, 450 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
7-3	8:10 a.m.	3.89	589	8-15	4:20 a.m.	4.21	720
7-8	10:30 p.m.	3.97	617	8-17	6:30 p.m.	7.36	2,980
8-11	10:45 p.m.	5.55	1,500				

* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

7-2186. Sapello Canal at Sapello, N. Mex.

Location.--Lat 35°46'10", long 105°15'00", in Las Vegas Grant, on right bank 20 ft downstream from highway crossing in Sapello, San Miguel County.

Records available.--June 1956 to September 1961.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 7,010 ft (from topographic map).

Extremes.--1956-61: Maximum daily discharge, 2.8 cfs June 1, 1957; no flow for long periods each year.

Remarks.--Records good. Canal diverts water from right bank of Sapello River for irrigation of land downstream from Sapello River gage (see p. 35).

Monthly discharge, in cubic feet per second, water year October 1960 to September 1961

Month	Maximum	Minimum	Mean	Runoff in acre-ft
October.....	0.3	0	0.12	0.7
November.....	0	0	0	0
December.....	0	0	0	0
Calendar year 1960.....	1.3	0	.28	202.7
January.....	0	0	0	0
February.....	0	0	0	0
March.....	0	0	0	0
April.....	0	0	0	0
May.....	1.8	0	1.05	65
June.....	2.1	.8	1.33	79
July.....	1.2	0	.37	23
August.....	.6	0	.25	15
September.....	0	0	0	0
Water year 1960-61.....	2.1	0	.25	182.7

ARKANSAS RIVER BASIN

7-2187. Manuelitas Creek near Rociada, N. Mex.

Location.--Lat 35°49'30", long 105°23'55", in Mora Grant, on right bank about 300 ft downstream from road crossing and 1½ miles southeast of Rociada, San Miguel County.

Drainage area.--52 sq mi.

Records available.--June 1956 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 7,350 ft (from topographic map).

Average discharge.--5 years, 15.1 cfs (10,930 acre-ft per year).

Extremes.--Maximum discharge during year, 415 cfs Aug. 18 (gage height, 4.15 ft); minimum daily, 1.3 cfs Oct. 14.

1956-61: Maximum discharge, 1,410 cfs Aug. 23, 1957 (gage height, 7.48 ft), from rating curve extended above 250 cfs on basis of slope-area measurement of peak flow; no flow at times.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 2,300 acres above station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.2	0.9	2.2	32
1.3	2.0	2.5	53
1.4	3.5	2.8	86
1.5	5.5	3.0	125
1.7	10	3.5	250
2.0	21	4.0	375

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.6	3.0	1.0	a9	b9	b9	2.8	5.2	2.5	1.1	1.3	3.6
2	2.2	2.8	1.0	a9	b9	b1.0	2.6	5.5	2.0	1.1	3.2	3.0
3	1.8	2.6	1.0	a9	b8	1.0	2.8	*5.7	1.9	1.7	3.0	4.8
4	1.8	2.4	b9	a9	b7	9.8	3.4	5.4	1.9	1.3	*2.0	4.4
5	1.6	2.4	b8	a9	b7	b9.5	5.0	4.9	1.8	1.2	2.6	3.4
6	*1.8	2.4	b7	a9	b7	b9	5.8	4.4	1.6	1.4	2.1	3.0
7	2.4	3.1	b7	a9	*b7	b9	6.6	3.9	*1.3	4.2	1.5	2.6
8	2.3	3.4	a7	a9	b7	b9	6.2	3.7	1.2	5.4	1.4	2.3
9	2.4	2.8	a7	a9	b7	b9.5	7.5	3.4	1.3	4.9	1.3	2.6
10	2.8	2.4	a7	a9	b8	*1.0	8.8	3.0	1.2	3.7	2.6	2.3
11	2.4	2.3	a8	a9	b8	1.1	8.0	3.1	1.2	3.1	3.7	2.1
12	1.7	2.1	a8	a9	b9	1.1	*6.6	3.6	1.2	*3.3	1.98	2.0
13	1.6	1.9	a8	a9	b9	1.1	6.5	3.7	1.1	4.0	1.06	1.8
14	1.3	1.7	a8	a9	b9	1.2	5.8	3.7	1.1	3.3	6.1	1.8
15	7.6	1.6	a8	a9	b9	1.3	5.1	3.3	2.7	3.4	1.19	2.1
16	1.1	1.5	a8	a9	b9	1.7	4.7	2.7	4.9	2.9	2.12	2.2
17	3.0	*1.5	a8	a9	b9	1.7	4.7	2.7	3.5	2.3	3.26	1.7
18	3.2	1.4	a9	*a9	b9	1.6	5.1	2.8	3.6	2.1	2.67	1.9
19	2.6	1.3	a9	b9	b9	1.6	5.8	2.8	3.5	2.0	2.33	*2.7
20	2.8	1.3	a9	b9	b8	2.0	7.1	3.2	3.3	1.6	1.05	2.1
21	3.4	1.2	a9	b9	b8	2.1	7.5	3.5	2.6	1.5	6.8	1.8
22	4.0	1.2	a9	b9	b8	2.1	7.3	3.6	*2.3	1.4	7.8	1.7
23	5.4	1.1	a9	b9	b8	2.3	7.2	3.3	2.1	1.2	1.80	1.6
24	5.5	1.2	a1.0	b8	b8	2.7	7.0	3.6	1.9	1.2	*9.0	1.5
25	5.5	1.1	a1.0	b8	b8	3.1	6.2	4.4	1.7	1.0	7.6	1.5
26	5.4	1.1	a1.0	b8	b8	3.0	5.5	4.4	1.6	9.2	1.12	1.4
27	6.2	1.1	a1.0	b7	b8	2.7	4.8	3.9	1.5	1.1	1.51	1.4
28	5.9	b9	a1.0	b7	b8	2.6	4.5	3.6	1.2	1.0	1.49	1.4
29	5.0	b1.0	a1.0	b7	-	2.7	4.6	3.4	9.8	8.8	6.3	1.3
30	4.1	b1.0	a1.0	b7	-----	2.8	4.9	3.1	9.0	8.2	4.9	1.2
31	3.4	-----	a1.0	b8	-----	2.8	-----	2.7	-----	8.2	4.0	-----
Total	701.3	54.8	27.2	26.7	22.8	527.8	1,704	1,162	595.8	658.4	2,930	672
Mean	22.6	18.3	8.77	8.61	8.14	17.0	56.8	37.5	19.9	21.2	94.5	22.4
Ac-ft	1,390	1,090	540	530	452	1,050	3,380	2,300	1,180	1,310	5,810	1,330

Calendar year 1960: Max 120 Min 0.5 Mean 13.3 Ac-ft 9,690
 Water year 1960-61: Max 326 Min 1.3 Mean 28.1 Ac-ft 20,360

Peak discharge (base, 120 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
4-10	5 p.m.	3.05	132	8-16	4 a.m.	3.66	290
7-8	5:30 p.m.	3.28	195	8-18	10:30 p.m.	4.15	415
8-2	6:15 p.m.	3.02	135	8-23	8:30 a.m.	3.83	332
8-12	2 a.m.	3.85	338	8-26	9 p.m.	3.92	355

* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

7-2200. Sapello River at Sapello, N. Mex.

Location.--Lat 35°46'05", long 105°15'00", in Las Vegas Grant, on downstream end of bridge pier nearest left bank, on State Highway 3, in town of Sapello, half a mile downstream from Manuelitas Creek, San Miguel County.

Drainage area.--132 sq mi.

Records available.--May to October 1915, January 1916 to November 1918, February 1919 to May 1921, July to September 1921, July to September 1921, July 1956 to September 1961. Monthly discharge only for some periods, published in WSP 1311. Gage heights and discharge measurements published under same name for August 1903 to March 1904 are for a site above Manuelitas Creek, and are not equivalent. Records for November to December 1915, December 1918, January 1919, and October 1921 to December 1928 have been found unreliable and should not be used.

Gage.--Water-stage recorder. Altitude of gage is 6,910 ft (by barometer). May 1915 to September 1921, staff gage at site 300 ft upstream at different datum.

Average discharge.--10 years (1915-20, 1956-61), 31.2 cfs (22,590 acre-ft per year).

Extremes.--Maximum discharge during year, 2,140 cfs Aug. 15 (gage height, 5.16 ft); minimum daily, 2.7 cfs Oct. 13. 1915-20, 1956-61: Maximum discharge determined, 6,160 cfs Aug. 4, 1957 (gage height, 7.40 ft), from rating curve extended above 1,500 cfs on basis of computation of peak flow over dam; no flow at times.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions above station for irrigation of about 4,200 acres. Station is bypassed by Sapello Canal (see p. 33).

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Aug. 27 to Sept. 30)

1.0	1.9	1.2	6.4	1.5	21	2.1	83	3.0	340
1.1	3.9	1.3	10	1.8	45	2.5	164	3.7	690

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.5	50	b16	b17	b21	b15	51	80	40	17	12	82
2	3.5	46	b16	b17	b21	b17	45	87	36	19	49	68
3	3.3	42	b16	b17	b18	19	47	*90	34	22	42	85
4	3.1	40	b15	b17	b16	17	52	90	34	22	*28	90
5	2.9	39	b13	b16	b15	19	88	87	32	19	23	70
6	*2.9	39	b13	b16	b14	16	106	71	30	18	33	63
7	2.9	44	b13	b16	*b14	16	152	63	*27	46	22	56
8	3.3	51	b13	b16	b17	16	142	53	23	162	19	53
9	3.3	45	b13	b16	b20	17	176	48	24	60	20	53
10	3.5	40	b14	b16	b24	*18	239	42	21	49	29	52
11	3.5	38	b16	b16	b25	18	214	42	22	41	124	50
12	3.1	34	b16	b16	b25	19	*150	50	22	*47	306	49
13	2.7	33	b16	b16	b20	17	140	53	19	55	234	43
14	2.9	30	b16	b16	20	16	112	55	18	50	152	45
15	6.2	29	*b14	b16	20	18	83	50	38	71	569	45
16	3.2	27	b14	b16	19	22	80	44	71	48	516	51
17	225	*27	b14	b15	19	27	74	42	64	36	683	41
18	238	24	b15	*b14	17	27	74	42	53	32	406	46
19	165	26	b15	b13	17	26	85	40	53	28	359	*52
20	171	24	b15	b13	17	30	115	43	49	26	205	44
21	153	22	b15	b13	16	38	123	47	42	24	136	39
22	132	22	b15	b14	16	41	121	49	*37	22	157	35
23	133	b18	b15	b15	17	42	121	84	35	20	311	34
24	125	b17	b16	b16	15	51	115	62	34	17	*224	32
25	114	b17	b17	b16	16	58	101	95	30	16	178	31
26	108	b17	b18	b16	17	53	90	72	28	14	168	30
27	110	b17	b18	b15	16	47	78	70	27	14	388	28
28	103	b14	b18	b13	14	44	71	63	24	15	289	28
29	87	b15	b18	b13	-	46	67	59	19	12	157	27
30	68	b16	b18	b17	-----	*46	74	51	17	11	119	24
31	56	-----	b18	b20	-----	47	-----	45	-----	10	99	-----
Total	2,070.6	903	479	483	506	903	3,186	1,869	1,003	1,043	6,057	1,446
Mean	66.8	30.1	15.5	15.6	18.1	29.1	106	60.3	33.4	33.6	195	48.2
Ac-ft	4,110	1,790	950	958	1,000	1,790	6,326	3,710	1,990	2,070	12,010	2,870

Calendar year 1960: Max 238 Min 2.6 Mean 24.4 Ac-ft 17,800
Water year 1960-61: Max 683 Min 2.7 Mean 54.7 Ac-ft 39,600

Peak discharge (base, 800 cfs)

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
7-8	2 p.m.	5.10	2,070	7-15	4 p.m.	4.15	1,050
8-15	7 p.m.	5.16	2,140	8-27	4:10 p.m.	4.85	1,780

7-2201. Lake Isabel feeder canal near Sapello, N. Mex.

Location--Lat 35°44'40", long 105°10'10", in Mora Grant, 1 mile northwest of the site of Los Alamos and 5 miles southeast of Sapello.

Records available--September 1956 to September 1961.

Gage--Water-stage recorder. Altitude of gage is 6,700 ft (from topographic map).

Extremes--1956-61: Maximum daily discharge, 190 cfs Oct. 20, 1957; no flow at times.

Remarks--Records good except those for October to February and May, which are poor. Canal diverts water from left bank of Sapello River to fill Lake Isabel which stores water for irrigation.

Monthly discharge, in cubic feet per second, water year October 1960 to September 1961

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October	130	0	30.3	1,860
November	10	0	.86	51
December	.1	0	.01	.8
Calendar year 1960	130	0	10.5	7,620
January	.1	0	.02	1.2
February	.2	0	.04	2.0
March	47	0	19.0	1,170
April	24	.1	11.3	670
May	55	0	15.4	945
June	10	0	6.49	386
July	6.3	2.4	3.44	211
August	71	0	7.57	465
September	0	0	0	0
Water year 1960-61	130	0	7.96	5,760

ARKANSAS RIVER BASIN

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7-2206. Sapello River near Watrous, N. Mex.

Location.--Lat 35°46'05", long 105°02'25", on line between Mora and Las Vegas Grants, on right bank 4 miles southwest of Watrous and about 6 miles upstream from mouth.

Drainage area.--213 sq mi.

Records available.--September 1956 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 6,500 ft (from topographic map).

Average discharge.--5 years, 22.2 cfs (16,070 acre-ft per year).

Extremes.--Maximum discharge during year, 1,340 cfs Aug. 27 (gage height, 6.78 ft); minimum daily, 2.1 cfs Oct. 7-10.

1956-61: Maximum discharge, 5,860 cfs Aug. 5, 1957 (gage height, 13.02 ft, from floodmark), from rating curve extended above 500 cfs on basis of slope-area measurement at gage height 13.02 ft; no flow at times.

A major flood occurred Sept. 29, 1904 (see WSP 131), and a discharge of about 11,400 cfs occurred June 11, 1913, at a site about 6 miles upstream from Los Alamos (see WSP 357).

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 5,500 acres above station.

Rating table, except periods of ice effect (gage-height, in feet, and discharge, in cubic feet per second)

1.3	1.0	1.6	8.4	2.5	95	4.0	365
1.4	2.4	1.8	20	3.0	169	4.5	486
1.5	4.8	2.0	38	3.5	261		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.3	4.8	2.2	b15	b20	1.5	4.4	81	41	8.9	*7.3	9.8
2	2.6	4.9	2.0	b15	b18	1.6	4.4	*86	32	8.0	11	81
3	*2.4	5.1	2.2	b15	b16	1.9	4.2	91	28	8.0	4.3	76
4	2.4	4.9	2.2	b15	b14	1.8	*4.3	91	27	8.4	1.9	99
5	2.3	4.7	b15	b15	b13	1.8	5.7	86	24	*8.9	1.4	77
6	2.3	4.6	b10	b15	*b12	1.8	7.0	76	*19	8.0	1.6	70
7	2.1	4.5	b9	b15	b11	*1.8	11.3	66	13	11	1.4	64
8	2.1	*5.0	b10	b15	a14	1.7	12.3	5.9	1.5	6.6	1.1	5.9
9	2.1	5.0	b11	b15	a17	1.7	10.9	5.2	1.0	7.6	8.9	5.7
10	2.1	4.6	b13	*b15	a22	1.8	19.8	4.7	1.0	4.4	1.0	5.7
11	2.3	4.3	b14	b15	a22	1.6	22.3	4.4	9.9	3.9	3.1	*5.4
12	2.3	4.0	b14	b15	a21	7.7	17.4	4.5	9.9	3.4	26.8	5.4
13	2.4	3.7	b14	b15	a20	7.3	17.4	5.0	9.4	3.7	18.0	5.0
14	2.4	3.5	b14	b15	a20	7.3	15.0	4.8	8.0	4.2	15.3	5.0
15	3.4	3.2	b11	b15	a20	7.0	12.5	1.4	1.1	3.7	23.7	4.8
16	10	30	b11	b15	20	7.0	10.9	2.1	2.2	5.7	38.7	5.1
17	8.7	*30	b11	b15	20	7.0	9.8	2.1	3.8	3.4	42.8	4.8
18	7.7	2.9	b12	b14	1.9	7.0	*9.0	2.2	3.0	2.7	33.1	4.6
19	5.7	2.7	b12	b12	1.8	6.6	9.1	2.1	3.0	2.1	31.6	4.6
20	5.0	2.7	*b12	b12	1.8	5.9	8.3	2.1	2.7	1.4	22.9	4.0
21	5.1	2.6	b12	b12	1.7	5.5	9.8	2.2	2.6	1.4	*17.1	3.5
22	4.9	2.6	b12	b13	1.7	5.2	9.5	2.3	1.9	1.2	14.4	3.2
23	4.6	2.3	b12	b13	1.7	5.2	9.4	2.6	1.7	1.0	25.9	2.9
24	4.9	2.2	b14	b13	1.5	4.3	9.2	2.9	1.6	8.4	22.9	2.8
25	6.0	2.3	b14	b13	1.5	6.6	8.8	2.4	1.4	7.7	17.8	2.7
26	6.0	2.3	b14	b12	1.7	7.3	9.6	2.8	1.2	6.2	19.5	2.7
27	5.9	2.2	b14	b11	1.8	8.0	8.8	1.4	1.2	5.9	28.9	2.6
28	6.4	b17	b15	b10	1.7	8.4	8.1	2.2	1.2	6.2	28.9	2.4
29	6.3	b16	b17	b10	—	9.4	7.7	1.9	1.0	5.2	18.0	2.4
30	5.4	b18	b17	b15	-----	10	7.5	3.1	8.9	4.3	14.6	2.3
31	4.9	-----	b17	b18	-----	3.4	-----	5.3	-----	4.1	12.2	-----
Total	920.5	1027	437	433	488	356.7	304.4	1333	561.1	673.2	4916.2	1500
Mean	29.7	34.2	14.1	14.0	17.4	11.5	10.1	43.0	18.7	21.7	159	50.0
Ac-ft	1,830	2,040	867	859	968	708	6,040	2,640	1,110	1,340	9,750	2,980

Calendar year 1960: Max 87 Min 1 Mean 10.7 Ac-ft 7,750

Water year 1960-61: Max 428 Min 2.1 Mean 43.0 Ac-ft 31,130

Peak discharge (base, 500 cfs)

Date	Time	Gage Height	Discharge	Date	Time	Gage Height	Discharge
8-12	6:45 a.m.	4.57	511	8-27	11:15 p.m.	6.78	1,340
8-16	1:20 a.m.	5.51	814				

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

ARKANSAS RIVER BASIN

7-2210. Mora River near Shoemaker, N. Mex.

Location.--Lat 35°48', long 104°47', on left bank $4\frac{1}{2}$ miles east of Shoemaker, Mora County, and 23 miles upstream from mouth.Drainage area.--1,104 sq mi, of which 71 sq mi is probably noncontributing.Records available.--October 1914 to July 1915, October 1915 to August 1918, May 1919 to July 1924, September to November 1924, March to July 1925, June 1927 to September 1961. Prior to October 1930, monthly discharge only, published in WSP 1311.Gage.--Water-stage recorder. Altitude of gage is 6,170 ft (from topographic map). Prior to Oct. 10, 1934, at site 2,000 ft up-stream at different datum.Average discharge.--43 years (1914-18, 1919-24, 1927-61), 62.0 cfs (44,890 acre-ft per year).Extremes.--Maximum discharge during year, 3,200 cfs Aug. 18 (gage height, 6.47 ft); minimum daily, 3.4 cfs Oct. 13-14.

1914-61: Maximum discharge, 15,200 cfs June 3, 1948 (gage height, 12.79 ft), from rating curve extended above 2,800 cfs on basis of slope-area measurements at gage heights 10.09 and 12.79 ft; no flow at times.

Floods of Sept. 29, 1904, and June 11, 1913, probably exceeded 30,000 cfs.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of about 26,000 acres above station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.4	2.6	2.0	192
.5	5.3	2.5	335
.7	14	3.0	535
1.0	35	4.0	1,060
1.5	98	5.0	1,790

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.2	12.3	b55	b40	b60	b40	7.8	18.5	7.6	5.9	5.3	32.4
2	7.6	11.6	b55	b35	b60	4.2	8.3	*17.2	6.9	7.0	11.9	28.2
3	8.0	11.6	b60	b35	b60	4.8	8.3	16.6	6.9	11.2	12.2	25.8
4	7.2	11.2	b60	b35	b50	4.7	*8.1	17.7	7.6	11.8	13.4	37.0
5	5.7	10.7	b50	b35	b40	4.7	9.2	17.0	7.5	7.6	9.8	29.7
6	5.3	10.0	b40	b35	*b40	4.8	13.0	15.4	*5.9	6.0	9.2	25.8
7	5.3	9.8	*b40	b35	b40	*4.8	17.4	13.0	4.8	5.1	8.2	23.7
8	5.3	10.0	b40	b35	b45	4.1	23.5	12.0	3.3	9.9	5.8	21.7
9	5.3	11.4	b40	b35	b45	4.3	23.2	9.5	4.0	27.1	4.5	20.7
10	4.8	10.5	b30	*b35	b54	4.1	32.8	7.1	4.2	15.6	3.6	20.7
11	4.2	10.0	b40	b30	b70	3.7	37.8	5.8	4.5	15.0	3.6	19.0
12	3.7	9.4	b45	b30	b66	3.1	33.2	4.5	5.7	13.4	6.92	19.6
13	3.4	8.9	b45	b35	b64	2.6	28.8	3.5	5.7	11.1	5.58	18.5
14	3.4	8.6	b45	b35	b62	2.6	27.3	4.7	5.5	11.1	4.45	17.4
15	6.8	8.2	b35	b35	5.9	2.9	23.7	4.2	6.0	9.6	8.79	16.6
16	1.8	7.9	b35	b35	5.8	3.0	20.7	2.1	10.8	11.8	10.90	16.3
17	15.4	*7.6	b35	b40	5.7	3.4	19.2	2.1	19.4	9.8	14.50	15.9
18	*32.1	7.5	b40	b40	5.3	4.1	18.3	1.9	18.8	*7.3	17.70	15.0
19	21.7	7.0	b45	b40	5.2	3.5	18.8	2.0	17.7	5.8	13.40	16.6
20	16.8	7.0	b45	b40	4.9	3.3	20.1	2.0	18.1	5.3	8.15	17.0
21	15.4	7.0	b40	b40	4.7	3.0	23.5	2.4	17.9	3.7	6.30	15.4
22	14.5	6.7	b40	b40	4.7	2.9	26.1	2.5	15.0	5.7	8.28	14.7
23	14.7	6.5	b40	b40	4.7	2.7	27.0	2.1	14.7	3.3	11.20	13.6
24	15.4	6.4	b45	b45	b35	3.1	27.9	4.5	13.0	2.6	9.82	13.0
25	15.9	6.5	b50	b45	b35	3.5	27.0	4.9	11.2	2.1	9.40	*12.5
26	15.7	6.4	b50	b40	b40	4.3	25.2	5.9	9.8	1.2	9.28	12.0
27	15.2	6.3	b50	b40	b40	4.9	21.7	6.9	7.8	6.8	6.80	11.2
28	15.4	b55	b50	b35	b35	5.1	19.9	6.6	7.5	7.6	*8.75	10.7
29	15.9	b50	b45	b35	5.2	18.8	7.8	6.9	6.8	6.8	5.40	10.3
30	14.8	b50	b40	b45	5.7	18.8	7.7	6.0	5.7	5.7	4.30	10.0
31	13.2	-----	b40	b55	-----	6.4	-----	7.6	-----	5.3	3.74	-----
Total	2,622.2	2,525	1,370	1,175	1,410	1,235	6,354	2,357	2,807	2,292.2	18,193.3	5,610
Mean	84.6	84.2	44.2	37.9	50.4	39.8	212	76.0	93.6	73.9	587	187
Ac-ft	5,200	5,010	2,720	2,330	2,800	2,450	12,600	4,680	5,570	4,550	36,090	11,130

Calendar year 1960: Max 383 Min 1.6 Mean 39.5 Ac-ft 28,700

Water year 1960-61: Max 1,770 Min 3.4 Mean 131 Ac-ft 95,130

Peak discharge (base, 800 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
8-2	7 p.m.	3.60	830	8-22	8:50 p.m.	5.41	2,140
8-12	5:30 a.m.	4.58	1,460	8-28	6:45 a.m.	4.65	1,460
8-18	2:30 a.m.	6.47	3,200				

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

ARKANSAS RIVER BASIN

39

7-2215. Canadian River near Sanchez, N. Mex.

Location.--Lat 35°39'15", long 104°22'30", in S $\frac{1}{2}$ sec.34, T.17 N., R.24 E., at downstream end of bridge pier on State Highway 65, 1 mile upstream from Lagartija Creek, 3 miles northeast of Sanchez, 10 miles downstream from Mora River, and 24 miles southwest of Mosquero.

Drainage area.--6,015 sq mi, of which 303 sq mi is probably noncontributing.

Records available.--April 1912 to December 1914, October 1935 to September 1961. Monthly discharge only for some periods, published in WSP 1311.

Gage.--Water-stage recorder. Altitude of gage is 4,500 ft (from topographic map). Apr. 12, 1912, to Dec. 31, 1914, at two sites within 100 ft about 3 miles upstream at different datums.

Average discharge.--28 years, 244 cfs (176,600 acre-ft per year).

Extremes.--Maximum discharge during year, 10,100 cfs Oct. 17 (gage height, 6.62 ft); minimum daily, 9 cfs Oct. 14. 1912-14, 1935-61: Maximum discharge, 87,800 cfs Sept. 2, 1942 (gage height, 19.3 ft, from floodmarks), from rating curve extended above 48,000 cfs on basis of slope-area measurement of peak flow; no flow at times. Maximum flood known occurred Sept. 29 or 30, 1904 (discharge probably exceeded 100,000 cfs).

Remarks.--Records fair except those for periods of ice effect, which are poor. Diversions for irrigation of about 56,000 acres above station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.0	3	0.4	55	1.4	520	4.0	3,340
.1	10	.6	107	2.0	1,040	5.0	5,370
.2	19	1.0	260	3.0	2,020		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	24	199	77	b55	b70	164	96	334	104	72	18	496
2	21	183	72	b55	b80	150	110	370	99	65	63	433
3	17	168	82	b50	b110	282	126	384	93	62	659	370
4	25	161	93	b50	b120	290	123	334	85	67	720	352
5	29	153	90	b50	b100	215	129	384	*82	131	588	426
6	21	153	93	b55	b80	143	*136	419	87	104	468	398
7	17	153	b100	b60	b70	120	171	448	79	*117	316	358
8	15	143	b85	b60	b70	107	343	358	85	113	207	328
9	13	139	b80	b60	b60	104	405	*334	65	514	146	300
10	12	*146	b40	b60	b70	93	440	295	49	396	147	275
11	10	150	b70	b60	b100	85	456	238	45	970	117	285
12	*10	143	99	b50	126	79	488	187	47	536	79	540
13	10	133	90	b50	202	79	440	175	45	614	598	464
14	9	126	136	b50	533	77	456	126	49	1010	815	316
15	39	117	136	b50	936	67	419	96	85	901	1330	260
16	125	113	b105	b50	*934	62	412	96	72	417	1720	233
17	4,730	104	b60	b50	1,440	69	370	150	123	233	1380	215
18	4,510	101	b70	b50	1,160	79	340	120	220	179	2,100	270
19	3,000	96	b80	b50	875	85	334	104	233	153	1,920	520
20	1,020	93	*b105	b50	536	96	310	77	199	120	1,600	641
21	568	87	b85	b45	407	96	340	62	*242	110	977	412
22	412	87	b90	b50	468	85	488	57	199	1,440	881	290
23	334	87	b70	b60	487	79	672	72	168	569	*1,220	246
24	310	87	b70	b60	391	74	*770	101	206	242	1,360	211
25	*290	82	b80	b60	211	69	743	69	274	139	1,250	195
26	280	82	b80	*b60	164	62	689	85	146	101	1,510	187
27	265	79	b70	b50	168	65	616	96	123	*77	1,160	179
28	246	82	b70	b40	*187	69	504	96	104	65	1,090	168
29	233	82	b70	b40	-	77	426	107	85	45	1,220	157
30	228	79	b70	b50	-----	85	364	101	82	33	815	150
31	215	-----	b70	b60	-----	93	-----	113	-----	24	608	-----
Total	17,038	3,608	2,588	1,640	10,155	3,300	11,716	5,988	3,575	9,619	27,082	9,675
Mean	550	120	83.5	52.9	363	106	391	193	119	310	874	322
Ac-ft	33,790	7,160	5,130	3,250	20,140	6,550	23,240	11,880	7,090	19,080	53,720	19,190

Calendar year 1960: Max 4,730 Min 2 Mean 153 Ac-ft 111,100

Water year 1960-61: Max 4,730 Min 9 Mean 290 Ac-ft 210,200

Peak discharge (base, 5,000 cfs).--Oct. 17 (4:30 p.m.) 10,100 cfs (6.62 ft)

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

7-2225. Conchas River at Variadero, N. Mex.

Location.--Lat 35°24'10", long 104°26'35", in NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.36, T.14 N., R.23 E., on left bank 1.5 miles northeast of Variadero and 15 miles west of Conchas Dam.

Drainage area.--523 sq mi, of which 130 sq mi is probably noncontributing.

Records available.--October 1936 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 4,430 ft (from topographic map). Prior to Mar. 30, 1942, at site 1 $\frac{1}{2}$ miles upstream at different datum. Mar. 30, 1942, to May 18, 1950, at present site at datum 0.5 ft higher.

Average discharge.--25 years, 19.6 cfs (14,190 acre-ft per year).

Extremes.--Maximum discharge during year, 1,620 cfs Sept. 19 (gage height, 4.60 ft), from rating curve extended above 760 cfs on basis of slope-area measurements at gage heights 10.0 and 19.5 ft; no flow at times.

1936-61: Maximum discharge, 44,000 cfs Sept. 1, 1942 (gage height, 19.96 ft, present datum), from slope-area measurement of peak flow; no flow at times.

Remarks.--Records good above 1 cfs and fair below, except those for periods of ice effect, which are poor. Diversions for irrigation of about 300 acres above station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 12-15)

0.06	0.0	0.3	1.0	0.7	4.9	2.0	101
.1	.1	.4	1.7	1.0	9.3	2.5	266
.2	.5	.5	2.6	1.5	26	3.0	515
						3.5	820

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.3	2.4	1.1	b1.0	b1.5	1.6	0.8	0.2	0	0.1	0	1.4
2	.2	2.2	1.1	b1.0	b1.5	1.6	.8	.2	0	.3	0	1.1
3	.2	2.2	1.5	b1.0	b1.5	1.3	.8	.2	.1	.2	0	1.1
4	.2	2.1	1.6	b1.0	b1.5	1.1	.6	.1	.1	0	0	1.2
5	.2	2.0	1.7	b1.0	b1.5	1.0	1.3	.1	*0	0	0	1.0
6	.2	2.0	1.4	b1.5	b1.5	.9	*1.4	0	0	0	0	1.0
7	.2	2.2	b1.5	b1.5	b1.0	.8	3.3	0	0	0	0	1.0
8	.2	2.1	b2.0	b1.5	b1.0	.7	8.0	.1	0	6.1	0	1.0
9	.2	2.1	b3.0	b1.5	b1.2	.8	12	*.1	0	15	0	1.0
10	.2	*2.1	b4.0	b1.5	b1.4	.8	5.9	0	0	4.9	3.3	.6
11	.2	2.0	b4.0	b1.5	b1.6	.8	4.2	.1	0	2.2	1.4	5.3
12	*.1	1.8	4.4	b1.5	1.7	.7	3.2	0	0	1.1	332	8.7
13	.1	1.7	3.9	b1.5	1.6	.7	2.5	0	0	1.0	45	3.2
14	.1	1.6	*4.1	b1.5	1.5	.8	1.9	0	0	1.6	362	1.6
15	9.4	1.4	b3.5	b1.5	1.6	.7	1.7	.1	.1	.7	156	1.4
16	87	1.4	b3.0	b1.5	*1.4	.7	1.6	.1	.4	.5	37	1.1
17	415	1.5	b2.5	b1.5	1.4	1.3	1.4	.1	.6	.2	41	.8
18	352	1.4	b2.5	b1.5	1.3	1.4	1.1	.1	.1	0	21	3.9
19	101	1.3	b2.7	b1.0	1.1	2.0	.9	.1	0	0	18	716
20	45	1.3	2.9	b1.0	1.4	1.9	.7	0	2.4	0	11	57
21	28	1.1	b2.4	b1.5	1.4	1.6	.5	.1	.3	5.4	7.2	2.4
22	16	1.0	b2.2	b1.5	1.3	1.4	.4	.1	.1	11	4.9	1.1
23	11	1.0	b2.2	b1.5	1.8	1.3	.2	.2	*0	1.9	*10	7.0
24	8.0	1.1	b2.2	b1.1	2.4	1.2	*.2	.1	.3	.7	52	5.4
25	5.9	1.1	b2.2	b1.3	2.1	1.1	.1	.8	.3	.3	19	4.4
26	4.9	1.0	b2.1	*b1.5	1.7	.8	.2	.3	.2	.1	9.1	3.5
27	4.2	.9	b2.0	b1.5	2.0	.7	.2	.2	.2	0	5.7	2.9
28	3.6	.8	b1.7	b1.5	*1.8	.7	.2	.1	0	0	4.3	2.7
29	3.2	.9	b1.5	b1.5	-	.7	.2	.1	0	0	3.0	2.2
30	2.8	1.1	b1.5	b1.5	-----	1.0	.2	.1	0	0	2.4	1.8
31	2.7	-----	b1.0	b2.0	-----	1.1	-----	.1	-----	0	2.0	-----
Total	1102.3		73.4		42.7		56.5		5.2		1159.9	
Mean	35.6	1.56	2.37	1.38	1.52	1.07	1.88	0.12	0.17	5.06	37.4	30.3
Ac-ft	2,190	93	146	85	85	66	112	7.5	10	311	2,300	1,800

Calendar year 1960: Max 615 Min 0 Mean 12.8 Ac-ft 9,260

Water year 1960-61: Max 716 Min 0 Mean 9.95 Ac-ft 7,210

Peak discharge (base, 1,500 cfs).--Sept. 19 (2:30 a.m.) 1,620 cfs (4.60 ft).

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

7-2230. Bell Ranch Canal near Conchas Dam, N. Mex.

Location.--Lat 35°24'00", long 104°11'05", in Pablo Montoya Grant, on left bank 1,270 ft downstream from Conchas Dam and $1\frac{3}{4}$ miles north of Conchas Dam Post Office, San Miguel County.

Records available.--October 1942 to September 1961.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 4,150 ft (from headgate elevations).

Extremes.--1942-61: Maximum daily discharge, 21 cfs July 10-13, Sept. 7-10, 1948, June 27, Aug. 7, 1951; no flow at times each year.

Remarks.--Records good. Canal diverts from Conchas Reservoir for irrigation of about 700 acres on Bell Ranch.

Monthly discharge, in cubic feet per second, water year October 1960 to September 1961

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	5.4	0	1.75	108
November.....	1.8	0	.34	20
December.....	0	0	0	0
Calendar year 1960.....	1.9	0	2.69	1,960
January.....	0	0	0	0
February.....	0	0	0	0
March.....	0	0	0	0
April.....	13	0	2.65	158
May.....	17	0	7.56	465
June.....	5.1	0	1.41	84
July.....	8.8	0	2.37	146
August.....	12	0	5.77	355
September.....	12	0	6.44	383
Water year 1960-61.....	17	0	2.37	1,720

7-2235. Conchas Reservoir near Conchas Dam, N. Mex.

Location.--Lat 35°24'10", long 104°11'25", in Pablo Montoya Grant, stilling well within concrete portion of Conchas Dam on Canadian River, 1 $\frac{3}{4}$ miles northwest of Conchas Dam Post Office and about 24 miles north of Newkirk.

Drainage area.--7,409 sq mi, of which 433 sq mi is probably noncontributing.

Records available.--December 1938 to September 1961.

Gage.--Water-stage recorder. Datum of gage is at mean sea level, datum of 1929.

Extremes.--Maximum contents during year, 377,400 acre-ft Feb. 19 (elevation, 4,201.75 ft); minimum, 329,400 acre-ft Oct. 14 (elevation, 4,196.55 ft).

1938-61: Maximum contents, 479,600 acre-ft Apr. 24, 1942 (elevation, 4,208.41 ft); minimum after initial filling, 93,460 acre-ft Sept. 24, 1954 (elevation, 4,155.80 ft).

Remarks.--Reservoir is formed by dam consisting of concrete main section and earthfill wings, completed Sept. 15, 1939; storage began Dec. 29, 1938. Capacity, 370,200 acre-ft between elevations 4,073.5 and 4,201.0 ft (crest of 300-foot ungated service spillway); dead storage, 90,800 acre-ft at elevation 4,155 ft. Reservoir usually not drawn below elevation, 4,157.35 ft (sill of irrigation outlet), capacity, 98,810 acre-ft, except for minor sluicing and operation of small powerplant; during 1954-55 there was some pumping into Conchas Canal. Capacity of 196,000 acre-ft between elevations 4,201.0 (crest of 300-foot ungated service spillway) and 4,218.0 ft (crest of 3,000-foot ungated emergency spillway) acts as detention storage in the control of floods. Figures given herein represent total contents. Reservoir is used for irrigation, flood control, and recreation. Diversion above station for irrigation of about 57,000 acres. Direct diversions through Conchas Dam to Conchas Canal and Bell Ranch Canal (see above) irrigate about 36,000 acres near Tucumcari and on Bell Ranch.

Cooperation.--Records furnished by Corps of Engineers.

Month-end elevation and contents, water year October 1960 to September 1961

Date	Elevation (feet) †	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	4,197.12	334,400	-
Oct. 31	4,200.45	364,900	+30,500
Nov. 30	4,200.70	367,300	+2,400
Dec. 31	4,201.11	371,200	+3,900
Calendar year 1960.....	-	-	+48,300
Jan. 31	4,201.10	371,100	-100
Feb. 28	4,201.43	374,300	+3,200
Mar. 31	4,201.08	371,000	-3,300
Apr. 30	4,201.32	373,300	+2,300
May 31	4,199.98	360,500	-12,800
June 30	4,199.06	352,000	-8,500
July 31	4,199.16	352,900	+900
Aug. 31	4,201.35	373,600	+20,700
Sept. 30	4,201.08	371,000	-2,600
Water year 1960-61.....	-	-	+36,600

† Elevation at 12 p.m.

7-2245. Canadian River below Conchas Dam, N. Mex.

Location.--Lat 35°24'30", long 104°10'10", in sec.27, T.14 N., R.26 E. (projected), in Pablo Montoya Grant, on right bank 2.4 miles north of Conchas Dam Post Office (1960 location) and 2.8 miles downstream from Conchas Dam.

Drainage area.--7,417 sq mi, of which 433 sq mi is probably noncontributing.

Records available.--May 1936 to December 1938, January 1942 to September 1961.

Gage.--Water-stage recorder. Datum of gage is 4,021.90 ft above mean sea level, datum of 1929. Prior to Dec. 13, 1941, at site 0.7 mile downstream at datum 6.2 ft higher.

Average discharge.--20 years (1941-61), 107 cfs (77,460 acre-ft per year).

Extremes.--Maximum discharge during year, 9,620 cfs Aug. 30 (gage height, 14.77 ft); minimum daily, 1 cfs July 30.

1936-61: Maximum discharge, 73,000 cfs June 3, 1937; maximum gage height, 20.34 ft May 30, 1938, present datum (backwater from temporary construction dam); no flow at times.

Remarks.--Records poor. Flow regulated by Conchas Reservoir (see preceding page). Diversions above station for irrigation of about 90,000 acres, 36,000 of which are below station. Bell Ranch Canal (see p. 41) diverts directly from Conchas Dam and flumes from right to left bank just above River gage for irrigation of about 700 acres on Bell Ranch. Conchas Canal diverts directly from Conchas Dam and bypasses gage for irrigation of about 35,000 acres around Tucumcari (see WSP 1341 and 1391 for sample year of diversion. Canal records will be available for 1962 water year).

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Feb. 22-24, Mar. 25 to Apr. 13, May 3-14, June 14 to July 7, Aug. 24-27, Sept. 18-28)

2.5	1.0	3.0	6.5	4.5	94	6.5	650	8.5	1,830
2.6	1.5	3.2	11	5.0	170	7.0	900	9.1	2,400
2.7	2.3	3.6	25	5.5	300	7.5	1,150		
2.8	3.4	4.0	47	6.0	450	8.0	1,480		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3	8	5	94	47	321	48	172	8	2	2	298
2	3	8	10	55	55	300	50	167	8	2	2	221
3	3	14	17	45	48	*248	56	140	8	2	2	200
4	3	10	125	51	61	235	65	152	7	2	2	174
5	3	7	60	39	77	224	54	151	8	*3	2	150
6	3	6	7	37	79	230	59	101	8	3	2	171
7	3	13	4	39	81	198	77	98	7	4	2	123
8	4	13	4	45	78	128	224	57	8	6	2	132
9	4	7	12	52	77	123	146	*62	8	5	2	160
10	4	9	32	49	76	111	212	67	8	5	2	162
11	5	25	31	40	80	87	225	60	7	6	*2	128
12	*5	11	48	40	126	90	270	38	8	7	3	188
13	5	23	*61	47	*75	75	357	141	8	7	4	234
14	6	14	52	40	84	77	300	23	18	7	4	252
15	8	34	48	39	162	67	297	2	11	6	5	237
16	13	12	58	40	352	61	312	2	2	6	3	212
17	55	6	56	39	566	66	327	3	2	6	4	154
18	12	8	64	41	745	75	343	3	2	8	5	139
19	7	27	70	45	830	77	345	4	2	11	5	606
20	6	5	*56	47	865	78	336	5	2	12	5	908
21	6	19	57	48	855	78	251	6	3	*11	5	800
22	6	38	62	42	745	69	178	4	2	11	6	595
23	5	12	71	42	*700	68	201	2	*4	10	5	464
24	5	29	71	42	685	72	*217	2	8	10	5.1	330
25	6	8	81	46	630	109	178	*3	4	10	344	*252
26	6	29	67	*37	530	156	219	4	3	7	685	182
27	10	128	71	42	360	95	240	5	3	3	1,040	128
28	*7	54	57	51	386	*20	228	5	4	2	1,130	89
29	8	5	56	42	—	16	216	6	3	2	1,240	107
30	9	7	54	45	—	15	192	7	2	1	*2,380	45
31	8	—	61	43	—	18	—	8	—	2	453	—
Total	231	589	1,528	1,404	9,455	3,587	6,223	1,500	176	179	7,399	7,841
Mean	7.5	19.6	49.3	45.3	338	116	207	48.4	5.9	5.8	239	261
Ac-ft	458	1,170	3,030	2,780	18,750	7,110	12,340	2,980	349	355	14,680	15,550

Calendar year 1960: Max 128 Min 1 Mean 9.6 Ac-ft 6,960

Water year 1960-61: Max 2,380 Min 1 Mean 110 Ac-ft 79,550

* Discharge measurement made on this day.

7-2265. Ute Creek near Logan, N. Mex.

Location.--Lat 35°24', long 103°30', in NE $\frac{1}{4}$ sec.35, T.14 N., R.32 E., on right bank a quarter of a mile from Logan-Trigg Ranch road crossing, $5\frac{1}{2}$ miles upstream from mouth, and 6 miles northwest of Logan.

Drainage area.--2,073 sq mi, of which 617 sq mi is probably noncontributing.

Records available.--August 1904 to June 1906 and April 1909 to May 1914 (gage heights and discharge measurements only), January 1942 to September 1961. Records of discharge for August 1904 to June 1906, April 1909 to December 1911, published in WSP 307, have been found to be unreliable and should not be used.

Gage.--Water-stage recorder. Datum of gage is 3,757.50 ft above mean sea level, datum of 1929. Prior to Aug. 1, 1911, staff gage at site $1\frac{1}{2}$ miles downstream at different datum. Aug. 1, 1911, to May 23, 1914, water-stage recorder at site $1\frac{3}{4}$ miles downstream at different datum. January 1942 to December 1955, water-stage recorder at present site at datum 1.00 ft higher.

Average discharge.--19 years, 31.9 cfs (23,090 acre-ft per year).

Extremes.--Maximum discharge during year, 4,700 cfs July 22 (gage height, 4.85 ft); no flow at times.

1942-61: Maximum discharge, 24,500 cfs May 28, 1946, July 12, 1951 (gage height, 9.4 ft, present datum), from rating curve extended above 7,700 cfs on basis of slope-area measurements at gage heights 6.2 and 8.2 ft (present datum); no flow at times.

Flood of May 1, 1914, reached a stage of 22.95 ft, site and datum then in use. Another major flood reached a stage of 17.0 ft (present datum) sometime in 1941, from information furnished by Bureau of Reclamation (discharge, about 70,000 cfs).

Remarks.--Records poor. Discharge measurements generally made 3 or more times a month. Diversions for irrigation of a few hundred acres above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-11, Oct. 28 to Dec. 14,
Apr. 7 to May 20, June 1-7, July 22 to Aug. 3, Aug. 15 to Sept. 1)

1.3	0	1.7	15	2.3	300
1.4	.3	1.8	35	2.6	570
1.5	1.4	1.9	70	3.0	1,020
1.6	5	2.0	115	3.5	1,750

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	1	0	2	3	1	0		0	0	0	20
2	0	1	0	2	2	1	0		0	0	0	7
3	0	1	0	2	3	1	0		0	0	21	3
4	0	1	0	2	9	1	0		0	0	126	0
5	0	1	0	2	7	1	0		0	0	42	0
6	0	1	0	2	5	0	0		0	0	28	0
7	0	13	1	2	6	0	1		6	38	12	0
8	0	12	1	2	6	0	18		2	190	1	0
9	0	1	1	2	7	0	66		0	176	0	0
10	0	0	2	3	9	0	20		0	46	0	0
11	1	0	2	3	15	0	15		0	110	0	0
12	0	0	6	3	10	0	2		0	102	10	794
13	0	0	26	4	6	0	1		0	33	70	213
14	0	0	79	4	4	0	0		0	3	142	106
15	2	0	120	4	3	0	0		9	48	459	42
16	6	0	33	4	3	0	0		10	164	209	18
17	1,270	0	10	3	2	3	0		2	60	60	7
18	806	0	10	3	1	2	0		0	14	11	2
19	196	0	11	2	1	3	0		0	2	78	324
20	74	0	12	2	1	11	0		0	0	18	235
21	24	0	14	2	1	11	0		0	0	26	84
22	22	0	11	2	1	9	0		0	1,070	10	66
23	15	0	6	2	1	6	0		0	300	2	30
24	12	0	7	2	1	3	0		0	142	29	15
25	7	0	6	2	1	2	0		0	56	52	5
26	4	0	5	1	1	1	0		0	11	90	1
27	3	0	6	2	1	0	0		0	2	159	1
28	2	0	4	2	1	0	0		0	0	60	1
29	2	0	3	2	-	0	0		0	0	132	0
30	1	0	3	2	-----	1	0		0	0	92	0
31	1	-----	3	3	-----	1	-----		-----	0	49	-----
Total	2,448	32	382	75	111	58	123	0	29	2,567	1,988	1,974
Mean	79.0	1.1	12.3	2.4	4.0	1.9	4.1	0	1.0	82.8	64.1	65.8
Ac-ft	4,860	63	758	149	220	115	244	0	58	5,090	3,940	3,920

Calendar year 1960: Max 3,350 Min 0 Mean 47.2 Ac-ft 34,300

Water year 1960-61: Max 1,270 Min 0 Mean 26.8 Ac-ft 19,400

Peak discharge (base, 6,000 cfs).--No peak above base.

7-2270. Canadian River at Logan, N. Mex.

Location.--Lat 35°21'20", long 103°25'20", in NE $\frac{1}{4}$ sec.15, T.13 N., R.33 E., on left bank 1,100 ft upstream from bridge on U.S. Highway 54, half a mile south of Logan, $1\frac{1}{2}$ miles upstream from Chicago, Rock Island & Pacific Railroad Co. bridge, $4\frac{1}{4}$ miles upstream from Revuelto Creek (formerly Tucumcari Creek), and $5\frac{1}{2}$ miles downstream from Ute Creek.

Drainage area.--11,141 sq mi, of which 1,110 sq mi is probably noncontributing.

Records available.--June 1904 to November 1905 (gage heights and discharge measurements only), December 1908 to September 1909, February 1910, April to July 1910, August 1910 to September 1911 (gage heights and discharge measurements only), October 1911 to May 1914, January to May 1924, September 1924 to July 1925, January 1927 to April 1934, August 1934 to September 1961. Monthly discharge only for some periods, published in WSP 1311. Records for December 1909, January 1910, and May to July 1934, published in WSP 267, 287, and 762 have been found to be unreliable and should not be used.

Gage.--Water-stage recorder at present site since Aug. 5, 1910; at different datums prior to Oct. 21, 1928, and at datum 1.54 ft lower Oct. 21, 1928, to Sept. 30, 1934. Altitude of present gage is 3,670 ft (from river-profile study). Prior to Aug. 5, 1910, staff gages $1\frac{1}{2}$ miles downstream at different datums (datum of gage, 3,651 ft above mean sea level Dec. 22, 1908, to Aug. 4, 1910).

Average discharge.--15 years (1908-9, 1911-13, 1926-38), 392 cfs (283,800 acre-ft per year), prior to completion of Conchas Dam; 23 years (1938-61), 270 cfs (195,500 acre-ft per year).

Extremes.--Maximum discharge during year, 10,200 cfs Oct. 17 (gage height, 9.30 ft); minimum daily, 1 cfs July 5.
1930-61: Maximum discharge, 219,000 cfs Sept. 22, 1941 (gage height, 29.3 ft, from floodmarks), from rating curve extended above 75,000 cfs by logarithmic plotting; no flow at times.
Maximum discharge known, 278,000 cfs Sept. 30, 1904 (gage height, about 36.5 ft, site and datum used in 1909), from rating curve extended above 140,000 cfs, from Ninth Biennial Report of State engineer.

Remarks.--Records fair except those for periods of ice effect, which are poor. Discharge measurements generally made 3 or 4 times a month. Flow partly regulated by Conchas Reservoir, 45 miles upstream (see p. 42). Diversions for irrigation of about 90,000 acres above station.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	20	28	52	b80	79	400	86	255	6	4	7	463
2	18	28	39	b70	68	364	72	255	4	4	8	370
3	17	27	33	b70	62	352	68	221	17	3	11	194
4	23	27	32	b70	66	270	64	185	8	2	80	212
5	25	26	30	b60	72	230	70	164	5	1	52	178
6	21	25	b30	b65	74	235	86	144	7	2	33	164
7	19	25	b30	b65	81	265	108	144	7	8	26	168
8	19	40	b60	66	90	255	185	144	8	602	28	164
9	18	30	b60	59	93	226	198	110	8	878	20	286
10	17	27	74	53	93	185	174	98	12	270	19	174
11	62	27	64	53	108	168	171	61	9	431	15	198
12	30	26	74	62	112	160	216	53	5	937	49	806
13	14	26	90	62	115	138	235	57	3	1,590	98	619
14	11	23	126	59	138	135	310	45	8	674	201	388
15	54	22	157	55	164	120	250	44	65	275	460	400
16	159	22	108	55	154	105	260	107	108	176	279	364
17	4,550	22	95	57	216	150	265	57	66	100	141	370
18	4,730	25	88	52	428	182	304	36	37	77	90	370
19	912	25	88	49	590	164	304	26	27	57	117	1,180
20	304	27	100	49	666	198	316	23	19	41	74	614
21	178	25	110	49	770	194	328	20	13	38	62	590
22	185	21	118	50	630	154	310	20	8	860	55	550
23	144	22	112	55	582	138	245	20	6	362	39	442
24	102	22	105	55	582	129	194	20	16	144	31	400
25	72	20	108	b50	502	120	221	19	94	74	64	340
26	61	24	108	b40	534	112	230	25	53	34	97	260
27	52	23	115	b45	421	115	226	44	30	18	235	245
28	43	23	115	b45	400	150	260	45	17	14	328	221
29	38	23	b100	b50	-	147	275	21	10	9	558	198
30	33	33	b100	b50	-----	126	275	13	5	7	590	168
31	30	-----	b90	b80	-----	105	-----	11	-----	8	1,350	-----
Total	11,961	764	2,611	1,780	7,890	5,792	6,306	2,487	681	7,700	5,217	11,096
Mean	386	25.5	84.2	57.4	282	187	210	80.2	22.7	248	168	370
Ac-ft	23,720	1,520	5,180	3,530	15,650	11,490	12,510	4,930	1,350	15,270	10,350	22,010

Calendar year 1960: Max 13,200 Min 1 Mean 222 Ac-ft 160,800

Water year 1960-61: Max 4,730 Min 1 Mean 176 Ac-ft 127,500

Peak discharge (base, 12,000 cfs).--No peaks above base.

b Stage-discharge relation affected by ice.

ARKANSAS RIVER BASIN

07-2271. Revuelto Creek near Logan, N. Mex.

Location.--Lat 35°20'30, long 103°23'30", in NE¼NW¼ sec.24, T.13 N., R.33 E., on right bank a quarter of a mile upstream from bridge on State Highway 39, 2 miles upstream from mouth, and 2 miles southeast of Logan.

Drainage area.--786 sq mi.

Records available.--August 1959 to September 1961. Unpublished records collected by Bureau of Reclamation for the period October 1961 to July 1947 are for a site 500 ft downstream at different datum. They are not equivalent because of major irrigation development; major peaks should be comparable.

Gage.--Water-stage recorder. Altitude of gage is 3,650 ft (from topographic map).

Extremes.--Maximum discharge during year, 7,330 cfs Oct. 17 (gage height, 7.00 ft); no flow at times.

1959-61: Maximum discharge, 26,700 cfs July 9, 1960 (gage height, 14.3 ft), from rating curve extended above 13,000 cfs on basis of slope-area measurement of peak flow; no flow at times.

1941-47: Maximum discharge determined, about 13,400 cfs Sept. 18, 1946 (gage height, 9.04 ft, site and datum then in use), computed by Bureau of Reclamation.

A peak of 26,100 cfs (time and date unknown; gage height, 12.9 ft) was measured by slope-area method in May 1957.

Remarks.--Records poor. Discharge measurements generally made 3 times a month. Low flows supplemented by surface and ground water return from irrigation in vicinity of Tucumcari.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	25	13	6	12	13	5	10	33	9	a 18	30	149
2	23	14	8	9	10	4	6	26	14	a 17	34	210
3	23	14	8	7	7	3	5	30	29	17	42	120
4	28	13	12	7	6	1	5	36	32	17	46	53
5	a28	12	12	a7	5	0	4	43	40	a17	48	34
6	a28	11	9	a7	7	0	5	35	40	a17	48	34
7	a28	11	11	a7	12	0	9	31	40	a20	48	87
8	a28	11	18	a7	9	0	59	36	31	a300	50	94
9	a28	10	24	a7	10	0	65	34	25	a400	47	879
10	a28	9	31	9	9	0	20	30	19	111	47	135
11	a50	9	52	7	9	0	12	31	19	204	56	95
12	31	9	105	7	7	0	7	27	16	376	72	268
13	26	9	132	9	6	0	5	19	11	131	104	225
14	24	8	a125	9	5	1	2	20	33	64	130	84
15	461	7	a90	7	5	1	2	39	a200	406	788	70
16	443	6	39	7	5	1	2	47	a125	136	200	50
17	4,650	6	20	7	5	22	2	34	84	40	88	47
18	2,850	6	22	8	4	a65	2	37	53	24	60	48
19	415	7	32	5	3	a60	1	45	72	18	62	50
20	164	7	51	5	3	a50	0	55	a175	12	56	44
21	105	7	32	4	4	a40	0	48	82	11	55	32
22	112	7	22	5	5	a30	0	72	37	50	40	26
23	96	6	22	7	6	a20	4	43	22	90	37	24
24	47	5	19	4	10	17	32	34	a25	76	37	29
25	36	6	16	6	14	17	34	40	a30	68	32	31
26	31	7	14	3	12	9	26	39	a28	31	251	28
27	28	6	11	3	8	5	24	47	a26	10	78	27
28	24	4	9	7	5	5	27	47	a24	20	56	20
29	22	3	7	11	-	5	29	29	a22	51	39	25
30	19	5	9	9	-----	5	29	17	a20	28	34	24
31	17	-----	9	16	-----	14	-----	10	-----	21	35	-----
Total	9,918	248	977	225	204	380	428	1,114	1,383	2,801	2,750	3,042
Mean	320	8.3	31.5	7.3	7.3	12.3	14.3	35.9	46.1	90.4	88.7	101
Ac-ft	19,670	492	1,940	446	405	754	849	2,210	2,740	5,560	5,450	6,030

Calendar year 1960: Max 13,800 Min 0 Mean 222 Ac-ft 161,400

Water year 1960:61: Max 4,650 Min 0 Mean 64.3 Ac-ft 46,550

Peak discharge (base, 4,500 cfs).--Oct. 17 (1:30 p.m.) 7,330 cfs (7.00 ft).

a No gage-height record.

BRAZOS RIVER BASIN

47

8-806. Running Water Draw near Clovis, N. Mex.

Location.--Lat 34°31'55", long 103°12'05", in W $\frac{1}{2}$ NE $\frac{1}{4}$ sec.31, T.4 N., R.36 E., on left bank a quarter of a mile upstream from State Highway 18 and 8 miles north of Clovis.

Drainage area.--109 sq mi, of which about 14 sq mi is probably noncontributing.

Records available.--October 1952 to September 1956 (annual maximum only), October 1956 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 4,250 ft (from topographic map). Prior to October 1956, crest-stage gage at site 900 ft downstream at datum 0.4 ft lower.

Average discharge.--5 years, 1.73 cfs (1,250 acre-ft per year).

Extremes.--Maximum discharge during year, 217 cfs Oct. 17 (gage height, 5.12 ft); no flow for most of year.

1952-61: Maximum discharge, 7,090 cfs Sept. 6, 1957 (gage height, 9.95 ft, from floodmarks), from rating curve extended above 130 cfs on basis of indirect measurements of flow at gage heights 6.28, 7.73, and 9.95 ft; no flow for most of time.

Remarks.--Records poor.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

3.3	0.0	3.8	22
3.4	.7	4.0	41
3.5	2.6	4.3	77
3.6	7.0	4.6	122

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0					0			(*)		0	
2	0					0					0	
3	0					0					0	
4	0					0					0	
5	0					0					0	
6	0					0					0	
7	0					0	(*)				0	
8	0					0			(*)		0	
9	0	(*)				0					0	
10	0					0					0	
11	0					0					0	
12	0					0		(*)			0	
13	0					0					0	
14	0					0					0	
15	3.0					0					0	
16	7.4					0					0	
17	11.6					0					* 0	
18	4.2					0					0	
19	0					0					0	
20	0					0					0	
21	0					0					2.8	
22	0				(*)	0					0	
23	0					0					0	
24	0					0				(*)	0	
25	0					.1					0	
26	0					0					0	
27	0					0					0	
28	0					0					0	
29	0		(*)			0					0	
30	0					0					0	
31	0			(*)		0					0	
Total	157.6	0	0	0	0	0.1	0	0	0	0	2.8	0
Mean	5.08	0	0	0	0	0.003	0	0	0	0	0.09	0
Ac-ft	313	0	0	0	0	0.2	0	0	0	0	5.6	0

Calendar year 1960: Max 163 Min 0 Mean 1.58 Ac-ft 1,150
 Water year 1960-61: Max 116 Min 0 Mean 0.44 Ac-ft 319

Peak discharge (base, 150 cfs)--Oct. 17 (3.00 p.m.) 217 cfs (5.12 ft).

* Discharge measurement or observation of no flow made on this day.

RIO GRANDE BASIN

8-2525. Costilla Creek above Costilla Dam, N. Mex.

Location.--Lat 36°53'50", long 105°15'20", in Sangre de Cristo Grant, on left bank 2 miles upstream from Costilla Dam and 17 miles southeast of Costilla, Taos County.

Drainage area.--26 sq mi, approximately.

Records available.--April 1937 to September 1961 (no winter records). Published as "above reservoir, near Costilla" 1937-51. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder. Altitude of gage is 9,280 ft (from topographic map). Prior to July 9, 1940, at wooden control 660 ft downstream at datum 9.53 ft lower. July 9, 1940, to July 22, 1954, at concrete control 600 ft downstream at datum 7.75 ft lower. July 23, 1954, to June 16, 1959, 200 ft upstream at datum 2.53 ft higher.

Extremes.--Maximum discharge during year, 104 cfs May 14 (gage height, 3.36 ft); minimum daily determined, 1.5 cfs Nov. 27-28. 1937-61: Maximum discharge, 3,870 cfs July 22, 1954 (gage height, 7.0 ft, from floodmarks, at present site and datum), on basis of slope-area measurement of peak flow; minimum daily recorded, 1.2 cfs Nov. 7, 1944, Sept. 19, 1956. The flood in 1954 is highest known since about 1909, from information by local range rider.

Remarks.--Records fair except those for periods of ice effect, which are poor.

Rating tables, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second) (Shifting-control method used May 17-23)

Oct. 1 to Nov. 7		May 1 to Sept. 30	
2.2	2.0	2.5	2.8
2.3	3.6	2.7	12
2.4	6.2	2.9	27
2.5	10	3.1	50

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.6	b 6						1 8	3 2	1 0	9.2	7.5
2	2.5	* b 6						1 6	* 3 1	8.1	* 1 2	6.6
3	2.6	b 6						1 8	2 9	7.0	1 3	1 3
4	* 2.8	b 6						2 3	2 6	6.6	1 1	1 3
5	2.8	5.9						2 3	2 4	7.5	1 1	1 1
6	2.6	5.4						2 1	2 3	1 0	8.1	9.2
7	2.5	6.6						2 1	2 3	1 2	7.5	8.1
8	2.5	b 6						2 1	2 4	7.0	6.2	* 7.5
9	2.6	b 6						1 8	2 2	6.6	5.3	7.5
10	2.3	b 6						2 1	2 1	5.3	5.7	7.5
11	2.2	b 6						2 5	1 9	* 4.9	6.6	7.5
12	2.2	b 6						2 9	1 6	5.3	8.6	6.6
13	2.2	b 5						2 5	1 4	4.5	1 4	5.7
14	2.5	b 4						3 3	1 6	3.6	1 0	5.7
15	2.2	b 3						2 4	3 7	4.1	9.7	6.6
16	3.4	b 2						2 4	2 6	4.1	1 1	8.1
17	5.7	* b 2						3 0	2 2	3.2	6.6	6.6
18	4.9	b 2						* 2 9	1 8	2.8	6.6	9.5
19	b 5.5	b 2						3 3	1 8	3.2	8.1	1 2
20	b 5.5	b 2						3 7	* 1 6	4.1	1 0	* 8.1
21	b 5.5	b 2						3 8	1 3	5.3	1 1	6.6
22	b 5.5	b 2						3 7	1 2	5.7	1 4	5.7
23	b 5.4	b 2						3 8	1 1	3.2	1 2	5.7
24	b 5.4	b 2						3 6	1 2	2.8	1 4	5.3
25	b 5.4	b 2						4 0	1 2	3.2	* 1 6	5.7
26	b 5.2	b 2						4 0	1 2	4.1	1 4	5.3
27	5.4	b 1.5						4 1	1 1	4.5	1 9	4.9
28	4.6	b 1.5						3 7	1 1	4.5	1 4	4.9
29	b 4.5	* b 3						3 3	1 2	7.0	1 1	4.5
30	b 4.5	a 3						3 3	1 3	7.0	1 0	4.9
31	b 5	-----						3 4	-----	9.7	9.7	-----
Total	11 8.5	11 4.9						896	576	176.9	324.9	220.8
Mean	3.82	3.83						28.9	19.2	5.71	10.5	7.36
Ac-ft	235	228						1,780	1,140	351	644	438

Calendar year : Max Min Mean Ac-ft
 Wateryear : Max Min Mean Ac-ft

Peak discharge (base, 40 cfs)

Date	Time	Gage Height	Discharge	Date	Time	Gage Height	Discharge
5-14	3:35p.m.	3.36	104	6-15	8:30a.m.	3.11	50
5-26	9:30p.m.	3.07	57	8-27	3:10p.m.	3.15	55

* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

RIO GRANDE BASIN

49

8-2530. Casias Creek near Costilla, N. Mex.

Location.--Lat 36°53'50", long 105°15'35", in Sangre de Cristo Grant, on left bank 200 ft downstream from road crossing, 2 miles upstream from Costilla Dam, and 17 miles southeast of Costilla, Taos County.

Drainage area.--19 sq mi, approximately.

Records available.--April 1937 to September 1961 (no winter records). Nov. 1-7, 1947, and Nov. 1-8, 13-16, 1948, gage heights only, discharge records have been found to be unreliable and should not be used. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 9,270 ft (from topographic map). Prior to July 18, 1940, water-stage recorder and wooden control 100 ft downstream at datum 1.56 ft lower.

Extremes.--Maximum discharge during year, 71 cfs June 15 (gage height, 1.44 ft); minimum daily recorded, 2.8 cfs Oct. 1. 1937-61: Maximum discharge, 122 cfs June 11, 1957; maximum gage height recorded, 1.90 ft June 14, 1938 (backwater from Costilla Reservoir); minimum daily recorded, 1.3 cfs Sept. 11-15, 26-28, 1951, Aug. 10, 1956.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of about 1,300 acres above station.

Rating table, except days of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.5	1.0	0.8	10	1.4	63
.6	3.2	1.0	21		
.7	6.2	1.2	38		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.8	b 8					-	14	59	16	12	17
2	3.0	* 7.3					-	15	* 59	14	* 15	16
3	3.0	5.8					-	16	56	14	21	22
4	* 3.2	5.8					-	17	52	13	23	23
5	4.0	6.2					-	17	48	14	19	19
6	4.0	5.8					-	16	47	17	14	18
7	4.3	7.0					-	16	46	20	14	16
8	4.3	5.2					-	16	47	21	13	* 16
9	4.6	4.9					-	14	47	19	12	17
10	4.3	b 5					-	13	47	18	13	17
11	4.3	-					-	14	48	* 17	12	18
12	4.3	-					-	16	44	18	14	17
13	4.6	-					-	18	42	16	25	15
14	4.9	-					-	22	45	15	14	16
15	4.3	-					-	20	61	14	15	16
16	5.8	-					-	18	46	14	18	16
17	6.2	-					-	16	42	13	16	14
18	7.0	-					-	* 18	39	12	15	20
19	7.0	-					-	24	38	12	13	19
20	7.3	-					-	28	* 37	14	12	* 16
21	7.0	-					-	31	34	14	10	14
22	7.0	-					-	33	28	14	11	14
23	7.3	-					-	39	23	12	10	14
24	7.3	-					-	35	22	10	13	14
25	8.1	-					* 12	39	21	9.2	* 15	13
26	8.5	-					9.6	43	21	9.6	12	12
27	10	-					10	46	20	9.2	21	12
28	8.5	-					10	49	19	8.5	14	12
29	7.7	-					11	48	19	10	12	12
30	7.3	-					12	52	18	9.6	12	11
31	b 9	-					5.9	5.9	12	12	14	11
Total	180.9	-	-	-	-	-	-	822	1,175	4,291	454	476
Mean	5.84	-	-	-	-	-	-	26.5	39.2	13.8	14.6	15.9
Ac-ft	359	-	-	-	-	-	-	1,630	2,330	851	900	944

Calendar year	Max	Min	Mean	Ac-ft
Water year	Max	Min	Mean	Ac-ft

Peak discharge (base, 50 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
6-2	4 a.m.	1.40	63	8-13	3 p.m.	1.37	60
6-15	6:30 a.m.	1.44	71	8-27	3 p.m.	1.42	70

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

RIO GRANDE BASIN

8-2535. Santistevan Creek near Costilla, N. Mex.

Location.--Lat 36°53'05", long 105°16'50", in Sangre de Cristo Grant, on left bank 200 ft upstream from road crossing, 0.9 mile upstream from Costilla Dam, and 16 miles southeast of Costilla, Taos County.

Drainage area.--2.5 sq mi, approximately.

Records available.--April 1937 to September 1961 (no winter records). Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 9,300 ft (from topographic map). Prior to June 27, 1940, water-stage recorder and wooden control at same site at datum 0.99 ft lower.

Extremes.--Maximum discharge during year, 9.6 cfs June 15 (gage height, 1.03 ft); minimum daily recorded, 0.6 cfs Oct. 15. 1937-61: Maximum discharge recorded, 18 cfs Aug. 11, 1941, July 12, 1957; maximum gage height recorded, 1.73 ft Aug. 11, 1941; minimum daily discharge recorded, 0.1 cfs Nov. 13-17, 1948.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. No diversion above or below station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

0.2	0.7
.4	2.1
.6	3.8
.8	5.9
1.0	8.4

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.9	1.0					-	2.3	7.0	4.4	2.3	2.5
2	.9	*1.0					-	2.5	*7.1	4.2	*2.4	2.5
3	.9	.9					-	2.6	7.4	4.1	2.1	2.6
4	*.9	.9					-	2.6	7.2	3.9	2.5	2.6
5	.9	.9					-	2.4	7.0	4.2	2.3	2.7
6	.9	.9					-	2.3	7.2	4.3	2.2	2.5
7	.8	1.0					-	2.2	7.0	4.2	2.1	2.4
8	.8	.9					-	2.2	7.0	4.1	2.1	*2.3
9	.9	.9					-	2.2	6.7	3.7	2.0	2.4
10	.9	1.0					-	2.3	6.7	3.0	2.2	2.4
11	.8	-					-	2.5	6.6	*2.9	2.2	2.5
12	.8	-					-	2.6	6.4	3.1	2.2	2.4
13	.9	-					-	2.8	6.1	2.6	2.8	2.2
14	.9	-					-	3.0	6.4	2.7	2.4	2.2
15	.6	-					-	2.8	8.3	2.9	2.3	2.2
16	.9	-					-	2.8	7.0	2.5	2.6	2.0
17	1.0	-					-	2.8	6.6	2.3	2.2	1.9
18	1.0	-					-	*3.2	6.3	1.9	2.3	2.5
19	1.0	-					-	3.7	5.9	1.8	2.1	2.2
20	1.2	-					-	4.4	*5.6	1.4	2.0	*2.0
21	1.2	-					-	4.7	5.3	1.8	2.1	1.9
22	1.1	-					-	4.9	5.0	2.0	2.2	1.8
23	1.2	-					-	5.3	5.0	1.8	2.5	1.8
24	1.2	-					-	*2.0	5.2	4.9	1.6	2.6
25	1.2	-					-	1.8	5.3	5.0	*2.6	1.7
26	1.2	-					-	a 1.6	5.7	4.9	1.8	2.6
27	1.2	-					-	a 1.7	5.8	4.7	1.6	3.0
28	1.2	-					-	a 1.8	5.9	4.6	1.6	2.6
29	1.1	-					-	a 2.0	6.0	4.5	2.2	2.5
30	b .9	-					-	a 2.2	6.3	4.4	2.2	2.5
31	b 1.0	-					-	6.5	6.5	2.1	2.5	2.5
Total	30.4	-	-	-	-	-	-	115.8	183.8	84.7	73.0	64.5
Mean	0.98	-	-	-	-	-	-	3.74	6.13	2.73	2.35	2.15
Ac-ft	60	-	-	-	-	-	-	230	365	168	145	128

Calendar year	Max	Min	Mean	Ac-ft
Water year	Max	Min	Mean	Ac-ft

Peak discharge (base, 5 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
6- 8	1p.m.	0.91	7.9	8-13	2:40p.m.	0.78	6.0
6-15	4a.m.	1.03	9.6	8-23	8:50p.m.	0.83	7.0
7- 5	2:40p.m.	0.78	6.3	8-27	3p.m.	0.74	5.9

* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

RIO GRANDE BASIN

51

8-2540. Costilla Creek below Costilla Dam, N. Mex.

Location.--Lat 36°52'35", long 105°16'45", in Sangre de Cristo Grant, on left bank 125 ft downstream from outlet of reservoir and 16 miles southeast of Costilla, Taos County.

Drainage area.--55 sq mi, approximately.

Records available.--April 1937 to September 1961 (no winter records 1937-44, 1948-49). Prior to October 1951, published as "below reservoir near Costilla." Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 9,180 ft (from topographic map).

Average discharge.--15 years (1944-47, 1949-61), 16.7 cfs (12,090 acre-ft per year).

Extremes.--Maximum discharge during year, 131 cfs Sept. 26-27 (gage height, 2.00 ft); minimum daily, 0.2 cfs for many days. 1937-61: Maximum discharge, 286 cfs May 9, 10, 1942 (gage height, 2.65 ft); no flow at times.

Remarks.--Records good except those for period of no gage-height record, which are poor. Flow regulated by Costilla Reservoir (capacity, 15,700 acre-ft, original survey). Diversions for irrigation of about 1,300 acres above station.

Rating table (gage-height, in feet, and discharge, in cubic feet per second)

Oct. 1 to June 30, Aug. 1 to Sept. 30

July 1 - 31

0.1	0.1	0.5	4.4	1.5	71	0.2	0.4	0.6	7.0	1.0	25
.2	.5	.6	7.1	2.0	135	.3	1.2	.7	10	1.2	40
.3	1.2	.8	14.9			.4	2.5	.8	14	1.6	81
.4	2.4	1.1	33			.5	4.4	.9	19	2.0	141

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.6	0.3	0.3	0.3		0.3	0.4	0.4	0.5	0.6	1.7	1.8
2	2.6	*.3	.2	.3		.3	.4	.4	*.5	1.7	*.99	1.2
3	2.6	.3	.2	.3		.3	.4	.4	.5	5.7	.99	1.8
4	*2.6	.3	.2	.3		.3	.4	.4	7.3	5.7	.42	2.5
5	2.8	.3	.2	.3		.3		.4	2.6	6.7	1.4	1.2
6	2.8	.3	.2	.3		.3		.4	3.9	8.7	4.0	1.2
7	2.6	.3	.2	.3		.4		.5	4.6	3.0	.93	1.2
8	2.6	.3	.2	.3		.4		.5	5.4	.6	.93	*1.2
9	2.8	.3	.2	.3		.4		.4	5.4	2.0	.93	1.2
10	2.6	.2	.2	.3		.3		.4	5.4	6.7	.93	1.2
11	2.8	.2	.3	.3		.4		.4	5.4	*6.7	.39	1.2
12	2.8	.2	.3	.3		.4		.4	5.4	6.7	1.3	1.2
13	2.8	.2	.3	.3	a 0.3	.4		.4	5.4	6.7	.36	1.2
14	2.8	.2	.3	.3		.4	a .4	.4	5.4	3.2	.73	1.2
15	2.8	.2	.3	.3	(*)	.4		.4	5.4	1.3	.63	1.2
16	3.0	.2	.3	.3		.4		.4	5.4	3.3	.60	1.2
17	1.9	*.2	.3	.3		.4		.4	2.1	7.5	.54	1.2
18	.3	.2	.3	.3		.4		*.4	1.5	8.2	.28	1.2
19	.3	.2	.3	.3		.4		.6	4.9	10.0	.15	1.2
20	.3	.3	.3	.3		.4		.5	*5.3	10.0	.31	*1.2
21	*.2	.3	.3	.3		.4		.5	6.0	4.8	.62	1.2
22	.2	.3	.3			.4		.5	6.0	2.2	.62	1.2
23	.2	.3	.3			.4		.5	6.1	4.6	.62	1.2
24	.2	.3	.3			.4	*.4	.5	6.1	10.0	.61	1.2
25	.2	.3	.3			.4	*.4	.5	6.8	10.7	*2.8	1.2
26	.2	.3	.3	a .3		.4		.5	8.1	10.7	.14	.40
27	.3	.3	.3		*.3	.4		.5	8.7	10.7	.20	1.24
28	.3	.3	.3		.3	.4		.5	.97	.42	.31	1.21
29	.3	*.3	.3		-	.4		.5	.97	7.0	.30	1.21
30	.3	.3	.3			.4		.5	3.3	.44	.31	1.19
31	.3		.3			.4		.5		12.1	.31	
Total	49.1	8.0	8.4	9.3	8.4	11.7	12.0	14.0	1.448.8	1.790.2	1.627	850
Mean	1.58	0.27	0.27	0.30	0.30	0.38	0.40	0.45	48.3	57.7	52.5	28.3
Ac-ft	97	16	17	18	17	23	24	28	2,870	3,550	3,230	1,690
(†)	2,100	2,600	3,000	3,120	3,550	3,990	6,240	10,020	11,090	9,200	8,020	8,020

Calendar year 1960: Max 116 Min 0.1 Mean 15.7 Ac-ft 11,380

Water year 1960-61: Max 124 Min 0.2 Mean 16.0 Ac-ft 11,580

* Discharge measurement made on this day.

a No gage-height record.

† Contents, in acre-feet, at end of month, in reservoir above station.

RIO GRANDE BASIN

8-2545. Costilla Creek near Amalia, N. Mex.

Location.--Lat 36°52'15", long 105°23'10", in Sangre de Cristo Grant, on right bank 50 ft downstream from third bridge upstream from Amalia, 1.5 miles downstream from Latir Creek, 6¼ miles southeast of Amalia, and 12 miles southeast of Costilla.

Drainage area.--140 sq mi, approximately.

Records available.--May 1949 to September 1959, April to September 1961 (no winter records).

Gage.--Water-stage recorder. Altitude of gage is 8,500 ft (from topographic map). Prior to May 3, 1956, at site 50 ft upstream at datum 1.0 ft higher.

Extremes.--Maximum discharge during year, 315 cfs Aug. 1 (gage height, 3.06 ft); minimum daily discharge recorded, 20 cfs Sept. 24, 25.

1949-59, 1960-61: Maximum discharge recorded, 689 cfs Apr. 25, 1958, from rating curve extended above 400 cfs; maximum gage height recorded, 3.85 ft May 13, 1958; minimum daily discharge recorded, 5.4 cfs July 22, 1956.

Remarks.--Records fair. Flow regulated by Costilla Reservoir (capacity, 15,700 acre-ft, original survey). Diversions for irrigation of about 1,300 acres above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

1.4	13	2.0	56
1.6	22	2.3	99
1.8	36	2.5	139

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							-	97	75	25	130	32
2							-	103	*71	25	96	24
3							-	99	67	71	*101	33
4							-	103	63	69	66	44
5							-	96	77	76	35	30
6							-	86	87	108	37	26
7							-	87	91	76	82	*25
8							-	77	99	26	84	25
9							-	67	99	27	84	25
10							-	67	96	77	93	26
11							-	80	97	78	62	25
12							-	91	92	*78	32	24
13							-	96	89	78	46	22
14							-	97	87	55	84	22
15							-	87	91	28	77	22
16							-	77	84	34	75	23
17							-	77	65	81	67	22
18							-	*82	39	86	56	26
19							-	92	74	101	32	31
20							-	99	*75	101	35	*26
21							-	99	80	68	67	23
22							-	97	78	36	71	21
23							103	99	77	41	*74	21
24							82	96	78	100	72	20
25							65	92	81	112	55	20
26							*65	99	94	116	35	27
27							64	99	94	110	33	120
28							72	89	103	71	44	118
29							80	86	105	21	38	116
30							93	82	70	33	38	116
31							-----	78	-----	130	38	-----
Total	-	-	-	-	-	-	-	2,776	2,478	2,138	1,939	1,135
Mean	-	-	-	-	-	-	-	89.5	82.6	69.0	62.5	37.8
Ac-ft	-	-	-	-	-	-	-	5,510	4,920	4,240	3,850	2,250

Calendar year : Max Min Mean Ac-ft
Water year : Max Min Mean Ac-ft

* Discharge measurement made on this day.

8-2555. Costilla Creek near Costilla, N. Mex.

Location.--Lat 36°57'55", long 105°30'10", in Sangre de Cristo Grant, on left bank 1 mile upstream from diversion dam and 2 miles southeast of Costilla, Taos County.

Drainage area.--195 sq mi.

Records available.--March 1936 to September 1961 (no winter records 1936-41). Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder. Concrete control since Oct. 13, 1952. Altitude of gage is 7,810 ft (from topographic map). Prior to June 18, 1944, at site half a mile downstream at different datum.

Average discharge.--20 years (1941-61), 46.1 cfs (33,380 acre-ft per year).

Extremes.--Maximum discharge during year, 418 cfs Apr. 19 (gage height, 3.87 ft); minimum daily, 4 cfs Jan. 4.

1936-61: Maximum discharge, 1,150 cfs May 11, 1942 (gage height, 5.37 ft, site and datum then in use); minimum daily recorded, 2 cfs Dec. 30, 1946.

The greatest flood known occurred in 1886, from information by local residents.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Regulation by Costilla Reservoir 20 miles upstream (capacity, 15,700 acre-ft, original survey). Diversions for irrigation of about 2,000 acres above station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.2	2.8	1.6	14	2.0	38	2.8	142
1.4	7.0	1.8	24	2.4	80	3.2	220

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.4	*12	b6	a7	a6	b6	16	120	*83	36	*130	46
2	9.4	12	b6	a6	a7	b7	16	127	76	31	120	a32
3	9.4	11	b7	*a5	a7	b8	23	123	71	61	125	44
4	9.7	11	b7	a4	a7	b8	72	125	65	70	101	57
5	*9.4	10	b6	a5	a7	b8	77	118	75	68	52	45
6	9.4	11	b5	a5	a6	b7	44	104	84	93	38	37
7	9.1	13	b5	a6	a6	b6	41	100	84	93	89	*34
8	9.1	15	b5	a6	a6	b6	30	93	93	36	94	32
9	9.1	13	b5	a6	a6	b6	29	81	94	30	93	32
10	10	b9	b5	a6	a6	b8	29	81	92	66	96	33
11	9.4	b9	b7	a6	a7	b8	*26	90	92	75	88	34
12	9.4	b9	b7	a6	b7	b8	23	106	89	*74	42	32
13	9.4	10	b7	a6	b7	*9.7	29	116	85	72	47	30
14	9.1	11	b7	a6	b7	12	28	115	85	62	89	28
15	9.7	10	b7	a6	*b9	16	27	102	94	30	83	29
16	12	*b6	b5	a6	b9	24	27	*86	90	25	89	30
17	20	b6	b5	*a5	b9	20	42	84	78	64	79	28
18	*21	b7	b6	a5	b9	17	92	90	41	71	75	32
19	16	b7	*b8	a5	b8	12	188	98	68	88	44	*43
20	14	b7	b7	a5	b8	14	212	110	76	93	38	35
21	14	b7	b7	a5	b8	14	158	111	*77	82	70	32
22	14	b7	b8	a5	b8	14	*148	110	76	41	75	29
23	14	b7	b8	a5	b8	23	147	113	75	35	*77	28
24	14	b7	b8	a5	b6	42	*125	108	79	81	80	27
25	14	b7	b8	a6	b7	37	98	98	80	98	71	27
26	13	b8	a8	a6	b7	27	*88	110	89	105	43	26
27	13	b7	a8	a6	b6	21	75	116	89	105	a36	96
28	14	b5	a8	a6	*b6	22	83	104	98	87	52	111
29	14	b5	a7	a5	-	*18	94	98	102	30	47	113
30	11	*b6	a6	a5	-----	19	108	92	85	25	46	113
31	9.1	-----	a7	*a6	-----	15	-----	88	-----	103	48	-----
Total	368.1	265	206	172	200	462.7	2195	3217	2465	2030	2257	1315
Mean	11.9	8.8	6.6	5.5	7.1	14.9	73.2	104	82.2	65.5	72.8	43.8
Ac-ft	730	526	409	341	397	918	4,350	6,380	4,890	4,030	4,480	2,610

Calendar year 1960: Max 125 Min 3 Mean 34.7 Ac-ft 25,170

Water year 1960-61: Max 212 Min 4 Mean 41.5 Ac-ft 30,060

Peak discharge (base, 250 cfs).--Apr. 19 (11:45 p.m.) 418 cfs (3.87 ft).

* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

RIO GRANDE BASIN

8-2605. Costilla Creek below diversion dam, at Costilla, N. Mex.

Location.--Lat 36°58'00", long 105°30'55", in Sangre de Cristo Grant, on right bank 650 ft downstream from diversion dam and 1.5 miles southeast of Costilla, Taos County.

Drainage area.--197 sq mi.

Records available.--April 1952 to September 1961 (no winter records).

Gage.--Water-stage recorder and concrete control. Altitude of gage is 7,790 ft (from topographic map).

Extremes.--Maximum discharge recorded during year, 411 cfs Apr. 19 (gage height, 3.41 ft); minimum daily recorded, 0.4 cfs Aug. 17.

1952-61: Maximum discharge recorded, 525 cfs July 22, 1954; maximum gage height, 5.05 ft July 24, 1957; minimum daily discharge recorded, 0.1 cfs Sept. 28-30, 1953, Sept. 12-28, 1956.

Remarks.--Records good. Flow partly regulated by Costilla Reservoir about 21 miles upstream (capacity, 15,700 acre-ft, original survey). Diversions above station for irrigation of about 5,000 acres, 3,000 of which lies below station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 22 to May 15)

0.6	0.3	0.9	5.8	1.5	45
.7	1.1	1.0	10	2.0	105
.8	2.8	1.2	21	2.6	210

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.4					-	1.8	11.4	*3.6	18	*8.6	1.4
2	1.4					-	1.7	9.9	5.4	1.1	6.2	1.4
3	1.4					-	4.5	8.3	1.6	6.0	9.2	2.0
4	1.2					-	3.5	7.7	5.8	4.0	1.7	7.7
5	*1.2					-	5.7	7.7	1.9	2.9	1.3	3.2
6	-					-	4.3	6.4	6.6	9.6	1.0	1.8
7	-					-	4.1	6.0	5.8	2.8	2.6	*1.8
8	-					-	3.2	5.4	1.1	1.6	1.5	1.8
9	-					-	3.0	4.3	1.4	2.8	1.2	1.8
10	-					-	2.7	4.7	1.4	6	2.7	1.8
11	-					-	*2.6	4.3	1.4	7	7.3	1.8
12	-					-	2.1	4.2	1.1	*1.5	1.0	1.8
13	-					-	2.6	5.0	7.1	2.0	1.5	1.7
14	-					-	2.2	5.1	7.1	2.2	5.5	1.5
15	-					-	2.1	3.5	1.4	.9	.9	1.4
16	-					-	2.1	*1.9	1.2	.6	.7	1.4
17	-					-	3.5	1.5	2.2	3.3	.4	1.4
18	-					-	8.2	1.6	3.5	1.2	1.6	2.0
19	-					-	1.77	2.2	1.2	1.7	1.5	*3.0
20	-					-	2.01	5.1	5.8	1.1	1.8	1.1
21	-					-	1.53	8.8	*7.1	1.3	2.2	1.0
22	-					-	1.44	4.1	6.2	1.4	2.0	.9
23	-					-	1.44	2.3	6.2	.9	2.2	.9
24	-					-	*1.23	1.8	7.5	2.4	*1.8	.9
25	-					-	.94	1.2	8.7	2.2	2.2	.8
26	-					-	*8.6	1.9	1.1	5.1	1.5	7.4
27	-					-	4.5	7.1	2.5	9.2	1.4	5.8
28	-				-	3.1	*7.5	1.6	1.1	1.2	1.5	7.3
29	-					*2.0	9.0	1.1	1.2	1.1	1.4	8.2
30	-					2.2	1.05	7.9	1.9	1.8	1.2	8.3
31	-					1.7		6.2		3.8	1.2	
Total	-	-	-	-	-	-	1,990	1,329.1	391.3	183.9	131.7	374.9
Mean	-	-	-	-	-	-	66.3	42.9	13.0	5.93	4.25	12.5
Ac-ft	-	-	-	-	-	-	3,950	2,640	776	365	261	744
Calendar year	: Max	Min			Mean		Ac-ft					
Water year	: Max	Min			Mean		Ac-ft					

* Discharge measurement made on this day.

8-2610. Costilla Creek at Garcia, Colo.

Location.--Lat 36°59'30", long 105°32'00", in Sangre de Cristo Grant, on left bank 200 ft downstream from old highway bridge, a quarter of a mile upstream from New Mexico-Colorado State line, and 0.6 mile south of Garcia.

Drainage area.--200 sq mi, approximately.

Records available.--June 1944 to September 1961 (no winter records).

Gage.--Water-stage recorder. Altitude of gage is 7,750 ft (based on estimated relation to former station). Prior to Apr. 20, 1950, at site 1,000 ft downstream at datum 7,747.43 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 445 cfs Apr. 20 (gage height, 4.60 ft); no flow for many days.

1944-61: Maximum discharge, 460 cfs July 24, 1957 (gage height, 4.76 ft); no flow at times in most years.

The greatest flood known occurred in 1886, information by local residents. Flood of May 11, 1942, probably reached a discharge of 1,000 cfs.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Flow partly regulated by Costilla Reservoir about 23 miles upstream (capacity, 15,700 acre-ft, original survey). Diversions above station for irrigation of about 5,500 acres, 2,000 of which lies below station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

1.8	0	2.8	18
1.9	.2	3.0	28
2.0	.6	3.2	40
2.2	1.8	3.5	69
2.4	4.6	3.8	120
2.6	9.7	4.2	239

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							a1.5	104	1.9	15	a6	10
2							a1.5	86	2.2	.4	a4	11
3							a4	76	9.4	.2	7.0	a2
4							28	64	4.5	1.4	14	a6
5							68	70	17	.6	a13	a3
6							40	56	3.2	3.8	a0	a2
7							42	53	6.4	2.2	1.0	*1.9
8							30	48	11	1.6	0	1.6
9							24	38	9.4	.7	0	1.4
10							26	38	9.2	*.5	0	1.3
11							*24	35	9.7	.9	3.6	1.3
12							19	34	a8	.7	0	1.2
13							23	42	a6	.5	0	.8
14							20	42	a6	.4	1.1	.7
15							16	31	a10	a0	0	.6
16							16	*16	a9	0	0	.6
17							25	10	a13	.9	0	.4
18							66	11	a20	0	a14	1.4
19							148	18	*0	.1	a13	*3.0
20							225	39	0	0	a2	1.4
21							172	82	1.6	9.4	a10	1.1
22							*167	39	1.2	14	a8	1.0
23							168	20	1.9	a0	a10	.9
24							134	16	2.8	a1	*9.4	.8
25							88	9.2	5.6	a.5	10	.7
26							73	15	6.2	.5	8.4	3.4
27							59	24	4.8	.3	7.5	4.3
28						-	67	14	7.2	6.0	8.6	6.5
29							84	9.2	7.8	9.8	8.4	*20
30					-----		97	4.6	14	.1	5.8	8.8
31					-----		-----	*3.8	-----	1.3	2.6	-----
Total	-	-	-	-	-	-	1,956.0	1,147.8	249.5	107.0	167.4	345.5
Mean	-	-	-	-	-	-	65.2	37.0	8.32	3.45	5.40	11.5
Ac-ft	-	-	-	-	-	-	3,880	2,280	495	212	332	685

Calendar year : Max Min Mean Ac-ft

Water year : Max Min Mean Ac-ft

Peak discharge (base, 200 cfs). --Apr. 20 (1:15 a.m.) 445 cfs (4.60 ft).

* Discharge measurement made on this day.

a No gage-height record.

RIO GRANDE BASIN

8-2625. Costilla Creek near Jaroso, Colo.

Location.--Lat 36°59'00", long 105°42'05", in SW $\frac{1}{4}$ sec.30, T.32 N., R.12 E. (projected), in Sangre de Cristo Grant, on left bank 1 mile upstream from mouth, 1 mile downstream from Colorado-New Mexico line, and 5 miles southwest of Jaroso, Costilla County.

Drainage area.--290 sq mi, approximately.

Records available.--April to September 1912 and May to September 1913 (published as "near mouth, N. Mex."), May to September 1936 (published as "near mouth, near Jaroso, Colo."), April 1948 to October 1961 (discontinued).

Gage.--Water-stage recorder. Altitude of gage is 7,500 ft (from topographic map). April 1912 to September 1913, staff gage at present site at different datum. May to November 1936, water-stage recorder at site 1 mile upstream at different datum.

Average discharge.--13 years (1948-61), 2.28 cfs (1,650 acre-ft per year).

Extremes.--Maximum discharge during year, 36 cfs Apr. 23 (gage height, 2.06 ft); no flow for most of year.

1912-13 (prior to completion of Costilla Reservoir): Maximum daily discharge, 344 cfs May 23, 24, June 7, 1912; no flow at times.

1936, 1948-61 (subsequent to completion of Costilla Reservoir): Maximum discharge, 360 cfs May 19, 1958 (gage height, 4.10 ft); no flow for long periods each year.

Remarks.--Records good. Flow partly regulated by Costilla Reservoir, completed in 1920, about 35 miles upstream (capacity, 15,700 acre-ft, original survey). Diversions for irrigation of about 6,000 acres above station. No flow Oct. 1-18, 1961.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

0.7	0	0.9	0.1	1.3	2.2	1.6	9.4
.8	.03	1.1	.6	1.4	4.0		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							0					
2							0					
3							0					
4							0					
5							0					
6							0					
7							0					
8							0					
9							0					
10							0					
11							0					
12							0					
13							0					
14							0					
15							0					
16							0					
17							0					
18							0					
19							0					
20							1.8					
21							* 6.8					
22							* 4.2					
23							7.3					
24							1.4					
25							0					
26							0					
27							0					
28							0					
29							0					
30							0					
31							0					
Total	0	0	0	0	0	0	21.5	0	0	0	0	0
Mean	0	0	0	0	0	0	0.72	0	0	0	0	0
Ac-ft	0	0	0	0	0	0	43	0	0	0	0	0

Calendar year 1960: Max 0.8 Min 0 Mean 0.003 Ac-ft 2.4

Water year 1960-61: Max 7.3 Min 0 Mean 0.06 Ac-ft 43

Peak discharge (base, 100 cfs).--No peak above base.

* Discharge measurement made on this day.

Principal diversions from Costilla Creek, New Mexico-Colorado

Records of discharge are collected at 9 gaging stations on 4 diversions from Costilla Creek. Each of these stations is equipped with a water-stage recorder and a Parshall flume. Water diverted is used for irrigation in the Sangre de Cristo Grant in New Mexico and Colorado below the gaging station on Costilla Creek near Costilla, N. Mex. Records are collected during irrigation seasons only. Discharge measurements generally made twice a month except during winter period.

- 8-2560. Acequia Madre at Costilla, N. Mex.--Lat 36°58'00", long 105°30'50", 275 ft downstream from diversion dam. Records available, May 1944 to September 1961. Acequia diverts from right bank of Costilla Creek.
- 8-2565. Mesa ditch near Garcia, Colo.--Lat 36°59'50", long 105°30'45", 429 ft north of milepost No. 136+54 on New Mexico-Colorado State line. Records available, June 1944 to September 1961. Ditch diverts from right bank of Acequia Madre for irrigation in Colorado.
- 8-2575. Cordillera ditch at Garcia, Colo.--Lat 36°59'40", long 105°31'40", 570 ft south of New Mexico-Colorado State line. Records available, June 1944 to September 1961. Ditch diverts from Acequia Madre for irrigation in Colorado.
- 8-2580. Cerro Canal at Costilla, N. Mex.--Lat 36°57'50", long 105°31'10", 1,400 ft downstream from diversion dam. Records available, April 1944 to September 1961. Canal diverts from left bank of Costilla Creek.
- 8-2585. Association ditch at Costilla, N. Mex.--Lat 36°57'45", long 105°32'20", 100 ft downstream from new diversion from Cerro Canal. Records available, May 1955 to September 1961. Ditch diverts from left bank of Cerro Canal.
- 8-2590. Cerro Canal near Jaroso, Colo.--Lat 36°59'35", long 105°34'35". Records available, June 1944 to September 1961. Flow measured is delivered to Colorado and to New Mexico branch of Cerro Canal.
- 8-2595. New Mexico Branch Cerro Canal near Jaroso, Colo.--Lat 36°59'35", long 105°34'45", 225 ft downstream from headgate. Records available, June 1944 to September 1961. Canal diverts from left bank of Cerro Canal for irrigation in New Mexico.
- 8-2600. Penasquito ditch at Costilla, N. Mex.--Lat 36°57'50", long 105°31'10", 1,200 ft downstream from point of diversion which is 100 ft below Costilla diversion dam. Records available, May 1955 to September 1961 (discontinued). Ditch diverts from left bank of Costilla Creek.
- 8-2620. Eastdale No.1 intake canal near Jaroso, Colo.--Lat 37°02'40", long 105°37'00", 750 ft downstream from headgate. Records available, June 1944 to September 1961. Canal diverts from right bank of Costilla Creek to Eastdale Reservoir No.1 for irrigation in Colorado.

