



962

Surface Water Records of New Mexico

PROPERTY OF
U.S. BUREAU OF
RECLAMATION



UNITED STATES DEPARTMENT OF THE INTERIOR-GEOLOGICAL SURVEY

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

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

SURFACE WATER RECORDS
OF NEW MEXICO

1962

Prepared in cooperation with

Office of the State Engineer
Interstate Stream Commission
Pecos River Commission
State Highway Department
Rio Grande Compact Commission
Costilla Creek Compact Commission
Pecos Valley Artesian Conservancy District
Bureau of Reclamation, U. S. Department of the Interior
Corps of Engineers, U. S. Army
Bureau of Indian Affairs, U. S. Department of the Interior
Fish and Wildlife Service, U. S. Department of the Interior
Soil Conservation Service, U. S. Department of Agriculture
National Park Service, U. S. Department of the Interior
Weather Bureau, U. S. Department of Commerce

PROPERTY OF
U.S. BUREAU OF
RECLAMATION

Copies of this report may be obtained from
District Engineer, Surface Water Branch
U. S. Geological Survey
Kruger Building
227 East Palace Ave.
P. O. Box 277
Santa Fe, N. Mex.

CALENDAR FOR WATER YEAR 1962

OCTOBER 1961

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

NOVEMBER 1961

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

DECEMBER 1961

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

JANUARY 1962

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

FEBRUARY 1962

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28				

MARCH 1962

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

APRIL 1962

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

MAY 1962

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

JUNE 1962

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

JULY 1962

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

AUGUST 1962

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

SEPTEMBER 1962

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

CONTENTS

	Page
Introduction	1
Cooperation	2
Definition of terms and abbreviations	3
Downstream order and station numbers	3
Explanation of data	4
Accuracy of field data and computed results	6
Supplemental data	7
Gaging-station records	8
Lower Mississippi River basin	
Mississippi River:	
<u>Arkansas River basin</u>	
Arkansas River:	
Cimarron River near Guy	8
Cimarron River near Kenton, Okla.	9
Canadian River near Hebron	10
Vermejo River near Dawson	11
Cimarron Creek:	
Six Mile Creek near Eagle Nest	12
Eagle Nest Reservoir near Eagle Nest	13
Cimarron Creek below Eagle Nest Dam	14
McEvoy Creek near Eagle Nest	15
Tolby Creek near Eagle Nest	16
Clear Creek near Ute Park	17
Cimarron Creek near Cimarron	18
Ponil Creek near Cimarron	19
Rayado Creek at Sauble Ranch, near Cimarron	20
Cimarron Creek at Springer	21
Canadian River near Roy	22
Rio Agua Negra (head of Mora River) near Holman	23
Vigil Canyon near Holman.	24
Agua Fria Creek near Holman.	25
Rio de la Casa near Cleveland.	26
La Cueva Canal below la Cueva	27
Mora River at La Cueva	28
Cebolla River near Golondrinas	29
Mora River near Golondrinas	30
Coyote Creek below Black Lake	31
Coyote Creek above Guadalupita	32
Coyote Creek near Golondrinas	33
Mora River near Watrous	34
Sapello River:	
Sapello Canal at Sapello	35
Manuelitas Creek near Rociada	36
Sapello River at Sapello	37
Lake Isabel feeder canal near Sapello	38
Sapello River near Watrous	39
Mora River near Shoemaker	40
Canadian River near Sanchez	41
Conchas River at Variadero	42
Conchas Reservoir:	
Bell Ranch Canal near Conchas Dam	43
Conchas Canal below Conchas Dam	43
Conchas Reservoir near Conchas Dam	44

	Page
Gaging-station records--Continued	
Lower Mississippi River basin--Continued	
Mississippi River--Continued	
Arkansas River basin--Continued	
Canadian River below Conchas Dam.	45
Ute Creek near Logan.	46
Canadian River at Logan.	47
Revuelto Creek near Logan	48
Western Gulf of Mexico basin	
<u>Brazos River basin</u>	
Double Mountain fork Brazos River:	
Salt Fork Brazos River:	
Running Water Draw (head of White River) near Clovis	49
<u>Rio Grande basin</u>	
Costilla Creek above Costilla Dam	50
Casias Creek near Costilla	51
Santistevan Creek near Costilla	52
Costilla Lake near Costilla	53-155
Costilla Creek below Costilla Dam	53
Costilla Creek near Amalia	54
Costilla Creek near Costilla	55
Costilla Creek below diversion dam, at Costilla	56
Costilla Creek at Garcia, Colo.	57
Principal diversions from Costilla Creek, New Mexico Colorado.	58
Latir Creek near Cerro	59
Rio Grande near Cerro.	60
Red River near Questa.	61
Cabresto Creek:	
Llano ditch near Questa.	62
Cabresto Creek near Questa	63
Red River at mouth, near Questa	64
Rio Hondo near Valdez.	65
Rio Hondo at Arroyo Hondo.	66
Rio Pueblo de Taos near Ranchito.	67
Rio Grande de Ranchos near Talpa	68
Rio Chiquito near Talpa.	69
Rio Pueblo de Taos at Los Cordovas.	70
Rio Pueblo de Taos below Los Cordovas	71
Rio Grande below Taos Junction Bridge, near Taos	72
Rio Grande at Embudo	73
Rio Chama near La Puente	74
Willow Creek near Park View	75
Rio Chama below El Vado Dam	76
Rio Chama above Abiquiu Reservoir	77
Rio Chama below Abiquiu Dam	78
Rio Chama near Abiquiu	79
Rio Ojo Caliente at La Madera	80
Rio Chama near Chamita	81
Santa Cruz River at Cundiyo	82
Pojoaque River:	
Tesuque Creek:	
Middle Fork Tesuque Creek near Santa Fe	83
Little Tesuque Creek near Santa Fe	84
Little Tesuque Creek tributary No.2 near Santa Fe.	85

CONTENTS

V

Page

Gaging-station records--Continued

Western Gulf of Mexico basins--Continued

Rio Grande basin--Continued

Rio Grande at Otowi Bridge, near San Ildefonso	86
Rito de los Frijoles near Los Alamos	87
Rio Grande at Cochiti	88
Santa Fe River near Santa Fe	89
Galisteo Creek at Domingo	90
Rio Grande at San Felipe	91
Jemez River below East Fork, near Jemez Springs	92
Rio Guadalupe at Box Canyon, near Jemez	93
Jemez River near Jemez	94
Jemez River below Jemez Canyon Dam	95
Bernalillo floodwater retarding reservoir No.1 (Piedra Lisa Arroyo) near Bernalillo	96
Rio Grande near Bernalillo	97
Rio Grande at Albuquerque	98
Rio Grande near Bernardo	99
Rio Puerco above Chico Arroyo, near Guadalupe	100
Chico Arroyo near Guadalupe	101
Bluewater Creek (head of Rio San Jose) below bluewater Dam	102
Bluewater Creek near Bluewater	103
Bluewater Creek at Grants	104
Grants Canyon at Grants	105
Rio San Jose near Grants	105
Rio San Jose at Correo	106
Rio Puerco at Rio Puerco	107
Rio Puerco near Bernardo	108
Rio Salado near San Acacia	109
Socorro main canal north at San Acacia	110
Rio Grande at San Acacia	111
Socorro Riverside drain: Socorro main canal south near San Antonio	112
San Antonio Riverside drain near San Antonio	112
Elmendorf interior drain near San Antonio	113
San Antonio Riverside drain near San Marcial	113
Rio Grande at San Marcial	114
Alamosa River near Monticello	115
Rio Grande below Elephant Butte Dam	116
Rio Grande below Caballo Dam	117
Las Cruces Arroyo near Las Cruces	118
McKelligon Canyon at El Paso, Tex.	118
Government ditch at El Paso	119
Pecos River near Pecos	120
Tecolote Creek near San Pablo	121
Pecos River near Anton Chico	122
Gallinas River near Montezuma	123
Gallinas River at Montezuma	124
Gallinas River near Lourdes	125
Gallinas River near Colonias	126
Pecos River at Santa Rosa	127
Pecos River near Puerto de Luna	128
Pecos River below Alamogordo Dam	129

	Page
Gaging-station records--Continued	
Western Gulf of Mexico basins--Continued	
Rio Grande basin--Continued	
Fort Sumner main canal near Fort Sumner	130
Pecos River near Acme.	131
Rio Ruidoso (head of Rio Hondo) at Hollywood	132
Rio Hondo at Picacho	133
Rio Hondo at Diamond A Ranch, near Roswell	134
North Spring River at Roswell	135
Rio Felix at old highway bridge, near Hagerman	135
Pecos River near Lake Arthur.	136
Cottonwood Creek near Lake Arthur.	137
Pecos River near Artesia.	138
Rio Penasco near Dunken.	139
Rio Penasco at Dayton	140
Pecos River (Kaiser Channel) near Lakewood	141
Four Mile Draw near Lakewood.	142
Pecos River below McMillan Dam	143
Pecos River at damsite 3, near Carlsbad.	144
Lake Avalon:	
Carlsbad main canal at head, near Carlsbad	145
Pecos River below Avalon Dam	145
Pecos River at Carlsbad	146
Black River:	
Rattlesnake Springs near White City.	147
Black River above Malaga	148
Pecos River near Malaga	149
Pecos River at Pierce Canyon Crossing, near Malaga	150
Pecos River at Red Bluff	151
Delaware River near Red Bluff	152
Reservoirs in Rio Grande basin	153-156
<u>Mimbres River basin</u>	
Mimbres River near Mimbres.	157
San Vicente Arroyo at Silver City	158
<u>Tularosa Valley</u>	
Rio Tularosa near Bent.	159
Colorado River basin	
<u>San Juan River basin</u>	
San Juan River near Carracas, Colo.	160
Piedra River near Arboles, Colo.	161
San Juan River at Rosa	162
Los Pinos River at La Boca, Colo.	163
Spring Creek at La Boca, Colo.	164
Navajo Reservoir near Archuleta.	165
San Juan River near Archuleta.	166
San Juan River at Bloomfield	167
Animas River near Cedar Hill	168
Animas River at Farmington	169
San Juan River at Farmington	170
La Plata River near Farmington	171
San Juan River at Shiprock	172
<u>Little Colorado River basin</u>	
Largo Creek near Mangas.	173

CONTENTS

VII

Page

Gaging-station records--Continued	
Colorado River basin--Continued	
<u>Gila River basin</u>	
Gila River near Gila	174
Gila River below Blue Creek, near Virden.	175
Sunset Canal near Virden.	176
New Model Canal near Virden.	177
San Francisco River near Reserve	178
San Francisco River near Glenwood	179
Discharge at partial-record stations and miscellaneous sites	180-184
Low-flow partial-record stations	180
Crest-stage partial-record stations.	180
Measurements at miscellaneous sites	181-184
Rio Ojo Caliente seepage investigation	185
Pecos River basin seepage investigations.	186-204
Index	205-207

SURFACE WATER RECORDS OF NEW MEXICO, 1962

INTRODUCTION

The surface-water records for the 1962 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 records 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 is the second in a series 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 have 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 papers 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 series will have WSP Nos. 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 collecting data through cooperative agreements with the Survey in 1962 are:

- Office of the State Engineer, S. E. Reynolds.
- Interstate Stream Commission, S. E. Reynolds, Secretary.
- Pecos River Commission, Berkeley Johnson, Federal Representative and Chairman, David P. Hale, Commissioner for New Mexico, J. C. Wilson, Commissioner for Texas.
- State Highway Department, T. B. White, State Highway Engineer
- Rio Grande Compact Commission, Berkeley Johnson, Federal Representative and Chairman, J. E. Whitten, Commissioner for Colorado, S. E. Reynolds, Commissioner for New Mexico, L. A. Scott, Commissioner for Texas.
- Costilla Creek Compact Commission, S. E. Reynolds, Commissioner for New Mexico, J. E. Whitten, Commissioner for Colorado.
- Pecos Valley Artesian Conservancy District, Tom Vandiver, Chairman.

Assistance in the form of funds or services was furnished by the following Federal Agencies.

- Corps of Engineers, U. S. Army, in the operation of 21 gaging stations.
- Bureau of Reclamation, U. S. Department of the Interior in the operation of 6 gaging stations.
- Bureau of Indian Affairs, U. S. Department of the Interior in the operation of 4 gaging stations.
- Fish and Wildlife Service, U. S. Department of the Interior in the operation of 4 gaging stations.
- Soil Conservation Service, U. S. Department of Agriculture in the operation of 1 gaging station.
- National Park Service, U. S. Department of the Interior in the operation of 2 gaging stations.

Assistance in the form of funds or services was also given by the following organizations:

- Forest Service, U. S. Department of Agriculture; Weather Bureau, U. S. Department of Commerce; the Cities of Ruidoso and Silver City; State Department of Game and Fish; Carlsbad Irrigation District; Public Service Company of New Mexico; Middle Rio Grande Conservancy District.

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 to 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. Records of stage are obtained from a water-stage recorder that gives a continuous record of fluctuations or from direct readings on a non-recording 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 1962 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/or the minimum discharge if it is meaningful. 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, or other special methods involving an equivalent adjustment to the gage height of more than one-fenth foot. Skeleton rating tables generally are not published for canals, ditches, drains, or springs.

The daily table gives the discharge corresponding to the daily mean gage height unless there are large or rapid changes in discharge during a day. For days having large or rapid changes, discharge for the day is computed by averaging the mean discharges for several parts of a day.

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. Total discharge, or runoff for the month is in acre-feet.

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. Time of day is expressed in 24-hour time, for example 12:30 a.m. is 0030, 1:30 p.m. is 1330.

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.

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. 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, diversions (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. This information is now available in printed form under title, "Flow Characteristics of New Mexico Streams," an unnumbered special Report, from New Mexico State Engineer, Capitol Building, Santa Fe, N. Mex.

ARKANSAS RIVER BASIN

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 1962.

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--20 years, 11.1 cfs (8,040 acre-ft per year).

Extremes--Maximum discharge during year, 475 cfs July 6 (gage height, 3.55 ft); no flow Aug. 18-20.

1942-62: 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)

0.1	0	0.5	2.5	1.2	29
.2	.2	.6	4.2	1.6	62
.3	.6	.8	9.5	2.0	110
.4	1.3	1.0	18	2.3	161

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.1	3.5	2.8	b 2.3	b 4	b 2	3.7	1.2	4.0	1.2	1.9	0.8
2	* 2.1	2.8	2.8	b 2.3	b 4	b 2.5	3.5	1.2	4.4	1.5	1.7	.8
3	2.3	2.8	2.8	b 2.3	b 4	b 2.5	3.2	1.0	3.5	2.7	1.3	.6
4	2.1	3.0	2.7	b 2.3	b 4	b 2.5	2.1	1.0	2.7	2.3	1.2	.6
5	2.1	3.2	2.7	b 2	b 3	b 2.5	1.1	.8	2.0	1.1	1.1	.7
6	2.0	3.2	2.5	b 2	b 3	3.5	1.1	.8	1.8	92	.9	.6
7	1.8	3.4	2.8	b 2	3	3.4	1.2	.9	1.9	1.8	.8	.8
8	1.8	3.2	2.5	b 2	3.4	3.4	1.2	.9	2.4	4.7	.8	1.7
9	2.4	3.5	2.0	b 1.5	3.2	* 3.4	1.2	.8	3.0	2.7	.8	1.7
10	2.5	3.5	b 1.5	b 1	3.2	3.2	* 1.5	.7	2.4	1.8	* 1.2	1.2
11	2.3	3.5	b 1	b 1	3.2	b 2.5	1.8	.7	2.0	1.4	.8	.9
12	2.1	3.7	b 1	b 1.5	3.2	b 2.5	1.9	.6	1.9	* 1.4	.5	.7
13	2.1	* 3.4	b 2	b 2	* 3.0	b 2	1.5	.5	2.1	1.3	.5	* .6
14	2.1	2.5	b 2.5	b 2.5	3.2	b 2	1.3	.4	1.8	1.2	.5	.6
15	2.3	b 3	* b 3	b 2.5	3.4	b 2.5	1.4	.3	* 1.5	1.5	.3	.9
16	2.3	b 2.5	b 3	b 3	3.2	b 3.5	1.5	.4	1.2	2.1	.1	.8
17	2.3	b 2.5	b 2.5	b 3	3	3.7	1.5	2.1	1.1	1.2	0	* .7
18	2.1	b 2.5	b 2.5	* b 3	1.8	3.7	1.3	1.50	1.2	1.1	0	.6
19	2.1	b 2.5	b 2	b 3	1.7	3.5	.7	1.9	1.2	1.0	0	.6
20	2.1	b 2.5	b 2.5	b 3	2.5	3.4	.6	7.7	1.2	1.0	0	.9
21	2.3	3.4	b 3	b 3	2.7	3.2	.5	4.2	1.1	1.2	3.5	.9
22	2.1	3.0	b 2.5	b 3	2.7	3.2	.5	3.0	1.2	1.2	1.5	.9
23	2.1	2.8	b 2	b 3	3.0	3.0	.5	* 2.8	1.2	1.3	3.2	.9
24	2.1	2.8	b 2.5	b 3.5	2.7	3.2	.6	2.7	1.4	1.44	1.5	1.1
25	2.4	2.8	b 2.7	b 4	3.5	3.4	.8	2.3	1.3	52	1.2	1.1
26	2.5	2.8	b 2.5	b 4	b 2.5	3.4	.8	2.0	1.3	4.7	1.0	.9
27	2.4	2.8	b 2	b 4	b 1.5	3.2	.6	1.9	1.2	2.5	.9	.8
28	2.4	2.8	b 2	b 4	b 1.5	3.2	.6	1.8	1.2	2.0	.4	.6
29	2.5	2.8	b 2	b 4	-	2.8	.8	1.9	1.2	5.8	.2	.6
30	3.9	2.8	b 2	b 4	-----	3.5	.9	2.1	1.2	12	.1	.5
31	4.4	-----	b 2.3	b 4	-----	3.7	-----	2.3	-----	2.0	.2	-----
Total	72.1	89.5	72.6	84.7	83.1	94.0	39.9	218.0	55.6	379.8	41.6	25.1
Mean	2.33	2.98	2.34	2.73	2.97	3.03	1.33	7.03	1.85	12.3	1.34	0.84
Ac-ft	143	178	144	168	165	186	79	432	110	753	83	50

Calendar year 1961: Max 405 Min 0.6 Mean 7.92 Ac-ft 5,730
 Water year 1961-62: Max 150 Min 0 Mean 3.44 Ac-ft 2,490

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

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

ARKANSAS RIVER BASIN

9

7-1545. Cimarron River near Kenton, Okla.

Location.--Lat 36°56', long 102°57', in SE¼ 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 1962.

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

Average discharge.--12 years, 20.9 cfs (15,130 acre-ft per year).

Extremes.--Maximum discharge during year, 2,530 cfs July 30 (gage height, 5.59 ft); no flow at times.

1950-62: 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.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Sept. 24-26)

0.3	0	1.0	12
.4	.2	1.1	18
.5	1.0	1.4	47
.6	2.1	1.9	117
.7	3.5	2.4	225
.8	5.3	3.3	550
.9	8.0		

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.5	4.0	2.5	3.9	4	1.8	1.0	0.8	3.1	0.1	7.3	1.0
2	3.7	3.2	2.5	3.7	4.4	2.1	1.1	.8	2.5	21	3.5	1.3
3	3.7	2.8	2.4	4.2	3.5	2.5	.8	.9	2.0	3.1	2.2	.6
4	3.7	2.2	2.2	*3.7	3.2	2.5	1.1	1.8	1.8	1.0	2.0	.6
5	3.7	2.2	2.4	2.6	2.7	*2.5	1.3	1.6	1.7	26	1.8	.6
6	3.2	*2.1	2.4	2.6	2.6	2.7	1.8	1.3	1.7	4.4	1.6	.5
7	3.2	2.1	*2.7	2.8	2.9	2.7	1.4	1.2	1.7	1.8	1.4	.5
8	3.2	2.1	2.7	3	2.8	2.5	1.3	1.2	*1.8	1.4	1.3	.5
9	*3.5	2.1	2.6	2.6	2.2	2.5	1.2	1.2	2.4	146	1.2	.5
10	4.2	2.0	2.2	2	2.2	2.5	1.8	1.1	2.2	9.7	.9	*.4
11	3.2	1.8	1.8	1	2.2	2.5	1.3	1.0	1.2	4.4	.8	0
12	3.1	1.8	1.4		*2.2	2.2	*1.2	.9	1.2	4.0	.7	0
13	3.1	2.0	1		2.1	2.1	1.0	.5	1.1	3.9	52	0
14	2.9	2.1	1		2.2	2.4	.8	.3	1.0	3.7	4.0	0
15	3.1	2	1.4		2.2	2.2	.6	*.4	.9	3.5	1.2	0
16	3.1	2.6	2	2	2.1	2.2	.4	.6	.8	3.4	0	0
17	2.8	3.9	2.8		2.1	2.0	0	1.6	.8	3.4	*0	0
18	2.8	3.9	3		2.1	1.9	0	22	.8	3.2	0	0
19	2.8	3.7	2.8		2.1	1.8	0	45	.9	3.1	0	0
20	2.8	3.5	3.2		2.1	1.1	0	3.9	.8	3.1	0	0
21	2.8	*3.2	3.4	3	2.0	1.1	0	2.5	.7	3.1	92	0
22	2.8	2.9	3.5		1.8	1.1	0	2.2	.7	3.1	5.3	0
23	2.8	2.7	4.4		2	1.4	0	2.2	2	3.1	6.4	0
24	2.8	2.5	4.0		1.8	1.8	*0	2.1	.1	3.1	2.1	*16
25	2.8	2.5	3.9		1.8	1.8	0	2.0	.1	4.5	1.3	2.9
26	2.9	*2.5	3.9	3	1.6	1.8	0	1.8	0	3.7	.9	1.4
27	2.9	2.5	4.0		1.4	1.8	0	1.8	*0	3.2	.8	.8
28	2.9	2.5	3.8		1.3	*1.1	0	1.7	0	3.1	.8	.4
29	2.9	2.5	4.4		-	.9	0	1.7	0	42	.8	2
30	4.6	2.5	4.6		-----	1.2	0	1.7	0	515	.8	0
31	4.8	-----	4.4	-----	-----	1.3	-----	1.7	-----	*9.0	.8	-----
Total	100.3	79.4	99.3	69.1	65.6	60.0	19.1	109.5	32.2	841.1	193.9	29.2
Mean	3.24	2.61	2.88	2.23	2.34	1.94	0.60	3.53	1.07	27.1	5.93	0.94
Ac-ft	199	156	177	137	130	119	36	217	64	1,670	365	56

Calendar year 1961: Max 1,050 Min 0 Mean 16.7 Ac-ft 12,100
Water year 1961-62: Max 515 Min 0 Mean 4.59 Ac-ft 3,330

Peak discharge (base, 3,000 cfs).--No peak above base.

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

Note.--No gage-height record Dec. 10-21, Jan. 9 to Feb. 1, Aug. 15. Stage-discharge relation affected by ice Nov. 15, 16, Dec. 9, 28, Jan. 4-8, Feb. 5, 6, Feb. 22 to Mar. 2.

ARKANSAS RIVER BASIN

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, 3 1/4 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 1962.

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.--16 years, 5.44 cfs (3,940 acre-ft per year).

Extremes.--Maximum discharge during year, 2,290 cfs Sept. 19 (gage height, 6.14 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.

1946-62: 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 table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 25 to July 8, Sept. 10-20)

2.0	0.0	2.5	45
2.1	.6	2.6	66
2.2	4	2.7	102
2.3	12	2.9	174

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.2	* 3.3	1.3	b 1	b 1.5	b 0.1	0.2	0.1	0.1	0	* 0.1	1 0.3
2	.2	3.0	2.0	b 1	b 1.5	b 2	.4	.1	.1	1.4	1 7	a 6
3	* .2	8.1	1.3	b 2	b 1.5	b 2.5	.3	* .1	.1	0	2.8	a 4
4	.2	3.0	2.6	b 2	b 2	b 2.5	.3	.1	* .1	0	.1	a 3
5	.2	2.6	b 2.5	* b 2	b 1	b 2.5	.4	.1	.1	* .1	0	a 2
6	.2	3.0	b 2.5	b 2	b 1	3.0	.4	.1	.1	.2	0	a 1
7	.9	4.0	b 2.5	b 2	b 1	2.6	.2	.1	.1	.1	0	a .5
8	4.8	3.0	* b 2	b 1	3.0	* 2.0	.2	.1	.1	6.5	0	a 2
9	8.0	2.6	b 1	b .1	* 2.3	b 1.5	* .2	.1	.1	2.6	0	a 1
10	8.0	2.3	b .5	a .1	1.3	b 1.5	.2	.1	.1	.5	0	* 0
11	6.4	.9	b .1	a .1	.9	b 1	.2	.1	.1	.3	0	0
12	7.2	.1	b .1	a .5	.9	b .5	.2	.1	.1	.4	2.6	0
13	8.8	.1	b .1	a .5	.9	b .2	.2	.1	.1	1.6	0	0
14	9.6	.2	b .5	a .5	.9	b .2	.2	.1	.1	.1	.5	0
15	8.8	.4	b .5	a .5	1.3	b .3	.2	.1	0	.1	0	0
16	6.4	.1	b 1	a 1	2.0	b .4	.2	.2	0	.2	0	0
17	5.6	.2	b .5	a 1	1.6	b .5	.2	.1	0	.2	0	0
18	4.8	4.0	b .5	a 1	b 1.5	b .5	.2	.1	0	.1	0	0
19	4.8	5.6	b .5	a 1	b 1.5	.4	.2	.1	0	.2	a 0	1 7.3
20	3.7	5.6	b 2	a 1.5	b 1.5	.3	.1	.1	.4	.5	6.6	2.1
21	3.0	2.3	b 2	a 1.5	b 1.5	.3	.1	.1	.1	.1	3.0	* .5
22	3.0	3.7	b 2	a 1.5	b 1.5	.2	.1	.1	.1	0	2.3	.1
23	3.0	3.7	b 2	a 1	b 1.5	.2	.1	.1	.1	.1	1.6	0
24	3.0	* 3.0	b 2	a 1.5	b 1.5	.3	.1	0	.1	.1	1.6	0
25	2.6	2.3	b 2	a 1.5	b 1.5	.3	.1	0	6.9	* .1	1.7	0
26	3.0	1.6	b 2	a 1.5	b 1	.2	.1	0	.2	1.2	1.2	0
27	3.0	1.3	b 1	b 1.5	b .5	.2	.1	0	.1	0	.7	0
28	2.6	1.3	b .5	b 1.5	b .1	.2	.1	.1	0	0	a 0	2.5
29	2.6	2.3	b .5	b 1.5	-	.2	.1	.1	0	0	a 0	2.6
30	6.4	1.3	b 1	b 1.5	-----	.5	.1	.1	0	0	a 0	.9
31	4.0	-----	b 1	b 1.5	-----	.3	-----	.1	-----	6.9	a 0	-----
Total	125.2	74.9	40.0	36.8	39.2	27.4	5.7	2.8	70.5	80.6	66.8	342.9
Mean	4.04	2.50	1.29	1.19	1.40	0.88	0.19	0.09	2.35	2.60	2.15	11.4
Ac-ft	248	149	79	73	78	54	11	5.6	140	160	132	680

Calendar year 1961: Max 99 Min 0 Mean 7.17 Ac-ft 5,180
Water year 1961-62: Max 173 Min 0 Mean 2.50 Ac-ft 1,810

Peak discharge (base, 1,000 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
6-25	1450	5.33	1,660	9-19	2030	6.14	2,290
9-1	1545	5.14	1,490				

* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

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 1962. 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.--38 years (1915-17, 1919-20, 1927-62), 20.1 cfs (14,550 acre-ft per year).Extremes.--Maximum discharge during year, 1,360 cfs Sept. 19 (gage height, 5.88 ft); minimum daily, 1.0 cfs Sept. 13-15. 1927-62: 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, 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)

1.6	0.9	2.0	11.5	2.6	54
1.7	1.9	2.2	20	2.8	84
1.8	3.9	2.4	33	3.0	122

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12	*15	13	b10	b11	b5	18	50	24	19	*65	31
2	15	14	12	b10	b12	b10	15	36	39	20	106	27
3	*12	9.9	13	b6	b12	12	16	*34	48	8.7	83	34
4	13	b12	10	*b4	b13	b10	18	32	*33	7.5	28	3.9
5	12	b12	6.2	b3	b12	14	21	48	16	*8.3	22	3.4
6	11	b12	b6	b4	b12	11	19	55	14	9.5	18	2.4
7	14	b12	b5	b5	b13	12	18	55	16	12	16	1.4
8	16	b12	*8.6	b4	b14	*9.1	18	44	15	16	14	2.0
9	16	15	b3.5	b4	*15	5.5	*20	42	20	14	12	2.2
10	20	14	b3.5	b3	14	4.8	18	43	25	14	12	*3.9
11	20	14	b3	b3	14	4.8	19	42	21	10	9.5	2.9
12	18	14	b3.5	b4	14	4.5	19	43	12	45	10	1.5
13	13	b11	b5	b5	16	b2	20	64	11	47	13	1.0
14	11	b8	b6	b6	15	b5	25	62	12	25	9.9	1.0
15	15	b9.5	b7	b8	13	b7	38	50	11	20	*5.5	1.0
16	16	b14	b8	b7	12	b12	53	58	12	18	33	1.1
17	11	b14	b7	b7	11	b10	67	41	13	19	13	1.6
18	9.1	b10	b7	b8	8.3	b7	71	33	16	19	7.5	1.4
19	9.5	b10	b7	b8	b5	b7	71	30	14	15	7.1	100
20	10	b9	b7	b9	b8	7.1	73	37	12	14	15	43
21	9.5	b14	b9	b9	b7	5.2	84	35	13	11	15	15
22	13	b12	b8	*b9	b7	4.8	88	30	14	12	8.7	11
23	14	b13	b8	*b9	b5	5.5	74	26	12	9.8	4.5	14
24	14	*b13	b8	*b9	b6	7.1	68	25	14	71	2.9	11
25	14	12	b9	8.3	b7	5.5	68	23	15	57	5.9	10
26	14	14	b9	b8	b5	6.6	71	21	15	60	7.5	9.9
27	14	14	b7	b8	b3	7.5	65	18	14	25	7.5	11
28	9.5	14	b7	b9	b2	6.6	61	22	11	13	5.9	12
29	10	12	b8	b9	-	b9	71	24	12	21	4.5	12
30	14	14	b9	b10	-	b12	70	22	12	62	3.9	10
31	16	-	b9	b10	-	b14	-	22	-	56	3.9	-
Total	415.6	373.4	232.3	216.3	286.3	243.6	1357	1167	516	837.0	569.7	298.8
Mean	13.4	12.4	7.49	6.98	10.2	7.86	45.2	37.6	17.2	27.0	18.4	9.96
Ac-ft	824	741	461	429	568	483	2,690	2,310	1,020	1,660	1,130	593
Calendar year 1961:	Max	158	Min	2.5	Mean	27.4	Ac-ft	19,840				
Water year 1961-62:	Max	106	Min	1.0	Mean	17.8	Ac-ft	12,910				

Peak discharge (base, 800 cfs).--July 24 (2140) 860 cfs (4.90 ft); Sept. 19 (2100) 1,360 cfs (5.88 ft).

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

ARKANSAS RIVER BASIN

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 1962. 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, 1958, to Sept. 11, 1938, water-stage recorder at site 88 ft upstream at datum 0.43 ft higher.

Average discharge.--5 years (1931-32, 1958-62), 2.63 cfs (1,900 acre-ft per year).

Extremes.--Maximum discharge during year, about 40 cfs Apr. 20 (gage height, 2.05 ft); minimum, 0.1 cfs Aug. 9. 1930-55, 1958-62: 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	2.2	43

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.1	2.1	b 2	a 0.5	b 1	*b 2	b 4	*1.9	3.7	1.9	0.4	1.3
2	2.1	*1.9	2.1	a.5	*b 1	b 2.5	b 4	1.8	4.1	2.5	*.6	1.3
3	2.1	b 1.5	2.1	*b.5	b 1.2	b 2.5	b 5	1.6	3.7	2.7	.5	1.2
4	*2.3	b 1.5	b 2	b.5	b 1.5	b 2.5	5.1	1.5	3.2	2.3	.4	.8
5	2.3	b 1.5	b 1.7	b.5	b 2	b 2.7	*5.6	1.5	2.8	2.5	.4	.8
6	2.1	b 1.5	*b 1.5	b.5	b 2.3	2.7	4.9	1.6	*3.0	*1.3	.3	1.0
7	2.1	b 1.8	b 1.5	a 1	b 2.3	2.7	5.4	1.6	3.0	1.2	.2	1.5
8	2.0	b 2	b 1.5	a 1	2.1	2.7	5.1	1.6	3.0	1.2	.2	1.3
9	2.4	2.1	b 1.5	a 1	1.8	b 2.5	6.8	1.5	2.8	1.1	.4	.9
10	2.7	2.1	b 1.5	a.5	2.4	b 2.5	7.4	1.5	2.7	.9	.3	.6
11	2.3	2.0	b 1	a.2	3.5	b 2.5	7.4	1.4	2.7	1.0	.2	*.7
12	2.1	b 1.7	a.2	a.5	4.4	b 2.5	*8.1	1.4	3.0	.4	.4	.8
13	2.1	b 1.5	a.5	a.5	9.9	b 2.5	9.9	1.3	2.7	.5	.2	1.0
14	2.0	b 1.5	a 1	a.7	6.1	b 2.5	1.3	1.2	2.4	.4	*.2	1.2
15	2.0	b 2.2	a 1	a 1	4.2	b 3	1.8	1.1	2.3	.4	.3	1.2
16	2.0	b 2	a 1	*a 1	3.3	b 3	2.3	9.7	2.0	.5	.4	1.2
17	2.0	b 1.5	a.5	a 1	2.7	b 3	2.2	8.9	2.0	.6	.3	1.3
18	2.0	b 1.5	a.5	a 1	b 2.5	b 2.5	2.8	8.1	2.1	.4	.2	1.2
19	2.0	b 1.5	a.5	a 1.5	b 2	b 2	3.2	7.6	2.1	.6	.2	1.1
20	2.1	b 1.5	a.5	a 1.5	b 2	b 2.5	3.5	7.4	2.1	*1.2	.4	1.3
21	2.0	b 1.5	a.5	a 1.5	b 2.5	b 2.5	3.8	6.8	1.9	.6	1.8	1.5
22	2.0	b 2	a 1	a 1.5	b 2.5	b 2.5	3.5	5.4	*2.0	.6	.8	1.2
23	2.0	b 2	a.5	a 1.5	b 2.5	b 2.5	2.5	5.1	1.8	.7	.6	1.4
24	2.0	b 2	a.5	a 1	b 2.5	b 2.5	2.0	*4.7	1.8	.7	1.0	2.5
25	2.0	2.5	a.5	a 1	b 2	b 2.5	2.2	4.2	1.8	1.4	.9	2.4
26	*2.0	2.5	a 1	a 1	b 2	b 3	2.6	4.2	1.8	1.0	1.3	1.8
27	2.0	b 2	a 1	a 1	b 1.5	b 4	2.5	4.1	1.4	.7	1.1	1.0
28	2.0	b 2	a 1	a.5	b 1	b 4.5	2.3	4.7	1.5	.6	1.1	.7
29	2.0	b 2	a.5	a.5	-	b 4.5	2.4	4.7	1.5	1.2	1.0	.8
30	2.3	b 2	a.5	a.5	-----	b 4.5	2.2	4.1	2.7	.8	1.2	.7
31	2.4	-----	a.5	a.5	-----	b 4	-----	3.7	-----	.6	1.2	-----
Total	65.5	55.4	31.6	25.9	74.7	88.3	509.7	318.4	73.6	32.5	18.5	35.7
Mean	2.11	1.85	1.02	0.84	2.67	2.85	17.0	10.3	2.45	1.05	0.60	1.19
Ac-ft	130	110	63	51	148	175	1,010	632	146	64	37	71

Calendar year 1961: Max 25 Min 0.1 Mean 3.61 Ac-ft 2,620
 Water year 1961-62: Max 38 Min 0.2 Mean 3.64 Ac-ft 2,640

Peak discharge (base, 15 cfs).--Apr. 20 (2200-2400) about 40 cfs (2.05 ft).

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

ARKANSAS RIVER BASIN

13

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 1962.

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 observed during year, 39,790 acre-ft May 15 (elevation, 8,117.50 ft); minimum observed, 21,100 acre-ft Nov. 2 (elevation, 8,103.35 ft).

1927-44, 1950-62: 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 1961 to September 1962

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	-	a21,720	-
Oct. 31	8,103.40	21,150	-570
Nov. 30	-	a21,570	+420
Dec. 31	-	a22,100	+530
Calendar year 1961	-	-	+11,540
Jan. 31	-	a22,640	+540
Feb. 28	-	a23,180	+540
Mar. 31	-	a26,110	+2,930
Apr. 30	-	a36,980	+10,870
May 31	-	a37,900	+920
June 30	-	a36,070	-1,830
July 31	8,113.30	33,440	-2,630
Aug. 31	-	a30,640	-2,800
Sept. 30	-	a29,300	-1,340
Water year 1961-62	-	-	+7,580

a No gage-height record; contents estimated or interpolated from a total of 46 observations during the year and outflow records (Cimarron Creek below Eagle Nest Dam, see following page).

ARKANSAS RIVER BASIN

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 1962. Prior to October 1962, 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--12 years, 12.3 cfs (8,900 acre-ft per year).

Extremes--Maximum discharge during year, 106 cfs May 15-16 (gage height, 1.81 ft); no flow at times.
1950-62: Maximum discharge, 205 cfs June 14, 1955 (gage height, 2.79 ft); no flow at times.

Remarks--Records good except those for periods of doubtful gage-height record, which are poor. 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	0.7	22
.1	.9	1.0	39
.2	3.0	1.4	68
.4	9.1	1.8	101

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.5	1.6	0.9					0	d 45	59	36	7.4
2	13	* 1.6	.9					0	d 50	69	* 36	9.2
3	13	1.6	.9					0	d 40	25	36	12
4	* 13	1.0	.9					0	d 30	52	15	12
5	13	3.5	.9					0	d 35	69	19	12
6	13	1.5	.9					0	* 50	* 69	21	13
7	13	1.5	.7					3.7	37	67	20	13
8	16	1.3	0					15	37	64	20	12
9	17	1.3	0					17	14	58	20	16
10	19	1.3	0					9.8	11	51	20	17
11	22	1.3	0					9.1	14	43	8.7	15
12	25	1.3	0					8.7	15	38	17	* 11
13	26	1.3	0					8.7	15	36	23	9.5
14	26	1.3	0					8.4	15	14	23	5.4
15	26	1.3	0					63	15	28	23	5.1
16	26	1.3	0					97	15	37	23	14
17	26	1.3	0					88	21	37	23	19
18	26	1.1	0					88	25	37	8.6	19
19	26	1.1	0					90	32	37	18	20
20	26	1.1	0					90	49	37	23	19
21	13	1.1	0					90	53	13	23	18
22	17	.9	0					63	53	26	23	18
23	24	.9	0					46	17	37	23	19
24	25	1.1	0					46	42	37	22	20
25	27	1.3	0					29	66	37	9.3	20
26	16	1.1	0					28	71	37	17	20
27	5.1	1.1	0					53	71	37	22	20
28	5.1	.9	0					54	71	12	22	19
29	12	.9	0					d 37	71	27	21	8.2
30	16	.9	0					d 30	60	37	21	14
31	16		0					d 35		37	21	
Total	569.7	91.0	6.1	0	0	0	0	1,107.4	1,140	1,274	657.6	436.8
Mean	18.4	3.03	0.20	0	0	0	0	35.7	38.0	41.1	21.2	14.6
Ac-ft	1,130	180	12	0	0	0	0	2,200	2,260	2,530	1,300	866

Calendar year 1961: Max 44 Min 0 Mean 8.72 Ac-ft 6,320
Water year 1961-62: Max 97 Min 0 Mean 14.5 Ac-ft 10,480

* Discharge measurement made on this day.

d Doubtful gage-height record.

ARKANSAS RIVER BASIN

15

7-2062. McEvoy Creek near Eagle Nest, N. Mex.

Location--Lat 36°33'00", long 105°13'30", in Maxwell Grant, on left bank 1.4 miles north of Eagle Nest Dam, and 2 miles east of Eagle Nest, Colfax County.

Drainage area--1.95 sq mi.

Records available--September 1961 to September 1962.

Gage--Water-stage recorder and V-notch sharp-crested weir. Altitude of gage is 8,600 ft (from topographic map).

Extremes--Maximum discharge during year, 1.37 cfs Apr. 30 (gage height, 0.82 ft); minimum, 0.003 cfs Nov. 3, result of freezup.

Remarks--Records fair.

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

Sept. 19 to Apr. 2

Apr. 3 to Sept. 30

0.2	0.05	0.2	0.05	0.6	0.65
.3	.13	.3	.13	.7	.94
.4	.26	.4	.26	.8	1.28
.5	.46	.5	.42	.9	1.69

Daily discharges, in cfs, for the period Sept. 19-30, 1961 are as follows: 0.19, 0.18, 0.19, 0.15, 0.16, 0.13, 0.11, 0.10, 0.10, 0.09, 0.09, 0.09.

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.18	0.25	0.22	a 0.19	0.20	0.25	0.31	1.21	0.39	0.20	0.20	0.14
2	.18	*.23	.22	a .20	.20	*.23	.37	* 1.04	.39	.20	*.19	.14
3	.18	.09	.20	*.19	.22	.23	.39	.94	.36	.23	.19	.14
4	*.18	.25	.15	.18	.22	.23	.39	.88	.31	.23	.18	.13
5	.19	.20	.10	.16	.22	.23	*.39	.85	.29	.23	.17	.20
6	.18	.13	.16	d.18	.22	.22	.41	.88	*.29	*.22	.15	.18
7	.18	.16	*.20	d.20	.23	.19	.41	.94	.27	.22	.14	.20
8	.18	.23	.22	d.20	.23	.15	.42	.97	.27	.20	.15	.19
9	.19	.23	.23	d.20	.23	.16	.42	1.01	.26	.20	.14	.18
10	.19	.22	.22	.18	.25	.19	.42	1.01	.24	.18	.13	.17
11	.20	.22	.20	b.16	.26	.22	.42	.97	.24	.18	.20	*.17
12	.19	.20	.19	b.16	*.28	.23	.47	.94	.26	.18	.18	.15
13	.19	.14	.19	b.17	.30	.23	.54	.88	.23	.17	.17	.15
14	.19	.19	.19	.18	.30	.23	.60	.82	.23	.17	*.17	.17
15	.19	.26	.16	.19	.26	.25	.71	.76	.22	.17	.15	.15
16	.19	.23	.16	.19	.26	.25	.82	.71	.22	.17	.18	.17
17	.20	.23	.19	*.19	.25	.23	*.85	.65	.22	.17	.17	.15
18	.20	.15	.19	.18	.12	.23	.85	.60	.20	.20	.14	.15
19	.20	.19	.20	.18	.13	.23	.88	.58	.20	.19	.14	.17
20	.20	.20	.20	.16	.30	.20	1.04	.54	.19	*.19	.19	.22
21	.20	b.21	.20	.16	.25	.20	1.18	.51	.19	.19	.19	.20
22	.20	.22	.20	.16	.22	.20	1.28	.49	*.18	.18	.18	.19
23	.20	.22	.20	.16	.25	.22	1.18	.47	.18	.20	.17	.22
24	.19	.22	.20	.18	.25	.22	1.08	*.42	.18	.24	.15	.32
25	.20	.22	.20	.18	.25	.22	1.04	.39	.18	.24	.15	.29
26	*.20	.22	.20	.19	*.25	.30	1.15	.39	.20	.22	.14	.24
27	.22	.20	.20	.19	.23	.33	1.18	.37	.20	.19	.13	.23
28	.20	.20	.19	.19	.23	.35	1.25	.39	.19	.23	.13	.23
29	.22	.16	.19	.20	-	.35	1.32	.39	.19	.23	.12	.22
30	.25	.22	a .18	.20	-----	.31	1.32	.36	.29	.23	.13	.22
31	.25	-----	a .18	.20	-----	.18	-----	.36	-----	.22	.14	-----
Total	6.11	6.09	5.93	5.65	6.61	7.26	23.09	21.72	7.26	6.27	4.96	5.68
Mean	0.197	0.203	0.191	0.182	0.236	0.234	0.770	0.701	0.242	0.202	0.160	0.189
Ac-ft	12	12	12	11	13	14	46	43	14	12	9.8	11

Calendar year : Max Min Mean Ac-ft
Water year 1961-62: Max 1.32 Min 0.09 Mean 0.292 Ac-ft 210

Peak discharge (base not determined).--Apr. 30 (0600) 1.32 cfs (0.82 ft); June 30 (0115); 0.74 cfs (0.63 ft).

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

ARKANSAS RIVER BASIN

7-2063. Tolby Creek near Eagle Nest, N. Mex.

Location.--Lat 36°31'20", long 105°13'30", on right bank in Maxwell Grant, 1 mile upstream from mouth and 2.5 miles southeast of Eagle Nest, Colfax County.

Drainage area.--8.5 sq mi.

Records available.--October 1961 to September 1962.

Gage.--Water-stage recorder and V-notch sharp-crested weir. Altitude of gage is 8,400 ft (from topographic map).

Extremes.--Maximum discharge during year, 27.3 cfs Apr. 20 (gage height, 2.04 ft); minimum recorded, 0.28 cfs Dec. 4.

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

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

Oct. 31 to Jan. 31

Feb. 1 to Sept. 30

0.3	0.21	0.4	0.60	1.0	4.91
.4	.44	.5	.99	1.2	7.59
.5	.77	.6	1.49	1.4	11.0
.6	1.21	.7	2.13	1.7	17.6
.7	1.78	.8	2.90	2.0	26.0

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		1.08	0.85	a 0.8	a 0.7	a 1.0	2.33	1.34	3.18	1.68	1.24	0.83
2		*.81	.85	.77	a.7	*1.14	2.59	*1.22	3.46	1.49	1.24	.79
3		.85	.85	*.77	a.7	1.09	2.90	1.14	2.90	1.49	*1.29	.79
4			.67	a.7	a.8	1.09	3.46	1.08	2.59	1.62	1.14	.76
5			b.6	a.7	a.8	1.09	*3.27	1.05	*2.36	1.62	1.04	1.14
6			.77	a.7	a.9	1.14	3.36	1.03	2.28	*1.49	.95	1.14
7			*.77	a.8	a.9	1.09	3.64	1.01	2.21	1.81	.91	1.34
8			.77	a.8	a 1.0	1.04	3.83	1.01	2.13	1.75	.91	1.19
9			.85	a.8	a 1.0	.99	3.74	9.73	2.07	1.62	.91	.99
10			.85	a.7	a 1.1	.99	3.94	9.55	1.94	1.39	.87	.91
11			.81	a.6	a 1.2	1.04	4.59	9.19	1.87	1.29	1.39	*.91
12			.81	a.6	*1.39	1.09	5.41	8.87	2.00	1.24	1.49	.87
13			.81	a.7	1.44	1.19	6.73	8.39	1.94	1.24	1.19	.91
14			.81	a.7	1.39	1.81	9.19	7.75	1.75	1.14	*1.14	.95
15			.85	a.8	1.39	2.36	16.6	7.02	1.68	1.14	1.09	.95
16			.85	a.8	1.39	2.00	15.2	6.30	1.62	1.24	1.09	.91
17			.85	*a.8	1.34	1.68	*1.69	5.78	1.62	1.24	1.04	.91
18			.81	a.8	b 1.0	1.39	20.7	5.28	1.55	1.14	.91	.91
19			.81	a.8	b 1.2	*1.24	2.33	4.80	1.55	1.19	.91	.99
20			.81	a.7	1.34	1.24	2.45	4.48	1.49	*1.87	.99	1.24
21		.85	.81	a.7	1.34	1.24	2.33	4.26	1.44	1.49	1.04	1.29
22		.85	*.81	a.7	b 1.3	1.34	20.8	3.94	*1.39	1.24	.95	1.09
23		.85	a.8	a.7	*b 1.2	1.34	18.6	3.64	1.39	1.39	.95	1.09
24		.90	a.8	a.7	1.14	1.39	17.6	*3.46	1.39	1.62	.87	1.94
25		.94	a.8	*.77	1.14	1.49	17.6	3.27	1.39	1.75	.87	1.94
26		.94	a.8	.81	*1.19	1.75	18.1	3.18	1.44	1.55	.83	1.68
27		.94	a.8	a.7	a 1.0	2.07	17.6	2.99	1.49	1.44	.79	1.39
28		.94	a.8	a.6	a 1.0	2.28	16.9	3.18	1.34	1.29	.76	1.29
29		b .7	a.8	a.6	-	2.36	16.2	3.46	1.39	1.55	.76	1.34
30		.90	a.8	a.6	-----	2.13	15.0	2.99	2.90	1.49	.76	1.19
31	1.34	-----	a.8	a.6	-----	2.11	-----	2.90	-----	1.39	.79	-----
Total	-	25.15	24.87	22.32	30.99	45.20	357.88	213.21	57.75	44.89	31.11	33.67
Mean	1	0.838	0.802	0.720	1.11	1.46	11.9	6.88	1.92	1.45	1.00	1.12
Ac-ft	62	50	49	44	61	90	710	423	115	89	62	67

Calendar year : Max Min Mean Ac-ft
 Water year 1962 : Max - Min - Mean 2.52 Ac-ft 1,820

Peak discharge (base,).--Apr. 20 (1830) 27.3 cfs (2.04 ft).

* Discharge measurement made on this day.

a No gage-height record. Discharge for October estimated on basis of hydrograph to complete water year.

b Stage-discharge relation affected by ice.

c Base discharge for supplemental peaks not determined.

ARKANSAS RIVER BASIN

17

7-2064. Clear Creek near Ute Park, N. Mex.

Location.--Lat 36°31' 35", long 105°10'30", on right bank in Maxwell Grant, a quarter of a mile upstream from mouth, and 4 miles southwest of Ute Park, Colfax County.

Drainage area.--7.44 sq mi.

Records available.--September 1961 to September 1962.