Diversions, in acre-feet, water year October 1960 to September 1961

[illegible]

8-2630. Latir Creek near Cerro, N. Mex.

Location.--Lat 36°49'45", long 105°32'45", in S $\frac{1}{2}$ SW $\frac{1}{4}$ sec.15, T.30 N., R.13 E., on right bank at mouth of canyon, 100 ft upstream from heading of Cerro community ditch and 6 miles northeast of Cerro.

Drainage area.--10 sq mi, approximately.

Records available.--June 1937 to September 1961. Monthly discharge only for some periods, published in WSP 1312. Records for April and May 1937, published in WSP 828, have been found to be unreliable (unknown portion of flow bypassing gage) and should not be used.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 8,250 ft (from topographic map).

Average discharge.--24 years, 6.58 cfs (4,760 acre-ft per year).

Extremes.--Maximum discharge during year, 23 cfs Sept. 18 (gage height, 1.09 ft); minimum daily, 0.2 cfs Jan. 20-21, 24.

1937-61: Maximum discharge determined, 121 cfs June 3, 1942, from rating curve extended above 56 cfs by logarithmic plotting; maximum gage height recorded, 4.2 ft July 19, 1945 (log jam; discharge not determined, but may have exceeded 121 cfs); minimum daily discharge, 0.2 cfs Jan. 20-21, 24, 1961.

Remarks.--Records fair except those for periods of ice effect or doubtful or no gage-height record, which are poor.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.2	1.5
.3	2.8
.5	6.1
.7	11
1.0	19

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.2	3.2	2.4	b1.5	b1.0	2.0	1.8	11	1.9	7.4	5.7	4.3
2	3.1	3.1	2.4	b1.2	b1.5	2.2	1.9	11	1.9	7.2	5.6	4.2
3	*3.1	*2.7	2.4	b1	1.8	2.2	2.4	10	1.8	6.7	6.4	5.7
4	3.0	2.7	b2.3	b1	1.9	2.0	3.0	9.8	1.7	6.5	7.8	5.6
5	2.8	2.5	b2.3	b1	1.9	2.0	2.8	6.9	1.6	6.5	6.1	6.5
6	2.8	2.7	b2.2	b1	1.9	2.0	2.8	5.7	*1.5	6.8	5.0	*5.7
7	2.8	2.7	b2.1	b1	2.0	2.0	2.4	5.0	1.5	8.8	4.7	5.4
8	2.8	2.5	d2.1	b.5	2.0	2.0	2.0	4.8	1.5	7.2	4.5	5.2
9	2.8	2.3	d2.1	b.5	2.0	2.2	2.4	6.6	1.6	6.5	4.3	7.6
10	2.8	2.4	d2.1	*b1	2.0	2.2	2.2	9.0	1.7	5.7	4.3	7.6
11	3.0	2.5	d2.2	b.5	2.2	2.2	2.0	11	1.7	5.7	4.3	7.6
12	2.8	2.4	d2.2	b.5	2.3	2.2	2.3	11	*1.7	*5.6	4.3	7.2
13	2.8	2.5	d2.2	b.5	2.3	*2.2	2.0	7.8	1.6	5.2	5.8	6.3
14	2.8	2.4	d2.2	b.5	2.3	2.3	2.0	7.2	1.5	5.0	5.0	6.1
15	2.3	2.3	d2	b.3	*2.3	2.4	2.5	6.7	1.7	4.8	4.3	5.7
16	3.4	*b2.5	d1.5	b.3	2.3	2.4	2.2	7.7	1.5	4.7	4.5	5.6
17	3.7	2.5	d1.5	b.5	2.3	2.2	2.5	9.1	1.4	4.5	4.3	5.2
18	3.4	*2.5	d2	b.5	2.3	2.2	*3.1	11	1.4	4.3	5.5	8.5
19	*3.2	2.7	d2.2	*b.5	2.3	2.2	4.2	12	1.3	4.3	4.3	7.6
20	3.2	2.7	*d2.2	b.2	2.3	2.0	6.7	13	1.2	4.5	3.8	6.5
21	3.2	2.4	d2.1	b.2	2.3	2.0	6.7	13	1.2	5.2	3.7	5.9
22	3.4	2.2	d2.1	b.4	2.3	2.2	7.6	14	*1.1	4.7	3.7	5.7
23	3.2	2.2	d2.1	b.3	2.2	2.4	8.0	15	1.1	4.2	*5.7	5.4
24	3.4	2.2	d2.1	b.2	2.2	2.4	7.2	*1.4	1.0	4.0	5.9	5.2
25	3.4	2.2	d2.1	b.3	2.2	2.2	5.7	14	9.9	4.5	4.7	4.8
26	3.4	2.2	d2.1	b.5	2.0	2.2	4.7	16	9.2	4.5	4.2	4.7
27	3.4	2.3	d2.1	b.5	2.0	2.2	4.7	16	8.4	4.3	5.8	4.5
28	3.4	b2.2	d2.1	b.3	*2.0	*2.0	*7.1	17	8.8	5.3	5.6	*4.3
29	3.2	b2.3	d2	a.3	-	1.8	9.4	18	8.2	5.0	4.8	4.3
30	2.8	*2.4	d1.5	a.3	-----	1.9	11	18	7.8	4.2	4.7	4.2
31	3.1	-----	d1.5	*b.6	-----	2.0	-----	1.9	-----	4.7	4.7	-----
Total	95.7	74.4	64.4	17.9	58.1	66.4	125.3	350.3	413.3	160.5	154.0	173.1
Mean	3.09	2.48	2.08	0.58	2.08	2.14	4.18	11.3	13.8	5.44	4.97	5.77
Ac-ft	190	148	128	36	115	132	249	695	820	334	305	343

Calendar year 1960: Max 31 Min 1.5 Mean 5.53 Ac-ft 4,020

Water year 1960-61: Max 19 Min 0.2 Mean 4.83 Ac-ft 3,500

Peak discharge (base, 40 cfs).--No peak above base.

* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

d Doubtful gage-height record.

RIO GRANDE BASIN

59

8-2635. Rio Grande near Cerro, N. Mex.

Location.--Lat 36°44'05", long 105°41'05", in N½ sec.20, T.29 N., R.12 E., on left bank 4 miles southwest of Cerro, 5½ miles north-west of Questa, and 7 miles upstream from Red River.

Drainage area.--8,440 sq mi, approximately (includes 2,940 sq mi in closed basin in San Luis Valley, Colo.).

Records available.--May 1948 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 7,100 ft (from river-profile map).

Average discharge.--13 years, 347 cfs (251,200 acre-ft per year).

Extremes.--Maximum discharge during year, 1,390 cfs May 2 (gage height, 7.28 ft); minimum daily, 71 cfs Oct. 8, 10.
1948-61: Maximum discharge, 9,740 cfs June 22, 1949 (gage height, 15.78 ft); minimum daily, 44 cfs Sept. 20 to Oct. 2, 1956.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Diversions for irrigation of about 626,000 acres above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

1.3	57	4.0	437
1.5	73	5.0	645
2.0	120	6.0	920
3.0	259	7.0	1,320

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	76	a112	125	189	197	296	194	647	866	a150	89	90
2	76	a112	132	183	202	280	200	961	854	a140	86	86
3	76	a*111	157	183	206	298	214	1,180	824	a138	85	86
4	*73	111	148	172	204	287	202	1,220	728	a135	88	101
5	72	111	112	*166	210	289	203	1,270	551	a132	101	128
6	72	111	143	165	*221	287	216	1,210	*445	a130	96	128
7	72	111	114	161	218	267	334	869	382	a130	94	127
8	71	110	126	160	214	266	318	620	333	a150	97	*123
9	72	111	186	161	215	272	326	529	262	a140	96	126
10	71	113	161	162	216	269	309	456	229	a130	94	164
11	80	381	162	164	220	273	284	443	251	a150	92	138
12	85	579	189	166	227	277	264	452	251	a150	94	122
13	79	600	200	168	233	287	248	467	224	a120	95	113
14	74	600	221	169	241	*287	238	535	208	a110	92	114
15	76	605	221	168	259	261	227	483	204	a105	101	123
16	85	*543	210	173	*273	243	230	369	187	a100	112	123
17	86	275	212	177	285	235	233	335	161	*98	*123	117
18	93	183	202	180	292	240	*209	302	152	a95	115	123
19	101	156	186	*180	285	241	194	287	161	a90	137	125
20	*116	148	*184	180	289	212	358	270	180	a90	109	115
21	161	143	170	182	292	210	707	277	183	88	107	112
22	175	141	183	184	290	209	815	339	*194	108	101	110
23	160	135	200	184	295	202	a800	337	209	123	116	112
24	152	129	209	184	299	198	a800	459	206	110	115	141
25	141	141	210	186	267	196	a760	848	206	101	105	144
26	138	137	212	189	287	204	a640	585	187	95	106	141
27	a130	137	214	189	256	218	*519	615	173	89	101	129
28	a125	122	214	186	*210	*209	471	758	166	127	98	*127
29	a120	115	210	191	-	210	416	971	156	120	91	120
30	a115	*122	206	198	-----	198	467	989	144	118	90	115
31	a114	-----	202	197	-----	200	-----	851	-----	95	90	-----
Total	3,137	6,505	5,621	5,497	6,903	7,621	11,396	19,934	9,277	3,657	3,116	3,623
Mean	101	217	181	177	247	246	380	643	309	118	101	121
Ac-ft	6,220	12,900	11,150	10,900	13,690	15,120	22,600	39,450	18,400	7,250	6,180	7,190

Calendar year 1960: Max 1,700 Min 60 Mean 317 Ac-ft 230,100

Water year 1960-61: Max 1,270 Min 71 Mean 236 Ac-ft 171,100

Peak discharge (base, 1,000 cfs).--May 2 (7:30 p.m.) 1,390 cfs (7.28 ft); May 30 (12 p.m.) 1,060 cfs (6.46 ft).

* Discharge measurement made on this day.

a No gage-height record.

RIO GRANDE BASIN

8-2650. Red River near Questa, N. Mex.

Location.--Lat 36°42'10", long 105°34'00", in SE $\frac{1}{4}$ sec.32, T.29 N., R.13 E. (projected), on left bank 1 $\frac{1}{4}$ miles upstream from Cabresto Creek and 1.5 miles east of Questa.

Drainage area.--113 sq mi.

Records available.--April to October 1910 and January to September 1911 (gage heights and discharge measurements only), October 1912 to September 1925 (fragmentary prior to September 1915), January to March 1926, September 1926 to September 1961. Published as 'above Questa' January 1926 to September 1930, and as Rio Colorado near Questa October 1930 to September 1947. Monthly discharge only for some periods, published in WSP 1312. Previously published figures of discharge for October to December 1925 have been found to be unreliable and should not be used.

Gage.--Water-stage recorder. Wood or concrete control since Mar. 20, 1936. Datum of gage is 7,451.72 ft above mean sea level, datum of 1929. Apr. 5 to Oct. 14, 1910, and Jan. 27 to Sept. 4, 1911, staff gages at sites 1 $\frac{1}{2}$ and 3 $\frac{1}{2}$ miles upstream, respectively, each at different datum. Oct. 6, 1912, to Aug. 21, 1920, chain gage at site 200 ft upstream at various datums. Aug. 22, 1920, to June 16, 1921, staff gage at present site at datum 2.29 ft lower. June 17, 1921, to Apr. 30, 1934, water-stage recorder at present site at datum 2.55 ft lower and May 1, 1934, to Oct. 3, 1938, at datum 1.41 ft lower.

Average discharge.--48 years (1912-25, 1926-61), 57.4 cfs (41,560 acre-ft per year).

Extremes.--Maximum discharge during year, about 220 cfs May 28; minimum daily, 9 cfs Dec. 17.

1930-61: Maximum discharge, 886 cfs May 25, 1942 (gage height, 2.32 ft), from rating curve extended above 450 cfs by logarithmic plotting; minimum daily, 6 cfs Dec. 5, 1955.

The peak of June 15, 1921, may have equaled or exceeded the peak of May 25, 1942.

Remarks.--Records good except those for periods of doubtful or no gage-height record and those for Apr. 28 to May 23, which are fair. Diversions for irrigation of a few hundred acres above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 2-5, 13, 15-21)

0.7	9.0	1.1	38	1.7	150
.9	20	1.4	82	1.9	210

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	16	a18	*17	13	*14	*14	18	102	d200	74	30	27
2	14	a18	18	11	14	14	17	114	d200	70	34	25
3	*14	a18	19	12	14	14	18	125	d190	65	43	34
4	14	*18	18	*13	14	14	20	140	d180	67	*37	37
5	14	18	16	13	14	15	22	130	d170	64	35	37
6	14	19	12	14	14	15	22	116	d170	62	31	*37
7	14	20	12	15	14	14	28	102	*a160	72	30	33
8	13	20	18	15	15	14	26	90	a155	62	28	31
9	15	20	19	16	14	16	22	75	a150	56	29	34
10	16	19	13	15	14	16	25	94	a150	52	30	d36
11	16	18	18	14	14	17	24	104	a150	50	32	d36
12	15	18	20	14	14	17	22	114	a150	50	34	d38
13	15	18	18	14	14	17	*24	132	a145	*49	33	d36
14	16	18	19	14	14	*19	26	120	a145	46	34	d35
15	18	*18	14	14	*14	19	23	116	a145	45	34	d35
16	21	15	11	14	14	19	25	111	a145	43	34	34
17	24	17	9.0	14	15	19	29	114	a140	39	33	33
18	22	16	13	*13	15	19	37	116	a130	37	33	35
19	*21	17	16	13	16	19	d56	132	a125	37	34	45
20	22	16	16	14	15	18	d75	150	a120	36	32	46
21	21	16	*14	14	15	19	d90	164	*109	37	32	44
22	20	17	14	14	15	19	d100	167	107	37	33	38
23	20	15	15	14	16	19	d110	*194	102	35	37	38
24	20	16	16	13	14	21	d100	d190	100	33	35	37
25	20	15	14	13	15	20	d90	d190	98	32	30	35
26	21	16	15	13	16	19	d80	d200	94	30	32	35
27	21	17	14	13	15	16	d75	d200	90	31	32	*33
28	20	14	16	13	16	*17	*77	d210	88	33	33	33
29	20	13	14	13	-	18	82	d200	82	31	30	34
30	19	16	13	14	-----	18	90	d200	77	29	31	34
31	a19	-----	14	14	-----	16	-----	d200	-----	30	32	-----
Total	555	514	475.0	423	408	531	1,453	4,412	4,067	1,434	1,017	1,065
Mean	17.9	17.1	15.3	13.6	14.6	17.1	48.4	142	136	46.3	32.8	35.5
Ac-ft	1,100	1,020	942	839	809	1,050	2,880	8,750	8,070	2,840	2,020	2,110

Calendar year 1960: Max 138 Min 8 Mean 38.8 Ac-ft 28,140

Water year 1960-61: Max 210 Min 9.0 Mean 44.8 Ac-ft 32,430

Peak discharge (base, 160 cfs). --220 cfs (estimated) May 28.

* Discharge measurement made on this day.

a No gage-height record.

d Doubtful gage-height record.

8-2655. Llano ditch near Questa, N. Mex.

Location.--Lat 36°43'45", long 105°33'00", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.21, T.29 N., R.13 E., on left bank 150 ft downstream from heading, 3 $\frac{1}{4}$ miles northeast of Questa, and 3 $\frac{3}{4}$ miles upstream from mouth of Cabresto Creek.

Records available.--September 1943 to September 1961 (no winter records).

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 7,877 ft above mean sea level (river-profile survey).

Extremes.--1943-61: Maximum daily discharge recorded, 42 cfs June 6, 7, 1958; no flow at times.

Remarks.--Records good. Ditch diverts water from right bank of Cabresto Creek for irrigation of about 800 acres near Questa.

Monthly discharge, in cubic feet per second, water year October 1960 to September 1961

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October	0	0	0	0
November	-	-	-	-
December	-	-	-	-
Calendar year 1960	-	-	-	-
January	-	-	-	-
February	-	-	-	-
March	-	-	-	-
April	19	0	3.34	199
May	30	14	21.2	1,310
June	26	1.1	11.5	682
July	16	0	4.14	254
August	0	0	0	0
September	0	0	0	0
Water year 1960-61	-	-	-	-

8-2660. Cabresto Creek near Questa, N. Mex.

Location.--Lat 36°43'45", long 105°33'10", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.21, T.29 N., R.13 E., on right bank a quarter of a mile downstream from Llano ditch heading, 2 $\frac{1}{2}$ miles downstream from Lake Fork, 3 miles northeast of Questa, and 3 $\frac{1}{2}$ miles upstream from mouth.

Drainage area.--36.7 sq mi.

Records available.--September 1943 to September 1961.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 7,845 ft above mean sea level (river-profile survey).

Average discharge.--18 years, 10.3 cfs (7,460 acre-ft per year).

Extremes.--Maximum discharge during year, 46 cfs May 3 (gage height, 2.24 ft); minimum daily, 3 cfs Dec. 16, 17, Jan. 2. 1943-61: Maximum discharge, 176 cfs June 8, 1957 (gage height, 4.44 ft); minimum daily, 1 cfs Jan. 19, 1960. The high water of May 25, 1942, reached a stage of 4.18 ft (discharge probably exceeded 200 cfs).

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Llano ditch (the only diversion above station) diverts from right bank a quarter of a mile above gage for irrigation of about 800 acres below. Flow regulated by Cabresto Reservoir (capacity, 732 acre-ft) on Lake Fork 1 mile above its mouth.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 20-25)

0.2	2.0	1.1	16
.3	3.2	1.5	25
.5	5.9	2.0	38
.8	11		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.5	5.6	*5.2	a4	*a4	4.6	5.2	23	12	15	10	6.4
2	4.6	5.8	5.1	a3	a4	4.8	5.2	31	12	15	11	5.9
3	*4.8	*5.8	5.1	a3.5	a4	4.8	5.8	35	12	15	12	7.9
4	4.9	5.9	5.1	*a4	a4	4.6	5.6	30	12	14	*10	8.2
5	4.9	5.9	5.1	a4.5	a4	4.5	8.5	27	12	14	10	8.4
6	4.9	5.9	4.2	a4.5	a4	4.5	8.5	24	11	13	9.0	*8.5
7	4.9	6.5	5.1	a4.5	a4	4.4	9.5	20	*11	13	8.2	7.4
8	4.9	6.4	b5	a4.5	a4	b3.5	8.7	18	12	12	8.2	6.8
9	4.8	6.2	b5	a4.5	a4	b4	7.2	19	14	12	8.2	7.6
10	4.6	5.8	b3.5	a4.5	a4	4.6	8.4	22	13	12	8.2	8.5
11	4.6	5.6	b4.5	a4.5	a4	4.2	8.0	25	13	14	8.2	8.2
12	4.6	5.6	5.2	a4.5	a4	4.1	7.6	27	12	13	8.2	8.2
13	4.6	5.8	5.2	a4.5	a4	*4.0	*8.4	28	12	*12	9.0	7.6
14	4.6	5.9	5.2	a4.5	a4	4.2	8.2	28	13	13	8.4	7.4
15	4.9	5.9	b4	a4.5	a4	4.6	7.4	26	13	10	7.4	7.4
16	5.6	*4.8	b3	a4.5	*4.2	5.2	7.7	24	13	11	7.1	7.1
17	5.9	4.9	b3	a4.5	4.2	5.2	9.0	24	12	14	7.0	7.1
18	5.8	5.1	b4	*a4.5	4.2	4.9	12	25	12	14	7.4	7.7
19	*5.8	5.2	b4.5	a4.5	4.0	4.9	16	27	13	13	7.4	9.3
20	5.8	5.2	*b5	a4.5	b3.5	4.8	19	28	13	13	7.0	8.4
21	5.8	5.2	b4	a4.5	b3.5	4.6	20	29	*13	*13	6.8	8.2
22	6.2	5.5	b4.5	a4.5	b4	4.8	20	29	*13	*12	6.6	8.2
23	6.2	5.3	b4.5	a4.5	4.8	5.3	16	28	13	11	6.6	7.9
24	6.4	5.2	b5	a4.5	b4	5.9	19	*23	13	11	6.5	a7.8
25	6.4	5.2	b5	a4.5	b4.5	5.8	17	19	12	10	6.6	a7.8
26	6.4	5.2	b5	a4.5	5.2	5.5	16	18	13	11	6.8	a7.7
27	6.4	5.3	b4.5	a4.5	5.1	5.3	*16	19	16	10	6.8	*7.6
28	6.5	4.9	b4.5	a4.5	*5.3	*5.3	17	14	16	10	7.4	7.4
29	6.4	4.6	b4.5	a4	5.3	5.3	17	13	15	9.7	6.6	7.2
30	5.9	5.2	b4	a4	5.2	5.2	18	12	15	9.2	6.4	7.2
31	5.6	-----	a4	a4	4.9	4.9	-----	12	-----	9.3	6.4	-----
Total	168.2	165.4	141.5	134.5	116.5	148.3	351.9	727	386	378.2	245.4	231.0
Mean	5.43	5.51	4.56	4.34	4.16	4.78	11.7	23.5	12.9	12.2	7.92	7.70
Ac-ft	334	328	281	267	231	294	698	1,440	766	750	487	458

Calendar year 1960: Max 40 Min 1 Mean 8.65 Ac-ft 6,280

Water year 1960-61: Max 35 Min 3 Mean 8.75 Ac-ft 6,330

* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

RIO GRANDE BASIN

63

8-2670. Red River at mouth, near Questa, N. Mex.

Location.--Lat 36°39'00", long 105°41'30", in NW¹/₄ sec.20, T.28 N., R.12 E., on left bank 800 ft upstream from Rio Grande and 6.5 miles southwest of Questa.

Drainage area.--190 sq mi.

Records available.--December 1950 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 6,600 ft (from topographic map).

Average discharge.--10 years (1951-61), 84.3 cfs (61,030 acre-ft per year).

Extremes.--Maximum discharge during year, 272 cfs May 29 (gage height, 3.96 ft); minimum daily, 41 cfs Dec. 17.
1950-61: Maximum discharge, 647 cfs Jan. 18, 1952; maximum gage height, 5.75 ft June 14, 1959; minimum daily discharge, 38 cfs Feb. 2, 1951, Jan. 6, 23, Feb. 20, 22, 1955.

Remarks.--Records good except those for period of no gage-height record, which are fair. Diversions for irrigation of about 3,000 acres above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

1.8	43
2.1	67
2.4	93
2.7	123
3.0	154
3.5	212
4.0	279

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	53	57	*53	44	50	*48	48	161	242	118	73	a74
2	53	56	53	42	*50	50	46	177	243	114	73	a70
3	*53	55	55	42	50	50	47	192	250	110	94	a78
4	53	*55	54	*43	51	50	49	204	220	115	90	a80
5	52	55	52	44	49	51	53	194	213	110	90	a82
6	51	55	48	45	47	50	54	168	203	108	88	a78
7	51	59	46	47	49	49	62	154	*194	117	87	*73
8	50	57	53	48	52	47	62	139	193	108	85	73
9	49	57	56	48	51	48	56	131	194	105	81	75
10	51	57	48	48	51	50	60	141	198	99	79	81
11	51	54	52	49	52	50	60	158	198	97	86	81
12	50	54	57	47	52	49	57	178	195	98	88	83
13	52	54	54	47	52	49	57	189	190	94	90	80
14	51	54	56	48	52	*50	61	178	188	*92	88	77
15	54	*54	50	48	49	52	61	169	194	89	85	74
16	58	52	44	49	*49	53	63	158	192	88	85	73
17	64	52	41	48	53	51	67	161	184	87	77	72
18	65	52	44	48	53	50	*75	168	182	75	74	76
19	61	53	48	49	53	49	105	186	174	73	80	88
20	*61	53	49	*48	51	49	139	204	169	73	a78	89
21	63	53	*47	48	50	49	143	226	*160	76	a78	88
22	60	53	47	48	51	49	155	224	156	76	a80	87
23	60	52	48	49	51	49	161	237	152	73	a84	85
24	61	52	50	50	47	53	150	*234	146	72	a82	83
25	60	53	49	48	49	52	134	235	144	71	a76	80
26	61	53	49	48	50	50	125	246	138	69	a78	77
27	60	53	48	49	49	49	*116	252	132	69	a78	*74
28	61	50	50	50	52	*49	117	259	130	72	a80	74
29	61	48	48	48	-----	49	127	257	125	73	a76	73
30	57	51	45	50	-----	49	143	248	121	73	a78	74
31	57	-----	45	51	-----	47	-----	246	-----	72	a80	-----
Total	1,744	1,613	1,539	1,471	1,415	1,540	2,653	6,074	5,400	2,766	2,541	2,352
Mean	56.3	53.8	49.6	47.5	50.5	49.7	88.4	196	180	89.2	82.0	78.4
Ac-ft	3,460	3,200	3,050	2,920	2,810	3,050	5,260	12,050	10,710	5,490	5,040	4,670

Calendar year 1960: Max 205 Min 41 Mean 78.9 Ac-ft 57,270

Water year 1960-61: Max 259 Min 41 Mean 85.2 Ac-ft 61,710

Peak discharge (base, 200 cfs).--May 5 (12:45 a.m.) 220 cfs (3.57 ft); May 29 (4:15 a.m.) 272 cfs (3.96 ft).

* Discharge measurement made on this day.

a No gage-height record.

RIO GRANDE BASIN

8-2675. Rio Hondo near Valdez, N. Mex.

Location.--Lat 36°32'30", long 105°33'20", in S $\frac{1}{2}$ sec. 28, T. 27 N., R. 13 E. (projected), on left bank 500 ft upstream from first diversion, a quarter of a mile upstream from Forest Service gate, $1\frac{1}{2}$ miles east of Valdez, 4 miles downstream from South Fork, and 9 miles upstream from mouth.

Drainage area.--36.2 sq mi.

Records available.--August 1934 to September 1961.

Gage.--Water-stage recorder. Concrete control since Oct. 28, 1938. Altitude of gage is 7,700 ft (from topographic map). Prior to Oct. 28, 1938, at datum 1.92 ft lower.

Average discharge.--27 years, 37.5 cfs (27,150 acre-ft per year).

Extremes.--Maximum discharge during year, not determined (probably occurred May 30 or 31); maximum gage height, 3.37 ft Jan. 3 (ice jam); minimum daily discharge determined, 7 cfs Dec. 17, Jan. 3, Feb. 6, 24.

1934-61: Maximum discharge, 541 cfs May 13, 1941, from rating curve extended above 300 cfs by logarithmic plotting; maximum gage height, 4.05 ft Dec. 15, 1953 (ice jam); minimum daily discharge, 3 cfs Jan. 21, 1935.

Remarks.--Records good except those for periods of ice effect or doubtful or no gage-height record, which are poor. No diversion above station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 6 to Aug. 22)

1.39	7.0	2.1	38
1.5	9.5	2.4	74
1.7	15	2.7	130
1.9	24		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	13	14	12	b9	a8	b9	12	73	a120	47	25	18
2	13	13	*12	b9	a8	10	12	*79	a120	45	26	17
3	13	13	b11	b7	*a8	10	13	84	a115	43	28	22
4	*13	*13	b11	b8	a9	10	17	88	a115	43	25	22
5	13	14	b11	b9	a8	10	22	82	a110	42	24	21
6	13	14	b11	a9	a7	10	20	66	110	42	22	*20
7	13	15	12	a9	a8	10	20	56	*108	43	22	19
8	13	15	12	a9	a8	b10	19	46	106	37	22	19
9	13	14	12	a9	a8	b11	b18	43	104	36	22	22
10	14	14	b9	*b9	a9	11	17	48	104	35	22	26
11	13	14	b10	b9	a9	11	17	66	103	36	22	24
12	13	14	b10	b9	a9	12	17	87	103	35	24	22
13	14	14	b10	b9	a9	12	19	95	99	32	22	21
14	14	14	b10	b9	a9	*13	18	74	97	32	22	20
15	15	*14	b10	b9	a8	14	b18	66	97	32	22	20
16	16	13	b8.5	b9	a8	14	17	60	94	32	*21	20
17	18	14	b7	b9	*a8	13	*20	63	92	29	22	19
18	17	14	b8.5	b9	a8	13	26	73	87	*29	24	22
19	16	13	b10	b9	a8	12	36	92	85	28	22	29
20	16	13	b10	b8	*b8	12	45	106	80	28	21	31
21	*16	13	*b10	b8	b9	12	46	112	*76	28	20	27
22	16	13	b10	b8	b9	12	50	108	71	27	22	26
23	15	13	b10	b8	b9	13	58	*117	68	26	22	25
24	15	12	b10	b8	b7	14	58	106	66	26	*21	25
25	15	12	b10	a9	b8	14	49	104	63	25	22	24
26	14	12	b10	a9	b9	14	42	d105	59	26	20	24
27	14	12	b10	a9	b9	13	36	d105	55	25	20	24
28	14	12	b10	a9	*b9	*13	37	d110	54	24	20	*24
29	14	b12	b8.5	a9	-	12	43	d120	50	25	19	24
30	14	12	b7.5	a8	-----	12	58	a125	48	26	19	24
31	14	-----	b8	a8	-----	12	-----	a130	-----	24	18	-----
Total	444	399	311.0	269	234	368	880	2,689	2,659	1,008	683	681
Mean	14.3	13.3	10.0	8.7	8.4	11.9	29.3	86.7	88.6	32.5	22.0	22.7
Ac-ft	881	791	617	534	464	730	1,750	5,330	5,270	2,000	1,350	1,350

Calendar year 1960: Max 114 Min 7 Mean 29.5 Ac-ft 21,450

Water year 1960-61: Max 130 Min 7 Mean 29.1 Ac-ft 21,070

Peak discharge (base, 100 cfs).--May 30 or 31 (time and discharge unknown).

* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

d Doubtful gage-height record.

8-2685. Rio Hondo at Arroyo Hondo, N. Mex.

Location.--Lat 36°31'55", long 105°41'05", in sec.32, T.27 N., R.12 E. (projected), on left bank 1 mile downstream from Arroyo Hondo and 1½ miles upstream from mouth.

Drainage area.--65.6 sq mi.

Records available.--April 1910 to June 1912, fragmentary (gage heights and discharge measurements only), July 1912 to December 1928, and January 1932 to September 1961. Monthly discharge only for some periods, published in WSP 1312. Published as "near Arroyo Hondo" prior to 1928.

Gage.--Water-stage recorder. Concrete control since Aug. 12, 1938. Altitude of gage is 6,670 ft (from topographic map). Prior to Feb. 29, 1928, staff gage at site 1.1 miles downstream at different datums. Feb. 29 to Dec. 31, 1928, and Jan. 21, 1932, to Aug. 13, 1934, staff gage at present site at datum 0.4 ft lower. Aug. 13, 1934, to Aug. 11, 1938, water-stage recorder at site half a mile downstream at different datum.

Average discharge.--45 years (1912-28, 1932-1961), 29.8 cfs (21,570 acre-ft per year).

Extremes.--Maximum discharge during year, 405 cfs Aug. 23 (gage height, 3.12 ft), from rating curve extended above 200 cfs on basis of slope-area measurement of peak flow and another at gage height, 2.68 ft; minimum daily, 5.6 cfs Aug. 20-21.

1938-61: Maximum discharge, 1,060 cfs July 19, 1948 (gage height, 3.75 ft), from rating curve extended above 200 cfs by logarithmic plotting; minimum daily, 4.8 cfs Apr. 15, 16, 1955.

Maximum gage height observed, 5.45 ft (site and datum then in use) Aug. 23, 1935 (discharge uncertain, but probably exceeded 1,100 cfs). A minimum daily discharge of 3 cfs occurred Oct. 19, 1912 (statement in WSP 328 that there was no flow in January and much of February 1912 is believed erroneous). Discharge not determined for the major floods of Oct. 6, 1911, Sept. 1, 1932, and July 22, 1934.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions above station for irrigation of about 2,500 acres, most of which is outside basin.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Discharge, in cubic feet per second, water year October 1960 to September 1961											
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
1	a 8	9.2	*17	b15	*16	13	11	44	68	18	9.8
2	a 8	8.9	16	a13	15	13	11	*51	56	16	10
3	a 8	9.2	16	a11	15	14	11	55	55	16	8.9
4	*8.0	*9.5	17	a10	15	14	10	59	53	13	7.4
5	7.7	9.2	17	a11	15	14	14	62	48	10	7.1
6	7.7	8.9	16	a13	b12	13	13	55	*46	11	6.8
7	8.0	9.5	b16	a14	b13	12	14	55	45	12	6.3
8	7.7	9.8	b17	a16	b14	10	14	46	44	10	6.8
9	7.7	9.2	b17	b17	b14	11	14	38	39	9.5	5.8
10	7.7	9.2	b13	*19	b14	10	15	35	38	9.8	5.8
11	7.7	8.9	b15	18	18	11	15	38	37	8.6	6.1
12	7.7	9.2	18	17	18	12	13	47	34	20	6.8
13	7.7	8.6	18	17	18	14	*14	54	33	18	6.3
14	7.7	9.2	18	17	*18	*11	14	43	31	*17	6.3
15	8.0	*8.6	b15	18	16	12	12	34	33	16	6.1
16	9.2	8.9	b13	18	16	12	12	30	37	11	6.1
17	9.8	10	b11	17	16	12	14	25	41	9.8	5.8
18	9.5	13	b13	18	15	a12	20	27	34	10	6.8
19	8.6	16	b15	17	15	a11	28	34	30	9.5	5.8
20	8.0	16	b15	16	14	a11	35	36	28	8.9	5.6
21	*8.0	15	b14	16	14	a11	39	63	*27	8.9	5.6
22	7.7	17	b14	15	13	a11	42	66	24	9.8	19
23	7.4	17	*b15	16	14	a12	44	*65	23	10	28
24	7.4	17	b15	18	b11	a13	45	66	22	9.2	*20
25	7.7	17	b15	17	b11	a13	40	66	21	8.0	22
26	7.7	16	b15	16	13	a13	36	66	20	12	20
27	7.4	16	b15	16	13	a13	34	68	22	12	33
28	7.4	16	b13	18	*13	*13	34	68	19	9.8	20
29	8.6	18	b11	16	-	13	37	74	17	7.7	18
30	10	18	b10	16	-----	13	38	76	17	7.4	18
31	9.2	-----	b12	16	-----	12	-----	79	-----	8.6	18
Total	250.9	368.0	462	492	409	379	693	1,625	1,042	357.5	358.0
Mean	8.09	12.3	14.9	15.9	14.6	12.2	23.1	52.4	34.7	11.5	11.5
Ac-ft	498	730	916	976	811	752	1,370	3,220	2,070	709	710

Calendar year 1960: Max 92 Min 6.7 Mean 20.6 Ac-ft 14,940

Water year 1960-61: Max 79 Min 5.6 Mean 19.2 Ac-ft 13,890

Peak discharge (base, 100 cfs)

Date	Time	Gage Height	Discharge	Date	Time	Gage Height	Discharge
7-12	6 p.m.	2.04	119	8-27	4 p.m.	2.68	279
8-23	1 a.m.	3.12	405				

* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

RIO GRANDE BASIN

8-2753. Rio Pueblo de Taos near Ranchito, N. Mex.

Location.--Lat 36°23'30", long 105°37'30", on left bank 300 ft downstream from Rio Fernando de Taos and 2 miles southwest of Ranchito, Taos County.

Drainage area.--199 sq mi.

Records available.--March 1957 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 6,730 ft (from topographic map).

Extremes.--Maximum discharge during year, 246 cfs July 12 (gage height, 2.66 ft); minimum daily, 4.0 cfs Oct. 5.
1957-61: Maximum discharge, 600 cfs May 13, 1957 (gage height, 3.72 ft); minimum daily, 1.8 cfs Sept. 11, 13, 1960.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of about 9,000 acres above station. Anderson ditch diverts from right bank about 125 ft below gage.

Rating table, except periods of ice effect (gage-height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Dec. 15)

1.2	2.7
1.3	6.9
1.5	20
1.7	42
2.0	88
2.5	200

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.6	15	20	b16	b16	17	18	*123	77	15	6.0	15
2	5.6	15	*19	b16	b16	17	17	155	78	13	9.1	12
3	5.2	15	21	15	17	17	17	178	67	11	16	23
4	5.2	*17	25	*14	17	19	35	155	64	11	11	23
5	*4.0	17	22	b13	17	20	52	155	58	11	10	18
6	4.4	17	25	b14	17	17	58	123	49	12	9.7	*18
7	4.4	21	b25	b15	18	15	55	107	45	21	8.0	18
8	4.4	19	25	b15	18	17	50	96	41	20	7.5	18
9	5.2	19	25	b15	17	15	42	78	42	19	7.5	18
10	5.2	18	b22	b15	17	15	38	74	38	18	12	20
11	4.8	17	b24	b14	20	15	35	90	35	17	19	20
12	4.4	15	25	b13	20	16	32	102	30	61	17	19
13	5.2	15	25	b13	20	*17	37	111	27	34	17	18
14	6.9	*17	26	b14	*20	17	*35	109	26	20	18	21
15	11	20	24	b14	20	18	30	93	38	18	18	19
16	13	17	b22	b14	20	21	30	82	45	15	17	17
17	15	17	b20	b14	19	21	32	*82	43	14	17	17
18	17	17	b22	b14	19	19	41	77	37	*12	17	23
19	16	16	b19	*b13	19	17	54	83	38	11	17	35
20	*12	17	b16	b12	16	17	92	88	*38	11	15	29
21	12	17	b16	b11	15	17	123	91	32	11	15	25
22	12	16	*b16	b12	17	17	115	90	29	11	16	22
23	15	17	b16	b13	17	17	119	85	29	10	5.2	21
24	15	17	b18	14	b15	22	130	83	29	9.1	*20	20
25	14	19	b18	14	b15	21	117	82	29	9.7	18	20
26	14	21	b18	15	17	21	96	83	25	9.7	17	*19
27	14	21	b17	16	*19	*18	80	82	21	8.6	21	18
28	15	19	b17	16	17	17	72	82	20	11	21	18
29	15	17	b16	b16	-	18	77	83	20	12	17	18
30	17	20	b16	b16	-----	23	96	78	18	9.1	17	18
31	15	-----	b16	b16	-----	22	-----	78	-----	6.9	17	-----
Total	312.5	525	636	442	495	560	1825	3078	1168	472.1	499.8	600
Mean	10.1	17.5	20.5	14.3	17.7	18.1	60.8	99.3	38.9	15.2	16.1	20.0
Ac-ft	620	1,040	1,260	877	982	1,110	3,620	6,110	2,320	936	991	1,190

Calendar year 1960: Max 83 Min 1.8 Mean 22.3 Ac-ft 16,190

Water year 1960-61: Max 178 Min 4.0 Mean 29.1 Ac-ft 21,060

Peak discharge (base, 130 cfs).--May 3 (6 a.m.) 190 cfs (2.51 ft); July 12 (6 p.m.) 246 cfs (2.66 ft).

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

8-2755. Rio Grande de Ranchos near Talpa, N. Mex.

Location.--Lat 36°17'55", long 105°34'55", in Rancho del Rio Grande Grant, on right bank 1 $\frac{3}{4}$ miles downstream from Rito de la Olla (locally known as Pot Creek), 3.0 miles south of Talpa, and 3.5 miles upstream from Rio Chiquito.

Drainage area.--83 sq mi, approximately.

Records available.--October 1952 to September 1961. Prior to October 1955, published as Rio Grande del Rancho near Ranchos de Taos.

Gage.--Water-stage recorder. Altitude of gage is 7,250 ft (from topographic map). Prior to Nov. 11, 1952, staff gage at site 35 ft downstream at datum 0.39 ft lower.

Average discharge.--9 years, 23.2 cfs (13,760 acre-ft per year).

Extremes.--Maximum discharge during year, 153 cfs May 3 (gage height, 3.10 ft); minimum daily, 3.5 cfs Jan. 3-7-21. 1952-61: Maximum discharge, 342 cfs May 19, 1958 (gage height, 3.78 ft); minimum daily, 0.6 cfs Jan. 5, 1955.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Minor diversions upstream for operation of sawmill and for irrigation.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 13, 14)

1.6	3.3	2.3	39
1.7	5.7	2.6	70
1.8	9.0	3.1	151
2.0	18		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.5	7.7	b7	a5	a4	b6	11	a110	80	15	11	24
2	4.5	7.7	b7	a4	a4	b6	11	132	77	17	9.8	21
3	4.5	7.7	b7	a3.5	a4	6.0	13	*143	73	15	16	24
4	*4.5	8.0	b7	a3.5	a4	6.4	18	140	69	13	14	24
5	4.5	8.0	b7	a3.5	a4	6.4	27	140	60	12	11	*21
6	4.5	8.3	b6	a3.5	*a4	b6	25	125	*56	14	9.4	19
7	4.2	*9.4	*b8	a3.5	*a4	b6	25	112	55	21	8.3	18
8	4.2	9.4	b8	a4	b4	b6	23	92	52	18	7.7	16
9	4.5	8.7	b7	a4	b4	b6	21	84	49	17	7.4	16
10	4.7	7.7	b6	a4	b4	6.7	23	86	47	15	8.3	16
11	4.5	b6	b7	*b4	b4.5	6.7	21	101	45	13	13	15
12	4.2	b6	b7	b4	b4.5	6.7	20	125	*41	15	9.0	15
13	4.7	5.7	b7	b4	b4.5	*7.0	23	140	38	14	12	13
14	4.5	*5.7	b7	b4	*b4.5	7.7	*21	127	36	12	14	13
15	6.4	*5.7	b6	b4	b4.5	9.0	19	105	37	13	18	13
16	7.7	b5	b5	b4	b5	10	20	96	38	11	16	14
17	9.8	b5	b5	b4	5.2	10	24	99	32	11	17	13
18	11	b5	b5	*b4	5.2	a9	34	101	29	*10	17	15
19	9.0	b5	b5.5	a4	5.0	a8	46	110	28	9.8	15	38
20	8.3	b5	b5.5	a4	*b5	a7	69	120	*27	9.8	14	35
21	*8.0	b5	b5.5	a3.5	b5	a7	74	124	24	9.8	14	34
22	7.7	b5	b5.5	a4	b5	a7	77	118	21	9.4	a15	33
23	7.7	b5	*b5.5	a4	5.5	a8	87	117	21	8.7	a40	31
24	7.0	b5	b5.5	a4	b5	a10	92	110	20	8.0	*21	29
25	7.0	b5	b5.5	a4	b5	a13	90	99	19	7.7	23	27
26	7.0	b6	b5.5	a4	5.2	a12	a80	99	18	7.4	23	*24
27	7.4	b6	a5.5	a4	5.5	*12	a70	93	17	7.4	24	21
28	7.7	b6	a5	a4	*5.5	12	a70	92	17	8.3	30	21
29	8.0	b6	a5	a4	-	12	a70	*90	15	7.0	29	19
30	8.0	b6	a5	a4	-----	12	a90	87	14	6.7	28	18
31	8.0	-----	a5	a4	-----	11	-----	83	-----	7.7	26	-----
Total	198.2	191.7	188.5	122.0	129.6	258.6	1,294	3,400	1,155	363.7	520.9	640
Mean	6.39	6.39	6.08	3.94	4.63	8.34	43.1	110	38.5	11.7	16.8	21.3
Ac-ft	393	380	374	242	257	513	2,570	6,740	2,290	721	1,030	1,270

Calendar year 1960: Max 117 Min 3 Mean 20.3 Ac-ft 14,760

Water year 1960-61: Max 143 Min 3.5 Mean 23.2 Ac-ft 16,780

Peak discharge (base, 75 cfs).--May 3 (8 to 10 a.m.) 153 cfs (3.10 ft).

* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

RIO GRANDE BASIN

8-2756. Rio Chiquito near Talpa, N. Mex.

Location.--Lat 36°19'50", long 105°34'50", on right bank in Rancho del Rio Grande Grant, 1 mile southeast of Talpa, Taos County, and $1\frac{1}{4}$ miles upstream from mouth.

Drainage area.--37.0 sq mi.

Records available.--March 1957 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 7,230 ft (from topographic map).

Extremes.--Maximum discharge during year, 68 cfs May 5 (gage height, 1.98 ft); minimum daily, 1.5 cfs Dec. 10, 15-17, Jan. 20-23. 1957-61: Maximum discharge, about 144 cfs May 13, 1958 (gage height, 2.24 ft), from rating curve extended above 50 cfs by logarithmic plotting; minimum daily, 1.3 cfs Nov. 30, 31, Dec. 1-5, 1960.

Remarks.--Records good except those for periods of ice effect or doubtful or no gage-height record, which are poor.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 2-7, 11, 12, 14)

1.1	1.0	1.6	14
1.2	1.9	1.8	29
1.3	3.4	2.0	49
1.4	5.8	2.2	84
1.5	9.6		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.2	3.6	3.0	b2.5	a2	2.4	4.6	a4.5	2.3	7.7	7.3	8.5
2	2.2	3.4	3.0	b2.5	a2	2.7	4.6	*5.8	2.2	9.6	8.1	7.7
3	2.0	3.4	2.9	b2	a2	2.7	4.9	6.1	2.0	8.5	11	9.2
4	2.2	3.4	3.0	b2	a2	2.9	6.6	6.4	2.0	8.1	9.6	10
5	*2.0	3.2	2.9	b2	a2	2.9	9.6	6.2	1.8	7.3	8.1	*9.6
6	2.0	3.4	2.0	b2	*b2	2.7	10	6.1	1.7	7.7	7.3	8.5
7	2.0	*4.0	*2.6	b2.5	b2	2.9	9.6	5.6	1.6	11	6.6	7.7
8	2.0	4.2	3.6	b2.5	b2	2.3	8.8	4.1	1.5	8.8	6.2	7.3
9	2.0	4.2	3.0	b2.5	b2	2.9	7.3	3.8	1.4	7.7	5.8	7.7
10	2.2	3.4	b1.5	b2.5	b2	3.0	8.5	4.1	1.3	a7	5.5	7.7
11	2.2	3.4	b2.5	*b2.5	b2.3	3.2	8.5	5.8	1.3	a6	7.3	7.3
12	2.0	3.0	3.6	b2.5	2.6	3.4	7.7	5.8	1.2	a11	6.6	6.9
13	2.3	3.4	3.4	b2.5	2.7	*3.6	8.8	4.9	1.2	a10	6.6	6.2
14	2.4	*3.6	3.2	b2.5	*2.6	3.8	*9.2	6.0	1.2	a8	6.9	6.2
15	3.2	3.6	b1.5	b2.5	2.7	4.2	9.2	4.5	1.2	a7	9.2	6.2
16	3.8	2.7	b1.5	b2.5	2.9	4.9	9.6	3.8	1.3	a6	8.5	5.8
17	5.2	b2.5	a1.5	b2.3	3.0	4.9	11	*3.8	1.1	*5.5	8.5	5.5
18	5.2	b2.5	a2.5	b2	2.9	4.6	1.3	3.8	1.1	5.2	8.8	6.2
19	4.2	b2.5	a2.5	*b2	2.9	4.6	1.7	3.8	1.1	5.2	8.5	1.4
20	3.6	b2.5	a2	b1.5	2.9	4.4	2.5	3.8	1.0	5.2	7.3	1.1
21	*3.8	b2.5	a2.5	b1.5	2.9	4.2	2.8	3.8	1.0	5.2	6.9	9.6
22	3.8	b2.5	a2.5	b1.5	2.9	4.4	3.3	3.8	*9.2	5.2	1.2	8.8
23	3.8	b2.5	*b2.5	b1.5	2.9	5.2	3.7	3.5	8.8	4.6	1.2	8.5
24	3.8	b2.5	b2.5	b1.8	2.6	5.5	3.8	3.5	8.8	4.4	*1.1	8.1
25	3.8	b2.5	b2.5	d2	2.7	5.8	3.5	3.5	8.5	4.4	1.1	7.7
26	3.8	3.0	b2.5	d2	2.9	5.5	3.5	3.8	8.1	4.6	1.0	*7.3
27	3.8	3.0	b2.5	d2	2.7	*5.5	3.3	3.5	7.7	4.6	9.6	6.9
28	3.8	2.6	b2.5	d2	*2.7	5.2	3.3	3.2	8.1	5.2	1.1	6.6
29	4.0	2.0	b2.5	d2	-	4.9	3.4	*2.8	7.7	4.4	9.6	6.2
30	3.8	b2.5	b2.5	d2	-----	4.6	3.7	2.7	7.7	4.2	9.2	6.2
31	3.4	-----	b2.5	a2	-----	4.2	-----	2.5	-----	5.5	8.8	-----
Total	96.5	92.2	79.2	66.1	69.8	124.0	536.5	135.3	379.6	204.8	264.8	235.1
Mean	3.11	3.07	2.55	2.13	2.49	4.00	17.9	43.6	12.7	6.61	8.54	7.84
Ac-ft	191	183	157	131	138	246	1,060	2,680	753	406	525	466

Calendar year 1960: Max 27 Min 1.3 Mean 5.97 Ac-ft 4,340

Water year 1960-61: Max 64 Min 1.5 Mean 9.59 Ac-ft 6,940

Peak discharge (base, 35 cfs). --May 5 (2 a.m.) 68 cfs (1.98 ft).

* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

d Doubtful gage-height record.

8-2760. Rio Pueblo de Taos at Los Cordovas, N. Mex.

Location.--Lat 36°23'20", long 105°38'00", in N½ sec.23, T.25 N., R.12 E. (projected), in Martinez Grant, on left bank 200 ft downstream from Rio Grande de Ranchos, 0.2 mile downstream from Arroyo Seco, half a mile northeast of Los Cordovas, and 3½ miles west of Taos.

Drainage area.--359 sq mi.

Records available.--April 1910 to January 1926, September 1926 to September 1961. Monthly discharge only for some periods, published in WSP 1312. Prior to October 1955, published as Rio Taos at Los Cordovas. All records include flow of Rio Grande de Ranchos.

Gage.--Water-stage recorder. Datum of gage is 6,709.59 ft above mean sea level, datum of 1929. Prior to Oct. 4, 1921, staff gages at nearby sites at different datums. Oct. 4, 1921, to Sept. 30, 1934, water-stage recorder at site 200 ft upstream at datum about 1.26 ft higher and Oct. 1, 1934, to Apr. 30, 1957, at site 200 ft upstream at datum 1.00 ft higher.

Average discharge.--50 years (1910-25, 1926-61), 59.6 cfs (43,150 acre-ft per year).

Extremes.--Maximum discharge during year, 479 cfs July 12 (gage height, 3.84 ft); minimum daily, 5.6 cfs Oct. 6. 1915, 1922, 1924-25, 1927, 1929-61: Maximum discharge, 1,830 cfs May 14, 1941 (gage height, 5.81 ft, site and datum then in use), from rating curve extended above 1,300 cfs by logarithmic plotting; minimum daily, 1.3 cfs July 17, Aug. 18, 1951.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Diversions above station for irrigation of about 12,000 acres, a small part of which is below station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second).
(Shifting-control method used Oct. 1 to Dec. 10, Mar. 22-31)

1.4	5.3	1.6	13	2.0	41	2.5	105	3.5	355
1.5	8.8	1.8	24	2.2	62	3.0	211		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.0	a18	27	a20	25	26	32	*232	127	19	10	34
2	7.4	a19	*24	a20	23	28	30	305	116	19	12	30
3	7.0	a19	29	a20	25	30	33	352	100	16	20	39
4	7.0	a20	33	a19	26	33	48	336	92	16	15	42
5	*6.0	a20	30	a18	b23	33	78	308	75	14	15	*34
6	5.6	a21	26	a18	b23	30	89	253	65	15	16	
7	6.7	*25	27	a19	*24	29	100	216	60	32	14	34
8	7.4	25	29	a19	26	26	89	182	54	36	13	32
9	8.4	24	29	a19	25	28	71	149	55	29	18	30
10	9.2	24	28	a18	26	29	70	145	52	27	19	31
												35
11	7.4	22	a28	*b17	27	29	66	169	45	23	34	
12	6.4	25	a29	b17	27	29	60	204	41	111	26	36
13	8.1	26	a29	b17	27	*28	67	253	37	51	48	36
14	9.6	*26	a29	b18	*26	30	*63	237	36	29	29	33
15	14	26	a27	b18	27	31	56	197	51	25	28	34
												33
16	14	24	a26	b18	28	36	58	160	62	21	26	30
17	14	24	a26	b18	28	37	65	*162	58	19	31	26
18	18	22	a26	b17	28	33	74	164	50	*18	30	36
19	18	22	a26	*b16	27	30	99	176	52	17	26	36
20	*16	22	a26	b15	26	27	164	187	*53	16	23	68
												65
21	16	23	a25	b14	a26	26	197	192	47	15	23	52
22	a16	23	*a24	b16	a27	24	209	185	43	16	40	50
23	a16	24	a24	b17	a26	27	a220	178	39	14	100	48
24	a17	26	a24	b19	a26	36	a230	164	44	13	47	44
25	a17	28	a24	24	a25	34	a220	156	45	13	*44	44
26	a17	30	a23	24	27	32	a180	169	36	13	43	*42
27	a17	30	a22	25	*27	*30	a160	158	31	12	46	39
28	a18	30	a22	25	27	30	a150	160	28	14	53	37
29	a18	27	a22	25	-	31	a150	151	26	13	45	36
30	a19	27	a21	24	-----	37	a180	*145	23	12	39	35
31	a18	-----	a20	24	-----	36	-----	137	-----	10	37	-----
Total	385.2	722	805	598	728	945	3,308	6,182	1,643	698	970	1,165
Mean	12.4	24.1	26.0	19.3	26.0	30.5	110	199	54.8	22.5	31.3	38.8
Ac-ft	764	1,430	1,660	1,190	1,440	1,870	6,560	12,260	3,260	1,380	1,920	2,310

Calendar year 1960: Max 173 Min 4.3 Mean 32.6 Ac-ft 23,690
Water year 1960-61: Max 352 Min 5.6 Mean 49.7 Ac-ft 35,980

Peak discharge (base, 200 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
5-3	7a.m.	3.52	369	8-23	12:45a.m.	3.07	229
7-12	7:30p.m.	3.84	479				

* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

RIO GRANDE BASIN

8-2763. Rio Pueblo de Taos below Los Cordovas, N. Mex.

Location.--Lat 36°22'30", long 105°40'10", in Gijosa Grant, on left bank 2 miles southwest of Los Cordovas, 2½ miles downstream from Rio Grande de Ranchos, 4½ miles upstream from mouth, Taos County.

Drainage area.--380 sq mi.

Records available.--March 1957 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 6,630 ft (from topographic map).

Extremes.--Maximum discharge during year, 804 cfs July 12 (gage height, 4.09 ft); minimum daily, 6.8 cfs Oct. 5, 6.
1957-61: Maximum discharge, 2,380 (revised) cfs Aug. 24, 1957 (gage height, 5.80 ft, revised), from rating curve extended above 900 cfs on basis of logarithmic plotting; minimum daily, 3.9 cfs July 9, 10, 14, 18, 1959, Sept. 6, 7, 13, 1960.

Remarks.--Records fair except those for periods of ice effect, which are poor. Diversions for irrigation of about 12,000 acres above station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.8	4.9
.9	8.0
1.0	13
1.2	27
1.5	56
2.0	118
2.5	195
3.1	350

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.1	19	29	b21	b25	25	35	*238	129	21	12	34
2	7.7	20	*28	b21	b24	28	32	293	122	20	14	30
3	8.0	20	32	b21	b26	30	36	341	103	16	21	39
4	7.7	21	33	b20	b23	33	53	341	96	16	16	44
5	*6.8	21	30	*b19	b23	34	92	338	80	15	16	*36
6	6.8	22	27	b19	b23	30	103	275	66	14	16	34
7	7.4	*26	b30	*b23	30	110	238	60	60	33	15	33
8	7.7	28	30	b20	25	27	95	203	56	35	14	30
9	8.5	26	29	b20	26	28	71	167	58	32	14	30
10	9.4	26	29	b19	27	30	69	158	54	30	20	35
11	8.5	24	b29	b18	30	30	64	178	48	25	43	36
12	8.0	26	30	b18	29	30	59	215	45	155	30	36
13	8.0	26	30	b18	30	*30	68	262	42	67	66	33
14	9.9	*26	30	b19	*29	30	*65	245	40	34	32	34
15	13	27	b27	b19	29	33	55	195	58	30	30	33
16	14	26	b27	b19	30	39	59	167	74	24	27	30
17	16	25	b27	b19	29	39	66	*168	67	21	42	27
18	18	24	b27	b18	28	34	84	167	57	*21	32	47
19	18	23	b27	b17	27	32	117	180	59	18	27	80
20	*16	22	b27	*b16	26	30	188	188	*60	17	25	64
21	16	23	b26	b15	26	29	213	192	52	17	24	51
22	16	24	*b25	b17	27	27	220	188	47	16	28	50
23	16	24	b26	b18	26	32	235	180	46	15	161	48
24	18	25	b26	b21	26	42	242	170	52	14	55	48
25	17	29	b26	b25	25	42	228	160	50	13	*50	48
26	18	30	b25	b25	27	39	192	170	41	21	47	*47
27	18	32	b23	b25	*26	36	168	160	34	13	48	40
28	18	30	b23	b25	28	37	158	160	32	15	56	38
29	19	28	b23	b24	-	*38	162	*152	29	16	47	37
30	20	28	b22	b24	-----	44	197	146	25	13	41	35
31	19	-----	b21	b24	-----	41	-----	136	-----	12	40	-----
Total	401.5	751	844	624	743	1029	3536	6371	1782	809	1109	1207
Mean	13.0	25.0	27.2	20.1	26.5	33.2	118	206	59.4	26.1	35.8	40.2
Ac-ft	796	1,490	1,670	1,240	1,470	2,040	7,010	12,640	3,530	1,600	2,200	2,390

Calendar year 1960: Max 190 Min 3.9 Mean 37.2 Ac-ft 26,990
Water year 1960-61: Max 341 Min 6.8 Mean 52.6 Ac-ft 38,080

Peak discharge (base, 230 cfs)

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
5-4	5 a.m.	3.12	362	8-13	4:45 a.m.	2.69	255
7-12	5:30 p.m.	4.09	804	8-23	1 a.m.	3.58	565
7-26	4:15 p.m.	2.67	240	9-18	4:30 p.m.	2.91	278

8-2795. Rio Grande at Embudo, N. Mex.

Location.--Lat 36°12'20", long 105°57'50", in SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.23, T.23 N., R.9 E., on right bank a quarter of a mile downstream from bridge at Embudo and 2 $\frac{1}{2}$ miles downstream from Embudo Creek.

Drainage area.--10,400 sq mi, approximately (includes 2,940 sq mi in closed basin in San Luis Valley, Colo.).

Records available.--January 1889 to September 1961. Monthly discharge only for some periods, published in WSP 1312. Figures of daily discharge published in WSP 358 for period Oct. 4 to Nov. 30, 1896, have been found to be unreliable and should not be used.

Gage.--Water-stage recorder. Datum of gage is 5,789.14 ft above mean sea level, datum of 1929. Jan. 1 to Feb. 28, 1889, staff gage 1 $\frac{1}{4}$ miles upstream at different datum. March 1889 to December 1903, staff gage 1,300 ft upstream at different datum. September 1912 to June 1914 on downstream end of bridge pier at site 200 ft upstream at present datum.

Average discharge.--72 years, 1,059 cfs (766,700 acre-ft per year).

Extremes.--Maximum discharge during year, 2,340 cfs May 3 (gage height, 5.61 ft); minimum daily, 229 cfs Oct. 1.

1889-1903, 1912-61: Maximum discharge, 16,200 cfs June 19, 1903 (gage height, about 15.9 ft); minimum daily, 130 cfs June 30, 1902.

A flood of about 14,000 cfs occurred between May 20 and June 10, 1905, from a comparison of records for Lobatos and Otowi Bridge. Another major flood occurred Sept. 29 or 30, 1904.

Remarks.--Records good. Diversions for irrigation of about 660,000 acres above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

2.4	215	4.0	1,050
2.7	330	5.0	1,800
3.0	470	6.0	2,720
3.5	740		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	229	344	*344	393	402	430	450	1,280	1,610	420	*258	411
2	232	*339	357	375	*411	*505	425	*1,580	1,600	420	262	380
3	*232	334	375	*370	a420	505	435	2,110	1,530	406	306	420
4	243	334	411	362	a420	510	475	2,180	1,450	384	344	480
5	246	334	375	357	a420	515	560	2,250	1,260	370	306	445
6	246	339	326	352	a420	500	576	2,170	1,080	362	318	475
7	246	357	357	352	a430	490	642	1,830	974	411	302	470
8	243	366	339	380	a430	460	728	1,440	908	549	290	*450
9	246	352	366	370	a432	480	664	1,160	860	500	290	445
10	246	348	406	366	a440	490	669	1,060	794	440	290	475
11	246	362	375	366	a450	485	642	1,060	770	402	370	591
12	250	698	406	370	a460	490	592	1,180	782	428	565	475
13	250	806	435	370	a455	495	586	1,320	740	647	411	430
14	250	824	455	375	a460	510	570	1,330	692	393	380	406
15	258	830	465	366	*a470	*515	540	1,240	716	375	370	398
16	278	812	435	370	480	510	535	1,050	836	344	384	402
17	310	686	416	370	495	505	555	950	*764	314	465	388
18	344	480	420	*375	500	480	592	920	686	294	565	495
19	322	402	420	375	505	470	652	926	647	278	565	598
20	322	384	416	375	490	460	846	968	642	270	545	598
21	357	370	402	375	500	425	1,160	994	620	262	475	515
22	406	366	*375	380	490	425	1,590	1,070	598	270	485	480
23	406	362	384	384	500	430	1,580	1,080	581	290	*1,080	465
24	398	348	406	393	490	445	1,540	1,090	581	298	570	445
25	384	352	420	393	490	455	1,500	1,420	625	282	520	470
26	366	370	420	388	495	450	1,450	1,470	608	274	530	470
27	362	370	420	402	495	445	1,200	1,330	515	290	485	455
28	362	366	435	398	460	460	1,080	1,420	485	282	602	425
29	352	334	430	388	-	460	1,040	*1,660	455	334	470	416
30	348	330	420	393	-----	470	1,080	1,820	*440	302	425	402
31	339	-----	411	411	-----	450	-----	1,690	-----	284	420	-----
Total	9,319	13,299	12,422	11,694	12,910	14,720	24,954	43,048	24,849	11,177	13,648	13,775
Mean	301	443	401	377	461	475	832	1,389	828	361	440	459
Ac-ft	18,480	26,380	24,640	23,190	25,610	29,200	49,500	85,380	49,290	22,170	27,070	27,320

Calendar year 1960: Max 2,130 Min 190 Mean 580 Ac-ft 421,100

Water year 1960-61: Max 2,250 Min 229 Mean 564 Ac-ft 408,200

Peak discharge (base, 2,000 cfs). --May 3 (8:40 a.m.) 2,340 cfs (5.61 ft); Aug. 23 (8 a.m.) 2,290 cfs (5.56 ft).

* Discharge measurement made on this day.

a No gage-height record.

RIO GRANDE BASIN

8-2765. Rio Grande below Taos Junction Bridge, near Taos, N. Mex.

Location.--Lat 36°19'00", long 105°45'30", in N $\frac{1}{2}$ sec.15, T.24 N., R.11 E., on left bank 2 miles downstream from Rio Pueblo de Taos and bridge on State Highway 96 and 12 miles southwest of Taos.

Drainage area.--9,730 sq mi, approximately (includes 2,940 sq mi in closed basin in San Luis Valley, Colo.).

Records available.--July 1925 to September 1961. Monthly discharge only July 1925 to September 1930, published in WSP 1312.

Gage.--Water-stage recorder. Datum of gage is 6,050.3 ft above mean sea level (planetable survey). Prior to Apr. 14, 1934, at bridge 2 miles upstream at different datum.

Average discharge.--36 years, 761 cfs (550,900 acre-ft per year).

Extremes.--Maximum discharge during year, 2,340 cfs Aug. 23 (gage height, 5.77 ft); minimum daily, 206 cfs Oct. 1, 9.

1926-61: Maximum discharge, 9,730 cfs June 7, 1948, June 22, 1949; maximum gage height, 10.7 ft July 3, 1927 (site and datum then in use), from graph based on recorder record ending at a gage height of 10.5 ft, 6 hours prior to peak; minimum daily discharge, 159 cfs Oct. 8-11, 1956.

Maximum flood known since at least 1888, about 14,000 cfs June 19, 1903, from records for Rio Grande at Embudo and estimated inflow. Other floods exceeding 10,000 cfs occurred June 9, 1905, May 28, 1920, and June 16, 1921, from comparison of records for stations near Lobatos and at Embudo.

Remarks.--Records good. Diversions for irrigation of about 650,000 acres above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

3.3	135	4.0	500	5.0	1,360
3.6	270	4.5	875	6.0	2,680

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	206	285	*295	375	370	392	370	*1,010	1,350	399	270	275
2	211	*280	310	342	*375	*454	358	1,340	1,350	387	*275	270
3	*220	275	336	*348	381	448	375	1,870	1,290	364	295	280
4	220	275	364	348	381	454	393	1,840	1,230	358	320	*310
5	220	275	331	342	387	454	435	1,900	1,030	348	280	315
6	216	275	295	336	381	454	442	1,830	884	342	300	331
7	216	280	315	336	393	417	521	1,510	795	375	275	331
8	211	285	285	336	399	405	584	1,120	739	416	275	326
9	206	280	331	336	399	429	535	934	678	370	285	326
10	220	285	364	336	405	435	535	851	626	336	308	406
11	211	321	336	336	405	423	500	843	626	326	342	405
12	220	708	364	336	411	429	474	918	648	512	383	348
13	220	771	387	331	417	435	454	978	605	418	338	320
14	220	795	399	336	417	442	442	1,020	584	331	305	320
15	220	787	417	336	*423	*435	423	960	*598	326	280	320
16	230	779	399	348	448	423	429	803	626	305	300	315
17	240	605	393	*348	454	417	442	739	591	295	356	315
18	260	399	393	348	474	405	461	708	535	280	320	348
19	265	348	393	353	474	405	480	708	528	275	326	318
20	270	331	387	348	461	387	640	747	542	270	315	387
21	310	326	*364	353	474	370	941	771	535	270	290	358
22	342	320	353	358	468	364	1,300	835	528	280	275	348
23	348	315	381	364	468	364	1,200	843	528	300	846	342
24	342	305	399	370	474	375	1,200	884	535	300	364	348
25	331	305	399	364	442	375	1,210	1,280	542	280	359	375
26	315	320	399	364	465	375	1,160	1,200	521	290	358	370
27	295	326	399	370	454	375	943	1,090	487	284	345	348
28	290	320	387	364	423	393	843	1,210	461	279	404	336
29	290	280	387	364	-----	393	795	*1,430	454	336	310	326
30	290	295	381	370	-----	399	835	1,600	*423	310	285	320
31	290	-----	381	375	-----	*381	-----	1,420	-----	275	280	-----
Total	7,945	11,751	11,324	10,871	11,923	12,707	19,720	35,192	20,869	10,237	10,264	10,037
Mean	256	392	365	351	426	410	657	1,135	696	330	331	335
Ac-ft	15,760	23,310	22,460	21,560	23,650	25,200	39,110	69,800	41,390	20,300	20,360	19,910

Calendar year 1960: Max 2,090 Min 175 Mean 524 Ac-ft 380,100
 Water year 1960-61: Max 1,900 Min 206 Mean 474 Ac-ft 342,800

Peak discharge (base, 1,600 cfs)

* Discharge measurement made on this day.

Date	Time	Gage Height	Discharge	Date	Time	Gage Height	Discharge
5-3	3:20 a.m.	5.57	2,020	5-30	6:30 a.m.	5.29	1,660
8-23	3:30 a.m.	5.77	2,340				

8-2841. Rio Chama near La Puente, N. Mex.

Location.--Lat 36°39'45", long 106°38'00", on right bank in Tierra Amarilla Grant, 0.7 mile downstream from Rito de Tierra Amarilla, 3 miles southwest of La Puente, and 6.7 miles upstream from flow line of El Vado Reservoir, Rio Arriba County.

Drainage area.--480 sq mi, approximately.

Records available.--October 1955 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 7,083 ft (from river-profile map).

Average discharge.--6 years, 332 cfs (240,400 acre-ft per year).

Extremes.--Maximum discharge during year, 4,340 cfs May 2 (gage height, 5.19 ft); minimum daily, 17 cfs Oct. 1, 3, 8.

1955-61: Maximum discharge, 8,040 cfs June 7, 1957 (gage height, 6.07 ft), from rating curve extended above 3,300 cfs on basis of logarithmic plotting and an inflow-outflow study of El Vado Reservoir; minimum daily, 4.4 cfs Sept. 19, 1956.

A discharge of about 9,000 cfs occurred Apr. 16, 1937, based on flow of Rio Chama at Park View with allowance for tributary inflow. A peak on May 21 or 22, 1926, may have exceeded 10,000 cfs.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 7,500 acres above station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 27-31, Mar. 13-21, Apr. 11, 12, June 15, July 9 to Sept. 30)

1.4	14	2.0	77	3.0	440	4.5	2,400
1.5	20	2.3	140	3.5	850	4.9	3,400
1.7	37	2.6	230	4.0	1,500		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*17	37	*45	b30	a40	*b30	123	2860	741	48	22	74
2	18	39	45	b30	a40	b35	131	3160	669	57	29	65
3	17	39	54	b30	a40	b40	185	3130	604	68	52	79
4	18	38	50	b30	a40	b40	308	2760	552	66	49	128
5	18	38	b40	b30	a35	b40	496	2200	510	58	44	133
6	18	39	b40	b30	a35	b35	380	1600	440	52	45	172
7	18	50	b40	b30	a35	b35	428	1290	422	115	42	130
8	17	66	b40	b30	a40	b30	398	1090	410	118	36	106
9	18	54	b40	b35	a50	b40	268	1400	386	116	32	116
10	19	47	b40	b35	a50	58	275	2070	368	103	31	158
11	22	41	b40	b35	a55	65	234	2350	362	116	32	a135
12	21	43	b40	b35	a60	73	*258	2440	338	91	230	a120
13	*21	47	b35	a35	a60	80	398	2070	285	*74	161	a100
14	18	48	b35	a35	*a55	107	315	1610	246	61	156	a90
15	18	50	*b35	a35	a55	144	246	1630	*275	57	*138	*110
16	23	37	b30	*a35	a55	*153	387	*1610	300	52	166	101
17	33	33	b30	a35	a55	140	640	1740	258	44	175	93
18	49	37	b30	a35	a50	123	944	1920	250	39	196	288
19	47	37	b30	a35	a45	101	1140	1940	230	36	138	1230
20	44	38	b30	a35	a40	91	1660	1810	199	34	101	588
21	42	38	b30	a35	b40	113	1850	1580	175	33	93	447
22	42	*38	b30	a35	b40	131	2080	1530	153	35	104	326
23	42	37	b30	a35	b40	156	2290	1470	140	30	212	270
24	44	37	b30	a40	b35	175	2190	1340	123	25	123	262
25	44	38	b30	a45	b35	156	1560	1200	116	22	138	206
26	44	43	b30	a45	b35	123	1520	1070	101	20	135	187
27	42	50	b30	a45	b30	108	1460	1040	81	20	93	166
28	*41	42	b35	a45	b30	116	*1880	996	65	*25	77	153
29	47	36	b35	a40	-	116	2320	916	*64	27	81	*140
30	44	*39	b30	a40	-----	114	2580	830	58	34	*79	135
31	38	-----	b30	*a40	-----	*106	-----	*770	-----	28	82	-----
Total	944	1256	1109	1105	1220	2874	28944	53422	8921	1704	3092	6308
Mean	30.5	41.9	35.8	35.6	43.6	92.7	965	1,723	297	55.0	99.7	210
Ac-ft	1,870	2,490	2,200	2,190	2,420	5,700	57,410	106,000	17,690	3,380	6,130	12,510

Calendar year 1960: Max 3,400 Min 8.4 Mean 333 Ac-ft 241,500

Water year 1960-61: Max 3,160 Min 17 Mean 304 Ac-ft 220,000

Peak discharge (base, 2,700 cfs).--May 2 (11 p.m.) 4,340 cfs (5.19 ft).

* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

RIO GRANDE BASIN

8-2845. Willow Creek near Park View, N. Mex.

Location.--Lat 36°40'20", long 106°42'10", in Tierra Amarilla Grant, on right bank 400 ft upstream from Willow Creek damsite, 0.3 mile downstream from Horse Lake Creek, and 8½ miles southwest of Park View, Rio Arriba County.

Drainage area.--193 sq mi.

Records available.--May 1936 to September 1961 (no winter records prior to 1943). Monthly or yearly discharges only for some periods, published in WSP 1312.

Gage.--Water-stage recorder. Altitude of gage is 6,950 ft (from river-profile map). Prior to Oct. 1, 1937, at datum 0.79 ft higher.

Average discharge.--24 years (1936-38, 1939-61), 22.1 cfs (16,000 acre-ft per year).

Extremes.--Maximum discharge during year, 1,080 cfs Sept. 18 (gage height, 5.46 ft); no flow at times.

1936-61: Maximum discharge, 4,500 cfs Apr. 23, 1942 (gage height, 10.45 ft), from rating curve extended above 1,400 cfs on basis of slope-area measurement of peak flow; no flow at times.

Remarks.--Records poor. Diversions for irrigation of about 300 acres above station.

Rating table, except periods of ice effect or uncertain stage-discharge relation (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-10, 17, 18, Oct. 29 to Nov. 3, Mar. 18, 19)

0.6	0	1.6	28
.7	.3	2.0	59
.8	.9	2.5	119
.9	2.0	3.0	205
1.1	6.5	3.5	320
1.3	13		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*1	3	b2		a0	*b0	65	10	1	3	4	1
2	1	3	b2		a0	b0	96	10	1	6	2	1
3	0	2	b3		a0	b1	151	9	0	8	4	2
4	0	a2	b3		a0	e2	221	8	0	8	6	2
5	0	a2	b2		a0	e2	217	7	0	7	5	2
6	0	a3	b1		a0	e2	99	7	0	6	4	1
7	0	a3	b1		a0	e2	219	6	1	11	4	1
8	0	a3	b1		a0	e2	306	7	2	12	4	1
9	0	a3	b2		a1	e2	107	6	2	10	4	1
10	1	a3	b1		a2	e4	82	5	2	11	3	1
11	1	a3	b1		a3	13	51	4	2	10	2	3
12	1	a2	b1		a5	21	*51	4	3	8	10	3
13	*1	a2	b1		a5	20	84	4	3	*6	10	2
14	0		b1		*b5	45	44	6	3	5	14	77
15	1		*b1		b5	67	26	6	3	5	13	7
16	3		b1		b4	*55	36	*5	4	4	12	7
17	4		b0		b3	*53	58	4	4	4	22	3
18	5		b0		b3	*56	71	3	5	3	13	196
19	a7	a2	b0		b2	38	78	3	6	3	10	206
20	a6		b0		b1	a35	87	3	5	3	6	24
21	a5		b0		b1	a40	75	3	5	3	10	11
22	a5		b0		b3	a60	60	4	5	3	40	5
23	a5		b0		b2	a100	50	5	4	2	60	3
24	a4		b0		b1	a80	37	6	4	2	8	2
25	a4		b0		b1	a60	18	4	4	2	4	1
26	a4	a2	b0		b1	a40	18	4	3	1	2	1
27	a4	a2	b0		b1	a35	14	3	3	2	2	0
28	*a4	a2	*b0		b0	a30	*12	3	3	*2	2	0
29	3		b0			a35	12	3	*3	2	3	*1
30	4	*b2	0		-----	a35	12	2	3	2	*2	0
31	3	-----	0		-----	a30	-----	*1	-----	3	2	-----
Total	77	68	24	0	49	965	2,457	155	84	157	287	565
Mean	2.5	2.3	0.8	0	1.8	31.1	81.9	5.0	2.8	5.1	9.3	18.8
Ac-ft	153	135	48	0	97	1,910	4,870	307	167	311	569	1,120

Calendar year 1960: Max 570 Min 0 Mean 18.0 Ac-ft 13,100

Water year 1960-61: Max 306 Min 0 Mean 13.4 Ac-ft 9,690

Peak discharge (base, 800 cfs).--Sept. 14 (3:45 p.m.) 802 cfs (4.86 ft); Sept. 18 (7:30 p.m.) 1,080 cfs (5.46 ft).

* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

e Uncertain stage-discharge relation.

8-2855. Rio Chama below El Vado Dam, N. Mex.

Location.--Lat 36°34'50", long 106°43'30", in Tierra Amarilla Grant, on left bank 1.5 miles downstream from El Vado Dam, 2.7 miles upstream from Rio Nutrias, and 13 miles southwest of Tierra Amarilla.

Drainage area.--877 sq mi.

Records available.--October 1913 to November 1915, April to November 1916, March, April 1920, September 1920 to August 1924, October 1935 to September 1961. Monthly discharge only for some periods, published in WSP 1312. Published as "Chama River" prior to 1935, as near Tierra Amarilla 1913-14, 1935-47, as "near El Vado" 1915-17, and as "at El Vado" 1920-24.

Gage.--Water-stage recorder. Datum of gage is 6,696.12 ft above mean sea level, datum of 1929. Prior to October 1935, at site 1.5 miles upstream at different datum. October 1935 to September 1938 at site 1.1 miles upstream at datum 30.34 ft higher.

Average discharge.--5 years (1913-15, 1920-23), 448 cfs (324,300 acre-ft per year), prior to completion of El Vado Dam; 26 years (1935-61), 386 cfs (279,500 acre-ft per year), subsequent to completion of El Vado Dam.

Extremes.--Maximum discharge during year, 1,470 cfs May 20 (gage height, 3.97 ft); minimum daily, 0.3 cfs Apr. 10-13. 1913-16, 1920-22, 1923-24, 1935-61: Maximum discharge observed, 9,000 cfs May 22, 1920 (gage height, 12 ft, site and datum then in use); no flow Mar. 25, 26, 31, 1955.

Flood of Oct. 4 or 5, 1911, exceeded floods of September 1904 and May 1920, from information by local residents.

Remarks.--Records good except those for periods of ice effect, which are poor. Flow regulated since 1935 by El Vado Reservoir (see p. 150). Diversions for irrigation of about 8,000 acres above station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second).

0.8	0.2	1.1	5.7	1.5	52	2.5	410	4.0	1,510
.9	.7	1.2	12 *	1.7	97	3.0	700		
1.0	2.2	1.3	22	2.0	191	3.5	1,070		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*14	35	44	b34	b35	*b52	0.6	1360	998	78	34	75
2	13	35	42	b33	b34	58	.5	1370	998	71	34	75
3	13	35	42	b32	b34	62	.4	1390	998	69	34	65
4	11	50	42	b32	b35	62	.4	1410	1010	54	185	54
5	11	58	42	b31	b35	60	.7	1420	960	177	993	69
6	11	54	42	b31	b34	58	.6	1420	990	970	532	75
7	11	54	40	b30	b37	54	.4	1420	654	496	532	92
8	11	60	40	b30	b35	b48	.4	1420	380	514	532	136
9	10	210	40	b30	b35	b48	.4	1200	380	440	532	160
10	10	833	40	b30	b35	50	.3	1250	380	71	532	160
11	9.5	784	42	b30	b35	58	.3	1440	380	71	532	160
12	9.5	476	42	b30	38	78	*.3	1440	385	71	308	160
13	*10	157	44	b30	42	108	.3	1450	355	*71	538	119
14	17	114	44	b30	*44	137	.4	1450	255	71	298	80
15	20	97	*42	30	b46	230	.4	1450	*222	71	*100	*69
16	20	87	42	*b30	50	298	.5	*1450	222	71	100	69
17	22	80	40	b34	52	*250	.6	1460	222	69	100	98
18	22	73	b37	b37	54	214	.7	1460	222	172	173	141
19	34	71	b37	b37	54	184	.7	1350	270	929	210	314
20	68	67	37	b35	b54	68	.8	1450	315	508	210	546
21	80	62	b37	b35	b56	7.0	.9	1360	290	514	162	397
22	80	*60	b37	b34	b58	5.2	1.0	1360	242	514	131	257
23	80	60	b37	b34	60	.7	1.4	1450	188	514	134	226
24	66	58	b37	b30	b58	.5	1.8	1380	147	514	186	226
25	40	58	b37	b30	b56	.5	2.2	1210	134	514	222	222
26	38	54	b37	b30	56	.5	2.4	1070	134	184	218	152
27	37	54	b37	b30	b56	.4	2.7	1170	117	47	137	105
28	*37	52	*38	b30	58	.5	*7.2	998	108	*47	67	105
29	35	50	42	b34	-	.6	1350	998	*108	49	52	*143
30	37	*45	b42	b34	-----	.6	1360	998	95	40	*52	117
31	37	-----	42	*b35	-----	.6	-----	*998	-----	35	66	-----
Total	914	3983	1244	992	1276	2194.1	27393	41052	12159	8016	7936	4667
Mean	29.5	133	40.1	32.0	45.6	70.8	91.3	1,324	405	259	256	156
Ac-ft	1,810	7,900	2,470	1,970	2,530	4,350	5,430	81,430	24,120	15,900	15,740	9,260

Calendar year 1960: Max 1,350 Min 9.5 Mean 383 Ac-ft 277,800
 Water year 1960-61: Max 1,460 Min 0.3 Mean 239 Ac-ft 172,900

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

RIO GRANDE BASIN

8-2875. Rio Chama near Abiquiu, N. Mex.

Location.--Lat 36°13'00", long 106°15'00", in Juan Jose Lobato Grant, at downstream end of bridge pier on State Highway 96, 1 $\frac{3}{4}$ miles upstream from El Rito Creek, 5 miles downstream from Abiquiu, Rio Arriba County, and 13.5 miles downstream from Abiquiu damsite (dam under construction).

Drainage area.--2,170 sq mi, approximately.

Records available.--October 1941 to September 1961. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder. Datum of gage is 5,873.17 ft above mean sea level, datum of 1929.

Average discharge.--20 years, 404 cfs (292,500 acre-ft per year).

Extremes.--Maximum discharge during year, 2,130 cfs Aug. 23 (gage height, 4.90 ft); minimum daily, 14 cfs Oct. 9.

1941-61: Maximum discharge, 7,870 cfs July 28, 1952, from rating curve extended above 2,900 cfs; maximum gage height, 6.38 ft Aug. 5, 1959; minimum daily discharge, 1 cfs June 11, 1947.

Remarks.--Records fair except those for periods of ice effect, which are poor. Flow regulated by El Vado Reservoir (see p.150). Diversions for irrigation of about 13,650 acres above station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 17-19, Apr. 21-24)

1.8	11	3.0	328
2.0	23	3.5	478
2.2	43	4.1	973
2.4	71	4.8	1,950
2.7	132		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	30	52	64	b50	*59	73	58	1580	1000	70	34	60
2	20	53	60	b48	56	*76	41	1670	973	60	33	71
3	19	*52	60	b47	58	92	35	1760	963	*73	*116	108
4	*17	51	68	41	b58	120	35	1800	953	50	96	94
5	16	50	64	b48	b57	98	*129	1750	953	43	269	88
6	17	65	52	*b50	b56	86	166	1720	885	186	701	66
7	17	73	b51	47	b54	83	146	1640	913	728	460	83
8	16	74	68	47	b58	78	143	1590	448	543	454	88
9	14	70	60	48	60	76	120	1560	338	466	454	142
10	15	293	55	48	65	80	80	*1130	323	398	*448	163
11	19	765	b73	b48	65	142	71	1530	323	116	460	212
12	20	722	68	b44	65	180	56	1640	318	*83	965	218
13	17	364	66	b48	71	170	*66	1680	*313	73	350	163
14	20	179	68	b46	68	220	85	1680	282	64	536	*125
15	31	132	70	b50	*85	270	71	1620	240	56	313	255
16	158	113	64	b55	108	*330	60	1620	253	56	157	298
17	300	104	47	b60	113	252	86	1600	206	53	256	100
18	368	96	52	51	92	236	135	1600	199	50	248	136
19	132	88	55	59	81	210	228	1620	189	244	236	533
20	70	85	*56	60	78	192	388	1540	210	*685	206	402
21	59	83	58	73	74	*186	*514	1600	248	424	199	491
22	94	*76	b46	76	83	86	610	1470	*203	430	217	333
23	96	71	b58	*78	106	*87	572	1480	186	436	600	224
24	92	70	68	70	106	87	518	1580	149	407	*316	189
25	90	71	58	59	81	78	338	1430	122	407	256	192
26	71	62	55	52	83	70	290	1360	106	407	381	192
27	59	60	55	64	92	52	210	1170	98	*171	217	157
28	56	64	58	60	80	50	221	1070	85	64	154	132
29	53	65	b62	47	-----	48	536	1040	73	56	*88	130
30	52	64	55	48	-----	59	1480	1020	71	42	65	127
31	51	-----	b56	59	-----	62	-----	1000	-----	42	60	-----
Total	2089	4167	1850	1681	2112	3929	7488	46550	11623	6983	9345	5572
Mean	67.4	139	60.0	54.2	75.4	127	250	1,502	387	225	301	186
Ac-ft	4,140	8,270	3,670	3,330	4,190	7,790	14,850	92,330	23,050	13,850	18,540	11,050

Calendar year 1960: Max 1,780 Min 14 Mean 437 Ac-ft 317,300

Water year 1960-61: Max 1,800 Min 14 Mean 283 Ac-ft 205,100

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

8-2890. Rio Ojo Caliente at La Madera, N. Mex.

Location.--Lat 36°20'59", long 106°02'38", in NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.1, T.24 N., R.8 E., on left bank 400 ft upstream from bridge on State Highway 111, 2 $\frac{1}{4}$ miles south of La Madera, 2 $\frac{3}{4}$ miles downstream from confluence of Rio Vallecitos and Rio Tusas, and 3 $\frac{1}{4}$ miles north of Ojo Caliente.

Drainage area.--419 sq mi.

Records available.--April 1932 to September 1961.

Gage.--Water-stage recorder. Datum of gage is 6,358.84 ft above mean sea level, datum of 1929. Prior to Apr. 23, 1934, at site about 2 $\frac{1}{2}$ miles upstream at different datum. Apr. 23, 1934, to June 22, 1936, at datum 12.58 ft lower and June 23, 1936, to Oct. 27, 1956, at datum 13.84 ft lower, both at site 1,400 ft downstream.

Average discharge.--29 years, 73.5 cfs (53,210 acre-ft per year).

Extremes.--Maximum discharge during year, 1,220 cfs Apr. 23 (gage height, 5.39 ft); minimum daily, 3.0 cfs July 28.

1932-61: Maximum discharge, 3,140 cfs Apr. 21, 1958, from rating curve extended above 1,300 cfs by logarithmic plotting; maximum gage height, 7.60 ft July 15, 1933, site and datum then in use; minimum daily discharge, 0.6 cfs Aug. 18, Sept. 17, 1956.

A flood which occurred in May 1920 may have exceeded 3,200 cfs from information by local resident.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Diversions above station for irrigation of about 8,400 acres.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 2-5, Aug. 17 to Sept. 30)

2.4	2.2	2.7	9.3	3.1	32	4.0	179	5.0	710
2.5	3.3	2.9	18	3.5	77	4.5	360	5.2	920

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.6	12	16	14	*19	20	48	679	36	5.5	a5.4	13
2	4.6	*12	17	12	18	*22	48	638	30	5.7	a5.6	10
3	4.6	12	19	13	19	25	68	538	24	5.7	a5.8	15
4	*4.6	13	20	14	19	23	136	*432	23	6.0	6.0	17
5	4.6	14	16	13	18	24	*283	351	20	6.0	5.2	16
6	4.6	14	*15	*12	17	22	*191	244	17	6.0	5.5	15
7	4.6	17	17	12	18	21	*250	208	16	*6.7	5.2	14
8	4.6	21	18	13	18	19	191	179	15	6.3	4.9	12
9	5.2	23	18	13	17	21	159	188	13	6.3	5.2	13
10	5.5	20	15	13	19	23	185	227	12	5.2	4.9	27
11	5.5	17	13	15	20	24	161	247	11	a4.0	5.5	23
12	5.5	15	18	15	22	28	132	254	11	*a3.3	4.9	20
13	5.5	15	17	14	22	28	*182	214	10	a3.3	3.6	17
14	5.7	14	18	14	21	32	163	171	9.7	a3.4	1.6	16
15	6.0	14	16	14	*23	44	120	191	*10	a3.6	21	*16
16	8.0	14	13	14	23	54	139	169	12	3.8	9.0	16
17	18	14	12	14	24	40	236	163	12	4.1	10	16
18	23	15	13	14	22	36	344	158	12	4.1	4.1	16
19	19	15	15	14	22	36	483	156	10	4.1	4.6	19
20	17	15	15	14	21	32	788	146	11	4.4	30	24
21	16	15	*12	13	21	*34	728	122	9.7	4.1	26	24
22	16	15	12	13	23	42	781	108	8.6	4.4	25	22
23	17	14	14	*14	23	60	829	92	7.6	4.4	74	20
24	14	15	15	14	20	80	658	91	7.6	4.4	48	18
25	14	15	15	15	20	70	394	82	6.3	4.1	*4.2	17
26	15	17	15	15	22	52	365	77	5.7	a3.7	36	16
27	14	18	14	16	22	43	328	72	6.7	a3.3	28	15
28	14	16	16	15	20	42	410	65	5.7	a3.0	23	14
29	14	12	14	15	-	44	528	60	5.7	4.9	20	14
30	15	12	13	17	-----	44	658	49	5.2	a5.0	17	14
31	13	-----	13	18	-----	42	-----	45	-----	a5.2	15	-----
Total	322.7	455	474	436	573	1127	9986	6416	383.5	144.0	627.1	509
Mean	10.4	15.2	15.3	14.1	20.5	36.4	333	207	12.8	4.65	20.2	17.0
Ac-ft	640	902	940	865	1,140	2,240	19,810	12,730	761	286	1,240	1,010

Calendar year 1960: Max 924 Min 2.6 Mean 58.4 Ac-ft 42,380

Water year 1960-61: Max 829 Min 3.0 Mean 58.8 Ac-ft 42,560

Peak discharge (base, 600 cfs).--Apr. 23 (1:00 a.m.) 1,220 cfs (5.39 ft); May 2 (12:30 a.m.) 1,110 cfs (5.27 ft).

* Discharge measurement made on this day.

a No gage-height record.

8-2900. Rio Chama near Chamita, N. Mex.

Location.--Lat 36°04'25", long 106°06'39", in NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.8, T.21 N., R.8 E., on left bank 200 ft downstream from bridge on U.S. Highway 285, half a mile west of Chamita, 2 $\frac{1}{2}$ miles northwest of San Juan Pueblo, and 3 miles upstream from mouth.

Drainage area.--3,200 sq mi, approximately.

Records available.--October 1912 to September 1961. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder. Datum of gage is 5,653.61 ft above mean sea level, datum of 1929. Prior to Oct. 4, 1933, at railroad bridge 2 miles downstream at different datums. Oct. 4, 1933, to Mar. 1, 1942, at site 150 ft upstream at datum 0.22 ft higher.

Average discharge.--49 years, 561 cfs (406,100 acre-ft per year).

Extremes.--Maximum discharge during year, 8,000 cfs Aug. 22 (gage height, 10.45 ft); minimum daily, 5.2 cfs July 19.

1912-61: Maximum discharge, 15,000 cfs May 22, 1920; maximum gage height, that of Aug. 22, 1961; no flow at times.

The floods of Sept. 29, 1904, and Oct. 4 or 5, 1911, probably exceeded 15,000 cfs. Another major flood occurred in 1884, from newspaper accounts.

Remarks.--Records fair except for periods of ice effect or no gage-height record, and those for Aug. 22 to Sept. 30, which are poor. Discharge measurements generally made 2 or 3 times a month. Diversions above station for irrigation of about 30,000 acres, a few hundred of which is below station. Flow partly regulated by El Vado Reservoir (see p. 150), 77 miles upstream.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

(Shifting-control method used Oct. 5-14, Mar. 23 to Apr. 16, May 1-3,

May 28 to June 5, June 19-22, July 22-28, Aug. 6 to Sept. 30)

1.2	3.2	1.6	41	2.5	311	4.0	1,620
1.3	7.9	1.8	81	3.0	565	4.5	2,340
1.4	16	2.0	136	3.5	1,020		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	29	66	84	b65	b72	94	102	2,020	965	a30	14	70
2	22	70	86	a60	b70	91	77	2,060	943	a30	18	74
3	12	63	89	a60	b68	99	81	2,040	932	25	13	97
4	9.8	57	b100	a60	b68	170	163	a2,000	932	19	157	77
5	14	57	b90	a62	b68	155	392	a1,900	932	11	78	70
6	14	63	b75	a62	b65	148	430	a1,800	886	7.9	794	63
7	16	89	b65	a64	b65	130	450	a1,750	910	736	445	89
8	19	97	b90	a62	b70	119	395	1,630	553	579	435	107
9	21	97	b85	a60	b75	119	303	1,610	353	517	445	137
10	19	155	b85	a62	84	127	280	1,410	328	500	420	238
11	20	753	a80	b64	86	163	265	1,590	336	186	425	298
12	25	753	a95	b58	89	273	224	1,740	324	84	864	321
13	19	517	a90	b60	94	271	242	1,780	324	52	495	265
14	14	280	a85	b60	97	324	272	1,790	307	40	523	250
15	18	184	a80	b65	102	367	232	1,720	272	21	405	278
16	92	148	a75	b70	133	416	224	1,710	305	14	180	328
17	259	133	a70	b75	167	a350	317	1,680	228	13	278	260
18	458	124	b70	b70	148	a320	520	1,700	197	9.8	352	339
19	227	119	b75	b72	116	a300	675	1,740	184	5.2	319	555
20	142	113	b80	b75	107	a250	1,080	1,670	184	669	265	445
21	a90	110	b65	b85	104	a250	1,310	1,740	210	410	254	359
22	a80	104	b55	b90	104	a140	1,400	1,630	200	415	617	254
23	a110	a85	b70	b90	110	155	1,400	1,620	180	420	1,200	238
24	a105	a80	b85	b90	136	177	1,210	1,660	164	400	438	133
25	a100	a77	b85	b88	97	161	772	1,570	130	386	375	180
26	a85	77	b80	b80	97	133	675	1,440	81	391	444	177
27	a70	77	b70	b90	124	107	547	a1,150	68	229	328	152
28	a70	81	b75	b80	107	91	593	1,140	66	73	276	136
29	a65	89	b75	b65	-	91	762	1,050	54	29	193	130
30	a65	84	b70	b65	-----	89	1,930	1,010	45	25	119	136
31	70	-----	b70	b70	-----	97	-----	987	-----	17	63	-----
Total	2,359.8	4,802	2,449	2,179	2,723	5,777	17,323	50,337	11,593	6,343.9	11,232	6,256
Mean	76.1	160	79.0	70.3	97.2	186	577	1,624	386	205	362	209
Ac-ft	4,680	9,520	4,860	4,320	5,400	11,460	34,360	99,840	22,990	12,580	22,280	12,410

Calendar year 1960: Max 2,240 Min 1.0 Mean 484 Ac-ft 351,500

Water year 1960-61: Max 2,060 Min 5.2 Mean 338 Ac-ft 244,700

a No gage-height record.

b Stage-discharge relation affected by ice.