Gage.--Water-stage recorder and V-notch sharp-crested weir. Altitude of gage is 7,860 ft (from topographic map).

Extremes.--Maximum discharge during year, 28.3 cfs May 13 (gage height, 1.90 ft); minimum, 0.15 cfs Dec. 5.

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

Rating tables, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second) *
(Shifting-control method used May 27-30)

Sept. 19 to Oct. 31 Apr. 14 to Sept. 30				Nov. 1 to Apr. 13	
0.4	0.38	1.2	7.40	0.3	0.21
.5	.68	1.4	11.6	.4	.44
.6	1.12	1.6	17.0	.6	1.21
.8	2.40	1.9	28.3	.8	2.48
1.0	4.40			1.0	4.33

Daily discharges, in cfs for the period Sept. 19-30, 1961 are as follows: 1.57, 1.62, 1.46, 1.40, 1.40, 1.34, 1.40, 1.40, 1.40, 1.40, 1.40, 1.40.

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.40	0.94	a0.6	a0.4	0.42	0.54	1.12	a1.2	8.18	1.97	1.34	0.52
2	1.40	.77	a.6	*.42	.42	*.47	1.38	*11.6	7.60	1.82	1.40	.49
3	1.34	.73	a.6	.44	.47	.47	1.92	11.6	6.90	1.75	*1.40	.46
4	*1.34	.77	b.4	a.4	.50	.47	2.34	11.9	6.74	1.90	1.34	.43
5	1.23	.67	b.4	a.4	.50	.44	*21.3	13.1	6.90	1.82	1.23	.61
6	1.18	.70	b.5	a.5	.50	.47	2.06	15.6	*7.40	1.82	1.18	.58
7	1.12	.64	*.50	a.5	.47	.47	2.20	17.4	8.18	1.90	1.12	.77
8	1.12	.73	.50	a.5	.50	.44	2.27	20.4	8.57	1.75	1.12	.58
9	1.34	*.77	.54	a.5	.50	.44	2.34	23.8	8.38	1.62	1.08	.52
10	1.23	.70	.54	a.3	.60	.44	2.41	25.4	7.79	1.46	1.03	.46
11	1.08	.70	a.5	a.3	.67	.47	2.65	26.2	7.24	*1.40	1.29	.43
12	1.03	.60	a.4	a.3	*.77	.67	3.07	27.5	7.07	1.34	1.18	*.43
13	.99	.70	a.4	a.4	1.03	.47	4.03	27.9	6.41	1.29	1.08	.43
14	.99	.70	a.5	a.4	.90	.50	5.75	27.1	6.08	1.23	.99	.49
15	.94	.73	.54	a.4	.77	.47	7.24	24.6	5.62	1.23	.94	.46
16	.90	.70	.57	.44	.73	.44	8.57	21.2	5.48	1.29	.94	.46
17	.86	.70	.54	*.42	.67	.42	*7.98	18.7	5.21	1.18	.86	.43
18	.81	.67	.54	.42	.67	.47	9.16	16.5	4.80	1.12	.77	.40
19	.81	.67	a.5	.42	.67	*.50	10.5	15.3	4.40	1.18	.72	.43
20	.77	.67	a.5	.42	.67	.57	a1.2	13.9	4.07	*1.18	.81	.68
21	.72	.70	.54	.42	.64	.50	a1.3	13.1	3.63	1.34	.81	.64
22	.72	.67	*.54	.42	.77	.54	a1.4	12.9	*3.30	1.12	.77	.49
23	.68	.67	a.5	.42	*.60	.54	a1.3	12.4	3.03	1.12	.68	.58
24	.68	.67	a.5	.42	.57	.50	a1.2	*11.9	2.85	1.23	.64	.99
25	.68	.67	a.5	.42	.57	.60	a1.1	10.9	2.67	1.29	.61	.94
26	*.68	.73	a.5	.44	.54	.77	a1.2	10.2	2.76	1.23	.58	.72
27	.68	.67	a.5	.42	.54	1.12	a1.3	9.70	2.49	1.12	.55	.64
28	.64	.64	a.5	.42	.54	1.38	a1.4	9.58	2.40	1.12	.52	.61
29	.64	.57	a.5	.42	-	1.55	a1.4	9.16	2.33	1.23	.49	.58
30	.86	.67	a.5	.42	-----	1.21	a1.3	8.61	2.85	1.34	.46	.58
31	.94	-----	a.5	.42	-----	1.00	-----	8.57	-----	1.34	.52	-----
Total	298.0	209.2	157.5	129.2	172.0	193.4	220.12	498.72	161.33	437.3	284.5	168.3
Mean	0.961	0.697	0.508	0.417	0.614	0.624	7.34	16.1	5.38	1.41	0.918	0.561
Ac-ft	59	41	31	26	34	38	437	989	320	87	56	33

Calendar year - : Max - Min - Mean - Ac-ft -
Water year 1962 : Max 27.9 Min 0.3 Mean 2.97 Ac-ft 2,150

Peak discharge (base, not determined).--May 13 (1300) 28.3 cfs (1.90 ft).

* Discharge measurement made on this day.

a No gage-height record.

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 1962. 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.--12 years, 20.0 cfs (14,480 acre-ft per year).

Extremes.--Maximum discharge during year, 444 cfs July 28 (gage height, 2.78 ft); minimum daily, 2.5 cfs Jan. 9-12.

1950-62: 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	0.9	23
.5	3.9	1.3	61
.6	6.0	1.6	104
.7	10	1.8	142

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.8	2.5	7.2	b4	b4.5	b3.5	6.4	4.9	6.9	7.1	*5.2	3.1
2	1.1	2.5	6.8	b4	*b4.5	4	6.8	*4.4	7.5	7.3	4.0	7.6
3	1.5	2.4	6.8	b4	5	4.5	7.6	4.2	6.8	6.0	3.7	8.0
4	1.5	2.4	7.2	*b4	5.4	b4.5	8.4	4.0	*5.2	3.3	3.3	7.2
5	1.6	1.7	b7	b4	b4.5	b4.5	8.8	4.1	5.2	7.0	2.8	7.6
6	*1.7	1.4	b6.5	b4	b4	b5.5	9.2	4.3	6.0	7.3	6.6	9.6
7	1.6	1.1	*b6.5	b4	4.3	6.0	9.6	4.5	5.6	7.4	3.4	8.0
8	1.6	1.1	b6.5	b3.5	3.9	*5.6	10	5.2	5.9	7.4	3.0	8.0
9	2.2	*1.1	b6	b2.5	5.6	4.5	*1.1	6.1	4.2	7.3	2.9	8.0
10	2.4	9.6	b5	b2.5	5.6	b4	1.2	5.7	2.4	6.5	2.8	*1.2
11	2.6	9.2	b4.5	b2.5	5.8	b4	1.2	5.7	2.5	*6.1	2.5	1.1
12	2.7	9.6	b4	b2.5	6.0	b3.5	1.2	5.7	2.9	6.1	2.2	1.2
13	3.0	9.6	b4	b3.5	7.6	b3.5	1.4	5.7	2.3	5.9	5.7	5.2
14	3.1	b9.5	4	b3.5	8.0	b3.5	1.7	5.4	2.5	4.5	6.0	6.8
15	3.1	b9.5	4.5	b3.5	8.0	b4	2.1	5.9	2.3	2.2	*6.0	8.4
16	3.2	9.6	4.5	b3.5	8.4	b4.5	2.9	12.6	2.2	4.9	6.1	9.4
17	3.2	9.2	b4.5	b3.5	8.8	b5	3.1	13.6	2.3	5.1	6.1	2.1
18	3.1	b9	b4.5	b3.5	b7	b5	3.7	13.6	2.9	5.2	4.7	2.2
19	3.1	b9	b4.5	b3.5	b7	b5	4.9	13.6	3.1	4.7	2.6	2.7
20	3.1	b9	b5	b3.5	b7	5.2	5.6	13.4	4.4	4.6	6.0	2.9
21	3.0	9.2	b5.5	b3.5	b7	4.7	5.9	13.2	5.6	4.0	6.1	2.4
22	1.9	b9.5	b5.5	b3.5	b7	4.7	6.0	11.7	5.8	1.9	5.9	2.2
23	2.9	b9.5	b5.5	b4	b7	4.7	5.3	7.7	4.8	4.7	5.9	2.4
24	3.0	*8.8	b6	b4	b6	4.7	4.8	7.1	2.8	5.0	5.9	3.1
25	3.2	8.4	b6.5	b4	b6	4.5	4.7	6.1	5.7	5.1	4.7	3.3
26	3.2	8.4	b6	b4	b5	4.7	5.0	3.1	7.0	4.9	2.0	3.2
27	2.0	8.8	b4.5	b4	b4	4.7	5.3	6.8	7.3	4.4	4.4	3.1
28	1.6	8.4	b4	b4	b3	5.0	5.3	8.0	7.1	5.2	4.6	3.0
29	1.6	b8	b4	b4	-	5.6	5.3	7.5	7.1	2.8	4.0	2.6
30	2.5	7.6	b4	b4	-----	6.4	5.2	5.9	7.1	4.7	3.7	1.2
31	2.5	-----	b4	b4	-----	b6.4	-----	6.4	-----	4.4	3.7	-----
Total	734.8	351.4	165.0	112.5	165.9	145.9	895.8	2,261	1,434	1,630	1,365	523.8
Mean	23.7	11.7	5.32	3.63	5.92	4.71	29.9	72.9	47.8	52.6	44.0	17.5
Ac-ft	1,460	697	327	223	329	289	1,780	4,480	2,840	3,230	2,710	1,040
(ft)	0	0	0	0	0	0	0	0	48	232	312	153

Calendar year 1961: Max 82 Min 1.5 Mean 24.3 Ac-ft 17,580
 Water year 1961-62: Max 136 Min 2.5 Mean 26.8 Ac-ft 19,400

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

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

ARKANSAS RIVER BASIN

19

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 1962. 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.--23 years (1915-25, 1927-28, 1950-62), 13.4 cfs (9,700 acre-ft per year).

Extremes.--Maximum discharge during year, 915 cfs Aug. 1 (gage height, 5.30 ft), from rating curve extended above 150 cfs on basis of slope-area measurements at gage heights, 4.55, 5.80, and 7.15 ft; minimum, 0.3 cfs Aug. 31.

1915-29, 1950-62: 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, 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)

0.7	0.2	1.2	7.5	2.0	54
.8	.8	1.4	13.5	2.5	118
.9	2.0	1.6	24	3.0	204
1.0	3.5	1.8	38		

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	10	* 9.9	6.5	b 5	b 5	b 5	14	7.5	12	5.7	* 6.9	0.6
2	11	9.0	6.3	b 5	b 5	b 6	13	6.6	15	5.1	2.6	.6
3	* 11	7.1	6.3	b 5	b 5	b 6.5	16	* 5.9	14	4.1	7.1	.6
4	10	7.1	b 5.5	* b 5	b 5	b 6	19	5.6	* 11	4.1	5.3	.5
5	10	7.1	b 5.5	b 5	b 5	b 6.5	22	5.7	9.9	3.7	3.5	.6
6	9.9	6.7	b 5.5	b 5	b 6	6.5	24	6.2	9.0	4.1	2.8	.6
7	9.6	6.5	b 5.5	b 5	b 6	6.5	25	6.3	8.4	5.3	2.3	.6
8	9.0	6.5	* b 5.5	b 4.5	b 6.5	* 6.3	26	6.2	8.7	4.5	2.3	.6
9	9.9	7.1	b 5	b 4	* b 6.5	5.9	* 25	6.2	8.4	3.7	2.0	.6
10	11	6.9	b 5	b 4	6.5	5.9	28	5.8	7.8	3.2	1.8	*.6
11	11	6.7	b 4.5	b 4	7.1	b 5.5	29	* 5.3	7.3	* 2.8	1.8	.6
12	9.6	6.9	b 4.5	b 4.5	7.8	b 5	32	5.0	9.1	3.4	2.2	.5
13	9.0	6.7	b 4.5	b 4.5	9.9	b 5	37	4.8	7.5	3.0	1.9	.4
14	9.0	8.4	b 5	b 4.5	11	b 5	50	4.4	6.5	2.6	2.8	.5
15	8.7	9.6	b 5	b 4.5	9.9	b 5	66	3.9	5.9	2.2	* 1.9	.6
16	8.4	7.5	b 5	b 4.5	9.3	b 5.2	91	3.4	5.5	2.2	1.5	.8
17	8.1	7.5	b 5	b 4.5	9.3	b 5.5	102	3.0	5.3	2.3	1.5	1.2
18	7.5	7.1	b 5	b 4.5	7.8	b 5.8	* 120	2.6	4.9	3.0	1.4	.7
19	7.5	7.5	b 5	b 4.5	7.3	5.9	134	2.4	4.9	4.7	1.2	3.4
20	7.3	7.5	b 5	b 5	8.1	6.1	144	2.1	4.7	* 4.3	1.3	9.2
21	7.3	7.3	b 5	b 5	7.1	6.1	154	1.9	4.5	3.4	1.8	2.6
22	7.1	6.3	b 5	b 4.5	b 6.5	6.1	142	1.8	* 4.1	2.9	1.5	1.8
23	6.9	6.3	b 5	* b 4.5	b 6.5	6.1	112	1.5	3.7	3.5	1.3	1.9
24	6.9	* 6.9	b 5	* b 5	b 6.5	6.3	96	1.4	3.7	6.5	1.2	2.0
25	6.7	6.9	b 5	b 5	b 6	6.3	98	1.3	4.1	7.1	1.0	2.4
26	6.9	6.9	b 5	b 5	b 6	6.1	105	1.2	4.9	7.4	.8	2.0
27	6.7	6.9	b 5	b 5	b 5	6.9	105	1.2	5.3	5.7	.7	1.9
28	6.7	6.9	b 5	b 5	b 5	8.4	98	1.2	4.5	4.9	.5	1.6
29	7.3	6.5	b 5	b 5	-	11	94	1.3	3.9	5.5	.4	1.4
30	9.0	6.9	b 5	b 5	-----	13	87	1.2	5.7	4.9	.4	1.3
31	10	-----	b 5	b 5	-----	11	-----	11	-----	4.9	.4	-----
Total	269.0	217.1	160.1	146.5	192.6	202.4	210.8	114.0	210.2	130.7	149.6	42.7
Mean	8.68	7.24	5.16	4.73	6.88	6.53	70.3	36.8	7.01	4.22	4.83	1.42
Ac-ft	534	431	318	291	382	401	4,180	2,260	417	259	297	85

Calendar year 1961: Max 194 Min 0.5 Mean 27.0 Ac-ft 19,510
 Water year 1961-62: Max 154 Min 0.4 Mean 13.6 Ac-ft 9,860

Peak discharge (base, 200 cfs).--Aug. 1 (2050) 915 cfs (5.30 ft).

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

ARKANSAS RIVER BASIN

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 1962. 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.--43 years (1911-12, 1913-14, 1915-20, 1923-24, 1927-62), 14.4 cfs (10,430 acre-ft per year).

Extremes.--Maximum discharge during year, 264 cfs Apr. 15 (gage height, 3.69 ft); minimum, 1.4 cfs Dec. 5.

1909-12, 1913-62: 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)
(Shifting-control method used Apr. 20 to May 20, July 20 to Aug. 3)

1.8	1.8	2.2	18	2.9	90
1.9	4.1	2.5	42	3.3	166
2.0	7.5				

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.2	1.3	7.5	b5	4.8	b4.5	1.6	8.9	2.7	1.4	8.8	4.4
2	1.3	9.3	7.2	b5	5.1	b5	1.7	8.3	2.8	1.0	8.8	4.8
3	1.3	7.5	7.5	b5	5.5	b5	2.5	7.9	2.6	9.3	8.0	4.4
4	1.2	8.0	6.5	b5	5.8	b4.5	3.8	7.6	2.0	9.3	6.4	3.9
5	1.1	6.8	b6	b5	b5.8	b4.5	3.4	7.4	1.8	1.7	4.8	4.1
6	1.1	7.2	b6	b5	b5.8	b5	3.8	7.5	*1.6	2.3	4.4	5.1
7	1.0	7.5	b6	b5	5.8	5.8	3.4	7.5	1.7	2.9	4.1	4.8
8	1.0	9.3	b6	5.1	6.1	5.5	3.8	7.5	1.7	1.8	3.9	5.5
9	1.2	8.8	b5.5	b4.5	6.1	b5	3.9	7.5	1.6	1.7	3.9	4.4
10	1.3	8.8	b5.5	b3.5	6.5	b6	5.6	7.5	1.4	1.3	3.9	4.1
11	1.1	8.8	b4.5	b4	8.0	b6	6.8	*7.5	1.4	*1.2	3.9	3.9
12	9.8	8.0	b4	b4.5	9.8	b6	6.6	7.2	1.3	1.2	4.1	3.6
13	9.3	b4.5	b5	b4.5	1.1	b6	7.7	6.9	1.3	1.1	3.9	3.6
14	9.3	b7.5	*b5.5	b4.5	9.3	b5	9.6	6.4	1.2	9.8	*8.2	3.6
15	9.3	1.0	b5.5	b4.5	8.8	b5	1.47	5.9	1.2	9.3	6.5	3.9
16	9.3	*8.8	b5.5	b4.5	*8.4	b5	*1.43	5.6	1.2	9.8	7.5	3.6
17	*8.8	b5.8	b5.5	b4.5	8.0	b5	1.11	4.9	1.1	9.8	7.2	3.6
18	8.8	b5.5	b5.5	b4.5	b7	b5	1.17	4.5	1.1	8.4	5.8	3.9
19	8.8	b6.8	b5.5	b4.5	b6	*6.1	1.11	4.0	1.1	9.2	5.5	3.6
20	8.4	b6.8	b6	b4.5	b6	5.8	1.28	3.8	9.7	1.2	5.8	5.1
21	8.4	8.8	b6	b5	b6	5.8	1.17	3.4	8.8	1.1	6.8	*7.2
22	8.0	9.3	b6	*b5	b6	5.8	1.11	3.1	8.4	1.1	6.1	4.8
23	8.0	8.4	b5.5	*b5	b5.5	6.1	1.08	3.1	8.0	9.3	5.5	4.4
24	8.4	8.0	b5.5	*b5	b5	5.8	1.01	2.7	7.5	1.4	5.1	6.8
25	7.2	8.0	b6	4.8	b5	6.5	1.01	*2.6	7.5	2.2	5.5	1.0
26	7.2	8.0	b5.5	5.1	b5	8.4	1.01	2.4	*8.8	1.7	5.1	*7.5
27	7.5	8.0	b4.5	b4.5	*b5	1.4	*1.03	2.4	1.0	*1.2	*4.4	5.8
28	7.5	7.5	b5	b4.5	b4	*2.9	1.03	2.4	9.8	9.8	4.4	5.1
29	8.0	8.8	*b5	b4.5	-	3.5	1.01	2.6	1.0	8.4	4.1	5.1
30	*8.4	*8.0	b5	b4.5	-----	2.2	9.6	2.3	3.5	8.4	4.1	4.4
31	1.2	-----	b5	*b4.4	-----	2.1	-----	2.3	-----	9.8	4.1	-----
Total	300.4	244.5	175.2	144.9	181.1	265.1	244.1	163.6	431.5	395.6	170.6	145.0
Mean	9.69	8.15	5.65	4.67	6.47	8.55	81.4	52.8	14.4	12.8	5.50	4.83
Ac-ft	596	485	348	287	359	526	4,840	3,240	856	785	338	288

Calendar year 1961: Max 164 Min 2 Mean 21.2 Ac-ft 15,320

Water year 1961-62: Max 147 Min 3.5 Mean 17.9 Ac-ft 12,950

Peak discharge (base, 100 cfs).--Apr. 15 (2245) 264 cfs (3.69 ft).

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

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 1962. 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.--38 years (1920-21, 1924-25, 1926-62), 18.0 cfs (13,030 acre-ft per year).

Extremes.--Maximum discharge during year, 895 cfs June 9 (gage height, 6.42 ft); minimum, 0.5 cfs Mar. 11.

1930-62: 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 or no gage-height record, which are poor. Flow partly regulated by Eagle Nest Reservoir (see p 13). 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	4.8	233
3.6	9.7	4.2	90	5.1	320

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	13	11	11	b7	*b7.5	b4	5.4	7.5	7.4	7.4	4.9	4.1
2	13	8.5	10	b7	b7.5	b4.5	4.9	8.2	9.2	8.5	1.0	4.1
3	13	7.4	11	b7	b8	b4.5	4.5	*8.6	12	7.4	*8.5	4.1
4	12	8.0	11	b7	b2	b4.5	4.5	7.5	14	7.4	4.9	4.5
5	*11	9.2	11	*b7	b8	5.8	4.9	6.1	8.5	*6.8	4.1	4.9
6	a10	11	10	b7	b7	5.8	4.9	5.4	5.8	7.4	3.4	4.9
7	a9	12	b9.5	b7	b8	5.8	6.3	3.0	8.5	8.5	2.8	*3.4
8	a9	8.5	11	b7	8.5	5.4	1.8	3.0	*17.0	8.5	2.5	2.5
9	a8	*8.5	12	b6	8.5	5.4	2.3	4.8	29.9	9.2	2.5	2.5
10	a8	8.0	b10	b4	8.0	5.8	1.6	4.8	7.3	9.2	2.8	2.5
11	a9	8.0	b10	b4	8.0	b3.5	*1.8	4.2	*3.0	8.0	3.1	2.8
12	a10	8.5	b7	b4	8.0	b4	3.4	3.4	2.1	9.2	3.4	2.3
13	a11	9.2	b7	b6	7.4	b4	5.2	3.1	1.7	9.2	3.1	2.0
14	a11	9.7	*b7	b6	8.0	b4	4.7	2.7	1.5	5.4	2.5	2.8
15	a11	1.0	b8	b6	7.4	b5	6.1	1.3	9.7	4.9	2.3	3.4
16	a11	1.2	b8	b6	6.3	6.3	9.4	9.2	9.2	9.7	2.3	3.4
17	a11	1.1	b8	b6	4.5	5.8	8.0	1.9	8.0	6.8	2.3	3.8
18	a11	1.0	b8	b6	4.5	5.8	1.10	2.7	7.4	4.9	2.3	3.8
19	a10	1.0	b8	b6	4.5	5.4	18.4	2.6	6.8	4.9	2.0	8.9
20	9.7	9.2	b9	b6	4.5	4.9	19.4	1.7	7.4	4.9	1.8	8.0
21	1.0	9.7	b10	b6	4.9	4.9	22.5	1.3	9.7	4.5	2.0	3.8
22	1.0	9.7	b10	b5.5	4.1	4.9	16.6	1.0	9.7	5.8	2.5	2.8
23	1.0	1.0	b10	b6	4.5	4.9	17.9	1.0	6.3	8.5	1.8	2.5
24	9.2	1.1	b11	b7	4.5	4.9	23.6	9.7	5.4	8.5	1.7	2.8
25	7.4	1.1	b12	b7	4.5	4.9	19.2	8.5	4.9	9.2	1.8	3.1
26	8.0	1.0	b10	b7	4.1	4.5	13.8	7.4	9.7	1.2	2.5	3.1
27	9.2	1.0	b9	b7	b3.5	4.1	8.3	6.3	9.7	1.1	2.8	2.8
28	9.7	1.0	b8	b7	b3.5	4.1	17.4	5.4	9.2	6.8	2.5	2.8
29	7.4	1.1	b7	b7	-	3.8	11.2	4.9	6.8	6.3	3.4	2.5
30	1.1	1.1	b7	b7	-	4.5	8.2	5.4	5.8	7.4	4.5	2.5
31	1.5	-----	b7	b7	-----	5.4	-----	6.8	-----	5.8	3.8	-----
Total	317.6	293.1	287.5	195.5	176.7	151.1	254.9	921.6	816.1	234.0	100.8	107.4
Mean	10.2	9.77	9.27	6.31	6.31	4.87	85.0	29.7	27.2	7.55	3.25	3.58
Ac-ft	630	581	570	388	350	300	5,060	1,830	1,620	464	200	213

Calendar year 1961: Max 406 Min 2.0 Mean 32.2 Ac-ft 23,320
 Water year 1961-62: Max 299 Min 1.7 Mean 16.9 Ac-ft 12,210

Peak discharge (base, 500 cfs).--June 9 (0215) 895 cfs (6.42 ft).

- * Discharge measurement made on this day.
- a No gage-height record.
- 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 E½ 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 1962. 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.--26 years, 132 cfs (95,560 acre-ft per year).

Extremes.--Maximum discharge during year, 3,790 cfs July 25 (gage height, 7.10 ft); minimum, 1.0 cfs Sept. 17.

1936-62: 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 table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.6	0.3	0.9	5.0	1.2	18	2.5	233	4.4	1,100
.7	1.5	1.0	8.0	1.5	45	3.0	383		
.8	3.0	1.1	12	2.0	119	4.0	850		

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	33	37	36	b 25	52	b 9	16	98	50	30	123	1.8
2	30	46	37	b 25	57	b 9	18	82	59	* 22	* 58	2.2
3	28	40	35	b 25	64	b 15	18	82	48	22	36	2.4
4	27	34	33	b 22	74	b 20	17	90	12	41	40	1.6
5	27	30	* 32	b 25	77	b 30	17	90	11	50	30	1.4
6	27	31	31	b 25	55	37	16	72	10	24	25	9.6
7	25	32	30	b 25	52	32	17	64	11	35	19	6.8
8	25	* 31	29	b 25	52	29	16	* 56	* 10	26	14	4.8
9	30	35	29	b 15	49	26	15	49	218	34	11	4.2
10	* 30	35	b 15	b 10	45	24	19	34	276	31	9.2	3.4
11	33	35	b 10	* b 10	41	24	32	47	139	18	7.1	2.7
12	35	32	b 10	b 10	37	17	30	46	68	20	6.8	* 2.4
13	35	30	b 14	b 15	* 34	16	* 25	37	47	51	6.8	2.2
14	34	34	b 20	b 15	33	* 18	31	31	209	21	5.6	2.1
15	32	37	b 25	b 15	32	23	55	26	194	15	8.0	1.8
16	31	35	b 25	b 15	31	27	52	26	70	10	8.4	1.5
17	33	43	b 25	b 15	30	26	81	26	34	8.0	7.1	1.1
18	35	45	b 25	b 15	27	26	98	24	21	8.4	5.9	6.5
19	36	40	b 20	b 20	25	24	88	17	16	7.7	4.2	3.8
20	32	41	b 25	b 20	22	20	173	22	13	10	3.2	2.7
21	31	36	b 25	b 20	20	18	187	21	* 10	6.8	2.7	7.5
22	28	34	b 25	b 15	19	17	236	17	8.0	5.9	2.4	7.0
23	26	37	b 25	b 20	17	16	197	13	8.0	6.2	2.2	3.8
24	24	36	b 25	* b 25	18	17	190	9.2	10	740	13	3.8
25	23	37	b 30	b 25	18	16	* 228	7.7	10	* 1040	11	3.6
26	23	37	b 30	b 25	18	15	195	7.1	8.0	318	7.4	2.6
27	22	39	b 25	b 25	b 15	14	171	5.9	31	176	4.6	2.0
28	21	37	b 20	b 30	b 10	* 14	95	4.8	56	134	3.6	1.5
29	22	36	b 25	b 35	-	14	161	4.6	37	290	2.7	1.2
30	26	36	b 25	b 40	-----	14	129	4.2	44	229	2.1	9.2
31	30	-----	b 25	b 45	-----	15	-----	3.6	-----	115	1.5	-----
Total	894	1088	786	677	1024	622	2623	1117.1	1596.7	3545.0	481.5	416.8
Mean	28.8	36.3	25.4	21.8	36.6	20.1	87.4	36.0	53.2	114	15.5	13.9
Ac-ft	1,770	2,160	1,560	1,340	2,030	1,230	5,200	2,220	3,170	7,030	955	827
Calendar year 1961:	Max 1,250	Min 5.6	Mean 109	Ac-ft 79,110								
Water year 1961-62:	Max 1,040	Min 1.1	Mean 40.7	Ac-ft 29,490								

Peak discharge (base, 4,000 cfs).--No peak above base.

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

ARKANSAS RIVER BASIN

23

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 1962.

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

Average discharge.--9 years, 14.0 cfs (10,140 acre-ft per year).

Extremes.--Maximum discharge during year, 257 cfs July 25 (gage height, 2.62 ft); minimum, 3.5 cfs Sept. 13, 17, 18.

1953-62: 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 table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.7	2.2	1.1	13.5	2.0	97
.8	4.4	1.3	22	2.4	182
.9	7.0	1.5	35		
1.0	10	1.7	55		

Discharge, in cubic feet per second, water year 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	15	13	b9	b7	b7.5	b7	21	84	21	11	19	4.2
2	15	11	21	b7	b7.5	b8	25	77	25	10	18	4.0
3	14	9.1	8.8	b7	b7.5	b8	*30	73	22	*10	15	4.0
4	14	9.1	7.6	b7	b7.5	b8	33	73	21	11	a14	3.7
5	14	9.1	*7.0	b7	b7.5	b8.5	30	74	19	12	a13	*4.2
6	13	9.1	b7	b7	b7.5	*b8.5	29	74	18	12	a12	4.7
7	12	*8.8	b7	b7	*8.2	b8.5	29	72	18	14	a11	6.8
8	12	9.1	b7	b7	8.5	b8	32	*73	18	20	*11	6.0
9	14	9.7	b7	b6	9.4	b7.5	33	76	19	18	10	5.7
10	*14	9.7	b6.5	*b5	9.7	b7	38	74	18	14	10	4.9
11	12	9.1	b6	a4	10	b6.5	40	73	16	12	9.7	4.4
12	12	9.4	b4.5	a5	10	b6.5	46	73	16	12	9.4	4.2
13	11	8.3	b5	a6	11	b6.5	58	73	*15	12	9.1	4.0
14	11	8.5	b6	a6	11	b6	76	67	15	9.7	8.5	4.4
15	11	10	b7	a6	10	b6	97	60	13	9.1	8.2	4.4
16	11	10	b8	a6	9.4	b7	124	54	12	11	9.4	4.2
17	11	9.7	b7	a6	8.8	b8	122	50	12	12	9.7	4.0
18	10	9.7	b7	a6	b8	b9	142	45	11	13	8.2	3.7
19	10	b9.5	*b7	a6	b7	b9	162	40	10	12	7.9	*4.0
20	10	b9	b7	a6	b7	10	165	38	9.4	12	8.2	4.4
21	10	*10	b7	a6	b7	*8.8	162	34	9.1	11	7.9	4.9
22	2.7	b9.5	b7.5	a7	b7.5	9.4	157	32	8.5	11	*7.3	4.4
23	9.7	b9.5	b7	a7	b8	10	120	29	7.9	11	7.0	4.7
24	*9.7	b9.5	b7	a7	b8	10	*108	27	7.3	32	6.7	6.5
25	10	b9.5	b7	a7	b8	b11	110	26	8.2	*4.5	6.2	8.5
26	9.7	10	b7	a7	b7.5	b12	110	25	8.5	25	5.7	7.9
27	10	9.4	b7	a7	b7	b14	105	23	8.5	d18	5.2	6.7
28	10	9.4	b7	a7	b6	b20	101	24	8.2	d16	4.9	6.2
29	11	8.8	b7	b7	-	26	97	23	8.2	d15	4.7	6.2
30	13	b9	b7	b7	-----	22	94	22	15	d14	4.7	5.7
31	15	-----	b7	b7	-----	20	-----	21	-----	d13	4.4	-----
Total	363.8	285.7	218.0	200	232.0	316.7	2,496	1,609	417.8	457.8	286.0	151.6
Mean	11.7	9.52	7.03	6.5	8.29	10.2	83.2	51.9	13.9	14.8	9.23	5.05
Ac-ft	722	567	432	397	460	628	4,950	3,190	829	908	567	301

Calendar year 1961: Max 330 Min 4 Mean 25.0 Ac-ft 18,090
 Water year 1961-62: Max 165 Min 3.7 Mean 19.3 Ac-ft 13,950

Peak discharge (base, 150 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
4-20	1100 to 1200	2.33	165	7-25	1515	2.62	257
7-24	1830	2.28	162				

* 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 1962.Gage.--Water-stage recorder. Concrete control since September 1956. Altitude of gage is 7,840 ft (by barometer).Average discharge.--6 years, 2.06 cfs (1,490 acre-ft per year).Extremes.--Maximum discharge during year, 24 cfs May 9 (gage height, 2.64 ft); no flow Aug. 31, Sept. 17-19.

1956-62: 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 fair. 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)

1.45	0.0	1.7	0.8	2.2	8.6
1.55	.1	1.8	1.6	2.4	14
1.6	.3	2.0	4.4	2.7	26

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.4	0.6	0.5	0.3	0.3	0.2	0.7	1.0	6.0	4.1	3.2	0.1
2	1.3	.5	.5	.3	.3	.3	.8	1.0	6.2	4.3	2.8	.2
3	1.3	.4	.5	.3	.3	.2	*.8	1.0	5.8	*4.8	2.4	.3
4	1.2	.4	.4	.4	.3	.2	.9	1.3	5.6	5.2	1.9	.4
5	1.2	.5	*.3	.3	.3	.2	.9	1.7	5.2	4.6	1.5	*.3
6	1.2	.5	.3	.3	.2	*.2	.9	1.8	5.2	4.3	1.2	.4
7	1.1	*.4	.3	.3	*.3	.3	.9	*1.8	5.4	5.0	1.2	.7
8	1.0	.5	b.3	b.2	.3	.3	.9	2.0	5.4	4.3	*1.0	.8
9	1.3	.5	b.3	b.1	.3	.3	1.0	2.1	5.4	3.8	.7	.5
10	*1.6	.5	b.3	*b.1	.3	b.2	1.0	2.2	5.2	2.8	.6	.3
11	1.4	.5	b.2	b.1	.3	b.2	1.0	1.4	4.4	2.8	.7	.2
12	1.4	.5	b.1	b.2	.3	b.2	1.0	7.0	4.0	2.9	.8	.2
13	1.2	.5	b.2	b.2	.4	b.2	1.3	7.0	*4.0	2.9	.6	.1
14	1.2	.4	b.3	b.2	.4	b.1	3.3	6.0	3.0	2.5	.6	.2
15	1.2	.5	.3	.2	.3	b.2	4.8	5.4	2.9	2.6	.6	.1
16	1.0	.5	.4	.2	.3	.2	6.4	5.2	2.9	2.9	1.3	.1
17	.9	b.4	.3	.2	.3	.2	6.0	4.4	2.8	3.2	1.5	.0
18	.6	b.4	.3	.2	.2	.2	7.5	5.8	2.5	4.1	.7	.0
19	.5	.5	*.4	.1	b.2	.3	8.6	7.3	2.6	3.7	.5	*.0
20	.5	.4	.4	.1	b.2	.3	1.0	7.5	2.5	4.0	.6	.1
21	.4	*.4	.4	.1	*.2	*.3	1.2	7.3	2.6	3.5	1.0	.1
22	.4	b.3	.4	.1	.2	.3	1.1	*7.5	2.4	3.5	*.6	.1
23	.4	.5	.4	.2	.3	.3	1.0	7.7	2.4	4.3	.6	.2
24	*.4	.5	.4	.2	.3	.3	*9.7	8.2	2.4	*6.0	.5	.3
25	.4	.5	.4	.2	.3	.4	1.2	8.2	2.4	6.4	.5	.7
26	.4	.6	.4	.2	.2	.5	1.5	8.2	2.3	4.6	.3	.8
27	.4	.5	b.3	.2	b.2	.5	1.2	8.4	1.6	3.5	.2	.6
28	.4	.5	b.3	.2	b.1	.6	1.1	7.5	1.6	3.3	.2	.5
29	.4	.4	.4	.2	-	.6	1.2	6.6	2.5	3.5	.1	.3
30	.5	.5	.4	.2	-----	.5	1.1	6.0	3.8	3.2	.1	.3
31	.7	-----	.3	.3	-----	b.4	-----	6.0	-----	3.2	0	-----
Total	27.3	14.1	10.7	6.4	7.6	9.2	17.4	310.2	111.0	119.8	28.5	8.9
Mean	0.88	0.47	0.35	0.21	0.27	0.30	5.81	10.0	3.70	3.86	0.92	0.30
Ac-ft	54	28	21	13	15	18	346	615	220	238	57	18

Calendar year 1961: Max 15 Min 0.1 Mean 2.74 Ac-ft 1,990
 Water year 1961-62: Max 22 Min 0 Mean 2.27 Ac-ft 1,640

Peak discharge (base 25, cfs).--No peak above base.

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

ARKANSAS RIVER BASIN

25

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 1962.

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

Average discharge.--6 years, 6.23 cfs (4,510 acre-ft per year).

Extremes.--Maximum discharge during year, 30 cfs May 12 (gage height, 1.52 ft); minimum daily, 0.6 cfs Dec. 12, 13, Jan. 10, 11, Mar. 13, 14; stream dry at times above transmountain diversion.

1956-62: Maximum discharge, 138 cfs Aug. 6, 1959; maximum gage height, 1.87 ft 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 table except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.6	0.5	0.9	2.9	1.2	10	1.5	26
.7	1.0	1.0	4.7	1.3	14	1.6	35
.8	1.8	1.1	7.0	1.4	19		

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.2	2.5	a1.5	b1	b1	b0.7	b1.8	1.5	1.6	9.7	5.8	1.5
2	4.2	1.9	a1.5	b1	b1	b8	*b2	1.5	1.6	*7.9	5.2	1.4
3	4.2	b1.4	a1.5	b1	b1	b1	2.6	1.5	1.6	9.3	4.9	1.4
4	4.2	b1.3	b1.2	b1	b1	b1	2.7	1.6	1.6	8.8	4.5	1.4
5	4.0	b1.3	*b1.2	b8	b1	b1	2.8	2.0	1.6	8.2	4.0	*1.9
6	4.0	b1.3	b1.2	b8	a1	*b1	2.9	2.3	1.6	7.9	3.6	2.9
7	4.0	*b1.3	b1.2	b8	*1.2	b1	2.9	2.3	1.6	8.8	3.4	3.4
8	4.0	1.4	b1.2	b8	1.3	b1	3.1	*2.5	1.5	7.9	*3.3	3.8
9	4.3	1.5	b1.2	b.7	1.3	b1	3.6	2.6	1.4	7.0	3.3	2.8
10	*4.2	1.7	b1.2	*b.6	1.4	b1	3.8	2.6	1.4	6.5	2.9	2.3
11	3.6	1.7	b8	b.6	1.4	b8	3.8	2.6	1.2	6.5	2.9	1.9
12	3.6	1.8	b.6	b8	1.5	b8	4.0	2.7	1.3	7.1	2.9	1.6
13	3.4	b1.5	b.6	b8	1.7	b.6	4.2	2.7	*1.3	7.6	2.6	1.5
14	3.3	b1.6	b1	b8	1.6	b.6	4.5	2.5	1.2	6.3	2.3	1.6
15	3.3	b1.8	b1	b8	1.6	b8	5.4	2.2	1.2	5.6	2.3	1.5
16	3.1	a1.5	b1	b8	1.5	b1	6.5	2.0	1.2	5.2	3.6	1.4
17	2.9	b1.3	b1	b8	1.6	b1.2	6.8	1.9	1.0	5.6	3.8	1.4
18	2.9	b1.3	b1	b8	b1.5	b1.2	7.6	1.8	1.0	7.0	2.7	1.4
19	2.9	b1.3	b1	b8	b1	b1.3	9.4	1.7	9.7	6.5	2.6	*1.2
20	2.8	b1.3	b1	b8	b1	1.4	9.7	1.8	9.4	6.8	2.9	1.4
21	2.8	*b1.3	*b1	b1	*b1	*1.3	10	1.7	8.5	5.8	2.8	1.6
22	2.8	b1.3	b1.2	b1	b1	b1.3	9.4	*1.6	8.2	5.2	*2.3	1.4
23	2.8	b1.3	b1.2	b1	b1	b1.2	8.2	1.5	7.9	6.1	2.1	1.8
24	*2.3	b1.3	b1.2	b1	b1	b1.4	*7.6	1.4	7.6	*8.2	2.0	3.1
25	2.3	b1.3	b1.2	b1	b8	b1.4	8.2	1.3	7.6	9.4	1.8	4.4
26	2.3	1.8	b1.2	b1	b8	1.6	8.5	1.3	7.6	7.3	1.7	4.7
27	2.9	1.7	b1	b1	b.7	1.7	11	1.3	7.3	6.3	1.6	3.3
28	2.7	1.7	b1	b1	b.7	1.8	15	1.5	7.3	6.1	1.5	2.8
29	2.8	b1.7	b1	b1	-	1.8	16	1.6	7.6	5.8	1.4	2.3
30	1.9	a1.5	b1	b1	-----	1.8	16	1.6	9.7	5.6	1.4	2.1
31	2.3	-----	b1	b1	-----	b1.8	-----	1.6	-----	5.4	1.5	-----
Total	101.0	45.6	33.9	27.3	32.6	36.3	200.0	587	347.4	217.4	89.6	65.2
Mean	3.26	1.52	1.09	0.88	1.16	1.17	6.67	18.9	11.6	7.01	2.89	2.17
Ac-ft	200	90	67	54	65	72	397	1,160	689	431	178	129

Calendar year 1961: Max 41 Min 0.6 Mean 8.19 Ac-ft 5,940
 Water year 1961-62: Max 27 Min 0.6 Mean 4.89 Ac-ft 3,530

Peak discharge (base, 20 cfs).--May 12 (2100) 30 cfs (1.52 ft).

* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

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 1962.Gage.--Water-stage recorder. Altitude of gage is 7,625 ft (by barometer).Average discharge.--6 years, 16.4 cfs (11,870 acre-ft per year).Extremes.--Maximum discharge during year, 67 cfs May 12 (gage height, 2.70 ft); minimum daily, 2 cfs Jan. 11, 12.

1956-62: 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. Duversions 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	2.2	18
1.8	3.1	2.4	32
1.9	5.6	2.7	64
2.0	8.9		

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.7	<u>8.9</u>	<u>5.6</u>	b4	b3	b3.5	<u>6.9</u>	<u>2.3</u>	<u>3.0</u>	<u>1.7</u>	<u>1.5</u>	3.6
2	9.7	6.9	5.4	b4	b3	b4	<u>6.9</u>	<u>2.3</u>	<u>2.9</u>	1.4	1.4	3.4
3	9.3	6.9	5.1	b4	b3	b4	7.9	2.5	2.7	1.6	1.4	2.9
4	8.6	6.6	4.8	b4	b3	b4	8.9	2.5	2.6	1.6	1.2	<u>2.8</u>
5	8.6	6.3	b5	b4	b3	b4	8.6	3.6	2.7	1.9	1.0	3.6
6	8.2	5.9	b5	b4	b3.5	4.5	8.6	3.9	2.7	1.8	8.6	6.9
7	7.9	<u>5.6</u>	b5	b4	4.1	3.4	8.2	3.7	2.6	1.8	8.2	7.6
8	7.9	5.6	b5	b4	3.8	3.4	8.2	4.2	2.7	1.6	7.6	7.2
9	9.7	5.9	b5	b4	4.1	b3	8.2	4.6	2.6	1.5	7.6	5.4
10	<u>1.0</u>	5.9	b4.5	b3.5	4.4	b3	8.9	5.1	2.7	1.3	6.9	4.6
11	8.9	5.6	b4	b2	4.8	b3	9.3	5.6	2.5	1.3	6.6	4.1
12	8.9	5.6	b3.5	b2	5.4	b3	1.0	6.0	2.4	1.4	6.6	3.8
13	8.6	5.6	b4	b2.5	<u>5.6</u>	b2.5	1.4	<u>6.2</u>	2.4	1.4	6.3	3.4
14	7.9	5.9	a4.5	b2.5	5.6	b2.5	1.6	5.6	2.4	1.2	5.1	3.8
15	7.6	6.6	a4.5	b2.5	5.1	b3	2.0	4.8	2.3	<u>1.0</u>	5.1	3.6
16	7.2	6.3	a4	b2.5	4.8	b3.5	2.2	4.5	2.2	1.0	7.6	3.4
17	6.9	6.3	a4	b2.5	4.8	b4	2.0	4.0	1.9	1.3	7.9	3.1
18	6.3	b6.3	a4	b2.5	b4	b4	2.3	3.6	1.9	1.6	6.9	2.9
19	5.9	b6.3	b4	b2.5	b3.5	b4	2.7	3.4	1.7	1.8	6.9	2.8
20	5.6	b6	b4	b2.5	b3.5	4.4	<u>3.0</u>	3.6	1.6	1.9	7.6	3.4
21	5.6	6.3	b4	b2.5	b4	3.8	3.0	3.4	1.6	1.4	6.9	3.9
22	5.4	b6	b4	b2.5	b4	4.1	2.6	3.2	1.4	1.4	5.6	3.4
23	5.1	5.9	b4	2.6	b4	4.1	2.1	3.0	1.4	1.6	4.6	4.9
24	<u>4.6</u>	5.9	b4	2.8	b4	4.4	2.0	3.0	1.4	1.6	4.4	6.6
25	5.6	6.6	b4	2.9	b3.5	4.4	2.4	3.0	1.4	<u>2.3</u>	4.1	<u>1.0</u>
26	5.4	7.9	b4	2.9	b3.5	5.1	2.5	3.0	1.4	1.8	3.6	8.6
27	5.9	7.2	b4	b3	b3	6.6	2.3	3.0	<u>1.3</u>	1.6	3.4	6.6
28	5.1	6.6	b4	b3	b2.5	<u>7.9</u>	2.6	3.2	1.4	1.6	3.1	5.4
29	6.3	5.9	b4	b3	-	7.6	2.6	3.0	1.4	1.6	<u>2.8</u>	4.8
30	7.2	5.9	b4	b3	-----	6.9	2.5	2.8	1.7	1.4	2.8	4.4
31	<u>1.0</u>	-----	b4	b3	-----	7.9	-----	3.0	-----	1.4	3.1	-----
Total	229.6	189.2	134.9	94.7	110.5	133.5	518.6	115.6	62.9	47.8	214.9	140.9
Mean	7.41	6.31	4.35	3.05	3.95	4.31	17.3	37.3	21.0	15.4	6.93	4.70
Ac-ft	455	375	268	188	219	265	1,030	2,290	1,250	948	426	279

Calendar year 1961: Max 121 Min 3 Mean 23.0 Ac-ft 16,680
 Water year 1961-62: Max 62 Min 2 Mean 11.0 Ac-ft 7,990

Peak discharge (base, 60 cfs).--May 12 (2100) 67 cfs (2.76 ft).

a No gage-height record.

b Stage-discharge relation affected by ice.

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 1962.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 7,015 ft (revised), from topographic map).

Extremes.--1956-62: 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 1962 a total of 30 discharge measurements and 13 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 1961 to September 1962

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October	0	0	0	0
November	0	0	0	0
December	0	0	0	0
Calendar year 1961	12	0	2.79	2,021
January	12	0	2.35	144
February	12	8.8	10.7	593
March	12	0	4.54	279
April	7.7	0	2.17	129
May	13	0	8.11	499
June	12	0	3.67	218
July	23	.1	9.80	603
August	17	1.8	7.75	476
September	8.7	0	4.76	283
Water year 1961-62	23	0	4.45	3,224

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 bank 300 ft downstream from Las Vegas-Mora highway bridge, a quarter of a mile southeast of La Cueva, half a mile downstream from La Cueva damsite, Mora County.

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 1962. 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. Datum of gage is 6,998.7 ft above mean sea level, datum of 1929. April 1931 to Apr. 18, 1962, at site 300 ft upstream at datum about 2 ft higher. 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.--35 years (1906-10, 1931-62), 29.1 cfs (21,070 acre-ft per year).

Extremes.--Maximum discharge during year, 1,050 cfs July 23 (gage height, 8.55 ft, new site and datum), from rating curve extended above 110 cfs on basis of slope area measurement at gage height 8.33 ft; minimum daily, 5 cfs Mar. 1.
1931-62: Maximum discharge, 1,530 cfs Sept. 23, 1941, from rating curve extended above 400 cfs by logarithmic plotting; maximum gage height, that of July 23, 1962; 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, 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 tables, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used July 24-29)

Oct. 1 to Apr. 18

Apr. 18 to July 23

July 24 to Sept. 30

0.7	4.6	1.2	38	1.8	12	2.7	86	1.8	7.5	2.4	37
.8	8.4	1.4	62	2.0	25	3.0	118	1.9	11	2.7	57
.9	14	1.6	92	2.2	40	3.3	152	2.0	15	3.0	81
1.0	20	1.8	30	2.4	58	3.6	190	2.2	25	3.3	109

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	34	37	26	b 18	13	b 5	33	71	73	37	41	11
2	43	34	26	b 18	13	b 5.5	* 29	68	83	* 32	57	13
3	42	31	26	b 19	13	b 6.5	29	55	72	34	54	13
4	38	29	26	20	13	b 5.5	27	46	65	36	46	11
5	27	30	* 24	20	10	b 6	29	44	64	50	38	* 8.9
6	22	30	25	b 19	* 9.4	8.4	34	53	64	54	29	9.6
7	17	30	23	22	10	8.0	31	54	62	50	26	10
8	17	* 30	24	22	10	12	32	50	65	54	25	9.6
9	17	32	26	* b 20	11	19	34	* 49	74	56	* 22	10
10	20	33	25	b 15	10	18	36	53	74	45	16	13
11	* 24	28	b 23	b 10	12	b 12	39	56	75	40	12	11
12	24	30	b 15	b 11	12	b 11	42	54	77	31	14	10
13	25	31	b 19	b 13	12	b 10	49	57	* 72	26	13	12
14	31	32	b 23	b 13	11	b 10	57	61	68	16	11	11
15	31	33	b 24	b 12	10	b 13	78	52	71	11	12	13
16	31	35	b 25	b 13	9.4	18	105	52	62	19	11	13
17	26	34	b 23	b 14	9.4	19	106	47	58	16	11	12
18	19	32	b 19	b 15	b 6.5	21	122	38	41	19	13	* 10
19	18	29	* b 19	15	b 7.5	19	144	34	23	21	13	10
20	19	28	b 23	15	b 7.5	17	156	33	14	23	16	10
21	20	34	24	16	8	b 19	169	* 35	13	17	15	10
22	20	* 28	24	14	7.3	* 18	177	37	13	13	14	9.6
23	23	27	b 22	16	7.6	14	158	35	22	106	* 13	10
24	24	30	b 22	19	9.4	14	120	35	22	100	11	11
25	* 23	29	22	20	9.4	15	* 103	31	17	103	11	12
26	26	28	22	17	7.3	12	114	28	18	* 90	12	12
27	28	29	21	16	b 6	19	96	28	25	75	9.2	11
28	31	26	b 20	17	* b 5.5	30	82	31	20	64	9.2	11
29	32	26	b 19	16	-	33	79	33	19	59	9.2	11
30	40	27	20	14	-	36	80	33	33	51	10	12
31	44	-----	b 20	13	-----	30	-----	45	-----	44	9.2	-----
Total	836	912	700	502	270.2	483.9	2,390	1,398	1,459	1,392	602.8	330.7
Mean	27.0	30.4	22.6	16.2	9.65	15.6	79.7	45.1	48.6	44.9	19.4	11.0
Ac-ft	1,660	1,810	1,390	996	536	960	4,740	2,770	2,890	2,760	1,200	656

Calendar year 1961: Max 448 Min 10 Mean 59.8 Ac-ft 43,300
Water year 1961-62: Max 177 Min 5 Mean 30.9 Ac-ft 22,370

Peak discharge (base, 300 cfs).--July 23 (1930) 1,050 cfs (8.55 ft).