8-2910. Santa Cruz River at Cundiyo, N. Mex.

Location.--Lat 35°57'40", long 105°54'10", in SE¼NW¼ sec.17, T.20 N., R.10 E., on left bank 135 ft downstream from highway bridge at confluence of Rio Medio and Rio Frijoles and 0.6 mile northwest of Cundiyo.

Drainage area.--86 sq mi, approximately.

Records available.--October 1930 to September 1961. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder. Concrete control since Jan. 3, 1954. Altitude of gage is 6,460 ft (from topographic map). Sept. 1, 1930, to Aug. 12, 1932, water-stage recorder at site about 1 mile downstream at different datum. Aug. 13, 1932, to Oct. 29, 1934, water-stage recorder at site 35 ft upstream at datum 0.42 ft higher. Oct. 30, 1934, to Jan. 2, 1954, water-stage recorder at present site at datum 0.64 ft lower.

Average discharge.--31 years, 30.3 cfs (21,940 acre-ft per year).

Extremes.--Maximum discharge during year, 136 cfs Aug. 23 (gage height, 2.65 ft); minimum daily, 5 cfs Dec. 10, 11. 1930-61: Maximum discharge, 2,420 cfs Sept. 24, 1931 (gage height, 7.8 ft), from rating curve extended above 170 cfs by logarithmic plotting; minimum daily, 1.1 cfs Dec. 3, 1950.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 1,000 acres above station.

Rating table, except periods of ice effect (gage-height, in feet, and discharge, in cubic feet per second)

1.5	4.9	2.0	32
1.6	8.2	2.2	54
1.8	18	2.5	102

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	11	11	b8	b8	*a7	b7	13	74	78	29	16	*30
2	11	*11	b8	b7	a7.5	b7	14	*81	a76	29	17	26
3	10	11	b8	b7	a7.5	7.8	18	88	a75	25	*23	31
4	*10	11	b7	b7.5	a7.5	7.8	32	89	a72	26	19	30
5	9.9	11	b6	b8	b7	7.8	46	84	a70	23	16	28
6	9.9	11	*b7	b8	b7	b7	*41	74	a75	*26	14	26
7	9.5	14	b8	b8	*7.8	b7	54	71	a70	52	12	23
8	9.0	13	b9	b8	*8.6	*b7	50	65	a68	35	13	23
9	11	11	b7	a8	*8.6	b7	42	64	a65	29	11	24
10	12	b9	b5	a8	8.2	b8	44	67	a65	23	12	23
11	10	b9.5	b5	*a8	8.6	b9	43	74	a70	23	14	23
12	9.9	b9.5	b6	b8	8.6	b9	38	82	a62	23	18	21
13	9.9	b9.5	b6	b8	8.2	10	40	88	a60	21	20	*19
14	9.0	11	b7	b8	9.0	12	37	86	a55	19	25	19
15	9.9	9	b7	b8	9.5	14	31	79	*58	18	22	18
16	13	b7	b8	b8	9.5	16	31	78	61	16	26	18
17	19	b8	b8	b8	8.2	14	37	78	52	15	39	16
18	17	b6.5	b9	b7	7.8	12	48	78	48	14	44	18
19	14	b6.5	b9	b7	7.4	11	64	84	43	14	31	33
20	13	b8	b8	b7	b7	10	78	88	41	14	27	27
21	13	b8	b9	b8	b7	*9.9	78	89	37	15	27	23
22	13	b7	b9	b9	b7	11	79	89	36	16	27	20
23	13	*b7.5	b9	a9	7.8	14	79	91	34	14	83	19
24	13	b8	b9	*a8	b7	18	76	91	33	14	60	18
25	12	b8	b9	a8	b6.5	16	68	89	30	13	52	18
26	12	b8	b9	a8	b6.5	15	61	89	29	13	46	17
27	12	b8	b9	a7	b7	14	55	89	29	15	42	16
28	12	b7	b9	a6	b7	13	55	89	27	14	40	16
29	12	b5.5	b8	a6	-	13	61	82	25	15	35	16
30	10	b6.5	b8	a6	-----	13	68	81	28	14	33	16
31	9.9	-----	b8	a6.5	-----	12	-----	79	-----	12	32	-----
Total	359.9	271.0	242	236.0	216.3	339.3	1,481	2,530	1,572	629	896	655
Mean	11.6	9.03	7.8	7.61	7.72	10.9	49.4	81.6	52.4	20.3	28.9	21.8
Ac-ft	714	538	480	468	429	673	2,940	5,020	3,120	1,250	1,780	1,300

Calendar year 1960: Max 130 Min 3.5 Mean 37.5 Ac-ft 27,240

Water year 1960-61: Max 91 Min 5.0 Mean 25.8 Ac-ft 18,710

Peak discharge (base, 200 cfs).--No peak above base.

* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

RIO GRANDE BASIN

8-3130. Rio Grande at Otowi Bridge near San Ildefonso, N. Mex.

Location.--Lat 35°52'30", long 106°08'30", near right bank on downstream side of pier of former railway bridge, 400 ft downstream from bridge on State Highway 4, 1½ miles southwest of San Ildefonso Pueblo, 2½ miles downstream from Pojoaque River, and 7 miles west of Pojoaque.

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

Records available.--February 1895 to December 1905, June 1909 to September 1961. Monthly discharge only for some periods, published in WSP 1312. In early reports this record was published as Rio Grande at water tank, as "at Rio Grande", and as "near Buckman."

Gage.--Water-stage recorder. Datum of gage is 5,488.48 ft above mean sea level, datum of 1929. Prior to May 19, 1904 and July 25 to Oct. 1, 1904, staff gage at site 180 ft upstream at datum 2.02 ft lower. May 19 to July 24, 1904, Oct. 2, 1904, to Dec. 31, 1905, and June 23, 1909, to May 31, 1910, staff gage or chain gage at same site and datum.

Average discharge.--62 years (1895-1905, 1909-61), 1,585 cfs (1,147,000 acre-ft per year).

Extremes.--Maximum discharge during year, 8,700 cfs Aug. 23 (gage height, 7.85 ft); minimum daily, 245 cfs Oct. 7. 1895-1905, 1909-61: Maximum discharge, 24,400 cfs May 23, 1920, maximum gage height, 14.5 ft Sept. 29, 1904 (present site and datum); minimum daily discharge, 60 cfs July 4, 5, 1902. The 1920 flood is greatest since at least 1884 and probably since 1741; information from H. W. Yeo's file on floods.

Remarks.--Records good except those periods of no gage-height record, which are fair. Discharge measurements generally made two or more times a month. Flow partly regulated by El Vado Reservoir (see p.150) on Rio Chama which contributes about 40 percent of total flow. Diversions above station for irrigation of about 619,000 acres in Colorado and 75,000 acres in New Mexico.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	254	423	423	465	506	606	581	3,370	2,590	419	259	510
2	257	419	431	435	514	686	561	3,680	2,590	435	272	483
3	252	415	440	403	524	708	542	4,100	2,570	435	300	514
4	250	415	492	415	538	767	601	4,200	2,500	403	461	664
5	247	411	496	415	538	761	830	4,180	2,370	365	387	591
6	250	411	452	423	538	725	1,080	4,010	2,120	358	996	566
7	245	457	399	435	538	714	1,050	3,650	1,980	1,050	798	576
8	247	483	440	452	557	658	1,170	3,260	1,630	1,100	737	596
9	257	465	448	448	571	653	1,040	2,900	1,280	1,150	708	586
10	264	461	492	431	576	653	1,000	2,570	1,190	1,030	686	698
11	264	1,030	465	431	586	669	a950	2,630	1,160	710	708	802
12	264	1,410	519	440	611	761	a850	2,910	1,190	506	1,490	792
13	269	1,420	547	452	621	804	a850	3,120	1,120	737	1,100	703
14	264	1,160	581	452	627	864	a870	3,160	1,060	492	959	642
15	269	1,020	581	457	632	951	a790	3,080	1,060	415	878	632
16	341	921	557	465	675	997	a760	2,880	1,240	358	621	719
17	552	844	510	470	719	1,000	a880	2,680	1,100	321	717	566
18	806	648	501	470	737	850	a960	2,640	982	283	936	763
19	561	519	528	474	719	830	1,170	2,640	914	262	1,000	1,220
20	483	496	542	465	697	767	1,760	2,590	878	790	844	1,050
21	440	478	510	465	680	697	2,370	2,660	900	671	842	1,080
22	492	470	474	474	680	653	2,770	2,640	837	680	1,040	951
23	538	457	488	478	703	586	3,010	2,640	767	686	3,800	818
24	528	427	519	488	731	616	2,830	2,720	767	691	1,170	697
25	514	431	533	496	708	642	2,360	2,900	743	680	881	675
26	501	435	524	496	680	606	2,170	3,000	669	669	1,120	669
27	474	444	524	514	743	571	1,820	2,630	616	648	824	648
28	457	444	524	501	691	557	1,750	2,790	547	444	899	590
29	448	448	538	492	-	576	1,830	2,740	510	354	675	528
30	431	399	506	478	-----	601	2,970	2,910	465	344	576	496
31	423	-----	478	496	-----	596	-----	2,790	-----	297	524	-----
Total	11,842	18,261	15,462	14,276	17,640	22,125	42,175	94,680	38,345	17,783	27,208	20,825
Mean	382	609	499	461	630	714	1,406	3,054	1,278	574	878	694
Ac-ft	23,490	36,220	30,670	28,320	34,990	43,880	83,650	187,800	76,060	35,270	53,970	41,310

Calendar year 1960: Max 4,160 Min 192 Mean 1,100 Ac-ft 798,700
 Water year 1960-61: Max 4,200 Min 245 Mean 933 Ac-ft 675,600

Peak discharge (base, 5,200 cfs). --Aug. 23 (12:15 a.m.) 8,700 cfs (7.85 ft).

a No gage-height record.

8-3133. Rito de los Frijoles near Los Alamos, N. Mex.

Location.--Lat 35°48'55", long 106°21'35", on right bank at upper Frijoles crossing, 5½ miles southwest of Los Alamos, 5½ miles upstream from Bandelier National Monument Headquarters, and 7½ miles upstream from the mouth.

Drainage area.--8.9 sq mi.

Records available.--August 1959 to September 1961.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 7,000 ft (from topographic map).

Extremes.--Maximum discharge during year, 9.5 cfs about Apr. 20 (gage height, 1.20 ft, from recorded range in stage); minimum daily, 0.8 cfs May 26-29, July 5, 6, 30, 31, Aug. 1, 2, 4-4.

1959-61: Maximum discharge, 13 cfs Apr. 7, 1960 (gage height, 1.30 ft); minimum daily, 0.7 cfs Jan. 19, 1960.

Remarks.--Records good except those for periods of no gage-height record, which are poor. No diversions above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

0.7	0.2
.8	.9
.9	2.2
1.0	4.0
1.2	9.5

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.9	1.0	1.4	a1	1.1	1.3	2.5	a4	a0.9	1.1	0.8	1.1
2	.9	1.0	1.5	a1	1.1	1.4	2.5	a4	a1	.9	.8	1.1
3	.9	1.0	1.6	a1	1.1	1.5	*2.7	a3.5	a1	1.0	.9	1.3
4	.9	1.1	1.6	a1	1.3	1.5	3.1	a3	a1	.9	.8	1.3
5	.9	1.1	1.5	a1	1.3	1.5	4.0	a2.5	a1	.8	.8	1.1
6	.9	1.3	1.5	a1	1.1	1.5	5.0	a2	a1	.8	.8	1.1
7	*.9	1.5	1.5	a1.1	1.1	*1.5	5.4	a2	a1.1	*1.0	.8	1.3
8	.9	1.4	1.5	a1.1	1.1	1.5	5.4	a2	a1.1	1.6	.8	1.1
9	.9	*1.3	*1.4	a1.1	1.1	1.6	5.4	*2.2	a1.1	1.6	.8	1.4
10	.9	1.3	1.5	a1.2	1.3	1.6	5.4	2.0	a1.1	1.4	.9	1.3
11	.9	1.3	1.5	a1.1	1.3	1.6	5.4	1.8	a1.1	1.3	1.0	1.3
12	.9	1.3	1.4	a1.1	1.3	1.8	5.2	1.6	a1.1	1.1	1.3	1.1
13	.9	1.3	1.4	*a1.1	1.4	1.8	5.2	1.5	a1.1	1.0	1.3	1.1
14	.9	1.3	1.3	a1.1	*1.3	1.9	5.7	1.4	*1.1	.9	1.4	1.1
15	1.3	1.3	1.3	a1.1	1.3	1.9	5.7	1.3	1.0	.9	1.4	*1.1
16	1.6	1.4	a1.2	a1.1	1.3	1.9	6.2	1.3	1.1	.9	1.0	1.1
17	2.7	1.4	a1.1	*1.1	1.3	1.9	7.0	1.1	1.3	.9	1.0	1.1
18	2.7	1.4	a1.2	1.1	1.1	2.0	a8	1.1	1.1	.9	1.1	1.3
19	1.8	1.4	a1.3	1.1	1.1	2.0	a9	1.1	1.1	1.1	1.1	1.3
20	1.5	1.4	a1.3	1.1	1.0	2.0	a9	1.0	1.1	1.0	1.1	1.1
21	1.5	1.4	a1.1	1.1	1.1	2.2	a9	1.1	1.3	.9	.9	1.3
22	1.4	1.3	a1.1	1.1	1.1	2.3	a9	1.1	1.1	1.0	1.0	1.3
23	1.3	1.3	a1.2	1.3	1.1	2.5	a7	1.0	1.0	1.0	1.9	1.3
24	1.1	1.3	a1.3	1.3	1.1	2.5	a6	1.1	1.0	1.0	1.4	1.3
25	1.1	1.4	a1.3	1.3	1.1	2.5	a5	.9	1.0	*1.0	1.4	1.3
26	1.1	1.4	a1.2	1.3	1.3	2.5	a4	.8	1.0	1.0	1.4	1.4
27	1.1	1.4	a1.2	1.4	1.3	2.7	a3	.8	1.0	1.0	1.4	1.4
28	1.0	1.4	a1.2	1.4	1.1	2.7	a2.5	a.8	1.0	.9	1.4	1.4
29	1.0	1.4	a1.2	1.3	-	2.7	a3	a.8	.9	.9	*1.3	1.4
30	1.0	1.4	a1.2	1.3	-----	2.7	a3.5	a.9	.9	.8	1.3	1.4
31	1.0	-----	a1.1	1.3	-----	2.7	-----	a1	-----	.8	1.3	-----
Total	36.8	39.2	41.1	35.6	33.2	61.7	159.8	50.7	31.6	31.4	34.6	37.2
Mean	1.19	1.31	1.33	1.15	1.19	1.99	5.33	1.64	1.05	1.01	1.12	1.24
Ac-ft	73	78	82	71	66	122	317	101	63	62	69	74

Calendar year 1960: Max 12 Min 0.7 Mean 1.83 Ac-ft 1,330

Water year 1960-61: Max 9 Min 0.8 Mean 1.62 Ac-ft 1,180

* Discharge measurement made on this day.

a No gage-height record.

RIO GRANDE BASIN

8-3145. Rio Grande at Cochiti, N. Mex.

Location.--Lat 35°37'10", long 106°19'20", in SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.17, T.16 N., R.6 E., on downstream end of concrete pier near left end of highway bridge, $1\frac{1}{2}$ miles northeast of Cochiti, $3\frac{1}{4}$ miles north of Pena Blanca, and 8 miles upstream from Galisteo Creek.

Drainage area.--14,600 sq mi, approximately (includes 2,940 sq mi in closed basin in San Luis Valley, Colo.).

Records available.--October 1924 to September 1961. Published as "near Cochiti" prior to 1928. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder since July 16, 1925. Datum of gage is 5,224.70 ft above mean sea level, datum of 1929. Prior to July 16, 1925, staff gage 1 mile upstream at different datum. July 16, 1925, to Jan. 28, 1947, at or near right abutment of bridge at same datum. Jan. 28 to May 15, 1947, 600 ft upstream at same datum.

Average discharge.--37 years, 1,355 cfs (981,000 acre-ft per year).

Extremes.--Maximum discharge during year, 9,550 cfs Aug. 23 (gage height, 8.30 ft); minimum daily, 111 cfs Oct. 6. 1924-61: Maximum discharge, 23,400 cfs May 15, 1941 (gage height, 10.93 ft); minimum daily, 1 cfs Aug. 10-12, 1934. The flood of May 23, 1920, probably exceeded 23,400 cfs, and is likely the highest since 1905.

Remarks.--Records good except for periods of ice effect or no gage-height record, which are fair. Discharge measurements generally made twice a month. Diversions above station for irrigation of about 700,000 acres, 6,000 of which are irrigated below by Cochiti east side and Sili main canals which bypass station. Possible regulation by two reservoirs on Rio Chama.

Rating tables, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 21 to May 2)

Oct. 1 to Apr. 30				May 1 to Sept. 30			
2.9	83	3.9	710	2.8	136	4.5	1,520
3.2	201	4.5	1,480	3.2	310	5.5	3,050
3.5	370	5.5	3,210	3.6	570	6.5	5,100
				4.0	930		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	290	405	440	510	538	660	520	3320	2520	a 450	206	424
2	224	440	480	500	547	650	496	3680	2490	a 350	147	464
3	134	440	488	460	538	690	464	4170	2590	a 300	168	450
4	134	433	547	433	556	690	472	4360	2440	321	255	578
5	114	433	547	480	556	721	630	4210	2270	263	437	478
6	111	448	529	480	556	700	1040	4230	2030	249	581	444
7	154	480	496	470	547	670	1020	3780	1870	549	690	444
8	257	529	460	500	556	640	1150	3270	1710	1020	527	491
9	214	512	490	510	574	620	1070	2820	1220	1060	527	548
10	161	488	500	490	565	630	965	2560	1170	870	534	527
11	153	828	490	480	574	640	940	2440	1070	704	573	626
12	149	1160	538	490	574	690	832	2750	1040	437	1080	659
13	157	1370	610	500	565	754	710	2980	963	547	1250	578
14	166	1190	630	510	583	743	754	3100	930	501	761	520
15	270	1120	620	500	592	820	721	3030	860	471	840	505
16	340	1000	601	500	610	868	640	2870	1030	a 330	618	695
17	512	966	570	529	670	953	640	2640	1080	a 220	505	520
18	776	754	540	529	700	820	820	2570	910	a 170	785	444
19	615	565	570	504	721	776	1080	2570	767	150	912	1120
20	456	512	583	504	690	700	1700	2640	722	340	695	996
21	419	488	583	504	680	660	2380	2620	731	673	626	952
22	488	480	530	520	680	620	2800	2540	677	626	626	900
23	496	480	510	538	650	538	3050	2460	a 660	536	4460	785
24	464	472	550	547	690	529	2860	2590	a 730	527	1310	618
25	440	456	560	556	680	556	2500	2670	a 600	498	785	556
26	419	456	560	565	660	538	2170	2840	a 500	484	914	570
27	398	504	550	565	700	520	1860	2700	a 400	527	758	556
28	398	472	550	547	710	496	1570	2700	a 380	437	704	498
29	472	472	560	520	-	496	1780	2590	a 350	338	610	478
30	405	440	550	512	-----	504	2580	2720	a 300	321	505	534
31	370	-----	520	520	-----	520	-----	2700	-----	268	424	-----
Total	10,156	18,793	16,772	15,773	17,262	20,412	40,215	93,120	35,010	14,557	23,813	17,958
Mean	328	626	541	509	616	658	1,340	3,004	1,167	470	768	599
(t)	4,540	77	0	0	0	3,000	5,280	6,340	5,580	4,520	5,020	4,410
Ac-ft	20,140	37,280	33,270	31,290	34,240	40,490	79,770	184,700	69,440	28,870	47,230	35,620

Calendar year 1960: Max 4,180 Min 43 Mean 1,062 Ac-ft 771,100
Water year 1960-61: Max 4,460 Min 111 Mean 887 Ac-ft 642,300

Peak discharge (base, 4,500 cfs).--May 3 (7 p.m.) 4,630 cfs (6.38 ft); Aug. 23 (1 a.m.) 9,550 cfs (8.30 ft).

† Combined monthly diversion, in acre-ft, of Sili main and Cochiti eastside canals; records of this flow are furnished by Bureau of Reclamation.

a No gage-height record.

Note.--Stage-discharge relation affected by ice Dec. 8-11, 17-19, Dec. 22 to Jan. 3, Jan. 5-16, 29.

RIO GRANDE BASIN

83

8-3160. Santa Fe River near Santa Fe, N. Mex.

Location.--Lat 35°41'10", long 105°50'35", in NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.23, T.17 N., R.10 E., on left bank 0.4 mile downstream from McClure Dam and 5 $\frac{1}{2}$ miles east of Santa Fe.

Drainage area.--18.2 sq mi.

Records available.--January 1913 to September 1961. Monthly discharge only for some periods, published in WSP 1312. Prior to October 1953, published as Santa Fe Creek near Santa Fe.

Gage.--Water-stage recorder and concrete control. Datum of gage is 7,718 ft above mean sea level, datum of 1929. Prior to Nov. 4, 1930, at site 1.5 miles downstream and Apr. 11, 1931, to September 1947 at site 0.3 mile upstream, each at different datum.

Average discharge.--48 years, 8.41 cfs (6,090 acre-ft per year).

Extremes.--Maximum daily discharge during year, 22 cfs May 29; minimum daily, 2.7 cfs Mar. 28 to Apr. 6.

1913-61: Maximum discharge, 1,500 cfs Aug. 14, 1921 (gage height, 5.17 ft, site and datum then in use), from rating curve extended above 150 cfs by logarithmic plotting; minimum daily, 0.1 cfs Feb. 7-10, 20, 21, 1927, Aug. 1-4, 1951.

Peaks which probably exceeded 1,000 cfs occurred Aug. 19, 1872, and Sept. 29 or 30, 1904. Without regulation the flood of Sept. 23, 1929, might have exceeded 1,500 cfs.

Remarks.--Records good. Flow regulated by McClure Reservoir (see p. 150), completed in 1926, raised in 1935, and again in 1947.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

1.6	1.9	1.9	8.4
1.7	3.4	2.1	16
1.8	5.6	2.3	27

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a14	3.1	*3.1	3.6	a3.4	a3.1	2.7	3.4	12	11	8.4	9.4
2	a14	3.1	3.1	3.9	a3.4	a3.1	2.7	3.4	*11	11	8.4	9.4
3	a14	3.1	3.1	3.9	*3.4	a3.1	*2.7	*3.4	10	10	8.4	9.8
4	a14	3.1	3.1	*4.1	3.4	a3.1	2.7	3.4	10	10	8.4	9.8
5	*14	3.1	3.1	4.5	3.4	a3.1	2.7	3.4	11	10	8.4	9.8
6	14	3.1	3.1	4.7	3.4	a3.0	2.7	3.4	11	*10	8.4	*10
7	*13	3.0	3.1	4.7	3.4	*3.0	3.0	3.4	11	10	8.4	10
8	13	3.0	3.1	4.7	3.6	3.0	3.0	3.4	10	9.8	8.4	10
9	13	3.0	3.1	4.7	3.6	3.0	3.1	3.4	10	9.8	8.1	10
10	13	3.0	3.1	4.5	3.6	3.0	3.1	4.1	9.4	9.8	8.1	10
11	13	3.3	3.1	4.3	3.4	3.0	3.1	4.1	8.4	9.8	8.1	9.8
12	13	3.3	3.1	4.3	3.4	3.0	3.1	4.1	8.4	9.4	8.1	9.8
13	8.6	3.3	3.1	4.1	3.4	3.0	3.1	4.1	8.8	9.4	8.1	6.3
14	4.9	3.3	3.1	4.1	3.4	2.8	3.0	4.3	9.4	9.4	8.1	3.4
15	4.9	3.3	3.1	4.1	3.4	2.8	3.1	4.5	8.8	9.4	8.4	3.4
16	4.9	3.3	3.1	4.1	3.4	2.8	3.1	4.3	9.1	9.4	8.4	3.4
17	4.9	3.3	3.1	3.9	3.4	2.8	3.1	4.7	9.4	9.1	8.4	3.4
18	4.9	3.3	3.3	3.9	3.4	2.8	3.1	4.9	9.4	9.1	*8.8	3.4
19	5.2	3.1	3.3	3.9	3.4	2.8	3.1	5.4	8.8	9.1	9.1	3.4
20	5.4	3.1	3.4	3.9	3.4	2.8	3.1	6.2	8.4	9.1	9.1	3.4
21	5.4	3.3	3.4	3.9	3.4	2.8	3.1	7.3	8.4	8.8	9.1	3.3
22	5.2	3.3	3.4	3.9	3.4	2.8	3.1	8.1	8.4	8.4	9.1	3.3
23	5.2	3.1	3.3	3.9	3.3	2.8	3.3	13	11	8.1	14	3.3
24	5.2	3.1	3.3	3.6	3.3	2.8	3.3	18	13	8.1	11	3.3
25	5.2	3.1	3.3	3.6	a3.2	2.8	3.3	20	13	8.1	10	*3.3
26	5.2	3.1	3.3	3.4	a3.2	2.8	3.3	14	12	8.1	9.8	3.4
27	5.2	3.1	3.3	3.4	a3.2	2.8	3.3	12	12	*8.1	9.8	3.4
28	5.2	3.1	3.3	3.4	a3.2	2.7	3.3	18	12	8.1	9.4	3.4
29	5.2	3.1	3.3	3.4	-	2.7	3.3	22	11	8.1	9.4	3.4
30	5.2	3.1	3.4	a3.4	-----	2.7	3.3	20	11	8.1	9.4	3.4
31	*3.9	-----	3.4	a3.4	-----	2.7	-----	15	-----	8.1	9.4	-----
Total	261.8	94.6	99.4	123.2	94.8	89.5	91.9	248.7	306.1	284.7	278.4	181.4
Mean	8.45	3.15	3.21	3.97	3.39	2.89	3.06	8.02	10.2	9.18	8.98	6.05
Ac-ft	519	188	197	244	188	178	182	493	607	565	552	360

Calendar year 1960: Max 39 Min 0.7 Mean 7.09 Ac-ft 5,140
 Water year 1960-61: Max 22 Min 2.7 Mean 5.90 Ac-ft 4,270

* Discharge measurement made on this day.
 a No gage-height record.

8-3180. Galisteo Creek at Domingo, N. Mex.

Location.--Lat 35°30'45", long 106°19'00", in SW $\frac{1}{4}$ sec. 21, T.15 N., R.6 E., in Santo Domingo Pueblo Grant, 160 ft downstream from highway bridge, 0.3 mile northeast of Domingo, 2 $\frac{1}{2}$ miles east of Santo Domingo Pueblo, and 4 miles upstream from mouth.

Drainage area.--640 sq mi, approximately.

Records available.--October 1941 to September 1961.

Gage.--Water-stage recorder. Datum of gage is 5,255.50 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to July 20, 1956, at site 160 ft upstream at same datum.

Average discharge.--20 years, 9.93 cfs (7,190 acre-ft per year).

Extremes.--Maximum discharge during year, 5,980 cfs Aug. 11 (gage height, 5.20 ft); no flow most of time.

1941-61: Maximum discharge, 19,600 cfs Sept. 25, 1955 (gage height, 12.1 ft, from floodmark), from rating curve extended above 11,000 cfs on basis of slope-area measurement of peak flow; no flow at times.

The floods of Sept. 23, 1929, and Aug. 20, 1935, probably exceeded 20,000 cfs. Discharge for the flood of Aug. 20, 1935, was estimated as 24,300 cfs by H. W. Yeo.

Remarks.--Records poor. Discharge measurements or observations of no flow generally made three times a month. Diversions for irrigation of about 50 acres above station.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	64		0	0.2	a 0.1	0	0		0	0	13	0.5
2	a 1		0	.3	a .1	0	0		0	0	53	.3
3	.1		.3	.2	0	0	0		0	0	.3	4
4	0		.4	.6	0	0	0		0	0	0	2
5	0		0	.2	0	0	0		0	0	0	.5
6	0		0	.3	0	0	0		0	0	0	.4
7	0		0	.4	0	0	.1		0	0	.3	.3
8	0		.1	.3	0	0	.1		0	.80	0	.1
9	0		0	.2	0	0	0		0	176	0	10
10	0		0	.2	0	0	0		0	82	0	3
11	0		0	.1	0	0	0		0	a .5	520	6
12	0		b .2	.2	0	0	0		0	0	53	2
13	0		b .1	.2	0	0	0		0	0	13	.3
14	0		b .1	.2	0	0	0		0	0	9	.2
15	9		b .1	.2	0	0	0		1	0	74	.2
16	48		.1	.1	0	0	0		0	0	126	.1
17	17		0	.1	0	0	0		0	0	486	.1
18	80		0	.1	0	.5	0		0	0	55	3
19	.5		.1	0	0	.1	0		0	0	156	28
20	0		.1	.1	0	0	0		0	0	a 8	5
21	0		.1	.1	0	0	0		0	0	25	1
22	0		.1	.1	0	0	0		0	0	a 3	.6
23	0		.1	.1	0	0	0		.1	0	120	.3
24	0		.1	0	0	0	0		0	0	48	.3
25	0		.1	0	0	0	0		0	0	23	.3
26	0		0	0	0	0	0		0	0	13	.3
27	0		0	.3	0	0	0		0	0	a 5	.2
28	0		0	a .1	0	0	0		0	0	182	.1
29	0		0	0	-	0	0		0	0	13	.1
30	0		.1	b .3	-----	0	0		0	0	2	.1
31	0	-----	.2	a .2	-----	0	-----		-----	0	.9	-----
Total	219.6	0	2.4	5.3	0.2	5.1	0.2	0	9.1	338.5	2001.5	69.3
Mean	7.08	0	0.08	0.17	0.007	0.16	0.007	0	0.30	10.9	64.6	2.3
Ac-ft	436	0	4.8	10.5	0.4	10.1	0.4	0	18.0	671	3970	137

Calendar year 1960: Max 796 Min 0 Mean 7.29 Ac-ft 5,300
 Water year 1960-61: Max 520 Min 0 Mean 7.26 Ac-ft 5,260

Peak discharge (base, 3,000 cfs)--Aug. 11 (10 p.m.) 5,980 cfs (5.20 ft); Aug. 17 (7 a.m.) 3,940 cfs (4.27 ft).

a No gage-height record.

b Stage-discharge relation affected by ice.

RIO GRANDE BASIN

85

8-3190. Rio Grande at San Felipe, N. Mex.

Location.--Lat 35°26'40", long 106°26'20", in SW 1/4 sec. 17, T.14 N., R.5 E., in San Felipe Grant, on right bank 200 ft below mouth of Tonque Arroyo, 1,800 ft upstream from steel highway bridge, three-quarters of a mile upstream from San Felipe Pueblo, and 11 miles northeast of Bernalillo.

Drainage area.--16,100 sq mi, approximately (includes 2,940 sq mi in closed basin in San Luis Valley, Colo.).

Records available.--October 1925 to September 1961. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder. Datum of gage is 5,115.73 ft above mean sea level, datum of 1929, 1951 adjustment. Prior to May 16, 1945, and Oct. 1, 1946, to Sept. 27, 1957, at site 0.4 mile downstream at datum 5.35 ft lower, and May 16, 1945, to Sept. 30, 1946, at same site at datum 5.94 ft lower than present datum.

Average discharge.--36 years, 1,450 cfs (1,050,000 acre-ft per year).

Extremes.--Maximum discharge during year, 7,440 cfs Aug. 23 (gage height, 6.95 ft); minimum daily, 189 cfs Oct. 5, 6. 1927-61: Maximum discharge, 27,300 cfs June 26, 1937 (gage height, 11.13 ft), from rating curve extended above 15,000 cfs by logarithmic plotting; minimum daily, 34 cfs July 7, 1934. Other major floods occurred in 1874, 1884 and 1904.

Remarks.--Records good except those for no gage-height record, which are fair. Discharge measurements generally made 2 or 3 times a month. Diversions for irrigation of about 705,000 acres above station. Possible regulation by two reservoirs on Rio Chama.

Rating table (gage height in feet, and discharge, in cubic feet per second)

(Shifting-control method used July 10 to Aug. 19, Sept. 10-30)

2.1	106	4.5	2,470
2.4	209	5.5	4,140
2.8	429	6.5	6,250
3.5	1,060	7.0	7,580

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	319	429	a460	514	537	651	583	3,410	2,580	436	323	492
2	265	457	a470	507	545	592	567	3,700	2,570	403	265	492
3	201	450	a500	471	537	651	529	4,090	2,740	342	241	457
4	193	443	a530	464	552	668	529	4,450	2,630	353	241	560
5	189	443	a560	478	552	740	634	4,430	2,280	330	391	552
6	189	443	a540	478	552	722	1,060	4,390	2,010	286	384	507
7	197	464	a520	471	545	677	1,050	3,960	1,760	302	807	492
8	260	522	a500	499	552	668	1,190	3,460	1,690	1,210	617	492
9	260	514	a500	507	567	625	1,110	2,970	1,210	1,180	592	560
10	209	492	a500	492	567	617	970	2,730	1,180	1,250	592	537
11	214	622	a500	478	567	634	970	2,450	1,100	866	642	634
12	214	1,130	a540	492	575	686	896	2,870	1,060	560	1,620	749
13	223	1,430	a580	499	567	759	807	3,140	1,020	488	1,570	659
14	237	1,230	a620	514	583	759	816	3,290	948	578	826	567
15	324	1,080	a630	499	592	816	807	3,170	907	464	907	522
16	384	1,030	609	499	609	886	749	2,950	948	384	786	651
17	496	982	575	522	659	1,040	704	2,630	1,140	291	1,020	609
18	807	855	537	522	704	917	816	2,580	970	255	768	478
19	746	659	560	514	704	866	1,080	2,550	797	218	1,090	986
20	529	592	575	514	686	778	1,560	2,690	740	197	800	1,130
21	471	567	567	507	668	722	2,310	2,600	731	659	700	948
22	499	545	522	514	668	677	2,760	2,600	713	617	750	959
23	522	529	507	514	686	592	3,160	2,470	677	592	4,140	835
24	522	514	545	529	704	600	2,980	2,680	731	545	1,600	695
25	514	499	560	537	686	642	2,630	2,790	686	537	876	625
26	499	499	560	545	659	617	2,260	2,950	592	537	948	634
27	485	514	552	583	677	592	2,010	2,870	529	529	936	625
28	464	514	552	552	704	552	1,660	2,710	485	514	835	575
29	492	a500	560	529	-	560	1,780	2,600	450	378	835	514
30	464	a450	560	514	-----	583	2,520	2,740	397	336	600	537
31	429	-----	522	514	-----	600	-----	2,820	-----	307	522	-----
Total	11,817	19,398	16,813	15,772	17,204	21,489	41,497	95,760	36,271	15,944	27,224	19,073
Mean	381	647	542	509	614	693	1,383	3,089	1,209	514	878	636
Ac-ft	23,440	38,480	33,350	31,280	34,120	42,620	82,310	189,900	71,940	31,620	54,000	37,830

Calendar year 1960: Max 4,290 Min 123 Mean 1,083 Ac-ft 786,400

Water year 1960-61: Max 4,450 Min 189 Mean 927 Ac-ft 670,900

Peak discharge (base, 5,000 cfs).--Aug. 12 (1 a.m.) 6,250 cfs (6.50 ft); Aug. 23 (9 a.m.) 7,440 cfs (6.95 ft).

a No gage-height record.

8-3215. Jemez River below East Fork, near Jemez Springs, N. Mex.

Location.--Lat 35°49'39", long 106°38'51", in NW¹/₄ sec.5, T.18 N., R.3 E., on left bank 0.4 mile downstream from East Fork and boundary of Santa Fe National Forest and 5.3 miles northeast of Jemez Springs.

Drainage area.--173 sq mi.

Records available.--May 1951 to September 1958 (irrigation seasons only), May 1959 to September 1961.

Gage.--Water-stage recorder. Datum of gage is 6,702.7 ft above mean sea level (planetable survey).

Extremes.--Maximum discharge during year, 780 cfs Apr. 17 (gage height, 4.05 ft from graph); minimum daily recorded, 11 cfs Dec. 5, 8, 1951-61: Maximum discharge recorded, 2,520 cfs Apr. 21, 1958 (gage height, 7.35 ft), from rating curve extended above 1,100 cfs on basis of slope-area and contracted-opening measurements of peak flow; minimum daily recorded, 6 cfs Jan. 5, 1960.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. No diversion above station.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12	19	16		16	20	63	66	*22	16	18	19
2	12	21	16		16	25	66	68	21	23	20	17
3	12	19	18		17	24	130	69	21	38	20	19
4	12	18	14		20	22	360	*68	20	26	17	22
5	12	18	11		25	20	*600	68	20	17	15	19
6		12	18		20	23	342	71	19	17	14	17
7		12	34		15	21	314	62	19	20	13	16
8		12	45		20	20	176	60	19	19	*12	16
9		13	25		18	20	131	54	19	31	*13	18
10		14	20		18	22	137	48	18	30	14	23
11		13	18	b15	20	23	132	43	17	20	19	23
12		13	18	18	20	25	151	42	17	15	38	22
13	*13	18	18		19	25	269	43	16	*14	37	19
14	13	18	18		19	25	259	51	15	14	25	16
15	40	17	b14	12	20	*47	224	46	16	13	22	15
16	50	14	b16		23	44	353	40	22	13	25	15
17	90	16	b17		23	44	428	37	20	12	26	15
18	60	15	18		22	43	390	*36	19	13	63	20
19	29	14	17		20	40	325	35	17	13	48	43
20	25	15	17		21	37	*248	34	*17	15	25	28
21	24	14	15		20	37	171	32	16	13	21	*20
22	23	14	15		21	49	134	32	15	14	*19	18
23	22	14	17		22	78	115	31	15	13	294	16
24	23	15	18		20	128	103	30	15	12	89	16
25	23	15	17		22	146	86	29	15	12	33	16
26	24	16	17		24	111	83	28	15	12	31	15
27	23	17	16		23	102	70	26	15	*12	26	14
28	25	13	18		20	*103	68	26	16	12	22	14
29	25	13	18		-	78	65	24	*17	12	32	14
30	23	16	15		-----	70	65	23	15	12	22	14
31	20	-----	13		-----	62	-----	23	-----	12	20	-----
Total	724	547	485	372	564	1,534	6,058	1,345	528	515	1,093	559
Mean	23.4	18.2	15.6	12.0	20.1	49.5	202	43.4	17.6	16.6	35.3	18.6
Ac-ft	1,440	1,080	962	738	1,120	3,040	12,020	2,670	1,050	1,020	2,170	1,110

Calendar year 1960: Max 405 Min 6 Mean 33.8 Ac-ft 24,560

Water year 1960-61: Max 600 Min 11 Mean 39.2 Ac-ft 28,420

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.--No gage-height record Oct. 15-18, Dec. 21 to Mar. 14.

RIO GRANDE BASIN

87

8-3230. Rio Guadalupe at Box Canyon, near Jemez, N. Mex.

Location.--Lat 35°43'55", long 106°45'45", in E $\frac{1}{2}$ sec. 6, T. 17 N., R. 2 E. (projected), in Canon de San Diego Grant, on left bank at downstream end of Guadalupe Box Canyon, 4.8 miles upstream from mouth, 5 miles southwest of Jemez Springs, and 7 miles north of Jemez.

Drainage area.--235 sq mi.

Records available.--May 1951 to September 1957 (irrigation seasons only), May 1958 to September 1961.

Gage.--Water-stage recorder. Datum of gage is 6,015.5 ft above mean sea level, datum of 1929 (planetable survey).

Extremes.--Maximum discharge during year, 452 cfs May 3 (gage height, 5.45 ft); minimum daily, 4.7 cfs Oct. 3-8.

1951-61: Maximum discharge determined, 1,440 cfs Apr. 21, 1958 (gage height, 7.6 ft, from floodmarks), from rating curve extended above 750 cfs on basis of slope-area measurements of peak flow; minimum daily determined, 3.0 cfs for several days in July and September 1956.

Maximum discharge known probably occurred on May 13 or 14, 1941, when a discharge of 3,190 cfs was computed for a downstream station (drainage area, 239 sq mi) called Rio Guadalupe near Jemez Springs.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Some regulation by San Geronimo Reservoir on Clear Creek, tributary to Rio de Las Vacas, to Rio Guadalupe (constructed July to October 1958, capacity, 345 acre-ft), and by transmountain diversion into Rio Puerco Basin for irrigation of 200 to 300 acres in vicinity of Cuba.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

3.0	4.7	4.0	81
3.2	10	4.5	183
3.4	19	5.0	316
3.7	42	5.5	496

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.9	10	8.5	b 8	* 7.9	11	46	342	* 63	13	19	9.4
2	4.9	9.7	* 8.2	b 7	8.5	10	46	375	58	14	17	8.8
3	4.7	9.7	9.7	b 6	8.8	12	70	379	52	36	17	9.7
4	4.7	9.4	10	b 7	b 10	12	118	* 351	45	28	19	12
5	4.7	9.4	8.8	b 8	b 15	12	174	310	41	18	21	12
6	4.7	9.4	b 8	b 8	b 12	11	* 149	222	38	14	17	11
7	4.7	13	b 10	b 7.3	11	11	169	195	35	14	11	10
8	4.7	* 16	11	b 7.5	8.5	10	145	153	31	15	9.7	9.4
9	5.4	16	11	b 8	7.9	11	119	169	30	21	* 9.1	11
10	6.3	12	b 9	b 8	8.2	12	119	224	27	23	8.5	19
11	5.8	11	b 11	b 8	8.5	14	111	255	25	17	8.8	21
12	5.8	10	12	b 8	8.8	14	109	275	24	14	22	20
13	* 5.8	10	12	b 8	8.2	16	123	222	21	* 12	21	17
14	5.6	10	11	8.5	8.2	21	115	174	20	10	23	13
15	9.9	10	b 12	8.5	8.8	* 28	106	188	19	10	18	11
16	14	8.5	b 10	* 8.2	9.4	35	117	178	25	9.7	16	11
17	29	8.8	b 11	8.2	9.4	34	149	176	25	8.8	36	11
18	33	8.5	b 10	8.2	9.1	37	190	* 172	21	8.8	30	17
19	23	8.2	10	8.5	8.8	32	242	172	20	8.5	29	4.5
20	20	8.5	9.4	b 8.5	9.1	33	* 295	169	* 18	8.2	20	31
21	20	8.5	b * 10	b 8	8.8	37	316	156	16	8.5	15	* 22
22	19	8.5	b 9	b 8	9.4	43	348	138	15	8.8	* 12	16
23	18	8.2	9.7	b 8	10	60	342	132	15	8.2	16	14
24	17	7.9	9.1	7.9	* 8.5	74	332	136	13	7.6	16	12
25	16	8.5	9.7	7.6	9.7	66	278	123	12	7.3	15	11
26	15	8.8	b 9	7.3	11	58	227	104	13	7.0	12	10
27	14	8.8	b 9	8.2	11	50	202	100	12	* 8.8	15	9.7
28	* 14	8.2	8.8	8.8	10	* 49	224	91	11	10	13	9.4
29	13	8.2	8.8	b 8	-	50	258	83	* 12	12	13	9.1
30	12	8.5	b 9	b 8	-----	46	301	74	11	9.4	11	8.8
31	11	-----	b 9	b 7	-----	41	-----	72	-----	12	10	-----
Total	370.6	292.2	303.7	244.2	264.5	950	5,540	5,910	768	402.6	520.1	431.3
Mean	12.0	9.74	9.80	7.88	9.45	30.6	185	191	25.6	13.0	16.8	14.4
Ac-ft	735	580	602	484	525	1,880	10,990	11,720	1,520	799	1,030	855

Calendar year 1960: Max 372 Min 4.2 Mean 42.1 Ac-ft 30,570
 Water year 1960-61: Max 379 Min 4.7 Mean 43.8 Ac-ft 31,720

Peak discharge (base, 400 cfs)--May 3 (11:50 p.m.) 452 cfs (5.45 ft).

* Discharge measurement made on this day.

b State-discharge relation affected by ice.

RIO GRANDE BASIN

8-3240. Jemez River near Jemez, N. Mex.

Location.--Lat 35°39'45", long 106°44'30", in NW 1/4 sec. 33, T. 17 N., R. 2 E. (projected), in Canyon de San Diego Grant, on left bank 0.7 mile downstream from Rio Guadalupe and 3 1/2 miles north of Jemez, Sandoval County.

Drainage area.--470 sq mi.

Records available.--June 1936 to May 1941 (published as Jemez Creek near Jemez), August 1949 to October 1950, May 1951 to September 1952 (irrigation seasons only), March 1953 to September 1954, May 1955 to September 1957 (irrigation seasons only), May 1958 to September 1961.

Gage.--Water-stage recorder. Datum of gage is 5,622.3 ft above mean sea level, datum of 1929. June 22, 1936, to Mar. 11, 1937, at site 60 ft upstream at datum 0.50 ft higher. Mar. 12, 1937 to July 8, 1938 at present site at datum 0.70 ft higher. July 9, 1938, to May 6, 1941, at site 60 ft upstream at datum 0.70 ft higher.

Average discharge.--9 years (1936-40, 1949-50, 1953-54, 1958-61), 64.1 cfs (46,410 acre-ft per year).

Extremes.--Maximum discharge during year, 1,330 cfs Apr. 5 (gage height, 5.08 ft); minimum daily, 15 cfs Oct. 4, 6, 1936-41, 1949-61: Maximum discharge recorded, 3,590 cfs May 6, 1941 (gage height, 8.60 ft, present datum); minimum daily recorded, 5.8 cfs July 11, 12, 1951.

Maximum flood known since at least 1890 occurred between May 6 and 15, 1941, after gage was destroyed (discharge probably exceeded 6,000 cfs), from information by local residents. A peak of 5,900 cfs occurred Apr. 21, 1958 (gage height, 8.2 ft), from rating curve extended above 2,200 cfs on basis of contracted-opening measurement.

Remarks.--Records good. Diversions for irrigation of about 300 acres above station.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	17	32	*29	22	*26	32	120	397	*88	22	55	29
2	17	33	*29	20	25	36	118	444	81	31	37	26
3	16	32	33	16	26	37	169	458	74	69	39	28
4	15	30	33	18	33	36	447	*430	68	59	38	31
5	16	28	24	22	42	35	881	379	63	41	37	29
6	15	28	22	23	35	36	*487	305	60	31	33	26
7	16	46	26	22	27	34	500	265	51	35	28	24
8	17	*72	26	22	31	31	330	220	50	35	24	22
9	19	47	27	22	28	33	256	231	49	46	*22	26
10	20	37	26	*23	28	35	268	270	46	62	22	36
11	18	33	27	22	29	38	244	292	44	45	37	43
12	19	31	33	22	30	40	233	318	40	34	53	41
13	*19	32	34	22	29	42	376	278	36	*29	60	39
14	19	31	34	21	29	45	382	231	35	25	55	30
15	66	30	28	20	31	*58	325	240	35	23	43	26
16	72	26	27	21	34	79	446	227	42	24	44	26
17	128	28	28	21	34	79	605	222	45	24	114	26
18	99	26	32	22	33	84	612	*212	41	23	116	26
19	61	25	33	21	30	78	596	204	37	22	98	76
20	51	27	32	21	32	74	*569	198	*34	22	58	68
21	49	25	*26	21	31	76	486	194	33	22	45	*49
22	46	26	26	21	33	85	479	176	31	23	*41	39
23	44	24	28	20	34	118	462	170	31	21	238	32
24	44	25	29	23	*31	190	440	172	28	21	123	29
25	44	27	28	22	33	216	370	159	26	18	64	28
26	42	28	27	22	36	181	325	140	26	16	50	26
27	41	28	26	26	36	156	288	131	26	*25	49	26
28	41	26	29	25	33	*158	298	122	26	22	39	26
29	*41	21	28	22	-	136	322	112	*26	22	47	24
30	38	28	25	23	-----	131	361	102	26	19	39	24
31	34	-----	24	26	-----	114	-----	100	-----	18	31	-----
Total	1,184	932	879	674	879	2,523	11,795	7,399	1,298	929	1,779	981
Mean	38.2	31.1	28.4	21.7	31.4	81.4	393	239	43.3	30.0	57.4	32.7
Ac-ft	2,350	1,850	1,740	1,340	1,740	5,000	23,400	14,680	2,570	1,840	3,530	1,950

Calendar year 1960: Max 594 Min 10 Mean 74.2 Ac-ft 53,900

Water year 1960-61: Max 881 Min 15 Mean 85.6 Ac-ft 61,990

Peak discharge (base, 1,000 cfs).--Apr. 5 (2 a.m.) 1,330 cfs (5.08 ft); Aug. 17 (10 p.m.) 1,290 cfs (5.38 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Dec. 9, 11, 16-18, Dec. 30 to Jan. 15, Jan. 19-23, 28-30, Feb. 6, 7.

8-3290. Jemez River below Jemez Canyon Dam, N. Mex.

Location.--Lat 35°23'10", long 106°31'45", in NE¼ sec.5, T.13 N., R.4 E., on right bank three-quarters of a mile downstream from Jemez Canyon Dam, 1½ miles upstream from mouth, and 6 miles north of Bernalillo.

Drainage area.--1,040 sq mi, approximately.

Records available.--March 1936 to January 1938, March 1943 to September 1961. Published as "Jemez Creek" prior to 1948, and as "near Bernalillo" prior to 1954.

Gage.--Water-stage recorder. Datum of gage is 5,095.60 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark). Prior to Apr. 24, 1951, at site three-quarters of a mile upstream at datum 24.51 ft higher. Apr. 24, 1951, to June 25, 1958, at site 37 ft upstream at datum 4.40 ft above present datum. Supplementary water-stage recorder at gates of Jemez Canyon Dam at datum 5,125.00 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark) used at times since January 1953.

Average discharge.--19 years (1936-37, 1943-61), 52.2 cfs (37,790 acre-ft per year).

Extremes.--Maximum discharge during year, 1,190 cfs Oct. 8 (gage height, 7.75 ft); no flow at times.

1936-38, 1943-61: Maximum discharge, 16,300 cfs Aug. 29, 1943 (gage height, 5.62 ft, site and datum then in use), from rating curve extended above 3,000 cfs by logarithmic plotting; no flow at times.

A flood in 1900 was probably less than 16,000, but highest known outside period of record.

Remarks.--Records for April are good, others fair. Subsequent to October 1953, flow at this station can be completely regulated by Jemez Canyon Reservoir (see p.150). However, reservoir is designed essentially for desilting and flood control rather than storage. Diversions for irrigation of about 3,000 acres above station.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	36	25	b12	20	32	101	378	32	0	0	a 20
2	0	37	29	b10	18	30	113	401	23	0	*160	a 17
3	0	* 34	30	* b 9	20	32	a 100	401	20	0	37	a 14
4	0	31	35	b 9	22	36	176	389	21	0	a 3	a 18
5	0	31	29	b10	24	30	531	360	18	0	a .3	a 5
6	0	33	18	b12	26	*30	* 785	342	18	0	a .1	a 0
7	0	38	11	b14	23	31	523	251	*17	0	a .1	a 0
8	0	47	b 9	b16	20	a 29	473	260	12	0	a .1	a 0
9	0	43	b11	b17	24	a 26	444	186	5.0	0	* .1	a 0
10	0	38	b14	b18	22	23	300	* 149	.8	6.6	.1	a 0
11	0	36	b12	b17	24	27	248	153	0	10	.1	a 0
12	0	36	* b11	b16	27	27	* 260	153	0	.8	40	a 5
13	0	35	b14	b14	*30	27	266	181	0	0	34	*14
14	0	34	b14	b13	28	30	396	144	.1	0	34	8.8
15	78	34	b12	b14	30	30	465	214	0	0	* 25	4.3
16	288	34	b 9	b13	33	46	349	298	0	0	23	4.0
17	* 425	32	b12	b13	34	68	416	185	0	0	46	2.7
18	929	31	b13	14	33	82	574	120	0	0	463	16
19	* 562	30	b13	b10	32	90	651	109	0	0	251	37
20	119	30	b13	15	30	78	509	104	0	0	37	36
21	46	*30	b12	15	31	67	486	108	0	0	a 30	25
22	42	29	b12	16	31	69	424	120	0	0	a 25	14
23	42	27	b12	*17	32	75	424	102	0	0	a 67	6.2
24	36	27	b12	17	32	102	331	* 106	0	0	* 234	2.6
25	35	29	b12	20	28	120	* 352	111	0	0	127	2.1
26	35	29	b12	22	30	122	367	115	0	0	a 42	5.2
27	34	27	b12	14	32	* 245	285	109	0	0	a 35	* 27
28	33	24	b12	5	36	212	254	75	0	0	a 30	3.3
29	37	22	b12	14	-	* 74	220	58	0	0	a 30	5.8
30	36	25	b12	22	-----	109	222	43	0	0	a 25	.3
31	40	-----	b12	21	-----	186	-----	34	-----	0	a 20	-----
Total	2,817	969	466	449	772	2,185	11,045	5,759	1,669	17.4	1,841.9	2,690
Mean	90.9	32.3	15.0	14.5	27.6	70.4	368	186	55.6	0.56	59.4	8.97
Ac-ft	5,590	1,920	924	891	1,530	4,330	21,910	11,420	331	35	3,650	534

Calendar year 1960: Max 929

Min 0

Mean 70.9

Ac-ft 51,450

Water year 1960-61: Max 929

Min 0

Mean 73.3

Ac-ft 53,060

* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

8-3291. Bernalillo floodwater retarding reservoir No. 1 (Piedra Lisa Arroyo), near Bernalillo, N. Mex.

Location.--Lat 35°18'50", long 106°31'45", in NW sec.33, T.13 W., R.4 E., 0.3 mile east of intersection of State Highways 44 and 422 and $\frac{1}{2}$ miles northeast of Bernalillo.

Drainage area.--4.1 sq mi, of which 1.1 sq mi has contour plowing, pitting, and small dams to reduce surface runoff.

Records available.--September 1955 to September 1961.

Gage.--Water-stage recorder and fixed port openings in reservoir tower. Datum of gage is 5,169.98 ft above mean sea level (levels by Soil Conservation Service). Since July 21, 1958, supplementary outflow gage 390 ft below toe of dam, water-stage recorder and Parshall flume.

Remarks.--Records good. Station serviced frequently during storm periods. Objective is to determine rate of inflow in cfs, and volume in acre-ft; outflow in cfs and acre-ft; volume of sediment deposited, and amount transported out of reservoir in connection with trap-efficiency studies. See table below.

Cooperation.--Two reservoir surveys, maps, plans, and miscellaneous data furnished by Soil Conservation Service.

Summary of inflow and outflow during period September 1955 to September 1961

Flow event	Date (water year)	Flow-duration		Maximum discharge		Maximum reservoir elevation (ft)	Maximum reservoir contents (acre-feet)	Total inflow (acre-ft)	Total outflow (acre-ft)	Difference (acre-ft)	Outflow at gage below dam
		Inflow (hrs)	Outflow (hrs)	Inflow (cfs)	Outflow (cfs)						
1	1956 WY July 19-20	2.8	23.8	2,330	5.5	5,181.21	57.2	64.4	53.0	*-11.4	-
2	Aug. 2-3	4.5	8.0	637	24	5,177.11	7.45	10.93	10.23	- .7	-
	1957 WY										
	1958 WY										
3	Oct. 12	2.5	4.0	85	15	5,176.12	1.88	4.38	3.99	- .39	-
4	Oct. 12-13	1.0	1.8	39	12	5,175.72	.51	1.17	1.15	- .02	-
5	Oct. 19	1.7	5.0	111	15	5,176.13	1.75	3.73	3.14	- .59	-
			about 3.0								
6	Nov. 4	.8		6	5	5,174.86	.04	4.8	.48	0	-
	1959 WY										
7	Aug. 6	1.0	2.8	59	13	5,175.90	1.08	1.86	1.65	- .21	1.68
	1960 WY										
8	Aug. 31	a2.5	a3.0	18	8.6	5,175.28	.13	.52	.51	- .01	.48
	1961 WY										
9	Oct. 17	3.1	3.2	6.8	5.7	5,174.87	.04	.59	.59	0	.65
10	Aug. 15	1.0	1.2	7.5	5.1	5,174.78	.03	.18	.19	+ .01	.09
Totals								88.24	74.93	-13.3	

* In flow event No. 1, sediment accumulation was 10.8 acre-feet and seepage losses 0.6 acre-foot.

a Estimated.

Note.--No flow into reservoir in summer of 1955 or in water year 1957.

8-3295. Rio Grande near Bernalillo, N. Mex.

Location.--Lat 35°17'05"N, long 106°35'45"W, in SE 1/4 NW 1/4 sec. 11, T. 12 N., R. 3 E. (projected), on right bank 2 miles northwest of Sandia Pueblo, 3 miles southwest of Bernalillo, 3.5 miles downstream from State Highway 44, and 8.5 miles downstream from Jemez River.

Drainage area.--17,300 sq mi, approximately (includes 2,940 sq mi in closed basin in San Luis Valley, Colo.).

Records available.--May 1941 to September 1961. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder. Datum of gage is 5,029.31 ft above mean sea level, datum of 1929. Prior to June 21, 1961, at site 1,900 ft upstream at datum 1.26 ft higher (some of daily records for period 1953-58 referred to present gage, formerly called "supplementary", but peaks referred to upstream datum, except two in 1956).

Average discharge.--20 years, 1,130 cfs (818,100 acre-ft per year).

Extremes.--Maximum discharge during year, 6,850 cfs Aug. 23 (gage height, 4.29 ft); no flow at times.

1941-61: Maximum discharge, 25,400 cfs May 16, 1941; maximum gage height, 6.83 ft Sept. 20, 1941; no flow at times.

Other major floods occurred as follows (based primarily on records for station at San Felipe): Sept. 23, 1929, about 23,000 cfs; Aug. 21, 1935, about 22,000 cfs; June 26, 1937, about 27,000 cfs.

Remarks.--Records fair. Discharge measurements generally made once a week. Diversion for irrigation of about 710,000 acres above station. Possible regulation by operation of two reservoirs on Rio Chama and flood-and-silt detention reservoir on Jemez River (see p. 150).

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	302	382	452	426	452	426	2930	2140	0	0	96
2	0	318	406	439	446	376	352	3410	2110	65	36	69
3	0	318	413	420	472	439	245	3850	2210	3.6	56	55
4	0	318	452	b370	493	500	285	4270	2240	0	7.5	65
5	0	324	465	364	493	528	574	4210	1810	0	0	142
6	0	324	432	b350	493	486	1110	4000	1390	0	0	84
7	0	352	376	b360	472	465	1190	3600	1250	0	97	63
8	0	507	318	b380	465	452	1300	3010	1190	195	62	52
9	0	542	b380	b420	472	413	1210	2690	878	1310	29	69
10	0	465	426	b450	493	346	939	2620	650	1000	26	71
11	0	452	394	b470	493	334	847	2470	775	760	28	69
12	0	915	400	b470	500	340	811	2620	493	116	820	205
13	0	1180	486	b470	493	446	626	2840	465	12	1490	183
14	0	1110	572	b450	486	479	698	3010	413	68	765	113
15	5	1030	588	b430	479	521	865	2800	400	14	342	76
16	275	988	558	426	486	580	793	2620	420	76	348	88
17	342	885	521	400	528	732	766	2540	540	3.0	550	410
18	872	750	465	400	580	724	880	2330	690	0	650	68
19	829	572	472	413	572	682	1190	2270	329	0	1320	400
20	450	486	479	426	565	558	1430	2370	265	0	740	850
21	302	465	452	420	528	479	2370	2400	235	2.8	238	600
22	307	426	406	426	514	432	3050	2140	224	33	263	640
23	312	400	400	420	507	370	3520	2110	216	47	3230	560
24	318	388	420	420	558	285	3270	2210	224	12	1750	590
25	312	382	465	426	565	382	2880	2470	497	8.2	1130	202
26	312	376	486	439	550	406	2470	2760	158	9.0	700	175
27	290	394	458	493	558	451	2140	2430	100	1.0	654	187
28	280	406	446	465	610	550	1720	2170	78	24	413	168
29	285	413	472	458	-	452	1650	1970	20	4.8	560	110
30	270	406	486	452	-----	439	1980	2300	9.0	0	279	127
31	250	-----	472	426	-----	479	-----	2370	-----	0	145	-----
Total	6,011	16,194	13,948	13,205	14,297	14,578	41,587	85,790	22,419.0	3,764.4	16,728.5	6,588
Mean	194	540	450	426	511	470	1386	2767	747	121	540	220
Ac-ft	11,920	32,120	27,670	26,190	28,360	28,920	82,490	170,160	44,470	7,470	33,180	13,070

Calendar year 1960: Max 4,670 Min 0 Mean 895 Ac-ft 649,500

Water year 1960-61: Max 4,270 Min 0 Mean 699 Ac-ft 506,100

Peak discharge (base, 5,000 cfs).--May 4 (11 p.m.) 5,110 cfs (3.90 ft); Aug. 23 (12 M) 6,850 cfs (4.29 ft).

b Stage-discharge relation affected by ice.

Note.--Gage heights referred to datum in use at time of peak.

8-3300. Rio Grande at Albuquerque, N. Mex.

Location.--Lat 35°05'20", long 106°40'50", in SE $\frac{1}{4}$ sec. 13, T. 10 N., R. 2 E. (projected), at downstream side of bridge on U. S. Highway 66 at Albuquerque.

Drainage area.--17,440 sq mi, approximately (includes 2,940 sq mi in closed basin in San Luis Valley, Colo.).

Records available.--October 1941 to September 1961. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder. Datum of gages is 4,946.16 ft above mean sea level, datum of 1929. Prior to Sept. 18, 1947, at various sites at datum about 2.00 ft higher; Sept. 18, 1947, to Apr. 12, 1959, at site 550 ft to the left of present site; Apr. 13, 1959, to June 29, 1960, at site 150 ft to the right of present site.

Average discharge.--20 years, 1,110 cfs (803,600 acre-ft per year).

Extremes.--Maximum discharge during year, 6,770 cfs Aug. 23 (gage height, 6.85 ft); minimum daily, 9.5 cfs Aug. 1-2. 1941-61: Maximum discharge, 25,000 cfs Apr. 24, 1942, from rating curve extended above 13,900 cfs by logarithmic plotting; maximum gage height, 7.0 ft July 18, 1953; no flow at times.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Discharge measurements generally made twice a week. Possible regulation by operation of reservoirs on Rio Chama and by flood-and-silt detention reservoir on Jemez River (see p. 150). Diversions above station for irrigation of about 718,000 acres, several hundred of which are below station.

Cooperation.--Records for Albuquerque Riverside drain and Arenal, Armijo, and Atrisco canals furnished by Bureau of Reclamation.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	22	401	445	492	520	660	558	3,070	2,500	36	9.5	219
2	45	389	458	492	528	535	535	3,450	2,400	35	9.5	180
3	40	383	478	492	528	438	438	3,760	2,440	26	45	183
4	32	383	512	445	535	588	272	4,170	2,620	24	28	176
5	31	383	542	420	542	528	306	4,200	2,360	23	22	183
6	29	389	558	401	565	520	1,490	4,170	2,250	22	16	186
7	40	414	520	401	558	498	1,370	3,940	1,740	21	11	170
8	24	451	439	432	535	478	1,270	3,380	1,400	24	56	139
9	37	528	485	472	535	520	1,180	2,780	1,160	232	31	136
10	48	492	535	498	572	414	1,070	2,480	840	725	42	176
11	31	492	505	492	565	420	900	2,380	973	850	108	170
12	27	924	505	492	550	426	910	2,640	680	458	684	223
13	31	1,290	565	492	542	465	777	3,010	535	180	766	316
14	32	1,240	628	498	535	492	795	3,160	458	154	842	268
15	120	1,150	612	492	542	492	1,060	2,840	432	193	686	208
16	373	973	604	485	542	558	1,010	2,700	458	145	750	190
17	472	973	588	512	558	786	890	2,580	563	72	770	311
18	982	920	535	512	620	813	890	2,420	795	26	813	238
19	932	696	558	478	660	723	1,360	2,440	518	23	1,490	433
20	644	512	580	478	644	636	1,600	2,700	321	21	940	685
21	355	492	588	478	628	512	1,910	2,740	286	23	490	660
22	327	485	565	472	620	485	2,360	2,460	226	24	371	687
23	343	478	505	478	620	395	3,060	2,440	223	22	2,680	660
24	332	478	485	505	628	321	3,140	2,460	226	24	1,800	660
25	349	478	535	505	669	349	3,060	2,620	336	17	1,050	420
26	349	445	572	535	660	414	2,640	2,780	256	16	a700	321
27	343	414	572	572	636	426	2,480	2,780	105	16	a600	296
28	343	426	550	550	678	528	2,070	2,700	76	19	535	301
29	338	438	542	542	-	612	2,050	2,180	53	14	588	259
30	338	472	558	528	-----	512	2,540	2,250	38	12	413	223
31	316	-----	542	512	-----	498	-----	2,520	-----	13	272	-----
Total	7,725	17,989	15,665	15,153	15,315	15,042	43,991	90,200	27,268	3,490	17,618	9,477
Mean	249	600	538	489	583	517	1,466	2,910	909	113	568	316
Ac-ft	15,320	35,680	33,050	30,060	32,360	31,820	87,250	178,900	54,090	6,920	34,940	18,800
(t)	7,940	738	954	584	583	10,120	16,130	22,370	16,750	19,600	14,270	13,350

Calendar year 1960: Max 4,380 Min 0 Mean 931 Ac-ft 675,500
 Water year 1960-61: Max 4,200 Min 9.5 Mean 772 Ac-ft 559,200

Peak discharge (base, 4,000 cfs).--May 5 (1 a.m.) 4,690 cfs (6.06 ft); Aug. 23 (5 p.m.) 6,770 cfs (6.85 ft).

† Combined flow, in acre-feet, of Albuquerque Riverside drain and Arenal, Armijo, and Atrisco canals. This flow, which bypasses river gage, can be added to river records to get entire surface flow in valley cross section.
 a No gage-height record.

8-3320. Rio Grande near Bernardo, N. Mex.

Location.--Lat 34°25'00", long 106°48'00", in E $\frac{1}{2}$ NE $\frac{1}{4}$ sec. 11, T.2 N., R.1 E., (projected) at bridge on U. S. Highway 60, 2 miles east of Bernardo and $\frac{1}{2}$ miles upstream from Rio Puerco.

Drainage area.--19,230 sq mi, approximately (includes 2,940 sq mi in closed basin in San Luis Valley, Colo.).

Records available.--June 1936 to January 1939, October 1941 to September 1961. Monthly discharge only October 1942 to June 1943 published in WSP 1312. Prior to October 1951, flow of Bernardo interior drain was included only when it carried river overflow; since that date entire flow is included.

Gage.--Water-stage recorder. There are 3 gages, 1 on a conveyance channel designed to carry 2,000 cfs, 5 miles downstream from heading, formerly San Francisco Riverside drain, 1 on the floodway (former river channel) which will now carry water when total flow exceeds about 1,700 cfs, and 1 on Bernardo interior drain. Datum of conveyance channel gage is 4,719.23 ft above mean sea level, datum of 1929, leveling of 1951. Prior to October 1952, main gage was on river channel (the present floodway gage) at datum 4,722.55 ft above mean sea level, datum of 1929, leveling of 1951. Datum of Bernardo interior drain supplementary recording gage is 4,713.99 ft above mean sea level, datum of 1929, leveling of 1951.

Average discharge.--22 years (1936-38, 1941-61), 1,072 cfs (776,100 acre-ft per year).

Extremes.--Maximum discharge during year, 4,600 cfs May 7; minimum daily, 2.3 cfs Oct. 1.
1936-39, 1941-61: Maximum discharge, 21,100 cfs Apr. 25, 1942 (gage height, 6.90 ft); no flow at times.

Remarks.--Records fair. Records represent total discharge of the river and are a summation of discharge in river channel (now called floodway), conveyance channel, and Bernardo interior drain. Flow in La Joya drain along left side of floodway is not included in the composite. Diversions for irrigation of about 740,000 acres above station.

Cooperation.--Records for La Joya Riverside drain are furnished by Bureau of Reclamation.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.3	350	487	575	563	588	618	2040	1940	61	4.5	230
2	2.9	347	487	542	551	576	683	2990	1580	80	3.9	132
3	6.9	345	481	524	548	519	652	2900	1520	134	3.2	83
4	14	355	505	512	563	477	450	3500	1620	106	2.8	77
5	9.1	367	514	497	560	530	278	3980	1840	70	2.6	78
6	9.4	365	544	482	557	534	224	3810	1270	55	2.5	70
7	8.0	365	562	470	563	488	1270	4080	1090	55	3.0	86
8	10	363	553	467	575	479	1290	3770	921	68	2.7	113
9	10	375	535	473	572	450	1180	2700	897	75	2.4	128
10	10	456	517	485	566	411	1120	2190	723	112	2.4	176
11	12	501	526	506	572	383	887	2020	529	154	2.4	228
12	16	474	511	506	588	340	756	1820	468	330	105	296
13	20	788	544	506	587	346	754	2210	456	272	28	155
14	19	1180	562	509	590	348	618	3080	218	186	99	168
15	27	1080	610	512	596	316	501	2870	225	105	147	193
16	40	945	632	515	599	349	589	2180	358	108	86	147
17	82	876	620	518	602	471	673	2130	435	130	162	109
18	288	866	610	542	602	620	468	1870	355	62	149	165
19	646	820	592	545	629	684	409	1760	495	35	283	212
20	550	696	568	536	673	589	472	1670	414	26	785	232
21	422	607	568	527	689	559	854	2070	224	23	600	578
22	383	568	577	524	677	436	1440	2090	144	21	390	553
23	332	556	572	518	673	419	2040	1910	102	20	290	534
24	339	547	550	530	657	364	2470	1820	77	18	1960	420
25	329	526	544	521	641	334	2350	2050	62	16	740	414
26	312	517	551	530	658	294	2140	2050	69	13	514	312
27	344	502	563	548	674	363	1720	2180	61	13	591	239
28	346	468	572	563	654	391	1580	2490	55	12	657	243
29	332	472	569	593	---	337	1250	2350	53	9.9	467	222
30	326	484	572	569	-----	693	1490	1590	54	8.8	318	211
31	315	-----	581	572	-----	701	-----	1740	-----	5.1	315	-----
Total	5,562.6	17,161	17,179	16,217	16,979	14,389	31,226	75,910	18,255	2,383.8	8,718.4	6,804
Mean	179	572	554	523	606	464	1,041	2,449	608	76.9	281	227
Ac-ft	110,30	34,040	34,070	32,170	33,680	28,540	61,940	50,600	36,210	4,730	17,290	13,500
(#)	2,450	2,340	2,340	2,320	2,110	5,700	6,030	7,870	6,110	4,200	3,790	5,080

Calendar year 1960: Max 4,350 Min 1.2 Mean 812 Ac-ft 589,360

Water year 1960-61: Max 4,080 Min 2.3 Mean 632 Ac-ft 457,800

* Monthly discharge, in acre-feet, of La Joya Riverside drain.

8-3340. Rio Puerco above Chico Arroyo, near Guadalupe, N. Mex.

Location.--Lat 35°36'05", long 107°09'55", in SW $\frac{1}{4}$ sec. 21, T.16 N., R.3 W., on right bank 1.6 miles upstream from Chico Arroyo and 5 $\frac{1}{2}$ miles northeast of village of Guadalupe, Sandoval County.

Drainage area.--420 sq mi, approximately.

Records available.--July 1951 to September 1961.

Average discharge.--10 years, 14.6 cfs (10,570 acre-ft per year).

Gage.--Water-stage recorder. Altitude of gage is 5,925 ft (by barometer).

Extremes.--Maximum discharge during year, 4,540 cfs Aug. 18 (gage height, 10.60 ft); no flow for many days.

1951-61: Maximum discharge, that of Aug. 18, 1961, from rating curve extended above 280 cfs on basis of slope-area measurement of peak flow; no flow for many days in each year.

Flood of June 29, 1943, probably exceeded 5,000 cfs (based on records for stations above and below).

Remarks.--Records fair except those for periods of no gage-height record and those below 5 cfs, which are poor. Diversions for irrigation of about 3,700 acres above station in past years, but present diversion negligible.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

(Shifting-control method used Aug. 20-24, 26, Sept. 20-22)

0.35	0	1.0	13
.4	.2	1.2	24
.5	.7	1.6	58
.6	1.7	2.2	140
.7	3.3	3.0	325
.8	5.6	4.0	670
.9	8.8	5.0	1,180

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0			0	0.1	a 2	a 15	71	9.2	0	5.4	0.2
2	0			0	.1	a 2	a 12	* 82	7.5	0	* 11	0
3	0			0	.1	21	a 10	86	a 6	180	2.7	.1
4	0			0	0	23	* 10	91	a 4	21	a 1	0
5	0			0	0	27	40	88	a 3	a 2	a .5	0
6	0			0	0	* 9.6	69	66	a 2	a .5	a 0	0
7	0			0	0	3.3	50	44	a 1	* .1	a 0	0
8	0			0	0	6.9	51	37	a 0	0	a 0	0
9	0			0	.1	1.7	35	25	a 0	67	a 0	3.2
10	0			0	.1	14	26	36	a 0	49	a 0	131
11	** 0			0	.1	47	21	55	a 0	* 2.0	a 0	69
12	0			0	.1	42	a 18	74	a 0	.1	a 0	15
13	0			0	0	25	a 12	77	a 0	* 0	13	a 6
14	0			0	4.0	* 22	a 10	45	a 0	0	150	a 2
15	53			0	89	21	a 9	36	a 0	0	* 4.2	a 1
16	52			0	14.4	24	a 8	* 33	a 0	0	66	a .5
17	255			0	52	22	a 10	35	a 0	0	226	a 0
18	295			0	13	17	* 22	33	a 0	0	* 1,060	63
19	82			0	a 8	21	34	28	a 0	0	241	447
20	a 9		(**)	0	18	16	44	30	0	0	25	* 43
21	a 3			0	* 24	a 12	50	29	0	0	* 6.2	11
22	a 1			0	32	a 10	50	30	0	0	18	a 6.6
23	a .5			0	48	a 8	66	27	0	0	14	a 4
24	a 1			0	19	13	65	26	0	0	5.1	a 2
25	** 0			0	a 8	20	57	28	0	0	a 2	a 1
26	0			0	a 10	22	49	* 25	0	0	68	a .5
27	0			0	a 5	a 15	43	18	0	0	11	a .2
28	0			1	a 2	a 10	37	16	0	0	a 4	a 0
29	0		(*)	.3	-	a 12	37	13	0	0	* 1.6	a 0
30	0			.1	-----	a 15	48	13	.1	0	1.4	a 0
31	0			** .1	-----	18	-----	10	-----	0	.3	-----
Total	750.6	0	0	1.5	476.7	522.5	1,008	1,307	32.8	321.7	2,006.0	806.3
Mean	24.2	0	0	0.02	17.0	16.9	33.6	42.2	1.09	10.4	64.7	26.9
Ac-ft	1,490	0	0	3.0	946	1,040	2,000	2,590	65	638	3,980	1,600

Calendar year 1960: Max 1,010 Min 0 Mean 22.3 Ac-ft 16,160

Water year 1960-61: Max 1,060 Min 0 Mean 19.8 Ac-ft 14,350

Peak discharge (base, 1,800 cfs).--Aug. 1 (4:00 p.m.) 2,050 cfs (6.45 ft); Aug. 18 (6:30 a.m.) 4,540 cfs (10.60 ft.).

* Discharge measurement made on this day.

** Field estimate made on this day (some less than 0.05 cfs).

a No gage-height record.

8-3405. Chico Arroyo near Guadalupe, N. Mex.

Location.--Lat 35°35'40", long 107°11'20", in NE $\frac{1}{4}$ sec. 30, T. 16 N., R. 3 W., on left bank a quarter of a mile upstream from mouth, $4\frac{1}{2}$ miles northwest of Guadalupe, and $5\frac{1}{2}$ miles southwest of Cabezón.

Drainage area.--1,390 sq mi, approximately.

Records available.--November 1943 to September 1961.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 5,895 ft (by barometer).

Average discharge.--18 years, 25.2 cfs (18,240 acre-ft per year).

Extremes.--Maximum discharge during year, 5,500 cfs Sept. 19 (gage height, 8.4 ft); no flow for many days.

1943-61: Maximum discharge, 12,200 cfs July 17, 1953 (gage height, 15.1 ft), from rating curve extended above 2,900 cfs on basis of slope-area measurements at gage heights 9.6 and 12.8 ft; no flow at times.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 100 acres above station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.9	0	2.8	21
2.0	.3	2.9	32
2.1	.9	3.0	49
2.4	4.9	3.2	108
2.5	6.8	3.5	260
2.6	10	4.1	720
2.7	14	4.8	1,430

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0	0.1	a 0	b 1.8	0.1	1.0	0	0	6.6	2.2	26
2	24	0	.1	a 0	b 1.2	.1	a .5	0	0	a .5	* 16	a 3
3	3.2	0	.2	a 0	b .6	.1	a .1	0	0	76	8.6	a .5
4	a 1	0	.3	a 0	b .6	.1	* 0	0	0	3.0	16	a .1
5	a .5	0	.2	a 0	b .5	0	.3	0	0	a .5	1.6	a 0
6	a .2	0	.2	a 0	b .5	* 0	.8	0	0	a .1	13	a 0
7	a .1	.2	b .1	a 0	b .3	.1	4.3	0	0	* 0	a 1	a 0
8	a .1	3.2	.1	a .1	.3	.1	3.8	.1	0	0	a .2	a 0
9	a 0	* .4	0	a .1	.2	.1	3.4	0	0	0	a 0	452
10	a 0	0	0	a .1	1.8	.1	2.8	0	0	0	a 0	1,260
11	* 0	0	0	* .1	23	.1	.9	0	0	0	a 0	316
12	0	0	.1	b .1	28	0	a .5	0	0	0	30	522
13	0	0	.2	b .1	25	.1	a .1	0	0	0	a 2	a 15
14	0	0	.4	b .1	48	* .1	a 0	0	0	0	231	a 5
15	4.28	0	b .2	b .1	90	.1	a 0	0	.1	0	* 24	77
16	4.12	0	b .2	* b .1	107	.2	a 0	0	.9	0	85	46
17	4.15	0	b .1	b .2	14	.2	a 0	0	a .1	0	622	a 10
18	7.15	0	b .1	b .2	5.7	.2	0	0	0	0	932	a 5
19	a 50	0	b .1	b .2	3.2	.3	0	0	a 0	0	955	1,370
20	a 1.0	0	b .1	b .2	1.8	1.6	.1	0	* 0	0	a 150	* 83
21	a 2	0	b .1	b .1	* .4	.3	0	0	0	0	* 7.6	9.2
22	a 1	0	b .1	b .1	.2	.1	0	0	0	0	1.6	3.9
23	a .5	0	b .1	b .2	.2	.1	0	0	0	0	1.4	a 2
24	a .2	0	b .1	b .2	.2	.1	0	0	0	0	22	a 1
25	* 0	0	b .1	b .2	.2	.1	.1	0	0	0	17	a .5
26	0	0	b .1	b .2	.1	1.3	0	* 0	0	0	a 3	a .2
27	0	0	b .1	b .2	.1	2.8	0	0	0	0	a 0	a .1
28	0	.1	b .1	b .3	.2	1.8	0	0	0	0	a 0	a 0
29	0	* 0	b .1	1.9	-	1.6	0	0	0	0	* 33	a 0
30	0	.1	a .1	3.8	-----	1.4	0	0	.1	0	3.8	0
31	0	-----	a .1	* b 2.3	-----	1.4	-----	0	-----	0	20	-----
Total	2,062.8	4.0	3.9	11.2	355.1	14.7	18.7	0.1	1.2	86.7	3,199.0	4,207.5
Mean	66.5	0.13	0.13	0.36	12.7	0.47	0.62	0.003	0.04	2.80	103	140
Ac-ft	4,090	7.9	7.7	22	704	29	37	0.2	2.4	172	6,350	8,350

Calendar year 1960: Max 2,060 Min 0 Mean 23.0 Ac-ft 16,730

Water year 1960-61: Max 1,370 Min 0 Mean 27.3 Ac-ft 19,770

Peak discharge (base, 2,900 cfs)--Sept. 10 (12:30 a.m.) 4,400 cfs (7.3 ft); Sept. 19 (2:20 a.m.) 5,500 cfs (8.4 ft).

* Discharge measurement made on this day (some less than 0.05 cfs).

a No gage-height record.

b Stage-discharge relation affected by ice.

8- 3415. Bluewater Creek below Bluewater Dam, N. Mex.

Location.--Lat 35°17'35", long 108°06'35", in SE $\frac{1}{4}$ sec.4, T.12 N., R.12 W., on left bank 350 ft downstream from Bluewater Dam and 9.3 miles west of Bluewater.

Drainage area.--201 sq mi.

Records available.--March 1951 to September 1961.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 7,320 ft (by barometer).

Average discharge.--10 years, 1.16 cfs (840 acre-ft per year).

Extremes.--Maximum discharge during year, 5.6 cfs Aug. 16 (gage height, 2.11 ft); minimum daily, 0.3 cfs for many days.
1951-61: Maximum discharge, 58 cfs July 1-3, 1952 (gage height, 2.75 ft); no flow at times in 1955, 1957.

Remarks.--Records fair. Flow regulated by Bluewater Lake (capacity at crest of uncontrolled siphon spillways, 38,500 acre-ft).

Rating table (gage height, in feet, and discharge,
in cubic feet per second)

(Shifting-control method used July 10-27)

1.5	0.3	1.8	1.6
1.6	.6	1.9	2.7
1.7	1.0	2.0	4.2

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	3.8	1.6	2.8	3.3
2	.4	*.4	.4	.3	.4	.4	.4	.4	4.6	2.0	2.8	1.4
3	.4	.4	.4	.4	.4	.4	.4	.4	4.4	2.1	2.8	.3
4	.4	.4	.3	.4	.4	.4	.4	.4	4.2	2.2	2.8	.4
5	*.4	.4	.3	*.4	.4	.4	*.4	.4	4.4	2.3	2.6	.3
6	.4	.4	.3	.4	.4	.4	.4	.4	4.2	2.3	2.6	*.4
7	.4	.4	.3	.3	.4	.4	.4	.4	4.2	2.3	2.8	.4
8	.4	.4	.3	.3	.4	*.4	.4	.4	4.0	2.3	3.0	.4
9	.4	.4	.3	.4	.4	.4	.4	.4	3.9	2.4	3.2	.4
10	.4	.4	.3	.4	.4	.4	.4	.4	3.8	2.7	3.2	.4
11	.4	.4	.3	.3	.4	.4	.4	.4	3.8	2.4	3.2	.6
12	.4	.4	.3	.3	.4	.4	.4	.4	3.9	2.4	3.2	.8
13	.4	.4	.3	.3	.4	.4	.4	.4	4.4	2.6	3.2	.8
14	.4	.4	*.3	.3	.4	.4	.4	.4	5.0	2.7	2.8	1.1
15	.5	.4	.3	.3	*.4	.4	.4	.4	4.0	2.7	2.8	.7
16	.4	.4	.3	.3	.4	.4	.4	.4	.4	2.7	*3.0	.5
17	.4	.4	.3	.3	.4	.4	.4	.4	.4	2.7	2.7	.5
18	.4	.4	.3	.3	.4	.4	.4	.4	.4	*2.8	2.8	.5
19	.4	.4	.3	.3	.4	.4	.4	*.4	.4	2.8	2.8	.4
20	.4	.4	.3	.3	.4	.4	.4	.4	.4	2.7	2.8	.4
21	.4	.4	.3	.3	.4	.4	.4	.4	1.2	2.7	2.8	.4
22	.4	.4	.3	.3	.4	.4	.4	.4	2.8	2.7	3.0	.3
23	.4	*.4	.3	*.3	.4	.4	.4	.4	*2.3	2.6	3.0	.3
24	.4	.4	.3	.3	.4	.4	.4	.4	2.1	2.6	3.0	.3
25	.4	.4	.3	.3	.4	.4	.4	.4	1.8	2.6	3.2	.3
26	.4	.4	.3	.3	.4	.4	.4	.4	1.6	2.6	3.0	.3
27	.4	.4	.3	.4	.4	.4	*.4	.4	1.6	2.6	3.2	.3
28	.4	.4	.3	.4	.4	.4	.4	.4	1.4	2.6	3.3	.3
29	.4	.4	.3	.4	-	.4	.4	.4	1.3	2.6	3.3	*.3
30	.4	.4	.3	.4	-----	.4	.4	.9	1.4	2.7	3.2	.3
31	.4	-----	.3	.4	-----	.4	-----	3.4	-----	2.7	3.2	-----
Total	12.5	12.0	9.6	10.4	11.2	12.4	12.0	15.9	82.1	77.7	92.1	17.1
Mean	0.40	0.40	0.31	0.34	0.40	0.40	0.40	0.51	2.74	2.51	2.97	0.57
Ac-ft	25	24	19	21	22	25	24	32	163	154	183	34

Calendar year 1960: Max 4.8 Min 0.2 Mean 0.81 Ac-ft 593
Water year 1960-61: Max 5.0 Min 0.3 Mean 1.00 Ac-ft 726

* Discharge measurement made on this day.

8-3420. Bluewater Creek near Bluewater, N. Mex.

Location.--Lat 35°17'50", long 108°01'40", in W $\frac{1}{2}$ SW $\frac{1}{4}$ sec. 5, T.12 N., R.11 W., on left bank $\frac{3}{2}$ miles northwest of Bluewater Village and 8 miles downstream from Bluewater Dam.

Drainage area.--209 sq mi.

Records available.--July 1912 to August 1915, April 1916 to June 1919, January 1927 to September 1961. Figures of daily discharge for July 20-23, 1912, published in WSP 358, have been found to be unreliable and should not be used. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder. Altitude of gage is 6,720 ft (by barometer). Prior to Mar. 4, 1918, at site 113 ft upstream at different datums. Mar. 4, 1918, to Mar. 17, 1939, at site 83 ft upstream; Mar. 4, 1918, to June 28, 1919 (destroyed by flood), at datum 1.92 ft higher; Apr. 6, 1921, to Mar. 17, 1939, at datum 1.57 ft higher.

Average discharge.--39 years (1912-15, 1916-18, 1927-61), 9.95 cfs (7,200 acre-ft per year).

Extremes.--Maximum discharge during year, 136 cfs Aug. 16 (gage height, 4.20 ft); minimum daily, 1.0 cfs Dec. 7 and Jan. 4. 1912-18, 1927-61: Maximum discharge observed, about 1,510 cfs Mar. 10, 1916 (gage height, 8.6 ft, site and datum then in use, from floodmarks), from rating curve extended above 4.4 ft by logarithmic plotting; no flow at times. Maximum flood known occurred Sept. 6, 1909, when Bluewater Dam washed out; stage and discharge not determined. A major flood occurred during period July 12-19, 1919, discharge not determined (gage height, 13.5 ft, from floodmarks, site and datum in use Mar. 4, 1918, to June 28, 1919).

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Flow regulated by Bluewater Lake (capacity at crest of uncontrolled siphon spillways, 38,500 acre-ft).

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.7	0.4	3.0	5.6
2.8	1.3	3.1	9.9
2.9	3.0	3.2	16

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.0	2.2	1.6	2.0	2.2	1.6	2.0	1.9	3.0	2.0	3.0	3.9
2	2.2	*2.0	1.6	1.5	2.0	1.6	1.7	1.9	3.7	2.0	3.0	3.7
3	2.0	2.0	1.6	1.1	1.9	1.4	1.6	2.0	4.2	2.0	3.0	2.8
4	2.2	2.0	1.7	1.0	1.9	1.4	1.6	1.4	4.2	2.2	2.8	2.0
5	*2.0	2.0	1.4	*1.2	1.9	1.6	*1.7	1.6	4.4	2.4	2.8	1.9
6	2.0	2.2	1.6	1.5	1.9	1.6	2.2	1.6	4.4	2.5	2.8	*1.9
7	1.9	2.2	1.0	1.5	2.0	1.7	1.9	1.6	4.2	2.5	2.8	1.9
8	2.0	2.2	2.0	1.5	2.0	*1.6	1.7	1.6	4.4	2.5	3.0	1.9
9	2.2	2.2	1.7	1.5	1.9	1.7	1.6	1.6	4.2	2.5	3.2	2.0
10	2.2	2.2	1.9	1.5	1.7	1.7	1.4	1.9	4.2	2.5	3.2	2.0
11	2.0	2.0	1.9	1.5	1.6	1.6	1.4	1.4	3.9	3.0	3.2	2.0
12	2.0	2.0	1.7	1.5	1.4	1.6	1.4	1.6	3.9	2.5	3.4	1.9
13	2.0	1.9	1.9	1.7	1.4	1.6	1.4	1.6	4.2	2.5	3.4	1.7
14	2.0	1.9	*1.9	2.0	1.4	1.6	1.4	1.7	4.7	2.7	3.4	2.0
15	4.2	1.9	1.9	2.0	*1.4	1.6	1.4	2.0	5.6	3.0	3.9	2.2
16	3.7	1.9	1.9	2.0	1.4	1.6	1.6	2.0	4.7	3.0	*1.4	1.9
17	4.4	1.9	1.9	2.0	1.6	1.6	1.7	1.7	2.4	3.0	6.4	1.9
18	3.2	1.9	2.0	2.0	1.4	1.6	1.9	1.9	1.9	*3.0	4.7	2.0
19	2.8	1.9	2.0	2.0	1.6	1.7	1.9	1.7	1.7	3.2	5.3	1.9
20	2.6	1.9	2.0	2.0	1.6	1.7	1.9	2.0	1.4	3.0	3.9	1.6
21	2.4	1.9	2.0	2.0	1.6	1.6	1.9	1.7	1.4	3.0	3.7	1.6
22	2.4	1.9	2.2	2.0	1.6	1.7	1.7	1.9	1.7	3.0	3.4	1.4
23	2.4	*1.9	2.2	2.0	1.6	1.6	1.7	1.9	*2.6	2.8	3.4	1.4
24	2.4	1.9	2.2	2.0	1.6	1.6	1.9	1.7	2.5	2.8	3.4	1.4
25	2.4	1.7	2.2	2.5	1.6	1.6	1.7	*1.7	2.3	2.8	3.4	1.4
26	2.4	1.7	2.2	3.0	1.7	1.9	1.9	1.7	2.2	2.8	3.4	1.4
27	2.4	1.7	2.2	*3.0	1.6	1.9	*1.9	1.9	2.1	2.8	3.7	1.4
28	2.2	1.4	2.4	2.5	1.6	1.7	1.9	1.7	2.0	3.0	3.7	1.6
29	2.2	1.3	2.4	2.5	-	2.0	1.9	1.7	2.0	2.8	3.9	*1.6
30	2.0	1.6	2.2	2.5	-----	2.2	2.2	1.7	2.0	2.8	4.2	1.4
31	2.0	-----	2.1	2.5	-----	2.0	-----	1.9	-----	2.8	3.9	-----
Total	74.8	57.4	59.5	59.5	47.1	51.9	52.1	54.2	96.1	83.4	121.3	57.7
Mean	2.41	1.91	1.92	1.92	1.68	1.67	1.74	1.75	3.20	2.69	3.91	1.92
Ac-ft	148	114	118	118	93	103	103	108	191	165	241	114

Calendar year 1960: Max 5.6 Min 1.0 Mean 2.63 Ac-ft 1,910

Water year 1960-61: Max 14 Min 1.0 Mean 2.23 Ac-ft 1,620

* Discharge measurement made on this day.

Note.--No gage-height record Jan. 1-4, 24-26, June 24 to July 17. Stage-discharge relation affected by ice Nov. 28, 29, Dec. 5, 31, Jan. 5-23, 27-31.

8-3430. Bluewater Creek at Grants, N. Mex.

Location.--Lat 35°09'20", long 107°52'10", in SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.26, T.11 N., R.10 W., on right bank at bridge on State Highway 53 at Grants, 0.2 mile south of U. S. Highway 66.

Drainage area.--1,020 sq mi, approximately.

Records available.--October 1912 to February 1914, June 1914, October 1914 to February 1915, May 1915 to June 1921, September 1921 to June 1923, October 1923 to May 1926, September to December 1926, May 1949 to September 1961. Monthly discharge only for some periods published in WSP 1312.

Gage.--Water-stage recorder. Datum of gage is 6,468.34 ft above mean sea level (levels by Corps of Engineers). Oct. 30, 1912, to Apr. 23, 1915, staff gage, Apr. 24, 1915, to Dec. 5, 1917, chain gage, and Dec. 6, 1917, to Dec. 31, 1926, staff gage, at nearby sites at different datums.

Average discharge.--22 years (1912-13, 1914-20, 1921-22, 1923-25, 1949-61), 5.35 cfs (3,870 acre-ft per year).

Extremes.--Maximum discharge during year, 2.2 cfs Feb. 8, 9 (gage height, 1.63 ft); no flow for most of year.

1949-61: Maximum discharge recorded, 1,760 cfs Aug. 28, 1952 (gage height, 5.35 ft), from rating curve extended above 300 cfs on basis of velocity-area studies; no flow for long periods.

Maximum flood known occurred Sept. 6 or 7, 1909, when Bluewater Dam washed out.

Remarks.--Records fair. Flow partly regulated by Bluewater Lake (capacity at crest of uncontrolled siphon spillway, 38,500 acre-ft). Diversions and ground-water withdrawals for irrigation of about 4,500 acres above station.

Discharge, in cubic feet per second, water October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1					0						0	
2					0						0	
3					0.5						0	
4					0.4						0	
5											0	
6					0.5						0	
7					1.0						0	
8					0.7						0	
9					0.9						0	
10					0						0	
11					0						0	
12					0						0	
13					0						0	
14					0						0	
15					* 0						0	
16					0						* 0	
17					0						0	
18					0						0	
19					0						0	
20					0						0.3	
21					0						0	
22					0						0	
23					0						0	
24					0						0	
25					0						0	
26					0						0	
27					0						0	
28					0						0	
29					-						0	
30					-----						0	
31					-----						0	
Total	0	0	0	0	4.9	0	0	0	0	0	0.3	0
Mean	0	0	0	0	0.18	0	0	0	0	0	0.01	0
Ac-ft	0	0	0	0	9.7	0	0	0	0	0	0.6	0

Calendar year 1960: Max 0.3 Min 0 Mean 0.04 Ac-ft 26

Water year 1960-61: Max 1.0 Min 0 Mean 0.01 Ac-ft 10

Peak discharge (base, 200 cfs).--No peak above base.

* Observation of no flow made on this day.

8-3435. Rio San Jose near Grants, N. Mex.

Location.--Lat 35°04'30", long 107°45'00", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.23, T.10 N., R.9 W., on right bank at west boundary of Acoma Pueblo Grant, 8 $\frac{1}{2}$ miles southeast of Grants.

Drainage area.--2,300 sq mi (revised), approximately, of which about 1,130 sq mi does not contribute directly to surface runoff.

Records available.--June 1936 to September 1961. Prior to October 1955, published as San Jose River near Grants.

Gage.--Water-stage recorder and concrete control. Datum of gage is 6,269.47 ft above mean sea level, datum of 1929.

Average discharge.--25 years, 6.85 cfs (4,960 acre-ft per year).

Extremes.--Maximum discharge during year, 330 cfs Aug. 16 (gage height, 3.19 ft); minimum daily, 3.7 cfs for several days.

1936-61: Maximum discharge, 1,330 cfs about Aug. 21, 1947 (gage height, 4.15 ft, from floodmarks), from rating curve extended above 500 cfs by logarithmic plotting; minimum daily, 3.7 cfs several times in 1943, 1946, 1958-59 and 1961.