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

ARKANSAS RIVER BASIN

29

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 2½ miles west of Golondrinas, Mora County.

Drainage area--64 sq mi.

Records available--June 1956 to September 1962.

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

Average discharge--6 years, 6.56 cfs (4,750 acre-ft per year).

Extremes--Maximum discharge during year, 233 cfs July 23 (gage height, 4.51 ft); minimum, 0.2 cfs May 13.

1956-62: 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, 6.35 ft Aug. 18, 1961, minimum discharge, that of May 13, 1961.

A major flood probably occurred in August 1952; discharge, about 9,300 cfs (gage height, about 11.8 ft, from old floodmark), 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 tables, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used July 23 to Sept. 19)

Oct. 1 to June 30

July 1 to Sept. 30

1.4	0.2	1.7	2.7	1.6	0.3	2.1	9.5
1.5	.6	1.9	6.6	1.7	1.0	2.5	21
1.6	1.4	2.1	11.2	1.8	3.1	2.9	38

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.8	6.8	5.3	b 4	b 6	b 2.5	8.4	2.4	1.2	4.6	5.8	4.6
2	6.6	6.4	5.3	b 4.5	b 6	b 3	* 8.0	2.3	1.7	* 2.3	5.4	3.7
3	6.6	5.7	5.3	b 4	b 6	b 4	8.2	2.3	1.7	1.4	4.2	3.5
4	6.4	5.5	5.1	b 4	b 6	b 3.5	8.4	2.3	1.3	2.0	3.3	3.3
5	6.2	5.5	* b 4.5	b 4	b 5	b 3	8.9	2.3	1.1	2.3	2.3	3.5
6	5.7	* 5.3	b 4.5	b 4	* b 5	b 3	8.4	2.1	.9	3.6	1.4	* 2.0
7	5.7	5.3	b 4.5	b 4	5.5	* 3.9	8.2	2.0	1.0	1.8	* 1.9	1.2
8	5.5	5.3	b 4.5	b 4	5.5	3.9	8.0	1.7	2.4	1.8	2.5	1.2
9	5.7	5.5	b 4.5	* b 3	5.5	b 3.5	8.0	1.6	2.1	1.4	2.3	1.0
10	* 6.2	6.2	b 4	b 2	5.7	b 3	8.2	* 1.5	1.7	1.0	1.8	1.0
11	5.9	5.7	b 3	b 1	5.7	b 3	5.9	1.6	1.3	.9	1.6	1.0
12	5.7	5.5	b 2	b 2	5.9	b 3	5.3	1.3	1.6	2.0	1.8	1.0
13	5.7	5.5	b 2.5	b 3	6.4	b 3.5	5.5	.2	2.3	2.0	1.6	1.2
14	5.7	5.9	b 4	b 2.5	6.4	b 3	5.3	.2	* 1.6	1.0	1.4	1.4
15	5.7	5.9	5.1	b 3	6.2	b 3.5	5.5	.4	1.3	.9	1.4	1.4
16	5.5	6.2	5.3	b 4	5.9	b 4	5.9	.5	1.2	.9	1.4	1.6
17	5.3	6.2	b 4.5	b 4	5.9	b 4	5.9	.4	1.1	2.1	1.2	1.0
18	5.3	5.9	b 4	3.7	b 4.5	b 3.5	5.7	.5	1.1	4.0	1.4	* 1.0
19	5.1	5.7	b 5	3.9	b 4	b 3.5	6.2	.5	1.0	2.3	1.4	4.0
20	5.1	b 5.3	* b 5.5	4.1	b 4.5	5.1	6.4	.5	.6	2.3	1.4	3.4
21	5.1	6.4	4.9	4.5	b 4.5	b 4.5	5.9	.5	.6	1.6	1.8	1.6
22	5.1	* 5.5	5.1	4.5	b 4	* 4.9	5.9	.5	.6	1.4	1.2	1.2
23	5.1	5.7	* 5	b 4	b 4	5.1	5.5	.6	.5	3.7	* 1.2	1.2
24	5.1	5.7	b 4.5	b 4	b 4	5.3	4.9	.6	.6	* 2.0	1.2	1.6
25	5.1	5.7	b 4	b 4.5	b 4	b 4.5	* 3.2	.6	.6	1.5	1.2	1.8
26	5.1	6.2	4.7	b 4	b 4	6.4	3.0	.6	.6	1.2	1.2	1.4
27	5.1	5.9	4.7	b 4	b 4	6.8	2.8	.7	.7	8.1	1.2	1.2
28	4.9	5.9	b 4	b 4	b 3.5	6.8	2.6	.9	.6	5.0	1.2	1.2
29	4.9	5.5	4.7	b 4.5	-	6.8	2.3	.8	.5	4.4	1.2	1.2
30	5.7	5.7	4.7	b 4.5	-----	7.8	2.4	.8	1.0	4.2	1.2	1.2
31	7.5	-----	b 4.5	b 5	-----	b 7	-----	1.1	-----	3.9	6.1	-----
Total	175.1	173.5	139.2	116.2	143.6	135.3	178.8	34.3	43.5	153.2	64.2	55.6
Mean	5.65	5.78	4.49	3.75	5.13	4.36	5.96	1.11	1.45	4.94	2.07	1.85
Ac-ft	347	344	276	230	285	268	355	68	8.6	304	127	110

Calendar year 1961: Max 265 Min 0.5 Mean 13.2 Ac-ft 9,520
Water year 1961-62: Max 37 Min 0.2 Mean 3.87 Ac-ft 2,800

Peak discharge (base, 100 cfs).--July 23 (2330) 233 cfs (4.51 ft).

* 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 1962. 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.--45 years (1915-20, 1921-22, 1923-62), 36.1 cfs (26,140 acre-ft per year).

Extremes.--Maximum discharge during year, 1,170 cfs July 23 (gage height, 6.35 ft), from rating curve extended above 700 cfs as explained below; minimum, 3.3 cfs Mar. 13.

1915-62: 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)

1.5	3.5	1.7	6.3	2.0	20	2.6	57	3.3	142
1.6	4.8	1.8	9.1	2.3	37	2.9	86	3.7	206

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	41	42	33	b25	b25	b6	38	60	61	41	47	8.2
2	47	41	33	b25	22	b6	35	61	75	33	54	8.2
3	48	38	33	b25	21	b8	33	51	70	32	51	8.6
4	45	36	*33	b25	21	b7	*34	36	61	36	44	*8.6
5	37	36	33	b25	18	*b7	35	36	58	43	38	7.3
6	28	*37	30	b25	*16	12	38	42	56	57	27	7.8
7	25	37	30	b25	16	11	36	*41	58	55	*26	7.8
8	24	36	30	*b25	15	11	36	31	50	47	29	9.1
9	*24	37	b32	b20	16	b8	38	36	74	*59	24	6.8
10	26	41	b30	a10	15	b6	40	38	68	44	20	7.6
11	30	36	b24	a10	15	b6	38	44	70	45	15	12
12	29	36	a10	a10	17	b6	38	44	69	39	17	9.1
13	29	38	a15	a15	16	b6	43	44	120	32	16	11
14	33	39	a21	a20	16	b6	49	52	*78	16	14	13
15	35	40	a25	a20	15	b12	69	47	63	11	15	12
16	34	43	a30	a20	14	21	91	43	54	12	13	15
17	33	43	a25	a20	14	22	102	37	50	15	12	13
18	26	41	a25	a20	13	23	114	31	42	24	12	11
19	22	37	a25	a20	11	22	139	26	31	21	11	21
20	24	36	*b25	a20	12	*22	150	18	13	24	11	*18
21	23	41	b25	a22	13	22	156	24	7.8	20	*11	14
22	24	38	b25	a22	9.6	23	156	33	4.9	14	11	13
23	27	34	b25	a22	9.1	21	151	24	4.7	*139	11	8.2
24	28	37	b25	a22	b8	18	112	27	12	200	12	8.6
25	27	36	b25	a22	b8	21	92	22	12	120	9.6	11
26	28	36	b25	a23	b7	19	*100	20	7.8	87	12	10
27	33	36	b25	a24	b6	19	91	21	9.1	74	10	11
28	36	35	b25	a25	b6	30	74	22	15	57	6.8	11
29	35	34	b25	a25	—	30	67	24	12	51	6.3	11
30	43	34	b25	a25	-----	35	69	24	28	44	6.5	11
31	53	-----	b25	b25	-----	35	-----	26	-----	41	8.8	-----
Total	997	1,131	817	662	394.7	501	2,264	1,085	1,334.3	1,533	601.0	3,239
Mean	32.2	37.7	26.4	21.4	14.1	16.2	75.5	35.0	44.5	49.5	19.4	10.8
Ac-ft	1,980	2,240	1,620	1,310	783	994	4,490	2,150	2,650	3,040	1,190	642

Calendar year 1961: Max 991 Min 10 Mean 79.8 Ac-ft 57,720
 Water year 1961-62: Max 200 Min 4.7 Mean 31.9 Ac-ft 23,090

Peak discharge (base, 400 cfs).--June 13 (2230) 846 cfs (5.75 ft); July 23 (2400) 1,170 cfs (6.35 ft).

* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

ARKANSAS RIVER BASIN

31

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 1962.

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

Average discharge.--9 years (1953-62), 4.88 cfs (3,530 acre-ft per year).

Extremes.--Maximum discharge during year, 96 cfs Apr. 23 (gage height, 3.14 ft); minimum, 0.2 cfs Mar. 12.

1953-62: 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 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 Oct. 1 to Nov. 2, Nov. 9-17, Feb. 1-4, Apr. 4-18)

0.7	0.2	1.2	4.0	2.4	35
.8	.6	1.4	6.8	2.8	57
.9	1.1	1.6	10	3.1	84
1.0	1.9	2.0	21		

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.7	9.2	1.1	d2	3.0	*b 2.5	1.4	*4.0	8.2	9.2	4.8	1.0
2	3.4	* 9.6	1.0	d2	* 3.0	2.8	1.3	3.9	1.0	9.0	* 3.7	1.2
3	3.0	b 8.5	1.0	d2	3.2	3.2	2.4	3.7	1.2	7.9	2.8	1.3
4	* 3.0	b 7	b 9.5	d2	3.8	5.4	4.5	3.5	1.3	6.7	1.8	1.3
5	3.2	b 6	b 8.5	d1.5	4.4	4.7	3.7	3.3	* 1.2	5.9	1.5	1.3
6	3.8	b 5.5	* b 8.5	d1.5	5.2	3.4	3.1	3.1	1.1	* 5.4	1.3	1.7
7	3.9	b 5	b 7	d1.5	5.4	3.4	2.7	3.1	9.2	4.9	1.2	2.6
8	4.0	b 6	b 6	d1	5.4	3.4	2.3	3.1	8.1	6.4	1.3	3.5
9	4.7	5.4	b 5	d.5	5.6	b 2.5	2.2	3.0	7.3	6.7	1.4	3.1
10	5.9	5.8	b 4	d.5	7.0	b 2.5	2.5	2.9	6.7	7.5	1.6	2.6
11	6.1	6.4	b 1	d.5	9.0	b 2.5	2.9	2.7	6.4	8.1	1.6	* 1.9
12	5.5	7.2	b 1	d1	1.5	b 2	* 2.9	2.5	5.9	7.2	1.5	1.8
13	5.4	7.7	b 2	d1	2.2	b 2	2.7	2.3	5.6	6.5	1.6	1.8
14	5.4	6.8	b 2.5	d1	2.0	b 2	2.6	2.1	5.1	5.2	1.5	2.0
15	5.2	6.5	b 3	d1	1.8	b 2	2.9	1.9	4.7	4.9	1.4	2.2
16	5.2	6.5	b 3	* d1.5	1.4	b 5	3.4	1.8	4.3	4.9	1.7	2.1
17	5.1	6.4	b 3	d1.5	1.2	5.3	3.8	1.7	3.8	4.7	2.2	2.0
18	5.1	b 6	b 3	d1.5	1.1	7.0	4.6	1.6	3.3	4.1	2.2	1.7
19	4.9	b 6	b 3	d1.5	1.0	7.3	5.9	1.5	2.6	4.7	2.1	2.2
20	4.5	b 6	b 3	d1.5	6.4	6.2	7.0	1.4	1.8	5.6	2.1	5.6
21	4.1	b 5.5	b 3	d1.5	b 4	4.8	7.3	1.3	1.3	5.6	2.4	7.9
22	4.0	b 5.5	b 3	d2	b 4	5.8	8.3	1.2	4	5.4	2.5	6.1
23	4.0	6.2	b 3	d2	b 4	8.4	8.3	1.1	4	5.9	2.3	4.9
24	3.9	5.9	b 2.5	d2	b 4	1.0	6.5	9.9	5	7.3	2.0	5.2
25	3.7	b 5.5	b 2.5	d2	b 3.5	9.2	5.5	9.6	6	1.0	1.7	6.1
26	3.4	7.2	b 2.5	d2	b 3	1.3	5.6	8.8	1.4	1.6	1.3	6.1
27	3.8	8.8	b 2.5	d2	b 2.5	4.1	5.7	8.1	1.8	1.8	1.1	5.5
28	4.4	9.7	b 2.5	d2	b 2	6.0	5.2	7.9	1.6	1.2	1.4	4.9
29	4.5	1.1	b 2	d2	-	4.6	4.6	7.7	1.6	8.6	1.0	4.0
30	5.8	1.3	b 2	d2	-----	2.9	4.0	7.2	7.2	6.5	1.0	3.4
31	8.4	-----	b 2	d2	-----	2.2	-----	7.5	-----	5.5	1.0	-----
Total	141.0	211.8	131.5	48.0	210.4	312.6	125.8	633.7	157.8	226.3	57.0	97.0
Mean	4.55	7.06	4.24	1.55	7.51	10.1	41.9	20.4	5.26	7.30	1.84	3.23
Ac-ft	280	420	261	95	417	620	2,500	1,260	313	449	113	192

Calendar year 1961: Max 56 Min 0.5 Mean 7.39 Ac-ft 5,350
Water year 1961-62: Max 83 Min 0.2 Mean 9.55 Ac-ft 6,940

Peak discharge (base, 15 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
11-30	1415	1.87	16	4-4	0900	2.55	47
2-13	1400	2.00	23	4-23	0030	3.14	96
3-28	0200	2.89	69	7-26	2400	1.92	19

* Discharge measurement made on this day.
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 1962.

Gage.--Water-stage recorder. Altitude of gage is 7,700 ft (from topographic map).

Average discharge.--6 years, 11.1 cfs (8,040 acre-ft per year).

Extremes.--Maximum discharge during year, 116 cfs Apr. 23 (gage height, 3.00 ft); minimum, 1.0 cfs June 23.

1956-62: 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	1.0	1.8	14
1.5	2.8	2.0	25
1.6	5.8	2.5	66
1.7	9.4	3.0	126

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.6	1.4	1.3	b 4.5	b 5.5	b 4	2.3	5.3	1.0	1.5	9.4	2.3
2	7.2	1.4	1.2	b 4.5	b 5.5	b 4	2.3	5.9	1.4	1.4	7.6	2.4
3	7.2	1.4	1.3	b 4	b 5.5	b 4	* 3.3	5.0	1.4	* 1.2	6.5	2.4
4	6.9	1.3	1.2	b 4	b 5.5	b 4	5.1	4.5	1.5	1.0	4.9	2.6
5	6.9	1.2	b 1.0	b 4	b 6	b 3.5	4.4	4.4	1.4	9.4	3.7	* 3.1
6	7.2	1.1	* b 9	b 3.5	b 7	* b 3.5	3.8	4.2	1.3	8.7	3.1	3.4
7	7.2	* 9.4	b 8	b 3.5	* b 8.5	b 3.5	3.2	4.1	1.2	8.0	3.1	3.7
8	7.2	8.7	b 7.5	b 3	9.0	b 3.5	2.9	4.0	1.1	9.0	* 3.4	4.9
9	8.0	9.0	b 7	* b 2.5	9.0	b 3.5	2.8	* 3.9	9.8	9.4	3.7	4.9
10	* 8.3	9.8	b 5	b 2.5	1.0	b 3.5	3.1	3.8	9.0	9.4	3.4	4.3
11	8.7	9.8	b 3.5	b 2.5	1.2	b 3.5	3.4	3.5	8.3	1.0	3.1	3.4
12	8.3	1.0	b 3.5	b 3	1.5	b 3.5	3.4	3.3	8.0	9.8	5.0	3.1
13	8.0	1.1	b 4	b 3.5	2.0	b 3	3.2	3.0	7.6	9.4	3.7	2.8
14	7.6	1.1	b 5	b 3.5	2.1	b 3	3.2	2.8	* 6.9	8.3	3.7	3.4
15	7.2	b 1.0	b 6	b 3.5	1.8	b 3	3.4	2.4	6.2	8.0	3.1	3.4
16	7.2	b 1.0	b 6	b 4	1.6	b 3.5	3.9	2.3	5.8	9.0	3.1	3.4
17	7.2	b 9.5	b 6	b 4	1.5	b 4	4.2	2.1	5.5	8.3	3.7	3.4
18	7.2	b 9	b 6	b 4	b 1.3	b 4.5	4.9	1.9	5.2	7.6	3.7	3.4
19	7.2	b 9	b 6	b 4	b 1.1	b 6	5.8	1.8	4.3	7.2	3.7	* 3.1
20	7.2	b 9	b 6	b 4	b 9	7.6	6.8	1.7	3.1	8.7	3.7	5.5
21	6.9	* b 9	* b 4	b 4.5	b 7.5	* 7.6	7.1	1.6	2.6	9.4	3.7	8.3
22	6.9	b 8	b 4.5	b 5	b 7.5	8.3	8.6	1.5	2.1	8.7	* 3.7	8.0
23	6.5	b 7	b 5	b 5	b 7.5	1.1	1.01	1.4	1.4	8.7	3.7	6.9
24	* 6.2	b 7	b 5	b 5	b 7.5	1.3	7.7	1.2	1.2	* 1.1	3.4	7.2
25	6.2	b 7.5	b 5	b 5	b 7.5	1.4	* 6.6	1.2	1.4	1.4	3.1	8.3
26	5.8	8.7	b 5	b 5	b 6.5	1.6	6.7	1.1	2.1	1.8	2.8	7.6
27	6.2	9.4	b 5	b 5	b 6	3.6	7.0	9.8	3.4	1.9	2.4	7.2
28	7.2	1.1	b 4.5	b 5	b 3.5	5.9	6.7	9.4	2.8	1.6	2.3	6.5
29	8.0	1.2	b 4.5	b 5.5	-	5.2	6.1	9.4	3.1	1.5	2.3	5.8
30	9.4	1.3	b 4.5	b 5.5	-----	3.5	5.4	8.7	1.5	1.2	2.3	5.5
31	1.3	-----	b 4.5	b 5.5	-----	3.2	-----	8.7	-----	1.0	2.3	-----
Total	231.8	305.8	200.0	128.0	275.0	362.5	1,474	825.0	217.8	333.0	117.3	140.2
Mean	7.48	10.2	6.45	4.13	9.82	11.7	49.1	26.6	7.26	10.7	3.78	4.67
Ac-ft	460	607	397	254	545	719	2,920	1,640	432	660	233	278

Calendar year 1961: Max 120 Min 1.7 Mean 12.8 Ac-ft 9,260
 Water year 1961-62: Max 101 Min 1.2 Mean 12.6 Ac-ft 9,140

Peak discharge (base, 100 cfs).--Apr. 23 (0215) 116 cfs (3.00 ft).

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

ARKANSAS RIVER BASIN

33

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 1962. 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.--34 years, 12.2 cfs (8,830 acre-ft per year).

Extremes.--Maximum discharge during year, 1,860 cfs July 16 (gage height, 6.80 ft), from rating curve extended above 245 cfs as explained below; minimum daily, 0.6 cfs Aug. 31.

1928-62: Maximum discharge, 4,050 cfs Aug. 17, 1961 (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; 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 Mar. 28 to June 29, July 9-29)

1.9	0.6	2.2	9.5	3.0	67
2.0	3.0	2.4	18	3.5	145
2.1	6.0	2.6	29	4.0	265

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.6	1.6	1.8	b10	b11	b9	3.4	4.7	2.3	9.2	2.6	0.8
2	1.5	1.6	1.8	b10	b11	b10	*2.7	4.5	4.8	8.8	2.2	1.3
3	1.4	1.5	1.8	b10	b11	b10	2.9	3.9	1.2	9.2	2.0	1.3
4	1.4	1.5	*1.8	b10	b11	b10	4.8	3.7	8.1	1.2	1.7	*1.1
5	1.3	1.5	b1.5	b10	b11	b10	5.5	3.4	3.3	1.2	1.4	1.1
6	1.3	*1.5	b1.2	b10	b11	b11	4.7	4.0	1.8	1.1	1.1	1.3
7	1.3	1.4	b10	b10	1.4	*1.1	4.0	*3.1	1.6	1.1	*9.2	1.3
8	1.2	1.4	b10	*b9	1.4	9.5	3.8	3.1	2.3	1.50	9.5	1.3
9	*1.2	1.5	b10	b8	*1.3	b8	3.5	2.8	3.3	*2.6	9.5	2.0
10	1.3	1.6	b9	b7	1.2	b8	3.6	2.3	6.4	1.5	9.2	2.0
11	1.3	1.5	b7	b7	1.3	b2	4.4	2.4	4.2	1.4	7.8	1.6
12	1.3	1.4	b7	b9	1.4	b3.5	4.8	2.1	3.0	1.2	7.0	1.3
13	1.2	1.4	b8	b9	1.8	b3.5	4.4	2.0	7.0	8.8	7.4	1.3
14	1.2	1.5	b10	b9	2.2	b3.5	4.4	1.4	*4.2	7.8	6.7	1.3
15	1.2	1.7	b10	b9	2.2	b4.5	5.0	8.8	3.3	8.8	5.4	1.8
16	1.1	1.8	b11	b10	2.2	b7	5.2	7.0	2.5	18.8	4.2	1.8
17	1.1	1.8	b12	b10	2.0	b10	5.6	8.1	3.0	3.2	5.1	1.8
18	9.9	b1.4	b12	b10	b15	b10	6.0	7.8	2.3	1.2	3.6	1.6
19	8.8	b1.3	b12	b10	b15	b10	6.8	7.4	1.6	7.8	3.6	1.6
20	8.8	b1.2	*b1.2	b10	b15	*1.1	7.8	8.1	2.0	6.0	4.5	*2.3
21	8.8	b1.2	b1.2	b11	b15	9.1	7.9	6.0	2.0	7.0	*6.0	2.3
22	8.8	b11	b12	b12	b15	7.8	8.7	4.8	2.0	1.3	4.2	2.5
23	8.8	b10	b10	b11	b15	8.1	9.5	3.3	2.0	*1.3	3.6	4.2
24	8.8	1.4	b10	b11	b15	1.5	7.7	3.3	2.8	7.2	2.8	4.8
25	9.2	1.4	b10	b11	b13	1.6	6.0	3.0	2.8	6.7	2.5	4.2
26	1.0	1.4	b12	b10	b11	1.3	*6.0	2.8	3.6	3.5	2.0	4.2
27	1.0	1.4	b11	b10	b9.5	1.8	6.1	4.2	3.9	4.2	2.5	5.1
28	1.0	1.5	b10	b10	b8	4.1	6.2	3.3	3.9	3.5	2.0	5.1
29	1.1	b1.3	b12	b11	-	4.8	6.6	2.5	4.5	3.0	1.3	5.4
30	1.3	b1.3	b12	b11	-----	4.5	5.1	2.3	5.7	5.1	.8	5.1
31	1.6	-----	b10	b11	-----	3.3	-----	2.0	-----	3.9	.6	-----
Total	360.9	431	360	306	396.5	415.5	1,631	518.7	112.2	965.4	231.0	72.8
Mean	11.6	14.4	11.6	9.9	14.2	13.4	54.4	16.7	3.74	31.1	7.45	2.43
Ac-ft	716	855	714	607	786	824	3,240	1,030	223	1,910	458	144

Calendar year 1961: Max 692 Min 0.4 Mean 23.7 Ac-ft 17,140
Water year 1961-62: Max 188 Min 0.6 Mean 15.9 Ac-ft 11,510

Peak discharge (base, 180 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
7-8	1530	6.15	1,380	7-24	2130	4.54	570
7-16	1820	6.80	1,860				

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

ARKANSAS RIVER BASIN

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

Location.--Lat 35°50'05", long 105°02'22", 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 1962.