Maximum flood known probably occurred Sept. 6 or 7, 1909, following destruction of Bluewater Dam. The peak of August 1947 may have been exceeded by those of August and September 1929, and August 1935.

Remarks.--Records poor. Flow partly regulated by Bluewater Lake (capacity at crest of uncontrolled siphon spillway, 38,500 acre-ft).

Diversions and ground-water withdrawal for irrigation of about 5,100 acres above station.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.9	5.4	4.9	5.1	4.9	5.1	4.9	3.7	4.2	4.4	4.6	4.4
2	4.9	* 5.4	4.9	4.9	4.9	5.1	4.9	3.7	4.2	4.4	4.6	4.2
3	4.9	5.1	5.1	5.1	5.1	5.1	4.9	3.7	4.2	4.4	4.6	4.2
4	4.9	5.1	5.1	5.1	5.1	5.1	4.9	3.7	4.2	4.4	4.6	4.2
5	* 4.9	5.1	5.1	* 5.4	5.1	5.1	* 4.9	3.7	4.2	4.4	5.1	4.2
6	5.1	5.4	4.9	5.4	5.1	5.1	4.9	3.9	4.2	4.4	4.6	* 4.2
7	5.1	5.4	4.9	5.1	5.1	4.9	4.6	3.9	4.2	4.4	4.6	4.2
8	4.9	5.4	4.9	5.4	5.1	* 4.9	4.6	3.7	3.9	4.4	4.6	4.2
9	5.1	5.4	4.6	5.4	5.1	4.6	5.1	3.7	3.9	4.4	4.6	4.2
10	5.1	5.4	4.4	5.4	* 4.9	4.9	5.1	3.9	3.9	4.4	4.6	4.2
11	5.1	5.4	4.4	5.4	5.1	4.9	4.9	3.9	4.2	4.4	6.2	4.6
12	5.1	5.4	4.4	5.4	5.1	4.9	5.1	3.9	4.2	4.4	6.7	4.9
13	5.4	5.4	4.4	5.4	5.1	4.9	4.9	4.2	4.2	4.4	4.6	4.4
14	5.4	5.4	* 4.4	5.4	5.1	5.1	4.9	4.2	4.2	4.4	4.6	4.4
15	5.1	5.4	4.4	5.1	* 5.4	5.1	4.9	4.2	4.2	4.4	4.9	4.4
16	5.1	5.4	4.4	5.1	5.4	5.1	5.1	4.2	4.2	4.4	* 1.7	4.4
17	5.1	5.4	4.4	5.1	5.7	* 5.1	5.1	4.2	4.4	4.4	4.9	4.6
18	5.1	5.4	4.4	5.1	5.7	5.1	5.1	4.2	4.4	* 4.4	4.6	4.2
19	5.1	5.4	4.6	4.9	5.7	5.1	4.9	* 4.2	4.4	4.4	4.4	4.3
20	5.1	5.4	4.6	4.9	5.4	5.4	4.9	4.2	4.6	4.6	4.4	4.4
21	5.1	5.4	4.6	5.1	5.4	5.1	4.9	4.2	4.6	4.6	4.4	4.6
22	5.1	5.4	4.6	4.9	5.4	5.1	4.9	4.2	4.6	4.6	4.4	4.6
23	5.1	* 5.4	4.6	* 4.9	5.1	5.1	4.9	4.4	* 4.6	4.4	4.2	4.4
24	5.1	5.4	4.6	5.1	5.1	5.1	4.9	4.4	4.6	4.6	4.2	4.4
25	5.1	5.4	4.6	5.1	5.1	5.1	4.9	* 4.4	4.6	4.6	5.1	4.6
26	5.1	5.4	4.6	5.1	5.1	5.1	4.9	4.4	4.4	4.6	7.2	4.6
27	5.1	5.4	4.6	5.1	5.1	5.1	* 4.9	4.4	4.4	4.6	4.2	4.6
28	5.1	5.1	4.9	5.1	5.1	4.9	3.7	4.4	4.2	4.6	3.0	4.6
29	5.4	4.9	4.9	4.9	---	4.6	3.7	4.4	4.2	4.6	1.5	* 4.6
30	5.4	4.9	5.1	5.1	---	4.6	3.7	4.2	4.2	7.3	4.9	4.6
31	5.4	---	5.1	4.9	---	4.9	---	4.2	---	4.6	4.6	---
Total	158.4	159.8	145.4	159.2	145.5	155.3	144.0	126.6	128.5	141.3	197.0	132.4
Mean	5.11	5.33	4.69	5.14	5.20	5.01	4.80	4.08	4.28	4.56	6.35	4.41
Ac-ft	314	317	288	316	289	308	286	251	255	280	391	263

Calendar year 1960: Max 6.3 Min 4.2 Mean 4.98 Ac-ft 3,620

Water year 1960-61: Max 30 Min 3.7 Mean 4.91 Ac-ft 3,560

Peak discharge (base, 100 cfs).--Aug. 16 (1 p.m.) 330 cfs (3.19 ft); Aug. 28 (7:30 p.m.) 321 cfs (3.17 ft).

* Discharge measurement made on this day.

RIO GRANDE BASIN

8-3515. Rio San Jose at Correo, N. Mex.

Location.--Lat 34°58'05", long 107°11'15", in NE $\frac{1}{4}$ sec.31, T.9 N., R.3 W., on right bank 0.7 mile upstream from State Highway 6, 0.8 mile northwest of Correo, and 14 miles upstream from mouth.

Drainage area.--3,660 sq mi (revised), approximately, of which about 1,130 sq mi does not contribute directly to surface runoff.

Records available.--April 1943 to September 1961. Prior to October 1955, published as San Jose River at Correo.

Gage.--Water-stage recorder. Datum of gage is 5,492.43 ft above mean sea level, datum of 1929. Prior to Oct. 1, 1958, water-stage recorder and concrete control at site 1 mile downstream at datum 17.55 ft lower.

Average discharge.--18 years, 12.1 cfs (8,760 acre-ft per year).

Extremes.--Maximum discharge during year, 1,450 cfs Sept. 10 (gage height, 3.66 ft, from floodmarks); no flow for many days.

1943-61: Maximum discharge, 7,150 cfs Aug. 11, 1955; maximum gage height, 20.7 ft Aug. 22, 1958, backwater from dam (site and datum then in use); no flow for long periods.

A flood which probably occurred Aug. 21, 1935, reached a stage of 15.4 ft, from floodmarks, former site and datum (discharge, about 11,000 cfs), but was probably exceeded by the flood of Sept. 23, 1929 (discharge not determined), based on study of records for Rio Puerco at Rio Puerco.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Flow partly regulated by Bluewater Lake (capacity at crest of uncontrolled siphon spillways, 38,500 acre-ft) and one small reservoir above station. Diversions and ground-water withdrawals for irrigation of about 7,800 acres above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

1.2	0	1.6	9.6	2.3	158
1.3	.1	1.7	20	2.6	300
1.4	.6	1.8	32	2.9	508
1.5	3.0	2.0	68	3.1	696

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0			6.6	4.3	1.4			0	14	4.8
2	a 0	0			6.6	3.8	9			0	0	.7
3	a 1	.1			4	3.8	1.4			0	0	0
4	a 0	.4			5.6	3.8	1.2			0	0	0
5	0	.7			6.9	3.8	.2			0	0	0
6	0	.9			5.4	3.4	.2			0	0	0
7	0	1.0			4.3	3.0	* 1.2			0	0	0
8	0	1.0			5.4	2.6	.8			0	0	0
9	0	1.0			5.4	2.6	0			0	0	0
10	0	* 1.4			5.4	1.7	0			* 2.0	0	2.10
11	0	1.8			4.8	2.6	.1			0	0	24
12	0	1.8			5.4	2.2	.2			0	1.3	2.9
13	0	1.6			4.8	* 2.2	0			0	0	22
14	0	1.6			5.4	2.6	0			0	2.5	* 4.8
15	1.5	.7			4.3	.3	0			0	1.3	3.6
16	a 1.50	.2			4.3	0	0			0	* 1.3	1.1
17	a 6.00	.2			4.3	0	0			0	2.0	1.1
18	6.90	0			3.8	.2	0			0	* 4.4	.3
19	* 4.4	0			4.3	.9	0			0	2.0	0
20	a 1.2	.1			* 3.8	1.6	0			0	3.2	0
21	5.4	.2			3.8	1.4	0			0	* 5.4	0
22	1.2	.3			3.4	1.2	0			0	.2	.8
23	.4	.1			3.4	.2	0			0	1.1	1.8
24	0	.1			2.3	.1	0			0	9.1	.9
25	0	.1			.5	.7	0			0	1.1	1.2
26	0	.2			0	.2	0			0	.5	1.0
27	.1	0			2.9	.1	0			0	7.5	.6
28	0	0			5.4	.1	0			0	0	.1
29	.2	0			-	0	0			0	0	0
30	.2	0			-----	.2	0			0	1.4	0
31	0	-----			-----	.5	-----			0	1.8	-----
Total	1 519.5	15.5	0	0	1 18.9	50.1	7.6	0	0	20.1	340.9	317.7
Mean	49.0	5.17	0	0	4.25	1.62	0.25	0	0	0.65	11.0	10.6
Ac-ft	3,010	31	0	0	236	99	15	0	0	40	676	630

Calendar year 1960: Max 690 Min 0 Mean 5.07 Ac-ft 3,680
 Water year 1960-61: Max 690 Min 0 Mean 6.55 Ac-ft 4,740

Peak discharge (base, 800 cfs).--Oct. 16-18 (time unknown) 1,060 cfs (3.40 ft); Sept. 10 (approx. 1 a.m.) 1,450 cfs (3.66 ft, from floodmarks).

* Discharge measurement made on this day.

a No gage-height record.

8-3525. Rio Puerco at Rio Puerco, N. Mex.

Location.--Lat 34°47'35", long 106°59'20", in SW $\frac{1}{4}$ sec. 31, T.7 N., R.1 W., in San Clemente Grant, on downstream end of pier nearest left abutment of The Atchison, Topeka and Santa Fe, Railway Co. bridge, 7 miles downstream from Rio San Jose.

Drainage area.--6,590 sq mi (revised), approximately, of which at least 1,130 sq mi does not contribute directly to surface runoff.

Records available.--June 1909 to December 1912 (records fragmentary, gage heights only), March 1934 to September 1961. Records for January 1913 to December 1914 published in WSP 358, 388, and 408 have been found to be unreliable and should not be used.

Gage.--Water-stage recorder and concrete control. Datum of gage is 5,008.59 ft above mean sea level, datum of 1929.

Average discharge.--27 years (1934-61), 64.6 cfs (46,770 acre-ft per year).

Extremes.--Maximum discharge during year, 3,700 cfs Aug. 19 (gage height, 3.25 ft); no flow for many days.

1934-61: Maximum discharge, 28,000 cfs Aug. 21, 1935 (gage height, 7.24 ft), by computation of peak flow over dam; no flow at times.

The damaging flood of Sept. 23, 1929, is the greatest since about 1880; it reached a stage of about 18 ft (discharge, 37,700 cfs, by weir formula, from reports of State engineer). The flood of Aug. 12, 1929, reached a stage of about 16 ft (discharge, 31,300 cfs, by weir formula, from reports of State engineer).

Remarks.--Records fair except those for periods of no gage-height record and for flows below about 10 cfs, which are poor. Diversions for irrigation of about 11,500 acres above station (includes 3,700 acres irrigated wholly or partly from wells).

Rating table (gage height, in feet, and discharge, in cubic feet per second)

0.22	0	0.7	14	1.4	335
.3	.3	.8	29	1.6	505
.4	1.6	.9	56	2.0	1,020
.5	4.3	1.0	100	2.4	1,750
.6	7.7	1.2	205		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	10	a 0.1			0	* 2.7	9.1	* 8	0	0	0	8.9
2	23	a 1			0	3.7	6.9	28	0	0	0	4.3
3	3.1	a 1			0	3.1	5.2	52	0	0	0	.6
4	3	a 1			0	2.5	3.1	65	0	0	0	5.6
5	1	a 1			.1	2.5	1.8	6.9	0	6.8	0	1.6
6	0	a 1			1.2	2.5	1.8	7.8	0	6	0	.2
7	0	a 1			2.3	2.0	* 28	60	0	32	0	0
8	0	a 1			2.1	5.7	5.6	35	0	a 1	0	0
9	.1	a 1			1.7	6.9	4.6	21	0	34	0	5.4
10	* 4	* 1			1.7	4.9	35	a 10	0	* 34.0	0	620
11	1	1			1.6	2.5	17	a 5	0	55	0	856
12	1	2			1.0	1.2	10	a 2	0	10	.6	303
13	1	2			1.2	* 1.6	7.7	25	0	2.0	10	468
14	0	3			.9	14	4.6	4.9	17	0	1.5	* 75
15	8.6	4			.8	14	2.5	* 4.6	a 6	0	205	19
16	380	2			30	12	1.6	12	* 45	0	* 74	6.5
17	637	3			153	12	* 8	7.3	a 5	0	87	26
18	* 1,590	1			49	14	12	6.9	a 2	0	* 804	16
19	680	0			21	13	.6	8.6	a 0	0	1,680	* 572
20	164	0			* 11	9.7	1	8.1	a 0	0	804	863
21	* 40	0			9.1	6.1	3.2	6.9	a 0	0	* 146	174
22	a 10	0			5.2	7.3	21	d 4	0	0	25	21
23	a 5	0			3.7	4.9	25	d 3	0	0	352	12
24	a 2	0			4.8	2.8	27	d 4	0	0	88	6.9
25	a 1	0			21	1.2	38	a 3	0	0	54	* 4.0
26	a 5	0			12	.8	43	a 2	0	0	27	1.4
27	a 3	0			8.6	.4	33	a 2	0	0	9.1	.8
28	a 2	0			3.7	.3	25	a 2	0	0	* 23	.3
29	a 2	0			-	1.8	d 15	* 1.8	0	0	6.0	0
30	a 2	0			-----	9.7	d 8	0	0	0	.4	0
31	a 2	-----			-----	9.1	-----	0	-----	0	4.9	-----
Total	3,556.5	2.8	0	0	346.7	174.9	477.2	624.6	76	548.0	4,401.5	4,071.5
Mean	115	0.09	0	0	12.4	5.64	15.9	20.1	2.53	17.7	142	136
Ac-ft	7,050	5.6	0	0	688	347	947	1,240	151	1,090	8,730	7,970

Calendar year 1960: Max 2,540 Min 0 Mean 38.0 Ac-ft 27,580

Water year 1960-61: Max 1,680 Min 0 Mean 39.1 Ac-ft 28,310

Peak discharge (base, 6,000 cfs).--No peak above base.

* Discharge measurement made on this day.

a No gage-height record.

8-3530. Rio Puerco near Bernardo, N. Mex.

Location.--Lat 34°24'30", long 106°51'10", in SE $\frac{1}{4}$ sec. 8, T. 2 N., R. 1 E., at bridge on U. S. Highway 85, 1.2 miles southwest of Bernardo, 3 miles upstream from mouth, and 18 miles south of Belen.

Drainage area.--7,350 sq mi (revised), approximately, of which at least 1,130 sq mi does not contribute directly to surface runoff.

Records available.--November 1939 to September 1961. Fragmentary gage-height record and footnotes concerning no flow for the period September 1910 to August 1914, published in WSP 358 and 388, have been found to be in error and should not be used.

Gage.--Water-stage recorder. Datum of gage is 4,725.44 ft above mean sea level, datum of 1929.

Average discharge.--21 years (1940-61), 55.2 cfs (39,960 acre-ft per year).

Extremes.--Maximum discharge during year, 2,470 cfs Aug. 19 (gage height, 9.35 ft); no flow for extended periods.

1939-61: Maximum discharge, 18,800 cfs Sept. 23, 1941, from rating curve extended above 7,800 cfs by logarithmic plotting; maximum gage height, 13.8 ft Aug. 12, 1955; no flow for extended periods.

The greatest flood known since about 1880 occurred Sept. 23, 1929, from information by local residents (discharge, about 35,000 cfs, estimated on basis of peak at Rio Puerco). Another flood occurred Aug. 12, 1929 (discharge 30,600 cfs, by slope-area method, from reports of State engineer).

Remarks.--Records fair. Discharge measurements made 2 to 5 times a month during periods of flow. Diversions for irrigation of about 11,500 acres above station (includes 3,700 acres irrigated wholly or partly from wells).

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0				0	1.4	3.4	4.6	0.7	0	0	0
2	0				0	.4	6.2	2.9	0	0	0	0
3	0				0	0	6.2	7.8	0	0	0	1.9
4	1.7				0	0	3.9	2.4	0	0	0	.1
5	0				0	0	2.4	3.4	0	0	0	0
6	0				0	0	1.0	4.2	0	13	0	0
7	0				0	0	1.4	4.9	0	5.8	0	0
8	0				0	0	.3	4.1	0	19	0	0
9	0				0	0	3.1	2.0	0	8.7	0	0
10	0				0	0	2.6	1.1	0	13.2	0	2.9
11	0				0	0	1.8	5.6	0	21.2	0	8.78
12	0				0	0	1.2	1.9	0	4.2	0	3.80
13	0				0	0	5.3	.2	0	8.4	0	3.47
14	0				0	0	3.2	8.9	2.3	3.0	0	1.63
15	1.3				0	0	2.3	3.0	2.3	2.8	0	4.2
16	2.2				0	1.0	1.4	2.5	.5	.1	10.1	2.3
17	40.4				0	3.7	.4	5.9	6.2	0	5.3	1.5
18	9.70				8.7	2.8	0	2.8	1.5	0	2.40	2.4
19	12.00				3.6	3.5	0	1.7	2.3	0	1.190	3.4
20	2.50				2.3	4.8	0	1.5	.1	0	1.160	9.60
21	8.6				1.1	4.3	0	3.7	0	0	2.96	3.00
22	3.2				7.7	1.9	0	2.6	0	0	5.0	6.3
23	1.6				4.6	1.4	0	1.0	0	0	1.69	2.4
24	8.8				2.4	1.9	1.4	.9	0	0	1.38	9.8
25	4.6				.7	.9	1.4	.9	0	0	.69	5.4
26	1.7				3.3	0.0	2.0	1.2	0	0	3.7	3.2
27	0				7.4	0.0	2.3	.9	0	0	1.6	1.2
28	0				4.3	0.0	1.9	.6	0	0	5.6	.3
29	0				-	0.0	1.4	0	0	0	8.9	1.2
30	0				-----	0.0	7.4	.8	0	0	5.6	0
31	0				-----	0.0	-----	1.4	-----	0	1.0	-----
Total	2,998.1	0	0	0	1,87.4	28.0	2,35.8	3,33.8	15.9	525.1	3,540.1	3,305.1
Mean	96.7	0	0	0	6.69	0.90	7.86	10.8	0.53	16.9	11.4	110
Ac-ft	5,950	0	0	0	372	56	468	662	32	1,040	7,020	6,560

Calendar year 1960: Max 1,480 Min 0 Mean 29.7 Ac-ft 21,540

Water year 1960-61: Max 1,200 Min 0 Mean 30.6 Ac-ft 22,160

Peak discharge (base, 3,000 cfs).--No peak above base.

RIO GRANDE BASIN

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8-3540. Rio Salado near San Acacia, N. Mex.

Location.--Lat 34°16'55", long 106°52'50", in E½ sec.30, T.1 N., R.1 E., near right bank 1.0 mile downstream from bridge on U. S. Highway 85, 1.4 miles upstream from mouth, 2.0 miles northeast of San Acacia, and 15 miles north of Socorro.

Drainage area.--1,380 sq mi, approximately.

Records available.--October 1947 to September 1961.

Gage.--Water-stage recorder. Datum of gage is 4,710.68 ft above mean sea level, datum of 1929.

Average discharge.--14 years, 12.9 cfs (9,340 acre-ft per year).

Extremes.--Maximum discharge during year, 10,900 cfs Sept. 11 (gage height, 12.50 ft); no flow for most of time.

1947-60: Maximum discharge, 16,600 cfs Sept. 25, 1954 (gage height, 12.80 ft), from rating curve extended above 2,000 cfs by logarithmic plotting, no flow for long periods.

The greatest flood known occurred Aug. 12, 1929 (discharge, 27,400 cfs, by slope-area method), from reports of State engineer.

Remarks.--Records poor. Diversions for irrigation of about 100 acres above station.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0								0	0.5	0	a 0
2	230								0	7	0	a 0
3	a 3								0	*a 15	0	a 0
4	*.4								0	a 2	*0	a 0
5	0								0	a 0	0	*0
6	0								0	0	0	0
7	0								0	0	0	0
8	0								0	0	0	0
9	0								0	0	0	25
10	0								0	0	0	130
11	0								.3	0	0	*480
12	0								*.4	0	6	400
13	0								0	0	*256	a 50
14	0								*0	a 10	*740	a 150
15	1								0	a 1	a 50	*130
16	14								0	0	a 10	a 50
17	910								a 5	0	*225	a 20
18	*520								a 1	0	200	a 5
19	180								0	0	a 50	a 0
20	a 10								0	0	a 10	a 0
21	*0								0	0	5	a 0
22	0								0	0	140	a 0
23	0								0	0	*1240	a 0
24	0								0	0	a 150	a 0
25	0								0	0	a 20	a 0
26	0								0	0	a 0	a 0
27	0								0	0	a 0	a 0
28	0								*0	0	a 0	a 2
29	0								0	0	a 0	*a 3
30	0								0	0	a 0	a 2
31	0								—	0	a 0	—
Total	1,868.4	0	0	0	0	0	0	0	6.7	35.5	3,102	1,447
Mean	60.3	0	0	0	0	0	0	0	0.22	1.15	100	48.2
Ac-ft	3,710	0	0	0	0	0	0	0	13	70	6,150	2,870

Calendar year 1960: Max 995 Min 0 Mean 11.3 Ac-ft 8,240
 Water year 1960-61: Max 1,240 Min 0 Mean 17.7 Ac-ft 12,810

Peak discharge (base, 3,000 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
10-17	9 p.m.	11.20	4,420	8-14	2:30 a.m.	11.20	4,600
8-22	11:30 p.m.	11.60	6,000	9-11	8:30 p.m.	12.50	10,900

* Discharge measurement or observation of no flow made on this day.
 a No gage-height record.

8-3545. Socorro main canal north at San Acacia, N. Mex.

Location.--Lat 34°15'15", long 106°53'45", in SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 1, T. 1 S., R. 1 W., on right bank at San Acacia, half a mile downstream from point of diversion.

Records available.--April 1936 to September 1961.

Gage.--Water-stage recorder. Datum of gage is 4,660.16 ft above mean sea level, datum of 1929. Prior to Mar. 8, 1958, at site 300 ft upstream (in old channel) at datum 0.42 ft lower.

Extremes.--1936-61: Maximum daily discharge, 240 cfs June 29, 1960; no flow at times.

Remarks.--Records fair except those for periods of no gage-height record, which are poor. Discharge measurements generally made once a week during periods of flow. Canal diverts water from right bank of Rio Grande for irrigation of about 8,000 acres. Three acequias, together irrigating about 300 acres, divert water from canal above station; for spot discharge measurements on San Acacia drainage canal which runs around and through this acreage, see page 184.

Monthly discharge, in cubic feet per second, water year October 1960 to September 1961

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October	129	0	36.6	2,250
November	8.6	0	1.91	114
December	0	0	0	0
Calendar year 1960.	240	0	70.8	51,400
January	0	0	0	0
February	0	0	0	0
March	209	0	174	10,670
April	212	147	188	11,170
May	218	183	203	12,460
June	207	69	173	10,300
July	182	4	97.3	5,980
August	163	3.2	91.3	5,620
September	167	5	63.6	3,790
Water year 1960-61	218	0	86.1	62,360

Note.--No gage-height record July 19-24, 29, 30, Aug. 20, Sept. 12, 21.

8-3550. Rio Grande at San Acacia, N. Mex.

Location.--Lat 34°15'13", long 106°53'45", in NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 1, T.1 S., R.1 W., on right bank an eighth of a mile southeast of San Acacia, 0.7 mile downstream from San Acacia diversion dam, and 2 $\frac{1}{2}$ miles downstream from Rio Salado.

Drainage area.--26,770 sq mi, approximately (includes 2,940 sq mi in closed basin in San Luis Valley, Colo.).

Records available.--April 1936 to September 1961.

Gage.--Water-stage recorder. There are 2 gages, 1 on a conveyance channel designed to carry 2,000 cfs, 0.8 mile below heading and 1 on the main or floodway channel. Elevation of conveyance channel gage is 4,652.5 ft above mean sea level (from Bureau of Reclamation channel specifications), datum of floodway channel gage is 4,658.10 ft above mean sea level, datum of 1929. Prior to Mar. 19, 1953, floodway gage at site $\frac{1}{2}$ mile upstream at datum 2.06 ft higher. Apr. 16, 1936, to July 24, 1941, and Nov. 29 to Dec. 14, 1946, at datum 4.46 ft higher than present datum; prior to Oct. 1, 1958, all flow in floodway.

Average discharge.--25 years, 1,124 cfs (813,700 acre-ft per year).

Extremes.--Maximum discharge during year, 8,620 cfs Sept. 11; no flow Nov. 6-8.

1936-61: Maximum discharge, 27,400 cfs Aug. 5, 1936 (gage height, 10.75 ft, site and datum then in use); no flow at times.

Remarks.--Records fair. Record is composite of main stem and conveyance channel (constructed in 1958, headgates opened May 18, 1959). Discharge measurements generally made 1 to 3 times a week on each channel, less often during low flow periods. Diversions above station for irrigation of about 760,000 acres; this includes Socorro main canal north, which bypasses station and irrigates about 8,000 acres.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.2	310	482	620	624	664	479	1,400	1,750	5.0	1.8	1.55
2	1.96	349	498	600	624	418	477	2,940	1,480	4.2	1.7	1.14
3	1.5	337	493	578	594	356	512	2,790	1,340	3.3	1.6	56
4	.3	361	527	564	579	352	323	3,370	1,370	3.7	1.5	21
5	.1	376	533	551	594	390	1.93	3,630	1,570	3.5	1.5	18
6	0	379	563	533	609	444	1.43	3,700	1,240	3.3	1.4	8.1
7	0	368	563	528	609	401	807	3,880	1,020	2.7	1.3	6.8
8	0	371	577	522	609	389	1,280	3,760	865	2.9	1.2	31
9	.2	389	563	508	609	403	1,100	2,790	719	60	1.2	35
10	.9	459	558	513	609	362	1,160	2,120	671	250	1.1	3.87
11	.3	487	592	538	594	321	831	1,860	472	315	1.1	1,540
12	.3	482	571	540	609	249	699	1,680	374	164	9.5	1,380
13	.4	531	599	540	609	227	625	2,180	366	225	64	511
14	.5	982	592	552	594	258	540	2,830	156	142	646	502
15	8.9	1,080	613	552	609	212	438	2,740	75	43	39	355
16	1.22	938	669	564	609	209	429	2,170	151	28	159	215
17	9.46	898	648	564	609	288	603	2,070	290	9.2	342	117
18	1.570	873	634	594	664	543	436	1,740	282	7.7	321	102
19	1,850	863	613	594	704	701	308	1,660	249	4.5	1,290	167
20	1,130	741	599	594	724	688	327	1,640	331	2.8	1,560	899
21	573	633	613	579	744	547	593	1,810	141	2.6	800	820
22	455	579	620	564	724	422	1,170	2,150	57	2.6	450	652
23	366	566	620	564	724	328	1,790	1,960	26	2.6	1,360	491
24	292	549	613	564	704	255	2,620	1,790	18	2.3	1,740	372
25	230	544	606	564	704	217	2,390	1,820	17	2.3	1,410	343
26	1.96	532	606	579	724	199	2,160	1,970	16	2.2	556	287
27	201	518	606	549	744	217	1,340	2,050	14	2.2	451	168
28	216	476	613	564	724	253	1,380	2,400	13	2.1	439	167
29	199	464	606	594	-	217	1,130	2,220	90	2.0	358	234
30	226	477	606	609	-----	354	1,050	1,560	5	1.9	241	167
31	229	-----	613	609	-----	666	-----	1,530	-----	1.9	200	-----
Total	9,010.6	16,912	18,209	17,488	18,177	11,550	27,333	72,210	15,087.0	1,334.2	12,450.9	10,320.9
Mean	291	564	587	564	649	373	911	2,329	503	43	402	344
Ac-ft	17,870	33,540	36,120	34,690	36,050	22,910	54,210	143,200	29,920	2,650	24,700	20,470
(t)	12,020	30,810	222	221	222	17,600	41,310	33,880	17,700	1,930	16,430	16,080

Calendar year 1960: Max 4,470 Min 0 Mean 805 Ac-ft 584,100

Water year 1960-61: Max 3,880 Min 0 Mean 630 Ac-ft 456,300

† Flow, in acre-feet, in conveyance channel only; this flow is included in above totals for composite flow.

8-3560. Socorro main canal south near San Antonio, N. Mex.

Location.--Lat 33°53'30", long 106°52'00", in NW¼ sec.8, T.5 S., R.1 E., on right bank 1½ miles upstream from Bosque del Apache Grant and 1¼ miles south of San Antonio.

Records available.--April 1937 to July 1938 (published as "at end near San Antonio"), March 1948 to September 1961.

Gage.--Water-stage recorder. Wooden control since Mar. 27, 1954. Datum of gage is 4,526.41 ft above mean sea level, datum of 1929. April 1937 to July 1938 at two different sites about 1½ miles downstream at different datums. March 1948 to November 1951 at site 30 ft upstream at datum 7.29 ft higher.

Extremes.--1937-38, 1948-61: Maximum daily discharge, 50 cfs Apr. 23, 1958, and Aug. 18, 1961; no flow at times.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Discharge measurements generally made 3 to 4 times a month during irrigation season. Canal diverts water from San Antonio Riverside drain for irrigation above and below station. Some diversion occurs between gage and north boundary of U. S. Fish and Wildlife Refuge (Bosque del Apache Grant). This is 1 of 3 stations gaging flow into refuge.

Monthly discharge, in cubic feet per second, water year October 1960 to September 1961

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October	41	0	15.6	961
November	.3	0	.01	.6
December	0	0	0	0
Calendar year 1960	41	0	12.1	8,810
January	0	0	0	0
February	0	0	0	0
March	47	0	25.0	1,540
April	36	11	26.0	1,550
May	32	13	24.6	1,520
June	45	4.4	25.5	1,520
July	35	.8	15.7	965
August	50	.1	15.3	944
September	34	1.7	18.2	1,080
Water year 1960-61	50	0	13.9	10,080

Note.--No gage-height record Mar. 8, Aug. 15-17, 20-25, Sept. 13, 15-25.

8-3565, San Antonio Riverside drain near San Antonio, N. Mex.

Location.--Lat 33°53'00", long 106°51'05", in SW¼SW¼ sec.9, T.5 S., R.1 E., on left bank 1 mile east of U.S. Highway 85, 1.2 miles upstream from boundary of Bosque del Apache Grant (wildlife refuge), and 2 miles southeast of San Antonio.

Records available.--March 1948 to September 1961. May 1936 to February 1938, at site 50 ft downstream from Elmendorf interior drain; records not equivalent.

Gage.--Water-stage recorder. Datum of gage is 4,524.33 ft above mean sea level (levels by Bureau of Reclamation). Mar. 15, 1948, to Mar. 31, 1949, at site 1.2 miles downstream at datum 1.14 ft lower.

Extremes.--1948-61: Maximum daily discharge, 161 cfs May 31, 1957; no flow at times since 1959.

Remarks.--Records poor. Discharge measurements or observations of no flow generally made four times a month. Diversions from drain above station, canal wasteways and interior drains entering channel above station. Flow represents 1 of 3 channels entering north boundary of Bosque del Apache Grant. Average pickup per mile between station and Grant boundary is about 5 percent (as determined from comparative discharge measurements).

Monthly discharge, in cubic feet per second, water year October 1960 to September 1961

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October	32	0	3.52	216
November	20	.2	2.33	139
December	2.0	.1	1.02	63
Calendar year 1960	49	0	3.59	2,610
January	3.0	.9	1.85	114
February	6.3	1.8	2.80	155
March	14	.8	5.90	363
April	29	5.5	13.6	806
May	38	18	27.1	1,660
June	76	7.5	30.1	1,790
July	25	0	9.63	592
August	44	0	7.41	455
September	30	3.7	8.57	510
Water year 1960-61	76	0	9.49	6,860

Note.--No gage-height record Oct. 2-4, 21-24, June 7. Gage height doubtful Feb. 7, 8, Mar. 8, Aug. 21-29, Sept. 20, 22-27.

8-3570. Elmendorf interior drain near San Antonio, N. Mex.

Location.--Lat 33°51'50", long 106°51'25", in NE¼ sec.20, T.5 S., R.1 E. (projected), in Bosque del Apache Grant (wildlife refuge), on right bank 2,000 ft downstream from north boundary of refuge, 1.0 mile east of railroad, and 3.7 miles south of junction of U. S. Highways 85 and 380.

Records available.--July 1936 to January 1938 (published as "at end", near San Antonio), March 1948 to September 1961.

Gage.--Water-stage recorder and wooden control. Datum of gage is 4,518.9 ft above mean sea level, datum of 1929 (levels by Bureau of Reclamation). July 1936 to January 1938, staff gage at site half a mile upstream in former channel at datum of 4,519.24 ft, datum of 1929. Mar. 11, 1948, to Nov. 10, 1949, at site about 2,500 ft upstream (in old channel) at different datum. Nov. 11, 1949, to Feb. 7, 1956, at site 2,000 ft upstream (present channel) at datum about 0.26 ft lower than present datum.

Extremes.--1948-61: Maximum daily discharge, 51 cfs June 3, 1956; June 18, 1961; no flow at times in February and March 1961.

Remarks.--Records good except those for periods of no gage-height record, and those for June 2-13, July 7-17, which are fair. Discharge measurements generally made 3 to 4 times a month. Flow past station represents part of inflow to wildlife refuge.

Monthly discharge, in cubic feet per second, water year October 1960 to September 1961

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	28	0.2	11.6	711
November.....	3.5	.1	.44	26
December.....	.4	.1	.23	14
Calendar year 1960.....	46	.1	12.0	8,680
January.....	.5	.2	.25	16
February.....	.2	0	.04	2.4
March.....	43	0	21.6	1,330
April.....	41	14	29.0	1,720
May.....	48	15	34.5	2,120
June.....	51	11	27.1	1,610
July.....	37	2.0	12.7	779
August.....	33	1.0	14.4	882
September.....	32	1.2	13.2	783
Water year 1960-61.....	51	0	13.8	9,990

Note.--No gage-height record Oct. 29, 30, Feb. 15, 23-27, Apr. 21-27; Sept. 1-7.

8-3575. San Antonio Riverside drain near San Marcial, N. Mex.

Location.--Lat 33°44'30", long 106°55'30", in Bosque del Apache Grant (wildlife refuge), on left bank 0.6 mile upstream from outlet to Rio Grande conveyance channel, 4.5 miles northeast of San Marcial, and 12 miles south of San Antonio. Prior to July 28, 1960, at site 0.4 mile upstream.

Records available.--March 1948 to September 1961.

Gage.--Water-stage recorder. Datum of gage is 4,485.70 ft above mean sea level, datum of 1929. Prior to July 28, 1960, water-stage recorder and wooden control at site 0.4 mile upstream at datum 3.42 ft higher.

Extremes.--1948-61: Maximum daily discharge, 226 cfs May 22, 1957; no flow at times.

Remarks.--Records good. Discharge measurements or observations of no flow generally made 3 to 4 times a month. Flow represents seepage from river and waste from wildlife refuge. Diversion for irrigation of a few hundred acres above station.

Monthly discharge, in cubic feet per second, water year October 1960 to September 1961

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	0	0	0	0
November.....	0	0	0	0
December.....	.3	0	.14	8.5
Calendar year 1960.....	68	0	17.4	12,620
January.....	8.4	.3	3.32	204
February.....	38	6.9	13.2	733
March.....	56	.8	35.8	2,200
April.....	63	34	43.2	2,570
May.....	76	59	67.9	4,170
June.....	70	34	55.6	3,310
July.....	49	2.1	27.7	1,700
August.....	31	1.5	11.3	697
September.....	42	17	28.1	1,670
Water year 1960-61.....	76	0	23.9	17,260

Note.--No gage-height record Dec. 9-18.

RIO GRANDE BASIN

8-3585. Rio Grande at San Marcial, N. Mex.

Location.--Lat 33°40'50", long 106°59'30", in Pedro Armendaris Grant 33, on pier of The Atchison, Topeka and Santa Fe Railway Co. bridge, 1.1 miles downstream from former site of San Marcial, Socorro County, and 18½ miles southwest of San Antonio.

Drainage area.--27,700 sq mi, approximately (includes 2,940 sq mi in closed basin in San Luis Valley, Colo.).

Records available.--January 1895 to September 1961.

Gage.--River channel (now called floodway): Water-stage recorder. Datum of gage is 4,455.19 ft above mean sea level, datum of 1929. Prior to June 25, 1943, floodway had water-stage recorder, inverted rod, inclined staff, and wire-weight gages at several sites within 2 miles of present site at various datums.

Conveyance channel: Water-stage recorder. Datum of gage is 4,454.00 ft above mean sea level (levels by Bureau of Reclamation). Prior to Apr. 29, 1958, at datum 4.19 ft higher. Apr. 14, 1950, to Feb. 28, 1954, bypass flow forming composite, measured at Tiffany Channel 4 miles upstream; prior to 1950 all flow through floodway.

Average discharge.--65 years, 1,358 cfs (983,200 acre-ft per year).

Extremes.--Maximum discharge during year, 4,300 cfs May 8; minimum daily, 9.1 cfs Oct. 7-10.
1895-1961: Maximum discharge, about 50,000 cfs Oct. 11, 1904; no flow at times.

Remarks.--Records fair. Record is composite of floodway and conveyance channel (flows below 2,000 cfs generally routed through conveyance channel). Discharge measurements generally made once or twice a week on each channel. Diversions for irrigation of about 775,000 acres above station (includes 15,820 acre-ft diverted from conveyance channel, figure furnished by Bureau of Reclamation).

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.4	338	250	425	531	635	626	1,250	1,580	123	26	248
2	9.8	320	267	388	567	560	572	1,400	1,790	102	26	230
3	23	317	275	330	539	557	652	2,420	1,400	104	24	212
4	14	323	290	360	517	722	562	2,570	1,340	134	22	178
5	9.4	344	304	368	535	605	431	3,060	1,370	144	22	148
6	9.4	353	308	385	517	610	365	3,500	1,490	137	20	134
7	9.1	353	317	362	508	572	386	3,510	1,020	123	20	139
8	9.1	350	340	355	493	546	1,180	3,950	874	110	19	139
9	9.1	356	213	335	518	556	1,050	3,160	805	110	18	155
10	9.1	365	210	302	540	530	1,180	2,320	773	210	18	306
11	11	464	195	402	506	509	988	2,070	668	340	18	400
12	18	461	182	505	497	476	880	1,660	556	377	20	1,350
13	19	464	181	490	510	434	732	1,580	546	302	20	635
14	20	700	195	500	503	434	668	2,170	500	353	118	514
15	22	1,020	210	478	506	428	584	2,810	365	329	178	524
16	25	913	205	490	521	395	509	2,410	335	281	87	387
17	27	880	215	481	545	419	639	1,990	395	220	311	296
18	941	859	232	462	542	510	616	1,940	455	180	269	242
19	1,430	868	248	459	669	760	479	1,690	449	137	800	225
20	1,470	815	270	467	649	818	443	1,710	425	110	1,220	370
21	676	668	300	465	649	722	461	1,600	524	68	1,430	864
22	486	600	320	429	626	639	850	2,130	350	45	590	677
23	396	578	340	426	603	518	1,290	1,930	302	41	974	533
24	341	556	368	453	611	485	1,280	1,840	254	38	820	456
25	275	536	410	469	611	440	1,780	1,730	208	35	1,590	398
26	254	530	490	461	608	425	1,960	1,940	202	34	735	373
27	220	515	510	460	617	419	1,720	2,000	192	31	501	307
28	215	461	510	468	655	431	1,440	2,050	180	30	450	229
29	218	186	490	495	-	434	1,400	2,370	168	30	425	301
30	236	216	462	520	-----	434	1,100	2,160	148	28	338	222
31	281	-----	448	538	-----	693	-----	1,450	-----	26	260	-----
Total	7,692.4	15,709	9,555	13,528	15,694	16,716	26,823	68,370	19,664	4,332	11,419	11,192
Mean	248	524	308	436	560	539	894	2,205	655	140	368	373
Ac-ft	15,260	31,160	18,950	26,830	31,130	33,160	53,200	135,600	39,000	8,590	22,650	22,200
(†)	12,350	30,950	10,940	13,210	13,480	31,410	47,930	55,860	30,040	8,590	17,700	20,900

Calendar year 1960: Max 3,700

Min 9.1

Mean 760

Ac-ft 551,600

Water year 1960-61: Max 3,950

Min 9.1

Mean 605

Ac-ft 437,700

† Flow, in acre-feet, in conveyance channel only; this flow is included in above totals for composite flow.

8- 3600. Alamosa River near Monticello, N. Mex.

Location.--Lat 33°34'10", long 107°36'20", in SW $\frac{1}{4}$ sec.31, T.8 S., R.7 W., on left bank at Alamosa damsite and old Fort Ojo Caliente, just downstream from Wildhorse Creek, 15 miles northwest of Monticello.

Drainage area.--403 sq mi.

Records available.--October to December 1929, May 1931 to April 1942, July 1956 to June 1958 (annual maximum only), July 1958 to September 1961. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder and crest-stage gage. Datum of gage is 6,142.04 ft above mean sea level, datum of 1929. Prior to Aug. 17, 1930, at different datum. May 2, 1931, to Dec. 14, 1939, water-stage recorder at datum 0.20 ft lower and Dec. 15, 1939, to Apr. 17, 1942, at present datum. July 16, 1956, to July 27, 1958, crest-stage gage only at present site and datum.

Average discharge.--13 years (1931-41, 1958-61), 8.23 cfs (5,960 acre-ft per year).

Extremes.--Maximum discharge during year, 1,530 cfs Sept. 14 (gage height, 5.6 ft); minimum daily, 6.2 for several days.

1931-42, 1956-61: Maximum discharge, 10,300 cfs Aug. 21, 1936 (gage height, 13.6 ft), from rating curve extended above 390 cfs on basis of slope-area measurements at gage heights 6.66 and 12.0 ft; minimum daily recorded, 5.6 cfs Jan. 9, 1932, Aug. 28-30, Sept. 3, 1936.

Maximum flood known probably occurred in 1895, from information by local residents. A flood in August 1943 was highest since 1917.

Remarks.--Records good. No diversion above station. Entire normal flow diverted below station for irrigation.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	* 4.7	6.6	7.0	6.8	6.4	6.8	7.3	7.0	7.3	7.0	6.6	7.0
2	8.8	6.6	7.0	6.8	6.2	6.8	7.3	7.0	7.0	7.0	6.4	6.8
3	8.0	6.6	7.0	6.8	6.2	6.8	7.0	7.0	7.0	7.0	6.4	6.8
4	7.8	6.6	6.8	6.6	6.4	6.8	7.0	7.0	7.0	11	6.2	6.8
5	7.5	* 6.6	6.8	6.6	6.4	6.8	7.0	7.0	7.0	7.5	6.2	6.8
6	7.5	6.6	6.8	6.6	6.4	6.8	7.0	7.0	6.8	* 7.3	* 6.4	11
7	7.3	6.6	6.8	6.6	6.4	6.8	7.0	7.0	6.8	6.8	6.4	9.6
8	7.3	6.6	7.0	6.6	6.2	6.8	6.8	7.0	6.8	6.8	6.4	33
9	7.5	6.4	6.8	6.6	6.4	6.8	6.8	7.0	7.0	7.8	6.6	52
10	7.5	6.6	6.8	6.6	* 6.4	6.8	7.0	7.0	7.0	12	6.6	14
11	7.5	6.6	6.8	* 6.6	6.4	7.0	7.3	7.0	7.0	7.5	11	15
12	7.5	6.4	6.8	6.6	6.4	6.8	7.3	7.0	7.0	6.6	7.0	7.8
13	7.0	6.6	7.0	6.4	6.2	6.8	7.3	7.0	7.0	6.4	7.0	27
14	7.3	6.4	7.0	6.4	6.4	6.8	* 7.0	7.0	7.3	6.4	8.0	55
15	7.3	6.6	6.8	6.4	6.4	* 6.8	7.5	7.0	7.3	6.4	7.0	8.0
16	9.2	6.6	6.8	6.4	6.4	6.8	7.5	7.0	7.3	6.4	4.0	6.8
17	11	6.6	6.8	6.4	6.4	6.8	7.3	* 7.0	7.3	6.4	18	6.6
18	7.3	6.6	6.8	6.4	6.6	6.8	7.0	7.0	7.3	6.4	28	6.4
19	7.3	6.6	* 6.8	6.4	6.6	7.0	7.0	7.3	7.0	6.4	16	6.2
20	* 7.3	6.8	6.8	6.6	6.6	7.0	7.0	7.0	7.0	6.4	7.0	6.2
21	7.5	6.8	6.8	6.6	6.6	7.0	7.0	7.0	7.0	6.6	7.0	6.4
22	7.3	7.0	6.8	6.6	6.6	6.8	7.0	7.0	7.3	6.6	7.3	6.4
23	7.0	7.0	6.8	6.6	6.6	6.8	7.0	7.0	7.3	6.6	7.0	6.4
24	7.0	7.0	6.8	6.8	6.6	6.8	7.0	7.0	7.3	6.6	7.0	6.4
25	7.0	7.0	7.0	6.8	6.6	7.0	7.0	7.0	7.0	6.6	7.0	6.4
26	7.0	7.0	7.0	7.0	6.6	7.0	7.0	7.0	7.0	6.6	7.0	* 6.4
27	7.0	7.0	6.8	7.0	6.6	7.0	7.0	7.0	7.0	6.6	7.3	6.4
28	7.0	7.0	6.8	6.4	6.6	6.8	7.0	7.0	7.0	6.8	14	51
29	7.0	7.0	7.0	6.2	-	6.8	7.0	7.3	7.0	6.8	7.5	7.8
30	6.8	7.0	7.0	6.4	-----	6.8	7.0	7.3	6.8	7.8	7.0	7.0
31	6.8	-----	6.8	6.4	-----	7.0	-----	7.3	-----	7.0	7.0	-----
Total	272.3	201.4	212.8	204.0	180.6	212.4	212.4	218.2	211.9	220.1	298.3	409.4
Mean	8.78	6.71	6.86	6.58	6.45	6.85	7.08	7.04	7.06	7.10	9.62	13.6
Ac-Ft	540	399	422	405	358	421	421	433	420	437	592	812

Calendar year 1960: Max 47 Min 5.8 Mean 7.19 Ac-Ft 5,220
 Water year 1960-61: Max 55 Min 6.2 Mean 7.82 Ac-Ft 5,660

Peak discharge (base, 1,000 cfs).--Sept. 14 (2:30 p.m.) 1,530 cfs (5.6 ft); Sept. 28 (4:40 p.m.) 1,060 cfs (4.95 ft).

* Discharge measurement made on this day.

RIO GRANDE BASIN

8-3610. Rio Grande below Elephant Butte Dam, N. Mex.

Location.--Lat 33°08'45", long 107°12'20", in SW $\frac{1}{4}$ sec.25, T.13 S., R.4 W. (projected), in Pedro Armendaris Grant, on left bank 1.0 mile downstream from dam and $\frac{1}{2}$ miles upstream from Cuchillo Negro River.

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

Records available.--October 1916 to September 1961.

Gage.--Water-stage recorder. Datum of gage is 4,242.09 ft above mean sea level, datum of 1929. Prior to Jan. 1, 1931, at one of three sites 0.1 to 1.0 mile upstream at different datums. Jan. 1, 1931, to Jan. 16, 1939, at site 400 ft downstream from dam at datum 12.80 ft higher than present datum. Jan. 17, 1939, to Dec. 31, 1940, at site 0.7 mile upstream at datums 0.06 ft lower and 1.36 ft lower Jan. 17 to Mar. 29, 1939, and Mar. 30, 1939, to Dec. 31, 1940, respectively. Jan. 1, 1941, to Apr. 23, 1942, at site 128 ft upstream from preceding gage at datum 0.91 ft lower than present gage.

Average discharge.--45 years, 1,059 cfs (766,700 acre-ft per year).

Extremes.--Maximum daily discharge during year, 1,880 cfs Mar. 21-22; minimum daily, 2.8 cfs Nov. 17. 1916-61: Maximum daily discharge, 8,220 cfs May 22, 1942; no flow at times prior to 1929.

Remarks.--Records good. Discharge measurements generally made 2 or 3 times a month. Flow regulated by Elephant Butte Reservoir (see p. 150). Diversion for irrigation of about 800,000 acres above station.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	74	129	5.6	7.1	1.250	1.820	1.130	1.160	1.260	1.620	1.500	4.66
2	84	127	5.6	a7	1.310	1.860	1.110	1.180	1.260	1.510	1.490	3.01
3	64	50	6.1	a6.5	1.310	1.840	1.130	1.180	1.260	1.500	1.500	6.1
4	5.6	6.6	6.6	a6	1.320	1.850	1.130	1.170	1.260	1.510	1.510	3.08
5	5.2	6.1	7.7	a5.5	1.310	1.350	1.140	1.180	992	1.530	1.530	2.98
6	4.7	6.1	10	5.2	1.320	1.850	1.150	1.180	921	1.540	1.530	4.1
7	5.2	6.1	6.6	5.2	1.320	1.850	1.140	1.190	911	1.530	1.540	8.2
8	5.2	6.1	7.1	5.2	1.320	1.840	1.130	1.190	902	1.510	1.560	a7.0
9	5.2	6.6	7.1	4.7	1.320	1.860	1.140	1.190	1.110	1.510	1.550	a7.0
10	5.6	5.2	7.1	4.7	1.330	1.860	1.140	1.200	1.220	1.500	1.560	a7.0
11	4.7	3.9	a7	7.2	1.320	1.860	1.150	1.200	1.200	1.520	1.570	a7.0
12	3.1	3.5	a6	9.4	1.330	1.430	1.140	1.220	1.180	1.500	1.570	a7.0
13	3.1	3.5	a5	16	1.330	1.860	1.140	1.220	1.190	1.500	1.570	a6.8
14	3.1	3.9	a6	16	1.340	1.860	1.150	1.220	1.240	1.500	1.580	a6.8
15	3.9	3.1	a6	15	1.230	1.870	1.170	1.070	1.240	1.490	1.540	a6.8
16	3.9	3.1	a6	15	1.360	1.870	1.150	1.240	1.210	1.510	1.540	a6.8
17	14	2.8	a5.5	16	1.360	1.870	1.150	1.200	1.240	1.520	1.540	a6.8
18	7.7	3.1	a5.5	16	1.360	1.860	1.150	1.190	1.240	1.540	1.540	a6.8
19	4.3	3.5	5.6	16	1.370	1.360	1.140	1.180	1.240	1.540	1.530	a5.8
20	3.9	3.5	a5.5	17	1.370	1.860	1.140	1.180	1.260	1.420	1.540	a5.7
21	4.7	3.5	a5.5	1.11	1.370	1.880	1.120	1.180	1.260	1.410	1.180	a6.5
22	4.7	3.1	5.6	18	1.350	1.880	1.120	1.070	1.270	1.410	1.020	a6.3
23	3.9	3.5	5.6	17	1.360	1.870	1.130	1.200	1.310	1.420	1.010	a6.1
24	3.9	3.5	5.6	16	1.340	1.860	1.130	1.200	1.300	1.400	1.120	a5.9
25	5.2	3.1	5.6	16	1.340	1.850	1.120	1.190	1.260	1.440	1.140	a5.7
26	4.7	3.5	5.6	17	1.340	1.350	1.110	1.190	1.250	1.410	1.130	a5.5
27	6.1	4.3	5.6	14	1.340	1.870	1.110	1.190	1.240	1.390	1.040	a5.6
28	5.2	3.9	5.2	14	1.340	1.870	1.100	1.190	1.240	1.400	1.260	a5.8
29	5.6	3.9	5.6	14	-	1.850	1.110	1.200	1.240	1.420	1.140	a5.9
30	5.2	4.3	5.6	13	-----	1.850	1.110	1.200	1.240	1.400	1.140	a6.0
31	6.8	-----	5.6	25	-----	1.860	-----	1.280	-----	1.400	1.130	-----
Total	4 27.6	4 19.3	1 89.7	4 76.7	3 72.60	5 5.670	3 3.980	3 5.830	3 5.946	4 5.800	4 3.120	1 576.9
Mean	13.8	14.0	6.12	15.4	1,331	1,796	1,133	1,188	1,198	1,477	1,391	52.6
Ac-ft	848	832	376	946	73,900	110,400	67,400	73,050	71,300	90,840	85,530	3,130

Calendar year 1960: Max 1,830 Min 2.8 Mean 918 Ac-ft 666,800

Water year 1960-61: Max 1,880 Min 2.8 Mean 799 Ac-ft 578,600

a No gage-height record.

8-3625. Rio Grande below Caballo Dam, N. Mex.

Location.--Lat 32°53'05", long 107°17'30", in NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.30, T.16 S., R.4 W., on left bank 600 ft upstream from Borjarquez Bridge, 4,200 ft downstream from Caballo Dam, $1\frac{1}{4}$ miles downstream from Apache Canyon, $1\frac{1}{3}$ miles upstream from Percha diversion dam, 3 miles northeast of Arrey, and 5 miles south of Caballo.

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

Records available.--January 1938 to September 1961.

Gage.--Water-stage recorder. Datum of gage is 4,140.9 ft above mean sea level, datum of 1929. Prior to Oct. 7, 1938, at datum 7.0 ft higher, Oct. 7-12, 1938, at datum 6.0 ft higher, and Oct. 13, 1938, to Dec. 31, 1945, at datum 5.0 ft higher than present datum.

Average discharge.--23 years, 944 cfs (683,400 acre-ft per year).

Extremes.--Maximum daily discharge during year, 2,820 cfs Mar. 25; minimum daily, 0.8 cfs Jan. 5.

1938-61: Maximum daily discharge, 7,650 cfs May 20, 1942; minimum daily, 0.1 cfs Oct. 31 to Nov. 14, 1954, Nov. 7 to Dec. 31, 1955.

Remarks.--Records good. Flow regulated by Caballo Reservoir (capacity, 344,000 acre-ft, 1958 survey) and Elephant Butte Reservoir (capacity, 2,195,000 acre-ft, 1961 survey). Diversions for irrigation of about 800,000 acres above station. Figures of daily discharge do not include Bonita ditch which diverts directly from Caballo Dam and bypasses station for irrigation below. See monthly table below for record of ditch.

Cooperation.--Records furnished by Bureau of Reclamation.

Discharge, in cubic feet per second, water year October 1960 to September 1961												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.0	1.5	1.6	1.1	1.2	1.4	1.680	740	1.130	1.980	1.900	1.620
2	2.0	1.5	1.6	1.1	1.2	1.4	1.600	748	1.260	1.940	1.850	1.510
3	1.9	1.5	1.6	1.0	1.2	1.4	1.580	745	1.390	1.750	1.850	1.520
4	1.8	1.5	1.6	.9	1.2	1.4	1.480	759	1.380	1.700	1.880	1.500
5	1.8	1.5	1.5	.8	1.2	1.4	1.300	866	1.370	1.720	1.910	1.430
6	1.8	1.5	1.5	1.3	1.2	1.4	1.220	957	1.450	1.750	1.780	703
7	1.8	1.5	1.5	1.3	1.2	1.4	1.200	982	1.550	1.800	1.680	385
8	1.8	1.5	1.5	1.3	1.2	1.4	1.180	968	1.550	1.800	1.740	864
9	1.8	1.5	1.5	1.3	1.1	1.4	1.100	1,070	1.660	1.790	1.810	424
10	1.8	1.5	1.5	1.3	1.1	811	1,040	1,160	1.770	1.720	1.800	211
11	1.8	1.5	1.5	1.2	1.1	1,490	892	1,100	1.790	1.660	1,950	1.3
12	1.8	1.5	1.5	1.2	1.2	1,510	807	1,120	1.710	1.630	1,950	1.3
13	1.7	1.5	1.5	1.2	1.2	1,740	813	1,120	1.750	1,480	1,740	1.3
14	1.7	1.5	1.5	1.2	1.2	2,270	796	1,110	1,840	1,540	1,320	1.3
15	1.8	1.5	1.5	1.2	1.2	2,680	794	1,090	1,640	1,670	453	1.3
16	1.8	1.5	1.4	1.2	1.2	2,660	809	1,070	1,610	1,690	286	1.3
17	1.9	1.5	1.4	1.2	1.2	2,750	810	1,070	1,610	1,720	508	1.3
18	1.9	1.5	1.4	1.2	1.2	2,790	956	1,080	1,600	1,990	516	1.3
19	1.8	1.6	1.4	1.2	1.2	2,800	999	1,180	1,510	2,200	638	1.3
20	1.7	1.6	1.4	1.2	1.3	2,800	1,120	1,250	1,500	2,250	785	1.3
21	1.7	1.6	1.4	1.2	1.3	2,740	1,210	1,250	1,530	2,320	798	1.3
22	1.7	1.6	1.4	1.3	1.3	2,720	1,190	1,240	1,470	2,330	1,300	1.3
23	1.7	1.6	1.3	1.3	1.3	2,740	1,180	1,250	1,460	2,350	1,550	1.3
24	1.7	1.6	1.3	1.3	1.3	2,770	1,130	1,280	1,470	2,340	1,610	1.3
25	1.7	1.6	1.3	1.2	1.3	2,820	1,070	1,270	1,480	2,220	1,870	1.3
26	1.7	1.6	1.2	1.2	1.4	2,720	1,010	1,230	1,580	2,070	2,060	1.3
27	1.6	1.6	1.2	1.2	1.4	2,600	865	1,180	1,650	2,060	2,190	1.3
28	1.6	1.6	1.2	1.2	1.4	2,420	783	1,160	1,670	2,140	2,190	1.3
29	1.6	1.6	1.2	1.3	-	2,310	796	1,100	1,660	2,190	2,180	1.4
30	1.6	1.6	1.2	1.3	-----	2,320	763	1,100	1,840	2,130	2,000	1.4
31	1.6	-----	1.2	1.3	-----	1,990	-----	1,140	-----	2,030	1,850	-----
Total	54.6		43.8		34.5		321.73		468.80		479.44	
Mean	1.76	1.54	1.41	1.20	1.23	1,692	1,072	1,077	1,563	1,934	1,547	1,019.32
Ac-ft	108	92	87	74	68	104,100	63,810	66,220	92,990	118,900	95,100	20,220
(†)	0	0	0	0	0	262	165	33	173	178	214	18

Calendar year 1960: Max 3,130 Min 1.1 Mean 971 Ac-ft 705,200

Water year 1960-61: Max 2,820 Min 0.8 Mean 776 Ac-ft 561,800

† Diversion, in acre-feet, by Bonita ditch. Bonita ditch diverts directly from Caballo Dam and this diversion is not included in the river records.

8-3636. Las Cruces Arroyo near Las Cruces, N. Mex.

Note.--Records for 1961 water year have been withheld pending better definition of stage-discharge relationship. They will be published in a subsequent report.

8-3656. McKelligon Canyon at El Paso, Tex.

Location.--Lat 31°49'20", long 106°28'15", on left bank 200 ft south of McKelligon Canyon drive, 0.5 mile south of crest of Sugarloaf Mountain, 1.6 miles west of U. S. Highway 54, and 4 miles north of El Paso business center.

Drainage area.--2.3 sq mi, approximately.

Records available.--June 1958 to September 1961.

Gage.--Water-stage recorder and small earth-fill dam with uncontrolled concrete outlet tower. Altitude of gage is 4,250 ft (from topographic map).

Extremes.--No flow during year.

1958-61: Maximum discharge, 76 cfs Sept. 11, 1958 (on basis of culvert measurement of peak flow); no flow except Sept. 11, 12, 1958.

Remarks.--No flow since Sept. 12, 1958. Flood flow controlled by two small reservoirs upstream.

8-3657. Inlet to Fort Bliss sump area at El Paso, Tex.

Location.--Lat 31°50'20", long 106°25'23", on right bank at culvert No. 1303.10 on Southern Pacific Railroad at northeast corner of El Paso Golf Course, 1 mile east of U. S. Highway 54 and 5 miles northeast of El Paso business section.

Drainage area.--3.5 sq mi, approximately.

Records available.--June 1958 to November 1961. Station discontinued.

Gage.--Water-stage recorder. Datum of gage is 3,868.47 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 423 cfs July 4 (gage height, 3.50 ft); no flow for most of time.

1958-61: Maximum discharge, 675 cfs Sept. 11, 1958 (gage height, 4.94 ft), on basis of contracted-opening measurement of peak flow; no flow for most of time.

Remarks.--Records fair above 100 cfs, poor below.

Discharge, in cubic feet per second, for period October 1960 to November 1961

Oct. 17. 2.8	July 4 *30	Sept. 8 15
Dec. 9. *1.4	54	Nov. 13 **1
30.2	31 3.6	14 *.8
Jan. 24.9	Aug. 161	21 11
June 15. 2.0	Sept. 65	22 20

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
October 1960	2.8	2.8	0	0.09	5.6
December	1.6	1.4	0	.05	3.2
January 1961	.9	.9	0	.03	1.8
June	2.0	2.0	0	.07	4.0
July	34.0	30	0	1.10	67
August	.1	.1	0	.003	.2
September	15.5	15	0	.52	31
November	31.9	20	0	1.06	63
Calendar year 1960	-	38	0	.20	146
Water year 1960-61	-	30	0	.16	113

Peak discharge (base, 300 cfs).--July 4 (6 p.m.) 423 cfs (3.50 ft).

* Discharge measurement made on this day.

** Field estimate made on this day.

Note.--Flow occurred only on days listed above. Observations of no flow generally made once a month.

8-3658. Government ditch at El Paso, Tex.

Location.--Lat 31°47'02", long 106°26'04", at intersection of Montana and Houston Streets, 2 miles northeast of the business center of El Paso.

Drainage area.--6.4 sq mi, approximately.

Records available.--June 1958 to September 1961.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 3,740 ft (from topographic map).

Extremes.--Maximum discharge during year, 348 cfs Sept. 8 (gage height, 2.16 ft); no flow for most of time.

1958-61: Maximum discharge, 550 cfs Sept. 11, 1958 (gage height, 2.64 ft), from rating curve extended above 6 cfs on basis of slope-area measurement of peak flow and velocity-area study; no flow for most of time.

Remarks.--Records fair.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Oct. 16. 0.4	Dec. 30. 0.9	July 22. 0.1	Aug. 20. *2.2
17. 3.4	Jan. 24. 1.2	31. 4.2	Sept. 6.6
Dec. 9. * .9	June 18.1	Aug. 14.1	8. 17
10.1	27.1	15.1	9.1
13.4	July 4. 10	16. 1.9	

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
October 1960.	3.8	3.4	0	0.12	7.5
December.	2.3	.9	0	.07	4.6
January 1961.	1.2	1.2	0	.04	2.4
June.	.2	.1	0	.007	.4
July.	14.3	10	0	.46	28
August.	4.3	2.2	0	.14	8.5
September	17.7	17	0	.59	35
Calendar year 1960.	17.3	3.8	0	.05	34.5
Water year 1960-61.	43.8	17	0	.12	86.4

Peak discharge (base, 100 cfs).--July 4 (4:40 p.m.) 130 cfs (1.21 ft); Sept. 8 (4:30 p.m.) 348 cfs (2.16 ft).

* Discharge measurement made on this day.

Note.--Flow occurred only on days listed above. Observations of no flow generally made once a month.

8-3785. Pecos River near Pecos, N. Mex.

Location.--Lat 35°42'25", long 105°41'00", in NE¼NE¼ sec.17, T.17 N., R.12 E., on left bank at downstream side of bridge on private road, 600 ft upstream from Indian Creek, 2 miles downstream from Holy Ghost Creek, and 9 miles north of Pecos.

Drainage area.--189 sq mi (contributing area).

Records available.--August 1919 to September 1961. Monthly discharge only for some periods, published in WSP 1312. Published as "near Cowles" 1919-25, "at Irvins Ranch" 1926-29, and as "at Irvins Ranch, near Pecos" 1930-39.

Gage.--Water-stage recorder. Datum of gage is 7,502.94 ft above mean sea level, datum of 1929.

Average discharge.--42 years, 102 cfs (73,840 acre-ft per year).

Extremes.--Maximum discharge during year, 647 cfs Aug. 23 (gage height, 3.76 ft); minimum daily, 10 cfs Dec. 10, Jan. 27. 1919-61: Maximum discharge, about 4,500 cfs Sept. 21 or 22, 1929 (gage height, 6.2 ft, from floodmark), from rating curve extended above 1,600 cfs by logarithmic plotting; minimum daily, 6 cfs Dec. 22, 23, 1956, Jan. 18, 22, 30, 1957. Flood of Sept. 29, 1904, was greatest since 1886, from information by local residents.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of about 75 acres (1959 determination) above station.

Rating tables, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.8	10	2.7	164
1.9	19	3.0	255
2.1	41	3.5	480
2.4	92		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	33	42	28	27	21	22	40	357	370	99	67	*143
2	31	41	26	24	20	23	40	415	357	92	90	131
3	30	40	29	22	*18	*25	47	469	326	107	105	141
4	31	40	27	24	16	25	74	469	302	92	86	138
5	30	40	22	*25	15	25	119	425	283	88	78	128
6	*30	40	15	26	14	21	*99	357	269	90	72	116
7	30	51	13	27	16	23	101	318	255	133	62	105
8	29	*54	20	28	19	24	88	280	242	126	58	101
9	30	45	15	30	23	26	74	269	232	114	54	121
10	36	35	10	27	24	25	80	306	222	128	57	107
11	31	35	15	25	25	26	80	375	216	107	62	101
12	30	34	20	27	25	31	72	452	210	110	99	96
13	29	35	*25	25	26	33	82	464	192	114	99	*88
14	28	35	28	25	24	37	*80	400	*189	*99	101	88
15	35	31	30	25	25	45	74	357	210	94	110	86
16	41	22	28	25	*25	48	72	344	232	90	189	88
17	60	26	30	26	23	41	90	*352	198	86	314	80
18	52	20	32	27	21	36	128	*362	198	82	*272	80
19	*45	20	34	25	17	34	198	400	178	82	229	112
20	41	22	31	23	17	31	272	447	172	76	198	101
21	47	24	28	21	18	33	294	464	154	70	181	88
22	48	18	*29	22	18	*39	306	464	146	*69	172	82
23	49	*20	30	23	21	48	326	469	138	64	366	80
24	54	22	31	*22	16	55	322	474	131	62	298	76
25	54	24	32	20	17	54	283	464	124	62	269	72
26	55	27	31	22	21	48	252	442	119	55	235	70
27	57	30	31	10	22	42	229	420	116	*57	219	67
28	57	27	29	15	20	41	235	410	*105	64	216	67
29	54	25	30	12	-	40	276	405	101	54	192	64
30	47	30	29	19	-----	39	322	395	96	52	175	64
31	44	-----	28	20	-----	39	-----	390	-----	57	156	-----
Total	1,268	955	806	719	567	1,079	4,755	12,415	6,083	2,675	4,881	2,881
Mean	40.9	31.8	26.0	23.2	20.2	34.8	158	400	203	86.3	157	96.0
Ac-ft	2,520	1,890	1,600	1,430	1,120	2,140	9,430	24,620	12,070	5,310	9,680	5,710

Calendar year 1960: Max 712 Min 10 Mean 105 Ac-ft 76,130
 Water year 1960-61: Max 474 Min 10 Mean 107 Ac-ft 77,520

Peak discharge (base, 310 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
5-3	10:00p.m.	3.58	528	8-23	8:00a.m.	3.76	647
8-17	7:50a.m.	3.33	390				

* Discharge measurement made on this day.
 Note.--Stage-discharge relation affected by ice Nov. 10-13, Nov. 16 to Feb. 16, Feb. 18-22, Feb. 24 to Mar. 2, Mar. 6-11 (no gage-height record Nov. 25 to Dec. 12, Jan. 16-25).

8-3792. Tecolote Creek near San Pablo, N. Mex.

Location--Lat 35°33'10", long 105°22'10", in Las Vegas Grant, half a mile downstream from San Pablo Creek and 1½ miles northeast of San Pablo.

Drainage area--83 sq mi, approximately.

Records available--June 1960 to September 1961.

Gage--Water-stage recorder. Altitude of gage is 6,730 ft (from topographic map).

Extremes--Maximum discharge during year, 10,900 cfs Aug. 17 (gage height, 15.57 ft), from rating curve extended above 320 cfs on basis of slope-area measurements at gage heights 10.50 and 15.57 ft; minimum daily, 0.4 cfs Oct. 8-14.
1960-61: Maximum discharge, that of Aug. 17, 1961; minimum, 0.4 cfs Sept. 21, 27, Oct. 8-14, 1961.

Remarks--Records good except those for periods of ice effect or doubtful gage-height record, which are fair. Diversions for irrigation of about 250 acres (1960 determination) above station.

Rating tables, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Jan. 30, 31, Feb. 4, 11-17, 19, 23, 26, 27)

Oct. 1 to Apr. 10

Apr. 11 to Sept. 30

0.55	0.4	1.0	9.9	0.6	1.7	1.7	69
.6	.6	1.1	15	.7	3.4	2.3	156
.7	1.5	1.3	28	.8	5.8	3.0	311
.8	3.2	1.6	55	1.0	13	5.2	960
.9	6.0	2.1	123	1.3	31		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.6	7.2	3.0	2.8	5.0	3.6	1.4	3.4	4.6	3.9	2.7	4.4
2	.6	6.4	2.8	2.8	6.4	3.6	1.3	3.4	3.9	3.6	1.9	4.1
3	.5	6.0	3.0	2.8	6.8	4.2	1.3	3.4	3.9	3.2	1.0	4.6
4	.5	5.6	2.7	2.8	4.2	4.4	1.8	*3.4	4.1	2.9	7.7	4.1
5	.5	5.3	2.5	3.0	3.6	4.7	3.5	3.3	3.6	2.6	1.2	3.6
6	.5	5.3	2.2	3.0	3.5	4.4	4.8	3.0	3.1	2.4	7.7	3.3
7	*.5	6.4	2.2	3.0	3.5	4.7	6.6	2.8	3.2	8.0	*5.3	3.0
8	.4	8.7	2.2	3.0	*3.7	4.4	6.4	2.5	*1.8	6.6	4.1	2.8
9	.4	7.2	2.2	3.0	3.9	4.7	10.7	2.2	4.6	1.8	4.1	2.7
10	.4	6.4	2.2	3.0	4.2	5.0	12.1	2.1	3.4	1.1	5.1	2.5
11	.4	6.0	2.5	3.2	5.0	*4.7	*10.1	2.0	3.2	4.2	3.1	2.3
12	.4	5.3	2.5	3.2	6.8	5.0	7.7	1.9	2.9	*6.6	3.7	2.2
13	.4	5.0	2.5	3.2	6.0	5.0	7.9	1.9	2.4	*4.0	5.8	2.0
14	.4	4.7	2.5	3.2	5.0	5.3	6.9	1.8	2.2	2.3	6.3	d 3.7
15	.9	4.7	2.5	3.3	5.0	6.4	5.7	1.7	3.6	2.3	4.9	d 2.0
16	2.2	*3.9	2.5	3.5	5.0	7.6	4.7	1.5	8.0	1.4	1.80	d 1.6
17	*1.19	4.2	3.0	*3.3	5.3	8.7	4.3	1.4	10	1.1	*9.43	d 1.4
18	5.4	3.6	3.0	3.0	5.0	8.7	4.3	1.4	9.0	1.1	2.32	d 1.8
19	3.9	3.6	3.0	2.7	4.2	8.7	5.2	1.3	7.4	1.0	*1.36	d 2.2
20	1.8	3.9	2.5	3.0	3.9	8.7	6.9	1.2	1.4	9.4	9.7	*d 1.4
21	1.5	3.6	2.5	3.2	3.9	1.1	6.6	9.8	7.1	*8.0	*7.1	1.3
22	1.3	3.4	2.5	3.5	3.9	1.3	6.1	10	1.5	7.7	*4.18	1.2
23	1.3	3.2	3.0	4.0	3.9	1.4	5.8	9.4	2.2	7.1	*3.70	1.1
24	1.3	3.2	3.0	3.5	3.9	1.7	5.4	9.8	1.4	6.1	1.91	1.1
25	1.3	3.2	2.8	3.7	4.0	1.9	4.7	9.8	1.1	5.6	1.31	1.0
26	1.2	3.2	2.8	3.5	3.9	1.8	4.2	9.0	8.7	4.8	1.24	9.4
27	1.1	3.0	2.8	2.5	4.2	1.6	3.7	8.4	7.4	4.6	1.33	9.0
28	1.1	3.0	*2.8	3.5	4.2	1.5	3.3	7.4	*6.1	5.1	1.12	9.0
29	9.9	2.6	2.8	4.5	-	1.4	3.2	6.4	4.8	3.2	8.1	8.4
30	8.7	2.8	2.8	5.6	-----	1.4	3.2	5.6	3.9	2.9	6.5	8.0
31	8.0	-----	2.8	5.3	-----	1.4	-----	5.1	-----	2.9	5.3	-----
Total	387.0	140.6	82.1	103.6	127.9	277.5	1,598	546.7	215.1	429.0	3,652.7	6,578
Mean	12.5	4.69	2.65	3.34	4.57	8.95	53.3	17.6	7.17	13.8	1.18	21.9
Ac-ft	768	279	163	205	254	550	3,170	1,080	427	851	7,250	1,300

Calendar year 1960: Max — Min — Mean — Ac-ft —
Water year 1960-61: Max 943 Min 0.4 Mean 22.5 Ac-ft 16,300

Peak discharge (base, 250 cfs, revised)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
4-9	5:00p.m.	2.80	272	8-11	10:45p.m.	2.92	290
7-8	4:10a.m.	3.53	461	8-17	12:45a.m.	15.57	10,900
7-11	7:15p.m.	2.81	262	8-22	5:00p.m.	10.50	3,490
7-12	8:00p.m.	4.21	663				

* Discharge measurement made on this day.
d Doubtful gage-height record.

Note.--Stage-discharge relation affected by ice Nov. 16, 18, 19, 21-24, 28-30, Dec. 4 to Jan. 29, Feb. 1-3, 5-10, 18, 20-22, 24, 25, 28, Mar. 1, 8, 9.

8-3795. Pecos River near Anton Chico, N. Mex.

Location.--Lat 35°10'50", long 105°06'20", in Anton Chico Grant, on right bank 2 miles upstream from Canyon Blanco, 2½ miles southeast of Anton Chico, and 10 miles downstream from Tecolote Creek.

Drainage area.--1,050 sq mi, approximately (contributing area).

Records available.--April 1910 to May 1916, October 1916 to September 1924, August to December 1925, January 1927 to September 1961. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder. Altitude of gage is 5,130 ft (from river-profile map). Prior to July 2, 1937, at five different sites from one-sixth mile to 8½ miles upstream at various datums. July 2, 1937, to June 21, 1951, at site 345 ft upstream at datum 2.42 ft higher.

Average discharge.--48 years (1910-15, 1916-24, 1926-61), 143 cfs (103,500 acre-ft per year).

Extremes.--Maximum discharge during year, 11,800 cfs Aug. 17 (gage height, 12.60 ft), from rating curve extended above 5,800 cfs on basis of slope-area measurement at gage height 16.62 ft; minimum daily, 1 cfs Oct. 1, 7-11, 14.

1911-61: Maximum discharge, 40,300 cfs June 1, 1937 (gage height, 20.34 ft, from floodmarks, at site and datum then in use), by slope-area measurement; no flow at times.

The greatest flood since 1879 occurred Sept. 29, 1904 (discharge, about 73,000 cfs), from information by a local resident.

Remarks.--Records fair except those for periods of ice effect or no gage-height record and those below 10 cfs, which are poor.

Diversion above station for irrigation of about 4,900 acres (1959 determination) above and below station. Bado de Juan Pais ditch (see table below) diverts water about 8 miles above gage and bypasses this station on left bank; ditch flow not included in record. Discharge measurements made at point opposite regular gage. A portion of this flow may be returned to the river about five miles downstream.

Discharge measurements, in cubic feet per second, of Bado de Juan Pais ditch, water year October 1960 to September 1961

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
Dec. 22	4	Mar. 29	0	May 2	20	July 11	15
Jan. 17	2	Apr. 10	0	June 6	18	Aug. 3	36
Feb. 9	16	13	0	21	30	19	2
Mar. 9	0	18	0	29	22	Sept. 8	26

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1	39	22	19	14	27	63	393	338	179	8	a160
2	2	38	22	15	10	25	58	*421	312	93	21	a150
3	2	38	23	b12	10	24	58	474	298	66	*352	a140
4	2	38	24	b12	11	25	55	525	278	54	85	a130
5	*2	36	24	14	11	27	70	525	248	56	79	a150
6	3	38	22	b12	b11	30	165	488	*225	42	61	a140
7	1	38	22	13	b9	30	212	421	214	38	34	a130
8	1	40	b20	15	8	30	272	369	199	107	22	*125
9	1	47	b20	15	*8	*30	237	305	181	167	11	127
10	1	49	b10	16	10	30	*272	263	169	111	9	158
11	1	45	b20	15	8	30	308	298	158	*147	10	158
12	3	40	b26	13	9	31	282	353	163	319	418	158
13	3	39	b32	13	25	31	*231	434	141	188	159	104
14	1	*39	b27	16	26	33	228	470	123	118	757	88
15	4	38	b25	15	24	34	223	401	121	90	379	114
16	26	36	23	16	23	38	201	345	143	143	223	91
17	222	34	19	*13	25	55	194	319	196	80	3150	78
18	*232	32	23	10	25	68	*189	323	163	55	*1190	181
19	111	24	31	14	25	70	223	326	160	45	*981	346
20	90	24	34	14	25	66	338	365	158	40	698	179
21	61	22	24	12	24	59	474	413	*165	68	570	*137
22	48	22	*22	11	22	52	515	438	123	66	672	114
23	45	22	22	10	23	54	515	434	111	18	1620	99
24	44	22	31	11	26	62	520	466	101	14	1090	88
25	42	22	29	14	26	76	502	461	91	9	a550	86
26	43	22	25	13	24	91	438	466	94	7	a550	76
27	43	22	22	11	24	86	393	434	88	7	a300	59
28	44	25	20	b5	26	75	338	409	69	8	a600	54
29	44	28	18	8	-	*70	338	385	*58	12	a300	54
30	44	27	b20	10	-----	72	353	357	43	9	a200	49
31	43	-----	18	b12	-----	70	-----	341	-----	8	a180	-----
Total	1,210	986	720	399	512	1,501	8,265	12,422	4,931	2,364	15,279	3,723
Mean	39.0	32.9	23.2	12.9	18.3	48.4	276	401	164	76.3	493	124
Ac-ft	2,400	1,960	1,430	791	1,020	2,980	16,390	24,640	9,780	4,690	30,310	7,380

Calendar year 1960: Max 1,210 Min 1 Mean 126 Ac-ft 91,540
 Water year 1960-61: Max 3,150 Min 1 Mean 143 Ac-ft 103,800

Peak discharge (base 3,000 cfs).--Aug. 17 (6 a.m.) 11,800 cfs (12.60 ft); Aug. 22 (11:30 p.m.) 4,490 cfs (8.54 ft).

* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

8-3805. Gallinas River near Montezuma, N. Mex.

Location.--Lat 35°39'00", long 105°19'10", in Las Vegas Grant, on left bank 2 miles west of Montezuma, San Miguel County, and 6 miles northwest of Las Vegas.

Drainage area.--84 sq mi, approximately.

Records available.--March to September 1915, June 1916 to September 1961. Monthly discharge only for some periods, published WSP 1312.

Gage.--Water-stage recorder. Altitude of gage is 6,950 ft (from topographic map).

Average discharge.--45 years (1916-61), 20.8 cfs (15,060 acre-ft per year).

Extremes.--Maximum discharge during year, 1,380 cfs Aug. 22 (gage height, 4.63 ft), from rating curve extended above 530 cfs on basis of computation of peak flow over dam at gage height 8.25 ft and slope-area measurement at gage height 5.25 ft; minimum daily, 4.6 cfs Oct. 14.

1915-61: Maximum discharge, 5,400 cfs Aug. 4, 1957 (gage height, 8.25 ft), from rating curve extended above 530 cfs on basis of computation of peak flow over dam; minimum daily determined, 0.2 cfs Oct. 6-9, 1922, Sept. 21, Oct. 9-14, 1956.

The greatest flood since about 1900 occurred the night of Sept. 29, 1904 (discharge not determined), from information by local residents and G. B. Monk's report on floods.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of about 80 acres (1959 determination) above station.

Rating tables, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Dec. 31				Jan. 1 to Sept. 30			
0.48	4.6	1.0	28	0.5	4.8	2.0	112
.6	7.8	1.5	66	.7	12	2.5	187
.7	11	2.0	119	1.0	28	3.0	314
				1.5	64	3.7	665

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.9	32	11	9	6.5	6	25	96	40	14	11	65
2	6.4	29	10	8	6.5	7.0	23	101	36	14	26	58
3	6.6	27	11	7	6	8.1	28	*109	34	14	29	65
4	6.4	26	10	7	5.7	8.1	40	109	31	11	*20	60
5	6.4	26	9	7.5	5	8.5	69	101	26	11	17	52
6	*5.3	26	8	7.5	*6	8.1	63	87	23	11	28	46
7	5.1	31	7	7.5	6	8.1	75	80	*22	24	19	41
8	4.8	38	8	8	6	7.5	71	70	24	27	16	36
9	4.8	32	6	8.5	6	8.1	76	61	26	33	16	40
10	5.8	26	6	7.5	6	*8.9	106	63	23	40	16	38
11	5.5	24	7	7.5	6.0	9.7	100	72	21	30	22	36
12	5.1	21	10	8	6.4	11	*86	84	20	*43	106	34
13	4.8	20	10	7.5	6.4	9.7	91	89	19	65	122	30
14	4.6	18	*9	7.5	6.0	11	83	78	19	44	115	37
15	8.1	*17	8	7.5	6.4	12	74	68	27	37	263	32
16	15	14	7	8	6.7	17	68	63	36	32	449	31
17	87	14	7	8.5	6.7	17	67	61	42	25	619	27
18	94	12	9	8	6.4	16	77	59	34	21	314	27
19	75	12	11	*7	6.4	12	101	59	32	22	218	34
20	55	12	9.7	7	6	14	132	64	30	19	167	*27
21	53	11	8.5	7.5	5.5	19	128	69	25	17	128	25
22	51	11	8.5	8	6	22	123	67	*24	19	287	22
23	53	10	9	8	6.7	30	122	64	27	15	531	21
24	54	11	9.5	7	6	39	113	65	23	14	*362	20
25	54	11	9.5	7	6.5	42	99	65	20	13	257	19
26	52	11	9	7	7.0	39	93	62	19	11	193	18
27	56	11	8.5	6	6.7	33	77	56	*19	11	176	18
28	57	9.4	7	5	6	31	75	52	17	11	140	17
29	52	9	8.5	5.5	-	29	80	48	15	8.5	108	16
30	42	10	8	6	-----	27	90	44	14	7.7	90	15
31	36	-----	8.5	6.5	-----	*24	-----	42	-----	8.9	77	-----
Total	972.6	561.4	268.2	227.5	173.5	542.8	2455	2208	768	673.1	494.2	1007
Mean	31.4	18.7	8.65	7.34	6.20	17.5	81.8	71.2	25.6	21.7	15.9	33.6
Ac-ft	1,930	1,110	532	451	344	1,080	4,870	4,380	1,520	1,340	9800	2,000

Calendar year 1960: Max 136 Min 4.6 Mean 25.5 Ac-ft 18,510
 Water year 1960-61: Max 619 Min 4.6 Mean 40.5 Ac-ft 29,360

Peak discharge (base, 250 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
8-15	11:20p.m.	4.57	1,320	8-25	12:30p.m.	3.83	751
8-22	5:00p.m.	4.63	1,380				

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 29, 30, Dec. 5-19, Dec. 21 to Feb. 3, Feb. 5-10, 20-22, 24, 25, 28, Mar. 1, 8.

8-3810. Gallinas River at Montezuma, N. Mex.

Location.--Lat 35°39'15", long 105°16'30", in Las Vegas Grant, at downstream end of middle pier of highway bridge, half a mile downstream from Montezuma, San Miguel County, and 5 miles northwest of Las Vegas.

Drainage area.--87 sq mi, approximately.

Records available.--August 1903 to September 1904 (gage heights only), October 1904 to May 1912, October 1912 to September 1961. Yearly estimate for water year 1912 (incomplete) and monthly discharge only for some periods, published in WSP 1312. Figures of daily discharge for the periods Oct. 8-22, 1904, and Jan. 1 to Feb. 20, 1906, published in WSP 177 and 213, respectively, have been found to be unreliable and should not be used.

Gage.--Water-stage recorder. Altitude of gage is 6,675 ft (from topographic map). Prior to Mar. 24, 1926, staff gage at site a quarter of a mile upstream. Gages at various datums prior to Sept. 3, 1942.

Average discharge.--57 years (1904-61), 19.9 cfs (14,410 acre-ft per year).

Extremes.--Maximum discharge during year, 893 cfs Aug. 15 (gage height, 5.58 ft); minimum daily, 2.0 cfs Oct. 7, 13, 14. 1904-61: Maximum discharge, 9,140 cfs Aug. 4, 1957 (gage height, 11.8 ft, from floodmark), from rating curve extended above 450 cfs on basis of slope-area measurement of peak flow; no flow Oct. 4-7, 1934, July 27, 28, 29, 1956, several days in 1957. Flood of Sept. 30, 1904, is the highest since about 1900 (discharge, 11,600 cfs by slope-area method), from G. B. Monk's report on floods and WSP 147.

Remarks.--Records good. Flow partly regulated at low flows by reservoirs owned by Public Service Co. of New Mexico. Diversions above station for irrigation of about 180 acres (1959 determination) and for Las Vegas city water supply.

Rating tables (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Aug. 15

Aug. 16 to Sept. 30

3.13	2.0	3.6	47
3.2	4.1	3.9	107
3.3	8.9	4.4	253
3.4	18	5.1	582

3.33	15
3.4	21
3.6	47

Note.--Same as preceding table above 3.6 ft.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.8	2.6	8.9	7.1	4.8	4.8	22	98	43	8.9	4.4	6.5
2	2.8	2.3	8.9	5.6	4.8	6.6	20	100	35	8.3	2.5	5.6
3	2.8	2.3	9.6	4.8	4.4	7.1	25	*114	32	8.9	2.9	6.5
4	2.6	2.2	8.9	5.2	4.4	7.1	35	117	32	7.1	*17	6.1
5	2.6	2.2	6.1	5.0	3.7	7.7	a 60	112	23	6.6	1.2	4.9
6	*2.3	2.5	8.3	7.7	*3.7	5.2	a 55	94	21	6.6	2.5	4.1
7	2.0	3.0	7.7	6.6	3.7	2.6	a 70	81	*20	2.5	1.6	3.7
8	2.3	3.8	8.9	6.1	3.7	2.6	a 65	71	22	2.9	1.1	3.1
9	2.3	3.5	8.3	7.1	3.7	2.8	a 70	60	23	3.8	1.1	3.5
10	2.3	3.3	5.0	6.1	4.1	3.7	a 100	58	21	4.4	9.6	3.4
11	2.3	2.2	7.7	6.1	4.8	*3.4	*96	67	16	3.0	2.5	3.0
12	2.8	1.5	1.1	5.2	4.8	4.4	89	92	14	*43	1.17	2.9
13	2.0	1.4	9.6	6.6	4.8	4.1	94	98	13	7.1	1.41	2.5
14	2.0	1.0	*8.9	5.2	4.8	6.6	83	81	14	4.4	1.29	3.8
15	4.1	*4.1	7.7	5.6	4.8	10	75	69	30	3.3	2.51	3.1
16	1.5	8.3	7.7	5.6	5.2	12	61	60	38	3.0	4.56	2.6
17	103	1.1	6.3	5.6	5.2	16	58	60	44	2.1	5.67	2.2
18	105	10	10	5.6	4.8	13	67	60	30	1.6	3.58	2.3
19	7.9	9.6	9.6	*5.2	4.8	7.1	100	61	26	1.7	2.61	3.2
20	5.6	1.1	8.9	4.4	4.4	8.3	147	67	23	1.4	1.99	*2.3
21	5.3	8.9	7.1	4.4	4.4	16	139	73	20	10	1.49	2.0
22	4.9	10	7.7	5.2	5.2	27	126	71	*17	1.2	2.59	1.8
23	4.7	8.3	8.3	4.8	5.6	33	126	69	22	8.9	4.73	1.7
24	4.9	9.6	8.3	4.8	4.4	3.8	126	71	17	7.1	*3.90	1.6
25	4.9	9.6	7.7	4.4	4.8	3.8	103	73	16	7.7	2.99	1.6
26	4.6	10	6.6	4.4	6.1	3.8	100	67	16	6.1	2.32	1.5
27	4.9	9.6	7.7	4.0	6.1	3.6	81	58	*16	1.3	2.12	1.6
28	5.3	7.7	8.9	3.5	5.2	29	69	53	14	10	1.66	2.3
29	4.7	6.1	7.1	4.5	-	26	75	51	10	4.8	1.26	1.6
30	3.8	8.9	6.1	4.8	-----	23	89	47	8.9	3.4	1.00	1.5
31	3.0	-----	7.1	5.2	-----	*21	-----	4.6	-----	4.1	8.1	-----
Total	906.0	480.7	250.6	166.4	131.2	460.1	2,426	2,299	676.9	588.5	5,151.0	925
Mean	29.2	16.0	8.08	5.37	4.69	14.8	80.9	74.2	22.6	19.0	166	30.8
Ac-ft	1,800	953	497	330	260	913	4,810	4,560	1,340	1,170	10,220	1,830

Calendar year 1960: Max 180 Min 1.5 Mean 23.1 Ac-ft 16,750
 Water year 1960-61: Max 567 Min 2.0 Mean 39.6 Ac-ft 28,680

Peak discharge (base, 200 cfs) *

* Discharge measurement made on this day.
 a No gage-height record.

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
8-15	12:00p.m.	5.58	893	8-25	1:00p.m.	5.07	565
8-22	6:00p.m.	5.56	879				

8-3820. Gallinas River near Lourdes, N. Mex.

Location.--Lat 35°28'15", long 105°09'35", in Las Vegas Grant, on right bank 0.8 mile upstream from ford on Lourdes-Romeroville road, 1.2 miles northwest of Lourdes, San Miguel County, 2.8 miles downstream from Pagosa Canyon, and 9 miles south of Las Vegas.

Drainage area.--313 sq mi.

Records available.--June 1951 to September 1961.

Gage.--Water-stage recorder. Datum of gage is 5,928 ft above mean sea level (levels from planetable bench mark).

Average discharge.--10 years, 14.8 cfs (10,710 acre-ft per year).

Extremes.--Maximum discharge during year, 6,680 cfs Aug. 17 (gage height, 9.40 ft), from rating curve extended above 2,100 cfs on basis of slope-area measurement of peak flow; minimum daily, 3.7 cfs May 1.

1951-61: Maximum discharge, that of Aug. 17, 1961; no flow June 17, July 2-10, 1957.

Flood of Sept. 30, 1904, is probably highest known. Other major floods occurred June 9, 1903 and June 1, 1937.

Remarks.--Records fair except those for periods of ice effect, which are poor. Diversions for irrigation of about 6,600 acres (1959 determination) above station.

Rating tables, except period of ice effect (gage height, in feet,
and discharge, in cubic feet per second)
(Shifting-control method used Aug. 11-16)

Oct. 1 to Aug. 16

Aug. 17 to Sept. 30

1.5	3.5	3.0	115	2.1	18	4.0	290
1.7	8.5	3.5	215	2.4	34	4.5	455
1.9	16	4.0	360	2.7	60	5.0	690
2.2	31	4.8	705	3.0	94	5.4	940
2.5	54			3.5	174		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.8	8.8	6.8	8	7	6.8	6.5	3.7	7.1	11	5.5	86
2	6.3	8.8	6.8	8	8	6.5	5.7	4.8	6.8	8.5	6.8	77
3	6.3	8.5	7.7	7	9	6.0	4.8	5.7	6.5	7.4	11	83
4	6.5	8.5	11	7	7	5.3	4.4	* 7.7	7.1	7.1	8.2	98
5	6.3	8.5	8	7	6	5.3	8.2	7.4	7.4	6.3	6.5	76
6	5.5	8.5	7	7	6	5.0	11	7.4	* 7.1	5.3	6.5	60
7	5.3	8.8	7	7	6	5.0	16	7.1	7.4	6.0	* 5.7	47
8	5.5	9.1	7	8	* 7	4.6	30	9.4	9.1	12	5.3	38
9	5.7	9.1	7	8	10	* 4.8	29	7.9	8.5	20	5.3	43
10	6.0	9.1	5	7	9	4.6	47	7.7	7.9	54	7.4	119
11	6.0	9.1	7	7	10	4.8	21	8.2	8.2	18	6.85	44
12	5.7	9.1	9	7	10	4.4	16	8.8	8.8	14	5.73	38
13	* 5.5	8.5	10	8	8.8	4.2	11	9.4	8.5	* 12	1.54	34
14	5.7	7.9	10	8	7.9	4.4	9.1	8.5	11	9.4	2.47	69
15	14	7.9	9	8	7.7	4.4	8.2	8.5	6.9	8.8	1.10	51
16	7.7	* 7.4	* 8	9	7.7	4.6	8.2	7.1	23	11	7.3	34
17	4.78	7.9	8	9	7.4	5.3	7.7	7.4	18	8.2	* 9.33	29
18	11.4	7.9	9	9	6.8	5.7	7.1	6.8	16	7.9	2.01	28
19	3.9	7.7	10	* 8	6.5	6.3	6.5	5.7	14	7.1	1.00	74
20	2.1	7.9	10	7	6.3	6.0	6.0	7.7	12	6.5	4.0	38
21	1.6	7.9	9	8	6.3	5.3	5.7	8.2	12	6.0	2.0	* 28
22	1.3	7.9	8	8	6.3	4.8	5.3	9.7	10	* 9.7	1.31	24
23	1.2	7.7	9	8	6.3	4.6	4.8	11	10	12	4.91	22
24	1.1	7.4	9	8	6.0	4.6	4.4	14	11	11	4.40	21
25	1.1	7.4	9	8	6.5	5.0	4.6	12	9.4	6.5	* 3.50	21
26	1.0	7.4	9	8	6.3	4.8	4.6	14	8.8	6.0	3.04	21
27	1.0	7.1	9	8	6.5	4.2	4.8	14	* 12	5.7	2.76	20
28	9.7	6.8	8	6	7.1	4.4	5.5	12	11	6.5	2.33	20
29	9.7	6.5	8	5	-	5.3	5.5	9.1	9.1	5.3	1.61	23
30	9.1	6.5	8	6	-----	6.3	4.4	8.8	8.2	4.6	1.26	18
31	8.8	-----	8	6	-----	* 7.9	-----	7.7	-----	4.6	1.05	-----
Total	946.4	241.6	257.3	233	205.4	161.2	313.0	267.4	364.9	318.4	582.12	1384
Mean	30.5	8.05	8.30	7.5	7.34	5.20	10.4	8.63	12.2	10.3	1.88	46.1
Ac-ft	1,880	479	510	462	407	320	621	530	724	632	1,550	2,750

Calendar year 1960: Max 478 Min 3.3 Mean 12.4 Ac-ft 9,020
Water year 1960-61: Max 933 Min 3.7 Mean 28.8 Ac-ft 20,860

Peak discharge (base, 1,100 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
8-11	8:30p.m.	8.95	5,830	8-18	5:15p.m.	6.10	1,590
8-17	1:15a.m.	9.40	6,680	8-22	10:00p.m.	6.42	1,960

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Dec. 4 to Feb. 11 (no gage-height record Jan. 26-31, Feb. 4-8).