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

Average discharge.--6 years, 54.4 cfs (44,230 acre-ft per year).

Extremes.--Maximum discharge during year, 7,050 cfs July 8 (gage height, 9.98 ft), from rating curve extended above 700 cfs on basis of slope-area measurements at gage heights 6.10, 7.36 and 9.98 ft; minimum, 2.7 cfs Mar. 11.

1956-62: Maximum discharge, that of July 8, 1962; 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, which are poor. Diversions for irrigation of about 17,000 acres above station.

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

Oct. 1 to July 8

July 9 to Sept. 30

1.7	12	2.8	205	1.7	3.4	2.5	78
1.8	20	3.4	397	1.9	9.6	2.9	174
2.1	58	4.0	625	2.2	31	3.4	350
2.4	107	4.5	870				

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	62	62	54	b45	b34	b16	74	101	57	68	163	16
2	62	58	54	b45	b33	b18	65	96	85	58	145	9.6
3	66	54	54	b45	b35	b21	59	83	96	52	85	9.2
4	66	52	*54	b45	b36	b23	*68	68	78	57	70	*8.1
5	59	53	b47	b45	*37	*26	90	62	69	61	58	7.0
6	49	52	b44	b45	33	26	86	65	65	80	*41	6.6
7	47	50	b42	b45	34	24	85	*68	68	90	36	7.8
8	44	*49	b42	*b45	33	24	74	57	58	*634	36	7.4
9	*44	52	b42	b30	33	26	74	59	94	*127	32	7.8
10	44	56	b40	b21	33	27	74	58	86	68	28	7.8
11	48	53	b30	b12	33	b14	78	64	85	56	21	8.5
12	49	50	b14	b14	36	b14	82	66	*78	44	21	9.2
13	49	53	b23	b22	38	b14	82	62	288	47	23	11
14	50	57	b30	b30	46	b14	88	68	346	26	21	12
15	54	58	b40	b30	46	b18	107	59	105	20	18	12
16	53	64	b50	b30	43	b22	136	54	92	113	17	13
17	50	64	b45	b30	40	36	160	47	85	130	14	14
18	44	61	*b45	b30	37	36	170	43	78	46	13	12
19	38	56	b45	b30	32	37	199	33	61	32	12	12
20	38	53	b45	b30	32	*34	232	29	46	30	12	*30
21	38	58	b45	b33	32	33	241	30	30	28	*12	20
22	39	58	b45	b33	26	32	250	32	22	26	12	18
23	40	54	b45	b33	b23	30	259	29	14	*44	10	16
24	43	53	b45	b33	b21	32	220	29	17	322	9.2	16
25	40	53	b45	b33	b21	39	170	28	27	343	9.2	17
26	42	53	b45	b33	b18	38	*155	23	26	150	8.9	16
27	46	53	b45	b37	b18	36	153	26	37	136	10	16
28	49	54	b45	b37	b18	67	134	28	38	101	8.5	16
29	53	53	b45	b37	-	90	122	28	30	90	6.6	15
30	58	54	b45	b37	-----	88	118	27	31	94	5.1	16
31	69	-----	b45	b37	-----	78	-----	27	-----	78	5.1	-----
Total	1,533	1,650	1,335	1,052	901	1,033	3,905	1,549	2,292	3,251	9,626	387.0
Mean	49.5	55.0	43.1	33.9	32.2	33.3	130	50.0	76.4	105	31.1	12.9
Ac-ft	3,040	3,270	2,650	2,090	1,790	2,050	7,750	3,070	4,550	6,450	1,910	768

Calendar year 1961: Max 1,130 Min 10 Mean 94.1 Ac-ft 68,120
 Water year 1961-62: Max 634 Min 5.1 Mean 54.4 Ac-ft 39,370

Peak discharge (base, 450 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
6-13	2330	8.15	4,000	7-25	1620	5.12	1,200
7- 8	1510	9.98	7,050	8- 1	2240	5.28	1,310
7-16	unknown		1,000				

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

ARKANSAS RIVER BASIN

35

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

Location.--Lat 35°46'10", long 105°15'05", in Las Vegas Grant, on right bank 20 ft downstream from highway crossing in Sapello, San Miguel County.

Records available.--June 1956 to September 1962.

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

Extremes.--1956-62: 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 37).

Monthly discharge, in cubic feet per second, water year October 1961 to September 1962				
Month	Maximum	Minimum	Mean	Runoff in acre-feet
October	0	0	0	0
November	0	0	0	0
December	0	0	0	0
Calendar year 1961	2.1	0	0.25	182
January	0	0	0	0
February	0	0	0	0
March	0	0	0	0
April	0	0	0	0
May	.7	0	.07	.44
June	.7	.1	.39	23
July	.6	.1	.29	18
August	.6	0	.22	13
September	.2	0	.07	4.0
Water year 1961-62	0.7	0	0.09	62.4

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 1962.

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

Average discharge--6 years, 13.7 cfs (9,920 acre-ft per year).

Extremes--Maximum discharge during year, 133 cfs July 17 (gage height, 2.97 ft); minimum, 0.7 cfs June 22.

1956-62: 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, 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)

1.0	0.6	1.2	1.6	1.4	4.0	1.7	12.
1.1	1.0	1.3	2.6	1.5	6.0	2.0	28

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12	11	8.3	b 10	b 7	* b 6	b 5	10	5.6	3.4	* 18	0.9
2	12	7.3	8.3	b 10	b 6.5	b 7	b 7	11	5.0	1.8	11	1.1
3	13	6.8	8.3	b 10	b 6	b 6	8.9	8.9	3.9	1.9	9.3	1.1
4	* 12	7.3	8.3	b 9	b 6	b 5.5	8.9	9.6	3.4	1.9	7.6	1.0
5	12	8.1	b 8	b 8	b 6	b 5	12	8.9	4.1	* 5.9	6.3	1.2
6	12	9.3	* b 7.5	b 9	b 6.5	b 5	12	10	2.2	4.6	5.4	1.9
7	11	8.9	b 7.5	b 9	b 7	5.6	11	9.3	1.8	3.8	4.8	2.6
8	11	* 8.9	b 7	b 7	* 7.8	5.8	9.6	8.3	1.6	3.4	* 4.8	2.0
9	14	10	b 7	b 5	8.1	b 4.5	9.7	10	2.1	3.4	4.6	2.0
10	16	9.7	b 6	b 4	8.1	b 3.5	8.1	10	2.2	1.9	3.0	* 2.0
11	12	7.3	b 5	b 4	8.1	b 4	* 8.6	9.6	2.2	1.5	2.2	1.9
12	11	7.3	b 5	b 5	8.3	b 4	9.6	10	* 2.1	3.1	3.0	1.5
13	10	8.5	b 6	b 4.5	8.1	b 4	9.6	11	2.1	2.9	3.0	1.1
14	10	10	b 7	b 4.5	7.8	b 3.5	11	12	1.7	1.8	2.0	1.3
15	9.6	12	b 8	b 4.5	7.0	b 4	14	* 10	1.3	1.9	1.9	1.4
16	9.6	12	b 9	b 5	6.5	b 4.5	16	9.6	1.2	2.1	1.9	1.2
17	9.3	11	b 10	b 6	b 6	b 5	12	9.3	1.1	2.3	1.9	1.3
18	8.9	b 10	b 10	* b 6	b 5.5	b 6	14	7.8	1.2	8.3	1.8	1.2
19	9.3	b 10	b 10	b 6	b 6	b 6	18	6.8	1.1	9.9	1.6	1.1
20	9.3	b 10	b 10	b 6	b 6	7.8	21	7.0	1.1	7.0	1.9	1.9
21	8.9	11	b 10	b 6	b 6	6.5	23	5.6	.9	5.0	2.0	1.6
22	8.9	b 10	b 11	b 6	b 6	* 5.8	26	6	.8	4.8	1.5	1.4
23	8.6	9.6	b 11	b 6	b 6.5	4.4	24	5.6	.8	6.6	1.5	2.0
24	8.3	9.6	b 10	b 6	b 6	4.4	18	4.4	.9	9.9	1.4	3.3
25	7.8	9.6	b 11	b 6	b 5.5	4.2	* 17	3.4	.9	2.5	1.4	4.2
26	7.8	11	b 12	b 6	b 5	4.4	18	3.3	1.6	1.8	1.3	3.2
27	5.8	11	b 11	b 6	b 5	4.4	14	3.0	2.5	1.1	1.2	2.4
28	5.4	10	* b 10	b 6	b 4.5	5.0	14	3.0	5.9	1.6	1.1	2.3
29	5.8	9.6	b 11	b 6	-	4.6	8.6	3.0	3.0	1.5	.9	1.6
30	13	9.6	b 12	b 6	-----	5.8	10	2.5	2.8	1.8	.8	2.0
31	17	-----	b 10	b 6.5	-----	b 5	-----	2.7	-----	2.0	.8	-----
Total	321.3	286.4	275.2	199.0	182.8	157.2	399.6	231.6	65.1	242.8	109.9	53.7
Mean	10.4	9.55	8.88	6.42	6.53	5.07	13.3	7.47	2.17	7.83	3.55	1.79
Ac-ft	637	568	546	395	363	312	793	459	129	482	218	107

Calendar year 1961: Max 326 Min 5 Mean 26.4 Ac-ft 19,090
 Water year 1961-62: Max 26 Min 0.8 Mean 6.92 Ac-ft 5,010

Peak discharge (base, 120 cfs).--July 17 (1600) 133 cfs (2.97 ft).

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

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

Location.--Lat 35°46'10", long 105°15'05", 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 1956 to September 1962. 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.--11 years (1915-20, 1956-62), 29.5 cfs (21,360 acre-ft per year).

Extremes.--Maximum discharge during year, 1,320 cfs Aug. 15 (gage height, 4.01 ft); minimum, 1.3 cfs June 17, 18, 21, 30. 1915-20, 1956-62: 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 35).

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

0.8	1.0	1.1	10	1.5	32
.9	3.1	1.2	14.5	1.7	50
1.0	6.3	1.3	20.0	1.8	61

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	22	19	14	b 12	b 13	b 11	13	16	4.9	2.4	* 5.3	2.4
2	22	14	14	b 12	b 13	b 11	13	15	6.3	3.1	2.9	2.4
3	22	14	14	b 12	b 13	b 11	13	14	7.0	3.1	2.3	2.4
4	* 21	14	14	b 12	b 13	b 11	13	13	4.9	3.4	1.9	2.4
5	19	14	b 12	b 11	b 13	b 11	14	12	4.6	* 8.2	1.6	2.4
6	19	15	* b 12	b 11	b 13	11	16	12	3.7	5.9	1.4	2.1
7	18	16	13	b 11	b 13	11	14	14	3.4	7.8	1.3	2.4
8	18	* 16	13	b 11	* 13	11	13	12	3.4	3.4	* 1.2	2.6
9	19	17	b 12	b 10	13	b 10	14	12	3.7	3.1	1.1	2.4
10	24	17	b 10	b 9	13	b 9	14	12	3.4	3.1	9.6	* 2.1
11	21	14	b 9	b 8	14	b 10	* 14	11	2.6	2.8	7.4	2.1
12	19	14	b 9	b 9	14	b 10	13	12	* 3.1	9.9	1.9	1.5
13	18	14	b 9	b 10	14	b 10	12	13	1.3	6.3	1.0	1.9
14	18	16	b 11	b 10	14	b 9	11	13	5.2	4.0	7.2	2.1
15	17	17	b 12	b 11	13	b 9	16	* 12	2.6	3.1	4.5	1.9
16	18	17	12	b 12	13	b 10	19	12	2.1	2.8	1.1	1.9
17	18	17	b 13	b 12	13	b 11	17	12	1.7	4.5	5.9	1.9
18	18	18	b 13	* b 12	12	12	18	12	1.5	1.1	5.2	2.1
19	18	16	b 13	b 12	12	12	16	10	1.7	4.6	4.3	2.1
20	16	16	b 13	b 13	b 11	12	22	10	1.7	9.0	4.6	2.4
21	15	19	b 13	14	b 11	11	22	10	1.7	4.6	4.6	2.4
22	15	17	14	14	b 11	* 11	28	9.6	1.7	4.0	4.3	2.1
23	15	17	b 13	13	b 11	10	27	9.6	1.5	6.0	4.0	2.4
24	14	17	b 13	13	b 11	11	19	9.3	1.7	1.7	3.7	3.1
25	14	16	b 13	13	b 11	9.6	* 16	8.5	1.7	2.7	3.7	4.0
26	14	15	13	13	b 11	9.3	19	5.6	1.9	5.2	3.4	4.0
27	14	15	13	b 14	b 11	9.6	19	4.6	4.2	2.3	3.1	3.7
28	13	16	* b 12	b 14	* b 10	9.6	16	4.3	3.1	1.7	2.8	3.7
29	13	16	b 12	b 14	-	10	15	4.0	2.6	2.1	2.6	3.4
30	14	15	b 12	b 14	-----	12	15	4.6	4.7	4.0	1.9	3.4
31	22	-----	b 12	b 13	-----	12	-----	4.6	-----	5.1	2.5	-----
Total	548	478	381	369	347	327.1	491	323.7	105.3	417.2	355.8	75.7
Mean	17.7	15.9	12.3	11.9	12.4	10.6	16.4	10.4	3.51	13.5	11.5	2.52
Ac-ft	1,090	948	756	732	688	649	974	642	209	828	706	150

Calendar year 1961: Max 683 Min 8 Mean 49.0 Ac-ft 35,510
 Water year 1961-62: Max 59 Min 1.5 Mean 11.6 Ac-ft 8,370

Peak discharge (base, 800 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
7-6	1700	3.53	845	8-15	2220	4.01	1,320
7-26	1910	3.91	1,220				

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

ARKANSAS RIVER BASIN

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

Location.--Lat 35°44'40", long 105°09'30", in Mora Grant, 1 mile northwest of the site of Los Alamos and 5 miles southeast of Sapello.

Records available.--September 1956 to September 1962.

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

Extremes.--1956-62: Maximum daily discharge, 190 cfs Oct. 20, 1957; no flow at times.

Remarks.--Records good except those for December to February, 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 1961 to September 1962

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October	19	0	5.32	327
November	20	13	16.2	966
December	16	0	.89	55
Calendar year 1961	71	0	7.18	5,200
January	.1	0	.06	3.6
February	6	0	2.15	119
March	8.5	.3	5.44	335
April	22	2.1	7.77	462
May	3.9	.6	2.24	137
June	16	0	1.75	104
July	66	.1	11.1	681
August	50	0	8.49	522
September	.2	0	.23	1.4
Water year 1961-62	66	0	5.13	3,710

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

Location.--Lat 35°46'05", long 105° 02' 28", on line between Mora and Las Vegas Grant, 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 1962.

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

Average discharge.--6 years, 19.7 cfs (14,260 acre-ft per year).

Extremes.--Maximum discharge during year, 2,510 cfs Aug. 2 (gage height, 8.90 ft); minimum daily, 0.1 cfs Sept. 14-19.

1956-62: 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)
(Shifting-control method used Oct. 19 to Dec. 3, Aug. 29 to Sept. 30)

1.1	0.1	1.4	2.4	1.8	20	3.0	169
1.2	.4	1.5	4.8	2.0	38	3.5	261
1.3	1.0	1.6	8.4	2.5	95	4.0	365

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	22	4.3	1.8	b 11	a 12	b 1.5	6.2	9.9	1.8	a 5	1.8	0.7
2	21	3.4	2.0	b 11	a 12	b 1.5	5.9	1.0	3.1	a 2.5	3.46	1.3
3	21	2.9	1.3	b 11	a 12	b 1.5	6.2	1.0	3.6	a 2.5	1.3	.8
4	20	2.9	*1.4	b 11	a 12	b 1.5	*5.5	1.0	1.8	a 3	8.9	.6
5	20	2.6	b 11	b 11	*1.2	*b 2	5.2	9.9	1.3	a 2.0	5.2	.5
6	19	2.9	b 11	b 11	1.2	b 2	4.8	8.4	1.1	a 10.0	*4.1	*.6
7	19	2.6	b 11	b 11	1.6	2.0	5.2	*9.4	1.0	a 10	3.8	.6
8	19	*2.6	b 11	*b 11	1.4	1.8	4.8	9.4	1.1	a 3.5	3.1	.5
9	*19	2.6	b 10	*b 10	1.4	b 1.5	5.2	9.9	1.7	a 2	2.4	.4
10	22	2.6	b 8	b 8	1.4	b 1.5	5.2	9.4	2.0	*1.6	2.0	.3
11	2.4	2.4	b 7	b 6.5	1.4	b 1	8.4	7.7	1.4	1.3	1.7	.2
12	2.2	2.3	b 6	b 5	1.4	b 1	4.8	6.6	*1.3	1.7	1.3	.2
13	2.2	2.3	b 8	b 7	1.2	b 1	4.6	5.9	4.7	.9	1.1	.2
14	2.2	2.4	b 10	b 10	1.2	b 1	4.8	5.9	4.9	.8	.9	.1
15	2.2	2.9	b 11	b 11	1.2	b 1	5.2	5.9	3.4	1.1	.8	.1
16	2.1	2.4	b 12	b 1.2	1.2	b 1.5	5.5	5.9	2.9	1.3	3.8	.1
17	2.1	2.3	b 12	b 1.2	9.4	b 1.5	4.8	5.5	1.8	1.3	3.4	.1
18	2.1	b 2	*b 12	b 12	b 7.5	b 1.5	4.6	5.5	1.6	1.3	2.4	*.1
19	1.1	b 2	b 12	b 12	b 6	b 1.5	3.6	5.5	1.8	1.3	1.8	.1
20	7.7	2.0	b 12	b 12	b 4.5	*b 1.5	3.8	5.2	1.8	1.4	1.1	1.5
21	7.7	2.4	b 12	b 12	b 3.5	b 1.5	3.6	4.6	1.7	1.3	*1.1	.7
22	5.5	2.1	b 12	b 12	b 3	b 1.5	3.8	4.6	1.6	1.1	1.1	.5
23	5.5	2.1	b 12	b 12	b 2	b 1.5	*3.1	4.6	1.1	*3.1	1.1	.4
24	5.9	2.0	b 12	b 12	b 1.5	b 2	5.8	3.1	1.0	5.6	1.1	.6
25	5.9	2.0	b 12	b 12	b 1.5	b 2	8.0	2.1	1.0	2.5	1.0	.9
26	5.5	2.0	b 12	b 12	b 1.5	2.3	8.4	1.8	a 1	8.1	.9	1.0
27	5.5	2.1	b 12	a 12	b 1.5	2.1	9.9	1.6	a 5	5.0	.8	1.4
28	5.2	2.1	b 12	a 12	b 1.5	2.0	9.9	1.6	a 2	3.8	.7	1.4
29	4.8	2.0	b 11	a 12	-	4.6	9.9	1.6	a 2	2.4	.5	1.1
30	5.2	2.1	b 11	a 12	-----	6.2	9.4	1.4	a 2.5	1.8	.4	1.0
31	5.5	-----	b 11	a 12	-----	6.6	-----	1.4	-----	4.3	.4	-----
Total	457.9	73.3	323.8	337.5	249.4	61.6	176.1	184.3	129.6	269.0	417.7	18.0
Mean	14.8	2.44	10.4	10.9	8.91	1.99	5.87	5.95	4.32	8.68	13.5	0.60
Ac-ft	908	145	642	669	495	122	349	366	257	534	828	36

Calendar year 1961: Max 428 Min 1.8 Mean 38.8 Ac-ft 28,090
Water year 1961-62: Max 346 Min 0.1 Mean 7.39 Ac-ft 5,350

Peak discharge (base, 500 cfs).--Aug. 2 (0100) 2,510 cfs (8.90 ft).

* Discharge measurement made on this day.

a No gage-height record.

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 1962. 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 upstream at different datum.Average discharge.--44 years (1914-18, 1919-24, 1927-62), 61.8 cfs (44,740 acre-ft per year).Extremes.--Maximum discharge during year, 8,890 cfs June 14 (gage height, 10.20), from rating curve extended above 2,800 cfs as explained below; minimum, 1.6 cfs Sept. 10.

1914-62: 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)

0.3	1.0	0.7	14	2.0	192	4.0	1,060
.4	2.6	1.0	35	2.5	335	5.0	1,790
.5	5.3	1.5	98	3.0	535		

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	94	75	63	b 55	b 50	b 20	45	86	57	68	95	23
2	86	69	63	b 55	b 50	b 25	46	77	92	64	478	24
3	90	66	61	b 55	b 50	b 30	41	72	48	64	120	23
4	92	64	67	b 55	b 50	b 30	35	61	41	61	96	21
5	84	63	65	b 55	* 47	* 28	51	49	31	61	79	21
6	73	64	b 60	b 55	33	26	58	51	26	18	* 70	* 20
7	66	61	b 55	b 55	31	25	58	52	24	61	59	20
8	59	51	b 55	b 55	36	24	49	37	40	430	53	20
9	60	52	b 55	b 40	42	16	46	25	36	344	47	21
10	64	53	b 55	b 30	42	14	42	24	72	* 102	35	20
11	67	64	b 35	b 20	35	b 15	40	22	77	73	28	23
12	64	60	b 20	b 15	34	b 15	37	25	* 72	46	24	23
13	65	60	b 30	b 20	36	b 15	39	23	73	40	24	21
14	66	64	b 45	b 40	40	b 15	40	23	1520	34	19	23
15	66	67	b 60	b 40	45	b 20	59	25	111	30	16	23
16	69	67	b 60	b 40	41	b 25	77	22	83	22	11	31
17	65	71	b 60	b 40	33	27	98	16	70	145	87	34
18	64	67	* b 60	b 40	31	27	103	14	63	49	76	40
19	55	69	b 55	b 40	28	26	107	14	46	40	72	45
20	47	* 61	b 55	b 40	25	20	143	87	31	27	76	72
21	48	64	b 55	b 45	25	15	156	* 87	21	32	72	48
22	45	67	b 55	b 45	24	15	177	72	16	23	61	50
23	* 47	64	b 55	b 45	b 20	15	* 196	72	11	24	57	57
24	48	60	b 55	b 45	b 20	13	172	96	91	388	61	61
25	49	61	b 55	b 45	b 20	14	141	57	13	587	50	76
26	48	60	b 55	b 45	b 20	18	121	61	96	275	37	80
27	51	60	b 55	b 45	b 20	21	121	61	87	184	37	83
28	53	61	b 55	b 50	b 20	18	116	57	83	136	31	72
29	57	61	b 55	b 50	-	40	100	72	87	125	26	57
30	61	61	b 55	b 50	-----	52	98	68	68	122	21	50
31	66	-----	b 55	b 50	-----	55	-----	57	-----	118	21	-----
Total	1,969	1,837	1,684	1,360	948	719	2,612	802.7	2,591.1	3,506.8	1,332.5	118.2
Mean	63.5	62.9	54.3	43.9	33.9	23.2	87.1	25.9	86.4	113	43.0	3.94
Ac-ft	3,910	3,740	3,340	2,700	1,880	1,430	5,180	1,590	5,140	6,960	2,640	234

Calendar year 1961: Max 1,770 Min 5.3 Mean 129 Ac-ft 93,190
 Water year 1961-62: Max 1,520 Min 2.0 Mean 53.5 Ac-ft 38,740

Peak discharge (base, 800 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
6-14	0200	10.20	8,890	7-25	2145	5.50	2,220
7-8	2200	6.50	3,240	8-2	0700	4.78	1,610

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

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

Location.--Lat 35°39'15", long 104°22'30", in S½ 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 1962. 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.--29 years, 239 cfs (173,000 acre-ft per year).

Extremes.--Maximum discharge during year, 6,610 cfs July 24 (gage height, 5.48 ft); minimum, 1 cfs Sept. 16.