8-3825. Gallinas River near Colonias, N. Mex.

Location.--Lat 35°11'10", long 104°54'40", on right bank 1½ miles upstream from mouth, 2 miles south of San Miguel-Guadalupe County line, and 6½ miles northwest of Colonias, Guadalupe County.

Drainage area.--610 sq mi, approximately.

Records available.--January 1951 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 4,940 ft (from river-profile map).

Average discharge.--10 years, 19.6 cfs (14,190 acre-ft per year).

Extremes.--Maximum discharge during year, 3,400 cfs Aug. 17 (gage height, 10.12 ft), from rating curve extended above 1,900 cfs as explained below; no flow for many days.

1951-61: Maximum discharge, 7,480 cfs Aug. 6, 1957 (gage height, 14.44 ft), from rating curve extended above 1,900 cfs on basis of slope-area measurements at gage heights 12.74 and 8.64 ft; no flow for long periods.

Maximum flood known occurred about June 1, 1937, when a stage of about 27 ft was reached; discharge determined as 23,000 cfs, by slope-area measurement made in 1951. A flood of about the same magnitude occurred Sept. 29-30, 1904.

Remarks.--Records fair except those for periods of ice effect of no gage-height record, which are poor. Diversion for irrigation of about 7,000 acres (1959 determination) above station.

Rating table (gage height, in feet, and discharge,
in cubic feet per second)
(Shifting-control method used June 14, 16-20)

1.5	0	2.6	58	4.5	319
1.7	2	3.0	98	5.0	455
1.9	8	3.5	160	5.5	620
2.2	26	4.0	233	6.5	1,080

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	a 6	0	0	4		0		0	0	0	95
2	0	a 5	0	0	3		0	(*)	0	0	0	79
3	0	a 5	0	b 0	15		0		0	0	* 0	72
4	0	a 4	1	0	25		0		0	0	0	83
5	* 0	a 3	b 1	0	b 12		0		0	0	0	89
6	0	a 3	b 1	b 0	b 9		0		* 0	0	0	73
7	0	a 3	b 1	b 0	b 6		0		0	0	0	62
8	0	a 2	1	b 0	4		0		0	7 0	0	50
9	0	a 2	b 1	b 0	* 4	(*)	4		0	3	0	44
10	0	a 2	b 1	b 0	3		* 14		0	11 9	0	87
11	0	a 2	b 1	b 0	2		31		0	251	0	83
12	0	a 2	b 1	0	1		17		0	41	961	49
13	0	a 2	b 1	0	1		7		0	* 14	425	35
14	0	a 2	b 1	0	2		3		0	5	623	30
15	0	a 2	b 1	0	1		2		0	4	378	46
16	28	* 2	b 1	0	1		1		12	21	131	52
17	558	2	b 1	1	1		0		19	6	1080	32
18	543	1	b 1	1	0		0		8	1	* 236	39
19	137	1	b 2	1	0		0		2	0	227	586
20	77	1	4	* 1	0		0		1	0	99	80
21	48	1	3	b 1	0		0		* 1	0	a 50	54
22	36	1	b 1	b 1	0		0		0	0	a 15	39
23	30	1	3	b 1	0		0		0	0	353	30
24	23	1	3	1	0		0		0	0	461	25
25	20	1	3	0	0		0		0	0	* 350	20
26	16	0	3	b 1	0		0		0	0	286	18
27	14	0	* 3	b 1	0		0		0	0	271	15
28	11	0	2	0	0		0		0	0	227	14
29	10	0	1	0	-		0		0	0	175	12
30	8	0	1	1	-----		0		0	0	134	12
31	6	-----	1	b 2	-----		-----		-----	0	113	-----
Total	1,565	57	45	13	94	0	79	0	43	535	6,595	2,005
Mean	50.5	1.9	1.5	0.4	3.4	0	2.6	0	1.4	17.3	213	668
Ac-ft	3,100	113	89	26	186	0	157	0	85	1,060	13,080	3,980

Calendar year 1960: Max 558 Min 0 Mean 13.2 Ac-ft 9,580
Water year 1960-61: Max 1,080 Min 0 Mean 30.2 Ac-ft 21,880

Peak discharge (base, 1,700 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
8-12	6:00a.m.	9.90	3,240	9-19	3:20a.m.	9.00	2,590
8-17	10:15a.m.	10.12	3,400				

* Discharge measurement or observation of no flow made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

8-3830. Pecos River at Santa Rosa, N. Mex.

Location--Lat 34°56'30", long 104°41'40", in SE¼SE¼ sec.3, T.8 N., R.21 E., a quarter of a mile upstream from bridge on U. S. Highway 66 and 1.7 miles upstream from Rio Agua Negra Chiquita.

Drainage area--2,650 sq mi, approximately (contributing area).

Records available--May 1903 to December 1905 (gage heights only), January to December 1906, February 1910 to July 1911, September 1912 to December 1925, March to May 1927, July 1927, January 1928 to September 1961. Monthly discharge only for some periods, published in WSP 1312. Figures of daily discharge for Apr. 5-20, May 4-7, 11, Aug. 13, 16-18, 24, Sept. 7-9, 11, 13, 19, 21, 23, 25, 27, Oct. 1-31, Nov. 3, 4, 9, 11, 20, 22, 1910, and Feb. 1 to Mar. 31, June 1 to July 31, 1911, published in WSP 358 have been found to be unreliable and should not be used.

Gage--Water-stage recorder. Datum of gage is 4,533.40 ft above mean sea level, datum of 1929. May 5, 1903, to Dec. 31, 1906, staff gage at site about 1,000 ft downstream at datum 2.52 ft lower. Feb. 2, 1910, to May 4, 1922, chain gage about a quarter of a mile downstream at different datum. May 5, 1922, to Sept. 30, 1936, water-stage recorder at present site at datum 0.60 ft higher. Oct. 1, 1936, to June 1, 1937, water-stage recorder at present site at datum 0.46 ft lower. June 2, 1937, to June 30, 1958, water-stage recorder at site about a quarter of a mile downstream at datum 3.63 ft lower.

Average discharge--45 years (1912-24, 1928-61), 153 cfs (110,800 acre-ft per year).

Extremes--Maximum discharge during year, 9,830 cfs Aug. 17 (gage height, 11.20 ft), from rating curve extended above 4,900 cfs by logarithmic plotting; minimum daily, 18 cfs July 6.

1930-61: Maximum discharge, 55,200 cfs June 2, 1937 (gage height, 25.7 ft), from rating curve extended above 32,000 cfs by logarithmic plotting; minimum daily (revised), 3.8 cfs June 26, 1954.

The flood of June 2, 1937, is the greatest since about 1886. Flood of Sept. 30, 1904, reached a stage of 24.7 ft (site about 1,000 ft downstream, datum 2.52 ft lower), discharge 45,500 cfs, by Kutter's formula. Flood of June 9, 1903, reached a stage of 21.1 ft (same site and datum as in 1904), discharge, 34,000 cfs, by comparison with 1904 flood.

Remarks--Records good prior to Apr. 20, fair thereafter. Diversions for irrigation of about 12,000 acres (1959 determination) above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

(Shifting-control method used Dec. 15 to Jan. 9, Apr. 22 to May 10, May 14, 15, 21, June 2-11, June 29 to July 15, July 17 to Aug. 15, Aug. 17-19, 23, Aug. 26 to Sept. 23)

1.0	14	2.3	311
1.2	28	3.0	695
1.5	69	4.0	1,480
1.8	136	6.0	3,500

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	27	35	28	28	26	23	21	204	131	23	31	278
2	26	35	28	27	26	23	20	247	133	25	33	225
3	27	34	30	26	26	23	19	262	120	32	32	178
4	30	34	32	28	27	23	19	320	101	23	110	136
5	* 30	33	28	25	26	22	19	324	88	19	64	150
6	31	a 32	27	28	26	*22	22	315	67	18	42	150
7	31	a 32	23	27	26	21	28	278	55	22	36	110
8	31	a 31	33	27	27	*21	84	228	*45	25	30	88
9	31	a 31	28	26	26	22	131	200	40	56	28	67
10	31	a 30	28	28	25	22	*128	150	35	55	28	* 49
11	31	a 30	32	28	25	22	162	103	34	*325	55	106
12	30	a 30	34	*26	24	21	197	108	a 34	286	607	*218
13	30	a 30	28	26	25	21	187	159	a 34	218	624	128
14	30	*30	28	25	25	22	139	228	a 41	128	979	69
15	152	30	27	25	25	21	*126	228	a 68	115	1,180	61
16	108	28	26	25	25	21	120	214	a 30	a 60	*413	53
17	766	30	27	25	25	23	95	*159	a 26	53	*3,080	73
18	*1,150	28	28	24	25	26	73	133	a 28	*52	*1,800	53
19	336	28	26	23	25	28	58	133	a 36	36	1,000	*2,130
20	* 175	30	25	23	26	27	61	136	a 37	34	630	400
21	133	30	25	24	*26	23	159	162	*a36	34	403	181
22	80	30	25	25	26	23	315	211	a 32	36	355	128
23	53	30	26	25	26	22	320	232	a 34	38	1,420	88
24	41	30	26	25	25	22	320	228	a 34	35	1,390	66
25	38	30	25	25	25	22	329	251	a 37	33	1,050	53
26	36	28	25	26	24	21	320	255	a 76	32	905	48
27	35	28	*26	20	*25	20	266	243	a 53	32	760	46
28	34	30	26	23	25	21	*232	222	a 32	31	*695	*44
29	34	*30	28	32	-	*20	204	*191	*28	31	600	44
30	34	28	28	*27	-----	23	200	175	25	30	455	41
31	* 34	-----	28	27	-----	23	-----	*142	-----	*30	355	-----
Total	3,655	915	854	799	713	694	4,370	6,441	1,570	1,967	19,190	5,461
Mean	118	30.5	27.5	25.8	25.5	22.4	146	208	52.3	63.5	619	182
Ac-ft	7,250	1,810	1,690	1,580	1,410	1,380	8,680	12,780	3,110	3,900	38,060	10,830

Calendar year 1960: Max 1,750 Min 13 Mean 93.0 Ac-ft 67,530
 Water year 1960-61: Max 3,080 Min 18 Mean 128 Ac-ft 92,480

Peak discharge (base 4,000 cfs)--Aug. 17 (4:30 p.m.) 9,830 cfs (11.20 ft); Sept. 19 (8:30 a.m.) 8,440 cfs (10.15 ft).

* Discharge measurement made on this day.

a No gage-height record.

RIO GRANDE BASIN

8-3835. Pecos River near Puerto de Luna, N. Mex.

Location.--Lat 34°44'00", long 104°31'30", in SE¼NW¼ sec.20, T.6 N., R.23 E., on left bank 9 miles southeast of Puerto de Luna and 17½ miles upstream from Alamogordo Dam.

Drainage area.--3,970 sq mi, approximately (contributing area).

Records available.--April 1938 to September 1961.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 4,315 ft (from river-profile map). Prior to Apr. 15, 1954, at datum 1 ft higher.

Average discharge.--23 years, 237 cfs (171,600 acre-ft per year).

Extremes.--Maximum discharge during year, 7,650 cfs Aug. 17 (gage height, 6.28 ft); minimum daily, 80 cfs July 28.

1938-61: Maximum discharge, 48,600 cfs Sept. 1, 1942 (gage height, 17.00 ft), from rating curve extended above 7,400 cfs on basis of flow at Santa Rosa; minimum daily, 34 cfs July 9, 1951.

Maximum flood known since at least 1885 occurred June 2, 1937, when peak at Santa Rosa was 55,200 cfs. Flood of July 24, 1895, was reported as "highest in 10 years." Other major floods occurred in June 1903 and May 1, 1914.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Diversion for irrigation of about 12,500 acres (1959 determination) above station. Discharge represents inflow to Alamogordo Reservoir (capacity, 122,100 acre-ft).

Rating table (gage height, in feet, and discharge, in cubic feet per second)

1.2	74	2.8	1,010
1.5	146	3.3	1,660
1.9	304	4.0	2,840
2.3	548		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	96	106	113	116	106	108	106	257	193	86	84	368
2	99	108	113	113	106	106	101	280	182	96	84	304
3	101	108	118	116	104	104	99	309	178	108	86	271
4	101	108	138	113	106	101	99	320	175	108	*101	223
5	101	111	121	111	105	104	94	397	168	99	178	204
6	99	111	113	111	106	104	106	397	152	96	113	244
7	96	111	121	108	106	104	118	385	132	*92	99	208
8	96	113	124	108	111	99	162	335	*118	124	90	484
9	96	106	115	108	116	*104	208	295	113	126	86	200
10	96	106	110	111	113	106	215	249	*108	140	82	*149
11	96	108	120	113	111	106	223	196	101	a 500	88	341
12	94	106	129	113	111	104	271	*175	99	a 320	369	*522
13	*99	106	129	111	108	104	249	204	99	a 350	838	228
14	96	108	118	111	111	101	*219	285	122	a 220	908	185
15	237	111	118	111	113	101	*200	346	296	a 190	2,170	140
16	334	106	115	111	118	101	204	304	129	a 140	*732	126
17	1,550	111	115	108	113	111	200	271	113	a 105	1,830	124
18	1,400	116	116	106	108	116	168	*228	111	a 120	*2,680	140
19	588	113	118	106	111	126	156	208	108	96	1,190	1,700
20	*314	111	118	106	108	124	143	219	111	94	880	*646
21	232	111	116	106	*108	111	159	228	113	*96	617	340
22	193	108	111	106	108	101	325	249	*104	153	478	244
23	152	106	116	104	108	101	373	290	99	99	1,170	204
24	138	108	116	104	108	101	368	299	118	94	1,440	175
25	124	108	113	106	108	99	391	314	118	86	1,270	156
26	118	108	113	106	106	96	391	*340	96	86	1,030	143
27	*113	108	113	100	106	94	*351	325	147	84	922	132
28	111	*108	*113	95	*108	94	314	309	108	80	*736	132
29	111	116	111	110	-	94	280	280	90	82	667	*126
30	111	118	121	*118	-----	108	266	257	86	84	579	121
31	106	-----	124	111	-----	113	-----	223	-----	86	446	-----
Total	7,298	3,283	3,649	3,377	3,051	3,246	6,559	8,774	3,887	4,240	22,043	8,580
Mean	235	109	118	109	109	105	219	283	130	137	711	286
Ac-ft	1,4480	6,510	7,240	6,700	6,050	6,440	13,010	17,400	7,710	8,410	43,720	17,020

Calendar year 1960: Max 1,580 Min 88 Mean 193 Ac-ft 139,800
 Water year 1960-61: Max 2,680 Min 80 Mean 214 Ac-ft 154,700

Peak discharge (base, 5,500 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
8-15	7:45p.m.	6.15	7,320	9-19	1:45p.m.	5.66	6,140
8-17	9:45p.m.	6.28	7,650				

* Discharge measurement made on this day.
 a No gage-height record.

8-3845. Pecos River below Alamogordo Dam, N. Mex.

Location.--Lat 34°36'20", long 104°23'10", in lot 1, sec.2, T.4 N., R.24 E., on left bank 1,200 ft downstream from Alamogordo Dam, 1½ miles downstream from Alamogordo Creek, and 4½ miles northeast of Guadalupe.

Drainage area.--4,390 sq mi, approximately (contributing area).

Records available.--October 1912 to April 1926, August 1926 to September 1961. Monthly discharge only for some periods, published in WSP 1312. Prior to October 1944, published as "near Guadalupe."

Gage.--Water-stage recorder and Parshall flume, with concrete control above top of flume. Datum of gage is 4,142.67 ft above mean sea level (Bureau of Reclamation datum). Prior to Sept. 10, 1936, at site 1½ miles upstream at different datum. Sept. 14, 1936, to Mar. 8, 1941, and June 11 to Sept. 21, 1941, at site a quarter of a mile downstream at different datums.

Average discharge.--24 years (1912-25, 1926-37), 244 cfs (prior to completion of Alamogordo Dam); 24 years (1937-61), 222 cfs (160,700 acre-ft per year).

Extremes.--Maximum discharge during year, 6,460 cfs Dec. 19 (gage height, 4.95 ft), from rating curve extended above 1,400 cfs on basis of logarithmic plotting; minimum daily, 35 cfs Jan. 29.

1912-61: Maximum discharge, 42,800 cfs Sept. 1, 1942, by computation of flow over spillway and through outlet gates of Alamogordo Dam by Bureau of Reclamation; maximum gage height, 15.5 ft May 1, 1914, site and datum then in use; no flow at times.

Remarks.--Records good except those for period Apr. 1 to June 8, which are fair. Diversion for irrigation of about 12,500 acres (1959 determination) above station. Flow regulated by Alamogordo Reservoir (see p.150).

Rating table, water year 1960-61 (gage-height, in feet, and discharge, in cubic feet per second)

0.8	30	2.4	215
1.0	44	2.6	330
1.5	86	3.0	725
2.0	142	3.5	1,420

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	94	136	59	161	108	99	94	251	212	102	1160	100
2	95	136	57	158	113	100	94	260	208	100	1140	100
3	94	97	57	156	110	100	94	267	190	100	1180	98
4	95	74	57	155	110	100	94	267	181	100	1190	98
5	96	74	57	156	108	100	91	267	174	101	1200	98
6	96	72	54	101	106	100	88	260	172	101	1200	98
7	96	71	53	67	105	98	85	274	170	100	1190	106
8	96	72	51	66	103	96	84	281	*534	99	442	104
9	96	70	50	66	104	97	83	274	1270	99	90	103
10	96	69	46	64	104	97	84	274	*1270	796	90	90
11	96	68	46	65	104	98	83	267	1300	1200	90	60
12	97	70	46	*65	104	98	84	267	1300	1220	91	*60
13	97	70	47	65	104	97	84	267	1300	1220	91	57
14	95	71	50	64	104	98	85	267	1300	1200	91	72
15	91	70	53	63	105	98	85	170	807	1200	93	78
16	90	68	53	62	105	98	88	121	100	1190	91	76
17	187	71	50	62	105	97	91	121	104	1200	*78	76
18	853	69	63	60	104	97	94	*121	110	1190	73	75
19	1180	68	343	58	102	97	*259	122	102	*1200	64	75
20	857	68	79	57	100	97	330	123	101	1200	64	75
21	*134	68	73	57	*101	98	281	124	102	1220	68	76
22	55	68	72	57	100	98	251	121	*102	1120	68	94
23	53	*70	70	56	100	98	246	117	102	1190	68	100
24	51	70	71	53	99	96	246	121	101	1180	70	102
25	49	71	73	48	98	96	246	174	102	1180	73	99
26	46	71	74	44	100	93	246	233	103	1180	74	103
27	44	69	77	41	98	93	*251	233	103	1070	73	103
28	44	*66	145	38	98	94	251	251	103	1120	83	103
29	44	180	*172	35	-	93	251	256	102	1190	99	102
30	44	62	169	60	-----	92	251	246	103	1180	104	100
31	102	-----	164	*94	-----	93	-----	238	-----	1160	101	-----
Total	5,263	2,359	2,531	2,354	2,902	3,006	4,694	6,635	11,928	26,508	10,589	26,811
Mean	170	78.6	81.6	75.9	104	97.0	156	214	398	855	342	89.4
Ac-ft	10,440	4,680	5,020	4,670	5,760	5,960	9,310	13,160	23,660	52,580	21,000	5,320

Calendar year 1960: Max 1,180 Min 3.2 Mean 175 Ac-ft 127,000
 Water year 1960-61: Max 1,300 Min 35 Mean 223 Ac-ft 161,600

* Discharge measurement made on this day.

RIO GRANDE BASIN

8-3850. Fort Sumner main canal near Fort Sumner, N. Mex.

Location.--Lat 34°30', long 104°16', in S½ sec.12, T.3 N., R.25 E., on right bank 160 ft downstream from bridge, 1½ miles downstream from diversion dam on Pecos River, and 2 miles northwest of Fort Sumner.

Records available.--July 1939 to December 1940 (published as Fort Sumner Irrigation District canal at Fort Sumner), April 1954 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 4,033 ft (from Bureau of Reclamation profile map of canal).

Extremes.--Maximum daily discharge during year, 100 cfs May 14; no flow for many days.

1939-40, 1954-61: Maximum daily discharge, 125 cfs Aug. 10, 1956; no flow for many days.

Remarks.--Records fair. Discharge measurements generally made one or more times a month during periods of flow. Canal diverts water from Pecos River for irrigation of about 6,600 acres (1961 determination) by the Fort Sumner Irrigation District.

Monthly discharge, in cubic feet per second, water year October 1960 to September 1961

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	94	0	58.8	3,610
November.....	38	0	1.3	75
December.....	0	0	0	0
Calendar year 1960.....	100	0	49.4	35,840
January.....	0	0	0	0
February.....	0	0	0	0
March.....	88	0	63.9	3,930
April.....	99	70	81.6	4,860
May.....	100	88	94.7	5,820
June.....	98	90	94.9	5,650
July.....	98	0	86.1	5,290
August.....	91	58	81.1	4,980
September.....	96	8	77.7	4,630
Water year 1960-61.....	100	0	53.7	38,840

8-3860. Pecos River near Acme, N. Mex.

Location--Lat 33°32'10", long 104°22'40", in NW¼ sec.14, T.9 S., R.25 E., on right bank 1 mile southeast of Melena railroad station, 2½ miles south of U. S. Highway 70, 3½ miles downstream from Salt Creek, 5 miles southwest of Acme, and 13 miles northeast of Roswell.

Drainage area--11,380 sq mi, approximately (contributing area).

Records available--September 1921 to June 1923, July 1937 to September 1961. Monthly discharge only for some periods, published in WSP 1312.

Gage--Water-stage recorder. Altitude of gage is 3,500 ft (from river-profile map). Prior to Nov. 1, 1938, at site on highway bridge 2 miles upstream at various datums.

Average discharge--24 years (1937-61), 223 cfs (161,400 acre-ft per year).

Extremes--Maximum discharge during year, 5,710 cfs Oct. 17 (gage height, 6.90 ft); minimum daily, 1 cfs July 10.

1937-61: Maximum discharge, 45,000 cfs Sept. 23, 1941 (gage height, 13.71 ft), from rating curve extended above 26,000 cfs by logarithmic plotting; no flow at times.

The flood of May 28, 1937, reached a discharge of 53,000 cfs (gage height, 14.82 ft, from floodmarks, site and datum then in use), by slope-area method, but may have been exceeded by the flood of Oct. 1, 1904. For other peaks prior to 1937, see Pecos River below Alamogordo Dam.

Remarks--Records fair. Discharge measurements generally made two or more times a month. Flow regulated by Alamogordo Reservoir (see p.). Diversions for irrigation of about 20,000 (1959 determination) acres above station.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	45	80	91	210	96	85	76	140	148	15	898	18
2	43	78	184	224	83	85	78	140	156	12	887	10
3	43	71	144	220	83	78	78	137	137	10	942	7
4	67	140	130	215	117	73	73	140	124	12	920	6
5	64	171	114	215	127	76	67	144	114	4	942	2
6	56	160	107	215	137	73	67	152	110	3	865	4
7	72	120	88	224	133	67	62	148	88	2	887	9
8	56	110	83	234	140	69	62	152	73	2	931	13
9	39	102	94	197	130	69	67	152	67	2	865	26
10	31	96	99	133	127	67	71	152	402	1	288	25
11	27	96	130	107	124	76	60	163	800	4	181	16
12	25	96	163	91	117	69	73	179	1,160	185	155	69
13	37	96	148	85	110	69	73	167	1,020	942	135	49
14	39	96	130	80	110	62	62	163	1,180	1,740	203	180
15	288	94	114	80	107	50	53	163	1,570	1,050	221	119
16	498	94	104	80	104	36	55	171	1,240	1,060	415	69
17	3,910	91	94	80	102	50	48	167	420	1,020	245	47
18	2,420	94	91	80	99	67	48	160	200	909	159	43
19	650	96	96	80	102	76	44	96	140	953	135	41
20	1,210	99	94	80	107	91	37	65	104	887	95	37
21	1,060	99	250	78	110	91	33	53	85	1,010	80	32
22	572	96	192	78	107	94	28	43	58	1,230	65	31
23	304	91	163	78	104	91	167	41	55	1,060	58	25
24	220	94	144	78	102	91	167	55	46	942	51	25
25	179	94	127	71	99	94	140	50	50	975	46	14
26	148	96	124	71	96	85	130	58	60	931	58	9
27	137	91	110	71	94	76	133	55	37	920	47	6
28	124	85	107	102	91	62	137	48	34	964	39	5
29	107	83	102	107	-	51	137	83	28	843	34	5
30	102	85	102	94	-----	62	140	96	20	964	23	6
31	91	-----	127	104	-----	73	-----	96	-----	698	21	-----
Total	12,664	2,994	3,846	3,862	3,058	2,258	2,466	3,629	9,726	19,550	10,891	948
Mean	409	99.8	124	125	109	72.8	82.2	117	324	631	351	31.6
Ac-ft	25,120	5,940	7,630	7,660	6,070	4,480	4,890	7,200	19,290	38,780	21,600	1,880

Calendar year 1960: Max 16,600 Min 0 Mean 300 Ac-ft 218,100
 Water year 1960-61: Max 3,910 Min 1 Mean 208 Ac-ft 150,500

Peak discharge (base, 2,500 cfs)

Date	Time	Gage Height	Discharge	Date	Time	Gage Height	Discharge
10-17	3:00p.m.	6.90	5,710	7-14	5:00a.m.	6.57	3,500
6-15	7:50a.m.	5.83	2,690				

8-3870. Rio Ruidoso at Hollywood, N. Mex.

Location.--Lat 33°19'50", long 105°36'25", in NE¼ sec.30, T.11 S., R.14 E., on right upstream end of a road bridge, 0.9 mile east of Hollywood, 2½ miles downstream from Carrizo Creek, and 2½ miles east of Ruidoso.

Drainage area.--120 sq mi, approximately.

Records available.--March 1953 to September 1961.

Gage.--Water-stage recorder and concrete control. Datum of gage is 6,365.72 ft above mean sea level, datum of 1929.

Average discharge.--8 years, 9.31 cfs (6,740 acre-ft per year).

Extremes.--Maximum discharge during year, 89 cfs Aug. 15 (gage height, 2.57 ft); minimum daily, 1.0 cfs Oct. 1, 4-9.

1953-61: Maximum discharge, 1,070 cfs July 26, 1957 (gage height, 7.80 ft), from rating curve extended above 130 cfs on basis of slope-area measurement of peak flow; minimum daily, 0.5 cfs June 20, 1954.

The flood of Sept. 29, 1941, is probably the highest since at least 1904 (discharge not determined).

Remarks.--Records good. Figures of discharge do not include F. Herrera ditch-S, which diverts from right bank 1½ miles upstream and bypasses station for irrigation of 75 acres (1959 determination) below. See monthly table below for record of ditch. Village of Ruidoso diverts from right bank 7 miles upstream for municipal use and returns a portion of this to river as effluent from sewage disposal plant 1½ miles upstream from station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

0.68	1.0	1.1	5.3
.7	1.1	1.3	9.6
.8	1.7	1.6	20
.9	2.6	1.9	37

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.0	3.1	2.2	2.8	3.4	4.1	7.4	6.8	2.1	1.2	3.4	3.8
2	1.2	*2.8	2.3	2.7	3.4	4.2	7.7	7.0	1.9	1.1	2.7	3.2
3	1.1	2.7	2.5	2.8	3.4	5.3	8.2	7.2	1.9	4.0	2.3	3.2
4	1.0	2.6	3.4	2.8	3.3	4.2	10	7.4	1.8	4.1	2.1	3.6
5	1.0	2.5	2.7	3.0	3.3	4.2	14	7.4	1.7	5.0	1.9	3.3
6	1.0	2.6	2.4	2.6	3.3	4.0	17	7.0	1.7	4.1	2.2	8.5
7	1.0	2.6	2.6	2.8	3.3	3.8	18	6.6	1.8	*3.6	2.4	9.1
8	1.0	*2.6	2.6	2.8	*3.3	3.3	16	6.4	1.6	3.0	2.4	11
9	1.0	2.5	2.7	2.7	3.4	3.4	14	5.9	1.2	3.1	3.0	14
10	*1.2	2.5	3.0	*2.7	3.3	3.7	14	5.2	1.7	2.8	2.4	26
11	1.2	2.5	2.6	2.8	3.4	3.8	13	*5.0	1.7	2.8	1.9	31
12	1.1	2.4	2.7	2.7	3.6	3.8	12	4.7	1.8	2.8	1.6	26
13	1.1	2.5	2.8	3.0	3.8	3.8	*9.6	4.4	1.9	2.4	4.7	30
14	1.1	2.5	2.8	3.1	4.0	4.2	9.6	4.7	1.9	2.6	1.2	37
15	1.2	2.4	2.7	3.1	3.8	4.4	9.6	4.4	6.0	2.4	1.6	29
16	1.4	2.4	2.8	3.1	3.8	4.7	9.9	4.2	3.7	2.3	7.4	27
17	3.4	2.3	2.8	3.2	4.0	5.0	10	3.7	5.1	2.2	*5.0	24
18	2.4	2.2	3.0	3.3	3.8	5.3	11	3.6	3.7	2.2	7.0	21
19	2.1	2.3	*3.1	3.1	3.8	5.9	*12	2.8	3.7	2.4	6.6	19
20	2.0	2.3	3.1	3.1	*3.8	5.2	12	2.5	*3.3	2.2	8.4	17
21	1.9	2.2	2.8	3.3	3.6	5.5	12	2.4	*3.4	1.5	7.9	*15
22	1.8	2.2	2.8	3.3	3.8	5.7	11	2.4	2.3	1.5	7.0	13
23	1.7	2.2	2.8	3.1	4.0	*6.0	8.9	2.3	1.5	1.8	10	12
24	1.7	2.2	3.0	3.2	3.8	7.2	8.6	2.4	1.4	1.4	9.4	11
25	1.7	2.2	3.0	3.1	3.7	7.4	8.2	3.0	1.3	1.4	7.4	10
26	2.2	2.2	3.0	3.1	4.1	7.9	9.1	*2.7	2.0	1.6	7.9	9.4
27	3.0	2.1	3.0	2.7	4.4	7.2	8.2	2.6	2.8	*1.6	7.2	8.6
28	3.0	2.3	3.0	3.1	4.2	7.0	7.2	2.5	3.0	1.5	7.7	8.4
29	3.1	2.2	2.8	3.2	-----	7.0	6.8	2.3	2.2	1.6	*6.2	8.2
30	2.7	2.2	3.1	3.3	-----	7.9	7.0	2.2	1.1	4.4	6.1	7.2
31	3.0	-----	3.0	3.6	-----	7.2	-----	2.3	-----	3.7	4.8	-----
Total	53.3	72.3	87.1	93.2	102.8	162.3	322.0	134.0	71.2	78.3	177.0	449.5
Mean	1.72	2.41	2.81	3.01	3.67	5.24	10.7	4.32	2.37	2.53	5.71	15.0
Ac-ft	106	143	173	185	204	322	639	266	141	155	351	892
(†)	69	28	27	10	0	0.2	82	113	154	109	68	94

Calendar year 1960: Max 46 Min 1.0 Mean 8.84 Ac-ft 6,410
 Water year 1960-61: Max 37 Min 1.0 Mean 4.94 Ac-ft 3,580

Peak discharge (base 100 cfs).--No peak above base.

* Discharge measurement made on this day.

† Diversion, in acre-feet, by F. Herrera ditch-S.

8-3901. Rio Hondo at Picacho, N. Mex.

Location.--Lat 33°21'25", long 105°09'25", in W½W½ sec.15, T.11 S., R.18 E., on right bank by road bridge just off of U. S. Highway 70, 870 ft upstream from mouth of Casey Canyon, 1.3 miles northwest of Picacho, and 35 miles west of Roswell.

Drainage area.--715 sq mi.

Records available.--December 1956 to September 1961.

Gage.--Water-stage recorder. Datum of gage is 4,945.49 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 1,870 cfs July 4 (gage height, 11.5 ft, from floodmark); no flow for many days.

1956-61: Maximum discharge, 3,510 cfs May 14, 1958 (gage height, 13.30 ft), from rating curve extended above 300 cfs on basis of slope-area measurement at gage height 13.22 ft; no flow at times in 1959-61.

A stage of 18.1 ft, present datum (discharge, about 6,600 cfs), was observed on Oct. 6, 1954. A stage of at least 30 ft occurred in September 1941.

Remarks.--Records good except those subsequent to June 12, which are poor. Diversions and ground-water withdrawals above station for irrigation of about 4,900 acres (1959 determination) above and below station. Two irrigation ditches, one on each bank, divert water above gage and bypass this station (see table below); ditch flow not included in record. Discharge measurements made at points opposite regular gage. A portion of this flow may be returned to the river at various sites within a mile downstream.

Discharge measurements, in cubic feet per second, of bypass ditches,
water year October 1960 to September 1961

Date	Discharge	Date	Discharge	Date	Discharge
Feb. 8	3.5	May 10	0.1	July 27	6.0
21	2.4	26	11	Aug. 16	2.8
Mar. 23	2.7	June 20	5.4	Sept. 20	0
Apr. 13	7.7	July 7	0		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.0	5.0	7.1	11	14	9.4	10		0	0	0.7	7.7
2	4.3	* 3.3	6.8	11	14	14	11		0	0	.7	7.4
3	3.1	3.3	6.5	12	14	15	12		0	0	.6	8.7
4	2.4	2.8	7.4	12	14	15	9.0		0	150	.6	9.0
5	2.1	2.8	7.4	12	15	15	9.8		0	30	0	8.4
6	1.8	3.8	7.7	12	15	15	9.0		0	5	0	9.4
7	2.0	4.3	8.0	10	16	14	7.4		0	* 3.6	0	11
8	2.0	2.8	8.4	10	* 1.7	13	6.5		0	3.8	0	7.4
9	2.0	* 2.8	9.4	11	1.7	12	5.3		0	3.1	0	9.2
10	2.1	3.1	8.4	11	1.7	11	4.8	(*)	0	.8	0	9.9
11	* 2.0	5.6	8.7	* 1.2	1.6	14	4.8		0	.6	0	8.2
12	2.1	4.3	8.7	13	1.6	12	3.6		0	.6	0	4.5
13	2.0	4.5	8.7	13	1.6	15	* 4.0		.2	.2	2.8	2.0
14	2.0	5.0	7.7	10	1.6	15	4.8		2.1	0	7.7	6.0
15	2.3	4.8	9.0	10	1.3	12	3.6		1.3	0	5.6	5.6
16	3.6	4.5	10	12	1.5	13	4.0		5.9	0	* 4.3	4.0
17	6.2	4.5	9.4	12	1.5	14	3.8		4.8	0	* 5.5	3.0
18	5.3	4.3	9.4	12	1.4	18	2.8		4.5	0	1.2	2.5
19	5.0	4.8	9.8	14	1.7	18	2.8		7.1	0	2.0	2.0
20	5.0	5.9	* 9.8	1.5	1.6	18	3.6		* 3.8	0	1.4	* 1.6
21	5.0	5.9	10	1.3	* 1.5	1.6	5.9		1.8	0	1.3	1.4
22	5.9	5.9	10	1.3	1.3	1.3	3.3		1.2	0	9.8	1.2
23	6.2	5.9	10	1.3	10	* 1.2	3.3		1.2	0	2.2	9.8
24	6.5	5.9	10	1.4	10	1.2	3.3		1.2	0	1.13	6.5
25	5.9	6.2	10	1.5	10	1.1	3.1		.8	0	* 7.1	4.0
26	4.8	5.0	10	1.6	7.7	1.1	3.3	(*)	.2	0	1.3	2.4
27	3.3	6.2	10	1.6	8.4	1.4	3.1		.1	* 0	1.2	2.1
28	2.4	2.4	10	1.6	9.8	1.2	3.1		0	0	10	2.0
29	4.0	9.0	10	1.5	-	9.8	2.2		0	0	* 9.0	2.0
30	6.2	7.4	11	1.5	-----	9.8	0		0	.4	8.7	1.8
31	5.6	-----	11	1.5	-----	8.7	-----		-----	.6	8.4	-----
Total	117.1	149.0	280.3	396	390.9	411.7	153.2	0	47.9	198.7	452.6	777.2
Mean	3.78	4.97	9.04	12.8	14.0	13.3	5.11	0	1.60	6.41	14.6	25.9
Ac-ft	232	296	556	785	775	817	304	0	95	394	898	1,540

Calendar year 1960: Max 214 Min 0 Mean 11.4 Ac-ft 8,280
Water year 1960-61: Max 150 Min 0 Mean 9.25 Ac-ft 6,690

Peak discharge (base, 1,000 cfs)

* Discharge measurement or observation of no flow made on this day.

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
7-4	4:00a.m.	11.5	1,870	8-25	2:20p.m.	10.45	1,210
8-24	5:50p.m.	10.02	1,000				

8-3905. Rio Hondo at Diamond A Ranch, near Roswell, N. Mex.

Location.--Lat 33°20'55", long 104°51'05", in NE¼NE¼ sec.20, T.11 S., R.21 E., on left bank on downstream side of road bridge at Diamond A Ranch, 18 miles upstream from Rocky Arroyo and 18 miles west of Roswell.

Drainage area.--947 sq mi (contributing area).

Records available.--May 1939 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 4,185 ft (from topographic map).

Average discharge.--22 years, 27.9 cfs (20,200 acre-ft per year).

Extremes.--Maximum discharge during year, 704 cfs July 4 (gage height, 9.2 ft); no flow for most of year.

1939-61: Maximum discharge, 27,000 cfs Sept. 22, 1941 (gage height, 28.78 ft), by slope-area measurement; no flow at times in each year.

The flood in 1941 is greatest since about 1900. A flood on June 1, 1937, reached a discharge of 24,900 cfs at Riverside about 13 miles upstream. Other major floods occurred Oct. 31, 1901, Sept. 29, 30, 1904, and July 25, 1905.

Remarks.--Records fair. Diversions and ground-water withdrawals above station for irrigation of about 6,500 acres (1959 determination) above and below station.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			0	1					0	0	0	0
2		(*)	0	0					0	0	0	0
3			0	0					0	0	0	0
4			0	0					0	97	0	0
5			0	1					0	37	0	0
6			0	1					0	1	0	0
7			0	1	(*)				0	*0	0	0
8			0	0					0	0	0	19
9			0	0					0	0	0	103
10			0	0				(*)	0	0	0	68
11	(*)		4	1					0	0	0	50
12			6	0					0	0	0	78
13			2	0			(*)		0	0	0	20
14			2	0					0	0	0	12
15			1	0					* 41	0	0	44
16			1	0					0	0	*0	21
17			3	0					0	0	0	11
18			2	0					0	0	0	3
19			2	0					0	0	0	3
20			*0	0					*0	0	29	2
21			0	0	(*)				0	0	0	*0
22			1	0					0	0	0	0
23			0	0		(*)			0	0	0	0
24			1	0					0	0	0	0
25			0	0					0	0	* 116	0
26			0	0				(*)	0	0	30	0
27			0	0					0	*0	1	0
28			*0	0					0	0	0	0
29			1	0	-				0	0	*0	0
30			1	0	-----				0	0	0	0
31		-----	1	0	-----		-----		-----	0	0	-----
Total	0	0	28	5	0	0	0	0	41	135	176	434
Mean	0	0	0.9	0.2	0	0	0	0	1.4	4.4	5.7	14.5
Ac-ft	0	0	56	10	0	0	0	0	81	268	349	861

Calendar year 1960: Max 355 Min 0 Mean 4.9 Ac-ft 3,550

Water year 1960-61: Max 116 Min 0 Mean 2.2 Ac-ft 1,620

Peak discharge (base, 1,000 cfs).--No peak above base.

* Discharge measurement or observation of no flow made on this day.

8-3936. North Spring River at Roswell, N. Mex.

Location--Lat 33°23'45", long 104°32'55", in NW¼SW¼SE¼ sec.31, T.10 S., R.24 E., in Roswell Municipal Golf Course, on left bank 2,400 ft upstream from Montana Avenue, in Roswell.

Drainage area--19.5 sq mi.

Records available--May 1958 to September 1961.

Gage--Water-stage recorder. Altitude of gage is 3,570 ft (from topographic map).

Extremes--Maximum discharge during year, 21 cfs Oct. 17 (gage height, 2.89 ft), from rating curve extended above 9 cfs by logarithmic plotting; no flow for most of year.

1958-61: Maximum discharge, that of Oct. 17, 1960; no flow for most of time.

Remarks--Records fair. No diversions above station.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Oct. 17..... *3.6
May 23..... .2

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
October 1960.....	3.6	3.6	0	0.12	7.1
May 1961.....	.2	.2	0	.006	.4
Calendar year 1960.....	-	3.6	0	.01	8.1
Water year 1960-61.....	-	3.6	0	.01	7.5

* Discharge measurement made on this day.

Note--Flow occurred only on days listed above. Observations of no flow generally made once a month.

8-3945. Rio Felix at old highway bridge, near Hagerman, N. Mex.

Location--Lat 33°07'30", long 104°20'40", in SW¼ sec.4, T.14 S., R.26 E., near left bank on downstream side of abandoned bridge pier, 0.6 mile upstream from U. S. Highway 285, 1½ miles northwest of Hagerman, and 2½ miles upstream from mouth.

Drainage area--932 sq mi (contributing area).

Records available--April 1939 to September 1961. March 1932 to April 1939 at site 1 mile downstream; records for periods of low flow not equivalent.

Gage--Water-stage recorder. Datum of gage is 3,403.40 ft above mean sea level, datum of 1929.

Average discharge--22 years (1939-61), 18.0 cfs (13,030 acre-ft per year).

Extremes--Maximum discharge during year, 3,590 cfs June 15 (gage height, 13.38 ft); no flow for many days.

1939-61: Maximum discharge, 74,000 cfs Oct. 7, 1954 (gage height, 27.5 ft, from floodmarks), from rating curve extended above 12,000 cfs on basis of slope-area measurement at point 5½ miles upstream from gage (corrected for channel storage); no flow for many periods.

Flood in 1954 is the highest since 1894, from information by local residents. Flood of Oct. 1, 1904, is probably second highest. Another major flood occurred in April 1915.

Remarks--Records good except those below 10 cfs, which are fair. Diversions for irrigation of about 350 acres (1959 determination) above station.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Oct. 17..... 9 Oct. 22..... 10 Feb. 22..... 1
18..... 18 23..... 10 26..... 1
19..... 18 24..... 7 June 15..... *934
20..... 3 25..... 6 16..... *39
21..... 2 Feb. 10..... 1

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
October 1960.....	83	18	0	2.7	165
February 1961.....	3	1	0	.1	6.0
June.....	973	934	0	32.4	1,930
Calendar year 1960.....	-	1,300	0	13.2	9,570
Water year 1960-61.....	-	934	0	2.9	2,100

Peak discharge (base, 500 cfs)--June 15 (11:20 a.m.) 3,590 cfs (13.38 ft).

* Discharge measurement made on this day.

Note--Flow occurred only on days listed above. Observation of no flow generally made once a month.

8-3955. Pecos River near Lake Arthur, N. Mex.

Location.--Lat 32°59'18", long 104°19'20", in SW¼NE¼ sec.27, T.15 S., R.26 E., on left bank 400 ft upstream from county bridge, 2½ miles east of Lake Arthur, 7 miles upstream from Cottonwood Creek, and 11 miles northeast of Artesia.

Drainage area.--14,760 sq mi, approximately (contributing area).

Records available.--August 1938 to September 1961.

Gage.--Water-stage recorder and rock control. Datum of gage is 3,327.07 ft above mean sea level, datum of 1929.

Average discharge.--23 years, 302 cfs (218,600 acre-ft per year).

Extremes.--Maximum discharge during year, 4,980 cfs Oct. 18 (gage height, 8.6 ft); minimum daily, 12 cfs July 7-9, 12.
1938-61: Maximum discharge, 49,600 cfs Sept. 24, 1941 (gage height, 21.90 ft), from rating curve extended above 16,100 cfs on basis of slope-area measurement at gage height 21.77 ft and logarithmic plotting; no flow at times in 1947, 1953-4.
Flood of May 30, 1937, reached a stage of 21.77 ft (discharge, 51,500 cfs, on basis of slope-area measurement of peak flow), but may have been exceeded by floods in 1904 and 1919.

Remarks.--Records good. Flow partly regulated by Alamogordo Reservoir (see p. 150). Diversions and ground-water withdrawals for irrigation of about 124,000 acres (1959 determination) above station.

Rating tables (gage height, in feet, and discharge,
in cubic feet per second)
(Shifting-control method used Oct. 17-21, Sept. 24-30)

Oct. 1 - 17

Oct. 17 to Sept. 30

2.2	38	1.8	8	3.1	298
2.4	73	1.9	13	3.5	485
2.7	147	2.0	20	4.5	1,110
3.5	419	2.2	41	6.0	2,420
5.1	1,180	2.4	77	8.0	4,620
		2.7	155		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	77	181	152	181	177	155	84	161	77	25	830	21
2	71	171	152	221	177	158	103	*155	86	17	806	15
3	62	*165	174	247	165	155	113	152	95	15	782	13
4	56	161	197	247	158	152	105	149	103	13	788	13
5	52	161	187	251	158	143	103	140	98	14	794	13
6	56	201	177	247	168	146	88	143	88	13	865	18
7	65	211	171	247	*177	149	79	143	79	12	858	44
8	60	207	174	247	187	143	73	146	73	12	*851	29
9	73	190	181	243	187	132	71	152	57	12	851	25
10	73	181	174	247	187	132	73	*158	49	*19	764	26
11	*69	177	168	*211	184	129	77	165	276	13	307	32
12	60	171	174	194	181	135	73	165	*770	12	165	49
13	60	171	207	184	177	123	*73	161	1,030	64	138	46
14	60	171	214	177	177	116	86	174	893	*1,220	126	79
15	65	*171	197	171	177	113	91	168	*2,030	1,110	121	77
16	140	171	190	168	177	103	91	155	1,520	865	*197	123
17	1,160	168	184	168	174	93	88	161	1,050	900	315	77
18	*4,390	168	177	168	171	91	82	143	430	806	201	51
19	*1,390	168	174	181	168	116	69	140	*254	734	140	27
20	945	171	*174	181	168	132	57	138	190	758	135	13
21	*1,160	171	171	174	168	118	59	93	149	764	118	16
22	1,000	171	251	171	*165	123	65	77	113	942	86	21
23	535	168	225	171	168	*113	61	65	84	1,400	65	22
24	411	168	218	181	171	113	57	44	55	907	46	21
25	*311	168	207	181	165	118	171	*39	63	851	36	*24
26	270	168	197	171	155	116	149	59	51	872	26	22
27	247	165	190	158	158	113	143	54	*39	824	30	30
28	225	165	187	161	155	98	143	54	41	*844	34	21
29	207	155	184	158	-	93	152	69	24	800	*22	16
30	201	155	184	168	-----	71	165	52	19	716	21	23
31	187	-----	184	177	-----	69	-----	51	-----	865	21	-----
Total	13,738	5,190	5,796	6,052	4,800	3,761	2,844	3,726	9,886	16,419	10,539	1,007
Mean	443	173	187	195	171	121	948	120	330	530	340	336
Ac-ft	27,250	10,290	11,500	12,000	9,520	7,460	5,640	7,390	19,610	32,570	20,900	2,000

Calendar year 1960: Max 11,200 Min 1.5 Mean 315 Ac-ft 228,500
Water year 1960-61: Max 4,390 Min 12 Mean 229 Ac-ft 166,100

Peak discharge (base, 2,500 cfs)

* Discharge measurement made on this day.

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
10-18	10:00a.m.	8.6	4,980	7-14	8:00p.m.	6.13	2,500
6-15	4:00p.m.	7.40	3,860				

8-3960. Cottonwood Creek near Lake Arthur, N. Mex.

Location.--Lat 32°54'55", long 104°22'00", in SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.15, T.16 S., R.26 E., on right bank 75 ft upstream from road bridge, 1 $\frac{1}{2}$ miles upstream from mouth, and 6 miles south of town of Lake Arthur.

Drainage area.--199 sq mi (contributing area).

Records available.--March 1932 to September 1961. All figures of discharge above 150 cfs prior to June 1937 and daily discharges Sept. 24-30, 1932, June 13, 14, Sept. 5, 1935, and May 29, 1937, as published in previous Water Supply Papers have been found to be unreliable and should not be used.

Gage.--Water-stage recorder and concrete control. Datum of gage is 3,316.3 ft above mean sea level (river-profile survey). At site 75 ft downstream at different datum Mar. 7, 1932, to Mar. 28, 1935, and at datum 1.36 ft and 2.10 ft lower than present datum Mar. 29, 1935, to Sept. 30, 1936, and Oct. 1, 1936, to Aug. 29, 1938, respectively. Aug. 30, 1938, to May 22, 1948, at present site at datum 1.54 ft lower.

Average discharge.--27 years (1932-34, 1935-36, 1937-61), 6.18 cfs (4,470 acre-ft per year).

Extremes.--Maximum discharge during year, 7.2 cfs Oct. 17 (gage height, 2.21 ft); minimum daily, 0.1 cfs for many days.

1932-61: Maximum discharge not determined, occurred June 13, 1935; maximum gage height, 12.0 ft May 30, 1937, present datum, from floodmarks (backwater from Pecos River); no flow at times.

Remarks.--Records fair. Diversions and ground-water withdrawals for irrigation of about 4,500 acres (1959 determination) above station. Capacity of original excavated channel at and above gage has been progressively reduced by salt cedar growth, blow sand, and bank erosion. Since 1957 a compacted earth plug in channel (forms pond for pump diversion) 1 mile above gage has reduced low-flow record to leakage through or under plug, ground-water inflow, and irrigation return entering channel in the 1-mile reach above gage. Higher sustained discharges originating above plug (moderate rises can originate below) will overflow banks and levees into swamps, farm areas, and Pecos River flood plain, most of over-bank flow remaining ponded or bypassing gage. Low-flow record represents contribution to Pecos River, based on comparative discharge measurements of March 1961.

Rating table (gage height, in feet, and discharge,
in cubic feet per second)
(Shifting-control method used Oct. 17, Dec. 9-31, Jan. 11-17, 24, Feb. 12 to Mar. 29;
backwater from Pecos River Oct. 18-19)

0.54	0.1	1.1	1.3
.6	.2	1.5	2.4
.7	.5	2.0	4.5

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.2	0.3	0.8	a 2.5	2.5	2.2	1.2	0.6	0.3	0.2	0.2	0.1
2	.2	.3	.8	a 2.5	2.4	2.3	1.2	* .5	.3	.2	.2	.1
3	.2	* .3	.9	a 2.5	2.5	2.2	1.2	.5	.3	.2	.2	.1
4	.2	.3	1.0	a 2.5	2.8	2.5	1.0	.4	.3	.2	.2	.2
5	.2	.4	1.1	a 2.6	2.8	2.7	1.1	.4	.3	.2	.2	.2
6	.2	.3	1.3	a 2.6	2.5	2.4	.8	.4	.3	.2	.2	.2
7	.2	.3	1.2	a 2.6	* 2.4	3.1	.8	.4	.3	.2	.2	.2
8	.2	.3	1.4	a 2.6	2.6	2.3	1.1	.4	.3	.2	.2	.2
9	.2	.4	2.2	a 2.7	2.8	2.1	.8	.4	* .2	.3	.1	.2
10	.2	.4	2.5	a 2.7	2.6	2.5	.8	* .3	.2	* .3	.1	.1
11	* .2	.4	2.0	* 2.7	2.7	2.4	1.3	.3	.2	.2	.1	.1
12	.2	.4	1.9	2.6	2.8	2.3	.8	.3	.2	.2	.1	.1
13	.2	.4	2.1	2.7	2.9	2.0	* .8	.3	.2	.2	.1	.1
14	.2	.4	2.2	2.5	2.8	2.0	1.0	.3	.3	* .2	.1	.1
15	.2	* .4	2.2	2.3	2.8	2.0	1.0	.3	.3	.2	.1	.1
16	.2	.4	2.2	2.0	2.9	2.1	.9	.3	.3	.2	* .1	.1
17	3.8	.4	2.2	1.9	3.1	2.0	1.0	.3	.3	.2	.1	.1
18	.9	.4	2.2	1.8	3.0	2.0	1.0	.3	.2	.1	.1	.1
19	.6	.4	2.4	1.8	3.2	2.5	1.0	.3	* .2	.1	.2	.1
20	.4	.5	* 2.6	* 1.6	3.3	2.2	1.0	.3	.2	.1	.1	.1
21	.4	.4	2.5	1.6	3.4	2.2	.9	.3	.2	.2	.1	.1
22	.4	.5	2.5	1.7	* 3.3	2.1	.9	.3	.2	.2	.1	* .1
23	.4	.4	2.5	1.7	3.6	* 2.0	.9	.3	.2	.2	.1	.1
24	.4	.4	2.4	3.0	2.8	2.0	.9	.3	.2	.2	.1	.1
25	.4	.5	2.5	2.5	2.2	2.4	.9	* .3	.2	.1	.1	.1
26	.4	.5	2.5	2.4	2.1	2.4	.9	.4	.2	.1	.1	.1
27	.4	.5	2.4	2.1	2.7	2.0	.9	.4	.2	.2	.1	.1
28	* .4	.6	2.5	2.4	2.2	2.0	.9	.4	.2	* .2	.1	.1
29	.4	.6	2.4	2.5	-	1.9	.7	.3	.2	.2	* .1	.1
30	.4	.7	2.6	2.5	-	1.5	.6	.3	.2	.2	.1	.1
31	.3	-	2.5	2.5	-	* 1.5	-	.3	-	.2	.1	-
Total	13.2	12.5	62.5	72.6	77.7	67.8	28.3	10.9	7.1	5.9	4.0	3.6
Mean	0.43	0.42	2.02	2.34	2.78	2.19	0.94	0.35	0.24	0.19	0.13	0.12
Ac-ft	26	25	124	144	154	134	56	22	14	12	7.9	7.1

Calendar year 1960: Max 33 Min .1 Mean 0.99 Ac-ft 716
Water year 1960-61: Max 3.8 Min .1 Mean 1.00 Ac-ft 726

* Discharge measurement made on this day.
a No gage-height record.

8-3965. Pecos River near Artesia, N. Mex.

Location.--Lat 32°50'25", long 104°19'25", in NW¼NW¼ sec.18, T.17 S., R.27 E., near left bank on downstream end of bridge pier on State Highway 83, 4.3 miles east of Artesia, 7.0 miles north of mouth of Rio Penasco, and 17 miles north of McMillan Dam.

Drainage area.--15,300 sq mi, approximately (contributing area).

Records available.--September 1905 to June 1909, August 1909 to September 1936, May 1937 to September 1961. Monthly discharge only for some periods, published in WSP 1312. Records for Aug. 22-31, 1934, and October 1936 to April 1937, published in WSP 763 and 828, respectively, have been found to be unreliable and monthly figures only should be used. Prior to February 1936, published as "near Dayton."

Gage.--Water-stage recorder. Datum of gage is 3,291.05 ft (Bureau of Reclamation bench mark). Prior to Aug. 27, 1914, staff gage and Aug. 27, 1914, to Feb. 20, 1936, water-stage recorder, at site 6½ miles downstream at different datum. Feb. 21, 1936, to Apr. 4, 1941, water-stage recorder at site 600 ft downstream at different datum.

Average discharge.--30 years (1905-8, 1909-36), 365 cfs (264,200 acre-ft per year), prior to completion of Alamogordo Reservoir; 25 years (1936-61), 326 cfs (236,000 acre-ft per year).

Extremes.--Maximum discharge during year, 3,900 cfs Oct. 18 (gage height, 12.38 ft; indefinite stage-discharge relation); minimum daily discharge, 5 cfs Sept. 1.

1905-61: Maximum discharge probably occurred May 30, 1937, when a discharge of 51,500 cfs was measured by slope-area method at a point 15 miles upstream (gage height, 14.7 ft, site and datum then in use); maximum gage height, 17.4 ft Sept. 30, 1932, site and datum then in use (discharge, 19,000 cfs); no flow at times in 1934, 1946-47, 1953-54, 1957.

Greatest flood known since at least 1893 occurred Oct. 2, 1904 (discharge not determined. The peak inflow to Lake McMillan, which includes Rio Penasco and Four Mile Draw, was estimated as 82,000 cfs). The second highest flood occurred July 25, 1905 (discharge below Rio Penasco, 50,300 cfs, based on gain in storage and spill from Lake McMillan). The floods of August 1893 and October 1904 damaged McMillan Dam and washed out Avalon Dam.

Remarks.--Records fair. Flow partly regulated by Alamogordo Reservoir (see p. 150). Diversions and ground-water withdrawals for irrigation of about 154,000 acres above station. Discharge represents inflow to Lake McMillan which stores water for irrigation of about 25,000 acres of Carlsbad project.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-17, 20-24, Nov. 14 to Dec. 13, June 12-18, June 28 to Aug. 26, Sept. 12-22;
stage-discharge relation indefinite Oct. 18-19)

3.1	5	4.5	129	9.0	1,300
3.3	12	5.0	204	11.0	2,400
3.6	30	6.0	394	12.0	3,480
4.0	68	7.0	634		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	72	196	157	199	183	* 151	76	* 156	* 64	22	* 825	5
2	71	193	157	206	* 183	151	90	149	78	25	801	30
3	* 67	188	162	* 249	174	150	110	147	85	18	774	17
4	61	183	199	256	163	149	110	147	99	14	768	12
5	59	175	196	258	157	146	102	139	91	* 12	771	* 12
6	54	198	186	256	169	140	97	140	78	12	819	10
7	61	224	183	252	180	150	85	136	70	10	837	14
8	66	219	190	252	193	146	84	143	* 65	7	819	28
9	62	198	199	251	193	142	72	140	55	13	* 837	25
10	78	190	193	254	194	135	75	151	39	* 10	807	21
11	72	186	178	233	193	135	70	156	37	16	481	22
12	66	182	186	207	190	128	81	158	603	14	186	33
13	60	177	201	193	185	130	69	156	979	11	139	* 42
14	64	175	221	182	183	119	79	164	* 888	464	129	47
15	61	* 175	214	178	180	115	84	168	1,620	1,160	115	74
16	75	174	206	174	175	106	92	153	* 1,680	834	160	101
17	450	169	199	172	174	99	92	156	1,040	* 914	256	97
18	* 3,400	169	191	170	172	91	85	151	587	882	235	74
19	* 2,160	170	188	178	169	99	78	143	* 314	744	153	50
20	914	168	188	* 191	170	122	69	139	233	* 804	130	34
21	* 1,230	169	190	185	174	122	* 60	111	175	792	132	22
22	1,000	168	* 212	180	168	113	69	81	130	937	* 98	26
23	668	169	252	178	164	112	67	72	97	1,220	75	29
24	462	168	235	186	164	106	62	59	61	1,040	59	29
25	* 358	166	228	196	162	113	88	48	52	831	47	29
26	308	166	216	188	156	113	153	52	57	* 898	37	25
27	258	163	209	174	153	116	132	61	* 46	844	29	22
28	240	164	206	172	154	103	133	52	40	844	18	24
29	231	* 160	204	170	-	98	139	62	39	837	13	19
30	223	157	201	170	-----	90	144	59	26	696	12	17
31	* 202	-----	201	183	-----	* 77	-----	41	-----	810	8	-----
Total	13,153	5,359	6,148	6,293	4,875	3,767	2,747	3,690	9,428	15,735	10,570	990
Mean	424	179	198	203	174	122	91.6	119	314	508	341	33.0
Ac-ft	26,090	10,630	12,190	12,480	9,670	7,470	5,450	7,320	18,700	31,210	20,970	1,960

Calendar year 1960: Max 9,800 Min 3 Mean 309 Ac-ft 224,600
Water year 1960-61: Max 3,400 Min 5 Mean 227 Ac-ft 164,100

Peak discharge (base, 2,000 cfs).--Oct. 18 (about 9:00 p.m.) 3,900 cfs; June 15 (9:45 p.m.) 3,560 cfs (11.83 ft).

* Discharge measurement made on this day.

8-3976. Rio Penasco near Dunken, N. Mex.

Location.--Lat 32°53'35", long 105°12'05", in SW¼NW¼ sec.27, T.16 S., R.17 E., on left bank 1.5 miles upstream from junction of State Highways 24 and 83 and 5½ miles north of Dunken.

Drainage area.--580 sq mi, approximately.

Records available.--October 1952 to September 1956 (annual maximum only), October 1956 to September 1961.

Gage.--Water-stage recorder. Datum of gage is 5,309.49 ft above mean sea level, datum of 1929. Prior to October 1956, crest-stage gage at site half a mile downstream at different datum.

Average discharge.--5 years, 5.84 cfs (4,230 acre-feet per year).

Extremes.--Maximum discharge during year, 980 cfs Aug. 26 (gage height, 6.50 ft), from rating curve extended above 57 cfs on basis of slope-area measurements at gage heights 9.48 and 13.36 ft; no flow for many days.

1952-61: Maximum discharge, 36,300 cfs Oct. 6 or 7, 1954 (gage height, 16.9 ft, present site, from floodmarks), based on slope-area measurement of peak flow; no flow at times.

Maximum stage known, 20 ft Sept. 22, 1941, from floodmarks (discharge, 70,000 cfs, from rating curve extended above slope-area measurement of 36,300 cfs).

Remarks.--Records poor. Diversions for irrigation of about 3,100 acres (1959 determination) above station.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.2	0.7	3.6	5.6	7.0	6.6	3.3	0	0	1.1	0	8.0
2	0	*.7	3.0	5.6	7.0	6.1	3.0	0	0	1.7	0	8.0
3	0	1.2	3.0	6.1	7.0	4.8	1.7	0	0	1.2	0	6.2
4	0	1.7	3.6	6.1	7.0	5.2	1.4	0	0	1.0	0	5.4
5	.3	1.7	3.6	5.6	7.0	5.6	1.4	0	0	9.2	0	5.4
6	.2	2.6	4.4	5.6	7.5	5.6	1.7	.1	0	* 1.7	0	6.6
7	0	2.6	4.0	5.6	7.0	5.6	1.7	1.2	0	.8	0	7.0
8	.2	1.7	6.1	5.6	* 7.0	5.2	1.9	1.9	0	1.0	0	6.6
9	.2	2.2	6.6	5.6	7.5	4.0	2.1	1.4	0	1.2	0	6.6
10	*.2	* 3.0	5.2	* 6.6	7.0	2.6	1.7	1.1	0	1.1	0	1.1
11	.2	3.0	4.8	6.1	7.0	2.6	1.2	*.8	0	.8	0	1.0
12	.1	2.6	4.8	6.6	7.0	2.2	* 1.1	.8	0	.8	0	1.3
13	.2	2.6	5.6	7.0	7.0	3.3	.7	1.1	0	1.0	0	8.0
14	.1	2.6	5.6	7.5	7.0	2.2	1.0	.6	0	1.4	.1	8.5
15	1.7	2.6	6.1	7.5	7.0	2.2	2.1	.1	0	2.1	3.7	8.5
16	3.3	3.0	6.1	7.0	7.0	2.2	1.2	0	.6	1.4	.1	7.5
17	4.8	3.3	6.1	7.0	7.5	2.6	1.2	0	0	.8	+0	7.0
18	3.0	3.3	6.1	6.6	7.5	2.6	1.0	0	.3	1.4	0	* 6.6
19	2.2	3.3	* 5.6	6.6	7.5	2.6	*.8	0	.8	1.2	0	6.6
20	1.7	3.3	5.6	6.6	* 7.5	2.6	.7	0	.8	1.1	1.2	6.2
21	.1	3.0	5.6	6.6	7.0	2.2	.4	0	* 1.7	1.9	.4	6.2
22	0	3.0	5.6	7.0	7.0	2.2	.4	0	0	1.1	0	6.2
23	.1	3.0	6.1	6.6	7.0	* 2.2	.4	0	1.7	.8	0	a 6
24	.1	3.0	6.1	7.5	7.0	3.3	.7	.1	.2	.6	.1	a 6
25	.1	3.0	5.6	7.0	6.6	2.6	.5	.1	.4	.5	.4	a 5.5
26	.1	2.6	5.2	7.0	5.6	2.2	.5	*.4	.4	*.6	7.2	a 5.5
27	.2	2.2	5.6	7.5	6.6	3.3	.5	0	.8	.2	1.5	a 5
28	.2	3.6	5.6	7.5	6.6	3.6	.4	0	.8	.3	* 1.2	a 5
29	.2	3.3	5.6	7.5	-	4.4	.3	0	.8	0	9.5	a 4.5
30	.2	3.6	6.6	7.5	-----	4.0	.1	0	1.0	0	8.5	a 4.5
31	.3	-----	6.1	7.5	-----	3.3	-----	0	-----	.2	9.0	-----
Total	20.2	78.0	163.2	205.7	196.4	109.7	35.1	9.7	10.3	38.2	132.0	207.1
Mean	0.65	2.60	5.26	6.64	7.01	3.54	1.17	0.31	0.34	1.23	4.26	6.90
Ac-ft	4.0	15.5	32.4	40.8	39.0	21.8	7.0	1.9	2.0	7.6	26.2	41.1

Calendar year 1960: Max 246 Min 0 Mean 4.67 Ac-ft 3,390
 Water year 1960-61: Max 72 Min 0 Mean 3.30 Ac-ft 2,390

Peak discharge (base, 300 cfs).--Aug. 26 (2 p.m.) 980 cfs (6.50 ft).

* Discharge measurement or observation of no flow made on this day.
 a No gage-height record.

8-3985. Rio Penasco at Dayton, N. Mex.

Location.--Lat 32°44'30", long 104°22'30", in SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.15, T.18 S., R.26 E., on right bank 3 ft upstream from crest of abandoned diversion dam, 1 mile northeast of old Dayton railway station, 3 $\frac{1}{2}$ miles upstream from mouth, and 7 miles southeast of Artesia.

Drainage area.--1,070 sq mi, approximately.

Records available.--April 1951 to September 1961. Prior to October 1953, published as "near Dayton."

Gage.--Water-stage recorder and concrete control. Datum of gage is 3,340.89 ft above mean sea level, datum of 1929.

Average discharge.--10 years, 5.0 cfs (3,620 acre-ft per year).

Extremes.--Maximum discharge during year, 1,860 cfs June 15 (gage height, 2.42 ft); no flow most days.

1951-61: Maximum discharge, 23,700 cfs Oct. 7, 1954 (gage height, 6.82 ft), from rating curve extended above 6,000 cfs on basis of slope-area measurement of peak flow; no flow for extended periods.

The greatest flood known occurred about Sept. 22, 1941, when a stage of about 9 ft (from old logs) was reached, and peak discharge for station near Dunken was 70,000 cfs (as determined for that station in 1956, from floodmarks and rating curve extended above 36,300 cfs).

Remarks.--Records good. Diversions and ground-water withdrawals for irrigation of about 3,200 acres (1959 determination) above station.

Discharge, in cubic feet per second, water year October 1960 to September 1961

June 15.....*275

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
June 1961.....	275	275	0	9.2	545
Calendar year 1960.....	-	503	0	4.3	3,110
Water year 1960-61.....	-	275	0	.8	545

Peak discharge (base, 750 cfs).--June 15 (6:30 a.m.) 1,860 cfs (2.42 ft).

*Discharge measurement made on this day.

Note.--Flow occurred only on day listed above. Observations of no flow generally made at least once a month.

8-3995. Pecos River (Kaiser Channel) near Lakewood, N. Mex.

Location.--Lat 32°41'22", long 104°17'53", in NW¼SE¼ sec.5, T.19 S., R.27 E., on left bank 3 miles upstream from high-water line of Lake McMillan, 6 miles northeast of Lakewood, 7 miles northeast of gates in McMillan Dam, and 12 miles southeast of Artesia.

Records available.--May 1950 to September 1961. Prior to October 1954, published as Kaiser Lake-McMillan Channel near Lakewood.

Gage.--Water-stage recorder. Datum of gage is 3,270.53 ft above mean sea level (Bureau of Reclamation bench mark). Prior to Mar. 23, 1955, at site 3 miles downstream at datum 9.83 ft lower.

Average discharge.--11 years, 169 cfs (122,400 acre-ft per year).

Extremes.--Maximum daily discharge during year, 1,650 cfs Oct. 19; no flow Sept. 2.

1950-61: Maximum daily discharge, 2,920 cfs July 12, 1960; no flow at times in most years.

Remarks.--Records good except those for periods of no gage-height record, and those below 10 cfs, which are fair. Flow partly regulated by Alamogordo Reservoir (see p. 150). Diversions and ground-water withdrawals for irrigation of about 170,000 acres (1959 determination) above station. Above about 1,500 cfs flow will begin bypassing station and, depending on the magnitude and duration of flow, may reach Lake McMillan.

Rating tables (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 27-31, Feb. 15 to Mar. 3, July 4-11, 13)

Oct. 1 to June 12

June 13 to Sept. 30

0.7	27	2.0	310	0	0	.9	72
.9	49	3.0	660	.2	2	1.5	201
1.2	97	6.0	1,900	.3	6	3.0	680
1.5	163			.4	12	6.0	1,900
				.6	30		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	69	206	153	192	186	*156	79	*141	*39	16	*836	a 1
2	68	197	151	186	*186	158	90	141	69	17	810	*0
3	*63	186	156	*250	186	156	103	137	71	16	785	29
4	59	181	189	266	171	156	111	135	90	8	774	8
5	52	171	203	266	158	151	105	130	90	*7	778	*5
6	48	179	192	266	161	144	99	126	76	7	796	7
7	50	220	184	259	176	151	92	130	66	7	824	4
8	57	226	186	259	195	149	86	128	59	4	806	19
9	53	203	197	259	200	146	81	132	53	4	*813	22
10	66	186	195	262	203	137	74	137	39	11	799	14
11	71	184	179	250	203	137	77	141	32	7	584	13
12	62	179	181	217	200	130	77	146	449	*14	238	17
13	55	176	195	195	197	132	81	141	928	7	a 150	30
14	55	176	226	181	197	126	76	144	*908	240	a 130	27
15	56	176	223	176	192	115	90	153	1100	1220	a 125	58
16	60	171	209	171	186	113	95	137	1480	754	a 120	69
17	392	166	197	168	184	97	95	135	1060	*806	243	105
18	1570	161	184	166	181	90	93	137	680	778	282	67
19	1650	163	179	166	176	88	88	126	*372	a 665	191	46
20	1030	163	179	186	179	109	73	121	279	698	164	27
21	*1360	163	181	195	181	128	*63	111	224	701	a 140	14
22	1180	163	*184	186	176	113	63	76	*162	785	*109	9
23	902	163	275	181	173	115	69	65	128	1000	77	16
24	a 590	163	244	189	171	107	63	55	92	988	59	19
25	*476	161	235	200	171	111	62	a 41	64	785	42	16
26	393	163	223	189	166	115	144	a 38	70	*876	31	21
27	343	166	209	171	158	113	126	50	*58	872	25	15
28	304	166	203	168	158	111	126	a 48	41	868	18	16
29	266	*158	197	168	-	101	126	a 46	40	872	a 11	17
30	232	153	195	163	-----	99	132	57	26	764	a 6	11
31	*217	-----	192	181	-----	*84	-----	a 42	-----	785	a 2	-----
Total	11,849	5,289	6,096	6,332	5,071	3,838	2,739	3,347	8,845	14,582	10,769	722
Mean	382	176	197	204	181	124	91.3	108	295	470	347	24.1
Ac-ft	23,500	10,490	12,090	12,560	10,060	7,610	5,430	6,640	17,540	28,920	21,360	1,430

Calendar year 1960: Max 2,920 Min 0 Mean 254 Ac-ft 184,500
Water year 1960-61: Max 1,650 Min 0 Mean 218 Ac-ft 157,600

* Discharge measurement or observation of no flow made on this day.
a No gage-height record.

RIO GRANDE BASIN

8-4000. Four Mile Draw near Lakewood, N. Mex.

Location.--Lat 32°40'45", long 104°23'40", in NW¼NW¼ sec.9, T.19 S., R.26 E., on downstream side of center pier of bridge on U. S. Highway 285, 3.8 miles northwest of Lakewood, 5½ miles upstream from mouth, and 1½ miles south of Artesia.

Drainage area.--265 sq mi, approximately.

Records available.--October 1951 to September 1961.

Gage.--Water-stage recorder. Datum of gage is 3,329.75 ft above mean sea level, datum of 1929.

Average discharge.--10 years, 1.43 cfs (1,040 acre-ft per year).

Extremes.--Maximum discharge during year, 15 cfs June 15 (gage height, 3.63 ft); no flow for most of time.

1951-61: Maximum discharge, 7,650 cfs Oct. 7, 1954 (gage height, 13.30 ft), from rating curve extended above 1,400 cfs on basis of slope-area measurement of peak flow; no flow for most days.

Remarks.--Records fair. No known diversions above station.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Oct. 17.....**0.2
June 15.....** .4

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
October 1960.....	0.2	0.2	0	0.01	0.4
June 1961.....	.4	.4	0	.01	.8
Calendar year 1960.....	-	336	0	2.09	1,510
Water year 1960-61.....	-	.4	0	.002	1.2

Peak discharge (base, 200 cfs).--No peak above base.

** Field estimate made on this day.

Note.--Flow occurred only on days listed above. Observations of no flow generally made at least once a month.

8-4010. Pecos River below McMillan Dam, N. Mex.

Location.--Lat 32°35'40", long 104°21'00", in NE¼ sec. 11, T.20 S., R.26 E., on left bank 700 ft downstream from gates in McMillan Dam and 3 miles southeast of Lakewood.

Drainage area.--16,990 sq mi, approximately (contributing area).

Records available.--January 1906 to March 1908, January 1909 to December 1911, August 1939 to December 1940, December 1946 to September 1961 (January 1906 and January 1910 to December 1911, gage heights and discharge measurements only). Published as "near Lakewood" 1906-11, and as "below McMillan Dam, near Lakewood" 1939-40.

Gage.--Water-stage recorder and rock control. Datum of gage is 3,238.21 ft above mean sea level, datum of 1929. January 1906 to December 1911 staff gage at three different sites within half a mile of present gage at different datums. August 1939 to December 1940 water-stage recorder at site 30 ft downstream at datum 0.10 ft higher; December 1946 to Mar. 11, 1957, at present site at datum 1.09 ft higher. Supplemental water-stage recorders on McMillan Dam spillways, Nos. 1 and 2, since July 9, 1960, and Apr. 6, 1960, respectively.

Average discharge.--16 years (1906-7, 1939-40, 1947-61), 110 cfs (79,640 acre-ft per year).

Extremes.--Maximum discharge during year, 735 cfs Aug. 11 (gage height, 4.48 ft); no flow for many days.

1939-40, 1947-61: Maximum discharge, 16,100 cfs Oct. 11, 1954, includes flow of two spillways; no flow for many periods. Flood of Oct. 2, 1904, may have reached 60,000 cfs; figure of 82,000 cfs previously published has been found to be "inflow to McMillan Reservoir," and is considered too high. This station may have had a higher discharge in August 1893 when part of McMillan Dam was blasted to prevent total destruction of the dam (that flood was described as "highest in 50 years" and it also destroyed Avalon Dam).

Remarks.--Records good. Flow regulated by Alamogordo Reservoir and Lake McMillan (see p. 150). Flow over McMillan Dam spillways bypasses station but is gaged and included with discharge. Diversions and ground-water withdrawals for irrigation of about 171,000 acres (1959 determination) above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Discharges include flow over two McMillan Dam spillways that bypass gage Oct. 25-28, 30, Nov. 9, 20, 22, Dec. 6-11, Jan. 13, 18-20, 24-30, Feb. 4-6, Feb. 9 to Mar. 8, Mar. 16-29)

1.4	0	2.0	24	3.5	340
1.5	1	2.3	56	4.0	540
1.6	2	2.6	104	4.5	770
1.8	11	3.0	190		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	121	*80	115	111	*5	296	**0	*49	399	*323	227
2	0	121	80	115	*111	4	296	0	110	395	410	170
3	*0	121	80	*113	109	4	296	0	143	286	418	111
4	75	121	78	115	112	4	296	0	143	188	492	111
5	113	119	78	45	115	35	293	0	141	*183	496	*171
6	86	50	83	0	110	56	293	0	137	259	330	219
7	25	0	81	0	37	125	293	0	139	438	293	199
8	0	0	82	0	0	122	290	0	139	442	233	107
9	0	154	188	0	3	121	290	0	137	245	259	35
10	28	150	261	0	1	121	372	0	139	133	384	0
11	78	119	257	0	48	260	418	0	172	183	657	0
12	61	119	255	0	76	167	422	0	290	216	466	0
13	18	119	200	1	76	0	418	76	230	173	0	0
14	0	100	150	0	106	0	414	238	203	208	0	88
15	0	67	150	0	126	0	410	198	163	213	308	183
16	0	67	150	0	126	1	406	137	115	236	422	180
17	0	67	150	0	128	53	406	109	117	369	399	131
18	0	67	150	4	128	132	403	250	91	458	296	102
19	0	67	130	2	131	131	250	230	0	406	150	102
20	0	68	90	1	129	61	113	105	0	384	117	100
21	0	67	90	65	128	1	113	105	0	351	117	100
22	0	68	170	102	130	1	113	105	0	213	115	100
23	0	67	210	102	141	2	212	105	0	47	153	100
24	0	66	210	131	135	3	51	105	155	0	300	98
25	3	66	210	155	94	2	0	91	447	217	296	98
26	241	66	180	208	4	2	0	54	438	462	238	98
27	318	66	115	208	11	82	0	54	410	492	143	96
28	218	66	115	264	6	282	0	54	403	358	150	96
29	216	66	115	307	-	317	0	52	403	290	313	96
30	219	72	115	184	-----	305	0	49	399	293	403	36
31	*183	-----	115	111	-----	*300	-----	49	-----	296	372	-----
Total	1,882	2,487	4,418	2,348	2,432	2,699	7,164	2,166	5,313	8,833	9,053	3,154
Mean	60.7	82.9	143	75.7	86.9	87.1	239	69.9	177	285	292	105
Ac-ft	3,730	4,930	8,760	4,660	4,820	5,350	14,210	4,300	10,540	17,520	17,960	6,260

Calendar year 1960: Max 5,210 Min 0 Mean 169 Ac-ft 122,500
Water year 1960-61: Max 657 Min 0 Mean 142 Ac-ft 103,000

* Discharge measurement or observation of no flow made on this day.

** Field estimate made on this day.

RIO GRANDE BASIN

8-4020. Pecos River at damsite 3, near Carlsbad, N. Mex.

Location.--Lat 32°30'40", long 104°20'00", in lot 14, sec.6, T.21 S., R.26 E., on right bank at damsite 3 of Carlsbad project of Bureau of Reclamation, about 1 mile upstream from flow line of Lake Avalon, 1.3 miles downstream from Rocky Arroyo, and 8 miles northwest of Carlsbad.

Drainage area.--17,980 sq mi, approximately (contributing area).

Records available.--August 1939 to December 1940, August 1944 to September 1961.

Gage.--Water-stage recorder. Datum of gage is 3,172.31 ft above mean sea level (Bureau of Reclamation datum). Prior to Aug. 10, 1944, at site 1,000 ft downstream at same datum.

Average discharge.--18 years, 186 cfs (134,700 acre-ft per year).

Extremes.--Maximum discharge during year, 1,080 cfs June 15 (gage height, 2.90 ft); minimum daily, 49 cfs Sept. 13. 1939-40, 1944-61: Maximum discharge, 53,000 cfs Oct. 7, 1954 (gage height, 18.53 ft), from rating curve extended above 15,000 cfs on basis of slope-area measurement of peak flow; minimum daily, 4.8 cfs Aug. 1, 4, 7, 8, 1954.

Peaks which probably exceeded 40,000 cfs occurred in August 1893, Oct. 2, 1904, July 25, 1905, Apr. 17, 1915, Aug. 7, 1916, and May 30, 1937, based primarily on records for station at Carlsbad. Floods of 1893 and 1904 originated above McMillan Dam and contributed to the two failures of Avalon Dam. The flood of Oct. 2, 1904, probably did not exceed 60,000 cfs; the estimate of 82,000 cfs erroneously published as flow over McMillan Dam was actually inflow to Lake McMillan, and is thought to be high.

Remarks.--Records good except those for periods of doubtful or no gage-height record, which are fair. Flow regulated by Alamogordo Reservoir and Lake McMillan (see p. 150). Diversions and ground-water withdrawals for irrigation of about 173,000 acres (1959 determination) above station. Discharge represents inflow to Lake Avalon.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 14 to Apr. 14)

0.3	49	1.5	370
.5	81	2.5	855
1.0	196		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a 65	191	*156	182	182	*90	350	*61	*94	442	*346	300
2	a 60	191	156	182	*182	87	346	61	117	442	442	241
3	*60	191	156	*182	182	89	350	61	177	386	450	164
4	80	191	154	182	185	89	350	58	177	a 240	504	162
5	156	191	154	153	191	110	350	58	177	*231	540	*191
6	146	166	154	79	185	123	350	58	177	268	406	247
7	110	83	156	76	153	196	350	55	180	454	342	292
8	60	79	159	76	87	199	350	58	180	500	303	159
9	56	160	215	76	85	193	350	56	180	350	288	200
10	56	247	334	76	87	193	398	56	177	191	394	58
11	128	193	330	74	94	274	468	55	180	213	605	54
12	115	193	330	74	154	320	468	54	311	260	654	50
13	96	193	290	76	154	90	464	52	282	225	83	49
14	60	191	228	76	166	83	459	259	231	244	69	64
15	56	146	228	76	202	81	464	228	438	d 257	241	213
16	69	146	228	76	202	81	464	196	164	d 260	472	216
17	276	146	228	76	202	90	459	149	162	d 374	468	193
18	66	146	225	76	202	202	454	227	162	d 495	378	144
19	a 60	146	219	76	205	202	373	315	80	d 464	235	142
20	a 60	146	162	76	205	177	172	152	56	d 430	185	139
21	a 60	149	159	113	202	85	172	146	55	d 422	174	142
22	a 58	149	200	169	199	81	172	146	55	d 292	174	142
23	a 58	146	274	169	202	81	244	146	55	d 164	177	142
24	a 58	146	274	199	219	83	184	149	95	52	350	142
25	a 58	144	274	205	205	81	69	146	422	d 138	354	142
26	a160	144	268	274	98	79	64	106	486	d 482	311	139
27	a420	142	185	274	96	92	62	102	446	d 536	222	139
28	a285	144	182	300	90	307	62	102	446	d 450	172	137
29	a285	144	182	374	-	366	62	100	446	d 342	342	137
30	a280	146	182	313	-----	358	61	94	442	d 342	442	115
31	*278	-----	182	185	-----	*350	-----	94	-----	d 342	438	-----
Total	3,835	4,790	5,624	4,595	4,616	4,932	8,941	3,600	6,650	10,288	10,561	4,655
Mean	124	160	214	148	165	159	298	116	222	332	341	155
Ac-ft	7,610	9,500	13,140	9,110	9,160	9,780	17,730	7,140	13,190	20,410	20,950	9,230

Calendar year 1960: Max 5,370 Min 30 Mean 222 Ac-ft 161,100
Water year 1960-61: Max 654 Min 49 Mean 203 * Ac-ft 147,000

Peak discharge (base, 1,700 cfs).--No peak above base.

* Discharge measurement made on this day.

a No gage-height record.

d Doubtful gage-height record.

8-4035. Carlsbad main canal at head, near Carlsbad, N. Mex.

Location.--Lat 32°29'28", long 104°15'08", in N½SW¼SW¼ sec.12, T.21 S., R.26 E., on right bank 220 ft downstream from headgates in Avalon Dam and 5.0 miles north of Carlsbad.

Records available.--July 1939 to December 1940 (published as Carlsbad project main canal near Carlsbad), April 1951 to September 1961.

Gage.--Water-stage recorder and concrete control. Datum of gage is 3,156.50 ft above mean sea level, datum of 1929. July 1939 to December 1940 at site 20 ft upstream at datum 0.9 ft higher.

Extremes.--1939-40, 1951-61: Maximum daily discharge, 490 cfs July 13, 1940; no flow at times.

Remarks.--Records good. Discharge measurements generally made once a month during irrigation season. Carlsbad main canal diverts water from Lake Avalon for irrigation of about 25,000 acres of Carlsbad Irrigation District. About 1,600 acres is irrigated on left bank of the Pecos River, most of it above gaging station on Pecos River at Carlsbad. The remaining acreage is on right bank, most of it downstream from Pecos River at Carlsbad gage.

Monthly discharge, in cubic feet per second, water year October 1960 to September 1961

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	134	0	49.0	3,010
November.....	0	0	0	0
December.....	0	0	0	0
Calendar year 1960.....	454	0	121	87,950
January.....	69	0	12.8	789
February.....	59	0	6.3	349
March.....	381	49	149	9,160
April.....	439	56	251	14,960
May.....	222	43	136	8,380
June.....	413	40	200	11,920
July.....	431	59	312	19,160
August.....	439	174	317	19,500
September.....	284	53	152	9,050
Water year 1960-61.....	439	0	133	96,286

8-4040. Pecos River below Avalon Dam, N. Mex.

Location.--Lat 32°28'53", long 104°15'43", in SW $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.14, T.21 S., R.26 E., 5,200 ft below Avalon Dam and 4.5 miles northwest of Carlsbad.

Drainage area.--18,080 sq mi, approximately (contributing area).

Records available.--January 1906 to March 1907 (published as "at Avalon"), June 1951 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 3,130 ft (from topographic map). January 1906 to March 1907 staff gage at site half a mile upstream at different datum.

Average discharge.--10 years (1951-61), 45.3 cfs (32,800 acre-ft per year).

Extremes.--Maximum discharge during year, 332 cfs Jan. 28 (gage height, 6.05 ft); no flow for most days.

1951-61: Maximum discharge, 41,000 cfs Oct. 7, 1954 (gage height, 23.3 ft, from floodmarks); no flow for many days.

Flood of Oct. 2, 1904, caused, in part, by failure of Avalon Dam, was described at that time as the greatest flood known. Flood in August 1893 is probably second highest, and was described as "greatest in 50 years"; it damaged McMillan Dam and washed out the original Avalon Dam.

Remarks.--Records good. Flow regulated by Alamogordo Reservoir, Lake McMillan and Lake Avalon (see p. 151). Diversions and ground-water withdrawals above station for irrigation of about 198,000 acres (1959 determination). Station bypassed by Carlsbad main canal (see preceding page).

Rating table (gage-height, in feet, and discharge, in cubic feet per second)

3.8	0	4.7	58
4.0	4	5.3	157
4.2	12	6.0	318
4.4	25		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0	75	136	113	* 2		(*)	(*)		(*)	
2	0	96	81	133	* 124	0						
3	* 0	140	87	* 133	127	0						
4	0	134	92	129	133	0						
5	0	131	89	131	131	0				(*)		(*)
6	0	81	92	80	133	0						
7	0	33	93	45	131	0						
8	0	23	108	27	80	0						
9	0	24	140	24	49	0						
10	0	100	225	23	37	0						
11	0	127	257	23	34	0						
12	0	125	265	19	58	0						
13	0	122	272	20	86	0						
14	0	118	211	19	97	0						
15	0	103	185	19	127	0						
16	0	72	177	19	142	0						
17	5	69	175	19	149	0						
18	0	69	175	4	142	0						
19	0	69	175	1	146	1						
20	0	69	144	0	157	38						
21	0	68	118	0	157	15						
22	0	69	117	0	157	0						
23	0	66	179	0	153	0						
24	0	69	213	39	151	0						
25	0	71	220	106	151	0						
26	0	72	222	169	94	0						
27	0	72	181	205	28	0						
28	0	68	146	272	10	0						
29	0	68	136	310	-	0						
30	0	* 71	140	297	-----	0						
31	* 0	-----	138	151	-----	* 0	-----		-----			-----
Total	5	2,399	4,928	2,553	3,097	56	0	0	0	0	0	0
Mean	0.2	80.0	159	82.4	111	1.8	0	0	0	0	0	0
Ac-ft	9.9	4,760	9,770	5,060	6,140	111	0	0	0	0	0	0

Calendar year 1960: Max 6,030 Min 0 Mean 70.5 Ac-ft 51,150
 Water year 1960-61: Max 310 Min 0 Mean 35.7 Ac-ft 25,850

* Discharge measurement or observation of no flow made on this day.

8-4050. Pecos River at Carlsbad, N. Mex.

Location.--Lat 32°25'05", long 104°13'25", in NW¼SE¼ sec.6, T.22 S., R.27 E., in downstream end of pier near center of Greene Street Bridge in Carlsbad, half a mile upstream from Dark Canyon.

Drainage area.--18,100 sq mi, approximately (contributing area).

Records available.--May 1903 to March 1908 (January 1907 to March 1908, gage heights and discharge measurements only), May 1914 to September 1915, and April 1920 to September 1961 in reports of Geological Survey. Monthly discharges only for some periods, published in WSP 1312. Records (except maximum discharges) for October 1915 to March 1920, published in WSP 438, 458, 478, and 508, have been found to be unreliable and should not be used.

Gage.--Water-stage recorder. Datum of gage is 3,080.28 ft above mean sea level, datum of 1929. Prior to June 1, 1920, staff gages in immediate vicinity of present site, and at different datums prior to Jan. 6, 1938.

Average discharge.--20 years (1903-4, 1905-6, 1914-15, 1920-37), 279 cfs (prior to completion of Alamogordo Dam); 24 years (1937-61), 188 cfs (136,100 acre-ft per year).

Extremes.--Maximum discharge during year, 591 cfs Jan. 3 (gage height, 3.15 ft); minimum daily, 0.8 cfs Jan. 23.

1903-6, 1914-15, 1920-61: Maximum discharge probably exceeded 90,000 cfs Oct. 2, 1904 (gage height, 23.44 ft, from floodmarks); minimum daily, that of Jan. 23, 1961.

Flood of Oct. 2, 1904, caused in part by failure of Avalon Dam, was described at that time as "greatest flood known at Carlsbad." Flood in August 1893 is probably second highest, and was described as "greatest in 50 years"; it damaged McMillan Dam and washed out the original Avalon Dam.

Remarks.--Records good. Flow regulated by Alamogordo Reservoir, Lake McMillan, and Lake Avalon (see p. 150), and at low stages by powerplant above station. Gage is bypassed on left bank by Carlsbad main canal east which irrigates several hundred acres adjacent to and below gage site, and on right bank by Carlsbad main canal south which with supplemental groundwater withdrawals irrigates about 23,000 acres below. This bypass flow is not presently gaged. Diversions and ground-water withdrawals above station for irrigation of about 198,000 acres (1959 determination).

Rating table (gage height, in feet, and discharge, in cubic feet per second)

0.44	0.8	0.7	5.3	1.1	24	2.2	138
.5	1.4	.8	8.5	1.5	52	2.5	228
.6	3.0	.9	13	1.9	89	2.8	375

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	23	33	100	168	140	*56	41	*41	*35	35	*38	31
2	30	63	112	165	*150	53	42	40	20	32	27	31
3	*31	136	119	*337	160	53	*42	40	40	31	28	31
4	30	132	125	252	162	53	40	40	40	36	27	30
5	30	128	119	180	160	54	40	40	39	*36	21	*30
6	31	106	129	152	162	52	39	39	37	36	7.3	32
7	34	65	114	117	162	53	40	40	36	40	33	15
8	30	56	140	99	127	54	43	38	35	33	30	27
9	29	48	168	93	99	52	40	38	35	33	28	29
10	29	89	232	92	84	51	43	39	35	26	27	29
11	29	132	281	90	82	49	46	42	33	41	39	29
12	31	130	286	88	95	48	44	33	33	38	18	28
13	32	130	300	88	121	47	47	37	33	33	32	28
14	28	130	245	88	130	45	47	37	33	40	32	27
15	30	123	*217	87	157	44	42	37	40	30	32	27
16	35	97	203	88	174	44	44	37	35	29	33	28
17	84	93	203	88	180	44	42	42	30	32	20	28
18	36	93	203	83	174	45	41	44	37	29	33	27
19	33	93	203	73	177	44	43	44	38	30	34	28
20	33	93	180	48	189	58	44	44	38	35	32	28
21	34	92	150	1.7	192	65	44	44	38	33	15	27
22	34	96	143	.9	189	46	44	44	37	34	30	30
23	34	113	192	*.8	183	42	44	29	36	100	22	31
24	34	94	237	1.6	177	43	44	44	37	35	26	32
25	35	106	245	97	183	43	42	43	35	34	33	29
26	33	99	250	177	148	42	41	42	36	35	36	32
27	34	99	217	221	85	45	40	39	38	31	30	37
28	34	110	180	271	63	43	40	39	40	35	14	38
29	34	98	168	320	-	48	44	38	38	29	33	*218
30	33	*92	171	*320	-----	42	44	38	37	30	33	*107
31	*33	-----	168	199	-----	46	-----	55	-----	34	30	-----
Total	1,040	2,969	5,800	4,086.0	4,105	1,504	1,277	1,221	1,074	1,078.0	873.3	1,144
Mean	33.5	99.0	187	132	147	48.5	42.6	39.4	35.8	34.8	28.2	38.1
Ac-ft	2,060	5,890	11,500	8,100	8,140	2,980	2,530	2,420	2,130	2,140	1,730	2,270

Calendar year 1960: Max 6,360 Min 0.9 Mean 98.6 Ac-ft 71,550
 Water year 1960-61: Max 337 Min 0.8 Mean 71.7 Ac-ft 51,890

* Discharge measurement made on this day.

RIO GRANDE BASIN

8-4053. Rattlesnake Springs near White City, N. Mex.

Location.--Lat 32°06'36", long 104°28'17", in SE¼SW¼ sec.23, T.25 S., R.24 E., on right bank of ditches Nos. 1 and 2, on left bank of ditch No. 3, and on springs pool, 5 miles south of Carlsbad Caverns, 7.2 miles southwest of White City, and 25 miles southwest of Carlsbad.

Records available.--February to September 1961. Periodic measurements of discharge from springs published as miscellaneous measurements, 1953-60. Miscellaneous measurements during period October 1960 to January 1961 published in table below.

Gages.--Water-stage recorders and Parshall flumes on ditches Nos. 1 and 2. Staff gage and V-notch weir, subsequent to July 25, on ditch No. 3. Water-stage recorder on springs pool. Sparling-type flow meters in pipelines from springs pool.

Extremes.--Maximum daily discharge during period, 2.73 cfs Mar. 3; minimum daily, 0.17 cfs July 25.

Remarks.--Records good. Discharge measurements generally made two or more times a month. Discharge represents total flow of springs and is determined by combining flows in ditches Nos. 1, 2, and 3, changes in pool storage, and metered pumpage from pool. Rattlesnake Springs is the source of water for Carlsbad Caverns National Park.

Results of discharge measurements, in cubic feet per second, of Rattlesnake Springs
for the period October 1960 to January 1961

Date	Discharge	Date	Discharge	Date	Discharge
Oct. 3	*0.81	Nov. 4	a1.78	Jan. 4	a2.18
31	*2.30	30	*2.49	30	*2.49

* Base flow

a Flow affected by pumpage for Carlsbad Caverns water supply.