1912-14, 1935-62: 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 good except those for periods of ice effect or doubtful gage-height record, 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)

-0.05	1	0.1	10	0.4	55	1.0	260	2.0	1,040
0.0	3	.2	19	.6	107	1.4	520	3.0	2,020

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	143	93	99	b90	107	b35	60	228	8	47	422	24
2	133	96	99	b85	110	b40	67	191	10	47	*417	24
3	120	117	99	b80	113	45	60	168	9	47	486	29
4	113	110	101	b75	123	51	62	168	8	41	191	12
5	117	104	*99	b55	123	57	60	157	6	*250	153	6
6	113	99	96	b60	123	69	57	150	35	444	133	4
7	113	*96	99	b60	101	72	62	123	*37	101	110	4
8	101	96	99	b55	90	62	69	*117	77	69	96	7
9	93	96	96	b55	79	60	72	113	67	546	77	8
10	*93	96	96	b40	85	55	67	85	250	512	65	9
11	82	93	b85	*b45	85	45	65	62	265	175	57	8
12	79	93	b80	b50	82	41	67	67	215	117	47	*5
13	79	96	b70	b50	74	37	*69	65	270	85	41	4
14	90	96	b75	b50	*69	*35	60	57	1,050	79	37	2
15	90	101	b80	b55	67	39	57	49	806	57	32	2
16	87	107	b100	b50	67	45	69	51	322	47	29	1
17	90	107	b100	b50	65	60	96	51	187	41	22	2
18	87	110	b100	b50	65	60	133	60	133	62	21	2
19	90	113	d90	b50	65	60	175	51	107	90	15	2
20	87	110	d90	b55	60	55	171	39	90	53	12	5
21	90	110	d100	b70	55	51	256	27	*67	49	9	8
22	77	104	d100	b50	53	47	316	27	51	37	8	77
23	72	99	d100	b70	51	43	398	25	39	43	7	110
24	67	104	d100	*b80	45	41	*405	21	32	610	5	69
25	65	96	d110	b80	45	33	391	15	27	*1,770	4	62
26	62	96	d110	b70	*43	32	384	12	22	1,990	4	60
27	65	96	b90	b80	39	30	322	9	39	983	6	51
28	65	101	b80	b85	b35	*27	280	7	55	412	8	37
29	67	101	b90	b90	-----	27	220	8	85	295	6	29
30	74	101	b90	b95	-----	29	270	6	55	1,010	5	24
31	87	-----	b90	b100	-----	33	-----	5	-----	1,330	4	-----
Total	2,791	3,037	2,913	2,050	2,119	1,416	4,840	2,214	4,424	11,439	2,529	687
Mean	90.0	101	94.0	66.1	75.7	45.7	161	71.4	147	369	81.6	22.9
Ac-ft	5,540	6,020	5,780	4,070	4,200	2,810	9,600	4,390	8,770	22,690	5,020	1,360

Calendar year 1961: Max 2,100 Min 18 Mean 251 Ac-ft 181,500
 Water year 1961-62: Max 1,990 Min 1 Mean 111 Ac-ft 80,250

Peak discharge (base, 5,000 cfs). --July 24 (2215) 6,610 cfs (5.48 ft).

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

d Doubtful gage-height record.

ARKANSAS RIVER BASIN

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 1962.

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.--26 years, 19.5 cfs (14,120 acre-ft per year).

Extremes.--Maximum discharge during year, 7,500 cfs Aug. 1 (gage height, 9.50 ft), from rating extended above 760 cfs on basis of slope-area measurements at gage heights 10.0 and 19.5 ft; no flow at times.

1936-62: 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 fair 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)
(Shifting-control method used Aug. 3 to Sept. 30)

0.06	0.0	0.3	1.0	0.7	4.9	2.0	101	3.5	820
.1	.1	.4	1.7	1.0	9.3	2.5	266	4.0	1,170
.2	.5	.5	2.6	1.5	26	3.0	515		

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.4	1.1	0.9	b1	0.9	b0.4	0.7	0.1	0.4	0.1	1.000	1.3
2	1.4	1.1	.9	b1	.9	b.6	.6	.1	.3	0	*1.070	1.1
3	1.3	1.1	1.0	b1	.9	b.8	.6	.1	5.5	*1.0	4.5	1.2
4	1.3	1.0	1.0	b1	.8	.9	.6	.1	5.8	1.28	2.6	1.0
5	1.3	.9	*1.0	b1	.8	.9	.8	.1	1.4	3.2	1.9	.8
6	1.1	1.0	1.0	b1	b.8	.9	.7	.1	.8	2.21	1.4	1.0
7	.9	*1.1	b1	b1	.8	.8	.7	.1	*1	4.2	1.1	1.0
8	.8	1.1	b1	b1	.8	.7	.7	*.1	.1	7.7	9.1	1.0
9	.9	1.4	b.9	a.8	.6	.8	.7	.1	.1	2.02	7.7	.9
10	*.8	1.3	b.8	a.6	.7	.7	.6	.1	.1	4.1	6.5	1.0
11	.7	1.2	b.6	*b.8	.7	.5	.8	.1	.1	1.9	5.4	.8
12	.7	1.2	b.4	b1	.7	.6	.6	.1	.1	1.3	4.7	.8
13	.6	1.0	b.3	b1	.7	b.8	*.5	.1	.1	1.1	4.1	.8
14	.6	1.6	b.5	b1	*.7	1.0	.4	.1	.1	1.2	3.5	.8
15	.7	2.0	b1	b1	.6	.9	.3	0	.1	1.0	3.0	.8
16	.7	1.6	b1.2	b1	.6	1.0	.3	.1	0	9.3	2.6	1.0
17	.7	1.6	b1	b1	.6	.9	.2	0	a0	1.1	2.2	1.6
18	.6	1.7	b1	b1	.6	.8	.3	.1	a0	1.1	1.8	4.3
19	.6	1.6	b1	b1	.7	.8	.4	.1	a0	.9	1.6	1.9
20	.6	1.6	b1	b1	.7	.7	.2	.1	a0	9.9	1.6	5.0
21	.5	1.6	b1	b1	.6	.7	.1	0	0	6.5	1.5	*1.5
22	.5	1.4	1.4	b1.2	.6	.6	.1	0	0	1.8	1.3	1.3
23	.5	1.4	b1	b1.4	.6	.5	.1	.1	0	4.4	1.1	8.3
24	.5	1.2	b1	*1.6	.6	.8	*.1	.1	0	2.03	1.0	6.6
25	.5	1.1	b1	1.6	.7	.7	.1	.1	0	*9.3	.9	7.2
26	.5	.8	b1	1.4	*.6	.6	.1	0	0	4.18	.8	8.0
27	.7	.9	1.1	1.4	b.4	.6	.2	0	.1	5.7	.8	5.0
28	.6	1.0	1.2	1.1	b.3	*.5	.2	0	.7	3.55	.7	3.7
29	.5	1.1	*1.4	1.1	-	.4	.1	0	.3	2.34	*.7	2.6
30	.9	1.0	b1	1.0	-----	.6	.1	0	.1	1.01	.7	2.1
31	1.4	-----	b1	1.0	-----	.8	-----	.3	-----	7.1	.7	-----
Total	24.8	37.7	29.6	33.0	19.0	22.3	11.9	2.4	16.3	3178.2	2249.0	161.7
Mean	0.80	1.26	0.95	1.06	0.68	0.72	0.40	0.08	0.54	103	72.5	5.39
Ac-ft	49	75	59	65	38	44	24	4.8	32	6,300	4,460	321

Calendar year 1961: Max 716 Min 0 Mean 6.86 Ac-ft 4,960
Water year 1961-62: Max 1,070 Min 0 Mean 15.9 Ac-ft 11,470

Peak discharge (base, 1,500 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
7- 8	2015	8.50	6,040	8- 1	2120	9.50	7,500
7-28	1740	4.92	1,900				

* Discharge measurement made on this day.

a No gage-height record.

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 1½ miles north of Conchas Dam Post Office, San Miguel County.

Records available.--October 1942 to September 1962.

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

Extremes.--1942-62: 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 1961 to September 1962

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October	4.2	0	1.07	66
November	0	0	0	0
December	0	0	0	0
Calendar year 1961	17	0	2.29	1,660
January	0	0	0	0
February	.5	0	.04	2.0
March	10	0	7.24	445
April	13	0	9.26	551
May	12	0	6.41	394
June	7.0	0	1.98	118
July	6.6	0	1.48	91
August	12	0	6.52	401
September	12	0	8.15	485
Water year 1961-62	13	0	3.53	2,550

7-2233. Conchas Canal below Conchas Dam, N. Mex..

Location.--Lat 35°21'45", long 104°10'15", in S½ sec. 3, T. 13 N., R. 26 E., on left bank at upstream end of tunnel transition section, about 1 mile downstream from headgates in Conchas Dam and 22 miles north of Newkirk.

Records available.--September 1945 to June 1949, April 1954 to June 1955, September 1961 to September 1962.

Gage.--Water-stage recorder and concrete control. Datum of gage is 4,156.9 ft above mean sea level (from Bureau of Reclamation elevation of concrete structure). Prior to Nov. 19, 1948, at site three-quarters of a mile upstream at different datum.

Extremes.--1945-49, 1954-55, 1961-62, 751 cfs Aug. 31, 1961; no flow during most of each winter period.

Remarks.--Records good above 100 cfs and fair below except those for Oct. 21 to Nov. 1 and May 19 to June 4, which are poor. No diversion or wasteway between canal headworks and gage.

Monthly discharge, in cubic feet per second, September 1961 to September 1962

Month	Maximum	Minimum	Mean	Runoff in acre-feet
September	a503	151	220	13,110
October	304	0	167	10,270
November	4	0	.7	42
December	1	0	.03	2.0
Calendar year 1960-61	-	0	-	-
January	1	0	.03	2.0
February	4	0	.2	9.9
March	421	0	175	10,740
April	401	163	279	16,610
May	430	190	329	20,210
June	358	154	248	14,740
July	472	139	288	17,680
August	622	3	385	23,700
September	450	5	254	15,090
Water year 1961-62	622	0	178	129,100

a Exceeded by 751 cfs Aug. 31, 1961 (only day of record in August).

ARKANSAS RIVER BASIN

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 1962.

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

Extremes.--Maximum contents during year, 371,400 acre-ft Feb. 7 (elevation, 4,201.13 ft); minimum, 299,500 acre-ft Sept. 30 (elevation, 4,193.02 ft).

1938-62: 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 preceding page) 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 1961 to September 1962

Date	Elevation (feet) †	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	4,201.08	371,000	-
Oct. 31.....	4,200.16	362,200	-8,800
Nov. 30.....	4,200.45	364,900	+2,700
Dec. 31.....	4,200.78	368,100	+3,200
Calendar year 1961....	-	-	-3,100
Jan. 31.....	4,201.06	370,800	+2,700
Feb. 28.....	4,200.95	369,700	-1,100
Mar. 31.....	4,199.64	357,300	-12,400
Apr. 30.....	4,198.45	346,400	-10,900
May 31.....	4,196.04	325,000	-21,400
June 30.....	4,194.85	314,800	-10,200
July 31.....	4,197.16	334,800	+20,000
Aug. 31.....	4,195.10	316,900	-17,900
Sept. 30.....	4,193.02	299,500	-17,400
Water year 1961-62....	-	-	-71,500

† Elevation at 2400.

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 1962.

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.--21 years (1941-62), 103 cfs (74,570 acre-ft per year).

Extremes.--Maximum discharge during year, 354 cfs Mar. 10 (gage height, 5.78 ft); minimum daily, 1 cfs June 16-20.

1936-62: Maximum discharge, 73,000 cfs June 3, 1937; maximum gage height, 20.34 ft May 30, 1938, present datum (back-water 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 43) 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.

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	38	8	8	4	16	10	5	5	3	3	3	3
2	14	9	6	4	19	39	5	4	3	2	3	3
3	5	5	5	4	22	18	5	4	3	3	* 3	3
4	15	5	5	5	30	3	* 5	4	3	3	4	2
5	3	5	5	5	28	2	5	4	* 3	2	4	2
6	6	5	5	5	34	7	5	4	3	2	4	2
7	27	5	5	5	49	35	5	4	3	2	4	2
8	6	5	6	5	95	18	5	4	3	2	4	2
9	2	6	6	4	35	12	5	* 4	4	4	4	2
10	13	5	5	4	40	107	5	4	4	2	4	2
11	5	5	5	7	24	28	5	4	3	2	4	2
12	2	4	5	8	30	* 4	6	4	6	2	3	2
13	* 3	4	6	27	43	2	5	4	7	2	3	2
14	4	4	13	7	* 27	2	5	4	4	2	3	2
15	5	4	* 9	4	21	5	5	4	2	2	3	2
16	6	3	14	* 4	43	6	5	5	1	2	3	3
17	8	3	7	11	87	6	5	5	1	* 2	3	3
18	8	3	7	4	13	8	5	6	1	2	3	3
19	8	3	5	3	13	7	5	4	* 1	2	3	2
20	10	* 3	4	17	36	* 11	5	4	1	2	3	2
21	10	3	4	11	39	8	5	4	2	3	4	2
22	10	3	5	3	47	7	4	4	2	3	* 3	2
23	11	3	4	3	19	8	5	5	2	3	3	2
24	11	3	4	9	5	6	4	5	2	5	3	3
25	12	5	6	5	44	4	4	3	3	8	3	3
26	10	6	5	6	5	3	5	3	3	5	3	2
27	12	4	4	11	3	3	5	3	3	4	3	2
28	15	4	4	8	2	6	5	3	2	3	3	3
29	10	2	4	9	-	6	5	3	2	3	3	3
30	8	8	4	11	-----	5	6	2	2	3	3	2
31	8	-----	4	15	-----	5	-----	3	-----	3	3	-----
Total	305	135	179	228	869	391	149	123	82	88	102	70
Mean	9.8	4.5	5.8	7.4	31.0	12.6	5.0	4.0	2.7	2.8	3.3	2.3
Ac-ft	605	268	355	452	1,720	776	296	244	163	175	202	139

Calendar year 1961: Max 2,380 Min 1 Mean 105 Ac-ft 76,120
 Water year 1961-62: Max 107 Min 1 Mean 7.5 Ac-ft 5,400

* Discharge measurement made on this day.

ARKANSAS RIVER BASIN

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 a mile downstream 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 1962. 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.--20 years, 30.8 cfs (22,300 acre-ft per year).

Extremes.--Maximum discharge during year, 3,600 cfs July 31 (gage height, 4.50 ft); no flow at times.

1942-62: 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 2 or 3 times a month. Diversions for irrigation of a few hundred 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 July 25-31, Sept. 16-25)

1.5	0.1	1.8	15	2.4	305
1.6	1.0	2.0	65	2.6	505
1.7	4.5	2.2	145	2.8	745

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	19	1	1	a7			0	0	a0	58	0
2	0	15	1	1	a2			0	0	0	25	0
3	0	4	1	1	b2			0	0	0	10	0
4	0	2	1	1	b2			0	0	0	2	0
5	0	1	1	1	1			0	0	0	0	0
6	0	1	1	1	1			0	0	0	0	0
7	0	1	1	0	1			0	0	0	0	0
8	0	1	1	0	0			0	0	20	0	0
9	0	1	b1	a0	0			0	4	a1	0	0
10	0	1	b1	a0	0			0	3	a0	0	0
11	0	1	a1	a0	0			0	0	a0	0	0
12	0	1	a1	a1	0			0	2	a18	0	0
13	0	1	a1	b1	0			0	11	a0	0	0
14	0	4	2	b1	0			0	44	a0	0	0
15	0	6	3	b1	0			0	124	a0	0	34
16	0	4	3	b1	0			0	a14	0	0	1
17	0	56	b2	b1	0			32	a1	0	0	27
18	0	71	b2	b1	0			390	0	19	0	15
19	0	59	b2	b1	0			406	0	a1	0	a2
20	0	33	b3	b1	0			71	0	0	0	a0
21	0	25	b4	b1	0			15	0	0	0	a0
22	0	15	b4	b0	0			a4	0	0	0	a0
23	0	11	b3	b1	0			a1	0	0	0	a0
24	0	11	b3	b1	0			0	0	0	0	46
25	0	4	b3	12	0			0	9	41	0	55
26	0	2	b3	a24	0			0	32	62	0	25
27	0	1	b3	a23	b0			0	17	64	0	10
28	0	1	b2	21	b0			0	a4	29	0	3
29	0	1	1	10	-			0	a0	123	0	1
30	1	1	1	9	-----			0	a0	224	0	0
31	31	-----	1	11	-----			0	-----	669	0	-----
Total	32	354	58	128	16	0	0	919	265	1,271	105	219
Mean	1.0	11.8	1.9	4.1	0.6	0	0	29.6	8.8	41.0	3.4	7.3
Ac-ft	63	702	115	254	32	0	0	1,820	526	2,520	208	434

Calendar year 1961: Max 1,070 Min 0 Mean 20.2 Ac-ft 14,620
Water year 1961-62: Max 669 Min 0 Mean 9.2 Ac-ft 6,670

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

a No gage-height record.

b Stage-discharge relation affected by ice.

ARKANSAS RIVER BASIN

47

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, $\frac{1}{2}$ miles upstream from Chicago, Rock Island & Pacific Railroad Co. bridge, $\frac{4}{5}$ 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 1962. 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 $\frac{1}{2}$ 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; 24 years (1938-62), 257 cfs (186,100 acre-ft per year).

Extremes.--Maximum discharge during year, 7,230 cfs July 31 (gage height, 8.82 ft); minimum daily, 2 cfs July 22, 23, Sept. 8. 1930-62: 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 14,000 cfs, from Ninth Biennial Report of State engineer.

Remarks.--Records fair except those for periods of ice effect, doubtful or no gage-height record, or uncertain stage-discharge relation, which are poor. Discharge measurements generally made 3 or 4 times a month. Flow partly regulated by Conchas Reservoir, 45 miles upstream (see p 44). Diversions for irrigation of about 90,000 acres above station.

Discharge, in cubic feet per second, water year October 1961 to September 1962												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	160	130	e16	14	b35	b50	30	13	20	154	1090	10
2	126	90	e16	14	b32	42	36	14	20	e75	422	10
3	93	42	e16	15	32	33	29	14	21	e50	243	11
4	69	24	e10	15	36	25	34	15	19	e40	151	9
5	52	18	e10	14	38	24	40	18	17	e40	108	10
6	39	13	e10	13	39	45	31	16	16	e40	67	11
7	35	11	e13	14	47	42	30	16	14	e35	49	6
8	33	11	e14	b10	56	32	25	16	16	e59	38	2
9	32	13	b14	b8	57	25	26	18	16	415	33	4
10	32	13	b14	b6	98	20	23	16	18	e25	a27	13
11	34	13	b12	b6	123	36	21	16	20	e20	a21	13
12	34	11	b10	b8	72	35	21	18	22	e15	a14	11
13	33	9	b10	b10	80	78	20	18	513	e12	7	6
14	28	18	12	b10	64	74	17	16	82	e8	8	4
15	28	56	14	b6	69	44	15	16	127	e5	7	187
16	28	e41	26	b10	87	30	15	37	a85	e3	6	114
17	28	e72	27	b14	61	24	16	33	a40	e10	4	76
18	26	e90	26	b14	57	20	16	188	13	e12	3	140
19	27	e55	25	b12	95	18	16	243	e10	e8	3	52
20	29	e45	26	b14	130	17	14	35	e10	e4	8	115
21	27	e38	29	b14	64	44	20	d25	e9	e3	17	155
22	27	e30	29	b14	44	29	18	d20	e8	e2	26	54
23	29	e25	22	b16	57	21	14	d15	e7	e2	20	a10
24	26	e25	19	26	87	18	12	e10	e6	e4	14	57
25	22	e20	19	33	90	18	12	e8	e6	1.830	11	126
26	20	e18	19	54	64	21	11	e6	356	2.150	8	77
27	17	e17	b15	50	47	23	14	e6	298	400	8	44
28	13	e16	b14	47	b27	22	18	7	120	195	10	39
29	13	e16	b11	46	-	26	17	8	90	538	9	23
30	20	e16	b11	36	-----	26	14	12	84	380	7	16
31	78	-----	b11	36	-----	25	-----	14	-----	4.340	7	-----
Total	1,258	996	520	599	1,788	987	625	907	2,083	10,874	2,446	1,405
Mean	40.6	33.2	16.8	19.3	63.9	31.8	20.8	29.3	69.4	351	78.9	46.8
Ac-ft	2,500	1,980	1,030	1,190	3,550	1,960	1,240	1,800	4,130	21,570	4,850	2,790
Calendar year 1961:	Max 1,590	Min 1	Mean 142	Ac-ft 102,600								
Water year 1961-62:	Max 4,340	Min 2	Mean 67.1	Ac-ft 48,600								

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

- a No gage-height record.
- b Stage-discharge relation affected by ice.
- d Doubtful gage-height record.
- e Uncertain stage-discharge relation.

7-2271. 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 1962. Unpublished records collected by Bureau of Reclamation for the period October 1941 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, 4,050 cfs June 26 (gage height, 5.50 ft); no flow at times.

1959-62: 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 three 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 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	23	50	3	3	4	a0	74	45	23	24	286	40
2	26	25	3	3	3	a0	90	47	28	49	127	180
3	38	18	a3	4	3	a0	42	52	29	27	168	65
4	35	a14	a2	4	2	0	38	53	25	14	92	68
5	33	a7	a2	2	2	0	45	46	25	169	72	65
6	27	a6	a2	a2	2	0	38	37	19	63	49	60
7	24	a10	a2	a2	2	0	45	39	18	31	35	52
8	23	a26	a4	a2	1	0	43	55	17	14	20	52
9	32	38	a2	a1	1	0	35	56	22	24	15	68
10	35	21	a1	a1	1	0	34	43	32	43	15	67
11	27	a15	a1	a1	0	0	26	42	25	23	28	63
12	33	a10	a1	a2	0	0	26	45	80	21	27	46
13	43	a15	a2	a2	0	0	37	40	132	14	27	38
14	38	a20	a4	a2	0	0	22	32	58	12	25	28
15	33	24	a5	a1	1	0	15	32	43	14	29	388
16	37	91	a6	b1	1	0	17	54	32	21	28	700
17	35	100	a6	b2	1	0	27	47	24	290	26	60
18	39	86	a6	b2	0	0	32	60	22	68	32	35
19	33	102	7	b2	0	20	39	40	33	63	38	25
20	33	82	5	b2	0	70	37	29	33	74	58	17
21	37	108	6	b2	0	63	40	23	24	78	159	23
22	47	60	5	b1	0	42	46	21	23	78	190	24
23	34	35	4	b1	0	34	58	23	17	95	198	20
24	26	23	3	b4	0	52	53	29	11	214	201	49
25	25	10	3	b6	0	70	49	20	16	444	133	142
26	25	a8	3	b5	a0	53	37	18	520	1,330	58	86
27	21	a6	2	b4	a0	67	62	15	670	412	58	56
28	11	4	2	4	a0	60	63	16	84	162	58	42
29	7	5	3	4	-	70	56	15	34	105	49	26
30	9	5	4	4	-----	56	47	19	31	316	24	23
31	210	-----	4	4	-----	63	-----	21	-----	1,590	24	-----
Total	1,099	1,024	106	80	24	720	1,273	1,114	2,150	5,882	2,349	2,608
Mean	35.5	34.1	3.4	2.6	0.9	23.2	42.4	35.9	71.7	190	75.8	86.9
Ac-ft	2,180	2,030	210	159	48	1,430	2,520	2,210	4,260	11,670	4,660	5,170

Calendar year 1961: Max 879 Min 0 Mean 39.9 Ac-ft 28,900

Water year 1961-62: Max 1,590 Min 0 Mean 50.5 Ac-ft 36,500

Peak discharge (base, 4,500 cfs).--No peak above base.

a No gage-height record.

b Stage-discharge relation affected by ice.

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

Location.--Lat 34°31'55", long 103°12'05", in W½NE¼ 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 1962.

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.--6 years, 1.44 cfs (1,040 acre-ft per year).

Extremes.--Maximum discharge during year, 33 cfs July 31 (gage height, 3.92 ft); no flow for most of year.

1952-62: 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. Precipitation at Clovis (8 mi south) was 16.73 inches during year, and at Clovis 13 N (5 mi north), 14.60 inches.

Discharge, in cubic feet per second, water year October 1961 to September 1962

July 31.....1.1

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
July 1962	1.1	1.1	0	.035	2.2
Calendar year 1961.....	-	2.8	0	.008	5.8
Water year 1961-62.....	-	1.1	0	.003	2.2

Peak discharge (base, 150 cfs). --No peak above base.

Note.--Flow occurred only on day listed above. Observation of no flow generally made at least once a month.

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 1962 (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, 65 cfs July 25 (gage height, 3.19 ft); minimum, 1.7 cfs Aug. 28.

1937-62: 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 good.

Correction.--WSP 1312, page 363: in the tables of mean monthly discharge in cubic feet per second and monthly runoff in acre-feet, the months at head of tables are offset to left by one space; that is, May data is printed under June, June data under July, July data under August.

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

May 1 to July 23

July 24 to Sept. 30

2.45	1.0	2.9	27	2.4	1.5	2.8	19
2.5	2.8	3.1	50	2.5	3.3		
2.7	12			2.6	7.0		

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.5							* 2.9	1.8	8.1	5.7	2.7
2	5.7							2.5	2.1	8.6	3.8	2.7
3	5.7							2.7	1.7	7.5	4.5	2.7
4								2.9	1.4	8.1	4.9	2.7
5								3.0	1.2	8.6	3.3	* 2.7
6								3.3	1.1	9.7	2.7	2.9
7								3.5	1.2	9.7	2.7	4.1
8								3.5	1.1	6.2	2.5	4.5
9								3.5	1.1	5.7	2.5	2.1
10								3.6	1.0	4.5	2.5	2.3
11								3.7	1.0	3.8	2.7	2.1
12								4.1	1.1	5.3	4.1	2.1
13								4.1	* 1.2	5.7	3.3	* 2.1
14								3.5	1.1	4.1	3.3	2.5
15								* 3.1	1.1	4.1	2.9	2.5
16								2.9	8.6	* 4.9	4.4	3.1
17								2.5	8.1	4.1	* 5.7	2.9
18								2.4	7.5	4.1	3.1	2.5
19								2.3	7.0	4.9	3.5	2.7
20								2.2	7.0	3.6	6.8	6.2
21								2.1	6.2	2.8	6.2	7.0
22								2.0	6.2	2.4	4.1	3.3
23								1.8	6.2	5.1	3.5	3.5
24								1.7	6.2	8.6	2.9	7.5
25								1.6	6.2	1.7	2.7	6.2
26								1.6	6.6	9.7	2.7	5.7
27								1.5	6.2	* 4.1	2.5	* 3.8
28								1.8	6.2	3.3	2.3	3.5
29								1.9	6.2	4.1	2.3	3.1
30								1.6	9.7	5.9	2.3	2.7
31								1.6		6.2	2.5	
Total	-	-	-	-	-	-	-	81.4	296.1	190.5	108.9	104.4
Mean	-	-	-	-	-	-	-	26.3	9.87	6.15	3.51	3.48
Ac-ft	-	-	-	-	-	-	-	1,610	587	378	216	207
Calendar year	: Max	Min	Mean	Ac-ft								
Water year	: Max	Min	Mean	Ac-ft								

Peak discharge (base, 40 cfs).--May 13 (0030) 49 cfs (3.09 ft); July 25 (1530) 65 cfs (3.19 ft).