Discharge, in cubic feet per second, February to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1					2.49	2.51	1.48	1.00	1.16	0.99	0.26	0.86
2					2.49	2.72	1.67	1.11	1.23	.98	.23	.82
3					2.49	2.73	1.69	1.15	1.16	1.01	.35	.85
4					2.49	2.64	1.58	1.16	1.30	.94	.47	.93
5					2.49	2.69	1.52	1.21	1.45	.76	.55	.80
6					2.51	2.62	1.47	1.35	1.56	.89	.38	.61
7					2.51	2.59	1.35	1.45	1.64	.89	.49	.76
8					2.51	2.60	1.35	1.39	1.65	.80	.60	.80
9					2.55	2.61	1.43	1.34	1.60	.79	.51	.81
10					2.56	2.64	1.55	1.28	1.59	.70	.49	.83
11					2.51	2.64	1.58	1.25	1.55	.83	.32	1.04
12					2.56	2.59	1.46	1.29	1.42	.78	.36	1.03
13					2.55	2.53	1.29	1.10	1.33	.76	.57	.92
14					2.55	2.58	1.28	1.12	1.27	.81	.50	.81
15					2.50	2.53	1.30	1.19	1.29	.85	.44	.51
16					2.58	2.45	1.25	1.17	1.39	.90	.37	.64
17					2.53	2.33	1.25	1.21	1.37	.80	.26	.75
18					2.47	2.25	1.16	1.05	1.27	.54	.18	.87
19					2.47	2.06	1.05	1.01	1.21	.44	.29	1.04
20					2.43	1.93	1.03	1.24	1.17	.18	.55	1.09
21					2.43	1.86	1.17	.93	1.02	.20	.65	1.17
22					2.52	1.77	1.21	.92	1.05	.24	.62	1.12
23					2.50	1.66	1.15	.91	.81	.33	.65	1.07
24					2.43	1.67	1.06	.91	.76	.25	.68	1.09
25					2.48	1.67	.99	.90	.99	.17	.75	1.22
26					2.53	1.60	1.05	.84	1.08	.22	.83	1.28
27					2.53	1.59	1.01	.88	1.15	.38	.84	1.24
28					2.53	1.54	.90	1.09	1.23	.31	.73	1.43
29					-----	1.46	.86	1.31	1.08	.19	.80	1.36
30					-----	1.45	.93	1.21	1.01	.42	.88	1.22
31					-----	1.40	-----	1.08	-----	.32	.94	-----
Total					70.19	67.91	38.07	35.05	37.79	18.67	16.54	28.97
Mean					2.51	2.19	1.27	1.13	1.26	0.602	0.534	0.966
Ac-ft					139	135	76	70	75	37	33	57

8-4055. Black River above Malaga, N. Mex.

Location--Lat 32°13'40", long 104°09'05", in SW¼ sec.12, T.24 S., R.27 E., on right bank 0.6 mile upstream from Black River diversion dam, 4.8 miles west of Malaga, and 7 miles upstream from mouth.

Drainage area--343 sq mi.

Records available--March to December 1940, December 1946 to September 1961.

Gage--Water-stage recorder. Altitude of gage is 3,070 ft (from topographic map). March to December 1940 water-stage recorder and Cipolletti weir at site 0.3 mile downstream at different datum.

Average discharge--14 years (1947-61), 12.9 cfs (9,340 acre-ft per year).

Extremes--Maximum discharge during year, 400 cfs Oct. 17 (gage height, 3.03 ft); minimum daily, 2.8 cfs Oct. 27, Sept. 21.

1946-61: Maximum discharge, 20,500 cfs Sept. 23, 1955 (gage height, 14.70 ft), from rating curve extended above 1,400 cfs on basis of slope-area measurements at gage heights 8.41 and 12.60 ft; minimum daily, 2.3 cfs Nov. 3, 4, 1959.

Maximum flood known since 1908 (from information by local resident), 33,000 cfs Sept. 20 or 21, 1941 (gage height, 19.0 ft, determined in 1947 from well-defined floodmarks), from rating curve extended above 1,400 cfs as explained above. Flood of Apr. 17, 1915, reached a stage of 11 ft at bridge on Loving-Malaga road.

Remarks--Records excellent. Diversions for irrigation of about 1,000 acres (1959 determination) above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

0.71	2.8	1.4	40
.8	5.5	1.7	76
.9	9.4	2.0	125
1.1	19		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.8	9.0	3.6	1.1	5.2	* 7.0	7.0	7.4	6.2	4.9	4.2	3.9
2	7.8	9.0	3.9	1.1	5.2	6.6	7.0	* 7.0	6.2	4.9	3.9	3.4
3	* 8.2	* 9.0	3.9	1.1	4.9	7.8	* 7.0	7.4	5.9	4.9	3.9	3.4
4	8.2	9.0	3.9	* 1.1	4.9	1.0	7.4	7.0	5.9	4.9	4.2	3.6
5	8.2	9.4	3.9	1.1	4.9	9.4	7.0	6.6	5.5	* 4.9	3.9	* 4.2
6	8.2	9.4	3.9	1.1	4.6	6.2	7.0	6.6	5.9	4.2	3.6	5.2
7	7.8	9.4	3.9	1.1	4.9	5.2	7.0	6.2	5.9	4.2	3.9	5.9
8	7.8	9.4	4.6	1.1	4.9	4.9	7.0	5.9	5.9	4.2	3.6	4.6
9	7.8	9.4	6.2	1.1	4.9	4.9	6.2	6.2	5.9	4.6	3.6	4.2
10	7.8	9.4	5.5	1.1	4.9	4.9	7.0	6.6	5.9	4.6	3.6	4.2
11	8.2	9.4	4.9	1.1	4.9	4.9	7.0	6.6	5.9	4.2	3.4	3.9
12	8.2	9.4	4.6	1.1	4.9	4.9	7.0	6.2	5.5	4.2	3.4	3.6
13	7.8	9.4	4.9	1.1	4.9	4.9	7.0	5.9	5.2	4.2	3.4	3.4
14	7.0	9.9	4.9	1.1	4.9	4.9	6.6	5.5	5.2	3.9	3.6	3.1
15	5.5	9.9	4.6	1.1	4.9	4.9	6.2	5.9	1.0	3.6	3.6	3.1
16	1.9	9.9	8.2	1.1	4.9	4.9	7.4	6.2	7.8	5.2	3.4	3.1
17	1.23	1.0	1.0	1.1	4.9	4.9	7.0	6.2	7.4	4.2	4.9	3.1
18	3.1	1.0	1.0	1.1	4.9	5.2	7.0	7.0	5.9	4.2	4.2	3.4
19	1.1	1.0	1.0	1.1	4.9	6.2	7.0	9.4	5.5	4.2	4.2	3.1
20	6.6	1.0	1.1	1.1	5.2	5.5	7.0	* 3.7	5.5	3.9	4.2	3.1
21	5.2	1.0	1.1	1.1	5.5	5.2	6.6	1.9	5.5	4.2	4.9	2.8
22	4.2	1.1	1.1	1.1	5.5	5.2	6.6	9.0	5.9	4.2	4.9	3.1
23	3.6	1.0	1.1	1.1	5.2	5.2	6.6	7.4	5.5	4.6	4.6	3.1
24	3.4	9.4	1.1	1.3	5.2	5.2	7.0	7.4	5.2	4.6	4.2	3.4
25	3.1	8.6	1.1	1.2	5.2	5.2	7.0	7.4	4.9	4.2	4.9	3.4
26	3.1	5.2	1.1	1.2	5.2	4.6	7.0	7.4	4.9	4.2	3.9	3.4
27	2.8	4.6	1.1	1.2	8.6	4.2	6.6	8.2	4.9	4.2	3.6	3.9
28	5.5	3.6	1.1	1.1	9.4	4.2	6.2	8.2	4.9	4.2	3.6	3.6
29	8.2	3.4	1.1	7.0	-	4.6	7.0	8.2	4.6	4.6	3.9	3.9
30	8.6	* 3.6	1.2	* 5.9	-----	4.9	7.8	6.6	4.6	4.6	3.6	3.9
31	* 8.6	-----	1.2	5.5	-----	5.9	-----	* 5.9	-----	* 4.6	3.9	-----
Total	363.2	259.7	239.4	331.4	148.4	172.5	207.2	257.5	174.0	136.3	122.7	110.0
Mean	11.7	8.66	7.72	10.7	5.30	5.56	6.91	8.31	5.80	4.40	3.96	3.67
Ac-ft	72.0	51.5	47.5	65.7	29.4	34.2	41.1	51.1	34.5	27.0	24.3	21.8

Calendar year 1960: Max 1,330 Min 2.8 Mean 17.1 Ac-ft 12,400
 Water year 1960-61: Max 123 Min 2.8 Mean 6.91 Ac-ft 5,000

Peak discharge (base, 450 cfs)--No peak above base.

* Discharge measurement made on this day.

8-4065. Pecos River near Malaga, N. Mex.

Location.--Lat 32°12'30", long 104°01'20", in N½ sec.19, T.24 S., R.29 E., on right bank 3 miles southeast of Malaga and 4 miles downstream from Black River.

Drainage area.--19,190 sq mi, approximately (contributing area).

Records available.--May 1920 to September 1961. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder. Datum of gage is 2,895.64 ft above mean sea level, datum of 1929. Prior to Mar. 25, 1949, at datum 3 ft higher.

Average discharge.--17 years (1920-37), 301 cfs (prior to completion of Alamogordo Reservoir); 24 years (1937-61), 237 cfs (171,600 acre-ft per year).

Extremes.--Maximum discharge during year, 866 cfs Oct. 18 (gage height, 5.54 ft); minimum daily, 24 cfs June 13, 30, July 1, 2, 18, 20, 26.

1920-61: Maximum discharge, 63,700 cfs Sept. 21, 1941, from rating curve extended above 22,500 cfs by logarithmic plotting; maximum gage height, 35.1 ft May 22, 1941, present datum, from floodmarks; minimum daily discharge, 5.6 cfs Aug. 18-20, 1954.

Flood in 1941 is believed to be the highest since 1904 when a flood of about the same magnitude occurred. Flood of Aug. 7, 1916, was revised to 70,000 cfs at Carlsbad, 27 miles upstream. Flood in September 1919 reached a stage of 29.4 ft, present datum (discharge, 40,400 cfs).

Remarks.--Records good. Flow regulated by storage in Alamogordo Reservoir, Lake McMillan, and Lake Avalon (see p. 150), and by several small diversion dams that divert for power or irrigation. Diversions and ground-water withdrawals above station for irrigation of about 202,000 acres (1959 determination). Harroun canal bypasses gage on left bank and irrigates approximately 1,000 acres adjacent to and below gage. This bypass is not gaged.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

1.9	21	3.0	152
2.1	36	3.5	239
2.3	55	4.3	440
2.6	91		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	32	91	147	221	239	123	30	46	30	24	37	30
2	31	92	152	216	198	77	31	*76	*55	24	29	33
3	33	102	152	214	205	*60	31	88	39	25	27	30
4	42	*208	159	414	212	52	31	87	28	29	25	29
5	65	208	157	274	210	52	34	76	26	52	30	30
6	74	205	159	237	208	57	34	81	66	57	39	*33
7	72	183	178	208	214	50	48	74	71	*56	36	40
8	72	128	172	172	212	41	48	83	74	53	36	51
9	77	111	214	154	179	37	54	71	68	56	32	40
10	*76	97	223	*146	149	39	50	81	56	59	28	40
11	78	120	282	142	134	44	81	74	40	49	28	37
12	83	194	*320	138	130	45	83	92	27	56	33	39
13	81	198	335	136	138	53	74	84	24	40	30	38
14	77	201	335	134	169	50	83	81	27	30	34	37
15	77	191	282	134	183	49	78	52	32	29	38	40
16	63	136	255	131	203	58	81	31	64	29	38	68
17	392	112	251	131	221	56	84	31	50	27	32	56
18	438	105	247	130	226	54	83	38	44	24	38	54
19	138	102	249	126	223	65	55	55	34	25	49	45
20	94	105	249	122	230	67	39	57	34	24	32	43
21	84	102	225	123	251	56	37	138	34	27	32	40
22	83	130	203	91	243	65	40	58	34	25	39	37
23	84	134	200	*76	237	54	35	37	30	27	32	33
24	91	152	247	83	228	43	34	30	28	26	29	40
25	92	134	280	108	219	42	35	35	27	25	29	39
26	91	144	288	113	221	44	33	45	27	24	30	38
27	90	134	288	235	186	48	33	45	27	29	33	31
28	90	128	255	280	146	46	37	56	29	46	44	29
29	91	141	225	355	-	*43	34	43	27	45	36	28
30	91	144	223	*380	-----	32	41	33	24	30	33	83
31	91	-----	225	362	-----	30	-----	31	-----	*34	31	-----
Total	3,073	4,232	7,177	5,786	5,614	1,632	1,491	1,909	1,176	1,106	1,039	1,211
Mean	99.1	141	232	187	200	52.6	49.7	61.6	39.2	35.7	33.5	40.4
Ac-ft	5,100	8,390	14,240	11,480	11,140	3,240	2,960	3,790	2,330	2,190	2,060	2,400

Calendar year 1960: Max 5,850 Min 17 Mean 134 Ac-ft 97,610

Water year 1960-61: Max 438 Min 24 Mean 97.1 Ac-ft 70,320

Peak discharge (base, 1,800 cfs).--No peak above base.

* Discharge measurement made on this day.

8-4070. Pecos River at Pierce Canyon Crossing, near Malaga, N. Mex.

Location.--Lat 32°11'20", long 103°58'45", in W½ sec.27, T.24 S., R.29 E., a quarter of a mile upstream from Pierce Canyon Crossing and 6 miles southeast of Malaga.

Drainage area.--19,260 sq mi, approximately (contributing area).

Records available.--July 1938 to September 1941, August 1951 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 2,890 ft (from river-profile map). July 1938 to September 1941 at datum 1.19 ft higher.

Average discharge.--13 years, 232 cfs (168,000 acre-ft per year).

Extremes.--Maximum discharge during year, 778 cfs Oct. 18 (gage height, 3.13 ft); minimum daily, 26 cfs Aug. 4.

1938-41, 1951-61: Maximum gage height, 24.8 ft May 22, 1941 (datum then in use), from floodmarks (discharge not determined).
minimum daily discharge, 4.4 cfs Aug. 20, 1954.

Remarks.--Records good. Flow regulated by storage in Alamogordo Reservoir, Lake McMillan, and Lake Avalon (see p. 150), and by several small diversion dams that divert for power or irrigation. Diversions and ground-water withdrawals above station for irrigation of about 202,000 acres (1959 determination).

Rating table (gage-height, in feet, and discharge,
in cubic feet per second)
(Shifting-control method used Mar. 17-29)

1.0	26
1.2	51
1.5	108
2.0	262
3.0	711

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	43	97	150	226	270	133	35	51	38	28	45	a 35
2	44	99	150	219	192	93	40	*61	*54	29	38	a 33
3	44	*101	153	216	199	*65	40	82	54	29	31	a 35
4	45	206	155	386	209	59	40	80	35	31	26	a 39
5	62	216	158	308	212	54	40	75	28	47	28	a 40
6	80	212	153	251	202	57	40	71	51	61	43	*43
7	78	192	173	219	209	57	48	73	67	*62	47	48
8	78	139	167	180	*212	47	49	73	69	56	38	56
9	84	120	216	164	186	43	52	67	64	54	37	49
10	*84	104	233	*153	150	44	49	71	57	61	31	48
11	82	106	281	147	136	52	71	71	48	62	29	45
12	86	189	*328	139	126	48	80	78	37	62	31	49
13	88	199	340	136	128	64	78	84	30	48	34	47
14	82	206	353	133	155	59	82	75	32	44	29	43
15	84	202	300	133	164	64	77	64	51	36	36	41
16	80	150	270	133	189	65	77	38	62	36	38	64
17	320	123	258	130	219	69	80	34	61	36	32	65
18	518	113	255	133	230	64	86	44	49	27	32	56
19	173	108	258	128	226	75	67	56	44	28	54	52
20	108	113	258	120	233	73	48	69	37	30	48	48
21	93	106	240	128	258	64	44	136	37	32	41	45
22	90	126	209	106	251	65	45	82	38	28	43	45
23	90	136	199	84	251	69	44	51	34	28	38	43
24	95	147	248	84	240	52	43	38	31	27	29	43
25	97	141	289	108	230	49	43	40	34	28	30	48
26	97	150	300	97	230	52	40	48	35	28	36	45
27	95	144	304	226	199	52	40	49	32	29	41	43
28	95	133	273	285	150	48	43	59	34	40	47	35
29	95	144	233	340	-	*48	40	54	32	51	47	37
30	97	150	226	382	-----	44	49	40	27	38	41	47
31	95	-----	226	378	-----	36	-----	43	-----	*36	a38	-----
Total	3,302	4,372	7,356	5,872	5,656	1,864	1,610	1,957	1,302	1,232	1,158	1,367
Mean	107	146	237	189	202	60.1	53.7	63.1	43.4	39.7	37.4	45.6
Ac-ft	6,550	8,670	14,590	11,650	11,220	3,700	3,190	3,880	2,580	2,440	2,300	2,710

Calendar year 1960: Max 6,290 Min 18 Mean 140 Ac-ft 101,600
Water year 1960-61: Max 518 Min 26 Mean 102 Ac-ft 73,480

* Discharge measurement made on this day.
a No gage-height record.

8-4075. Pecos River at Red Bluff, N. Mex.

Location.--Lat 32°04'30", long 104°02'20", in sec.1, T.26 S., R.28 E., on right bank at Red Bluff, 0.2 mile downstream from Red Bluff Draw and 5.5 miles upstream from Delaware River.

Drainage area.--19,540 sq mi, approximately (contributing area).

Records available.--October 1937 to September 1961.

Gage.--Water-stage recorder. Datum of gage is 2,850.05 ft above mean sea level, datum of 1929.

Average discharge.--24 years (1937-61), 244 cfs (176,600 acre-ft per year).

Extremes.--Maximum discharge during year, 820 cfs Oct. 17 (gage height, 5.41 ft); minimum daily, 25 cfs July 27.

1937-61: Maximum discharge, 52,600 cfs May 24, 1941 (gage height, 28.3 ft), from rating curve extended above 30,000 cfs on basis of slope-area measurement of peak flow; minimum, 1.4 cfs Aug. 21, 1954.

Maximum stage known, that of May 24, 1941. Flood in October 1904 reached a stage of 28.0 ft, from information by Panhandle and Santa Fe Railway Co.

Remarks.--Records good. Flow regulated by storage in Alamogordo Reservoir, Lake McMillan and Lake Avalon (see p. 150), and by several small diversion dams that divert for power or irrigation. Diversions and ground-water withdrawals above station for irrigation of about 202,000 acres (1959 determination).

Rating table (gage height, in feet, and discharge,
in cubic feet per second)

2.8	19	3.7	152
3.0	36	4.3	318
3.3	73	5.0	600

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	41	101	157	231	315	141	36	48	39	30	37	32
2	42	101	157	225	204	117	35	*46	*36	31	42	28
3	44	*103	164	223	204	*80	41	75	63	31	35	31
4	43	162	164	306	209	72	38	80	41	31	29	30
5	49	214	169	377	212	63	39	76	33	35	26	34
6	72	214	166	256	209	62	39	69	32	56	32	*37
7	78	209	174	242	212	64	42	72	67	*60	44	42
8	76	162	184	198	*214	57	49	70	72	57	41	45
9	76	134	206	174	206	50	49	73	69	54	36	52
10	*82	117	234	*162	166	48	52	67	64	56	35	43
11	82	109	256	154	145	46	55	72	54	64	29	44
12	83	171	*321	150	137	50	80	70	45	57	28	44
13	87	201	342	148	134	52	78	85	34	56	31	44
14	82	209	352	145	152	57	75	76	31	45	31	43
15	82	209	321	141	176	57	80	73	117	40	31	40
16	97	176	280	141	188	56	76	48	59	36	37	48
17	494	137	265	139	214	66	76	36	75	35	37	69
18	581	124	262	139	228	64	82	38	57	32	31	57
19	240	120	262	137	223	69	75	46	52	27	42	54
20	128	120	265	128	225	73	51	64	43	29	50	45
21	103	115	259	132	242	72	43	100	41	28	41	43
22	98	122	223	124	248	62	42	105	40	30	38	43
23	96	143	209	96	245	73	43	60	40	26	39	42
24	98	148	223	90	234	63	40	43	36	27	32	40
25	103	154	283	100	225	51	40	41	36	26	28	44
26	101	148	299	103	223	52	37	41	37	26	34	46
27	101	157	302	165	217	54	37	50	37	25	35	45
28	100	143	292	259	166	52	40	50	37	28	39	39
29	100	143	253	305	-	*48	39	56	37	43	45	37
30	101	157	239	377	-----	48	41	46	33	42	41	39
31	101	-----	234	381	-----	41	-----	45	-----	*34	35	-----
Total	3,661	4,523	7,517	5,948	5,773	1,960	1,550	1,921	1,457	1,197	1,111	1,280
Mean	118	151	242	192	206	63.2	51.7	62.0	48.6	38.6	35.8	42.7
Ac-ft	7,260	8,970	14,910	11,800	11,450	3,890	3,070	3,810	2,890	2,370	2,200	2,540

Calendar year 1960: Max 5,740 Min 21 Mean 141 Ac-ft 102,100
 Water year 1960-61: Max 581 Min 25 Mean 104 Ac-ft 75,160

* Discharge measurement made on this day.

8-4085. Delaware River near Red Bluff, N. Mex.

Location--Lat 32°01'25", long 104°03'15", in SE¼ sec.23, T.26 S., R.28 E., near center of channel on downstream side of pier of bridge on U. S. Highway 285, 3.5 miles upstream from mouth, 4 miles south of Red Bluff, and 14 miles south of Malaga.

Drainage area--689 sq mi.

Records available--April 1912 to September 1913, May 1914 to June 1915, October 1937 to September 1961. Published as "near Malaga, N. Mex." 1912-13, and as "near Angeles, Tex." 1914-15.

Gage--Water-stage recorder and concrete control. Datum of gage is 2,900.66 ft above mean sea level, datum of 1929. Prior to May 1914, at site 3 miles upstream at different datum. May 1914 to June 1915 at site 2½ miles downstream at different datum.

Average discharge--24 years (1937-61), 14.6 cfs (10,570 acre-ft per year).

Extremes--Maximum discharge during year, 2,160 cfs Oct. 17 (gage height, 4.97 ft); no flow at times.

1912-13, 1914-15, 1937-61: Maximum discharge, 81,400 cfs Oct. 2, 1955 (gage height, 27.0 ft, from floodmark), from rating curve extended above 1,500 cfs on basis of slope-area measurements at gage heights 8.65, 12.84, 18.00, and 27.0 ft; no flow at times.

Maximum stage known since at least 1911, that of Oct. 2, 1955. Flood of June 27, 1938, reached a stage of 18.00 ft, from floodmark.

Remarks--Records good except those above 100 cfs, which are fair. No diversion above station.

Rating table (gage height, in feet, and discharge in cubic feet per second)

0.1	0	1.1	6.5	2.4	79
.3	.2	1.3	10	2.7	148
.5	.7	1.5	14	3.0	259
.7	1.8	1.8	23	3.5	550
.9	3.7	2.1	38	4.1	1,150

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.1	2.4	2.2	3.0	2.6	2.1	1.8	0.7	1.8	0	0	
2	.1	2.3	2.3	2.6	2.5	2.1	1.7	*.7	*.7	0	0	
3	.1	*2.3	2.3	2.5	2.4	*2.0	1.7	.6	.3	0	0	
4	.2	2.4	2.3	2.5	2.4	1.9	1.7	.5	.1	0	0	
5	.2	2.5	2.2	2.5	2.3	1.9	1.7	.4	.1	0	0	
6	.2	2.5	2.2	2.5	2.3	1.8	1.7	.3	0	0	0	(*)
7	.1	2.6	2.4	2.6	2.4	1.7	1.7	.2	0	*0	0	
8	.1	2.5	2.8	2.6	*2.4	1.7	1.7	.1	0	0	0	
9	0	2.3	4.0	2.5	2.3	1.7	1.7	.1	0	11.5	0	
10	*0	2.2	3.7	*2.5	2.3	1.8	1.6	.1	0	2.7	0	
11	0	2.3	3.2	2.4	2.3	1.8	1.5	.1	0	2.7	0	
12	0	2.4	*2.9	2.4	2.3	1.8	1.5	0	0	.6	0	
13	0	2.2	3.0	2.4	2.2	1.7	1.4	0	0	6.1	0	
14	0	2.2	3.0	2.4	2.2	1.7	1.3	0	0	5.2	0	
15	0	2.2	2.9	2.4	2.2	1.8	1.2	0	*0	5.6	0	
16	1.1	2.1	2.6	2.4	2.3	1.8	1.2	0	0	1.8	0	
17	1.1 3.0	2.1	2.6	2.4	2.2	1.9	1.3	0	.1	5.3	0	
18	1.7 6	2.2	2.5	2.4	2.1	2.0	1.4	0	.7	1.5	0	
19	2.6	2.2	2.5	2.3	2.1	2.9	1.4	0	.4	.6	0	
20	1.3	2.2	2.5	2.3	2.2	2.6	1.2	0	.1	.2	0	
21	8.4	2.3	2.4	2.3	2.2	2.3	1.1	0	.1	0	0	
22	6.2	2.2	2.4	2.4	2.2	2.1	.9	0	0	0	0	
23	5.0	2.2	2.4	2.4	2.1	2.1	.8	0	0	0	0	
24	4.4	2.2	2.4	3.3	2.0	2.1	.7	0	0	0	0	
25	3.8	2.3	2.4	3.4	2.0	2.0	.6	0	0	0	2.3	
26	3.3	2.3	2.4	2.9	2.0	1.8	.6	0	0	0	4.1	
27	3.1	2.2	2.4	2.6	2.0	1.7	.6	0	0	0	1.6	
28	2.9	2.0	2.4	2.6	2.0	1.7	.6	0	0	0	.2	
29	2.6	2.0	2.4	2.6	-	*1.7	.7	0	0	0	0	
30	2.5	2.1	3.1	2.6	-----	1.8	.7	9.2	0	0	0	
31	2.4	-----	3.3	2.6	-----	1.8	-----	3.1	-----	*0	0	-----
Total	1.4 0 1.7	6 7.9	8 2.1	7 9.3	6 2.5	5 9.8	3 7.7	1 2 6.8	4 4	2 8 5.0	6 5.8	0
Mean	45.2	2.26	2.65	2.56	2.23	1.93	1.26	4.09	0.15	9.19	2.12	0
Ac-ft	2,780	135	163	157	124	119	75	252	8.7	565	131	0

Calendar year 1960: Max 1,130 Min 0 Mean 9.06 Ac-ft 6,580

Water year 1960-61: Max 1,130 Min 0 Mean 6.23 Ac-ft 4,510

Peak discharge (base, 1,700 cfs)--Oct. 17 (7:00 a.m.) 2,160 cfs (4.97 ft).

* Discharge measurement or observation of no flow made on this day.

Reservoirs in Rio Grande basin

- 8-2850. El Vado Reservoir.**--Lat 36°34'45", long 106°43'55", in Tierra Amarilla Grant, at left end of dam on Rio Chama, at Village of El Vado, 13 miles southwest of Tierra Amarilla, N. Mex. Drainage area, 873 sq mi. Records available, January 1935 to September 1961. Water-stage recorder (records stages above spillway floor only) and inclined staff gage. Datum of gage is 8.21 ft above mean sea level, datum of 1929, leveling of 1953. Maximum contents at 7:30 a.m. during year, 88,480 acre-ft May 22-25 (gage height, 6,859.9 ft); minimum, 1,600 acre-ft Nov. 30 to Dec. 3 (gage height, 6,771.6 ft). Maximum contents during period 1935-61, 204,900 acre-ft June 4, 5, 1948 (gage height, 6,904.2 ft); no contents at times.
- Reservoir is formed by rock-fill dam, steel faced. Storage began in January 1935. Capacity, 194,500 acre-ft between gage heights 6,758.5 (stoplog seat) and 6,902.0 ft (top of spillway gate). No dead storage. Prior to Jan. 1, 1947, figures represent usable contents computed from capacity table furnished by Middle Rio Grande Conservancy District in 1940; Jan. 1, 1947, to Sept. 30, 1954, figures represent usable contents, computed from capacity table based on survey of 1944 by Corps of Engineers; after Oct. 1, 1954, used revised table based on partial survey (below gage height 6,770 ft) by Bureau of Reclamation. Water is used for irrigation by Middle Rio Grande Conservancy District. Gage readings and contents given herein are generally those at 7:30 a.m. Continuous recorder registers gage heights above 6,879.3 ft (floor of spillway). Staff-gage readings furnished by Middle Rio Grande Conservancy District.
- 8-3155. McClure Reservoir.**--Lat 35°41'20", long 105°50'10", in NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.24, T.17 N., R.10 E., on outlet tower at McClure Dam on Santa Fe River, $2\frac{1}{2}$ miles upstream from Nichols Reservoir, and 6 miles east of Santa Fe, N. Mex. Drainage area, 17.4 sq mi. Records available, October 1947 to September 1961. Water-stage recorder. Datum of gage is 7,768.12 ft above mean sea level, datum of 1929, and 165.9 ft above Public Service Co. of New Mexico assumed datum. Maximum contents at 12 p.m. during year, 2,970 acre-ft May 28 (gage height, 101.5 ft); minimum, 1,580 acre-ft Mar. 9-16. Maximum contents during period 1947-61, 3,140 acre-ft June 25, 1960 (gage height, 103.7 ft); no contents Jan. 25 to May 8, 1951.
- Reservoir is formed by earth-fill dam, completed in 1926 (capacity, 503 acre-ft), raised 5 ft in 1935 (capacity, 650 acre-ft), raised 36.5 ft in 1947. Capacities and changes in height of dam are for effective height of spillway which includes 1 foot of flashboards above concrete crest 1926 to July 1935, 2 ft August 1935 to September 1947, and varying heights of sandbag bulkheads from October 1947 to May 1953 when spillway was equipped with radial gates which open automatically at gage height about 103.1 ft (some adjustment possible). Capacity, 3,090 acre-ft between gage heights -0.2 (bottom of lowest outlet tube), and 103.1 ft. No dead storage. Figures given here represent contents at 12 p.m. Water is used for municipal consumption of city of Santa Fe. Capacity table computed from area-capacity table furnished by Public Service Co. of New Mexico.
- 8-3165. Nichols Reservoir.**--Lat 35°41'20", long 105°52'40", in E $\frac{1}{2}$ NE $\frac{1}{4}$ sec.21, T.17 N., R.10 E., on outlet tower at dam on Santa Fe River, three-quarters of a mile upstream from Two Mile Reservoir, $2\frac{1}{2}$ miles downstream from McClure Dam, and $3\frac{1}{2}$ miles east of Santa Fe, N. Mex. Drainage area, 22.8 sq mi. Records available, December 1942 to September 1961. Water-stage recorder. Datum of gage is 7,313.2 ft above mean sea level, datum of 1929. Maximum contents at 12 p.m. during year, 577 acre-ft Sept. 12, 13 (gage height, 163.2 ft); minimum, 137 acre-ft Oct. 1 (gage height, 139.8 ft). Maximum contents during period 1943-61, 836 acre-ft June 8, 1952 (gage height, 171.8 ft); minimum, 16 acre-ft Feb. 11 to Mar. 10, 1944, Feb. 1-19, 1948.
- Reservoir is formed by earth-fill dam. Storage began Mar. 16, 1943. Capacity, 796 acre-ft between gage heights 121.2 (bottom of lower operational gate) and 171.0 ft (top of flashboards in spillway). Dead storage, 14 acre-ft. Figures given herein represent total contents at 12 p.m. Water is used for municipal consumption of city of Santa Fe. Capacity table computed from survey furnished in 1943 by Public Service Co. of New Mexico.
- 8-3285. Jemez Canyon Reservoir.**--Lat 35°23'40", long 106°32'45", in SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.32, T.14 N., R.4 E., at corner of outlet works control tower of Jemez Canyon Dam, about $2\frac{1}{4}$ miles upstream from mouth and 6 miles north of Bernalillo, N. Mex. Drainage area, 1,034 sq mi. Records available, October 1953 to September 1961. Water-stage recorder. Datum of gage is at mean sea level (levels by Corps of Engineers). Maximum contents during year, 2,580 acre-ft Oct. 18 (elevation, 5,152.4 ft); no contents for most of year. Maximum contents during period 1953-63, 71,220 acre-ft June 8, 1958 (elevation, 5,213.36 ft); no storage for most of time.
- Reservoir is formed by earth-fill dam, completed about October 1953. Capacity, 183,900 acre-ft (from capacity table adopted Mar. 15, 1960) between elevations 5,125.0 (sill of outlet gates) and 5,252.3 ft (operating deck of spillway). Floor of spillway is at elevation 5,232.0 ft (capacity, 113,900 acre-ft); spillway is located about three-quarters of a mile south of dam and flows directly to Rio Grande. Original plan for reservoir operation was to desilt all flow above 30 cfs by storage for one day before releasing to Rio Grande, and for possible detention during flood stage on Rio Grande. Records furnished by Corps of Engineers.
- 8-3414. Bluewater Lake.**--Lat 35°17'40", long 108°06'40", in SE $\frac{1}{4}$ sec.4, T.12 N., R.12 W., on left end of dam and 9.5 miles west of Bluewater, N. Mex. Drainage area, 201 sq mi. Records available, June 1927 to December 1950 in Water Bulletins (Nos. 10-20) of International Boundary and Water Commission. January 1951 to June 1958 in files of Bluewater-Toltec Irrigation Co. July 1958 to January 1961, inclined staff and supplemental vertical staff sections, and since January 1961, water-stage recorder. Datum of gage is 7,345.57 ft above mean sea level, datum of 1929. Gage heights have been reduced to elevations above mean sea level. Maximum contents observed during year, 9,050 acre-ft in April, date unknown (elevation, 7,377.4 ft); minimum observed, 6,490 acre-ft Sept. 30 (elevation, 7,373.2 ft). Maximum contents determined during period 1927-50, 1958-61, 47,100 acre-ft April 1941 (date and elevation not available).
- Reservoir is formed by concrete arch dam. Storage began in 1927. Capacity, 38,500 acre-ft at elevation 7,402.6 ft (crest of uncontrolled siphon spillway which is vented to avoid drawdown below crest), and 44,200 acre-ft at elevation 7,405.6 ft (crest of ungated spillway over dam). Dead storage, 3.4 acre-ft at elevation 7,345.4 ft (sill of lower outlet tube). Lake not usually drawn below conservation pool level (elevation, 7,365.36 ft), below which ownership is by State Game and Fish Department. Above this level, water is owned and used by Bluewater-Toltec Irrigation Co. Figures given herein represent total contents, based on table derived from 10-foot contour survey made in 1945 by Bureau of Reclamation. Contents figures are from daily staff gage readings at about 8 a.m. prior to Jan. 27, 1961, and from recorded gage heights at 12 p.m. thereafter.
- 8-3605. Elephant Butte Reservoir.**--Lat 33°09'15", long 107°11'30", in NW $\frac{1}{4}$ sec.30, T.13 S., R.3 W. (surveys by Bureau of Reclamation), at dam on Rio Grande, 1 mile west of Elephant Butte and 4 miles northeast of Truth or Consequences (Hot Springs), N. Mex. Drainage area, 29,445 sq mi, approximately (includes 2,940 sq mi in closed basin in San Luis Valley, Colo.). Records available, March 1915 to September 1961. Water-stage recorder. Datum of gage is 43.3 ft above mean sea level, datum of 1929. Maximum daily contents during year, 452,200 acre-ft Jan. 31 (gage height, 4,329.10 ft); minimum daily, 183,800 acre-ft Sept. 5 (gage height, 4,301.99 ft). Maximum daily contents during period 1915-61, 2,302,800 acre-ft June 16-18, 1942 (gage height, 4,409.19 ft); minimum daily after initial filling, 9,900 acre-ft Aug. 6, 1954 (gage height, 4,258.03 ft).

Reservoirs in Rio Grande basin--Continued

8-3605. Elephant Butte Reservoir--Continued

Reservoir is formed by concrete dam. Storage began Jan. 6, 1915. Dam completed May 13, 1916. Capacity, 2,195,000 acre-ft (survey of 1961) between gage heights 4,231.5 (sill of outlet gate) and 4,407.0 ft (spillway crest). Capacity by original survey was 2,638,900 acre-ft. No dead storage, surveys of 1957 and 1961. No storage allocated to flood control. Figures given herein represent usable contents. Water is used for power development and irrigation on Rio Grande project of Bureau of Reclamation. Lake is major recreational area. Contents given herein are computed from mean daily gage heights. Records furnished by Bureau of Reclamation.

8-3620. Caballo Reservoir.--Lat 32°53'45", long 107°17'30", in SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.19, T.16 S., R.4 W., at dam on Rio Grande, 0.5 mile downstream from mouth of Apache Canyon, 0.9 mile upstream from Bojarquez Bridge, 2 miles upstream from Percha diversion dam, 3.5 miles northeast of Arrey, and 5 $\frac{1}{4}$ miles south of Caballo, N. Mex. Drainage area, 30,700 sq mi, approximately (includes 2,940 sq mi in closed basin in San Luis Valley, Colo.). Records available, February 1938 to September 1961. Water-stage recorder. Datum of gage is 43.3 ft above mean sea level, datum of 1929. Maximum daily contents during year, 114,000 acre-ft Mar. 12 (gage height, 4,155.93 ft); minimum daily, 5,100 acre-ft Oct. 1 (gage height, 4,123.66 ft). Maximum daily contents during period 1938-61, 347,000 acre-ft Mar. 4, 1942 (gage height, 4,182.06 ft); minimum daily, 118 acre-ft Oct. 14, 1938 (gage height, 4,108.1 ft).

Reservoir is formed by earth-fill dam, completed Sept. 19, 1938. Storage began Feb. 8, 1938. Capacity (1958 survey), 344,000 acre-ft between gage heights 4,104 (bottom of tunnel entrance to gates) and 4,182 ft (gage height above which spillway gates operate automatically). No dead storage. Storage held for flood control, 100,000 acre-ft. Figures given herein represent usable contents. Water released from Elephant Butte Reservoir for power development is stored in Caballo Reservoir and released for irrigation on Rio Grande project of Bureau of Reclamation. Contents given herein are computed from mean daily gage heights. Records furnished by Bureau of Reclamation.

8-3840. Alamogordo Reservoir.--Lat 34°36'30", long 104°23'10", in SW $\frac{1}{4}$ sec.34, T.5 N., R.24 E., at dam on Pecos River, 5 miles northeast of Guadalupe and 12 miles northwest of Fort Sumner, N. Mex. Drainage area, 4,390 sq mi (contributing area). Records available, January 1939 to September 1961. Staff gage. Datum of gage is at mean sea level, Bureau of Reclamation datum. Maximum contents at 8 a.m. during year, 122,500 acre-ft Oct. 18, 19, Feb. 2-4 (elevation, 4,275.10 ft); minimum, 44,360 acre-ft Aug. 8-12 (elevation, 4,252.00 ft). Maximum contents observed during period 1939-61, 138,300 acre-ft (revised) May 23-30, June 1-10, July 21, Sept. 22, 23, 30, Oct. 12, Nov. 4, 5, 30, 1941 (elevation, 4,275.00 ft); maximum elevation, 4,276.10 ft June 3, Sept. 8, 1958; no storage (revised) July 28 to Aug. 2, 1951 (elevation, 4,200.70 ft).

Reservoir is formed by Alamogordo Dam; completed and storage began in 1938. Total capacity, 122,100 acre-ft at elevation 4,275.0 ft (top of spillway gates). No dead storage. No storage allocated for flood control. Figures given herein represent total contents and are computed from elevations at 8 a.m. Elevation record furnished by Carlsbad Irrigation District. Capacity table based on data furnished by Bureau of Reclamation, Corps of Engineers, and Carlsbad Irrigation District.

8-4005. Lake McMillan.--Lat 32°35'45", long 104°20'55", in SE $\frac{1}{4}$ sec.2, T.20 S., R.26 E., near gates on dam on Pecos River, 3 miles southeast of Lakewood, N. Mex. Drainage area, 16,990 sq mi (contributing area). Records available, January 1939 to September 1961. Float-tape gage. Datum of gage is 3,241.6 ft above mean sea level, Bureau of Reclamation datum. Maximum contents at 8 a.m. during year, 38,300 acre-ft Jan. 25 (gage height, 25.90 ft); minimum, 6,530 acre-ft July 14 (gage height, 18.00 ft). Maximum contents observed 1939-61, 68,500 acre-ft Sept. 26, 1941 (gage height, 29.95 ft); no storage at times in 1944, 1946-54, 1957.

Lake is formed by McMillan Dam; completed and storage began in 1893. The dam was partially impaired by floods of October 1893 and Oct. 2, 1904. Capacity, 32,920 acre-ft between gage heights 0.0 (sill of outlet gate) and 24.9 ft (crest of spillway 2). Flashboards may increase this capacity. Maximum capacity without spill is 39,430 acre-ft at gage height 26.1 ft (crest of spillway 1). No dead storage. Figures given herein represent usable contents and are computed from daily gage readings at 8 a.m. Gage heights may be affected by variable drawdown due to flow through gates. Water is used for irrigation by Carlsbad Irrigation District. Gage-height record and capacity table furnished, respectively, by Carlsbad Irrigation District and Bureau of Reclamation.

8-4038. Lake Avalon.--Lat 32°29'25", long 104°15'00", in SW $\frac{1}{4}$ sec.12, T.21 S., R.26 E., on headwall at outlet gate on dam on Pecos River, 5 miles north of Carlsbad, N. Mex. Drainage area, 18,070 sq mi (contributing area). Records available, January 1939 to September 1961. Staff gage. Datum of gage is 3,157.0 ft above mean sea level, Bureau of Reclamation datum. Maximum contents at 8 a.m. during year, 5,550 acre-ft Jan. 28 (gage height, 20.90 ft); minimum, 820 acre-ft Oct. 16 (gage height, 14.20 ft). Maximum contents observed during period 1939-61, 11,000 acre-ft May 22, 1941 (gage height, 25.0 ft); no storage at times when natural flow was passing through reservoir.

Lake is formed by Avalon Dam. The original Eddy (Avalon) dam was completed and storage began in 1893. The dam was destroyed by flood in October 1893 (date of reconstruction not available), was destroyed again by flood of Oct. 2, 1904, present dam rebuilt in 1905-6. Capacity, 5,080 acre-ft between gage heights 0.0 (sill of outlet gates) and 20.4 ft (crest of spillway 2). No dead storage. Figures given herein represent usable contents and are computed from daily gage readings at 8 a.m. Water is used for irrigation by Carlsbad Irrigation District. Capacity table furnished by Bureau of Reclamation.

8-4100. Red Bluff Reservoir.--Lat 31°54'05", long 103°54'40", at right end of Red Bluff Dam on Pecos River, 3 miles upstream from Salt (Screwbean) Draw, 4.5 miles north of Orla, Reeves County, Tex. Drainage area, 20,720 sq mi, approximately (contributing area). Records available, February 1937 to September 1961. Monthly contents only for some periods, published in WSP 1312. Staff gage read at irregular intervals. Datum of gage is 0.30 ft below mean sea level, datum of 1929. Maximum contents observed during year, 132,400 acre-ft Mar. 6, 8 (gage height, 2,821.9 ft); minimum observed, 50,000 acre-ft Sept. 30 (gage height, 2,804.0 ft). Maximum contents observed during period 1937-61, 352,000 acre-ft Sept. 27, 28, 1941 (gage height, 2,846.2 ft, observed on staff gage at service spillway, affected by variable drawdown due to flow through taintor gates); minimum observed, 11,080 acre-ft May 13, 1948 (gage height, 2,781.4 ft).

Reservoir is formed by earth-fill dam, rock-faced. Storage began in 1936. Dam completed early in 1937. Capacity, 307,000 acre-ft between gage heights 2,764.0 (penstock intake sill) and 2,842.0 ft (top of taintor gates). Dead storage, 3,000 acre-ft. Figures given herein represent total contents. Water is used for power development and for irrigation from Mentone to Grandfalls. Contents computed from intermittent gage readings. Capacity curve based on U. S. G. S. topographic survey in 1925, and gage-height record furnished by Red Bluff Water Power Control District.

RIO GRANDE BASIN
Reservoirs in Rio Grande basin--Continued

Monthly elevations and contents, water year October 1960 to September 1961

Date	Elevation or gage height (feet)	Contents (acre- feet)	Change in contents (acre- feet)	Elevation or gage height (feet)	Contents (acre- feet)	Change in contents (acre- feet)	Elevation or gage height (feet)	Contents (acre- feet)	Change in contents (acre- feet)
	El Vado Reservoir			McClure Reservoir			Nichols Reservoir		
Sept. 30.	6,787.1	7,450	-	93.7	2,410	-	139.0	129	-
Oct. 31.	6,787.1	7,450	0	88.0	2,030	-380	152.1	319	+190
Nov. 30.	6,771.6	1,600	-5,850	86.5	1,940	-90	149.7	274	-45
Dec. 31.	6,773.1	1,940	+340	85.4	1,870	-70	148.5	256	-18
Calendar year 1960	-	-	-120	-	-	+470	-	-	+69
Jan. 31.	6,773.0	1,910	-30	82.7	1,710	-160	143.4	182	-74
Feb. 28.	6,775.6	2,600	+690	80.8	1,600	-110	141.8	162	-20
Mar. 31.	6,789.2	8,580	+5,980	80.9	1,600	0	152.0	317	+155
Apr. 30.	6,843.4	61,600	+53,020	92.7	2,340	+740	159.2	472	+155
May 31.	6,859.4	87,570	+25,970	101.1	2,940	+600	156.9	419	-53
June 30.	6,856.4	82,250	-5,320	98.5	2,750	-190	155.2	380	-39
July 31.	6,849.3	70,550	-11,700	92.3	2,310	-440	153.8	352	-28
Aug. 31.	6,843.7	62,040	-8,510	99.0	2,790	+480	160.3	499	+147
Sept. 30.	6,846.6	66,370	+4,330	98.8	2,770	-20	160.6	507	+8
Water year 1960-61	-	-	+58,920	-	-	+360	-	-	+378
	Jemez Canyon Reservoir			Bluewater Lake			Elephant Butte Reservoir		
Sept. 30.	0	0	-	7,376.7	8,580	-	4,322.42	*385,100	-
Oct. 31.	0	0	0	76.4	8,380	-200	4,323.40	396,200	+11,100
Nov. 30.	0	0	0	76.1	8,180	-200	4,325.39	419,200	+23,000
Dec. 31.	0	0	0	75.9	8,060	-120	4,327.10	**439,600	+20,400
Calendar year 1960	-	-	0	-	-	+3,180	-	-	-146,800
Jan. 31.	0	0	0	7,375.6	7,870	-190	4,329.10	452,200	+24,400
Feb. 28.	0	0	0	75.4	7,750	-120	4,325.57	409,500	-42,700
Mar. 31.	5,142.05	389	+389	75.5	7,810	+60	4,318.96	335,700	-73,800
Apr. 30.	5,144.70	782	+393	77.1	8,840	+1,030	4,317.64	321,900	-13,800
May 31.	5,137.40	23	-759	76.3	8,320	-520	4,322.28	371,800	+49,900
June 30.	0	0	-23	75.3	7,690	-630	4,318.87	334,700	-37,100
July 31.	0	0	0	74.4	7,150	-540	4,310.06	249,700	-85,000
Aug. 31.	0	0	0	73.9	6,870	-280	4,302.22	185,600	-64,100
Sept. 30.	0	0	0	73.2	6,490	-380	4,304.30	201,600	+16,000
Water year 1960-61	-	-	0	-	-	-2,090	-	-	-171,700
	Caballo Reservoir			Alamogordo Reservoir			Lake McMillan		
Sept. 30.	4,123.48	4,900	-	4,273.95	117,400	-	21.15	16,520	-
Oct. 31.	4,127.10	9,620	+4,720	4,275.00	122,100	+4,700	24.95	33,180	+16,660
Nov. 30.	4,129.19	13,160	+3,540	4,274.80	121,200	-900	24.95	33,180	0
Dec. 31.	4,130.82	16,360	+3,200	4,275.05	122,300	+1,100	24.90	32,920	-260
Calendar year 1960	-	-	-44,280	-	-	+13,700	-	-	+22,070
Jan. 31.	4,132.15	19,220	+2,860	4,275.05	122,300	0	25.65	36,920	+4,000
Feb. 28.	4,150.52	83,370	+64,150	4,275.00	122,100	-200	25.70	37,190	+270
Mar. 31.	4,149.83	79,940	-3,430	4,275.00	122,100	0	25.05	33,700	-3,490
Apr. 30.	4,149.98	80,660	+720	4,275.00	122,100	0	21.55	18,010	-15,690
May 31.	4,150.42	82,870	+2,210	4,275.00	122,100	0	20.85	15,430	-2,580
June 30.	4,145.69	61,220	-21,650	4,271.15	105,600	-16,500	21.30	17,070	+1,640
July 31.	4,137.61	33,080	-28,140	4,258.80	62,620	-42,980	22.60	22,160	+5,090
Aug. 31.	4,134.48	24,720	-8,360	4,266.20	86,840	+24,220	21.70	18,580	-3,580
Sept. 30.	4,129.10	12,990	-11,730	4,269.35	98,480	+11,640	18.70	8,440	-10,140
Water year 1960-61	-	-	+8,090	-	-	-18,920	-	-	-8,080

* Contents on Sept. 30, 1960, from new capacity table, 373,300 acre-ft.

** Contents on Dec. 31, 1960, from new capacity table, 427,800 acre-ft.

Reservoirs in Rio Grande basin--Continued

Monthly elevations and contents, water year October 1960 to September 1961

Date	Elevation or gage height (feet)	Contents (acre- feet)	Change in contents (acre- feet)	Elevation or gage height (feet)	Contents (acre- feet)	Change in contents (acre- feet)	Elevation or gage height (feet)	Contents (acre- feet)	Change in contents (acre- feet)
	Lake Avalon			Red Bluff Reservoir					
Sept. 30.....	15.70	1,560	-	-	a85,400	-			
Oct. 31.....	20.00	4,710	+3,150	2,814.8	93,000	+7,600			
Nov. 30.....	20.60	5,260	+550	2,816.0	99,000	+6,000			
Dec. 31.....	20.75	5,410	+150	-	a112,800	+13,800			
Calendar year 1960	-	-	+2,210	-	-	+42,500			
Jan. 31.....	20.65	5,310	-100	2,820.3	122,800	+10,000			
Feb. 28.....	20.50	5,170	-140	2,821.8	131,800	+9,000			
Mar. 31.....	18.15	3,160	-2,010	-	a125,800	-6,000			
Apr. 30.....	19.00	3,840	+680	2,819.2	116,200	-9,600			
May 31.....	15.65	1,540	-2,300	2,817.2	105,100	-11,100			
June 30.....	15.55	1,480	-60	2,815.1	94,500	-10,600			
July 31.....	14.90	1,140	-340	-	a79,100	-15,400			
Aug. 31.....	14.90	1,140	0	-	a59,300	-19,800			
Sept. 30.....	14.80	1,100	-40	2,804.0	50,000	-9,300			
Water year 1960-61	-	-	-460	-	-	-35,400			

a No gage-height record.

8-4770. Mimbres River near Mimbres, N. Mex.

Location.--Lat 32°52'30", long 107°59'00", in NE¼SW¼ sec.33, T.16 S., R.11 W., on left bank a quarter of a mile downstream from Bear Canyon and ½ miles northwest of Mimbres.

Drainage area.--152 sq mi.

Records available.--June 1921 to September 1930 (fragmentary), October 1930 to September 1961. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder. Concrete control since Mar. 26, 1938. Datum of gage is 5,972 ft above mean sea level, datum of 1929. Prior to Sept. 12, 1923, at site 10 ft downstream at datum 0.3 ft higher. Sept. 12, 1923, to Jan. 17, 1934, at datum 0.1 ft lower.

Average discharge.--31 years, 9.80 cfs (7,090 acre-ft per year).

Extremes.--Maximum discharge during year, 460 cfs Aug. 28 (gage height, 4.67 ft); minimum daily, 1.0 cfs Sept. 1, 2.
1930-61: Maximum discharge determined, 1,560 cfs Aug. 2, 1952 (gage height, 6.22 ft), from rating curve extended above 230 cfs by logarithmic plotting; minimum daily, 0.9 cfs July 22, 1947, Aug. 10, 1951.

Remarks.--Records good. Discharge measurements generally made twice a month. Some regulation by Bear Canyon Reservoir (capacity, 700 acre-ft). Diversions for irrigation of about 300 acres above station.

Rating table (gage-height, in feet, and discharge, in cubic feet per second)

(Shifting-control method used May 28 to June 15, July 3-17, July 31 to Aug. 28)

2.0	0.3	2.8	13
2.2	1.9	2.9	18
2.4	4.4	3.1	37
2.6	7.9		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.6	1.6	1.9	3.6	3.8	1.9	2.2	5.3	1.6	3.7	2.3	1.0
2	1.7	1.8	1.9	3.6	3.8	2.8	1.9	4.4	1.5	3.8	2.3	1.0
3	1.7	2.4	2.0	3.4	3.8	2.9	1.8	4.1	1.4	5.1	2.4	1.2
4	1.7	3.4	1.9	3.6	3.7	2.6	2.3	3.7	1.5	2.8	2.3	3.3
5	1.7	3.6	1.9	3.7	3.8	3.1	2.4	3.0	1.5	2.8	1.6	3.8
6	1.7	3.6	2.0	3.8	3.8	3.3	2.2	2.4	1.5	2.6	1.4	3.8
7	1.6	3.4	2.0	4.0	3.8	3.8	2.0	2.7	1.5	1.6	1.4	3.4
8	1.6	3.6	3.6	4.0	4.1	4.1	2.1	2.1	1.4	1.6	1.4	2.7
9	1.7	3.4	4.6	4.0	4.1	4.3	2.1	2.1	1.4	1.7	1.4	2.3
10	1.7	3.3	4.4	4.0	4.7	3.8	1.9	1.8	1.4	1.9	1.3	5.2
11	1.6	3.3	4.3	4.0	4.6	3.3	1.9	1.6	1.4	1.9	1.3	6.4
12	1.7	3.1	4.0	4.0	4.6	3.3	1.8	1.6	1.3	1.7	1.6	5.3
13	1.6	3.1	3.8	3.8	4.6	3.4	1.8	1.7	1.2	1.6	1.6	4.1
14	1.7	3.4	3.8	3.7	4.4	3.6	1.8	1.6	1.1	1.5	1.6	3.4
15	1.7	3.6	3.7	3.4	4.3	3.3	1.9	1.6	1.7	1.4	1.7	3.3
16	1.7	3.7	3.7	3.4	4.1	3.3	2.1	1.4	4.7	1.4	1.9	3.7
17	1.7	3.7	3.7	3.6	4.1	3.1	1.9	1.5	2.2	1.5	1.8	4.4
18	1.6	3.7	3.4	3.7	4.3	3.3	1.8	1.5	2.4	1.5	1.8	4.3
19	1.6	3.8	3.4	3.7	4.3	3.1	1.8	1.6	2.7	1.6	1.6	4.0
20	1.6	4.0	3.4	3.7	4.1	2.3	1.8	1.6	3.9	1.8	1.6	3.8
21	1.7	4.3	3.4	3.8	4.1	1.9	2.2	1.6	4.0	1.4	1.5	3.3
22	1.7	4.4	3.3	3.8	3.1	2.4	3.7	1.6	5.5	2.2	1.4	2.4
23	1.7	2.5	3.3	3.7	1.6	2.6	5.7	1.6	5.3	2.7	1.4	2.2
24	1.7	2.1	3.4	4.4	1.6	2.1	1.4	1.6	5.2	2.8	1.3	2.3
25	1.7	2.7	3.6	4.3	1.8	2.0	1.2	1.6	4.7	2.4	1.3	2.6
26	1.8	3.4	3.6	4.1	1.7	1.9	1.1	1.5	4.3	2.3	1.3	2.0
27	1.8	3.8	3.6	4.3	1.5	2.2	9.4	1.5	3.6	2.2	1.3	1.7
28	1.6	3.1	3.4	4.0	1.6	2.2	8.3	1.5	3.7	2.3	2.9	2.4
29	1.6	2.6	3.6	3.8	-	2.1	6.9	1.5	3.7	2.1	7.7	2.7
30	1.6	2.1	3.8	3.8	-----	2.1	5.8	1.5	3.6	2.2	3.5	3.1
31	1.7	-----	3.6	3.8	-----	2.0	-----	1.6	-----	2.3	1.2	-----
Total	51.8	96.5	102.0	118.5	99.8	88.1	118.5	64.4	80.9	68.4	85.2	95.1
Mean	1.67	3.22	3.29	3.82	3.56	2.84	3.95	2.08	2.70	2.21	2.75	3.17
Ac-ft	103	191	202	235	198	175	235	128	160	136	169	189

Calendar year 1960: Max 54 Min 1.3 Mean 7.96 Ac-ft 5,780

Water year 1960-61: Max 29 Min 1.0 Mean 2.93 Ac-ft 2,120

Peak discharge (base, 290 cfs).--Aug. 28, (2 p.m.) 460 cfs (4.67 ft).

MIMBRES RIVER BASIN

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8-4776. San Vicente Arroyo at Silver City, N. Mex.

Location.--Lat 32°46'15", long 108°16'30", in NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 3, T.18 S., R.14 W. (projected), on left bank in Silver City, 800 ft upstream from bridge at Broadway Street and 1,300 ft downstream from confluence of Silva Creek and Pinos Altos Creek.

Drainage area.--26.5 sq mi.

Records available.--August 1953 to September 1961.

Gage.--Water-stage recorder and concrete control. Datum of gage is 5,862.58 ft above mean sea level, datum of 1929. Prior to May 25, 1958, at site 500 ft downstream at datum 17.99 ft lower.

Average discharge.--8 years, 0.77 cfs (557 acre-ft per year).

Extremes.--Maximum discharge during year, 1,470 cfs July 30 (gage height, 4.63 ft, from floodmarks), from rating curve extended above 200 cfs on basis of conveyance-slope method and slope-area measurement of peak flow; no flow at times.

1953-61: Maximum discharge, 3,660 cfs Aug. 11, 1960 (gage height, 7.92 ft, present site and datum); no flow for many days each year.

Maximum flood known occurred July 21, 1895 (discharge probably exceeded 10,000 cfs), from newspaper accounts. A peak of 6,800 cfs was measured by slope-area method from old floodmarks found in 1950 (probably occurred Sept. 9, 1938).

Remarks.--Records fair except those for periods of no gage-height record, which are poor. Discharge measurements or observations of no flow generally made 2 or 3 times a month and more often during periods of flow.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

1.34	0	1.7	9.5
1.4	.1	1.8	20
1.5	1.0	2.0	51
1.6	3.5	2.2	94

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0		0	0.1	0.1	0.1	0.1		0	0	a 0	a 0
2	0		0	.1	.1	.1	.1		0	0	a 0	a 0
3	0		.1	.1	.1	.1	0		0	0	a 0	a 0
4	0		0	.1	.1	.1	0		0	1.5	a 0	a 0
5	0		0	.1	.1	.1	0		0	.4	a 0	a 0
6	0		0	.1	.1	0	0		0	0	a 0	0
7	0		0	.1	.1	0	0		0	0	a 0	0
8	0		.1	.1	.1	0	0		0	0	a 0	1.5
9	6.7		.1	.1	.1	0	0		0	0	a 0	4.3
10	a 0		.1	.1	.1	0	0		0	0	a 0	a .4
11	a 0		.1	.1	.1	0	0		0	0	a 0	0
12	a 0		.1	.1	.1	0	0		0	0	a 0	0
13	a 0		.1	.1	.1	0	0		0	0	a .5	0
14	a 0		.1	.1	.1	0	0		0	0	a 0	0
15	.4		0	.1	.1	0	0		6.5	0	6.7	0
16	1.3		0	.1	.1	0	0		.7	0	a 0	0
17	2.2		0	.1	.1	.1	0		.1	0	a 0	0
18	a 0		0	.1	.1	.1	0		0	0.7	a 0	0
19	a 0		0	.1	.1	0	0		0	0	a 0	0
20	a 0		0	.1	.1	0	0		0	0	a 0	0
21	a 0		0	.1	.1	0	0		0	0	a 0	0
22	a 0		0	.1	.1	0	0		0	0	a 0	0
23	a 0		0	.1	.1	0	0		0	0	a 0	0
24	0		0	.8	.1	0	0		0	0	a 0	0
25	0		0	.4	.1	0	0		.2	0	a 0	0
26	0		0	.1	.1	.1	0		0	0	a 0	0
27	0		0	2.0	.1	.1	0		0	0	1	0
28	0		0	.4	.1	.1	0		0	0	a .5	1.2
29	0		.1	-	-	.1	0		0	0	a 0	a 0
30	0		.2	.1	-----	.1	0		0	4.8	a 0	a 0
31	0		.1	.1	-----	.1	-----		-----	a 0	a 0	-----
Total	30.4	0	1.6	6.3	2.8	1.3	0.2	0	66.0	50.6	8.7	7.4
Mean	0.98	0	0.05	0.20	0.10	0.04	0.01	0	2.20	1.63	0.28	0.25
Ac-ft	60	0	3.2	12	5.6	2.6	0.4	0	131	100	17	15

Calendar year 1960: Max 94 Min 0 Mean 0.65 Ac-ft 474

Water year 1960-61: Max 65 Min 0 Mean 0.48 Ac-ft 347

Peak discharge (base, 500 cfs).--June 15 (6:30 p.m.) 1,070 cfs (4.10 ft, from floodmark); July 30 (4 p.m.) 1,470 cfs (4.63 ft).

a No gage-height record.

TULAROSA VALLEY BASIN

8-4815. Rio Tularosa near Bent, N. Mex.

Location.--Lat 33°08'40", long 105°53'50", in SE¼NW¼ sec.32, T.13 S., R.11 E., on right bank 50 ft downstream from bridge on U. S. Highway 70, 2.6 miles west of Bent, and 8.5 miles northeast of Tularosa.

Drainage area.--120 sq mi, approximately.

Records available.--December 1947 to September 1961.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 5,450 ft (from topographic map).

Average discharge.--13 years (1948-61), 9.80 cfs (7,090 acre-ft per year).

Extremes.--Maximum discharge during year, 1,820 cfs July 4 (gage height, 3.74 ft), from rating curve extended above 160 cfs on basis of slope-area measurement of peak flow; minimum daily, 2.4 cfs Aug. 9.

1947-61: Maximum discharge, 2,360 cfs July 12, 1950 (gage height, 5.3 ft), from rating curve extended above 33 cfs on basis of logarithmic plotting and slope-area measurement at gage height 5.3 ft; minimum daily, 1.4 cfs Aug. 3, 1959.

A major flood probably occurred Sept. 3, 1938, when a peak of 9,640 cfs was computed for station near Tularosa. Another high peak may have occurred July 2, 1914.

Remarks.--Records poor. Diversion for irrigation of about 1,000 acres (1959 determination) above station.

Rating table (gage height, in feet, and discharge,
in cubic feet per second)
(Shifting-control method used July 26, Aug. 17, 22)

2.25	2.4	2.5	30
2.3	4.4	2.6	60
2.4	13	2.7	104

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.2	8.2	9.1	11	10	7.3	9.1	7.3	4.6	6.5	7.3	8.2
2	8.2	*7.3	8.2	11	11	7.3	8.2	6.5	3.6	8.0	12	7.3
3	8.2	7.3	8.2	11	11	7.3	7.3	6.2	4.4	1.9	12	7.3
4	8.2	8.2	8.2	11	10	8.2	6.5	6.3	3.2	*9.5	11	6.5
5	7.3	8.2	6.5	11	10	9.1	6.5	5.9	3.6	7.3	11	7.3
6	7.3	8.2	6.5	11	10	7.3	5.7	6.8	4.5	6.5	11	12
7	6.5	8.2	6.5	11	10	7.3	6.5	5.5	8.2	*7.3	7.4	a7
8	7.3	8.2	6.5	11	*10	11	7.3	5.8	8.2	7.3	2.8	a10
9	7.3	8.2	6.5	11	11	11	5.7	5.7	8.2	7.3	2.4	a7
10	*8.2	9.1	7.3	*11	11	10	5.7	11	9.1	6.5	5.7	a7
11	9.1	10	7.3	11	10	9.1	6.2	*10	10	8.2	6.5	a6
12	9.1	11	7.3	11	9.1	7.3	*11	9.1	6.8	6.5	6.5	a6
13	10	10	7.3	11	9.1	7.3	11	9.1	5.0	6.5	12	a15
14	10	10	8.2	11	9.1	6.5	11	9.1	5.0	5.7	a9	a10
15	10	9.1	8.2	11	9.1	6.5	11	6.5	6.0	5.7	a15	a9
16	11	9.1	9.1	11	9.1	8.2	11	5.7	6.2	5.0	a10	a8
17	11	10	9.1	10	8.2	10	8.2	9.1	6.5	5.7	*1.8	a8
18	10	10	9.1	10	7.3	12	5.0	10	5.6	5.0	13	a8
19	10	10	*10	10	9.1	12	*6.5	7.6	5.8	6.5	12	8.2
20	10	10	12	11	*10	12	6.5	5.4	5.9	6.5	11	8.2
21	9.1	11	12	11	9.1	11	7.3	6.0	*11	5.7	10	*7.3
22	8.2	11	12	10	8.2	11	7.3	5.7	11	5.7	18	6.5
23	7.3	11	12	11	5.7	*10	5.0	5.7	12	5.0	8.2	7.3
24	7.3	11	12	12	5.0	14	5.0	9.1	12	4.4	9.1	5.7
25	8.2	11	12	12	6.5	13	6.5	10	12	3.5	8.2	5.7
26	8.2	10	11	11	5.7	10	10	*10	7.0	*9.3	7.3	5.7
27	9.1	9.1	12	12	5.0	10	11	10	7.8	8.2	6.5	6.5
28	10	9.1	12	11	5.0	10	10	8.2	5.7	9.1	*8.2	6.5
29	10	9.1	11	10	-	10	9.1	4.4	5.7	8.2	7.3	6.5
30	10	11	11	10	-----	10	9.1	4.5	7.0	8.2	9.1	6.5
31	9.1	-----	11	10	-----	10	-----	4.5	-----	7.3	12	-----
Total	273.4	283.6	289.1	337	244.3	295.7	236.2	226.7	211.6	306.6	299.5	230.2
Mean	8.82	9.45	9.33	10.9	8.72	9.54	7.87	7.31	7.05	9.89	9.66	7.67
Ac-ft	542	563	573	668	485	587	468	450	420	608	594	457

Calendar year 1960: Max 18 Min 2.4 Mean 8.67 Ac-ft 6,300
 Water year 1960-61: Max 95 Min 2.4 Mean 8.86 Ac-ft 6,420

Peak discharge (base, 125 cfs)

* Discharge measurement made on this day.
 a No gage-height record.

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
7-3	1:00p.m.	2.86	202	8-15	2:30p.m.	2.8	160
7-4	4:00p.m.	3.74	1,820	8-17	2:10p.m.	2.64	174
7-26	4:30p.m.	2.81	167	8-22	4:30p.m.	2.89	223

9-3505. San Juan River at Rosa, N. Mex.

Location.--Lat 37°00'20", long 107°24'10", in SW $\frac{1}{4}$ sec.21, T.32 N., R.5 W., on right bank 75 ft upstream from highway bridge, a quarter of a mile downstream from Piedra River, 0.9 mile upstream from Colorado-New Mexico State line, and 1 mile north of Rosa.

Drainage area.--1,990 sq mi, approximately.

Records available.--July to November 1895, May 1896 to December 1897, April to December 1898, May to September 1899, September 1910 to September 1961. Monthly discharge only for some periods, published in WSP 1313. Prior to October 1920, published as two stations, Piedra and San Juan Rivers at Arboles, Colo., sum of which is equivalent.

Gage.--Water-stage recorder. Altitude of gage is 5,980 ft (from river-profile map). Prior to Oct. 1, 1920, at sites on Piedra and San Juan Rivers at Arboles, Colo. (see WSP 1313 for descriptions). Oct. 1, 1920, to Apr. 12, 1922, chain gage at site 75 ft downstream at different datum. Apr. 13, 1922, to Sept. 18, 1930, water-stage recorder at site 550 ft upstream at datum 0.7 ft higher. Sept. 19, 1930, to Aug. 31, 1938, water-stage recorder at sites 330 and 430 ft upstream at datum 1.0 ft higher. Sept. 1, 1938, to Dec. 19, 1949, water-stage recorder at present site at datum 1.0 ft higher.

Average discharge.--52 years (1896-97, 1910-61), 752 cfs (881,800 acre-ft per year).

Extremes.--Maximum discharge during year, 4,560 cfs May 20 (gage height, 5.69 ft); minimum daily, 70 cfs Dec. 6.

1920-61: Maximum discharge, about 25,000 cfs June 29, 1927 (gage height, 13.5 ft, from estimated graph, site and datum then in use), from rating curve extended above 8,000 cfs by logarithmic plotting; minimum daily, 39 cfs Oct. 8, 1956.

Maximum flood known occurred Oct. 5, 1911. A major flood occurred Sept. 5 or 6, 1909.

Remarks.--Records good except those for periods of ice effect, which are poor. Discharge measurements generally made twice a month. Diversions for irrigation of about 14,000 acres above station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second).

1.0	58	2.0	285	3.5	1,170
1.3	104	2.5	489	4.5	2,320
1.6	168	3.0	780	5.5	3,990

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	106	173	166	b 100	b 120	b 130	894	3,200	3,540	505	208	314
2	108	176	161	b 90	b 120	b 130	865	3,500	3,330	499	231	292
3	127	173	171	b 80	b 120	184	1,090	3,520	2,840	591	625	262
4	125	173	195	b 80	b 120	190	1,660	3,320	2,350	536	647	401
5	125	173	b 140	b 80	b 120	182	2,210	2,660	2,310	479	586	393
6	121	171	b 70	b 80	b 110	b 150	1,240	2,170	2,150	419	505	406
7	121	219	b 100	b 90	b 100	b 140	1,500	1,850	2,090	419	361	365
8	114	285	b 160	b 100	b 110	b 130	2,160	1,580	2,060	547	299	321
9	136	228	b 160	b 100	b 120	b 120	1,400	1,420	2,120	625	285	429
10	166	195	b 150	b 120	b 120	205	1,220	1,760	2,190	515	262	1,180
11	192	176	b 150	b 120	b 130	274	937	2,290	2,180	423	365	816
12	203	173	b 150	b 120	b 150	346	930	3,220	2,060	369	340	642
13	190	166	b 150	b 120	b 150	383	1,290	3,130	1,890	335	505	531
14	166	173	b 150	b 120	b 150	443	1,120	2,470	1,750	299	433	465
15	179	173	b 150	b 120	b 150	600	837	2,170	1,660	292	410	451
16	200	b 160	b 140	b 120	b 170	718	942	1,970	1,770	272	515	505
17	303	b 120	b 110	b 120	b 170	642	1,390	2,180	1,520	249	823	441
18	410	b 130	b 105	b 120	b 170	563	1,910	2,760	1,360	234	1,260	846
19	332	b 130	b 110	b 120	b 130	499	2,190	3,370	1,310	222	908	2,000
20	249	b 125	b 110	b 120	b 130	463	2,290	3,950	1,220	214	642	1,240
21	234	b 125	b 110	b 120	b 140	512	2,470	3,420	1,130	265	525	1,020
22	243	b 125	b 110	b 120	b 150	676	2,320	3,740	1,060	299	484	945
23	240	b 125	b 110	b 120	b 150	901	2,570	3,940	975	228	432	872
24	240	b 115	b 110	b 130	b 130	1,220	2,490	3,590	930	198	521	872
25	237	b 115	b 110	b 130	b 130	1,060	1,830	3,520	858	179	471	747
26	219	b 115	b 110	b 130	b 150	760	1,590	3,350	773	168	636	690
27	214	b 130	b 110	b 150	b 130	552	1,430	3,590	684	173	470	614
28	208	b 130	b 130	b 150	b 130	575	1,700	3,670	597	214	385	547
29	208	b 115	b 130	b 140	-----	922	2,250	3,660	552	252	325	505
30	200	b 100	b 120	b 130	-----	997	2,760	3,620	541	285	310	460
31	184	-----	b 110	b 120	-----	848	-----	3,610	-----	225	314	-----
Total	6,100	4,687	4,058	3,560	3,770	1,551	4,948	9,221	4,980	10,530	15,083	19,572
Mean	197	156	131	115	135	500	1,650	2,975	1,660	340	487	652
Ac-ft	12,100	9,300	8,050	7,060	7,480	30,770	98,150	182,900	98,780	20,890	29,920	38,820

Calendar year 1960: Max 6,010 Min 70 Mean 1,113 Ac-ft 807,800

Water year 1960-61: Max 3,950 Min 70 Mean 752 Ac-ft 544,200

Peak discharge (base, 4,000 cfs). -- May 2 (7:00 a.m.) 4,050 cfs (5.49 ft); May 20 (8:00 a.m.) 4,560 cfs (5.69 ft).

b Stage-discharge relation affected by ice.

SAN JUAN RIVER BASIN

9-3540. Los Pinos River at Ignacio, Colo.
(Locally known as Pine River)

Location.--Lat 37°07'45", long 107°37'50", in S $\frac{1}{2}$ sec. 5, T.33 N., R.7 W., on downstream wingwall of left abutment of highway bridge, three-quarters of a mile upstream from Ignacio, 2 miles upstream from Rock Creek, and 6 miles south of Bayfield.

Drainage area.--448 sq mi.

Records available.--April 1899 to May 1900, April to September 1901, April to June 1902, April to October 1903, September 1910 to September 1961 (discontinued). Monthly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder. Datum of gage is 6,468.85 ft above mean sea level, datum of 1929, supplementary adjustment of 1940. Prior to Mar. 5, 1912, staff or chain gages on bridge at same site at different datums. Mar. 5, 1912, to Apr. 5, 1924, chain gage and Apr. 6, 1924, to Feb. 22, 1930, water-stage recorder, at same site at datum 0.18 ft higher.

Average discharge.--30 years (1910-40), 374 cfs (prior to completion of Vallecito Dam); 21 years (1940-61), 214 cfs (154,900 acre-ft per year).

Extremes.--Maximum discharge during year, 1,100 cfs May 31 (gage height, 3.65 ft); minimum daily, 20 cfs Nov. 3.

1924-61: Maximum discharge, 7,000 cfs June 29, 1927 (gage height, 7.3 ft, datum then in use), from rating curve extended above 3,000 cfs by logarithmic plotting; minimum daily, 1.3 cfs Sept. 8, 1933.

Maximum flood known occurred Oct. 5, 1911. A major flood occurred Sept. 5 or 6, 1909.

Remarks.--Records good except those for periods of ice effect, which are poor. Discharge measurements generally made twice a month. Flow regulated by Vallecito Reservoir (capacity, 126,280 acre-ft) since April 1941. Diversions or irrigation of about 25,000 acres above station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.3	18	1.6	47	2.2	168	3.0	545
1.4	27	1.9	92	2.5	277	3.5	950

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	49	25	55	b45	b55	b50	192	141	671	153	80	64
2	22	60	b45	b60	b60	178	126	449	165	87	62	62
3	54	20	60	b45	b60	68	216	111	234	182	203	72
4	51	22	b60	b45	b50	68	253	64	162	192	111	78
5	46	22	b45	b45	b45	69	273	60	153	141	62	75
6	45	22	b45	b45	b45	69	273	60	153	141	62	75
7	42	21	b30	b45	b45	64	185	92	120	136	59	70
8	40	44	b60	b45	b45	b60	321	107	111	150	55	64
9	43	69	66	b50	b45	b50	415	89	109	209	45	63
10	55	62	69	b50	b50	b55	261	82	107	178	43	105
11	62	60	b55	b50	b55	b70	241	60	109	216	46	107
12	58	63	b55	b45	66	96	212	72	113	136	51	77
13	55	60	b55	b45	64	123	212	84	163	113	56	85
14	46	59	b60	b45	69	138	241	82	414	102	52	87
15	41	52	b60	b45	85	168	216	82	346	90	62	82
16	54	52	b60	b45	92	195	182	78	293	78	68	89
17	147	55	b50	b45	90	195	195	55	414	70	80	96
18	88	52	b50	b45	85	165	226	50	356	68	168	89
19	174	54	b45	b45	74	162	261	58	257	130	132	138
20	66	52	b45	b45	b68	133	277	58	202	153	157	165
21	51	52	b45	b45	b65	141	286	56	159	150	107	171
22	46	50	b45	b45	b68	165	286	68	128	138	98	165
23	43	51	b45	b45	b70	178	253	69	113	87	94	175
24	39	54	b45	b45	b65	185	249	98	118	80	84	171
25	39	58	b45	b50	b55	199	241	133	128	84	78	156
26	38	58	b45	b55	b55	168	195	133	126	80	78	144
27	36	56	b45	b55	66	130	171	141	113	75	77	178
28	35	60	b45	b55	66	120	156	147	96	74	70	182
29	36	b45	b50	b55	b55	141	147	223	92	66	63	178
30	32	54	b50	b45	-	162	126	318	100	75	58	209
31	30	54	b45	b45	-----	182	133	664	120	84	64	253
31	28	-----	b45	b45	-----	178	-----	770	-----	92	66	-----
Total	1,669	1,449	1,590	1,455	1,768	3,938	6,800	4,381	6,076	3,752	2,554	3,650
Mean	53.8	48.3	51.3	46.9	63.1	127	227	141	203	121	82.4	122
Ac-ft	3,310	2,870	3,150	2,890	3,510	7,810	13,490	8,690	12,050	7,440	5,070	7,240

Calendar year 1960: Max 1,150 Min 20 Mean 152 Ac-ft 110,400
Water year 1960-61: Max 770 Min 20 Mean 107 Ac-ft 77,520

b Stage-discharge relation affected by ice.

SAN JUAN RIVER BASIN

157

9-3545. Los Pinos River at La Boca, Colo.
(Locally known as Pine River)

Location.--Lat 37°00'40", long 107°35'55", in S $\frac{1}{2}$ sec.15, T.32 N., R.7 W., on downstream end of right abutment of The Denver & Rio Grande Western Railroad Co. bridge at southeast edge of La Boca, and 0.1 mile upstream from Spring Creek and 13 miles upstream from mouth.

Drainage area.--510 sq mi, approximately.

Records available.--October 1950 to September 1961. Monthly discharge only for some periods, published in WSP 1733.

Gage.--Water-stage recorder. Datum of gage is 6,143.58 ft above mean sea level, datum of 1929.

Average discharge.--11 years, 195 cfs (141,200 acre-ft per year).

Extremes.--Maximum discharge during year, 1,100 cfs May 31 (gage height, 5.38 ft); minimum daily, 36 cfs Nov. 3-6.

1950-61: Maximum discharge, 6,400 cfs July 27, 1957 (gage height, 8.95 ft); minimum daily, 14 cfs Apr. 23, 24, 26, 1951. Maximum flood known occurred Oct. 5, 1911.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Discharge measurements generally made twice a month. Flow regulated by Vallecito Reservoir (capacity, 126,280 acre-ft). Diversions for irrigation of about 33,000 acres above station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second).
(Shifting-control method used Feb. 10-19, 25-28, Mar. 3-6, 10-16, 18, 21, 29, 30,
Apr. 6-12, July 26 to Aug. 24, Sept. 16-30)

3.0	23	4.0	240
3.2	38	4.5	480
3.4	64	5.0	830
3.6	112	5.5	1,280

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	90	41	62	b 55	b 65	b 60	a 250	161	a 800	219	152	115
2	102	38	69	b 55	b 70	b 75	a 240	146	a 600	236	146	110
3	102	36	71	b 55	b 70	82	a 260	102	a 400	268	332	126
4	92	36	b 65	b 55	b 65	85	a 280	73	a 300	284	205	158
5	87	36	b 60	b 55	b 60	92	a 300	78	a 200	226	132	146
6	85	36	b 40	b 55	b 55	92	194	115	167	212	126	132
7	85	48	b 65	b 55	b 55	b 80	316	143	155	230	118	140
8	82	85	b 70	b 60	b 55	b 70	567	126	158	304	115	123
9	100	69	b 75	b 60	b 70	b 80	292	107	155	252	94	170
10	120	62	a 70	b 60	107	115	260	85	155	296	80	240
11	104	62	a 65	b 55	100	161	222	85	158	212	97	161
12	97	62	a 65	b 55	110	198	212	97	174	188	123	155
13	90	60	a 65	b 55	115	208	256	100	426	177	118	152
14	80	60	a 70	b 55	137	212	233	110	395	149	134	140
15	107	60	b 70	b 55	155	248	191	102	308	143	146	149
16	329	62	a 65	b 55	120	248	202	94	504	126	164	149
17	231	61	a 60	b 55	112	d 200	236	85	432	123	282	134
18	483	61	a 55	b 55	85	198	276	85	312	170	240	198
19	180	62	a 55	b 55	78	d 170	300	80	260	212	264	248
20	107	62	a 55	b 55	b 80	d 180	308	82	230	198	164	212
21	87	61	a 55	b 55	b 85	202	308	90	188	202	152	205
22	78	62	a 55	b 55	b 90	a 220	284	104	170	152	149	208
23	69	66	a 55	b 55	b 85	a 240	268	123	177	123	132	205
24	69	73	a 55	b 60	b 65	a 260	260	170	194	137	123	188
25	69	69	a 55	b 65	73	a 250	205	174	180	129	134	170
26	64	71	a 55	b 65	80	a 230	184	184	177	120	134	205
27	62	73	a 55	b 65	76	a 200	167	a 195	161	120	115	198
28	61	55	a 65	b 65	71	a 210	158	a 300	161	107	110	188
29	54	b 55	b 65	b 55	-	260	132	a 400	158	118	107	202
30	47	b 66	b 55	b 55	-----	288	143	a 600	177	149	118	248
31	44	-----	b 55	b 55	-----	a 240	-----	a 900	-----	155	118	-----
Total	3,457	1,750	1,897	1,765	2,389	5,454	7,504	5,296	8,032	5,737	4,624	5,175
Mean	112	58.3	61.2	56.9	85.3	176	250	171	268	185	149	172
Ac-ft	6,860	3,470	3,760	3,500	4,740	10,820	14,880	10,500	15,930	11,380	9,170	10,260

Calendar year 1960: Max 1,210 Min 36 Mean 200 Ac-ft 144,900

Water year 1960-61: Max 900 Min 36 Mean 145 Ac-ft 105,300

a No gage-height record.

b Stage-discharge relation affected by ice.

d Doubtful gage-height record.

SAN JUAN RIVER BASIN

9-3550, Spring Creek at La Boca, Colo.

Location.--Lat 37°00'50", long 107°35'40", in S $\frac{1}{2}$ sec.15, T.32 N., R.7 W., on right bank in an excavated channel, a quarter of a mile upstream from mouth and a quarter of a mile east of La Boca.

Drainage area.--58 sq mi, approximately.

Records available.--October 1950 to September 1961. Monthly discharge only for some periods, published in WSP 1733.

Gage.--Water-stage recorder. Altitude of gage is 6,160 ft (from topographic map).

Average discharge.--11 years, 28.3 cfs (20,490 acre-ft per year).

Extremes.--Maximum discharge during year, 292 cfs Oct. 18 (gage height, 3.26 ft); minimum daily, 1 cfs for several days during period of ice effect.

1951-61: Maximum discharge, 362 cfs July 19, 1957 (gage height, 3.97 ft), from rating curve extended above 100 cfs by logarithmic plotting; maximum gage height, 5.98 ft Mar. 9, 1960; minimum daily discharge determined, 1 cfs Feb. 25, 26, 1951, for several days during period of ice effect in 1960-61.

Remarks.--Records good except those for periods of ice effect, doubtful or no gage-height record, which are poor. Discharge measurements generally made twice a month. Part of flow is return waste from irrigation.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used July 29 to Aug. 5)

0.5	1.2	1.3	29
.6	2.7	1.6	50
.7	4.7	2.0	91
1.0	14	2.7	186

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	34	18	b4	b2	b3	b4	d19	10	d9.3	52	73	67
2	36	16	b5	b2	b3	b5	d18	8.6	27	52	79	67
3	37	16	b5	b2	b3	b6	d20	7.3	33	56	107	72
4	34	14	b5	b1	b3	b7	d21	14	38	60	87	87
5	36	13	b3	b1	b3	b8	d27	15	41	57	72	71
6	34	13	b2	b1	b4	b7	d12	18	38	55	72	69
7	34	18	b4	b1	b5	b5	28	22	43	60	66	70
8	34	13	b5	b2	b6	b4	71	24	41	64	57	67
9	38	7	b4	b3	b8	b10	19	21	40	61	54	79
10	41	b4	b3	b3	b7	b18	a18	20	41	64	54	88
11	35	b4	b3	b2	b11	b22	a18	19	44	69	54	81
12	36	b4	b3	a2	b14	b20	a17	22	45	93	57	76
13	37	b4	b4	a2	b18	b19	a17	26	52	90	58	66
14	38	b4	7	a2	b22	b18	a16	31	52	83	63	59
15	51	b4	b6	a2	b23	b19	a16	30	59	54	65	64
16	132	b4	b5	a2	b25	20	a15	29	81	44	79	62
17	100	b5	b4	a1	b16	14	a15	26	56	47	106	59
18	179	b5	b3	b1	b10	13	a14	26	62	51	94	114
19	50	b5	b3	b1	b10	14	14	24	60	58	101	89
20	a30	b5	b3	b1	b10	44	14	25	58	56	76	67
21	a26	b5	b3	b1	b13	38	12	28	57	76	76	57
22	a24	b5	b3	b1	b16	15	11	34	61	69	70	49
23	a23	b4	b3	b2	b14	13	18	35	63	61	70	46
24	21	b4	b3	b3	b6	15	22	41	63	63	74	43
25	20	b5	b3	b4	b7	16	20	40	59	61	81	41
26	18	b4	b3	b5	b6	9.9	8.0	41	59	57	82	43
27	17	b5	b4	b6	b5	8.0	5.7	38	57	58	70	39
28	17	b4	4.5	b6	b4	9.3	4.7	39	58	57	68	38
29	20	b3	5.2	b4	-	54	6.5	42	60	64	68	37
30	20	b4	b4	b2	-----	6.9	5.2	32	60	69	70	25
31	19	-----	b3	b3	-----	2.9	-----	13	-----	68	66	-----
Total	1,271	219	1,197	71	275	553.2	522.1	800.9	1,527.3	1,929	2,269	1,892
Mean	41.0	7.3	3.86	2.3	9.8	17.8	17.4	25.8	50.9	62.2	73.2	63.1
Ac-ft	2,520	434	237	141	545	1,100	1,040	1,590	3,030	3,830	4,500	3,750

Calendar year 1960: Max 179 Min 1 Mean 29.6 Ac-ft 21,510
Water year 1960-61: Max 179 Min 1 Mean 31.4 Ac-ft 22,720

Peak discharge (base, 120 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
10-16	9a.m.	2.68	183	4-8	1a.m.	2.87	205
10-18	1:15a.m.	3.26	292	8-17	9:15p.m.	2.65	181
3-20	8:30p.m.	2.43	145	9-18	3:15p.m.	2.59	180
3-29	10:15p.m.	2.55	158				

a No gage-height record.

b Stage-discharge relation affected by ice.

d Doubtful gage-height record.

SAN JUAN RIVER BASIN

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9-3555. San Juan River near Archuleta, N. Mex.

Location.--Lat 36°48'30", long 107°42'00", in SW $\frac{1}{4}$ sec.17, T.30 N., R.8 W., on right bank half a mile upstream from Gobernador Canyon, 1 mile north of Archuleta, and 6.8 miles downstream from Navajo Dam. Prior to Dec. 29, 1959, at site 4.6 miles upstream.

Drainage area.--3,260 sq mi, approximately.

Records available.--December 1954 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 5,655 ft (from river-profile survey). Prior to Dec. 29, 1959, at site 4.6 miles upstream at datum 50 ft higher.

Average discharge.--6 years, 1,307 cfs (946,200 acre-ft per year):

Extremes.--Maximum discharge during year, 4,620 cfs May 31 (gage height, 6.76 ft); minimum daily, 128 cfs Dec. 7.
1954-61: Maximum discharge, 18,900 cfs July 27, 1957 (gage height, 11.00 ft, site and datum then in use); minimum daily, 110 cfs Dec. 23-26, 1956.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Discharge measurements generally made 2 to 4 times a month. Some regulations by Vallecito Reservoir (capacity, 126,280 acre-ft) on Los Pinos River. Also, some effect by involuntary storage above Navajo Dam, currently under construction. Diversions above station for irrigation of about 47,000 acres.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.8	122	3.1	226	4.0	750	6.0	3,130
2.9	152	3.5	420	5.0	1,730	7.0	5,050

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	252	a300	191	a190	b214	243	1,100	3,150	4,270	806	a460	578
2	265	a290	235	a150	b210	243	1,040	3,520	4,000	790	558	538
3	278	a285	248	a140	218	274	1,110	3,660	3,490	830	1,060	526
4	292	a320	292	150	218	330	1,590	3,520	2,960	982	1,160	631
5	283	a350	a250	140	218	330	2,480	3,180	2,620	878	a1,100	722
6	278	a330	176	152	203	315	2,140	2,670	2,480	a820	a1,190	708
7	274	a355	128	162	199	274	1,620	2,260	2,360	a800	a900	701
8	269	409	283	170	191	269	2,740	1,980	2,310	a720	564	617
9	278	392	320	a180	210	248	2,460	1,730	2,310	a820	506	617
10	350	325	278	195	210	292	1,610	1,720	2,370	a860	a450	1,240
11	360	292	278	206	260	414	1,430	2,150	2,440	a820	624	1,340
12	365	265	a280	191	270	558	1,220	2,740	2,420	729	604	1,040
13	376	265	292	203	269	680	1,430	3,180	2,380	680	a620	910
14	350	252	301	184	387	715	1,540	3,030	2,360	a620	a700	782
15	360	252	269	180	409	782	1,230	2,540	2,110	a560	854	798
16	663	252	226	195	444	1,050	1,080	2,240	2,300	a460	846	798
17	814	243	199	191	432	1,000	1,360	2,160	2,220	a390	1,190	758
18	1,600	206	a170	184	370	910	1,870	2,500	1,930	a440	1,720	894
19	910	226	a140	191	297	790	2,360	3,030	1,670	526	1,670	2,300
20	545	239	b187	191	274	743	2,520	3,620	1,620	493	1,180	2,130
21	409	243	b226	b199	287	846	2,640	3,730	1,470	a490	937	1,540
22	404	239	b146	b203	306	894	2,660	3,620	1,330	a520	846	1,290
23	360	235	b222	b214	360	991	2,610	3,890	1,250	a540	937	1,230
24	350	222	b235	218	320	1,230	2,730	3,930	1,160	a440	a840	1,170
25	365	218	b226	218	278	1,310	2,430	3,690	1,080	387	a780	1,080
26	360	218	b252	218	274	964	1,890	3,660	982	387	a820	1,020
27	335	239	b248	b230	297	701	1,680	3,710	937	365	a780	973
28	320	260	230	b226	269	624	1,690	3,820	878	330	a680	894
29	330	235	248	b195	-	902	2,100	3,910	806	a495	590	830
30	325	199	b218	b214	-----	1,490	2,640	4,060	798	a520	578	822
31	a310	-----	210	b214	-----	1,350	-----	4,430	-----	a480	564	-----
Total	13,030	8,156	7,204	5,894	7,894	21,762	57,000	97,030	61,311	18,978	26,308	29,477
Mean	420	272	230	190	282	702	1,900	3,130	2,040	612	849	983
Ac-ft	25,840	16,180	14,290	11,690	15,660	43,160	113,100	192,500	121,600	37,640	52,180	58,470

Calendar year 1960: Max 6,800 Min 128 Mean 1,417 Ac-ft 1,029,000
Water year 1960-61: Max 4,430 Min 128 Mean 970 Ac-ft 702,300

Peak discharge (base, 4,700 cfs). --No peak above base.

- a No gage-height record.
b Stage-discharge relation affected by ice.

9-3570. San Juan River at Bloomfield, N. Mex.

Location.--Lat 36°42'00", long 107°59'10", in NW $\frac{1}{4}$ sec.27, T.29 N., R.11 W., on downstream end of bridge pier on State Highway 44 three-quarters of a mile south of Bloomfield, 3 miles upstream from Kutz Canyon, and 10 miles downstream from Canyon Largo.

Drainage area.--5,410 sq mi, approximately.

Records available.--January 1910 to September 1911, August 1927 to December 1931, November 1955 to September 1961. Monthly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder. Altitude of gage is 5,405 ft (from river-profile map). Prior to Apr. 3, 1910, staff gage and Apr. 3, 1910, to Oct. 3, 1911, water-stage recorder, at same site at different datum. July 27, 1927, to Dec. 19, 1931, water-stage recorder at same site at different datum.

Average discharge.--10 years (1910-11, 1927-31, 1956-61), 1,577 cfs (1,142,000 acre-ft per year).

Extremes.--Maximum discharge during year, 6,510 cfs Sept. 19 (gage height, 6.67 ft); minimum daily, 130 cfs Dec. 22.

1910-11, 1927-31, 1955-61: Maximum discharge determined, 20,500 cfs July 27, 1957; maximum gage height, 11.50 ft Aug. 11, 1929, site and datum then in use (discharge not determined); minimum daily discharge determined, 50 cfs Sept. 15, 1956.

Maximum flood known reached a stage of 12 ft Oct. 6, 1911, datum then in use (discharge, 80,000 cfs, estimated). Another major flood occurred Sept. 6, 1909.

Remarks.--Records fair except those for periods of ice effect, doubtful or no gage-height record, which are poor. Discharge measurements generally made 4 to 6 times a month. Diversions above station for irrigation of about 52,000 acres, 2,000 of which is below station. Citizens ditch bypasses gage on right bank and Kutz Canyon Division bypasses gage on left bank; bypass flow not included in record.

Discharge, in cubic feet per second, of bypass flow, water year October 1960 to September 1961

Date	Citizens ditch Discharge	Kutz Canyon Diversion Discharge	Date	Citizens ditch Discharge	Kutz Canyon Diversion Discharge
July 19	47.3	17.2	Aug. 29	41.0	15.0
Aug. 2	46.0	15.4	Sept. 12	39.1	15.1
Aug. 15	51.8	13.8	Sept. 27	25.4	0

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	200	285	183	b200	b220	247	1,010	3,030	4,290	670	385	413
2	183	268	200	b150	b220	227	981	3,460	4,120	680	469	399
3	204	268	227	b140	b190	247	942	3,560	3,610	680	770	364
4	218	d285	274	b140	b200	332	1,450	3,510	3,050	750	770	448
5	209	d338	302	b140	b190	344	2,380	3,270	2,600	710	860	620
6	215	d314	b200	b150	b180	320	2,600	2,670	2,440	700	806	530
7	196	d314	b160	b160	b170	296	1,650	2,130	2,280	680	680	600
8	183	d332	b270	b170	b225	268	2,620	1,860	2,220	690	590	530
9	179	d399	b285	b180	227	252	2,750	1,620	2,210	794	506	506
10	241	320	b290	b200	236	258	1,740	1,540	2,260	818	469	830
11	302	290	b280	b210	252	364	1,500	1,820	2,340	770	469	1,060
12	332	268	b290	b210	263	538	1,360	2,460	2,280	650	610	1,490
13	371	252	b310	b205	252	680	1,410	3,210	2,280	610	610	1,150
14	344	236	b300	b205	296	730	1,540	3,230	2,280	522	710	1,050
15	449	232	b280	b215	371	866	1,380	2,600	2,080	462	782	1,220
16	924	236	b260	b220	498	942	1,280	2,170	2,130	392	1,120	1,100
17	1,050	236	b220	b220	562	942	1,330	1,950	2,170	350	1,080	1,070
18	1,880	214	b200	b210	506	794	1,620	2,210	1,790	308	1,610	1,910
19	1,220	214	b170	b215	371	760	2,220	2,830	1,570	332	3,170	4,270
20	580	236	b160	b220	285	740	2,500	3,460	1,420	364	d1,110	2,580
21	427	227	b220	b225	290	854	2,710	3,830	1,350	364	d900	a2,000
22	357	214	b130	b230	302	878	2,810	3,560	1,290	427	710	a1,500
23	357	204	b150	b240	326	968	2,690	3,830	1,220	434	730	a1,300
24	357	200	b210	b250	357	1,180	2,830	3,880	1,120	326	782	a1,250
25	392	196	b240	b250	279	1,210	2,540	3,630	1,030	290	690	a1,200
26	350	196	b270	b250	258	1,060	1,900	3,510	929	279	690	a1,100
27	320	214	b265	b260	274	854	1,650	3,510	830	247	660	1,020
28	320	236	b260	b280	274	750	1,570	3,610	750	258	570	968
29	314	258	b250	b220	-----	830	1,750	3,750	818	314	476	916
30	308	214	b240	b230	-----	1,380	2,340	3,910	680	427	441	866
31	296	-----	b230	b240	-----	1,350	-----	4,230	-----	434	406	-----
Total	13,278	7,696	7,326	6,435	8,074	21,461	57,053	93,840	59,437	15,732	24,631	34,260
Mean	428	257	236	208	288	692	1,902	3,027	1,981	507	795	1,142
Ac-ft	26,340	15,260	14,530	12,760	16,010	42,570	113,200	186,100	117,900	31,200	48,850	67,950

Calendar year 1960: Max 7,070 Min 130 Mean 1,490 Ac-ft 1,082,000

Water year 1960-61: Max 4,290 Min 130 Mean 957 Ac-ft 692,700

Peak discharge (base 6,000 cfs). --Aug. 19 (6 a.m.) 6,180 cfs (6.90 ft); Sept. 19 (1 a.m.) 6,510 cfs (6.67 ft).

a No gage-height record.

b Stage-discharge relation affected by ice.

d Doubtful gage-height record.

9-3635. Animas River near Cedar Hill, N. Mex.

Location.--Lat 37°02'15", long 107°52'25", in sec.7, T.32 N., R.9 W., on right bank three-quarters of a mile downstream from Florida River, 2.5 miles upstream from Colorado-New Mexico State line, and 8.5 miles north of Cedar Hill.

Drainage area.--1,090 sq mi, approximately.

Records available.--October 1933 to September 1961. Monthly discharge only for October and November 1933, published in WSP 1313.

Gage.--Water-stage recorder. Altitude of gage is 5,960 ft (from topographic map). Prior to Sept. 14, 1937, at datum between 1.52 and 1.36 ft higher. Sept. 15, 1937, to Sept. 30, 1946, at datum 1.36 ft higher.

Average discharge.--28 years, 911 cfs (659,500 acre-ft per year).

Extremes.--Maximum discharge during year, 4,950 cfs May 28 (gage height, 7.40 ft); minimum daily, 166 cfs Mar. 1, 2.
1933-61: Maximum discharge, 13,100 cfs June 19, 1949 (gage height, 11.45 ft); minimum daily, 90 cfs Jan. 21, 1935.
Maximum flood known occurred Oct. 5 or 6, 1911.

Remarks.--Records good except those for periods of ice effect, doubtful or no gage-height record, which are poor. Discharge measurements generally made twice a month. Diversions for irrigation of about 20,000 acres above station. During water years 1944-49, Twin Rocks Canal diverted above station for irrigation below.

Rating tables, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to July 31

2.9	151	5.0	1,300
3.4	290	6.0	2,500
3.9	510	7.0	4,150
4.4	800	7.2	4,540

July 31 to Sept. 30

4.0	305	4.6	720
4.3	480	4.9	1,000

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	246	286	258	b230	183	166	415	2,200	4,080	940	d320	441
2	240	280	249	b220	189	166	415	2,560	3,880	905	482	415
3	240	269	262	b210	183	176	475	2,890	3,260	863	837	403
4	237	272	294	b220	183	186	752	2,860	2,470	842	846	460
5	231	276	262	b230	183	194	1,040	2,170	2,360	849	747	467
6	228	262	b200	b230	178	186	884	1,660	2,460	770	684	474
7	228	298	b225	b230	183	186	912	1,380	2,500	770	582	460
8	225	306	b240	b240	183	183	996	1,180	2,770	764	536	428
9	231	290	b260	b240	186	178	764	1,040	2,970	746	501	530
10	280	272	b260	b240	191	199	722	1,170	2,970	710	441	882
11	342	d265	b240	b240	194	234	680	1,600	2,920	638	397	837
12	374	d265	b230	b230	199	266	644	2,350	2,830	584	422	684
13	346	d265	b245	b230	194	269	698	2,470	2,620	550	558	598
14	326	d265	b260	b230	212	294	722	1,870	2,320	520	428	515
15	350	d265	b240	b230	212	326	650	1,500	2,300	480	480	494
16	456	d262	b225	b235	212	354	614	1,430	2,090	446	598	501
17	520	d252	b220	b235	217	342	680	1,620	2,010	438	614	454
18	628	272	b220	b230	199	350	905	2,060	2,010	392	729	675
19	446	276	b230	b230	191	350	1,070	3,010	1,880	374	693	801
20	379	280	b240	b230	178	330	1,270	3,690	1,880	370	590	810
21	362	266	b240	b230	191	346	1,400	3,210	1,870	384	536	801
22	346	266	b240	b220	199	322	1,350	3,780	1,690	397	522	774
23	334	266	b240	b220	207	362	1,470	3,830	1,550	358	454	846
24	334	266	b240	b225	181	406	1,520	3,690	1,370	326	434	910
25	330	255	b240	b215	178	433	1,300	3,790	1,320	318	454	819
26	330	262	b240	a210	173	388	1,040	4,150	1,240	302	460	756
27	318	272	b250	a200	173	346	926	4,400	1,150	290	434	693
28	318	258	b240	a200	169	366	972	4,460	1,070	286	391	666
29	318	252	b240	a195	-----	428	1,300	4,230	964	280	385	675
30	306	249	b230	a185	-----	460	1,760	4,080	948	314	385	630
31	286	-----	b230	189	-----	433	-----	3,860	-----	340	441	-----
Total	10,135	8,090	7,490	6,899	5,321	9,225	28,346	84,190	65,752	16,546	16,381	18,899
Mean	327	270	242	223	190	298	945	2,716	2,192	534	528	630
Ac-ft	20,100	16,050	14,860	13,680	10,550	18,300	56,220	167,000	130,400	32,820	32,490	37,490

Calendar year 1960: Max 5,240 Min 150 Mean 909 Ac-ft 660,000

Water year 1960-61: Max 4,460 Min 166 Mean 760 Ac-ft 550,000

Peak discharge (base, 4,000 cfs). --May 28 (10:30 a.m.) 4,950 cfs (7.40 ft).

a No gage-height record.

b Stage-discharge relation affected by ice.

d Doubtful gage-height record.

SAN JUAN RIVER BASIN

9-3645. Animas River at Farmington, N. Mex.

Location.--Lat 36°43'20", long 108°12'00", in SE $\frac{1}{4}$ sec.16, T.29 N., R.13 W., on left bank at bridge on former State Highway 17, 0.6 mile southeast of Farmington and 1.3 miles upstream from mouth.

Drainage area.--1,360 sq mi, approximately.

Records available.--June 1904 to October 1905 (published as "near Farmington"). September 1912 to September 1961. Monthly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder. Altitude of gage is 5,278 ft (from bridge-profile plans). Prior to Nov. 1, 1905, chain gage at old bridge a quarter of a mile upstream at different datum. Sept. 17, 1912, to Oct. 4, 1938, water-stage recorder at site 0.6 mile downstream at lower datums (datum lowered 2.0 ft Aug. 15, 1927, and raised 0.2 ft Dec. 16, 1929).

Average discharge.--50 years, 962 cfs (696,500 acre-ft per year).

Extremes.--Maximum discharge during year, 4,280 cfs May 28 (gage height, 5.41 ft); minimum daily, 58 cfs July 27.

1904-5, 1912-61: Maximum discharge, about 25,000 cfs June 29, 1927 (gage height, 8.5 ft, site and datum then in use), from rating curve extended above 10,000 cfs by logarithmic plotting; minimum daily, 2.4 cfs Sept. 5, 1956.

Maximum flood known occurred Oct. 6, 1911, when a stage of about 16.5 ft was reached (present site and datum). Flood of Sept. 6, 1909, reached a stage of 11.1 ft, 1904-5 site and datum (discharge, about 19,000 cfs).

Remarks.--Records good. Discharge measurements generally made 2 to 4 times a month. Diversions for irrigation of about 30,000 acres above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used July 26-28, Sept. 18-22)

Oct. 1 to Oct. 22

Oct. 23 to Sept. 30

2.2 88 2.9 400
2.4 145 3.4 840
2.6 225

2.1 48 4.0 1,500
2.3 86 4.5 2,350
2.6 182 5.0 3,350
2.9 340 5.5 4,500
3.4 760

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	118	303	269	218	218	182	458	1,830	3,630	660	131	243
2	124	310	269	191	209	178	434	2,200	3,560	642	184	232
3	115	279	274	191	218	178	434	2,540	3,100	660	793	253
4	115	279	328	174	204	204	546	2,520	2,410	642	804	328
5	112	279	322	218	200	232	892	2,090	2,030	651	670	382
6	115	279	263	200	196	227	947	1,540	2,160	624	597	368
7	115	279	237	222	178	218	815	1,260	2,160	546	514	354
8	136	316	279	237	196	218	1,060	1,040	2,390	530	382	340
9	153	316	322	253	209	200	826	881	2,580	506	316	375
10	153	291	310	253	214	204	710	859	2,690	498	258	774
11	235	279	310	237	218	232	700	1,240	2,650	482	196	925
12	302	274	291	237	227	279	642	1,840	2,540	403	196	826
13	324	274	269	232	218	316	651	2,200	2,390	382	258	624
14	314	279	303	237	218	310	700	1,860	2,140	354	354	546
15	442	279	279	237	237	347	642	1,360	2,030	310	310	482
16	534	274	269	232	237	389	579	1,180	2,000	248	361	482
17	559	274	243	222	248	396	570	1,270	1,810	186	613	522
18	830	269	222	227	258	396	710	1,600	1,790	134	710	845
19	595	269	227	222	227	403	914	2,290	1,730	102	690	1,030
20	478	274	269	222	214	389	1,060	2,990	1,640	94	579	936
21	421	279	269	222	196	375	1,240	2,870	1,600	96	458	903
22	386	274	269	227	209	375	1,220	2,970	1,490	134	434	870
23	368	269	269	227	218	389	1,230	3,330	1,320	122	354	881
24	361	279	279	227	209	426	1,330	3,140	1,200	96	303	947
25	347	269	279	258	191	466	1,240	3,120	1,100	80	291	892
26	340	269	269	237	191	450	980	3,390	1,030	63	303	804
27	347	269	263	279	191	396	826	3,740	947	58	291	710
28	334	274	253	269	191	389	771	4,010	870	60	243	642
29	328	253	258	218	-	466	936	3,940	740	63	186	579
30	328	269	243	218	-----	522	1,360	3,710	660	181	191	570
31	316	-----	237	200	-----	498	-----	3,600	-----	86	191	-----
Total	9,745	8,380	8,443	7,044	5,940	10,250	25,423	72,410	58,387	9,693	12,161	18,665
Mean	314	279	272	227	212	331	847	2,336	1,946	313	392	622
Ac-ft	19,330	16,620	16,750	13,970	11,780	20,330	50,430	143,600	115,800	19,230	24,120	37,020

Calendar year 1960: Max 4,670 Min 10 Mean 818 Ac-ft 594,200
Water year 1960-61: Max 4,010 Min 58 Mean 675 Ac-ft 489,000

Peak discharge (base, 4,000 cfs).--May 28 (6 p.m.) 4,280 cfs (5.41 ft).

SAN JUAN RIVER BASIN

163

9-3650. San Juan River at Farmington, N. Mex.

Location.--Lat 36°43'25", long 108°13'30", in SE¼ sec.17, T.29 N., R.13 W., on left bank 360 ft downstream from highway bridge, 4,000 ft downstream from Animas River and 1 mile west of Farmington.

Drainage area.--7,240 sq mi, approximately.

Records available.--June to December 1904, January 1905 to September 1906 (gage heights and discharge measurements only; discharge records for January to December 1905, published in WSP 175, have been found to be unreliable and should not be used), September 1912 to September 1961. Monthly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder. Datum of gage is 5,230.37 ft above mean sea level, datum of 1929. June 19, 1904, to May 10, 1906, wire-weight gage at site 1½ miles downstream at different datum. May 11 to Sept. 22, 1906, chain gage and Sept. 19, 1912, to July 2, 1918, staff gage, at site half a mile upstream at different datums. Nov. 1, 1921, to Nov. 18, 1933, water-stage recorder at site 360 ft upstream at datum 1.04 ft higher prior to October 1932, and 0.53 ft higher thereafter.

Average discharge.--49 years (1912-61), 2,574 cfs (1,863,000 acre-ft per year).

Extremes.--Maximum discharge during year, 8,080 cfs May 28 (gage height, 4.96 ft); minimum daily, 306 cfs July 28.

1912-61: Maximum discharge, about 68,000 cfs June 29, 1927 (gage height, 10.2 ft, site and datum then in use), from rating curve extended above 37,000 cfs; minimum daily, 27 cfs Aug. 22, 1939.

Maximum flood known occurred Oct. 6, 1911. Flood of Sept. 6, 1909, reached a stage of about 12.3 ft, site and datum then in use.

Remarks.--Records good except those for periods of ice effect, which are poor. Discharge measurements generally made 2 to 4 times a month. Diversions above station for irrigation of about 86,000 acres, 4,000 of which is irrigated by Farmers Mutual ditch (see table below) which diverts from Animas River and bypasses this station; ditch flow not included in record. At times this ditch may be supplied partly or entirely by diversion from San Juan River below this station.

Discharge, in cubic feet per second, of Farmers Mutual ditch, water year October 1960 to September 1961									
Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
Oct. 3	21	Jan. 13	0	Mar. 31	112	May 31	*127	Aug. 7	107
10	0	31	0	Apr. 10	113	June 5	116	14	*121
27	*105	Feb. 6	0	17	112	12	*123	21	134
Nov. 7	87	13	0	24	128	19	*120	28	105
30	105	20	84	May 1	134	30	*133	Sept. 1	113
Dec.12	92	28	78	8	110	July 14	*136	8	*123
27	0	Mar. 16	88	15	113	26	*62	18	110
30	0	20	0	22	129	31	68		

*Result of discharge measurement.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 8 to May 1, June 22 to Sept. 30)

1.4	270	1.8	560	2.3	1,090	3.0	2,200	4.0	6,250
1.6	400	2.0	750	2.6	1,510	3.5	3,280	4.5	6,250
								5.0	8,200

Discharge, in cubic feet per second, water year October 1960 to September 1961												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	393	587	400	b 430	488	393	1720	4690	7800	1260	496	670
2	379	569	408	b 400	472	365	1590	5440	7560	1250	544	670
3	365	544	440	b 350	472	372	1500	5970	6840	1300	2030	680
4	365	528	512	b 350	464	456	1880	5720	5660	1450	1860	710
5	358	528	536	b 400	448	528	2820	5170	4690	1400	1720	982
6	358	528	480	b 400	432	512	3400	4380	4570	1330	1700	959
7	365	520	408	b 450	408	488	2500	3570	4430	1250	1250	937
8	386	569	424	b 500	b 400	448	3160	3090	4690	1140	882	915
9	424	650	536	b 500	b 450	424	3520	2540	4840	1300	730	871
10	456	641	544	b 500	480	400	2560	2260	4990	1330	641	1520
11	578	587	528	b 500	496	488	2160	2860	5080	1260	536	2280
12	641	536	520	b 500	536	650	1810	3960	4870	982	690	2430
13	690	520	528	496	544	838	1790	5080	4780	871	700	1690
14	680	512	544	512	560	970	2280	4990	4540	783	937	1380
15	1210	504	528	496	605	1160	2040	3860	4290	660	937	1510
16	1440	504	480	504	605	1500	1610	3380	4150	578	1550	1400
17	1640	496	432	488	623	1560	1700	3180	4210	496	2370	1280
18	2270	472	393	480	614	1330	2320	3750	3910	432	2800	2480
19	2070	448	386	480	520	1350	3110	4990	3500	408	4400	5380
20	1250	464	b 400	480	448	1210	3520	6280	3160	416	2060	3750
21	970	440	b 400	464	424	1180	3750	6720	3020	424	1360	2730
22	838	440	b 420	480	432	1280	3880	6640	2820	488	1180	2300
23	720	440	b 380	480	440	1220	3750	7240	2520	528	1070	2180
24	730	440	b 380	496	b 450	1500	4070	7240	2380	440	1090	2180
25	740	432	b 450	528	424	1820	4180	7120	2160	393	994	2110
26	680	416	b 470	488	400	1640	2970	7240	1980	365	1030	1860
27	680	416	b 470	632	424	1260	2460	7480	1810	344	1100	1650
28	660	440	b 500	614	416	1040	2200	7720	1640	306	882	1510
29	641	440	544	480	-	1130	2560	7840	1390	515	730	1320
30	632	432	536	448	-----	1820	3620	7680	1260	615	660	1190
31	614	-----	496	424	-----	2070	-----	7840	-----	528	650	-----
Total	24,223	15,043	14,473	14,750	13,475	31,402	80,430	165,920	119,540	24,842	39,579	51,524
Mean	781	501	467	476	481	1,013	2,681	5,352	3,985	801	1,277	1,717
Ac-ft	48,050	29,840	28,710	29,260	26,730	62,280	159,500	329,100	237,100	49,270	78,500	102,200

Calendar year 1960: Max 9,100 Min 249 Mean 2,232 Ac-ft 1,620,000

Water year 1960-61: Max 7,840 Min 306 Mean 1,631 Ac-ft 1,181,000

Peak discharge (base, 8,000 cfs). --May 28 (11:00 p.m.) 8,080 cfs (4.96 ft).

b Stage-discharge relation affected by ice.

SAN JUAN RIVER BASIN

9-3675. La Plata River near Farmington, N. Mex.

Location.--Lat 36°44'30", long 108°14'45", in SW $\frac{1}{4}$ sec.7, T.29 N., R.13 W., on right bank at downstream end of old bridge abutment, 40 ft upstream from former highway bridge, 1,300 ft upstream from bridge on U.S. Highway 550, 1,800 ft upstream from mouth, and 2 $\frac{1}{2}$ miles northwest of Farmington.

Drainage area.--583 sq mi.

Records available.--March 1938 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 5,215 ft (from river-profile map).

Average discharge.--23 years, 27.4 cfs (19,840 acre-ft per year).

Extremes.--Maximum gage height during year, 4.82 ft Jan. 27, ice jam (discharge not determined); no flow for many days.
1938-61: Maximum gage height, 6.03 ft Sept. 10, 1939 (discharge not determined); no flow for long periods.
Major floods occurred Sept. 5 or 6, 1909, and Oct. 5 or 6, 1911.

Remarks.--Records fair. Discharge measurements or field estimates generally made 3 to 5 times a month. Diversions for irrigation of about 24,000 acres above station.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0		0	b2	b5	4	10	6	0	0	0	1
2	0		0	b2	b7	5	11	6	0	0	71	1
3	0		0	b2	b10	4	14	6	0	1	55	1
4	0		0	b2	b10	5	27	3	0	1	6	1
5	0		0	b2	b10	6	53	1	0	1	3	2
6	0		a0	b2	a10	4	47	1	0	0	3	2
7	0		a0	b3	a10	4	32	1	0	0	2	2
8	0		a0	b3	a15	4	60	1	0	0	1	2
9	0		a1	a3	a20	6	81	1	0	0	0	27
10	0		a3	a2	33	4	62	1	0	0	0	76
11	0		a5	a2	33	2	47	1	0	0	0	6
12	0		b7	a2	d36	3	39	0	0	0	1	4
13	0		b5	a3	22	4	38	3	1	0	1	4
14	0		b2	a3	28	4	40	2	2	0	8	3
15	58		b2	a3	24	4	27	1	2	0	7	3
16	d44		b3	b4	22	8	20	0	16	0	8	3
17	d39		b4	b4	19	6	15	1	6	0	126	2
18	d74		b3	b5	14	4	8	2	1	0	19	205
19	d47		b3	b5	9	6	27	2	2	0	49	22
20	a19		b4	b3	8	7	27	2	3	0	17	6
21	a10		b5	b3	5	6	27	1	3	0	8	6
22	a3		b5	a4	4	2	26	1	2	0	a6	5
23	a2		b4	b5	4	1	29	1	1	0	a5	3
24	a1		b2	b5	d3	1	40	1	0	0	a4	2
25	a0		b3	b5	d3	1	32	0	d0	0	24	3
26	0		b3	b5	d3	1	11	0	0	0	43	3
27	0		b3	b5	d3	1	3	1	1	0	11	2
28	0		b5	b5	4	2	1	1	0	1	3	1
29	0		b5	b5	-	6	1	0	0	1	1	1
30	0		b4	b5	-----	7	0	0	0	1	2	1
31	0	-----	b4	b5	-----	9	-----	0	-----	0	1	-----
Total	297	0	85	109	374	131	855	47	40	6	485	400
Mean	9.6	0	2.7	3.5	13.4	4.2	28.5	1.5	1.3	0.2	15.6	13.3
Ac-ft	589	0	169	216	742	260	1,700	93	79	12	962	793

Calendar year 1960: Max 335 Min 0 Mean 23.3 Ac-ft 16,870
Water year 1960-61: Max 205 Min 0 Mean 7.8 Ac-ft 5,620

- a No gage-height record.
b Stage-discharge relation affected by ice.
d Doubtful gage-height record.

SAN JUAN RIVER BASIN

165

9-3680. San Juan River at Shiprock, N. Mex.

Location.--Lat 36°47'35", long 108°43'55", in SW $\frac{1}{4}$ sec.22, T.30 N., R.18 W., on left bank 3 miles west of Shiprock and 6 miles downstream from Chaco River.

Drainage area.--12,900 sq mi, approximately.

Records available.--January to October 1911, February 1927 to September 1961. Monthly or yearly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder. Datum of gage is 4,848.68 ft above mean sea level (river-profile survey). Prior to Apr. 6, 1922, chain gage and Apr. 7, 1922, to Oct. 25, 1933, water-stage recorder, at site 3 miles upstream at different datum. Oct. 26, 1933, to Sept. 30, 1936, water-stage recorder at present site at datum 3.31 ft higher and Oct. 1, 1936, to Sept. 30, 1952, at datum 1.77 ft higher. Supplementary water-stage recorders all at gage datum, 400 ft downstream since Oct. 26, 1938 (at datum 1.00 ft higher prior to July 24, 1939); 400 ft upstream since Dec. 19, 1942 (at datum 1.77 ft higher prior to Dec. 30, 1953). Records compiled from any 1 or all 3 gages.

Average discharge.--35 years (1926-61), 2,381 cfs (1,724,000 acre-ft per year).

Extremes.--Maximum discharge during year, 8,240 cfs June 2 (gage height, 5.70 ft); minimum daily, 77 cfs July 29.

1927-61: Maximum discharge, about 80,000 cfs Aug. 11, 1929 (gage height, 5.7 ft, site and datum then in use); minimum daily, 8 cfs Aug. 25, 26, 1939.

Maximum flood known occurred Oct. 6, 1911, and reached a stage of 22 ft, site and datum then in use.

Remarks.--Records good except those above 2,000 cfs which are fair and those for periods of ice effect or no gage-height record, which are poor. Discharge measurements generally made 6 to 8 times a month. Diversions for irrigation of about 118,000 acres above station.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	270	645	560	475	582	525	2120	4620	7490	1120	559	546
2	260	613	540	378	599	500	1720	4920	7610	1120	621	540
3	245	629	588	b342	550	495	1610	5770	6810	1170	1500	534
4	225	589	691	a370	510	510	1740	6250	5770	1320	2050	570
5	209	573	733	a400	495	610	2460	5800	4820	1420	1870	712
6	217	581	677	a450	490	610	2870	4520	4590	1270	1860	892
7	205	597	588	a500	460	588	2780	3630	4520	1220	1420	780
8	221	663	540	a520	446	550	3030	3250	4460	1040	964	828
9	250	735	658	a520	490	540	3280	2720	4490	1080	719	788
10	307	857	719	a520	566	515	3000	2230	4620	1210	570	1160
11	361	745	712	a530	566	545	2620	2400	4690	1160	470	2260
12	525	690	684	a510	628	691	2270	3580	4820	972	409	2840
13	565	654	664	a480	646	946	2000	4420	4520	733	510	1720
14	549	645	726	a500	658	1080	2300	4660	4420	621	663	1390
15	1150	637	719	a510	705	1240	2440	3990	4110	564	804	1170
16	1650	621	684	490	733	1500	1930	3550	3990	475	1010	1350
17	1880	645	622	495	804	1600	1740	3230	3990	398	2200	1220
18	2140	637	582	495	a800	1360	2180	3580	3680	290	2600	1440
19	2120	604	555	495	a700	1360	3320	4170	3500	204	4620	5950
20	1660	604	505	500	652	1280	3990	4890	3050	172	2840	4800
21	1180	599	515	485	572	1160	3960	6030	3050	223	1710	2920
22	1020	622	520	520	572	1300	3790	5690	2800	223	1250	2680
23	904	604	490	520	577	1250	3930	6510	2450	294	980	2300
24	820	616	465	588	588	1440	3700	6690	2240	342	916	2180
25	778	604	540	652	588	1700	3740	6690	2120	204	1280	2030
26	735	594	560	640	530	1840	3140	6940	1960	137	1260	1830
27	717	588	560	652	515	1590	2560	7280	1730	112	1160	1720
28	699	582	588	764	515	1290	2120	7470	1560	92	1030	1600
29	690	604	604	670	-	1290	2340	7710	1320	77	748	1470
30	672	582	599	577	-----	1840	3550	7530	1180	338	600	1410
31	663	-----	540	545	-----	2440	-----	7320	-----	478	558	-----
Total	23887	18959	18728	16093	16537	34185	82230	158040	116360	20079	39751	51630
Mean	771	632	604	519	591	1,103	2,741	5,098	3,879	648	1,282	1,721
Ac-ft	47,380	37,600	37,150	31,920	32,800	67,800	163,100	313,500	230,800	39,830	78,840	102,400

Calendar year 1960: Max 9,210 Min 72 Mean 2,215 Ac-ft 1,608,000

Water year 1960-61: Max 7,710 Min 77 Mean 1,634 Ac-ft 1,183,000

Peak discharge (base 8,500 cfs).--No peak above base.

a No gage-height record.

b Stage-discharge relation affected by ice.

LITTLE COLORADO RIVER BASIN

9-3860.5. Largo Creek near Mangas, N. Mex.

Location.--Lat 34°08'30", long 108°30'05", in SW¼ sec.10, T.2 S., R.16 W., on right bank at El Caso Ranch, half a mile upstream from Sawmill Canyon, 10½ miles southwest of Mangas, and 14 miles south of Quemado.

Drainage area.--63 sq mi, approximately.

Records available.--September 1959 to September 1961.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 7,600 ft (from topographic map).

Extremes.--Maximum discharge during year, 13 cfs Aug. 17 (gage height, 0.87 ft); minimum daily, 0.02 cfs July 25-27.
1959-61: Maximum discharge, 181 cfs May 8, 1960 (gage height, 2.30 ft); minimum daily, that of July 25-27, 1961.

Remarks.--Records good except those for periods of no gage-height record or uncertain stage-discharge relation, which are fair. No diversion above station.

Rating table, except period of uncertain stage-discharge relation
(gage-height, in feet, and discharge, in cubic feet per second)

0.09	0
.1	.01
.2	.2
.3	.9
.4	2.0

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	^a 0.07	0.1	^a 0.2	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.05	0.1
2	*.07	1	*.2	2	3	2	2	1	1	1	.05	.09
3	.07	1	2	2	3	2	2	1	1	1	.05	.09
4	.07	1	2	*.2	3	2	2	1	1	1	.05	.07
5	.07	1	2	2	3	2	1	1	1	.09	.05	.05
6	.07	1	2	2	3	2	2	1	1	.09	.05	.09
7	.07	1	2	2	3	2	2	1	1	1	.03	.09
8	.07	1	2	2	3	*.2	2	1	1	.09	.05	*.1
9	.09	1	2	*.2	3	2	2	1	1	.09	.05	.5
10	.09	1	2	2	3	2	2	1	1	2	.4	1
11	.09	1	2	2	3	1	2	1	1	.09	.2	.09
12	.09	1	2	2	*.3	1	1	1	1	.07	.09	.09
13	.07	1	2	2	3	1	1	2	1	.07	.09	.09
14	.09	1	2	2	3	1	1	2	1	.07	.09	1
15	2	1	2	2	3	1	1	1	1	.07	1	1
16	3	1	2	2	2	1	1	1	1	.05	1	1
17	6	1	2	2	3	1	1	1	1	.05	1.5	.09
18	3	1	2	2	3	2	1	1	1	.05	3	1
19	2	1	2	2	3	2	1	*.1	1	.03	1	1
20	1	1	2	2	3	2	1	1	1	.03	1	1
21	1	1	2	3	2	2	1	1	1	*.03	1	1
22	1	1	2	3	2	2	1	1	1	.03	.09	1
23	1	1	2	3	2	2	1	1	1	.03	.09	1
24	1	2	2	3	2	1	1	1	1	.03	.09	1
25	1	^a 2	2	3	2	1	1	1	1	.02	.09	.09
26	1	^a 2	2	3	2	*.2	1	1	2	.02	.09	.09
27	1	^a 2	2	4	2	2	1	1	4	.02	.09	.07
28	1	^a 2	2	4	-	2	1	1	1	.03	1.3	.07
29	1	^a 2	2	4	-	2	1	1	1	.03	2	.07
30	1	^a 2	2	4	-----	2	1	1	1	.05	1	.07
31	1		2	3	-----	2	-----	1	-----	.07	1	-----
Total	3.88	3.7	6.0	7.8	7.3	5.4	4.1	3.3	3.4	2.00	5.84	3.10
Mean	0.13	0.12	0.19	0.25	0.23	0.17	0.14	0.11	0.11	0.06	0.19	0.10
Ac-ft	7.7	7.3	12	15	14	11	8.1	6.5	6.7	4.0	12	6.1

Calendar year 1960: Max 90 Min 0.03 Mean 2.26 Ac-ft 1,650

Water year 1960-61: Max 1.5 Min 0.02 Mean 0.15 Ac-ft 110

Peak discharge (base, 30 cfs).--No peak above base.

* Discharge measurement made on this day.

^a No gage-height record.

Note.--Stage-discharge relation uncertain July 5-20.

GILA RIVER BASIN

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9-4305. Gila River near Gila, N. Mex.

Location.--Lat 33°03'45", long 108°32'20", in NW $\frac{1}{4}$ sec.30, T.14 S., R.16 W., on left bank at Hooker damsite, 1 mile upstream from Moggollon Creek, and 7 miles northeast of Gila.

Drainage area.--1,864 sq mi.

Records available.--April to December 1914, December 1927 to September 1961. Monthly discharge only December 1927 to September 1930, published in WSP 1313.

Gage.--Water-stage recorder. Datum of gage is 4,655.8 ft above mean sea level (river-profile survey). Prior to Dec. 31, 1928, at site 5 miles upstream at different datum. Dec. 31, 1928, to Jan. 7, 1942, at site 200 ft upstream at same datum.

Average discharge.--34 years, 122 cfs (88,320 acre-ft per year).

Extremes.--Maximum discharge during year, 318 cfs June 17 (gage height, 3.71 ft); minimum daily, 24 cfs July 27, 28, Aug. 10. 1929-61: Maximum discharge, 25,400 cfs Sept. 29, 1941 (gage height, 17.2 ft, from floodmark), from rating curve extended above 1,100 cfs on basis of velocity-area studies and logarithmic plotting; minimum daily, 17 cfs July 6, 7, 1956.

Remarks.--Records good except those for periods of doubtful gage-height record, which are fair. Discharge measurements generally made 2 to 4 times a month. Diversions for irrigation of about 500 acres above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

2.5	14	3.2	170
2.6	26	3.5	285
2.9	80		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	31	65	54	65	71	65	122	76	34	42	32	30
2	32	63	54	61	71	63	117	74	32	42	39	27
3	32	61	57	59	67	63	114	71	30	44	37	d26
4	32	59	71	59	61	63	110	71	30	52	32	d25
5	31	59	69	59	61	69	117	76	29	48	29	d30
6	31	59	63	59	63	74	127	78	29	41	27	32
7	31	61	61	59	63	74	143	76	29	48	27	37
8	29	59	61	57	63	71	152	69	27	46	27	39
9	40	57	69	55	63	74	152	69	27	42	26	44
10	42	57	67	55	63	74	146	65	27	42	24	48
11	40	57	63	55	63	78	135	61	27	51	32	54
12	39	57	59	57	63	80	127	59	27	44	63	55
13	39	57	61	55	63	82	120	57	27	41	37	61
14	40	55	61	55	63	86	112	59	27	41	32	61
15	49	55	61	55	63	93	107	59	29	39	63	55
16	62	55	59	55	63	107	102	55	84	36	64	55
17	120	55	59	57	65	114	100	54	122	32	50	52
18	254	55	57	57	65	117	98	54	d70	29	67	48
19	220	55	57	57	67	114	96	52	57	29	63	44
20	154	55	57	57	67	114	98	50	52	29	54	42
21	120	55	59	57	67	110	105	48	48	27	46	41
22	102	55	57	57	67	105	112	44	44	30	52	39
23	91	55	59	57	67	110	110	42	41	30	74	37
24	86	55	59	59	67	114	102	42	39	27	63	36
25	80	55	59	65	65	124	100	41	41	26	57	34
26	76	55	59	65	65	130	98	41	41	26	48	34
27	71	54	59	71	65	132	93	41	85	24	42	32
28	69	54	59	82	65	127	86	39	57	24	55	32
29	67	55	61	80	-	124	82	37	46	27	48	32
30	65	54	67	78	-----	124	80	37	42	34	41	32
31	65	-----	67	76	-----	127	-----	36	-----	36	34	-----
Total	2,240	1,703	1,885	1,895	1,816	3,002	3,363	1,733	1,300	1,129	1,385	1,214
Mean	72.3	56.8	60.8	61.1	64.9	96.8	112	55.9	43.3	36.4	44.7	40.5
Ac-ft	4,440	3,380	3,740	3,760	3,600	5,950	6,670	3,440	2,580	2,240	2,750	2,410

Calendar year 1960: Max 1,570 Min 25 Mean 142 Ac-ft 103,000

Water year 1960-61: Max 254 Min 24 Mean 62.1 Ac-ft 44,960

Peak discharge (base, 600 cfs).--No peak above base.

d Doubtful gage-height record.

9-4320. Gila River below Blue Creek, near Virden, N. Mex.

Location.--Lat 32°38'55", long 108°50'45", in SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.18, T.19 S., R.19 W., on left bank at head of canyon, 1 $\frac{1}{4}$ miles downstream from Blue Creek, 10 miles east of Virden, and 16 miles upstream from New Mexico-Arizona State line.

Drainage area.--3,203 sq mi, excluding Animas River basin.

Records available.--May to November 1914, March to September 1915, July 1927 to September 1961. July 1927 to May 1931 monthly discharge only, published in WSP 1313, computed as sum of flow at Virden Bridge, 8 $\frac{1}{2}$ miles downstream, and in Sunset Canal. Published as Gila River near Duncan, Ariz., 1914-15 and as Gila River at Fuller's Ranch, near Duncan, Ariz. 1931-38.

Gage.--Water-stage recorder at present site and datum since July 8, 1931. Altitude of gage is 3,875 ft (from river-profile map). May 11, 1914, to Sept. 30, 1915, at site 6 miles downstream, 1,000 ft upstream from intake of Sunset Canal. June 1 to July 7, 1931, staff gage at present site and datum.

Average discharge.--34 years (1927-61), 159 cfs (115,100 acre-ft per year); median of yearly mean discharges, 130 cfs (94,100 acre-ft per year).

Extremes.--Maximum discharge during year, 1,920 cfs Aug. 15 (gage height, 8.19 ft); minimum daily, 6.0 cfs July 26. 1927-61: Maximum discharge, 41,700 cfs Sept. 29, 1941 (gage height, 25.78 ft); minimum, 1 cfs July 14, 1934.

Remarks.--Records good. Discharge measurements generally made twice a month. Station is above all Duncan Valley diversions. Diversions for irrigation of about 6,200 acres above station.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	14	88	60	91	98	78	114	66	17	31	70	37
2	19	85	58	91	98	76	122	52	15	46	49	34
3	21	83	56	89	96	79	120	48	14	42	111	28
4	18	80	60	89	96	76	113	46	13	47	47	25
5	18	80	69	90	95	83	113	40	14	42	33	24
6	21	81	70	90	91	83	106	36	11	43	24	23
7	22	82	66	91	88	81	109	34	11	48	21	22
8	20	78	68	91	84	76	123	40	11	41	19	21
9	32	74	78	93	89	75	142	43	11	36	19	158
10	68	75	78	93	93	71	137	39	9.7	36	18	228
11	53	75	79	93	90	68	128	39	9.0	65	60	178
12	52	76	80	93	90	68	113	39	8.4	43	99	171
13	50	76	73	93	91	85	109	35	8.1	38	64	110
14	50	76	70	93	90	83	103	39	8.4	34	242	99
15	52	76	69	94	93	81	96	38	8.1	29	608	94
16	123	74	71	94	93	79	89	33	7.2	26	315	83
17	378	73	71	94	87	79	81	26	13	25	178	75
18	315	73	69	93	81	79	75	24	12.5	21	160	62
19	315	72	73	91	88	87	69	27	8.5	20	132	50
20	239	72	69	93	88	95	69	29	6.5	17	120	46
21	191	73	69	94	90	91	62	29	6.0	16	116	40
22	160	72	73	95	87	89	63	31	5.0	15	111	34
23	143	69	73	95	81	85	66	30	4.0	11	166	31
24	130	69	76	103	82	87	68	25	3.7	7.5	91	27
25	122	70	80	106	87	88	69	23	3.7	6.3	82	20
26	110	70	81	104	84	96	69	22	4.0	5.0	76	14
27	106	70	81	120	83	113	69	19	4.4	7.2	65	13
28	100	72	80	122	80	111	65	19	4.2	5.2	54	12
29	96	70	81	106	-	107	64	19	4.0	4.1	53	12
30	95	6.5	89	106	-----	107	64	20	3.5	4.3	60	12
31	89	-----	93	104	-----	109	-----	19	-----	16.3	46	-----
Total	3,222	2,249	2,263	2,994	2,493	2,665	2,790	1,029	888.9	1,098.0	3,309	1,783
Mean	104	75.0	73.0	96.6	89.0	86.0	93.0	33.2	29.6	35.4	107	59.4
Ac-ft	6,390	4,460	4,490	5,940	4,940	5,290	5,530	2,040	1,760	2,180	6,560	3,540

Calendar year 1960: Max 4,280 Min 4.4 Mean 191 Ac-ft 139,000

Water year 1960-61: Max 608 Min 6.0 Mean 73.4 Ac-ft 53,120

Peak discharge (base, 1,900 cfs).--Aug. 15 (7 p.m.) 1,920 cfs (8.19 ft).

9-4330. Sunset Canal near Virden, N. Mex.

Location.--Lat 32°39'20", long 108°56'00", in NW $\frac{1}{4}$ sec.17, T.19 S., R.20 W., on left bank 1.7 miles downstream from intake and 4.5 miles southeast of Virden.

Records available.--October 1914 to September 1915, July 1922 to September 1931, January 1936 to September 1961. Monthly discharge only January 1936 to December 1938, published in WSP 1313. Prior to 1939, published as "near Duncan, Ariz."

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 3,790 ft (from topographic map). Oct. 1, 1914, to Sept. 30, 1915, staff gage at site 0.4 mile upstream and July 15, 1922, to Sept. 30, 1931, staff gage at site 0.5 mile downstream at different datums. Mar. 9, 1936, to Feb. 20, 1942, water-stage recorder and submerged rectangular weir at site 300 ft downstream at different datum.

Extremes.--1914-15, 1922-31, 1936-61: Maximum daily discharge, 62 cfs Sept. 21, 22, 1929; no flow at times.

Remarks.--Records good. Canal diverts from right bank of Gila River in SW $\frac{1}{4}$ sec.21, T.19 S., R.20 W., for irrigation of about 2,750 acres in Virden-Duncan Valley. No diversion between intake and station.

Rating table (gage height, in feet, and discharge,
in cubic feet per second)

0.0	0.06	0.5	8.7
.1	.6	.7	14
.2	2.0	1.0	25
.3	3.9	1.5	42

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.9	1.3	5.4		0	0	0	0	1.3	1.8	0	1.4
2	1.3	1.3	5.9		0	0	0	0	*1.1	2.0	0	1.4
3	*1.8	1.2	5.7		0	0	0	5.3	1.0	2.0	0	1.4
4	1.5	7.1	5.4		0	0	0	1.6	8.4	2.0	0	1.4
5	1.2	6.4	6.2		0	3.4	1.9	1.6	7.9	1.9	0	1.4
6	1.6	6.2	6.2		0	1.0	*3.1	1.7	6.6	2.0	0	1.6
7	1.6	6.4	*1.0		0	3.2	3.1	1.8	6.2	2.1	1.7	1.8
8	1.6	6.2	1.2		0	4.3	3.1	1.7	6.2	2.1	7.4	1.1
9	1.9	5.7	1.3		0	4.3	3.3	1.7	7.1	2.0	7.4	2.1
10	2.1	5.9	1.3		0	*4.5	3.3	1.6	5.4	1.9	6.9	2.0
11	2.0	5.9	1.3		0	4.5	*3.3	1.8	4.8	2.0	6.2	2.7
12	1.8	5.4	1.2		0	4.5	.5	*1.8	3.5	1.3	1.8	*3.0
13	1.6	5.9	1.2		0	5.0	0	1.6	3.1	6.2	*0	3.3
14	1.4	5.9	1.2		3.1	4.8	0	1.7	2.9	6.2	*0	3.5
15	1.4	5.9	1.2		3.8	7.2	0	1.7	2.6	5.9	*0	3.1
16	7.3	5.7	1.2		3.4	*8.5	0	1.6	4.1	5.9	1.8	2.6
17	9.0	5.9	1.2		3.7	5.4	0	1.6	3.0	6.6	*2.9	1.8
18	*1.4	5.9	3.5		8.0	5.4	0	1.8	1.7	6.2	3.0	1.6
19	1.1	5.9	5.4		2.3	5.2	0	1.9	1.1	1.2	3.2	1.3
20	1.2	2.7	8.2		*4.2	7.2	0	2.1	3.5	1.5	3.2	1.2
21	0	5.6	7.9		0	7.3	0	2.2	7.7	1.4	2.3	1.2
22	0	6.9	*1.1		0	7.5	0	2.4	1.7	1.2	1.8	7.4
23	1.8	6.4	1.3		0	*1.1	0	2.4	1.6	1.0	2.2	6.4
24	2.6	6.2	1.2		0	1.1	0	2.1	1.6	5.2	2.5	7.4
25	*4.2	6.2	1.3		0	1.1	0	1.9	1.6	3.7	1.8	7.4
26	4.2	*6.2	1.3		0	1.1	0	1.9	1.8	3.7	1.7	7.1
27	6.3	5.9	1.3		0	1.1	0	1.6	1.8	*3.5	1.7	7.1
28	8.5	5.9	1.3		0	1.1	0	1.5	1.6	4.5	1.8	6.6
29	1.2	6.2	1.3		-	5.3	0	*1.4	1.7	8.5	1.5	6.9
30	9.0	5.9	1.4		-----	0	0	1.6	1.7	0	1.5	7.1
31	1.2	-----	1.4		-----	0	-----	1.4	-----	0	1.7	-----
Total	339.0	198.4	321.8	0	28.5	164.5	21.6	502.3	296.0	360.1	393.6	472.4
Mean	10.9	6.61	10.4	0	1.02	5.31	0.72	16.2	9.87	11.6	12.7	15.7
Ac-ft	672	394	638	0	57	326	43	996	587	714	781	937

Calendar year 1960: Max 40 Min 0 Mean 12.9 Ac-ft 9,340
 Water year 1960-61: Max 35 Min 0 Mean 8.49 Ac-ft 6,140

* Discharge measurement made on this day.
 a No gage-height record.

GILA RIVER BASIN

9-4360. New Model Canal near Virden, N. Mex.

Location.--Lat 32°40'30", long 108°59'30", in NE $\frac{1}{4}$ sec.10, T.19 S., R.21 W., 1 mile downstream from intake, 1 mile southeast of Virden, and $\frac{3}{4}$ miles east of State line.

Records available.--October 1914 to September 1915, July 1922 to September 1931, January 1936 to September 1961. Monthly discharge only January 1936 to December 1938, published in WSP 1313. Published as Model Canal near Duncan, Ariz., 1914-15, as Moddle Canal near Duncan, Ariz., 1922-31, and as Moddle Canal near Virden, N. Mex., 1936-51.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 3,745 ft (from topographic map). Prior to Nov. 25, 1926, staff gage and Nov. 25, 1926, to Feb. 21, 1942, water-stage recorder, at several sites within half a mile upstream at different datums.

Extremes.--1914-15, 1922-31, 1936-61: Maximum daily discharge, 74 cfs Sept. 9, 1930; no flow at times.

Remarks.--Records good. Discharge measurements or observations of no flow generally made twice a month. Canal diverts from left bank of Gila River in NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.11, T.19 S., R.21 W., for irrigation of about 2,450 acres in Virden-Duncan Valley.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

0.0	0.0	0.6	13
.1	.8	.8	20
.2	2.3	1.0	30
.4	6.6		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						0	5.6	0	0	2.8	0	0
2						0	3.7	0	0	3.0	0	0
3						0	4.5	0	0	2.3	0	0
4						0	3.6	0	0	1.1	0	0
5						0	2.8	1.7	0	1.4	0	0
6						0	0	2.5	0	8.2	0	0
7						0	0	2.3	0	1.3	0	0
8						0	0	4.7	0	8.2	0	1.0
9						0	0	5.4	0	5.6	0	0
10						0	0	5.4	0	4.7	0	0
11						0	0	5.4	0	9.6	0	7.9
12						0	0	3.0	0	6.8	0	1.3
13						2.0	0	4.9	0	0	0	8.8
14						4.0	0	5.4	0	0	0	8.2
15						3.6	0	6.4	0	0	1.3	7.4
16						3.4	0	4.0	0	0	2.6	4.0
17						4.9	0	1.2	0	0	1.4	0
18						4.3	0	0	1.5	0	1.6	0
19						5.2	0	0	2.0	0	1.3	0
20						4.0	0	0	1.1	0	1.6	0
21						4.9	0	0	3.6	0	1.2	0
22						5.2	0	0	.5	0	3.3	0
23						4.3	0	0	0	0	1.1	0
24						4.9	0	0	0	0	7.5	0
25						4.9	0	0	0	0	0	0
26						6.6	0	0	0	0	0	0
27						6.6	0	0	1.0	0	0	0
28						5.6	0	0	5.9	0	0	0
29						6.1	0	0	1.0	0	0	0
30						5.6	0	0	3.0	0	0	0
31						5.2		0		0	0	
Total	0	0	0	0	0	91.3	20.2	52.3	70.0	109.9	131.8	50.3
Mean	0	0	0	0	0	2.94	0.67	1.69	2.33	3.55	4.25	1.68
Ac-ft	0	0	0	0	0	1.81	4.0	10.4	13.9	21.8	26.1	10.0
Calendar year 1960:	Max 47			Min 0		Mean 4.66		Ac-ft 3,390				
Water year 1960-61:	Max 25			Min 0		Mean 1.44		Ac-ft 1,040				

9-4426.8 San Francisco River near Reserve, N. Mex.

Location.--Lat 33°44'30", long 108°46'15", in SW 1/4 sec. 35, T.6 S., R.19 W., on left bank 500 ft upstream from mouth of Rainbow Bridge Canyon and 2 miles northwest of Reserve.

Drainage area.--350 sq mi, approximately.

Records available.--March 1959 to September 1961.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 5,850 ft above mean sea level (from topographic map).

Extremes.--Maximum discharge during year, 267 cfs Oct. 17 (gage height, 1.78 ft); minimum daily, 1.7 cfs July 17.

1959-61: Maximum discharge, 628 cfs July 19, 1959 (gage-height, 2.92 ft), from rating curve extended above 300 cfs on basis of slope-area measurement of peak flow; minimum daily, 1.4 cfs June 11, 12, 28, 1959.

Remarks.--Records good. Discharge measurements generally made 1 to 3 times a month. Slight regulation at times by one small reservoir. Diversion for irrigation of about 500 acres above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

0.45	1.7	0.9	28
.5	2.9	1.0	39
.6	7.2	1.1	55
.7	14	1.2	77
.8	21	1.3	102

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.5	6.0	5.5	4.0	7.8	6.6	2.5	5.5	2.6	2.4	4.6	4.2
2	3.5	6.0	6.0	4.8	7.2	7.2	2.2	5.5	2.6	3.8	4.2	3.5
3	3.8	6.0	6.0	5.6	7.8	9.9	2.1	4.6	2.4	4.2	3.8	3.2
4	4.2	6.0	6.6	5.6	7.8	12	2.0	4.6	2.6	5.5	3.8	3.2
5	3.8	6.0	4.4	6.5	6.0	12	2.1	4.6	2.4	3.8	3.8	2.9
6	3.5	6.0	4.3	5.4	6.2	12	2.1	4.6	2.6	3.8	3.5	2.9
7	3.5	6.0	5.6	4.9	6.2	11	2.0	4.2	2.6	3.8	3.5	3.2
8	3.5	5.5	5.0	5.2	6.2	11	2.1	4.2	2.4	3.8	3.2	3.8
9	16	5.5	4.1	5.3	6.6	12	2.4	4.2	2.6	4.2	3.5	9.5
10	6.6	5.5	4.4	5.6	5.9	14	2.5	4.6	2.4	3.8	3.8	16
11	5.0	5.5	4.5	5.5	6.6	19	2.3	3.8	2.4	3.5	3.8	8.9
12	4.6	6.0	4.6	5.3	8.5	20	2.4	3.5	2.4	2.9	6.0	26
13	4.2	6.0	7.8	5.8	8.5	20	2.2	3.8	2.4	2.6	5.0	9.9
14	4.6	5.5	7.2	5.4	7.2	21	1.9	4.2	2.4	3.2	4.6	6.6
15	9.2	5.5	3.9	5.9	6.6	21	1.7	3.8	2.4	2.9	8.0	6.0
16	2.3	5.0	4.0	6.2	6.6	22	1.6	3.8	2.9	2.1	7.2	5.5
17	7.9	5.5	4.5	6.1	7.2	19	1.4	3.8	4.2	1.7	5.0	5.0
18	2.9	5.0	4.9	7.0	7.2	19	1.3	3.5	3.8	1.9	5.0	6.0
19	1.9	5.5	5.3	6.0	8.5	19	1.1	3.8	3.2	2.1	5.0	6.0
20	1.2	5.0	5.0	5.5	9.2	19	1.1	3.2	2.4	2.1	4.6	5.0
21	9.2	5.5	4.4	5.8	7.8	24	9.2	2.9	2.4	2.1	3.8	4.6
22	8.5	5.5	5.7	6.2	8.5	22	9.2	2.9	2.4	2.4	5.7	4.6
23	7.8	5.5	5.3	6.2	8.5	21	8.5	2.9	2.6	2.4	6.0	4.2
24	7.8	5.5	5.7	7.2	6.0	21	7.8	2.9	2.4	2.1	7.7	4.2
25	7.8	5.5	5.4	7.2	6.6	19	6.6	2.9	2.4	2.4	4.2	3.8
26	7.2	6.0	5.0	6.6	7.8	19	6.0	2.9	2.1	2.1	3.8	3.8
27	6.6	6.0	5.4	8.5	7.8	21	6.6	3.2	2.1	2.4	3.2	3.8
28	6.6	5.0	6.1	9.2	7.8	19	6.0	3.2	2.1	2.6	3.2	3.5
29	6.6	4.6	7.2	6.6	—	20	6.6	2.9	2.1	4.6	3.5	3.5
30	6.0	6.0	7.2	7.0	—	24	6.0	3.2	2.1	3.2	4.2	3.5
31	5.5	—	5.4	7.8	—	24	—	3.2	—	5.5	3.8	—
Total	321.1	168.1	166.4	189.9	204.6	540.7	462.5	116.6	76.4	95.9	141.0	176.8
Mean	10.4	5.60	5.37	6.13	7.31	17.4	15.4	3.76	2.55	3.09	4.55	5.89
Ac-ft	637	333	330	377	406	1,070	917	231	152	190	280	351

Calendar year 1960: Max 322 Min 2.0 Mean 19.0 Ac-ft 13,780

Water year 1960-61: Max 79 Min 1.7 Mean 7.29 Ac-ft 5,270

Peak discharge (base, 200 cfs).--Oct. 17 (1:30 p.m.) 267 cfs (1.78 ft).

9-4440. San Francisco River near Glenwood, N. Mex.

Location.--Lat 33°15'05", long 108°52'40", in NE¼NW¼ sec.23, T.12 S., R.20 W., on left bank a quarter of a mile upstream from hot springs, 5 miles south of Glenwood, and 6 miles downstream from Whitewater Creek.

Drainage area.--1,653 sq mi.

Records available.--October 1927 to September 1961. Monthly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder. Datum of gage is 4,552.06 ft above mean sea level, datum of 1929. Prior to Feb. 15, 1934, at site 4½ miles upstream at datum 98.82 ft higher.

Average discharge.--34 years, 61.6 cfs (44,600 acre-ft per year).

Extremes.--Maximum discharge during year, 4,050 cfs Sept. 11 (gage height, 8.00 ft); minimum daily, 4.1 cfs Aug. 6.

1927-61: Maximum discharge, 7,800 cfs Jan. 13, 1949 (gage height, 10.74 ft), from rating curve extended above 2,800 cfs on basis of slope-area measurement of peak flow; minimum daily, 2.5 cfs June 25, 1956.

Major floods occurred Jan. 19 and Oct. 14, 1916, when discharges of 90,000 cfs (or greater) were computed for station at Clifton, Ariz.

Remarks.--Records fair. Discharge measurements generally made 2 to 4 times a month. Diversions for irrigation of about 2,000 acres above station.

Rating table (gage height, in feet, and discharge,
in cubic feet per second)
(Shifting-control method used Oct. 18, Mar. 9-13, Apr. 2-7,
Apr. 14 to May 1, May 8 to Aug. 16, Sept. 13-30)

2.0	3.0	2.6	80
2.1	6.6	2.8	145
2.2	13	3.0	230
2.3	23	3.6	520
2.4	37		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12	24	15	18	20	16	26	21	15	8.8	14	20
2	12	24	16	20	20	16	22	22	16	12	21	18
3	13	24	16	20	20	14	22	24	16	13	13	18
4	12	23	20	20	18	18	21	26	20	20	8.8	18
5	12	24	16	18	18	20	16	27	20	15	9.4	16
6	11	24	21	20	18	18	18	22	21	16	4.1	20
7	6.6	24	21	18	18	18	23	26	24	13	10	18
8	6.6	24	21	20	18	18	34	23	16	12	7.1	22
9	18	24	18	18	18	16	36	18	15	11	8.2	440
10	24	26	21	18	18	18	34	20	14	31	6.6	180
11	22	26	20	15	15	15	31	18	21	5.9	52	450
12	20	27	18	15	15	16	32	18	18	22	37	500
13	18	27	18	16	16	16	27	18	11	21	21	52
14	16	26	20	16	18	18	22	18	16	18	3.9	42
15	21	24	20	16	18	20	18	21	18	16	28	30
16	37	23	18	16	18	21	24	24	20	11	30	22
17	30.4	26	18	18	16	23	26	23	16	11	220	18
18	300	21	18	16	16	28	20	22	12	11	95	14
19	9.9	20	18	15	18	26	16	16	14	11	44	13
20	54	18	18	16	18	30	14	16	16	17	48	14
21	32	18	18	18	18	30	16	20	20	11	22	11
22	27	20	18	20	18	31	21	18	20	12	18	12
23	24	18	18	21	18	32	26	15	15	a12	88	14
24	24	18	18	21	16	30	24	16	11	a11	37	15
25	24	18	18	21	15	26	22	16	11	a10	26	16
26	24	16	18	20	16	27	20	18	9.4	a10	22	15
27	24	20	18	22	18	27	18	21	10	a9	21	12
28	25	16	18	21	16	24	23	23	10	8.8	18	12
29	24	16	18	21	-	23	22	32	5.7	7.6	18	11
30	24	16	21	22	-----	22	20	21	7.1	7.1	21	15
31	25	-----	20	21	-----	28	-----	16	-----	11	20	-----
Total	1,295.2	655	574	577	489	685	694	639	458.2	458.3	1,027.2	2,058
Mean	4.18	2.18	18.5	18.6	17.5	22.1	23.1	20.6	15.3	14.8	33.1	68.6
Ac-ft	2,570	1,300	1,140	1,140	970	1,360	1,380	1,270	909	909	2,040	4,080

Calendar year 1960: Max 1,440 Min 7.1 Mean 68.9 Ac-ft 50,010

Water year 1960-61: Max 500 Min 4.1 Mean 26.3 Ac-ft 19,070

Peak discharge (base, 800 cfs)

a No gage-height record.

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
8-17	9:50 a.m.	6.94	2,940	9-9	2 a.m.	5.45	1,680
9-11	11 p.m.	8.0	4,050				

As the number of streams on which streamflow information is likely to be desired far exceeds the number of stream-gaging stations feasible to operate at one time, the Geological Survey collects limited streamflow data at sites other than stream-gaging stations. When limited streamflow data are collected on a systematic basis over a period of years for use in hydrologic analysis, the site at which the data are collected is called a partial-record station. Data collected at these partial-record stations are usable in low-flow or flood-flow analyses, depending on the type of data collected. In addition, discharge measurements are made at other sites not included in the partial-record program. These measurements are generally made in times of drought or flood to give better areal coverage to those events. Those measurements and others collected for some special reason are called measurements at miscellaneous sites.

Records collected at partial-record stations are presented in two tables. The first is a table of discharge measurements at low-flow partial-record stations, and the second is a table of annual maximum stage and discharge at crest-stage stations. Discharge measurements made at miscellaneous sites for both low flow and high flow are given in a third table.

Low-flow partial-record stations

Measurements of streamflow in the state at low-flow partial-record stations are given in the following table. Most of these measurements were made during periods of base flow when streamflow is primarily from ground-water storage. These measurements, when correlated with the simultaneous discharge of a nearby stream where continuous records are available, will give a general picture of the low-flow potentiality of the stream. The columnheaded "Period of record" shows the water years in which measurements were made at the same, or practically the same, site.

Discharge measurements made at low-flow partial-record stations during water year 1961

Discharge measurements made at low-flow partial-record stations during water year 1961						
Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
Rio Grande basin						
3865	Rio Ruidoso near Ruidoso, N. Mex.	SW $\frac{1}{4}$ sec.19, T.11 S., R.13 E., at Mescalero Apache Indian Reservation boundary, 3 miles west of Ruidoso.	17.2	1953-61	12-19-60	0.94
					2-20-61	2.59
					6-21-61	2.33
					9-21-61	10.2
3866	Carrizo Creek at Ruidoso, N. Mex.	SW $\frac{1}{4}$ sec.26, T.11 S., R.13 E., at mouth at Ruidoso.	24.2	1953-61	12-19-60	2.33
					2-20-61	2.28
					6-21-61	2.11
					9-21-61	2.39
Gila River basin						
*4299	Snow Creek near Mogollon, N. Mex.	Lat 33°24'50", long 108°29'40", about 1,000 ft below Gila Wilderness boundary, 17.5 miles east of Mogollon.	89.6	1958-61	5-7-61	0.99

* Also a crest-stage station.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Crest-stage partial-record stations

The following table contains annual maximum discharge for crest-stage stations. A crest-stage gage is a device which will register the peak stage occurring between inspections of the gage. A stage-discharge relation for each gage is developed from discharge measurements made by indirect measurements of peak flow or by current meter. The date of the maximum discharge is not always certain but is usually determined by comparison with nearby continuous-record stations, weather records, or local inquiry. Only the maximum discharge for each water year is given. Information on some lower floods may have been obtained, and discharge measurements made for purposes of establishing the stage-discharge relation, but these are not published herein. The years given in the period of record represent water years for which the annual maximum has been determined.

Annual maximum discharge at crest-stage partial-record stations

Annual maximum discharge at crest-stage partial-record stations							
Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (ft)	Discharge (cfs)
Arkansas River basin							
1544	Carrizozo Creek near Kenton, Okla.	NE $\frac{1}{4}$ sec.31, T.31 N., R.37 E., under bridge on New Mexico State Highway 18, 4 miles southwest of Kenton.	111	1953-61	6- -61	3.47	780
2010	Raton Creek at Raton, N. Mex.	Lat 36°54', long 104°26', 60 ft above bridge on State Highway 72 at Raton.	14.4	1953-61	7- 7-61	4.24	860
2115	Canadian River near Taylor Springs, N. Mex.	NW $\frac{1}{4}$ sec.27, T.24 N., R.23 E., 1 mile above Chico Creek, 2 $\frac{1}{2}$ miles below Cimarron Creek, and 2 $\frac{1}{2}$ miles south of Taylor Springs.	2,853	1940-58†, 1959-61	8- 2-61	7.17	3,370
2137	Canadian River tributary near Mills, N. Mex.	NE $\frac{1}{4}$ sec.3, T.22 N., R.25 E., on downstream end of left bridge abutment on State Highway 39, 6 miles north of Mills.	b4.2	1954-61	9-12-61	2.03	178
2209	Dog Creek near Shoemaker, N. Mex.	Lat 35°49'32", long 104°53'28", 0.5 mile above Valmora-Shoemaker road, and 1.8 miles northwest of Shoemaker.	11.2	1954-61	8- 2-61	8.64	(j)
2216	Lagartija Creek tributary near Sanchez, N. Mex.	SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.5, T.16 N., R.24 E., at bridge on State Highway 65, 0.9 miles northeast of Sanchez, in San Miguel County, N. Mex.	b1	1961		(a)	(†)
2223	Trementina Creek at Trementina, N. Mex.	NW $\frac{1}{4}$ sec.8, T.14 N., R.24 E., at bridge on State Highway 65 at Trementina.	b65	1959-61	7- 7-61	2.82	(†)
2250	Pajarito Creek at Newkirk, N. Mex.	SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.24, T.10 N., R.25 E., on downstream side of bridge on U.S. Highway 66, 1 mile east of Newkirk.	b35	1954-61	9-11-61	3.26	655
2255	Ute Creek near Gladstone, N. Mex.	On line of secs.14 and 23, T.24 N., R.28 E., on bridge on State Highway 58, 3 miles east of Gladstone.	256	1953-61	4- -61	-0.58	(†)
2262	Bueyeros Creek at Bueyeros, N. Mex.	E $\frac{1}{2}$ sec.7, on downstream end of right abutment of bridge on State Highway 57 at Bueyeros.	b34	1957-61	7-21-61	7.51	(j)
2263	Carrizo Creek near Roy, N. Mex.	NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.16, T.21 N., R.28 E., 800 ft below State Highway 120, and 15 miles northeast of Roy.	b68	1954-61	8- -61	3.29	160
2270.5	Plaza Larga Creek tributary near Ragland, N. Mex.	NE $\frac{1}{4}$ sec.15, T.7 N., R.30 E., at culvert on State Highway 18, 1.2 miles north of Ragland.	b0.5	1952-61	7-21-61	7.09	240
2271.5	Arroyo del Puerto near Endee, N. Mex.	SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.26, T.10 N., R.36 E., at bridge on State Highway 93, 5.4 miles south of Endee, in Quay County, N. Mex.	b25	1961	9-11-61	3.37	(†)
2272.95	Sandy Arroyo tributary near Clayton, N. Mex.	NW $\frac{1}{4}$ sec.21, T.25 N., R.34 E., above culvert on State Highway 58, 8 miles southwest of Clayton.	-	1952-61	7- -61	0.50	(†)
2273	Sandy Arroyo near Clayton, N. Mex.	At center of boundary of secs.2 and 3, T.24 N., R.35 E., on downstream side of bridge on State Highway 18, 7.5 miles south of Clayton.	b42	1953-61	7- -61	1.16	(†)

Explanation of symbols used with partial-record crest-stage station listings will be given at end of the tables.

Annual maximum discharge at crest-stage partial-record stations--Continued

Annual maximum discharge at crest-stage partial-record stations--Continued							
Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (ft)	Discharge (cfs)
Rio Grande basin							
2640	Red River near Red River, N. Mex.	NE $\frac{1}{4}$ sec.36, T.28 N., R.14 E. (projected), 100 ft below confluence of Middle and East Forks and 6 miles south of Red River.	19.2	1940-55†, 1956-61	5- -61	3.0	145
2690	Rio Pueblo de Taos near Taos, N. Mex.	Sec.26, T.26 N., R.13 E., 2 $\frac{1}{2}$ miles east of Taos Pueblo and 4 $\frac{1}{2}$ miles northeast of Taos.	67.2	1911, 16†, 1940-51†, 1952-61	5- -61	2.39	220
2710	Rio Lucero near Arroyo Seco, N. Mex.	NE $\frac{1}{4}$ sec.10, T.26 N., R.13 E. (projected), in Antoine Leroux Grant, 2 miles southeast of Arroyo Seco.	17.1	1911-15†, 1933-51†, 1952-61	7-11-61	2.13	139
2774	Rio Grande tributary at Rinconada, N. Mex.	SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.21, T.23 N., R.10 E., at culvert on U.S. Highway 64, 0.6 mile west of Rinconada.	.021	1952-61	1961	-	(†)
2790	Embudo Creek at Dixon, N. Mex.	NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.19, T.23 N., R.10 E., at bridge on U.S. Highway 64, 0.5 mile above mouth, $\frac{3}{4}$ mile east of Embudo Post Office, and 1.6 miles northwest of Dixon.	305	1923-24†, 1926-55†, 1956-61	1961	7.50	1,520
2812	Wolf Creek near Chama, N. Mex.	Lat 36°57'20", long 106°32'10", at bridge on State Highway 19, and 4 $\frac{1}{2}$ miles northeast of Chama.	27.7	1959-61	1961	2.75	(†)
2840	Rito de Tierra Amarilla at Tierra Amarilla, N. Mex.	Lat 36°41'55", long 106°33'25", 400 ft below culvert on U. S. Highway 84, at Tierra Amarilla.	49.7	1957-61	4- -61	3.00	254
2867	Arroyo Seco near Abiquiu, N. Mex.	Lat 36°16'55", long 106°28'15", 1,000 ft below bridge on U. S. Highway 84, and 10 miles northwest of Abiquiu.	162	1953-61	9- -61	4.30	(†)
2880	El Rito near El Rito, N. Mex.	Sec.19, T.25 N., R.7 E., 3 miles northwest of El Rito.	49.8	1932-51†, 1952-61	8- -61	3.50	330
2920	Santa Clara Creek near Espanola, N. Mex.	SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.11, T.20 N., R.7 E., 5 $\frac{1}{2}$ miles southwest of Espanola.	34.5	1936-41†, 1949-50†, 1952-61	8-21-61	3.73	221
2950	Rio Nambe near Nambe, N. Mex.	SE $\frac{1}{4}$ sec.24, T.19 N., R.9 E., in Nambe Pueblo Grant, 2 $\frac{1}{2}$ miles southeast of Nambe Pueblo and 3 $\frac{1}{2}$ miles southeast of Nambe.	38.2	1931-51†, 1952-61	8-22-61	4.17	695
3025	Tesuque Creek above diversions, near Santa Fe, N. Mex.	NW $\frac{1}{4}$ sec.5, T.17 N., R.10 E., 500 ft above point of diversion of Cajon Grande ditch, 1 mile above Little Tesuque Creek, and 4 miles northeast of Santa Fe.	11.7	1936-51†, 1953-61	9- -61	4.76	536
3131	Canada Ancha tributary near Santa Fe, N. Mex.	Lat 35°44'05", long 106°07'00", in Caja del Rio Grant, 9 miles northwest of Santa Fe.	1.23		1961	6.32	283
3134	Bland Canyon near Cochiti, N. Mex.	Lat 35°42'11", long 106°24'56", 200 ft south of Forest Service road, 0.3 miles inside Santa Fe National Forest, 7.5 miles north of Cochiti, in Sandoval County.	b9	1961	k	-	-
3171	Arroyo Yupa tributary near Cerrillos, N. Mex.	S $\frac{1}{2}$ NE $\frac{1}{4}$ sec.13, T.15 N., R.7 E., 300 ft above culvert on U. S. Highway 85, 1.4 miles southwest of Turquoise Trading Post, and 6.5 miles north of Cerrillos.	.47	1957-61	1961	.40	1
3175	Galisteo Creek at Canoncito, N. Mex.	NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.7, T.15 N., R.11 E., above railroad bridge, 0.2 mile above Apache Canyon at Canoncito.	11.3	1955-56, 1959-61	8-14-61	2.81	(j)
3176	San Cristobal Arroyo near Galisteo, N. Mex.	Lat 35°22'55", long 105°51'05", at bridge on U. S. Highway 285, 5 $\frac{1}{2}$ miles east of Galisteo.	116	1955-61	8-14-61	13.34	(j)
3177	Jaspe Arroyo tributary near Galisteo, N. Mex.	Lat 35°21'55", long 105°50'40", at culvert on U. S. Highway 285, 6 miles southeast of Galisteo.	b1.5	1952-61	7- 7-61	13.90	c120

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Annual maximum discharge at crest-stage partial-record stations--Continued

Annual maximum discharge at crest-stage partial-record stations--Continued							
Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Discharge (cfs)
Rio Grande basin--Continued							
3178	Canada de las Minas tributary near Santa Fe, N. Mex.	Lat 35°36'27", long 105°54'42", at culvert on U. S. Highway 84, 85, and 285, 1.3 miles northeast of Seton Village, and 5.7 miles south of Santa Fe.	0.56	1952-61	8-22-61	3.94	(†)
3189	San Pedro Creek near Golden, N. Mex.	Lat 36°13'45", long 106°18'00", 1 mile below bridge on State Highway 10 and 5½ miles southwest of Golden.	45.2	1953-61	8- -61	1.25	(j)
3219	Rio de las Vacas near Senorita, N. Mex.	Lat 35°59'35", long 106°47'45", at bridge on side road, 0.1 mile south of State Highway 126 and 6.5 miles east of Senorita.	26.8	1957-61	4- -61	3.92	395
3219.2	Rock Creek near Cuba, N. Mex.	W½ sec.6, T.20 N., R.2 E., 1 mile east of State Highway 126, 8 miles east of village of Senorita, and 11 miles east of Cuba.	b3.7	1960-61	4- -61	2.56	(†)
3278	Arroyo Ojito at Zia Pueblo, N. Mex.	SE¼SE¼ sec.21, T.15 N., R.2 E., 100 ft upstream from culvert on State Highway 44, in Zia Pueblo Grant, 0.7 mile south of Zia Pueblo, in Sandoval County.	b18	1961	8-14-61	8.16	(j)
3304	Juan Toro Canyon near Miera, N. Mex.	W½SE¼ sec.7, T.9 N., R.6 E., 150 ft east of State Highway 10, 1 mile southeast of Cedro, and 4½ miles northwest of Miera.	1.57	1959-61	1961	(a)	(†)
3305	Tijeras Arroyo at Albuquerque, N. Mex.	Lat 35°03'40", long 106°28'40", 300 ft south of U. S. Highway 66 and 0.4 mile southeast of city limits of Albuquerque.	75.3	1943-48†, 1958-61	7- 8-61	4.36	(j)
3306	Tijeras Arroyo near Albuquerque, N. Mex.	SE¼SW¼ sec.17, T.9 N., R.3 E., at culvert on State Highway 47, 5.7 miles south of Central Avenue (U. S. Highway 66) in Albuquerque.	133	1952-61	8-14-61	2.93	1,350
3311	Belen Highline Canal tributary near Los Lunas, N. Mex.	Lat 34°49'20", long 106°49'10", above culvert on State Highway 6, 5.0 miles west of Los Lunas.	.16	1952-53 1955-61	1961	(a)	0
3316.5	Canada Montoso near Scholle, N. Mex.	SW¼SW¼ sec.12, T.2 N., R.4 E., 130 ft upstream from dip on abandoned highway, 700 ft upstream from bridge on U. S. Highway 60, 3.6 miles southwest of Scholle, in Socorro County.	b35	1961	8-11-61	2.89	(j)
3317	Abo Arroyo tributary near Scholle, N. Mex.	Lat 34°24'10", long 106°30'35", at culvert on U. S. Highway 60, 2.5 miles southeast of junction of U. S. Highway 60 and State Highway 6, and 5.5 miles southwest of Scholle.	b0.2	1954-61	9- -61	4.11	(†)
3413	Bluewater Creek above Bluewater Dam, near Bluewater, N. Mex.	NE¼ sec.20, T.12 N., R.12 W., 2.3 miles south of Bluewater Dam, and 8 miles west of Bluewater.	b75	1953-61	1961	1.63	96
3485.	Encinal Creek near Casa Blanca, N. Mex.	NW¼NW¼ sec.34, T.11 N., R.6 W., 1.8 miles north of Village of Encinal, and 6.8 miles north of Casa Blanca.	6.19	1937-39†, 1959-61	8- -61	5.27	(j)
3514	Arroyo Colorado near Correo, N. Mex.	SE¼ sec.35, T.9 N., R.4 W., at bridge on former U. S. Highway 66, 3 miles west of Correo.	437	1953-61 (h)	10-16-61	.78	82
3535	La Jencia Creek near Magdalena, N. Mex.	S½ sec.1, T.2 S., R.4 W., 3½ miles northeast of Magdalena.	195	1957-61	7- 2-61	9.03	(j)
3536	La Jencia Creek tributary near Magdalena, N. Mex.	NE¼SW¼ sec.13, T.2 S., R.4 W., at Santa Fe Railroad bridge, 2.7 miles northeast of Magdalena.	5.67	1957-61	7- 2-61	4.10	(j)

Annual maximum discharge at crest-stage partial-record stations--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Dis-charge (cfs)
Rio Grande basin--Continued							
3586	Chupadera Wash tributary at Bingham, N. Mex.	NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.12, T.5 S., R.5 E., 75 ft upstream from culvert on U. S. Highway 380, 0.1 mile west of Bingham, in Socorro County.	b1	1961	8-12-61	2.94	(†)
3593	San Jose Arroyo near Monticello, N. Mex.	NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.3, T.10 S., R.4 W., at head of box canyon just below major tributary, 800 ft below culvert on U. S. Highway 85, 13 miles northeast of Monticello.	b27	1959-61	9- -61	(a)	c30
3594	Lumber Canyon tributary near Monticello, N. Mex.	N $\frac{1}{2}$ NE $\frac{1}{4}$ sec.5, T.11 S., R.4 W., at culvert on U. S. Highway 85, 0.2 mile north of road to Red Rock ranger station, and 10.5 miles east of Monticello.	b0.9	1952-61	1961	.48	(†)
3616.5	Percha Creek near Kingston, N. Mex.	NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.15, T.16 S., R.8 W., at bridge on State Highway 180, 3.3 miles east of Kingston.	21.5	1953-61	9- -61	8.11	(j)
3616.6	Percha Creek tributary near Kingston, N. Mex.	NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.14, T.16 S., R.8 W., 500 ft above culvert on State Highway 180, and 3.5 miles east of Kingston.	.58	1957-61	9- -61	1.79	(†)
3617	Percha Creek near Hillsboro, N. Mex.	SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.18, T.16 S., R.7 W., 150 ft south of State Highway 180, and 2 miles west of Hillsboro.	35.4	1957-61	9- -61	5.66	(j)
3618	Percha Creek at Caballo Dam near Arrey, N. Mex.	SW $\frac{1}{4}$ sec.24, T.16 S., R.5 W., at bridge on U. S. Highway 85, 0.5 mile above mouth and Caballo Reservoir, and 3.5 miles north of Arrey.	119	1953-61	9- -61	2.37	(†)
3630.5	Rio Grande tributary near Rincon, N. Mex.	SE $\frac{1}{4}$ sec.13, T.19 S., R.3 W., 140 ft below dip on U. S. Highway 85, and 2.2 miles south west of Rincon.	b8.5	1959-61	1961	2.38	(†)
3631	Rio Grande tributary near Radium Springs, N. Mex.	N $\frac{1}{2}$ NW $\frac{1}{4}$ sec.9, T.21 S., R.1 W., above culvert on U. S. Highway 85, 120 ft above mouth, and 1.4 miles west of Radium Springs.	.40	1955-61	1961	5.59	(†)
3632	Aleman Draw at Aleman, N. Mex.	SW $\frac{1}{4}$ sec.13, T.15 S., R.2 W., on Santa Fe Railroad bridge, 140 ft above dip on Engle-Rincon road, and $\frac{1}{4}$ mile west of Aleman.	b27	1959-61	1961	7.60	(†)
3793	Tecolote Creek at Tecolote, N. Mex.	Lat 35°27'20", long 105°16'55", on bridge on U. S. Highway 85 at Tecolote.	122	1954-61	8-17-61	12.92	(j)
3796	Pecos River tributary near Dilia, N. Mex.	Lat 35°12'50", long 105°04'50", above culvert on U. S. Highway 84, and 1.7 miles northwest of Dilia.	.16	1952-61	9- -61	1.02	(j)
3803	Gallinas River tributary at Gallinas, N. Mex.	Lat 35°41'19", long 105°21'22", about 500 ft upstream from culvert on State Highway 65, at north edge of Gallinas, in Las Vegas Grant, San Miguel County.	b8	1957 1961	8- 4-57 8-22-61	- 2.00	2, 250 (j)
3829	Pecos River tributary near Pintada, N. Mex.	Lat 34°58'06", long 105°05'38", in Anton Chico Grant, 1,500 ft south of U. S. Highway 66, 6.8 miles north of Pintada, Guadalupe County.	b10	1961	8-27-61	1.45	(j)
3832	Pintada Arroyo tributary near Clines Corners, N. Mex.	Lat 34°50'40", long 105°35'05", above culvert on U. S. Highway 285, 12.2 miles south of Clines Corners.	-	1952-61	8- -61	2.52	160
3832.1	Pintada Arroyo tributary near Encino, N. Mex.	Lat 34°48'40", long 105°34'00", above culvert on U. S. Highway 285, 0.1 mile south of ranch road, and 12 $\frac{1}{2}$ miles northwest of Encino.	b1	1959-61	1961	(a)	c1

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Annual maximum discharge at crest-stage partial-record stations--Continued

Annual maximum discharge at crest-stage partial-record stations--Continued							
Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Dis-charge (cfs)
Rio Grande basin--Continued							
3833	Pintada Arroyo near Santa Rosa, N. Mex.	NE $\frac{1}{4}$ sec.29, T.8 N., R.21 E., 300 ft above culvert on U. S. Highway 54, and 4 $\frac{1}{2}$ miles southeast of Santa Rosa.	896	1959-61	7-12-61	5.52	(j)
3833.7	Pecos River tributary near Puerto de Luna, N. Mex.	NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.32, T.8 N., R.22 E., 25 ft upstream from culvert on State Highway 91, 3.1 miles north of Puerto de Luna, and 6 miles southeast of Santa Rosa, Guadalupe County.	b2	1961	9-12-61	(j)	(j)
3855.3	Alamosa Creek tributary near Jordan, N. Mex.	SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.27, T.7 N., R.28 E., 500 ft upstream from dip on State Highway 156, 6.9 miles west of Jordan, Quay County.	b10	1961	k	-	-
3856	Yeso Arroyo near Fort Sumner, N. Mex.	SE $\frac{1}{4}$ sec.25, T.1 N., R.25 E., at abandoned bridge 1 mile below State Highway 20, and 14.5 miles south of Fort Sumner.	242	1937 1952-61	1961	1.62	900
3856.7	Aragon Creek tributary near Encinoso, N. Mex.	NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.22, T.7 S., R.14 E., 0.3 mile upstream from wooden bridge on dirt road, 1.2 miles north of State Highway 48, 4.3 miles west of Encinoso, 10 miles north of Capitan, Lincoln County.	b6	1961	9- -61	(j)	(j)
3856.9	Bonita Canyon tributary near Corona, N. Mex.	S $\frac{1}{2}$ sec.7, T.1 S., R.13 E., above culvert on U. S. Highway 54, and 1.8 miles southeast of Corona.	-	1959-61	1961	(a)	(†)
3857	Cloud Canyon near Gallinas, N. Mex.	SW $\frac{1}{4}$ sec.15, T.2 S., R.12 E., above culvert on U. S. Highway 54, and 2.0 miles southwest of Gallinas.	b10	1957-61	1961	(a)	(†)
3859	Salt Creek tributary near Roswell, N. Mex.	NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.17, T.9 S., R.24 E., at culvert on U. S. Highway 285, 4.7 miles north of junction of U. S. Highways 70 and 285, and 10 miles north of Roswell.	0.045	1952-61	1961	.42	(†)
3880	Rio Ruidoso at Hondo, N. Mex.	NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.4, T.11 S., R.17 E., $\frac{1}{4}$ mile above confluence with Rio Bonito, and $\frac{1}{2}$ mile southwest of Hondo.	290	1931-55†, 1956-61	7- 3-61	d6.0	950
3890	Rio Bonito near Fort Stanton, N. Mex.	SW $\frac{1}{4}$ sec.16, T.9 S., R.15 E., at bridge on U. S. Highway 380, 2.5 miles northeast of Fort Stanton.	b85	1955-61	8- -61	d5.61	(†)
3890.6	Rio Bonito tributary near Fort Stanton, N. Mex.	SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.15, T.9 S., R.15 E., at culvert on U. S. Highway 380, 150 ft above mouth, and 3.5 miles northeast of Fort Stanton.	.72	1955-61	1961	(a)	(†)
3895.	Rio Bonito at Hondo, N. Mex.	NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.4, T.11 S., R.17 E., at bridge on U. S. Highway 70, at Hondo.	f295	1931-55†, 1956-61	7- 3-61	5.97	1,520
3901.5	Casey Canyon tributary near Picacho, N. Mex.	NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.9, T.12 S., R.18 E., 500 ft east of road, 5 miles south of Picacho, Lincoln County.	b2	1961	k	-	-
3920	Pancho Canyon near Arabella, N. Mex.	SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.19, T.9 S., R.18 E., 200 ft downstream from dip on State Highway 368, 5.6 miles south of Arabella, 9.7 miles north of Tinnie, in Lincoln County.	b16	1961	k	-	-
3934	Eight Mile Draw near Roswell, N. Mex.	SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.32, T.10 S., R.23 E., and 6.5 miles west of Roswell.	397	1941 1952-61	1961	(a)	(†)

Annual maximum discharge at crest-stage partial-record stations--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Dis-charge (cfs)
Rio Grande basin--Continued							
3973.9	Curtis Canyon near Mayhill, N. Mex.	E $\frac{1}{2}$ NE $\frac{1}{4}$ sec.4, T.17 S., R.14 E., $\frac{1}{4}$ mile above SCS dam, 0.4 mile west of State Highway 130, and 2.5 miles southwest of Mayhill.	10.3	1959-61	8-26-61	1.89	(†)
3974	Hyatt Canyon near Cloudcroft, N. Mex.	NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.9, T.16 S., R.13 E., $\frac{1}{2}$ mile south of State Highway 83, and 7 miles east of Cloudcroft.	3.08	1953-61	8-26-61	.49	(†)
3978	Bluewater Creek near Dunken, N. Mex.	SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.33, T.17 S., R.17 E., 300 ft above dip on State Highway 24, and 1.3 miles south of Dunken.	143	1958-61	8-26-61	1.11	(†)
4018	Rocky Arroyo near Carlsbad, N. Mex.	SW $\frac{1}{4}$ sec.23, T.21 S., R.24 E., 0.1 mile north of State Highway 137, 0.7 mile above dip on State Highway 137, and 14 miles west of Carlsbad.	254	1953-61	1961	39.11	(†)
4050.5	Last Chance Canyon tributary near Carlsbad Caverns, N. Mex.	E $\frac{1}{2}$ NW $\frac{1}{4}$ sec.21, T.23 S., R.23 E., above culvert on State Highway 137, 0.1 mile north of road to Sitting Bull Falls, and 12 $\frac{1}{2}$ miles northwest of Carlsbad Caverns.	b .2	1959-61	1961	(a)	0
4051	Mosely Canyon near White City, N. Mex.	SE $\frac{1}{4}$ sec.34, T.23 S., R.25 E., 600 ft below dip on Dark Canyon road, and 5 $\frac{1}{2}$ miles north of White City.	14.6	1959-61	5-19-61	4.82	(†)
Mimbres River basin							
4772	Iron Creek near Kingston, N. Mex.	Lat 32°54'54", long 107°46'35", 50 ft east of State Highway 180, 1.6 road miles west of Emory Pass, and 4.5 miles west of Kingston.	.74	1955-61	9- -61	3.93	(†)
4775.6	Little Walnut Creek near Silver City, N. Mex.	NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.28, T.17 S., R.14 W., 85 ft above dip on Bear Mountain Road, and 2 miles north of Silver City.	5.10	1959-61	6-15-61	d2.40	(†)
4775.7	Silva Creek tributary at Silver City, N. Mex.	SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.27, T.17 S., R.14 W., 350 ft above dip on Little Walnut Road, and 0.7 mile north of boundary of Silver City.	2.12	1958-61	7-30-61	3.58	595
4775.8	Silva Creek at Silver City, N. Mex.	Lat 32°46'41", long 108°16'41", 190 ft above Twelfth Street Bridge at Silver City.	10.0	1958-61	7-30-61	4.90	2,070
4775.9	Pinos Altos Creek at Silver City, N. Mex.	Lat 32°46'52", long 108°16'04", 2 blocks below U. S. Highway 260 at Silver City.	4.63	1958-61	7-30-61	3.90	960
4780	Cameron Creek at Central, N. Mex.	SE $\frac{1}{4}$ sec.35, T.17 S., R.13 W., 400 ft above culvert on U. S. Highway 260, at north edge of Central.	19.6	1954-61	1961	1.49	(†)
4780.2	Cherry Creek near White Signal, N. Mex.	NE $\frac{1}{4}$ sec.1, T.20 S., R.15 W., 180 ft above culvert on State Highway 180, and 3 $\frac{1}{2}$ miles northeast of White Signal.	3.80	1958-61	1961	(a)	(†)
4782	Mimbres River tributary near Spalding, N. Mex.	S $\frac{1}{2}$ sec.5, T.22 S., R.10 W., at culvert on U. S. Highway 260, 0.7 mile northeast of junction with State Highway 61, 4.5 miles southeast of Spalding, and 13 miles northwest of Deming.	-	1952-61	1961	.82	(†)
4785	Mimbres River at Deming, N. Mex.	On section line 22 and 27, T.23 S., R.9 W., at bridge on U. S. Highway 260, at north end of Deming.	1,370	1954-61	1961	.60	126
4786	Mimbres basin tributary near Florida, N. Mex.	Near boundary of sec.25 and 36, T.22 S., R.8 W., above culvert on State Highway 26, and 5 miles southwest of Florida.	b.4	1959-61	1961	1.40	(†)

Annual maximum discharge at crest-stage partial-record stations--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Dis-charge (cfs)
Mimbres River basin--Continued							
4790	Hermanas Draw tributary at Hermanas, N. Mex.	SW $\frac{1}{4}$ sec.22, T.28 S., R.11 W., at Southern Pacific Railroad bridge, 110 ft above State Highway 9, 0.3 mile west of Hermanas, and 11 miles west of Columbus.	10.8	1959-61	9- -61	4.52	(†)
4793.	Deer Creek tributary near Antelope Wells, N. Mex.	Sec.6, T.34 S., R.18 W., 0.1 mile below dip on State Highway 79, 2 $\frac{1}{2}$ miles east of San Luis Pass, and 12 miles west of Antelope Wells.	b4.3	1959-61	1961	.79	(†)
4801	White Oaks Canyon at White Oaks, N. Mex.	SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.19, T.6 S., R.13 E., 40 ft upstream from culvert on State Highway 349, 1 mile north-east of White Oaks, in Lincoln County.	b3	1961	9- 8-61	1.14	(†)
4801.5	White Oaks Canyon near Carrizozo, N. Mex.	NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.6, T.7 S., R.11 E., 100 ft upstream from culvert on U. S. Highway 54, 6 miles north of Carrizozo, 6.1 miles west of White Oaks, in Lincoln County.	31	1959 1961	7-26-59 9- 8-61	- 3.25	7,690 (†)
4802	Taylor Canyon tributary near Bingham, N. Mex.	SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.15, T.6 S., R.7 E., 200 ft north of U. S. Highway 380, 12 miles southeast of Bingham, in Socorro County.	b2	1961	8-12-61	(j)	(j)
Tularosa Valley							
4805.9	Tularosa basin tributary near Oscura, N. Mex.	SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.25, T.10 S., R.8 E., 50 ft below culvert on U. S. Highway 54, and 5.2 miles south of Oscura.	3.22	1958-61	1961	1.61	(†)
4806.5	Minnie Hall Draw near Three Rivers, N. Mex.	SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.36, T.10 S., R.9 E., 8 miles northeast of Three Rivers.	9.89	1956-61	7- 4-61	d14.0	(†)
4807	Indian Creek near Three Rivers, N. Mex.	SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.10, T.11 S., R.10 E., 150 ft above diversion dam, and 11 $\frac{1}{2}$ miles east of Three Rivers.	b6.8	1956-58 $\frac{1}{2}$, 1959-61	9- -61	(j)	(j)
4809	Indian Creek at mouth near Three Rivers, N. Mex.	Lat 33°22'45", long 105°57'25", 75 ft above diversion dam, 0.35 mile above mouth, and 5 $\frac{1}{2}$ miles east of Three Rivers.	10.9	1956-58 $\frac{1}{2}$, 1959-61	9- -61	6.19	1,170
4810	Three Rivers at Three Rivers, N. Mex.	NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.3, T.12 S., R.9 E., 150 ft below Southern Pacific Railroad bridge, 400 ft above bridge on U. S. Highway 54, and 1.3 miles south of Three Rivers.	96.0	1956-61	7- 4-61	5.67	6,850
4811	Tularosa basin tributary near Three Rivers, N. Mex.	SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.3, T.12 S., R.9 E., at culvert on U. S. Highway 54, 1.6 miles south of Three Rivers.	13.8	1952-61	7- 4-61	.23	192
4862	Black Prince Canyon tributary near Organ, N. Mex.	NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.33, T.21 S., R.4 E., above culvert on U. S. Highway 70, 2.3 miles east of San Augustin Pass, and 4.0 miles east of Organ.	.73	1959-61	1961	.95	(†)
4864	Tularosa basin tributary near Orogrande, N. Mex.	S $\frac{1}{2}$ SE $\frac{1}{4}$ sec.1, T.22 S., R.8 E., at bridge on U. S. Highway 54, and 2.7 miles northeast of Orogrande.	2.53	1959-61	1961	(a)	(†)
Estancia Valley							
4880	Estancia Valley tributary at Cedar Grove, N. Mex.	NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.21, T.11 N., R.7 E., 50 ft upstream from culvert on State Highway 344, 0.1 mile south of Cedar Grove, in Santa Fe County.	1.21	1955	9-23-25- 55 1961	d10.0 (a)	1,140 (†)
4881	Juan Tomas Canyon near Edgewood, N. Mex.	SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.19, T.10 N., R.7 E., 140 ft upstream from culvert on U. S. 66, 2.5 miles northwest of Edgewood, in Santa Fe County.	b20	1961	k -	-	-

Annual maximum discharge at crest-stage partial-record stations--Continued

Annual maximum discharge at crest-stage partial-record stations--Continued							
Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Dis-charge (cfs)
Estancia Valley--Continued							
4882	Estancia Valley tributary near Clines Corners, N. Mex.	SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.17, T.9 N., R.11 E., 100 ft upstream from culvert on U. S. Highway 66, 7.5 miles west of Clines Corners, in Torrance County.	b10	1961	9- -61	5.05	(j)
4885	Canon de Torreon at Torreon N. Mex.	Lat 34°43'20", long 106°17'50", at culvert on State Highway 19, in Torreon.	18.2	1954-61	8-11-61	(j)	(j)
4890	Canada del Leon near Mountainair, N. Mex.	SE $\frac{1}{4}$ sec.10, T.2 N., R.7 E., $\frac{1}{4}$ mile above culvert on State Highway 10, and 8.4 miles south-east of Mountainair.	-	1953-61	1961	3.29	(†)
Salt basin							
4925	Cornucopia Canyon near Pinon, N. Mex.	NE $\frac{1}{4}$ sec.6, T.21 S., R.16 E., 0.2 mile above dip in ranch road, and 7.5 miles south of Pinon.	17.2	195-61	8- -61	(j)	(j)
San Juan River basin							
3462	Rio Amargo at Dulce, N. Mex.	NW $\frac{1}{4}$ sec.1, T.31 N., R.2 W., 100 ft below bridge on State Highway 17, at Dulce.	168	1956-61	9- -61	4.02	(†)
3510	Vaqueros Canyon near Gobernador, N. Mex.	SW $\frac{1}{4}$ sec.17, T.29 N., R.4 W., 50 ft east of State Highway 17 and 4.2 miles east of Gobernador.	b60	1956-61	9-22-25-1961	2.03	(†)
3557	Gobernador Canyon near Gobernador, N. Mex.	NW $\frac{1}{4}$ sec.36, T.29 N., R.6 W., 0.2 mile south of State Highway 17 and 4 miles southwest of Gobernador.	b22	1956-61	9- -61	6.58	930
3564	Manzanares Canyon near Turley, N. Mex.	W $\frac{1}{2}$ SW $\frac{1}{4}$ sec.8, T.29 N., R.8 W., 600 ft above culvert on State Highway 17 and 4.2 miles east of Turley.	b3.1	1956-61	9-18-61	1.44	(†)
3567	Valdez Draw near Bloomfield, N. Mex.	NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.20, T.29 N., R.10 W., above culvert on State Highway 17, 4 miles east of Bloomfield.	b1.3	1956-61	e	e-	(†)
3572	Gallegos Canyon tributary near Nageezi, N. Mex.	E $\frac{1}{2}$ sec.11, T.25 N., R.10 W., at culvert on State Highway 44, 1.1 miles northwest of Huerfano Trading Post and 5.0 miles northwest of Nageezi.	-	1952-61	8-25-62	d2.39	138
3675	San Juan River tributary near Kirtland, N. Mex.	NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.15, T.29 N., R.14 W., on upstream side of abandoned culvert, 200 ft above U. S. Highway 550, 0.4 mile above mouth, and 3.3 miles east of Kirtland.	b3.0	1951-55 1957-61	1961	2.12	(†)
3678.4	Yazzie Wash near Mexican Springs, N. Mex.	Lat 35°50'40", long 108°53'00", 5.0 miles northwest of Mexican Springs and 23 miles north of Gallup.	b2.1	1953-54 1956-61	8-24-51	4.11	(j)
3678.6	Chusca Wash near Mexican Springs, N. Mex.	Lat 35°48'40", long 108°50'50", 1.8 miles northwest of Mexican Springs and 20 miles north of Gallup.	b8.7	1953-61	8-24-61	4.79	2,900
3678.8	Catron Wash near Mexican Springs, N. Mex.	Lat 35°46'15", long 108°49'40", 1.5 miles south of Mexican Springs and 18 miles north of Gallup.	26.9	1954 1956-61	8-24-61	d5.59	(j)
3679	Black Springs Wash near Mexican Springs, N. Mex.	Lat 35°45'40", long 108°49'00", 2.5 miles south of Mexican Springs and 17 miles north of Gallup.	7.05	1954-61	7- -61	.35	260
3679.5	Chaco River near Waterflow, N. Mex.	NE $\frac{1}{4}$ sec.19, T.29 N., R.16 W., at Stanolind, 7 miles southwest of Waterflow, and 8 miles south-east of Shiprock.	4,350	1959-61	9- -61	4.45	1,650

Annual maximum discharge at crest-stage partial-record stations--Continued

Annual maximum discharge at crest-stage partial-record stations--Continued							
Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Dis-charge (cfs)
Little Colorado basin							
3861	Largo Creek near Quemado, N. Mex.	NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.8, T.1 N., R.16 W., on downstream side of bridge on ranch road 2 $\frac{1}{2}$ miles southwest of Quemado.	151	1954-61	9- -61	2.03	(†)
3861.5	Mangas Creek tributary near Pietown, N. Mex.	About at corner common to secs. 13, 14, 23 and 24, T.1 N., R.13 W., above culvert on U. S. Highway 60, 1.3 miles west of Pietown Post Office.	-	1952-61	9- -61	.61	(†)
3862	Carrizo Creek near Salt Lake, N. Mex.	SE $\frac{1}{4}$ sec.3, T.3 N., R.21 W., on downstream side of bridge, 1.3 miles east of New Mexico-Arizona State line and 15 miles west of Salt Lake.	1560	1957-61	9- -61	.56	(†)
3870	Galestena Canyon tributary near Black Rock, N. Mex.	SE $\frac{1}{4}$ sec.30, T.9 N., R.17 W., 100 ft below bridge on State Highway 32 and 10.5 miles southeast of Black Rock.	b19	1957-61	9- -61	3.10	(†)
3954	Puerco River tributary near Fort Wingate, N. Mex.	Lat 35°25'55", long 108°33'30", 0.5 mile below culvert on secondary road between Fort Wingate and McGaffey and 3 miles south of Fort Wingate.	14.5	1949 1953-61	8- -61	.48	(†)
3955.	Puerco River at Gallup, N. Mex.	SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.15, T.15 N., R.18 W., on right bank north of the Santa Fe RR. freight depot, 1,500 ft above Second Street Bridge at Gallup.	558	1940-46†, 1956-61	8- -61	7.10	3,500
3956	Puerco River tributary near Gamarco, N. Mex.	SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.7, T.16 N., R.18 W., above abandoned culvert on former U. S. Highway 666, 0.5 mile north of junction of U. S. Highway 666 and State Highway 68, 4.5 miles north of Gamarco, and 8 miles north of Gallup.	.42	1951-61	7- -61	2.65	178
Gila River basin							
4298	Diamond Creek near Beaverhead, N. Mex.	E $\frac{1}{2}$ sec.7, T.12 S., R.12 W., 3.5 miles west of State Highway 61, 4 miles above Gila River, and 13 miles south of Beaverhead.	106	1957-61	1961	6.19	(†)
*4299	Snow Creek near Mogollon, N. Mex.	Lat 33°24'50", long 108°29'40", 1,000 ft below Gila Wilderness boundary and 17.5 miles east of Mogollon.	89.6	1958-61	1961	(e)	(†)
4309	Duck Creek at Cliff, N. Mex.	SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.28, T.15 S., R.17 W., at Cliff below bridge on State Highway 211, and 0.6 mile above mouth.	228	1957-61	9- 8-61	3.71	(†)
4310	Gila River near Cliff, N. Mex.	S $\frac{1}{2}$ sec.4, T.16 S., R.17 W., on downstream end of pier of bridge on U. S. Highway 260, 1 $\frac{1}{2}$ miles downstream from Bear Creek, 1 $\frac{1}{2}$ miles south of Cliff, and 2 $\frac{1}{2}$ miles southwest of Gila.	2,438	1942-51†, 1952-61	9- 8-61	6.72	3,890
4426.5	Trout Creek near New Mexico-Arizona State line near Luna, N. Mex.	W $\frac{1}{2}$ sec.34, T.4 S., R.21 W., at culvert on Luna-Underwood Lake road, about 1 mile east of N. Mex.-Ariz. State line, and 8 miles northwest of Luna.	b9.9	1958-61	4- -61	8.12	17
4426.6	Trout Creek near Luna, N. Mex.	NW $\frac{1}{4}$ sec.29, T.5 S., R.20 W., 500 ft downstream from bridge on Luna-Red Hill road and 2.6 miles north of Luna.	b32	1954-61	4- -61	1.32	56
4426.9	Tularosa River near Aragon, N. Mex.	NW $\frac{1}{4}$ sec.3, T.5 S., R.16 W., about 100 ft to the left of State Highway 12 and 2 miles northwest of Aragon.	b89	1955-61	4- -61	4.07	23

Annual maximum discharge at crest-stage partial-record stations--Continued

Annual maximum discharge at crest-stage partial-record stations--Continued							
Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Dis-charge (cfs)
Gila River basin--Continued							
4426.95	Rito Negrito at Aragon, N. Mex.	NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.18, T.5 S., R.16 W., above culvert on State Highway 12, at west edge of Aragon.	9.46	1958-61	9-10-61	(j)	(j)
4427	Apache Creek near Apache Creek, N. Mex.	E $\frac{1}{2}$ sec.25, T.4 S., R.18 W., 7 miles north of Apache Creek.	94.6	1957-61	1961	(a)	20
4427.4	Tularosa River near Reserve, N. Mex.	SE $\frac{1}{4}$ sec.33, T.6 S., R.18 W., 150 ft west of Eagle Peak Lookout road and 3.3 miles northeast of Reserve.	426	1956-61	9- -61	1.97	189
4439.5	Colt Canyon at Pleasanton, N. Mex.	E $\frac{1}{2}$ NE $\frac{1}{4}$ sec.14, T.12 S., R.20 W., 175 ft above abandoned dip, 350 ft above culvert on U. S. Highway 260, about 1 mile south of Pleasanton.	b3.1	1959-61	9-11-61	1.00	(†)
4558	Steins Creek at Steins, N. Mex.	S $\frac{1}{2}$ SE $\frac{1}{4}$ sec.9, T.24 S., R.21 W., at culvert on State Highway 14, 0.9 mile west of Steins, and 19 $\frac{1}{2}$ miles southwest of Lordsburg.	-	1959-61	1961	(a)	c12
Animas Valley							
5390	Animas Creek near Cloverdale, N. Mex.	NE $\frac{1}{4}$ sec.33, T.31 S., R.20 W., near head of small box canyon, 0.1 mile west of State Highway 338, and 11 miles north of Cloverdale.	157	1959-61	8- -61	5.59	1,180

† Discharge not determined.

‡ Operated as a continuous-record gaging station.

* Also low-flow station.

a Peak did not reach bottom of gage.

b Approximately.

c Estimated.

d From high-water mark.

e Unknown.

f Contributing area.

g Former site and datum.

h Discontinued as of end of water-year.

j Measurement computations not complete.

k Period of record did not include annual maximum.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Measurements at miscellaneous sites

Measurements of streamflow at points other than gaging stations or partial-record stations are given in the following table. Those that are measurements of base flow are designated by an asterisk (*); measurements of peak flow by a dagger (†). Listings are in downstream order, by basins, streams, and individual measuring points. The order of major basins in this report will be: LOWER MISSISSIPPI BASIN, WESTERN GULF OF MEXICO BASINS, COLORADO RIVER BASIN.

Discharge measurements made at miscellaneous sites during water year 1961

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
Rio Grande basin						
Santa Fe River	Rio Grande...	NW $\frac{1}{4}$ sec.19, T.17 N., R.11 E., at former station at Monument Rock, 1 mile upstream from McClure dam and 7 miles east of Santa Fe, N. Mex.	b14	1910-11 ‡ 1960-	10-7-60 10-31-60 12- 1-60 4- 3-61 5- 3-61 7- 6-61 7-27-61 8-18-61	*1.35 *1.58 *1.86 4.47 16.8 2.43 *1.72 24.8
San Acacia drainage canal	Lemiter Riverside drain	Lat 34°14'10", long 106°54'40", near crossing of Socorro main canal north, $\frac{1}{2}$ mile above mouth and 1 $\frac{1}{2}$ miles southwest of San Acacia in Sevilleta Grant, Socorro County (represents seepage and surface waste from land irrigated by Alamillo and San Acacia ditches which divert from Socorro main canal north above gaging station).			10-14-60 11- 9-60 1-14-61 1-18-61 3-10-61 3-22-61 5- 1-61 6- 7-61 7- 7-61 8-28-61	1.82 1.20 2.44 2.70 3.52 18.8 3.02 3.62 2.39 1.40
Alamosa River	Rio Grande...	SE $\frac{1}{4}$ sec.26, T.9 S., R.7 W., 2,000 ft above San Mateo Canyon, 8 miles northwest of Monticello, N. Mex.	-		9-20-61	*0.48
do	do	S $\frac{1}{2}$ SE $\frac{1}{4}$ sec.26, T.9 S., R.7 W., 300 ft above San Mateo Canyon, 8 miles northwest of Monticello, N. Mex.	-		9-20-61	*.32
do	do	W $\frac{1}{2}$ NW $\frac{1}{4}$ sec.36, T.9 S., R.7 W., 1,000 ft below San Mateo Canyon, 7 $\frac{1}{2}$ miles northwest of Monticello, N. Mex.	-		9-20-61	*.62
do	do	E $\frac{1}{2}$ sec.1, T.10 S., R.7 W., below Shipman Canyon, 6 miles northwest of Monticello, N. Mex.	-		8- 6-61	*6.45
do	do	NW $\frac{1}{4}$ sec.7, T.10 S., R.6 W., above Monticello diversion, about 5 miles northwest of Monticello, N. Mex.	-	1958	9-26-61 9-20-61	*5.48 *4.54
Cuchillo Negro	do	N $\frac{1}{2}$ sec.20, T.12 S., R.6 W., $\frac{1}{2}$ mile above diversion, 7 miles west of Cuchillo.	-		8-23-61 9-18-61	*1.16 *.90
Palomas River	do	Sec.4, T.13 S., R.6 W., at Box Canyon, $\frac{1}{2}$ mile above diversion and ranch house, about 13 miles northwest of Truth or Consequences, N. Mex.	-		8-23-61 9-18-61	*1.38 *1.44
do	do	SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.31, T.13 S., R.5 W., $\frac{1}{4}$ mile below Doolittle farm, about 8 miles west of Truth or Consequences, N. Mex.	-	1958	9-21-61	1.03
do	do	SE $\frac{1}{4}$ sec.5, T.14 S., R.5 W., $\frac{1}{4}$ mile above Palomas Community ditch, about 7 miles west of Truth or Consequences, N. Mex.	-		8-23-61 9-18-61 9-21-61	1.08 1.59 1.67
do	do	NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.8, T.14 S., R.5 W., 75 ft below Palomas diversion, about 6 $\frac{1}{2}$ miles west of Truth or Consequences, N. Mex.	-		9-21-61	1.37
Carrizo Creek	Rio Ruidoso	SW $\frac{1}{4}$, sec.33, T.11 S., R.13 E., at Mescalero Apache Indian Reservation boundary, 2 miles above mouth and 1 $\frac{1}{2}$ miles south of Ruidoso.	-		9-21-61	*1.09

* Base flow.

† Operated as a continuous-record gaging station.

b Approximately.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

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Measurements at miscellaneous sites

Discharge measurements made at miscellaneous sites during water year 1961

Discharge measurements made at miscellaneous sites during water year 1961						
Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
Rio Grande basin						
Upper Diamond A Ranch diversion	Rio Hondo	W½NE¼ sec.27, T.11 S., R.19 E., 0.8 mile east of Riverside, N. Mex.	-	1957-60	11-2-60	a5.02
Cottonwood Creek	Pecos River	SE¼ sec.4, T.16 S., R.26 E., at bridge on U.S. Highway 285, 3 miles south of Lake Arthur, N. Mex.	-		3-31-61	.84
Drain	Cottonwood Creek	NW¼ sec.15 T.16 S., R.26 E., at mouth 0.2 mile below diversion dam, 5 miles south of Lake Arthur, N. Mex.	-		3-31-61	1.30
Cottonwood Creek	Pecos River	NW¼ sec.15, T.16 S., R.26 E., below mouth of drain from right bank, 5 miles south of Lake Arthur, N. Mex.	-		3-31-61	1.56
do	do	NW¼ sec.26, T.16 S., R.26 E., at mouth, 7½ miles south of Lake Arthur, N. Mex.	-		3-31-61	1.63
Silver Springs Canyon	Elk Canyon	SE¼SE¼ sec.15, T.15 S., R.13 E., at Mescalero Apache Indian Reservation boundary, 6.2 miles northeast of Cloudcroft, N. Mex.	-	1958-60	12-19-60 2-20-61 6-21-61 9-18-61	*0.05 *.26 *.16 *.40
do	do	SE¼NE¼ sec.14, T.15 S., R.13 E., at Parshall flume 1 mile downstream from Mescalero Apache Indian Reservation boundary, 7.2 miles northeast of Cloudcroft, N. Mex.	-		6-21-61 9-18-61	*.42 *.71
do	do	SE¼SW¼ sec.34, T.14 S., R.14 E., ¾ mile above mouth, 12.2 miles northeast of Cloudcroft, N. Mex.	-	1958-60	12-19-60 2-20-61 6-21-61 9-18-61	0 0 0 *.37
Black River	Pecos River	NE¼SE¼ sec.3, T.26 S., R.24 E., below Mayes Ranch, 10 miles southwest of White City, N. Mex.	-	1953-60	10- 3-60 10-31-60 11-30-60 1- 4-61 2- 9-61 3- 1-61 4- 3-61 4-14-61 4-24-61 5-11-61 5-31-61 6-20-61 7- 5-61 7-20-61 7-25-61 7-31-61 8-18-61 9- 5-61 9-19-61	*0.70 *.72 *.68 *.85 *.63 *.81 *.64 *.53 *.59 *.48 *.48 *.50 *.50 *.38 *.48 *.48 *.38 *.46 *.44

* Base flow.

a No flow in Rio Hondo below diversion.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Measurements at miscellaneous sites

Discharge measurements made at miscellaneous sites during water year 1961

Discharge measurements made at miscellaneous sites during water year 1961						
Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
Blue Springs	Pecos River	SW $\frac{1}{4}$ sec.27, T.24 S., R.26 E., above all diversions, 5 $\frac{1}{2}$ miles east of White City, N. Mex.	—	1907, 1952-60	10- 3-60	b10.1
					10-31-60	b9.98
					11-30-60	b9.33
					1- 4-61	b9.24
					2- 9-61	b10.5
					3- 1-61	b11.5
					3-13-61	b10.9
					4- 3-61	b10.4
					4-24-61	b10.4
					5-11-61	b10.2
					5-31-61	b9.69
					6-20-61	b9.36
					7- 5-61	b8.88
					7-14-61	b9.65
					7-31-61	b8.44
					8-18-61	b9.37
					9- 5-61	b9.31
					9-19-61	b9.20
Gila River basin						
New Model Canal <u>d</u> /	Gila River	In NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.6, T.19S., R.21 W., 500 ft above New Mexico-Arizona State line and 2 $\frac{3}{4}$ miles west of Virden, N. Mex.	-	1939-53† 1953-61	10- 3-60	0
					10-18-60	0
					10-25-60	0
					11-26-60	0
					12- 7-60	0
					12-22-60	0
					1- 5-61	0
					1-24-61	0
					2-20-61	0
					3-10-61	0
					3-16-61	1.82
					3-23-61	3.53
					3-30-61	2.55
					4- 6-61	0
					4-11-61	0
					4-21-61	0
					4-25-61	0
					5-21-61	3.59
					5-29-61	0
					7- 2-61	0
					7-27-61	0
					8-17-61	10.6
					9-12-61	10.1

† Operated as continuous record gaging station.

b Spring flow.

d Published as Moddle Canal at New Mexico-Arizona State Line near Virden, N. Mex., 1939-53.

MORA RIVER SEEPAGE INVESTIGATION
(Known as Rio Agua Negra above Rio de la Casa tributary)

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On Nov. 16-18, 1960 a downstream-order series of discharge measurements was made on Mora River from the most upstream gaging station, Rio Agua Negra near Holman, to the gaging station nearest mouth, Mora River near Shoemaker. The following tabulation shows flow in mainstream, diversions, return waste and tributary inflow. October precipitation at Chacon was about 4 inches, and another 0.10 inch fell Nov. 7, leaving the surface soil nearly saturated. This soil moisture coupled with low morning temperatures caused a heavy diurnal which is reflected in divergence of overlapping discharge measurements. Indicated gains or losses of ditches are in parentheses.

The reach measured on Nov. 16 was from Rio Agua Negra gaging station to Mora River near Golondrinas station. The reach was subdivided into 3 segments, one field party working each, overlapping measurements being made at segment ends. Two other parties measured takeouts and inflow. On Nov. 17 a similar procedure was used on the reach from the Golondrinas station to the Shoemaker station. On Nov. 18 a similar procedure was used on Coyote Creek, and on Trampero ditch. The ditch run was to study losses and/or gains during a non-irrigation period.

Water samples were taken at upper and lower points of Mora River and main tributaries; suspended-sediment and bed load samples were taken at La Cueva and near Watrous, plus suspended load samples from La Cueva Canal at La Cueva.

The investigation was performed under the direction of the Geological Survey.

Results of discharge measurements on Mora River and tributaries, Nov. 16-18, 1960, and supplemental data

Date and time	Stream or diversion	Location	Discharge in cfs				Water Temp. (°F)
			Main stream	Tributary or diversion	Gain or loss		
Indica- ted	Cumula- tive						
Nov. 16, 1960 8:50 a.m.	Rio Agua Negra	At gaging station 2½ miles south of Chacon and 5.0 miles north of Holman.	5.72		-	-	32
10:15 a.m.	Lovatos and Romero ditch †	300 ft below head, ½ mile below Rio Agua Negra gaging station and 3 miles south of Chacon.		*0.06			32
11:40 a.m.	do	4.5 miles south of Chacon.		0			
9:45 a.m.	Rio Agua Negra	300 ft below head, ½ mile below Rio Agua Negra gaging station and 3 miles south of Chacon.	9.27		+3.61		32
10:55 a.m.	Lovatos and Raton ditch ‡	50 ft below wasteway, 350 ft below head and 3.8 miles south of Chacon.		*.58			34
11:55 a.m.	do	4.4 miles south of Chacon.		.09			37
1:00 p.m.	do	Below 1st wasteway, 5.0 miles south of Chacon.		.025			37
11:30 a.m.	Rio Agua Negra	4.4 miles south of Chacon.	13.6		+4.91	+8.52	36
11:45 a.m.	Acequia del Media †	4.4 miles south of Chacon.		*0			
12:05 p.m.	Romero ditch †	Below 1st wasteway, 5.0 miles south of Chacon.		*0			
12:30 p.m.	Rio Agua Negra	do	12.7		-.90	+7.62	37
2:10 p.m.	Acequia Madre de Holman ‡	Below 1st wasteway ¾ mile north of Holman.		*.36			37
1:40 p.m.	Rio Agua Negra	do	12.6		+.26	+7.88	37
7:50 a.m.	Los Martinez ditch †	½ mile north of Holman.		0			
2:40 p.m.	Rio Agua Negra	½ mile north of Holman.	11.0		-1.6	+6.28	38
8:10 a.m.	do	do	3.76				34
9:25 a.m.	La Morada ditch ‡	3/8 mile north of Holman.		*.80			36
9:00 a.m.	Rio Agua Negra	do	3.70		+.74		36
7:50 a.m.	Vigil Canyon	At regular gaging station, 1½ miles west of Holman.		.17			35
8:15 a.m.	La Acequia Arriba †	At State Highway 3, 0.7 mile west of Holman.		.08			
8:30 a.m.	Unnamed ditch ‡	At State Highway 3, 0.6 mile west of Holman.		.21	(+.12)		
8:35 a.m.	do	At State Highway 3, 0.4 mile west of Holman.		0			
8:35 a.m.	Vigil Canyon	Below diversions, 0.4 mile west of Holman.		0			
10:30 a.m.	Trampero (del Media) ditch †	Below 1st wasteway, ½ mile south of Holman.		*.76			36
Nov. 18, 1960 9:20 a.m.	Trampero (del Media) ditch	Below wasteway, ½ mile south of Holman.		.79			33
9:55 a.m.	do	Above diversion, ¼ mile below head of diversion.		.76	(-.03)		35
10:20 a.m.	do	Below diversion, ¼ mile below head.		.66			35
10:45 a.m.	do	Above diversion, ½ mile below heading.		.64	(-.02)		36
11:15 a.m.	do	Above diversion, .6 mile below heading.		.78			39
11:50 a.m.	do	Below diversion, .6 mile below heading.		.69			39

* Diversion from or tributary to main stream.

‡ Right bank.

† Left bank.

MORA RIVER SEEPAGE INVESTIGATION
(Known as Rio Agua Negra above Rio de la Casa tributary)

Results of discharge measurements on Mora River and tributaries, Nov. 16-18, 1960 and supplemental data

Results of discharge measurements on Mora River and tributaries, Nov. 16-18, 1960 and supplemental data							
Date and time	Stream or diversion	Location	Discharge in cfs				Water Temp. (°F)
			Main stream	Tributary or diversion	Gain or loss		
		Indica- ted			Cumula- tive		
Nov. 18, 1960							
12:30 p.m.	Trampero (del Media) ditch	1 mile below heading.		0.61	(-.08)		40
9:15 a.m.	do	do		.70			33
10:00 a.m.	do	1.6 miles below heading.		.93	(+.23)		32
10:15 a.m.	Trampero (Abajo) Canal †	.6 mile below heading, feeder canal at this point to Trampero (del Media) canal.		.58			32
10:30 a.m.	Trampero (del Media)ditch	1.7 miles below heading.		1.59	(+.08)		33
10:40 a.m.	Turnout (from above ditch)	200 ft above road crossing, 2 miles above heading.		.01			
11:40 a.m.	Trampero (del Media) ditch	100 ft above road crossing, 2 miles below heading.		1.45	(-.13)		33
12:05 p.m.	Turnout (from above ditch)	50 ft above road crossing, 2 miles below heading.		.01			
11:00 a.m.	Trampero (del Media) ditch	Road crossing, 2 miles below heading.		1.63	(+.19)		33
9:10 a.m.	do	Road crossing, 2 miles below heading.		.98			32
9:40 a.m.	do	2.1 miles below heading above turnout.		.94	(-.04)		33
10:00 a.m.	do	2.1 miles below heading below turnout.		1.04			33
10:40 a.m.	do	2.5 miles below heading.		.49	(-.55)		33
11:10 a.m.	do	2.7 miles below heading.		.59	(+.10)		33
Nov. 16, 1960							
10:05 a.m.	Rio Agua Negra	Below 1st wasteway, ½ mile south of Holman.	2.68		-.26		35
11:35 a.m.	do	Above Trampero (Abajo) diversion, 1½ miles south of Holman.	3.59		+.91	+1.39	36
9:30 a.m.	Agua Fria Creek	At regular gaging station, 1¾ miles southwest of Holman.		3.92			33
10:25 a.m.	Canoncito ditch †	At head, 1¾ miles southwest of Holman.		.86			
10:50 a.m.	Agua Fria Creek	Below Canoncito ditch, 1¾ miles southwest of Holman.		2.92	(-.14)		
11:50 a.m.	Encinal ditch †	At head, 1½ miles southwest of Holman.		0			
11:40 a.m.	Agua Fria Creek	Below head of Encinal ditch, 1½ miles southwest of Holman.		2.97	+.05		
1:20 p.m.	Rio de la Casa	At regular gaging station, 1½ miles southwest of Cleveland.		8.96			37
Nov. 16, 1960							
2:30 p.m.	Encinal ditch †	At head, 1¼ miles southwest of Cleveland.		2.85			
2:10 p.m.	Rio de la Casa	Below Encinal ditch, 1¼ miles southwest of Cleveland.		3.62	-2.49		
2:50 p.m.	El Alto(south) ditch †	At road crossing ¾ mile southwest of Cleveland.		.08			
3:05 p.m.	Martinez ditch †	At road crossing, ¾ mile southwest of Cleveland.		1.02			
3:40 p.m.	Rio de la Casa	Below Martinez ditch at road crossing, ¾ southwest of Cleveland.		6.03	+1.31	+2.70	
1:30 p.m.	Cassidy Mill ditch †	100 ft below wasteway, ¾ mile southeast of Cleveland.		*2.99			45
1:00 p.m.	Mora River	100 ft below wasteway from Cassidy Mill ditch and ¾ mile southeast of Cleveland.	16.3		+15.7	+18.0	45
2:45 p.m.	El Alto (north) ditch †	150 ft below head and 1¼ miles southeast of Cleveland.		*.03			45
3:20 p.m.	Lucero ditch	1 mile northwest of Mora.		6.41			45
3:10 p.m.	En Medio ditch †	1 mile northwest of Mora.		0			
3:45 p.m.	Mora River	Below En Medio ditch, 1 mile northwest of Mora.	12.7		+2.6	+21.0	45
4:20 p.m.	do	At road crossing in Mora.	12.1		-.60	+20.4	44
5:00 p.m.	do	at State Highway 3, 1½ miles east of Mora.	27.3				42
8:10 a.m.	do	do	32.7				36
8:55 a.m.	Canoncito de La Cueva ditch †	100 ft below head and 2½ miles northeast of Mora.		*4.07			37
9:35 a.m.	do	Below turnout, 225 ft below head and 2½ miles northeast of Mora.		.81			37

* Diversion from or tributary to main stream.

‡ Right bank

† Left bank.

MORA RIVER SEEPAGE INVESTIGATION
(Known as Rio Agua Negra above Rio de la Casa tributary)

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Results of discharge measurements on Mora River and tributaries, Nov. 16-18, 1960, and supplemental data

Date and time	Stream or diversion	Location	Discharge in cfs				Water Temp. (°F)
			Main stream	Tributary or diversion	Gain or loss Indicated	Cumulative	
Nov. 16, 1960							
10:10 a.m.	Canoncito de La Cueva	1 mile below 1st turnout.		0.70	(-.11)		37
10:50 a.m.	do	15 ft above 2nd turnout and 1 mile below head.		.66	(-.04)		37
11:10 a.m.	do	20 ft below 2nd turnout and 1 mile below head.		.67			38
11:50 a.m.	do	10 ft above 3rd turnout and .5 mile below head.		.69	(+.02)		39
12:05 p.m.	do	30 ft below turnout No. 3, 150 ft above turnout No. 4 and .6 mile below head.		.68			39
12:20 p.m.	do	50 ft below turnout No. 4 and .7 mile below head.		.58			39
12:40 p.m.	do	10 ft above turnout No. 5 and .7 mile below head.		.59	(+.01)		41
1:00 p.m.	do	10 ft below turnout No. 5 and .7 mile below head.		.49			42
1:35 p.m.	do	10 ft above turnout No. 6 and 1 mile below head.		.54	(+.05)		43
1:25 p.m.	do	10 ft below turnout No. 6, 300 ft above turnout No. 7 and 1 mile below head.		.51			43
2:05 p.m.	do	300 ft below turnout No. 7, 600 ft above turnout No. 8 and 1.1 mile below head.		.52			43
2:30 p.m.	do	100 ft below turnout No. 8 and 1.2 miles below head.		.40			42
2:55 p.m.	do	10 ft above turnout No. 9 and 1.5 miles below head.		.43	(+.03)		
3:15 p.m.	do	30 ft below turnout No. 9 and 1.5 miles below head.		.47			43
4:00 p.m.	do	30 ft above turnout turnout No. 10 and 1.8 miles below head.		.38	(-.09)		42
3:40 p.m.	do	8 ft below turnout No. 10 and 1.8 miles below head.		.36			43
4:20 p.m.	do	2 miles below head.		.30	(-.06)		38
4:40 p.m.	do	2.3 miles below head at termination of ditch into Mora River.		.30	(0)		37
8:00 a.m.	La Cueva Canal †	At gaging station, $\frac{1}{2}$ mile west of La Cueva.		*13.2			34
5:00 p.m.	do	do		13.2a			
9:50 a.m.	do	At gaging station, 200 ft below mill at La Cueva.		*1.16	(-12.04)		35
5:00 p.m.	do	do		1.16a			
10:35 a.m.	Mora River	At gaging station at La Cueva.	17.1				37
5:00 p.m.	do	do	18.7a				
1:15 p.m.	Buena Vista ditch †	$\frac{3}{4}$ miles southeast of La Cueva.		*14.3			41
1:45 p.m.	do	2 $\frac{3}{4}$ miles southeast of La Cueva, opposite head of Riner ditch.		0			
2:00 p.m.	Riner ditch †	Below wasteway, 1 mile above River Lake and 2 $\frac{3}{4}$ miles southeast of La Cueva.		*.12			40
2:15 p.m.	Wasteway below Riner	2 $\frac{3}{4}$ miles southeast of La Cueva.		*.20			
2:30 p.m.	Mora River	Below Riner ditch wasteway, 2 $\frac{3}{4}$ miles south-east of La Cueva.	18.7		+16.02	+3.98	40
3:30 p.m.	Cebolla River	At gaging station, 2 $\frac{1}{4}$ miles west of Golondrinas.		*9.31			43
4:35 p.m.	South Golondrinas ditch †	At head, $\frac{1}{4}$ mile below Cebolla River and 1 $\frac{1}{4}$ miles west of Golondrinas.		*2.00			42
5:00 p.m.	North Golondrinas ditch †	At head, 1 mile west of Golondrinas.		*.28			42
5:40 p.m.	Mora River	Below North Golondrinas ditch, 1 mile west of Golondrinas.	27.1		+1.37	+5.35	41
6:30 p.m.	do	At gaging station, 2 miles east of Golondrinas.	24.0a		-3.10	+2.25	
Nov. 17, 1960							
8:50 a.m.	Sandoval and Weathers ditch †	1 mile below gaging station, Mora River near Golondrinas.		*0			
9:00 a.m.	Mora River	At gaging station, 2 miles east of Golondrinas.	26.0				34
10:50 a.m.	do	100 ft above mouth of Coyote and 1 mile below gaging station near Golondrinas.	25.0	1.00			38

* Diversion from or tributary to main stream.
† Right bank
‡ Left bank
a Discharge calculated from gage-height record.

MORA RIVER SEEPAGE INVESTIGATION
(Known as Rio Agua Negra above Rio de la Casa tributary)

Results of discharge measurements on Mora River and tributaries, Nov. 16-18, 1960, and supplemental data

Results of discharge measurements on Mora River and tributaries, Nov. 10-18, 1960, and supplemental data							
Date and time	Stream or diversion	Location	Discharge in cfs				Water Temp. (°F)
			Main stream	Tributary or diversion	Gain or loss		
Indica- ted	Cumula- tive						
Nov. 18, 1960							
2:05 p.m.	Mora River	100 ft above mouth of Coyote Creek, 1 mile east of gaging station, Mora River near Golondrinas.	25.2				44
9:40 a.m.	Coyote Creek	At gaging station, 1½ miles north of Guadalupita.		2.33			34
9:50 a.m.	Max Graham ditch †	0.15 mile below gaging station.		0			
10:00 a.m.	Santo Tomas ditch †	0.14 mile below gaging station, 1 mile north of Guadalupita.		0			
10:10 a.m.	Coyote Creek	Below Santo Tomas ditch, 1 mile north of Guadalupita.		2.34	+ .01		35
11:00 a.m.	do	½ mile south of Guadalupita, 2½ miles below gaging station.		3.56	+1.22		36
11:40 a.m.	Los Cocas ditch †	Below wasteway, 2.4 miles south of Guadalupita.		.61			37
12:05 p.m.	Coyote Creek	Below Las Cocas ditch, 2.4 miles south of Guadalupita.		2.27	- .66		37
12:45 p.m.	Unnamed tributary †	At mouth, 4.9 miles south of Guadalupita.		.16			46
1:00 p.m.	Santa Rita ditch †	2¾ miles north of Lucero		0			
1:20 p.m.	Coyote Creek	Below Santa Rita ditch, 2¾ miles north miles north of Lucero.		5.86	+3.43		40
1:50 p.m.	Unnamed ditch†	1½ miles north of Lucero.		0			
2:00 p.m.	Coyote Creek	1½ miles north of Lucero		6.25	+ .39		39
8:10 a.m.	Unnamed tributary †	Above Montoya ditch, ¼ mile southeast of Lucero.		.02			34
2:45 p.m.	Coyote Creek	¼ mile southeast of Lucero.		8.53	+2.26		41
8:30 a.m.	Montoya ditch†	Below wasteway, ¼ mile southeast of Lucero.		.09			33
8:50 a.m.	Coyote Creek	Below Montoya ditch, ¼ mile south of Lucero.		1.61	+1.70		33
9:45 a.m.	Rainesville ditch †	Below wasteway, ½ mile southeast of Lucero.		2.87			33
9:25 a.m.	Coyote Creek	Below Rainesville ditch, ½ mile southeast of Lucero.		.05	+2.92		35
10:35 a.m.	Porter ditch †	Below wasteway, 2 miles south of Rainesville.		.64			40
11:00 a.m.	Coyote Creek	Below Porter ditch, 2 miles south of Rainesville.		1.75	+2.39		43
11:30 a.m.	La Jara Creek (from right)	At mouth, 3¾ miles southeast of Rainesville.		1.41			40
12:40 p.m.	Berg Ranch ditch †	Below wasteway, 3½ miles northeast of Golondrinas.		1.02			44
12:15 p.m.	Coyote Creek	Below Berg Ranch ditch wasteway, 3½ miles northeast of Golondrinas.		5.52	+3.38		44
1:20 p.m.	do	At gaging station near Golondrinas.		6.09	+ .57		
Nov. 17, 1960							
8:00 a.m.	do	do		6.90a			
2:40 p.m.	do	200 ft above mouth, 1 mile east of gaging station, Mora River near Golondrinas.		6.73	+ .64		44
10:05 a.m.	do	do		*7.93			37
11:55 a.m.	Mora River	4 miles below Golondrinas gaging station.	34.7		+1.77		41
9:25 a.m.	do	At gaging station near Watrous.	39.4		+4.70	+6.47	37
10:10 a.m.	Upper Clyde ditch †	Below wasteway, 3 miles southeast of Loma Parda.		*2.91			33
10:55 a.m.	Phoenix ditch †	Below wasteway, 3½ miles southeast of Loma Parda.		*1.30			36
10:30 a.m.	Mora River	Below Phoenix ditch, 3½ miles southeast of Loma Parda.	35.5		+ .31	+6.78	36
10:45 a.m.	Lower Clyde ditch †	3 miles northwest of Watrous.		*0			
11:00 a.m.	Kroenig ditch †	2¾ miles northwest of Watrous.		*0			
11:30 a.m.	Mora River	Below wasteway of Kroenig ditch 2¾ miles northwest of Watrous.	31.5		-4.0	+2.78	40

- * Diversion from or tributary to main stream.
 ‡ Right bank.
 † Left bank.
 a Discharge calculated from gage-height record.

MORA RIVER SEEPAGE INVESTIGATION
(Known as Rio Agua Negra above Rio de la Casa tributary)

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Results of discharge measurements on Mora River and tributaries, Nov. 16-18, 1960, and supplemental data

Results of discharge measurements on Mora River and tributaries, Nov. 16-17, 1960, and supplemental data							
Date and time	Stream or diversion	Location	Main stream	Tributary or diversion	Discharge in cfs		Water Temp. (°F)
					Gain or loss		
					Indica- ted	Cumula- tive	
Nov. 17, 1960							
11:30 a.m.	Crowley ditch †	2½ miles northwest of Watrous		*0			
11:45 a.m.	Mora River	Above mouth of Sapello River, ¾ mile northwest of Watrous.	37.5		+6.0	+8.78	40
9:55 a.m.	Sapello Canal †	At gaging station at Sapello.		0			
12:30 p.m.	Sapello River	Below Sapello Canal above mouth of Manuelitas Creek, at Sapello.		9.59			45
9:45 a.m.	Manuelitas Creek	At gaging station near Rociada.		14.7			34
8:30 a.m.	Canoncito de la Manuelitas ditch †	Below wasteway, ¾ miles southeast of Rociada.		0			
9:00 a.m.	Manuelitas Creek	Below wasteway of Canoncito de la Manuelitas ditch, ¾ miles southeast of Rociada.		15.6	+0.9		34
9:50 a.m.	Alcanter ditch †	Below wasteway, ¾ miles northwest of Sapello.		1.09			34
11:00 a.m.	do	At road crossing opposite Los Martinez ditch, ½ miles northwest of Sapello.		.13			
10:20 a.m.	Manuelitas Creek	½ mile below Alcanter ditch and ½ miles northwest of Sapello.		16.4	+2.02		35
11:15 a.m.	Los Martinez ditch †	Below wasteway, 4 miles northwest of Sapello.		0			
11:30 a.m.	Manuelitas Creek	Below wasteway of Los Martinez ditch 4 miles northwest of Sapello.		16.5	+.10		37
12:10 p.m.	Sapello River	At gaging station at Sapello.		26.4	+.31		43
1:50 p.m.	Acequia de Llano †	Below wasteway, 1½ miles southeast of Sapello.		.37			44
1:30 p.m.	Sapello River	Below wasteway of Acequia de Llano, 1¾ miles southeast of Sapello.		25.7	-.33		
3:35 p.m.	Lake Isabel feeder canal †	At head, ½ miles southeast of Sapello.		.17			47
3:50 p.m.	Turnout (from above canal)	100 yds. above Lake Isabel feeder canal gaging station.		0			
4:00 p.m.	Lake Isabel feeder canal	At gaging station, 5 miles southeast of Sapello.		.19			47
3:15 p.m.	Sapello River	Below Lake Isabel feeder canal, ½ miles southeast of Sapello.		28.5	+2.97		47
4:30 p.m.	do	At York Ranch Bridge in Los Alamos.		30.4	+1.90		45
1:35 p.m.	do	At gaging station near Watrous.		30.1	-.30		45
1:50 p.m.	Kroenig's ditch † No. 1	¼ mile below Sapello River near Watrous gaging station.		0			
2:15 p.m.	Kroenig's ditch † No. 2.	½ mile below Sapello River near Watrous gaging station.		0			
3:15 p.m.	Sapello River	At mouth, ½ mile northwest of Watrous.		*30.7	+.60		41
1:00 p.m.	Tipton ditch †	Below wasteway, 1½ miles east of Watrous.		*0			
1:05 p.m.	Mora River	Below Tipton ditch, 12 miles east of Watrous.	64.8		-3.4	+5.38	40
2:55 p.m.	Wolf Creek	At mouth, ¾ miles south of Valmora.		*.05			48
2:15 p.m.	Mora Creek	¾ mile southeast of Valmora.	68.5		+3.75	+9.13	42
1:10 p.m.	Cherry Valley ditch †	Below wasteway, 2 miles southeast of Valmora.		*3.25			41
1:45 p.m.	Mora River	Below Cherry Valley ditch, 2 miles southeast of Valmora.	61.9		-3.35	+5.78	42
2:00 p.m.	Dog Creek	At mouth, 1¾ miles north west of Shoemaker.		*0			
2:05 p.m.	Mora River	At gaging station near Shoemaker.	69.9		.80	13.8	

* Diversion from or tributary to main stream.

‡ Right bank.

† Left bank.

During the 1961 water year, two series of discharge measurements were made in New Mexico from the regular gaging station below Elephant Butte Dam to the upper end of the existing pool of Caballo Lake.

The run of November 30 was made under steady and favorable conditions with only leakage passing Elephant Butte Dam. Conditions were also favorable for the January 20 run, flow past the gaging station having been stable for the previous week.

Indicated gains and/or losses are mathematical differences between measurements, noted inflow being considered a contribution and not a gain.

Stream and Location	Discharge, in cubic feet per second			
	Nov. 30, 1960		Jan. 20, 1961	
	Measured discharge	Indicated gain or loss	Measured discharge	Indicated gain or loss
Rio Grande below Elephant Butte Dam, at gaging station in SW $\frac{1}{4}$ sec.25, T.13 S., R.4 W., 0.8 mile upstream from mouth of Cuchillo Negro Creek.	4.28	-	17.3	-
Rio Grande in NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.3, T.14 S., R.4 W., 1.7 miles southwest of mouth of Cuchillo Negro Creek.	8.35	+4.07	20.8	+3.5
Drain from hot springs into Rio Grande in Truth or Consequences, N. Mex.	1.02	-	1.13	-
Estimated inflow to Rio Grande from two sewage plants and waste from hospital.	.6	-	.6	-
Rio Grande in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.6, T.14 S., R.4 W., 3.8 miles northeast of bridge on U. S. Highway 85 over Palomas River and 9.5 miles southwest of mouth of Cuchillo Negro Creek.	10.5	+5.3	22.5	0
Rio Grande in the SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.7, T.14 S., R.4 W., 3.0 miles northeast of bridge on U. S. Highway 85 over Palomas River.	10.1	-.4	21.7	-.8
Rio Grande in the SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.18, T.14 S., R.4 W., 2.3 miles northeast of bridge on U. S. Highway 85 over Palomas River.	10.7	+6	23.4	+1.7
Rio Grande in the NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.29, T.14 S., R.4 W., 1.6 miles northeast of bridge of U. S. Highway 85 over Palomas River.	13.1	+2.4	24.6	+1.2
Rio Grande in the NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.5, T.15 S., R.4 W., 2.0 miles southeast of bridge on U. S. Highway 85 over Palomas River.	18.8	+5.7	30.4	+5.8
Rio Grande in the NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.17, T.15 S., R.4 W., 3.7 miles southeast of bridge on U. S. Highway 85 over Palomas River.	23.5	+4.7	32.3	+1.9
Rio Grande in the SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.19, T.15 S., R.4 W., at mouth of Arroyo Seco.	29.6	+6.1	39.5	+7.2

A series of discharge measurements was made Apr. 18, 1961, to study gains and losses on the Pecos River from the gaging station "near Anton Chico" to the ford at Walker Ranch (River Ranch), 8 miles northwest of Santa Rosa, N. Mex. There are no surface diversions in this reach. Bado de Juan Pais community ditch, which diverts upstream from the Anton Chico gage, was dry; therefore there was no return flow from this ditch.

Overlap measurements were made at various sites and results listed one above the other. The discharge shown above the line was the last measured by the engineer working downstream to this site, and the discharge shown below the line was the first measured by the engineer working downstream from this site.

Records of chemical analyses of water samples obtained during this investigation are available and will be published.

River mile locations were obtained from the U. S. Geological Survey Plan and Profile of the Pecos River, Lake McMillan to Pecos, N. Mex., maps.

Indicated gains or losses may be substantially in error due to fluctuations in discharge during the investigation as well as only fair measuring conditions.

Pecos River mile	Stream	Location	Discharge, in cubic feet per second		
			Main stream	Tributary	Indicated gain or loss
316.5	Pecos River	2 miles upstream from Canyon Blanco, 2½ miles southeast of Anton Chico (regular gaging station)	201	-	-
314.0	Do.	½ mile downstream from Canyon Blanco, 2¼ miles southwest of Dilia.....	184	-	-17
311.3	Do.	Downstream from U. S. Highway 84 bridge, 1¼ miles south of Dilia.....	196	-	+12
308.3	Do.	Downstream from mouth of arroyo 2¼ miles east of Dilia.....	192	-	-4
307.0	Unnamed arroyo	At mouth, from left bank, 3½ miles east of Dilia.....	-	0.14	-
307.0	Pecos River	Downstream from mouth of arroyo, 3½ miles east of Dilia.....	169	-	-23
305.1	Do.	At ford at La Cueva ruins, 5 miles east of Dilia.....	<u>166</u> 163	-	-3
303.3	Do.	Downstream from mouth of arroyo, 6 miles east of Dilia.....	154	-	-9
302.0	Do.	Upstream from ford, 6¾ miles east of Dilia.....	159	-	+5
300.9	Do.	Downstream from horseshoe bend, 7 miles east of Dilia.....	145	-	-14
297.6	Gallinas River	At mouth, 8¾ miles east of Dilia, 5½ miles northwest of Colonias.....	-	0	-
296.9	Pecos River	0.7 miles downstream from mouth of Gallinas River, 5½ miles northwest of Colonias.	<u>125</u> 124	-	-20
295.0	Do.	At ford at ruins, 5 miles northwest of Colonias.....	116	-	-8
293.2	Do.	3¼ miles northwest of Colonias.....	98.7	-	-17
291.3	Do.	At abandoned diversion dam, 2 miles northwest of Colonias.....	88.9	-	-9.8
288.6	Do.	At ford at Colonias.....	<u>63.9</u> 70.9	-	-25.0
287.2	Do.	At ruins on right bank, 1 mile southeast of Colonias.....	59.6	-	-11.3
285.4	Do.	Downstream from arroyo, 2½ miles southeast of Colonias.....	44.8	-	-14.8
284.4	Do.	Above ruins on left bank, 3.0 miles southeast of Colonias.....	46.4	-	+1.6
283.2	Do.	Below ruins on left bank, 3.8 miles southeast of Colonias.....	50.4	-	+4.0
277.8	Do.	NW¼ sec.32, T.10 N., R.21 E., at ford at Walker Ranch (River Ranch).....	66.9	-	+16.5

PECOS RIVER SEEPAGE INVESTIGATION
Colonias to Alamogordo Reservoir, N. Mex.

A series of discharge measurements was made Mar. 8-9, 1961, to study gains and losses on the Pecos River from a point about 3 miles southeast of Colonias, where water reappeared in the channel, to the head of Alamogordo Reservoir. During winter months the river channel is normally dry from near the mouth of the Gallinas River to the site where this investigation began, a distance of about 14 miles. All known tributaries and diversions were measured. The Puerto de Luna east ditch, which diverts directly from the Pecos River, and the Puerto de Luna west ditch, which diverts from Rio Agua Negra, were both dry. Those measurements not involved in the computation of indicated gains or losses are enclosed in parentheses.

Overlap measurements were made at various sites and results listed one above the other. The discharge shown above the line was the last measured by the engineer working downstream to this site, and the discharge shown below the line was the first measured by the engineer working downstream from this site.

Records of chemical analyses of water samples obtained during this investigation are available and will be published.

River mile locations were obtained from the U. S. Geological Survey Plan and Profile of the Pecos River, Lake McMillan to Pecos, N. Mex., maps.

Indicated gains and losses may be in error due to good to fair measuring conditions. Weather conditions were good and fluctuation in discharge was near minimum.

Pecos River mile	Stream	Location	Discharge, in cubic feet per second		
			Main stream	Tributary	Indicated gain or loss
Mar. 8, 1961					
284.4	Pecos River	Anton Chico Grant, 3.0 miles southeast of Colonias.....	0	-	-
283.2	Do.	Anton Chico Grant, 3.8 miles southeast of Colonias.....	4.34	-	+4.34
281.8	Do.	NW¼ sec.24, T.10 N., R.20 E., 4.8 miles southeast of Colonias.....	13.2	-	+8.86
281.0	Do.	SE¼ sec.24, T.10 N., R.20 E.....	15.4	-	+2.2
279.7	Do.	NE¼ sec.25, T.10 N., R.20 E.....	16.5	-	+1.1
278.0	Do.	NW¼ sec.32, T.10 N., R.21 E., at Walker Ranch (River Ranch).....	17.7 19.7	-	+1.2
276.4	Do.	NW¼ sec.33, T.10 N., R.21 E., below Walker Ranch.....	16.1	-	-3.6
271.8	Do.	Perea Grant 8.5 miles north of Santa Rosa, above mouth of Esteros Creek.	22.9	-	+6.8
271.7	Esteros Creek	At mouth.....	-	0.02	-
267.7	Pecos River	Perea Grant, 6.8 miles north of Santa Rosa, above unnamed arroyo from left, west of Asphalt pit mine.	17.6 13.6	-	-5.3
262.4	Do.	Perea Grant, 3.5 miles north of Santa Rosa, 4.0 miles below Los Esteros damsite.	15.0	-	+1.4
260.6	Do.	SW¼ sec.26, T.9N., R.21 E., below Rattlesnake Canyon.....	15.2	-	+2
259.5	Spring	NE¼ sec.34, T.9N., R.21 E., from right bank, 1.3 miles north of Santa Rosa.	-	.83	-
259.4	Pecos River	SE¼ sec.34, T.9N., R.21 E., 1.2 miles north of Santa Rosa.....	17.1	-	+1.1
258.2	Do.	NW¼ sec.3, T.8N., R.21 E., 1 mile northwest of Santa Rosa.....	19.6 17.5	-	+2.5
257.1	Do.	SE¼ sec.3, T.8N., R.21 E., at Santa Rosa (regular gaging station)...	18.4	-	+9
255.7	Unnamed Tributary	SW¼ sec.11, T.8N., R.21 E., from right bank at Gallegos Ranch.....	-	1.34	-
-	Casaus ditch	NE¼ sec.14, T.8N., R.21 E., at road crossing.....	-	(1.03)	-
255.6 ⁺ (mouth)	Do.	SW¼ sec.11, T.8N., R.21 E., from right bank, at road crossing at Gallegos Ranch	-	.91	-
-	Sewage effluent	SE¼ sec.11, T.8N., R.21 E., at entrance to Rio Agua Negra Chiquita..	-	(.26)	-
255.4	Rio Agua Negra Chiquita	SW¼ sec.11, T.8N., R.21 E., at mouth.....	-	30.0	-
255.0	Spring	NE¼ sec.14, T.8N., R.21 E., from left bank.....	-	.22	-
255.0	Do.	NE¼ sec.14, T.8N., R.21 E., from right bank.....	-	.04	-
255.0	Pecos River	NE¼ sec.14, T.8N., R.21 E., below Rio Agua Negra Chiquita.....	61.4 65.7	-	+10.5
254.5 ⁺ (mouth)	Spill from Casaus ditch	SE¼ sec.14, T.8N., R.21 E., from right bank at road crossing 0.1 mile from river.	-	.38	-
254.2	Spill from Labandie ditch	SW¼ sec.13, T.8N., R.21 E., from left bank at mouth.....	-	9.49	-

PECOS RIVER SEEPAGE INVESTIGATION
Colonias to Alamogordo Reservoir, N. Mex.--Continued

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Pecos River mile	Stream	Location	Discharge, in cubic feet per second		
			Main stream	Tributary	Indicated gain or loss
Mar. 8, 1961--Continued					
253.9 ⁺ (mouth)	Spill from Ortega ditch	SW $\frac{1}{4}$ sec.13, T.8N., R.21 E., from right bank below road crossing....	-	5.72	-
-	Ortega ditch	SW $\frac{1}{4}$ sec.13, T.8N., R.21 E., below spill to river.....	-	(1.23)	-
-	Do.	NE $\frac{1}{4}$ sec.24, T.8N., R.21 E., adjacent to river mile 253.4.....	-	(1.30)	-
253.5	Spring	NE $\frac{1}{4}$ sec.24, T.8N., R.21 E., at mouth from right bank.....	-	.23	-
253.4	Pecos River	NE $\frac{1}{4}$ sec.24, T.8N., R.21 E., at Johnson Ranch.....	83.8	-	+2.3
249.8	Do.	NE $\frac{1}{4}$ sec.31, T.8N., R.22 E., above Pintada Canyon (Rio Agua Negra)...	<u>92.4</u>	-	+8.6
Mar. 9, 1961					
			<u>84.8</u>	-	-
249.7	Rio Agua Negra	NE $\frac{1}{4}$ sec.31, T.8N., R.22 E., at mouth.....	-	15.6	-
245.4	Pecos River	SE $\frac{1}{4}$ sec.17, T.7N., R.22 E., at Puerto de Luna.....	103	-	+2.6
242.9	Unnamed tributary	SW $\frac{1}{4}$ sec.29, T.7N., R.22 E., at road crossing 0.4 miles above mouth..	-	.14	-
242.6	Pecos River	SE $\frac{1}{4}$ sec.29, T.7N., R.22 E., 2.5 miles south of Puerto de Luna.....	<u>103</u> 99.4	-	0
236.2	Do.	SW $\frac{1}{4}$ sec.36, T.7N., R.22 E., 4.8 miles southeast of Puerto de Luna...	102	-	+2.6
230.4	Do.	SW $\frac{1}{4}$ sec.8, T.6N., R.23 E., above mouth of San Juan de Dios Arroyo...	<u>104</u> 104	-	+2.0
230.3	San Juan de Dios Arroyo	SW $\frac{1}{4}$ sec.8, T.6N., R.23 E., at mouth.....	-	.002	-
228.1	Pecos River	NW $\frac{1}{4}$ sec.20, T.6N., R.23 E., 9 miles southeast of Puerto de Luna (regular gaging station)	104	-	0
224.4	Do.	SW $\frac{1}{4}$ sec.33, T.6N., R.23 E., above head of Alamogordo Lake.....	104	-	0

PECOS RIVER SEEPAGE INVESTIGATION
Alamogordo Dam to Acme, N. Mex.

A series of discharge measurements was made Nov. 28, 1960, to study gains and losses on the Pecos River from the gaging station "below Alamogordo Dam" to the gaging station "near Acme." There were no diversions from this reach during the period of this investigation.

This reach of the river was divided into three sections for this investigation, with one engineer making all of the measurements in the upper and the lower sections. In the middle section two engineers alternated measurements because all sites were not accessible from the same side of the river. Overlap measurements were made at the site below Ft. Sumner Project, the results being listed one above the other. The discharge shown above the line was the last measured by the engineer working downstream to this site, and the discharge shown below the line was the first measured by the engineer working downstream from this site.

Records of chemical analyses of water samples obtained during this investigation are available and will be published.

River mile locations were obtained from the U. S. Geological Survey Plan and Profile of the Pecos River, Lake McMillan to Pecos, N. Mex., maps.

Indicated gains and losses may be somewhat in error due to only good to fair measuring conditions. Weather conditions were good and fluctuation in discharge was near minimum.

Pecos River mile	Stream	Location	Discharge, in cubic feet per second		
			Main stream	Tributary	Indicated gain or loss
210.5	Pecos River	Lot 1, sec.2, T.4N., R.24 E., below Alamogordo Dam (regular gaging station)	63.5	-	-
207.5	Arroyo Salado	SW $\frac{1}{4}$ sec.10, T.4N., R.24 E., at mouth, 3 miles below Alamogordo Dam.....	-	0.82	-
207.5	Pecos River	NE $\frac{1}{4}$ sec.16., T.4N., R.24 E., below mouth of Arroyo Salado.....	70.1	-	+5.8
193.8	Do.	SE $\frac{1}{4}$ sec.2, T.3N., R.25 E., above Ft. Sumner Diversion dam.....	74.8	-	+4.7
190.7	Pecos River	NW $\frac{1}{4}$ sec.19, T.3N., R.26 E., at Ft. Sumner.....	70.8	-	-4.0
187.1	Ft. Sumner Project upper drain	NE $\frac{1}{4}$ sec.32, T.3N., R.26 E., at mouth, 2 miles southeast of Fort Sumner.	-	.14	-
181.7	Ft. Sumner Project middle drain	NE $\frac{1}{4}$ sec.15, T.2N., R.26 E., at mouth, 6 miles southeast of Fort Sumner.	-	8.48	-
176.8	Ft. Sumner Project lower drain	NE $\frac{1}{4}$ sec.35, T.2N., R.26 E., at mouth, 10 miles southeast of Fort Sumner	-	2.69	-
176.6	Pecos River	SW $\frac{1}{4}$ sec.36, T.2N., R.26 E., below Fort Sumner Project, 10 miles southeast of Fort Sumner	91.0 85.2	-	+8.9
175.8	Taiban Creek	SW $\frac{1}{4}$ sec.1, T.1N., R.26 E., at mouth, 11 $\frac{1}{2}$ miles southeast of Fort Sumner	-	0	-
175.7	Pecos River	SW $\frac{1}{4}$ sec.1, T.1N., R.26 E., below Taiban Creek.....	88.1	-	+2.9
165.8	Do.	NE $\frac{1}{4}$ sec.8, T.1S., R.26 E., above Arroyo Yeso.....	93.8	-	+5.7
163.0	Do.	NE $\frac{1}{4}$ sec.17, T.1S., R.26 E., below Arroyo Yeso.....	95.9	-	+2.1
156.6	Do.	NE $\frac{1}{4}$ sec.3, T.2S., R.25 E., above mouth of Conejos Creek.....	92.2	-	-3.7
156.1	Conejos Creek	SW $\frac{1}{4}$ sec.3, T.2S., R.25 E., at mouth.....	-	.20	-
155.9	Pecos River	SE $\frac{1}{4}$ sec.3, T.2S., R.25 E., below Conejos Creek.....	88.6	-	-3.8
152.8	Cedar Creek	NE $\frac{1}{4}$ sec.22, T.2S., R.25 E., at mouth.....	-	0	-
152.8	Pecos River	NE $\frac{1}{4}$ sec.22, T.2S., R.25 E., below Cedar Creek.....	93.5	-	+4.9
146.8	Do.	NW $\frac{1}{4}$ sec.10, T.3S., R.25 E., above Arroyo de la Mora.....	99.1	-	+5.6
144.7 (mouth)	Arroyo de la Mora	SE $\frac{1}{4}$ sec.3, T.3S., R.24 E., at road crossing 6 miles above mouth.....	-	.15	-
143.0	Pecos River	NE $\frac{1}{4}$ sec.28, T.3S., R.25 E., above Wylie Draw.....	87.3	-	-12.0
142.0 (mouth)	Wylie Draw	NW $\frac{1}{4}$ sec.33, T.3S., R.25 E., at road crossing 1 mile above mouth.....	-	.04	-
128.5	Pecos River	SW $\frac{1}{4}$ sec.36, T.4S., R.25 E., at Benedict's pump, above Huggins Creek....	86.0	-	-1.3
124.5	Huggins Creek	NE $\frac{1}{4}$ sec.14, T.5S., R.25 E., at mouth.....	-	0	-
124.3	Pecos River	NE $\frac{1}{4}$ sec.14, T.5S., R.25 E., below Huggins Creek.....	87.5	-	+1.5
118.4	Do.	NW $\frac{1}{4}$ sec.10, T.6S., R.26 E., below Crockett Draw.....	82.8	-	-4.7
113.7 (mouth)	Bosque Draw	NW $\frac{1}{4}$ sec.25, T.6S., R.26 E., at road crossing 3 miles above mouth.....	-	0	-
113.0	Pecos River	NW $\frac{1}{4}$ sec.33, T.6S., R.26 E., below Bosque Draw.....	88.0	-	+5.2
111.0	Do.	SE $\frac{1}{4}$ sec.5, T.7S., R.26 E., above Five Mile Draw.....	92.0	-	+4.0

PECOS RIVER SEEPAGE INVESTIGATION
 Alamogordo Dam to Acme, N. Mex.--Continued

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Pecos River mile	Stream	Location	Discharge, in cubic feet per second		
			Main stream	Tributary	Indicated gain or loss
106.6	Pecos River	NE $\frac{1}{4}$ sec.29, T.7S., R.26 E., at Transwestern pipeline crossing.....	91.7	-	-0.3
104.2 (mouth)	Six Mile Draw	SE $\frac{1}{4}$ sec.32, T.7S., R.26 E., at road crossing, 2 miles above mouth...	-	0.05	-
102.9	Pecos River	SW $\frac{1}{4}$ sec.1, T.8S., R.25 E., at El Paso pipeline crossing.....	91.0	-	-.7
98.9 (mouth)	Bob Crosby Draw	NW $\frac{1}{4}$ sec.30, T.8S., R.26 E., at U. S. Highway 70 crossing, 1 $\frac{1}{2}$ miles above mouth.	-	.003	-
97.6	Pecos River	NW $\frac{1}{4}$ sec.35, T.8S., R.25 E., above Arroyo Atascoso.....	89.1	-	-1.9
97.4	Arroyo Atascoso	NW $\frac{1}{4}$ sec.35, T.8S., R.25 E., at mouth, $\frac{1}{2}$ mile north of U. S. Highway 70	-	.08	-
94.0	Pecos River	NW $\frac{1}{4}$ sec.14, T.9S., R.25 E., near Acme (regular gaging station)	90.4	-	+1.2

PECOS RIVER BASIN SEEPAGE INVESTIGATION
Fort Sumner Irrigation Project, N. Mex.

A series of discharge measurements was made Mar. 20-22, and Sept. 11, 1961, on the Fort Sumner Irrigation Project canal system and that reach of the Pecos River adjacent to the project.

Independent seepage investigations were made on Fort Sumner Main Canal, High Line Canal, West-Side Lateral, and Wilson Lateral, arteries of the Fort Sumner Project distribution system. Investigations were not made on the Main Canal or High Line Canal in September because of adverse weather conditions. The Pecos River was measured at four sites adjacent to the Project on Mar. 20-22 and Sept. 11. In addition, each of the three drains from the Project and the Fort Sumner sewage effluent were measured as they entered the river. All turnouts and wasteways from the canals and laterals were checked. However, only those with at least 0.01 cfs flow are included in the tabulations.

Overlap measurements were made at various sites and the results are listed one above the other. The discharge shown above the line was the last measured by the engineer working downstream to this site, and the discharge below the line was the first measured by the engineer working downstream from this site.

Indicated gains or losses in certain reaches of the canals and laterals, as shown by discharge measurements, may be somewhat misleading. Measuring conditions were generally good but there was some fluctuation in discharge noted in the canal system during the period of the investigation. This fluctuation was caused by changes in lateral diversions.

Records of chemical analyses of water samples obtained at selected sites during this investigation are available and will be published.

River mile locations for the Pecos River and drains were obtained from the U. S. Geological Survey Plan and Profile of the Pecos River, Lake McMillan to Pecos, N. Mex., maps. The canal mile locations were obtained from the U. S. Bureau of Reclamation Fort Sumner Project topographic map.

Main Canal seepage investigation, Mar. 21, 1961

Site	Canal mile	Discharge, in cubic feet per second		
		Main Canal	Diversion	Indicated gain or loss
Main Canal	Turnout			
at gaging station.....	1.25	48.8	-	-
above turbine.....	2.45	47.0	-	-1.8
	High Line Canal below siphon.....	2.61	-	8.49
900 ft above old U. S. Rt. 60 hwy. crossing..	2.82	40.6	-	+2.1
below new U. S. Rt. 60 hwy. crossing.....	3.20	40.9	-	+3
below siphon.....	3.34	41.5	-	+6
at check below T. O. 8.....	3.69	40.5	-	-1.0
at check below T. O. 14.....	4.47	41.5	-	+1.0
	17-L	4.66	-	.02
at check below T. O. 19.....	4.87	<u>39.6</u> 44.9	-	-1.9
	Westside Lateral.....	5.66	-	11.1
at check below T. O. 30.....	5.71	30.0	-	-3.8
at check below T. O. 33.....	5.95	30.1	-	+1
at check below T. O. 38.....	6.28	31.1	-	+1.0
at check below T. O. 42.....	6.80	30.4	-	-.7
at check below T. O. 44.....	7.16	31.4	-	+1.0
at check below T. O. 47.....	7.28	28.9	-	-2.5
at check below T. O. 52.....	7.98	28.2	-	-.7
above siphon.....	8.31	<u>27.8</u> 27.6	-	-.4
below siphon.....	8.34	27.7	-	+1
at check below T. O. 56.....	8.60	27.1	-	-.6
at check below T. O. 60.....	9.20	28.0	-	+9
at check below T. O. 61.....	9.45	26.7	-	-1.3
at check below T. O. 66.....	10.05	27.3	-	+6
above entrance of High Line Canal.....	10.30	26.6	-	-.7
below entrance of High Line Canal.....	10.36	<u>35.0</u> 32.0	-	+8.4
at check below T. O. 71.....	10.85	36.6	-	+4.6
at check below T. O. 72.....	10.90	36.1	-	-.5
at check below T. O. 73.....	11.11	36.6	-	+5

Main Canal seepage investigation, Mar. 21, 1961--Continued

Main Canal	Site	Turnout	Canal mile	Discharge, in cubic feet per second		
				Main Canal	Diversion	Indicated gain or loss
at check below T. O. 76.....			11.40	37.1	-	+0.5
at check below T. O. 78.....			11.73	37.1	-	0
at check below T. O. 80.....			11.86	36.0	-	-1.1
at check below T. O. 81.....			11.98	35.6	-	-.4
at check below T. O. 82.....			12.42	<u>37.1</u> 32.9	-	+1.5
	Wilson Lateral.....		12.67	-	9.28	-
at check below T. O. 84.....			12.71	25.5	-	+1.9
at check below T. O. 85.....			13.06	24.5	-	-1.0
at check below T. O. 86b.....			13.37	26.0	-	+1.5
at check below T. O. 86c.....			13.80	25.1	-	-.9
at check below T. O. 88.....			14.96	24.7	-	-.4
at check below T. O. 90.....			15.75	22.8	-	-1.9
at drop structure above entrance to "lower drain"			16.00	23.0	-	+2

Pecos River and drain measurements

Stream and Location	Pecos River mile	Mar. 20, 1961			Mar. 21, 1961		
		Discharge, in cubic feet per second			Discharge, in cubic feet per second		
		River	Drain	Indicated gain or loss	River	Drain	Indicated gain or loss
Pecos River below Ft. Sumner diversion dam.....	193.5	52.6	-	-	49.0	-	-
Pecos River at highway bridge at Ft. Sumner.....	190.7	47.6	-	-5.0	45.8	-	-3.2
Upper Drain at mouth.....	187.1	-	0.21	-	-	0.40	-
Ft. Sumner sewer outlet at mouth, below Upper Drain....	187.1	-	.25	-	-	.22	-
Pecos River 1 mile above Middle Drain.....	182.7	56.0	-	+7.9	56.4	-	+10.0
Middle Drain 1,000 ft above mouth.....	181.7	-	17.2	-	-	16.8	-
Lower Drain at mouth.....	176.8	-	30.0	-	-	34.0	-
Pecos River below mouth of Lower Drain and Ft. Sumner Project.	176.6	107	-	+3.8	111	-	+3.8

Stream and Location	Pecos River mile	Mar. 22, 1961			Sept. 11, 1961		
		Discharge, in cubic feet per second			Discharge, in cubic feet per second		
		River	Drain	Indicated gain or loss	River	Drain	Indicated gain or loss
Pecos River below Ft. Sumner diversion dam.....	193.5	47.2	-	-	5.45	-	-
Pecos River at highway bridge at Ft. Sumner.....	190.7	47.8	-	+0.6	12.8	-	+7.35
Upper Drain at mouth.....	187.1	-	0.29	-	-	0.33	-
Ft. Sumner sewer outlet at mouth, below Upper Drain....	187.1	-	.08	-	-	.05	-
Pecos River 1 mile above Middle Drain.....	182.7	52.8	-	+4.6	32.3	-	+19.1
Middle Drain 1,000 ft above mouth.....	181.7	-	16.3	-	-	28.5	-
Lower Drain at mouth.....	176.8	-	31.2	-	-	42.1	-
Pecos River below mouth of Lower Drain and Ft. Sumner Project.	176.6	104	-	+3.7	107	-	+4.1

PECOS RIVER BASIN SEEPAGE INVESTIGATION
Fort Sumner Irrigation Project, N. Mex.--Continued

High Line Canal seepage investigation, Mar. 22, 1961

High Line Canal	Site	Turnout	Canal mile	Discharge, in cubic feet per second		
				Canal	Diversion	Indicated gain or loss
at head below siphon.....			0.38	8.49	-	-
above U. S. Rt. 84 and T. O. 2.....			.60	8.47	-	-0.02
above concrete pipe section.....			.79	8.53	-	+0.06
below concrete pipe section.....			1.00	8.46	-	-0.07
at check below T. O. 10.....			1.82	8.58	-	+0.12
at check below T. O. 14.....			2.20	8.86	-	+0.28
		15-R	2.42	-	0.01	-
at check below T. O. 16.....			2.44	<u>8.52</u> 8.32	-	-0.33
above siphon under U. S. Rt. 60.....			2.74	8.16	-	-0.16
below siphon under U. S. Rt. 60.....			2.76	8.15	-	-0.01
at check below T. O. 19.....			2.87	8.18	-	+0.03
at check below T. O. 21.....			3.12	7.86	-	-0.32
at check below T. O. 24.....			3.44	<u>8.34</u> 8.35	-	+0.48
at check below T. O. 25.....			3.62	8.73	-	+0.38
at check below T. O. 27.....			3.74	7.87	-	-0.86
at check below T. O. 29.....			4.05	8.02	-	+0.15
at check below T. O. 30.....			4.20	8.31	-	+0.29
at check below T. O. 31.....			4.33	<u>8.00</u> 7.31	-	-0.31
at check below T. O. 33.....			4.59	7.24	-	-0.07
at check below T. O. 34.....			5.08	7.76	-	+0.52
at check below T. O. 35.....			5.19	7.15	-	-0.61
		36-R	5.35	-	.06	-
at check below T. O. 36.....			5.37	7.35	-	+0.26
at check below T. O. 38.....			5.49	<u>7.24</u> 8.04	-	-0.11
at check below T. O. 39.....			5.66	8.13	-	+0.09
at check below T. O. 40.....			5.93	8.12	-	-0.01
above T. O. 41.....			6.33	8.19	-	+0.07
at check below T. O. 42.....			6.64	8.29	-	+0.10
at check below T. O. 43.....			6.83	<u>7.86</u> 7.99	-	-0.43
at check below T. O. 44.....			7.04	8.02	-	+0.03
at check below T. O. 46.....			7.27	7.82	-	-0.20
at check below T. O. 47.....			7.82	7.65	-	-0.17
at check below T. O. 48.....			8.04	7.62	-	-0.03
at entrance to Main Canal.....			8.30	7.60	-	-0.02

PECOS RIVER BASIN SEEPAGE INVESTIGATION
Fort Sumner Irrigation Project, N. Mex.--Continued

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West-Side Lateral seepage investigations								
Site West-Side Lateral	Turnout	Lateral mile	Mar. 20, 1961			Sept. 11, 1961		
			Discharge, in cubic feet per second			Discharge, in cubic feet per second		
			Lateral	Diversion	Indicated gain or loss	Lateral	Diversion	Indicated gain or loss
below weir at head.....		0	11.1	-	-	11.1	-	-
at check below T. O. 1.....		.19	10.7	-	-0.4	10.6	-	-0.5
at check below T. O. 2.....		.45	11.3	-	+6	10.9	-	+3
at check below T. O. 6.....		.72	10.8	-	-5	10.8	-	-1
at check below T. O. 7.....		.81	10.4	-	-4	10.7	-	-1
at check below T. O. 8.....		.94	11.0	-	+6	10.6	-	-1
at check below T. O. 9.....		1.24	10.7	-	-3	11.2	-	+6
at check below T. O. 10.....		1.37	10.2	-	-5	10.8	-	-4
	12-L	1.61	-	0	-	-	0.01	-
at check below T. O. 12.....		1.62	10.6	-	+4	11.0	-	+2
at check below T. O. 13.....		1.75	9.65	-	-95	<u>10.7</u> 10.6	-	-3
at check below T. O. 14.....		1.91	10.6	-	+95	11.0	-	+4
at check below T. O. 16.....		2.15	9.97	-	-63	10.8	-	-2
	17-L	2.27	-	.01	-	-	0	-
at check below T. O. 17.....		2.28	9.58	-	-38	9.89	-	-91
	18-L	2.40	-	.01	-	-	0	-
at check below T. O. 18.....		2.41	10.2	-	+63	10.3	-	+41
	19-R	2.49	-	.01	-	-	0	-
at check below T. O. 19.....		2.50	9.97	-	-22	10.1	-	-2
at check below T. O. 22.....		2.68	10.1	-	+13	10.2	-	+1
at check below T. O. 23.....		2.84	10.2	-	+1	10.7	-	+5
at check below T. O. 24.....		2.95	10.1	-	-1	9.82	-	-88
at check below T. O. 26.....		3.10	<u>10.2</u> 10.4	-	+1	<u>10.1</u> 9.54	-	+28
at check below T. O. 27.....		3.24	10.6	-	+2	9.83	-	+29
at check below T. O. 28.....		3.37	10.6	-	0	9.65	-	-18
at check below T. O. 30.....		3.55	10.7	-	+1	10.1	-	+45
	31-L	3.65	-	0	-	-	.04	-
at check below T. O. 31.....		3.66	9.30	-	-1.40	9.95	-	-11
at check below T. O. 32.....		3.84	10.3	-	+1.00	9.50	-	-45
	34-L	3.94	-	0	-	-	.01	-
at check below T. O. 34.....		3.96	9.69	-	-61	8.82	-	-67
at check below T. O. 36.....		4.15	7.65	-	-2.04	10.5	-	+1.68
at check below T. O. 41.....		4.27	10.0	-	+2.35	11.1	-	+6
at end.....		4.31	8.88	-	-1.12	10.9	-	-2

PECOS RIVER BASIN SEEPAGE INVESTIGATION
Fort Sumner Irrigation Project, N. Mex.--Continued

Wilson Lateral seepage investigations								
Site Wilson Lateral	Turnout	Lateral mile	Mar. 20, 1961			Sept. 11, 1961		
			Discharge, in cubic feet per second			Discharge, in cubic feet per second		
			Lateral	Diversion	Indicated gain or loss	Lateral	Diversion	Indicated gain or loss
below weir at head.....		0.03	7.57	-	-	9.48	-	-
at second drop.....		.17	8.85	-	+1.28	10.1	-	+0.62
at check below T. O. 4a.....		.38	8.38	-	-.47	9.11	-	-.99
at intersection of sec. 14, 15, 22, 23		.60	9.03	-	+.65	10.3	-	+1.19
below T. O. 5.....		.76	8.63	-	-.40	9.43	-	-.87
	6-R	.85	-	0.01	-	-	0.04	-
at check below T. O. 6.....		.86	8.91	-	+.29	9.77	-	+.38
at check below T. O. 7.....		.91	8.77	-	-.14	9.84	-	+.07
	8-R	1.10	-	.01	-	-	.01	-
at check below T. O. 8.....		1.11	8.71	-	-.05	9.69	-	-.14
	9-R	1.47	-	0	-	-	.01	-
	9-L	1.47	-	.01	-	-	.01	-
at check below T. O. 9.....		1.48	8.79	-	+.09	9.85	-	+.18
	10-R	1.70	-	0	-	-	.01	-
at check below T. O. 10.....		1.71	8.91	-	+.12	9.88	-	+.04
	11-L	1.76	-	.01	-	-	.01	-
at check below T. O. 11.....		1.77	<u>8.41</u> 9.39	-	-.49	<u>10.5</u> 10.4	-	+.63
	12-L	1.88	-	.04	-	-	.03	-
at check below T. O. 12.....		1.89	9.31	-	-.04	10.4	-	0
at check below T. O. 13.....		2.02	8.42	-	-.89	10.2	-	-.2
	14-L	2.26	-	.14	-	-	.04	-
	15-L	2.27	-	0	-	-	.01	-
at check below T. O. 15.....		2.28	8.58	-	+.30	10.2	-	0
	16-L	2.57	-	.02	-	-	.04	-
at check below T. O. 16.....		2.58	8.54	-	-.02	10.3	-	+.1
	Leakage	2.59	-	.01	-	-	-	-
	17-L	2.83	-	0	-	-	.17	-
at check below T. O. 17.....		2.84	8.44	-	-.09	9.86	-	-.27
	18-L	2.92	-	0	-	-	.03	-
at check below T. O. 18.....		2.93	8.00	-	-.44	9.64	-	-.19
at check below T. O. 19.....		3.16	8.70	-	+.70	9.28	-	-.36
	20-R	3.26	-	0	-	-	.01	-
	20-L	3.26	-	0	-	-	.01	-
at check below T. O. 20.....		3.27	8.89	-	+.19	9.04	-	-.22
	21-L	3.38	-	.01	-	-	.02	-
	21-R	3.38	-	.01	-	-	0	-
at check below T. O. 21.....		3.39	8.95	-	+.08	-	9.55	+.53
at check below T. O. 22.....		3.65	8.39	-	-.56	-	8.54	-1.01

A series of discharge measurements was made Nov. 9, 1960, to study gains and losses on Rio Hondo from Hondo, where Rio Ruidoso and Rio Bonito join to form Rio Hondo, to Diamond A Ranch, where the entire flow was being diverted into storage for irrigation. All known surface diversions and returns were included. There was no flow at the regular gage "Rio Hondo at Diamond A Ranch near Roswell" at the time of this investigation.

Overlap measurements were made at site 169.8. The discharge shown above the line was the last measured by the engineer working downstream to this site, and the discharge shown below the line was the first measured by the engineer working downstream from this site.

Locations of measurement sites were obtained from a base map furnished the U. S. Geological Survey, Ground Water Branch, Albuquerque, N. Mex. Site numbers are used to establish the downstream order of the measurements and are used only for filing purposes; they have no relation to river mile.

Indicated gains and losses between adjacent measurement sites may be substantially in error as affected by inaccuracies in open-channel measurements. Weather conditions were good and fluctuation in discharge was near minimum.

Site No.	Stream and Location	Discharge, in cubic feet per second			
		Main stream	Tributary	Diversion	Indicated gain or loss
102.9	Rio Ruidoso at Hondo (discontinued gaging sta.) NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.4, T.11 S., R.17 E.	-	0.88	-	-
156.5	Rio Bonito at Hondo (discontinued gaging sta.) NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.4, T.11 S., R.17 E.	-	0	-	-
158.9	Analla ditch on south bank, 1 mile east of Hondo, NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.10, T.11 S., R.17 E.	-	a.18	a0.18	-
159	Rio Hondo 1 mile east of Hondo, below all springs, NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.10, T.11 S., R.17 E.	8.95	-	-	+8.07
159.5	Upper diversion ditch on north bank $\frac{1}{2}$ mile above Tinnie diversion dam at point of inflow into Rio Hondo, SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.10, T.11 S., R.17 E. (source Rio Bonito)	-	1.47	-	-
161 a	Tinnie diversion ditch, on north bank of Rio Hondo, 700 ft below Tinnie diversion dam, NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.11, T.11 S., R.17 E.	-	-	4.99	-
161 d	Nelson diversion ditch on south bank of Rio Hondo, 700 ft below Tinnie diversion dam, NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.11, T.11 S., R.17 E.	-	-	2.05	-
161.9	Rio Hondo, 700 ft below Tinnie diversion dam, NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.11, T.11 S., R.17 E.	3.17	-	-	-.21
165.1	Diversion ditch on south bank at Massey's Curio Shop, below Tinnie, NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.17, T.11 S., R.18 E.	-	-	2.22	-
165.2	Rio Hondo below diversion and overflow at Massey's Curio Shop below Tinnie, SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.8, T.11 S., R.18 E.	b2.46	-	-	-.54
166.9	Diversion ditch on north bank at highway bridge 1 mile west of Picacho, SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.15, T.11 S., R.18 E.	-	-	6.85	-
167	Rio Hondo, at regular gaging station, at Picacho, W $\frac{1}{2}$ W $\frac{1}{2}$ sec.15, T.11 S., R.18 E.	2.71	-	-	+7.10
168.1	Rio Hondo .2 mile below Picacho below Bowser's, SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.23, T.11 S., R.18 E.	5.23	-	-	+2.52
168.2	Picacho ditch on north bank at point of return to the Rio Hondo, SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.23, T.11 S., R.18 E.	-	4.24	-	-
169.8	Rio Hondo $\frac{1}{2}$ mile above old Montano Dam $2\frac{1}{2}$ miles southeast of Picacho, NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.30, T.11 S., R.19 E.	<u>11.6</u> 11.4	-	-	+2.13
172.5	Pump diversion on south bank of Rio Hondo, SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.30, T.11 S., R.19 E. 4 miles southeast of Picacho, N. Mex.	-	-	3.12	-
173.2	Pump diversion on north bank of Rio Hondo above "Rio Frio Ranch" above Sunset, NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.29, T.11 S., R.19 E.	-	-	1.37	-
173.4	Rio Hondo at "Rio Frio Ranch" above Sunset, NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.29, T.11 S., R.19 E.	5.95	-	-	-.96
174.5	Rio Hondo at ford 0.4 mile below Sunset, SW $\frac{1}{4}$ sec.21, T.11 S., R.19 E.	6.13	-	-	+1.18
177.5	Upper Diamond A Ranch diversion ditch, $\frac{3}{4}$ mile below Riverside, W $\frac{1}{2}$ NE $\frac{1}{4}$ sec.27, T.11 S., R.19 E.	-	-	6.74	+6.61
177.55	Upper Diamond A Ranch diversion ditch, above point of return to Rio Hondo, NE $\frac{1}{4}$ sec.32, T.11 S., R.20 E.	-	-	7.49	+7.75
185	Middle Diamond A Ranch diversion ditch at head, NW $\frac{1}{4}$ sec.34, T.11 S., R.20 E.	-	-	4.05	-3.44
185.4	Middle Diamond A Ranch diversion ditch on south bank of Rio Hondo above entrance to earth reservoir, NW $\frac{1}{4}$ sec.24., T.11 S., R.20 E.	-	-	3.61	-.44

a Flow diverted from spring; no return flow to Rio Hondo.

b Includes return flow from Nelson Diversion (Site No. 161 d)

PECOS RIVER BASIN SEEPAGE INVESTIGATION
Rio Penasco - Mayhill to Rt. 24 highway bridge near Dunken, N. Mex.

A series of discharge measurements was made Nov. 10, 1960, to study gains and losses on Rio Penasco from Mayhill to a point just downstream from N. Mex. Rt. 24 highway bridge near Dunken. All known surface diversions and returns were included.

Overlap measurements were made at site 261.6. The discharge shown above the line was the last measured by the engineer working downstream to this site, and the discharge shown below the line was the first measured by the engineer working downstream from this site.

Locations of measurement sites were obtained from the Mayhill Quadrangle Map of the New Mexico State Highway Department, compiled 1938. Site numbers are used to establish the downstream order of the measurements and are used only for filing purposes; they have no relation to river mile.

Indicated gains and losses between adjacent measurement sites may be substantially in error as affected by inaccuracies in open-channel measurements. Weather conditions were good and fluctuation in discharge was near minimum.

Site No.	Stream and Location	Discharge, in cubic feet per second			
		Main stream	Tributary	Diversion	Indicated gain or loss
256.8	Rio Penasco above Upper Penasco Springs above Mayhill, NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.26, T.16 S., R.14 E.	0.65	-	-	-
256.95	Rio Penasco below Upper Penasco Springs above Mayhill, NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.26, T.16 S., R.14 E.	6.32	-	-	+5.67
258.65	Diversion from north channel of Rio Penasco 0.8 mile below Mayhill Ranger Sta., NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.19, T.16 S., R.15 E.	-	-	1.20	-
258.7	North channel of Rio Penasco 0.8 mile below Mayhill Ranger Sta., NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.19, T.16 S., R.15 E.	2.14	-	-	-1.10
258.7	South channel of Rio Penasco 0.8 mile below Mayhill Ranger Sta., NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.19, T.16 S., R.15 E.	1.88	-	-	
258.9	Rio Penasco 2.7 miles below Mayhill Ranger Sta., NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.17, T.16 S., R.15 E.	4.18	-	-	+1.16
259.15	Diversion ditch on south bank 3.7 miles below Mayhill Ranger Sta., NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.16, T.16 S., R.15 E.	-	-	.25	-
259.2	Un-named Canyon from south bank 2.8 miles above east boundary of Lincoln National Forest, SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.15, T.16 S., R.15 E.	-	0.03	-	-
259.8	Rio Penasco at east boundary of Lincoln National Forest, NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.24, T.16 S., R.15 E.	4.29	-	-	+1.33
260.1	South diversion ditch at mouth of Agua Chiquita Canyon, 2.3 miles above Elk, NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.20, T.16 S., R.16 E.	-	-	.59	-
260.2	North diversion ditch 300 ft below mouth of Agua Chiquita Canyon 2.3 miles above Elk, NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.20, T.16 S., R.16 E.	-	-	3.04	-
260.3	Rio Penasco below mouth of Agua Chiquita Canyon, below diversion ditch, 2.3 miles above Elk, NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.20, T.16 S., R.16 E.	.69	-	-	+1.03
260.5	Rio Penasco 0.25 mile below Elk, NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.8, T.16 S., R.16 E.....	3.88	-	-	+3.19
261.6	Rio Penasco 1.5 miles below Elk, 200 yds. above mouth of Mathew Canyon, NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.4, T.16 S., R.16 E.	<u>1.62</u> 1.49	-	-	-2.26
262	Rio Penasco below Lower Penasco Springs 4 miles below Elk on Williams Ranch, NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.11, T.16 S., R.16 E.	14.4	-	-	+12.9
262.2	Upper Diversion (above Powell-Runyan Diversion) on south bank just above Penasco Falls, SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.12, T.16 S., R.16 E.	-	-	.003	-
262.3	Powell-Runyan Diversion on south bank just above Penasco Falls, SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.12, T.16 S., R.16 E.	-	-	4.00	-
262.4	Rio Penasco below Powell-Runyan Diversion and just above Penasco Falls, SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.12, T.16 S., R.16 E.	9.27	-	-	-1.13
263.1	Spring entering Rio Penasco from north bank below Penasco Falls, SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.18, T.16 S., R.17 E.	-	.10	-	-
263.2	Rio Penasco at Powell Ranch below Penasco Falls, SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.13, T.16 S., R.16 E.	9.96	-	-	+1.59
263.3	Runyan Diversion on north bank 2.6 miles above gaging station, NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.30, T.16 S., R.17 E.	-	-	.51	-
263.4	Rio Penasco below Runyan Diversion 2.6 miles above gaging station, NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.30, T.16 S., R.17 E.	5.31	-	-	-4.14
263.6	Rio Penasco below Runyan Springs 0.9 mile above gaging station, NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.28, T.16 S., R.17 E.	5.32	-	-	+1.01

PECOS RIVER BASIN SEEPAGE INVESTIGATION
Rio Penasco - Mayhill to Rt. 24 highway bridge near Dunken, N. Mex.--Continued

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Site No.	Stream and Location	Discharge, in cubic feet per second			
		Main stream	Tributary	Diversion	Indicated gain or loss
263.8	Rio Penasco at gaging station 1.5 miles above N. Mex. Rt. 24 highway bridge, SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.27, T.16 S., R.17 E.	2.98	-	-	-2.34
264	Rio Penasco, at Walnut grove, 0.5 mile below gaging station, NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.27, T.16 S., R.17 E.	1.78	-	-	-1.20
264.2	Rio Penasco, 800 ft below N. Mex. Rt. 24 highway bridge, NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.35, T.16 S., R.17 E.	b.54	-	-	-1.24

a Includes return from diversion at Site No. 260.2.

b No flow at point 200 ft downstream.

PECOS RIVER SEEPAGE INVESTIGATION
McMillan Dam to damsite 3, near Carlsbad, N. Mex.

A series of discharge measurements was made Dec. 1, 1960, to study gains and losses on the Pecos River from the gaging station "below McMillan Dam" to the gaging station "at damsite 3, near Carlsbad."

Locations of measurement sites were obtained from U. S. Geological Survey topographic maps.

The discharges shown are the average of several measurements made at each site. Indicated gains and losses between adjacent measurement sites may be substantially in error as affected by inaccuracies in open-channel measurements. Weather conditions were good. There was no fluctuation in discharge.

Stream and Location	Discharge, in cubic feet per second	
	Main Stream	Indicated gain or loss
Pecos River below McMillan Dam (regular gage) NE $\frac{1}{4}$ sec.11, T.20 S., R.26 E.....	81.9	-
Pecos River below all known springs, 0.3 mile downstream from old Major Johnson Springs gage, NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.28, T.20 S., R.26 E.	158	+76.1
Pecos River at Hardesty's Ranch, NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.27, T.20 S., R.26 E.....	157	-1
Pecos River at mouth of Rocky Arroyo, SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.35, T.20 S., R.26 E.....	148	-9
Pecos River at damsite 3 (regular gage) NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.6, T.21 S., R.26 E.....	156	+8

PECOS RIVER BASIN SEEPAGE INVESTIGATION
Carlsbad Irrigation Project, N. Mex.

A series of discharge measurements was made Mar. 15, 1961, on the Carlsbad Main Canal. All turnouts and wasteways from the canal were checked. However, only those with at least 0.01 cfs flow are included in the tabulations.

Overlap measurements were made at various sites and the results listed one above the other. The discharge shown above the line was the last measured by the engineer working downstream to this site, and the discharge shown below the line was the first measured by the engineer working downstream from this site.

Indicated gains or losses between adjacent measurements may be substantially in error as affected by inaccuracies in open-channel measurements. Weather conditions and measuring conditions were both good. There was little or no fluctuation in discharge during the period of this investigation.

The canal stations, in feet below the head, listed in the tabulation are from information furnished by the Carlsbad Irrigation District.

Site	Canal Station in feet	Discharge, in cubic feet per second		
		Main Canal	Lateral or Diversion	Indicated gain or loss
at head (regular gage).....	200	45.4	-	-
	Poteet (Boyd)	6,000	-	0
below Poteet (Boyd).....	6,100	44.3	-	-1.1
above East Canal.....	12,200	42.3	-	-2.0
	East Canal	16,300	.01	-
	Floodway	16,400	.01	-
below flume.....	19,000	41.6	-	-.7
	1	25,100	.05	-
below Church Street.....	27,300	40.2	-	-1.4
	5	33,700	.02	-
below Lea Street.....	34,000	37.9	-	-2.3
above Dark Canyon siphon.....	43,000	37.2	-	-.7
at San Jose Blvd.....	46,700	36.7	-	-.5
	8	47,500	.10	-
at South Highway (U. S. 62 & 180).....	52,100	<u>35.0</u> 33.5	-	-1.6
	9	54,300	.03	-
above lateral 10.....	59,900	31.6	-	-1.9
	10	60,000	.07	-
	10½	63,100	.01	-
below check below Lateral 10½.....	65,000	31.3	-	-.2
	12	68,700	.01	-
at road below Lateral 12.....	68,800	32.0	-	+ .7
	13	73,100	.01	-
above Lateral 14.....	74,600	29.1	-	-2.9
	14	74,600	.03	-
	Cass Draw Wasteway	80,400	.01	-
below Cass Draw Wasteway.....	80,700	27.3	-	-1.8
below Lateral 15½.....	84,800	26.6	-	-.7
at start of concrete lining.....	88,300	26.1	-	-.5
	Floodgates	92,000	.04	-
	18	94,400	.15	-
at C. I. D. gage below lateral 18.....	94,500	26.2	-	+ .3
	19	99,400	.07	-
below Lateral 19.....	99,500	<u>26.6</u> 27.8	-	+ .5
above Lateral 20.....	105,000	27.0	-	-.8
below check at Lateral 21.....	110,000	26.8	-	-.2

PECOS RIVER BASIN SEEPAGE INVESTIGATION
 Carlsbad Irrigation Project, N. Mex.--Continued

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Site	Lateral or Diversion	Canal Station in feet	Discharge, in cubic feet per second		
			Main Canal	Lateral or Diversion	Indicated gain or loss
below check at Lateral 22.....		114,400	26.1	-	-.7
below Lateral 22½.....		118,900	27.0	-	+.9
	23	120,000	-	.02	-
above Lateral 23½.....		123,300	25.7	-	-1.3
	23½	123,600	-	.04	-
	24	126,500	-	.06	-
below Lateral 25.....		128,400	25.8	-	+.2
	26½	136,000	-	.02	-
below Lateral 26½.....		136,000	25.8	-	0
at end of concrete.....		140,600	24.7	-	-1.1
	26½	142,400	-	.06	-
above mouth at Black River.....		147,600	24.6	-	0

PECOS RIVER SEEPAGE INVESTIGATION
Carlsbad to Malaga, N. Mex.

A series of discharge measurements was made Jan. 23, 1961, to study gains and losses on the Pecos River from the gaging station "at Carlsbad" to one mile above the gaging station "near Malaga." All known surface inflow and diversions were included.

Overlap measurements were made at site 315.2. The discharge shown above the line was the last measured by the engineer working downstream to this site, and the discharge shown below the line was the first measured by the engineer working downstream from this site.

Records of chemical analyses of water samples obtained during this investigation are available and will be published.

Locations of measurement sites were obtained from U. S. Geological Survey topographic maps. Site numbers listed in the tabulation are used to establish the downstream order of the measurements; they have no relation to river mile.

Indicated gains and losses between adjacent measurement sites may be substantially in error as affected by inaccuracies in open-channel measurements. Fluctuation in discharge upstream from site 318 was near minimum. Indicated gains below site 318 may be high because of water draining from channel storage. Weather conditions were good.

Site No.	Stream and Location	Discharge, in cubic feet per second			
		Main stream	Tributary	Diversion	Indicated gain or loss
308	Pecos River at Carlsbad, SE $\frac{1}{4}$ sec.6, T.22 S., R.27 E., at Greene St. bridge (regular gage)	0.78	-	-	-
310	Pecos River above Carlsbad sewage inflow, SW $\frac{1}{4}$ sec.9, T.22 S., R.27 E....	4.00	-	-	+3.2
310.5	Carlsbad sewage inflow, NW $\frac{1}{4}$ sec.10, T.22 S., R.27 E.....	-	3.3	-	-
311	Pecos River below Carlsbad sewage inflow, SE $\frac{1}{4}$ sec.10, T.22 S., R.27 E...	10.7	-	-	+3.4
311.5	C.I.D. drain "F" at mouth, SE $\frac{1}{4}$ sec.10, T.22 S., R.27 E.....	-	0	-	-
312	C.I.D. drain "A" at mouth, NW $\frac{1}{4}$ sec.14, T.22 S., R.27 E.....	-	.28	-	-
312.2	C.I.D. drain "B" at mouth, SE $\frac{1}{4}$ sec.14, T.22 S., R.27 E.....	-	.05	-	-
312.4	Western Farms Canal at State Engineer gage, NW $\frac{1}{4}$ sec.24, T.22 S., R.27 E.	-	-	0	-
313	Pecos River below Six Mile Dam, NE $\frac{1}{4}$ sec.24, T.22 S., R.27 E.....	17.0	-	-	+6.0
313.2	C.I.D. drain "C" at mouth, SE $\frac{1}{4}$ sec.24, T.22 S., R.27 E.....	-	0	-	-
313.4	Brantley drain "A" at mouth, NE $\frac{1}{4}$ sec.30, T.22 S., R.28 E.....	-	.02	-	-
313.6	Brantley drain "B" at mouth, SE $\frac{1}{4}$ sec.30, T.22 S., R.28 E.....	-	0	-	-
314	C.I.D. drain "E" at mouth, at Dickson Crossing, SE $\frac{1}{4}$ sec.30, T.22 S., R.28 E.	-	.01	-	-
314.4	Pecos River below Dickson Crossing, SW $\frac{1}{4}$ sec.29, T.22 S., R.28 E.....	18.0	-	-	+1.0
315	Cass Draw at mouth, NW $\frac{1}{4}$ sec.5, T.23 S., R.28 E.....	-	2.70	-	-
315.2	Pecos River below Cass Draw, SW $\frac{1}{4}$ sec.5, T.23 S., R.28 E.....	25.9 28.7	-	-	+5.2
315.4	C.I.D. drain "H" at mouth, NE $\frac{1}{4}$ sec.8, T.23 S., R.28 E.....	-	0	-	-
315.6	Pecos River above Harroun Dam, NW $\frac{1}{4}$ sec.9, T.23 S., R.28 E.....	38.5	-	-	+9.8
316	Harroun (U. S. Refinery) canal at State Engineer gage, SE $\frac{1}{4}$ sec.11, T.23 S., R.28 E.	-	-	9.56	-
318	Pecos River below Harroun Dam, SW $\frac{1}{4}$ sec.11, T.23 S., R.28 E.....	32.9	-	-	+4.0
318.2	C.I.D. drain "G" at mouth, SW $\frac{1}{4}$ sec.13, T.23 S., R.28 E.....	-	.55	-	-
318.4	Pecos River east of Loving, NW $\frac{1}{4}$ sec.30, T.23 S., R.29 E.....	37.1	-	-	+3.6
332	Black River $\frac{1}{2}$ mile above mouth, SE $\frac{1}{4}$ sec.2, T.24 S., R.28 E.....	-	17.0	-	-
333	Pecos River at Harroun Crossing, SW $\frac{1}{4}$ sec.1, T.24 S., R.28 E.....	70.0	-	-	+15.9
333.5	Pecos River east of Malaga, 1 mile above gaging station, SW $\frac{1}{4}$ sec.18, T.24 S., R.29 E.	74.3	-	-	+4.3

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