* Discharge measurement made on this day.

RIO GRANDE BASIN

51

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 1962 (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, 44 cfs during period July 23-28 (gage height, 1.23 ft, from recorded range in stage); minimum recorded, 1.8 cfs during period Aug. 7-16.

1937-62: 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 fair except those for periods of no gage-height record, which are poor. Diversions for irrigation of about 1,300 acres above station.

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

Oct. 1-20				May 1 to Sept. 30			
0.7	6.2	0.9	15	0.5	1.0	0.8	10
.8	10			.6	3.2	1.0	22
				.7	6.2	1.2	40

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1 0							1 8	2 0	a 1 4	7.0	a 3
2	1 2							1 6	2 0	g 1 6	5.8	a 3.5
3	1 1							1 5	2 0	g 1 6	7.6	g 3.8
4	1 0							1 7	2 0	g 1 4	6.2	3.2
5	1 0							1 8	1 8	g 1 7	5.2	* 2.0
6	9.6							2 0	1 6	g 1 8	4.9	3.5
7	9.2							2 2	g 1 9	a 1 5	g 5.8	4.9
8	9.2							2 4	g 1 9	g 1 4	g 5.8	4.9
9	1 2							2 4	1 9	g 1 4	g 5.8	4.3
10	1 0							2 3	a 1 9	g 1 2	g 5.2	4.0
11	9.6							2 3	g 1 9	g 1 1	a 5	4.0
12	9.6							3 2	g 1 7	g 1 0	a 5	3.8
13	8.9							3 2	* 2 3	g 1 0	g 5.2	* 3.8
14	8.9							3 0	2 3	a 9	g 5.8	4.0
15	8.9							* 3 1	2 2	a 9	g 5.2	3.8
16	8.5							3 0	2 2	g 8.7	5.2	4.6
17	8.1							2 8	2 0	g 8.7	4.3	4.3
18	7.7							2 6	1 8	g 9.6	4.0	3.8
19	7.7							2 3	1 6	* 8.7	a 4	4.0
20	7.3							2 3	g 2 2	g 8.7	g 6.6	8.2
21	-							2 2	g 2 2	a 8	g 5.2	9.4
22	-							2 2	g 2 1	a 8	g 5.2	5.2
23	-							2 2	a 2 0	g 9.6	a 5	5.2
24	-							2 0	a 1 9	g 9.6	g 4.6	7.9
25	-							1 9	g 1 9	g 1 0	a 4.5	7.0
26	-							1 9	g 1 9	a 1 3	a 4	6.2
27	-							2 2	g 1 7	a 1 0	g 4.3	* 5.5
28	-				-			2 3	g 1 6	* 7.0	g 4.3	5.2
29	-							2 4	g 1 4	7.0	a 4	4.9
30	-							2 0	a 1 3	6.6	a 4	4.6
31	-							1 9		8.3	a 3.5	
Total	-	-	-	-	-	-	-	71.3	57.2	341.5	158.2	142.5
Mean	-	-	-	-	-	-	-	23.0	19.1	11.0	5.10	4.75
Ac-ft	-	-	-	-	-	-	-	1,410	1,130	677	314	283

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

Peak discharge (base, 50 cfs).--No peak above base.

- * Discharge measurement made on this day.
- a No gage-height record.
- g Once daily staff gage readings.

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 1962 (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, 6.2 cfs May 12 (gage height, 0.79 ft); minimum recorded, 0.7 cfs Sept. 4.

1937-62: 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 good except those for periods of 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)

0.1	0.3
.2	.8
.4	2.4
.6	4.5
.8	7.0

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.9							2.9	4.9	3.7	1.9	0.9
2	1.9							*2.8	4.7	3.6	1.8	.9
3	1.9							2.9	4.5	3.6	1.9	.8
4	1.8							2.9	4.4	3.5	1.8	.8
5	1.8							3.2	4.3	3.6	1.6	*.8
6	1.8							3.4	4.3	3.5	1.6	.8
7	1.7							3.7	4.3	3.3	1.5	1.4
8	1.7							4.2	4.3	3.2	1.5	1.2
9	1.9							4.4	4.3	3.0	1.5	1.1
10	1.6							4.7	4.3	2.9	1.4	1.0
11	1.7							5.2	4.3	2.8	1.4	.9
12	1.6							5.7	*4.3	2.8	1.6	.9
13	1.6							6.0	4.2	2.6	1.4	*.9
14	1.6							6.0	4.2	2.4	1.4	1.0
15	1.6							*6.0	4.2	2.4	1.3	.9
16	1.6							6.0	4.3	2.4	1.7	1.1
17	1.6							5.8	4.3	2.4	*1.4	1.0
18	1.5							5.7	4.2	2.3	1.3	.9
19	1.5							5.7	4.3	*2.3	1.3	.8
20	*1.4							5.7	4.3	2.0	1.5	1.6
21	-							5.7	4.4	a 2	1.4	1.6
22	-							5.6	4.3	a 2	1.2	.9
23	-							5.5	4.4	a 2.5	1.2	.9
24	-							5.2	4.3	a 3	1.2	1.3
25	-							5.0	4.4	a 3.5	1.2	1.1
26	-							5.0	4.2	a 2.5	1.1	1.1
27	-							4.9	4.1	2.1	1.1	*a1
28	-							4.9	4.2	1.9	1.0	a1
29	-				-			5.2	4.1	1.9	1.0	a1
30	-				-----			4.9	4.2	1.9	.9	a1
31	-				-----			4.7	-----	2.3	.9	-----
Total	-	-	-	-	-	-	-	149.5	129.5	83.9	43.0	30.6
Mean	-	-	-	-	-	-	-	4.82	4.32	2.71	1.39	1.04
Ac-ft	-	-	-	-	-	-	-	297	257	166	85	61

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

Peak discharge (base, 6 cfs, revised)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
5-12	1600	0.79	6.2	7-31	1350	0.72	6.0
5-22	1100	.76	6.0				

* Discharge measurement made on this day.
a No gage-height record.

RIO GRANDE BASIN

53

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 1962 (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.--16 years (1944-47, 1949-62), 17.3 cfs (12,520 acre-ft per year).

Extremes.--Maximum discharge during year, 126 cfs June 25 (gage height, 1.91 ft); minimum daily, 0.1 cfs Sept. 30. 1937-62: Maximum discharge, 286 cfs May 9, 10, 1942 (gage height, 2.65 ft); no flow at times.

Remarks.--Records good. 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)

0.1	0.1	0.6	7.0	1.2	40
.2	.4	.7	10	1.6	81
.3	1.2	.8	14	2.0	141
.4	2.5	.9	19		
.5	4.4	1.0	25		

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	11.8	*5.8	0.5	0.5	0.5	a 0.5	0.5	6.8	4.7	4.0	7.6	9.6
2	11.8	10.6	.5	.5	.5	a.5	*.5	*6.4	4.7	11.6	7.5	3.1
3	11.8	10.6	.5	.5	.5	a.5	.5	6.2	5.3	11.4	3.2	8.3
4	*11.8	4.5	.5	.5	.5	a.5	.5	5.9	6.6	11.3	1.2	8.3
5	6.2	.5	.5	.5	.5	a.5	.5	5.9	7.3	11.3	2.9	8.3
6	1.6	.5	.5	.5	.5	a.5	.5	5.9	9.2	5.2	7.5	*8.3
7	1.6	.5	.5	.5	.5	a.5	.5	5.9	9.2	2.6	8.0	3.4
8	1.6	.5	.5	.5	.5	a.5	.5	5.9	4.6	4.3	9.7	8.8
9	1.6	.5	.5	.5	.5	a.5	.5	3.1	2.4	8.2	9.7	2.5
10	1.6	.5	.5	.5	.5	a.5	.5	6.8	4.3	7.1	3.5	5.8
11	1.6	.5	.5	.5	.5	a.5	.5	6.8	9.6	7.1	6.8	4.9
12	1.6	.5	.5	.5	.5	a.5	.5	4.5	10.5	7.1	2.7	3.0
13	1.6	.5	*.5	.5	.5	a.5	.5	3.4	*10.5	3.2	8.1	*2.9
14	1.6	.5	.5	.5	.5	a.5	.5	3.4	10.5	1.4	7.9	1.4
15	1.6	.5	.5	.5	.5	a.5	.5	*3.4	6.4	3.5	7.8	6.8
16	1.6	.5	.5	.5	.5	a.5	*.6	3.4	4.1	9.0	7.6	1.1
17	1.6	.5	.5	.5	.5	a.5	.6	3.4	4.7	9.0	*3.0	1.8
18	1.7	.5	.5	.5	.5	a.5	.6	3.4	9.2	9.0	4.2	1.8
19	1.7	.5	.5	.5	a.5	a.5	.6	3.4	8.7	*9.0	1.7	1.8
20	*1.7	*.5	.5	.5	a.5	a.5	.6	2.7	7.6	3.7	4.8	1.8
21	1.6	.5	.5	.5	a.5	a.5	.6	4.4	7.6	1.3	5.3	1.1
22	1.6	.5	.5	.5	a.5	a.5	.6	4.6	4.2	3.5	6.6	7.1
23	1.6	.5	.5	.5	a.5	a.5	4.9	5.1	2.6	8.8	6.6	1.3
24	1.6	.5	.5	.5	a.5	a.5	10.1	5.3	3.5	8.8	2.8	2.2
25	1.6	.5	.5	.5	a.5	a.5	12.1	5.6	10.3	8.8	8.5	1.6
26	1.6	.5	.5	.5	a.5	a.5	8.0	5.8	11.3	8.7	2.7	9.6
27	1.6	.5	.5	.5	a.5	a.5	4.6	5.8	11.3	3.5	8.3	*9.6
28	1.6	.5	.5	.5	a.5	a.5	4.8	5.8	11.2	*1.2	8.3	3.6
29	1.6	.5	.5	.5	-	a.5	5.1	5.8	5.0	2.8	8.3	.2
30	1.6	.5	.5	.5	-----	a.5	6.2	5.1	1.9	7.6	8.2	.1
31	1.6	-----	.5	.5	-----	a.5	-----	4.7	-----	7.6	3.2	-----
Total	95.3	32.8.0	15.5	15.5	14.0	15.5	56.9.7	1.168.9	2.09.0	2.01.6	1.666.5	80.2.4
Mean	30.7	11.7	0.50	0.50	0.50	0.50	19.0	37.7	69.7	65.0	53.8	26.7
Ac-ft	1,890	651	31	31	28	31	1,130	2,320	4,150	4,000	3,310	1,590
(†)	6,990	7,030	7,350	8,100	8,570	9,360	10,850	12,280	10,280	7,790	5,120	4,190

Calendar year 1961: Max 124 Min 0.3 Mean 19.4 Ac-ft 14,020
 Water year 1961-62: Max 121 Min 0.1 Mean 26.5 Ac-ft 19,160

* 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, $6\frac{1}{4}$ miles southeast of Amalia, and 12 miles southeast of Costilla.

Drainage area.--140 sq mi, approximately.

Records available.--May 1949 to September 1959, April 1961 to September 1962 (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, 151 cfs July 5 (gage height, 2.48 ft); maximum gage height, 3.25 ft Aug. 9; minimum discharge recorded, 7.8 cfs Sept. 30.

1949-59, 1960-62: 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.

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1								151	86	35	87	18
2								*149	87	116	89	19
3								149	87	122	53	85
4								151	96	122	20	90
5								158	99	128	19	95
6								156	112	87	83	90
7								149	114	45	83	56
8								146	80	43	104	17
9								135	44	92	104	15
10								116	50	81	62	*58
11								112	*114	81	15	58
12								114	126	81	20	*33
13								108	122	54	*86	32
14								101	122	23	84	26
15								*89	84	27	81	15
16								81	48	92	77	15
17								75	47	97	57	27
18								68	99	*97	12	27
19								62	103	99	14	23
20								71	91	64	57	28
21								97	91	25	64	31
22								96	58	27	74	28
23								96	37	97	77	33
24								96	36	103	53	47
25								96	102	103	16	*38
26								96	122	99	18	26
27								96	122	61	90	18
28								97	120	*21	90	16
29								99	65	20	*92	8.9
30								91	30	83	86	8.2
31								81		87	42	
Total	-	-	-	-	-	-	-	3,382	2,594	2,312	1,909	1,081.1
Mean	-	-	-	-	-	-	-	109	86.5	74.6	61.6	36.0
Ac-ft	-	-	-	-	-	-	-	6,710	5,150	4,590	3,790	2,140

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

* Discharge measurement made on this day.

RIO GRANDE BASIN

55

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 1962 (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.--21 years (1941-62), 46.1 cfs (33,380 acre-ft per year).

Extremes.--Maximum discharge during year, 304 cfs Apr. 16 (gage height, 3.53 ft); minimum daily, 3.5 cfs Jan. 9-11.
1936-62: 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	3.4	265

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	118	35	6	3.8	11	10	26	180	89	45	79	22
2	118	*104	6	3.8	12	10	29	170	90	97	77	19
3	118	105	6	3.8	12	9	37	*157	86	113	64	62
4	120	96	5.5	3.8	12	8	*42	155	94	118	29	74
5	*107	25	4	3.8	*13	9	35	159	93	127	24	79
6	41	20	4	3.8	13	*15	34	161	110	108	57	31
7	35	18	4.5	4	16	16	33	167	113	64	68	70
8	34	18	4.5	3.8	18	14	40	172	97	52	83	30
9	37	19	5	*3.5	19	13	34	163	60	85	88	22
10	43	18	4.5	3.5	20	9	39	128	55	81	72	49
11	37	16	4	3.5	18	9	40	125	*99	80	24	*58
12	34	16	*4	3.8	16	9	48	125	118	80	24	38
13	34	14	4	3.8	16	8	86	122	120	70	*68	34
14	32	17	4	3.8	14	11	154	111	120	34	79	31
15	31	18	4	4.5	13	11	178	99	103	29	79	19
16	31	17	4	5	13	12	182	*90	64	73	76	18
17	30	16	4	5	12	11	*169	84	60	88	66	23
18	29	14	4	9	13	10	178	80	88	*92	22	24
19	*28	13	4	11	*11	11	180	74	99	92	17	22
20	29	13	4	11	10	*14	183	75	90	77	48	28
21	29	*12	4.2	11	9	12	179	94	89	33	57	37
22	28	7.3	4.5	11	9	13	159	93	77	28	65	22
23	28	6.3	4.2	*11	9	14	144	96	49	76	70	20
24	26	7.0	4	11	10	13	219	94	46	93	56	30
25	27	7	4	11	11	13	253	93	80	96	22	*34
26	26	6.5	4.2	11	10	18	245	93	105	92	18	26
27	26	6	4.2	10	9	31	196	94	113	75	61	22
28	27	6	*4	10	8	56	190	*100	113	32	*75	20
29	29	5.5	4.2	10	-	49	191	102	97	*28	76	16
30	29	6	4.2	10	-----	34	188	93	50	64	76	14
31	31	-----	4.2	10	-----	24	-----	86	-----	79	62	-----
Total	1,392	681.6	1,359	2,140	357	496	3,711	3,635	2,667	2,301	1,782	1,044
Mean	44.9	22.7	4.38	6.90	12.8	16.0	124	117	88.9	74.2	57.5	34.8
Ac-ft	2,760	1,350	270	424	708	984	7,360	7,210	5,290	4,560	3,530	2,070

Calendar year 1961: Max 212 Min 4 Mean 45.3 Ac-ft 32,800
Water year 1961-62: Max 253 Min 3.5 Mean 50.5 Ac-ft 36,500

Peak discharge (base, 250 cfs).--Apr. 16 (0045) 304 cfs (3.53 ft).

* Discharge measurement made on this day.

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 1962 (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, 301 cfs Apr. 16 (gage height, 2.88 ft); minimum daily recorded, 0.9 cfs July 22, Aug. 29.

1952-62: 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 except those for period of no gage-height record, which are fair. 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)

0.6	0.3	0.9	5.8	1.5	48
.7	1.1	1.0	10	2.0	120
.8	2.8	1.2	21	2.6	238

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.5	1.5					2.2	14.5	9.2	3.1	1.2	2.2
2	8.2	*9.8					2.5	12.9	10	5.1	1.2	3.5
3	8.1	10.2					3.1	*11.0	7.9	6.2	2.5	7.7
4	8.1	9.4					3.6	10.6	9.5	8.7	2.4	10
5	*6.9	1.8					3.1	10.9	7.9	1.2	2.2	1.5
6	*4.4	-					3.0	11.2	9.6	1.2	2.7	2.8
7	1.5	-					2.9	10.8	10	4.8	3.8	6.3
8	1.1	-					3.5	10.7	9.7	2.2	2.4	3.6
9	4.0	-					3.0	9.5	9.2	5.7	4.8	2.4
10	1.0	-					3.4	a5.5	8.7	7.8	8.6	2.8
11	4.5	-					3.4	a4.5	1.3	1.7	2.2	*6.4
12	3.4	-					2.9	a4.0	*1.4	1.5	2.0	2.6
13	2.4	-					6.2	a4.0	1.3	2.8	*2.0	2.2
14	1.5	-					14.6	a3.5	1.2	3.4	1.2	2.4
15	1.2	-					17.4	a3.0	1.0	2.2	1.8	2.0
16	1.1	-					18.2	*a3.0	6.2	2.8	2.4	2.0
17	1.0	-					*16.8	a2.0	4.5	3.4	1.6	1.8
18	1.0	-					17.3	a2.0	3.4	*9.0	1.1	1.8
19	*1.0	-					17.7	a1.5	1.8	1.5	2.2	2.0
20	1.0	-					17.6	a.5	4.2	2.2	2.1	2.0
21	1.0	-					16.7	a1.0	1.8	1.4	2.0	4.2
22	.9	-					15.1	a1.0	2.3	.9	1.7	1.7
23	.9	-					12.6	a1.0	1.7	1.8	1.5	1.5
24	3.1	-					20.4	a1.0	1.8	3.6	1.2	2.0
25	7.1	-					22.9	a1.0	3.4	4.2	1.5	*4.5
26	6.2	-					21.4	a1.0	8.3	2.2	1.1	2.6
27	6.2	-					16.6	*2.0	1.2	3.4	1.2	2.2
28	6.2	-					16.6	2.2	1.2	1.5	*1.2	2.2
29	6.2	-			-		17.2	1.2	1.2	*1.2	.9	2.0
30	6.2	-			-----		16.1	7.1	3.6	1.5	1.8	1.8
31	6.6	-----			-----		-----	8.0	-----	1.4	2.7	-----
Total	487.7	-	-	-	-	-	3,380	1,485.1	284.9	1,347	91.5	1,062
Mean	15.7	-	-	-	-	-	113	47.9	9.50	4.35	2.95	3.54
Ac-ft	967	-	-	-	-	-	6,700	2,950	565	267	181	211
Calendar year	: Max	Min	Mean	Ac-ft								
Water year	: Max	Min	Mean	Ac-ft								

* Discharge measurement made on this day.

a No gage-height record.

RIO GRANDE BASIN

57

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 1962 (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, 286 cfs Apr. 16 (gage height, 4.53 ft); no flow for many days.

1944-62: 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 fair. 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)
(Shifting-control method used Oct. 5-29, Apr. 12-21, 23-26)

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

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.0	1.1					1.5	1.36	4.6	0	0.1	0
2	8.5	7.2					1.8	1.18	5.3	.4	.1	0
3	8.5	*10.4					*2.7	*10.2	3.6	.2	.5	2.3
4	9.2	-					3.1	9.7	4.3	1.0	.6	1.2
5	*7.8	-					2.5	9.8	3.6	3.0	.5	1.0
6	*1.3	-					2.4	10.4	4.6	*4.6	.3	.4
7	5.3	-					2.4	10.0	5.3	.2	.6	2.7
8	3.6	-					2.9	10.0	5.1	.3	.2	3.6
9	5.2	-					2.4	9.1	4.4	2.2	.2	7.0
10	1.2	-					2.8	4.5	3.8	4.4	1.3	5.2
11	5.6	-					2.8	3.4	7.0	0	.6	3.3
12	3.3	-					2.4	3.4	*7.8	0	.2	*2.3
13	2.5	-					5.3	3.4	6.8	.3	.2	.9
14	1.8	-					1.33	3.1	5.6	.1	0	.8
15	1.6	-					1.61	2.7	5.1	0	0	.4
16	1.6	-					1.82	1.9	2.4	0	0	0
17	1.4	-					*1.67	1.4	1.5	.1	6.1	0
18	1.4	-					1.71	1.2	1.7	1.5	7.0	0
19	*1.5	-					1.73	1.2	.2	8.1	0	0
20	1.6	-					1.74	6.7	.2	.1	0	0
21	1.4	-					1.69	9.8	8.5	0	0	1.1
22	1.4	-					1.51	8.9	8.8	0	0	0
23	1.4	-					1.26	6.8	1.1	.1	0	0
24	1.7	-					2.07	6.0	.5	.6	.2	0
25	4.6	-					2.24	4.4	.9	1.8	.1	.7
26	5.6	-					2.06	6.1	1.0	.3	0	.3
27	5.6	-					1.59	1.4	3.1	*.6	0	0
28	6.0	-					1.56	*1.5	4.6	.3	0	0
29	7.0	-					1.65	8.1	4.3	0	0	0
30	7.5	-					1.51	4.7	.5	0	0	0
31	8.4	-						3.8		0	0	
Total	542.0	-	-	-	-	-	3,225	1,302.3	126.1	30.2	18.8	42.2
Mean	17.5	-	-	-	-	-	108	42.0	4.20	0.97	0.61	1.41
Ac-ft	1,080	-	-	-	-	-	6,400	2,580	250	60	37	84

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

Peak discharge (base, 200 cfs).--Apr. 16 (0145) 286 cfs (4.53 ft).

* Discharge measurement made on this day.

Principal diversions from Costilla Creek, New Mexico-Colorado

Records of discharge are collected at 8 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 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 1962. 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 1962. 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 1962. 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 1962. 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 1962. 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 1962. 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 1962. Canal diverts from left bank of Cerro Canal for irrigation in New Mexico.
- 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 1962. Canal diverts from right bank of Costilla Creek to Eastdale Reservoir No.1 for irrigation in Colorado.

Diversions, in acre-feet, water year October 1961 to September 1962

[illegible]

RIO GRANDE BASIN

59

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 1962. 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.--25 years, 6.50 cfs (4,710 acre-ft per year).

Extremes.--Maximum discharge during year, 28 cfs Sept. 21 (gage height, 1.17 ft); minimum daily, 1.3 cfs Jan. 11.
1937-62: 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 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)

0.1	0.5
.2	1.6
.3	3.0
.5	6.8
.7	12
1.0	22

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.3	a 3	2.4	a 1.7	a 1.7	2.4	3.0	6.7	11	7.5	3.6	2.6
2	4.1	a 2.7	2.4	a 1.6	a 1.8	2.2	2.8	7.6	11	7.0	3.4	2.6
3	4.1	a 2.5	2.4	a 1.7	a 1.9	2.1	* 3.1	8.9	11	6.6	3.3	2.5
4	4.1	a 2.5	a 2.2	a 1.8	a 2	1.9	3.3	9.0	10	6.4	3.4	2.5
5	4.1	a 2.5	a 2	a 1.9	* 2.2	* 2.1	3.0	10	11	6.4	3.1	2.5
6	4.0	a 2.5	a 2.2	a 2	2.4	2.4	2.6	12	12	6.5	3.1	2.8
7	4.0	a 2.5	a 2.2	a 2	2.4	2.2	2.6	12	12	6.6	3.1	5.0
8	4.0	a 2.5	a 2.2	* b 2	2.4	2.1	2.4	11	12	5.7	3.1	3.6
9	* 4.7	a 2.5	a 2.2	b 1.7	2.4	2.1	2.4	12	12	5.3	3.1	3.1
10	4.0	a 2.5	a 2.2	b 1.5	2.4	2.1	2.2	14	12	5.1	3.1	3.0
11	a 4	a 2.5	a 2	b 1.3	2.4	2.1	2.4	13	12	4.9	3.3	3.0
12	a 4	a 2.5	a 1.5	a 1.5	2.5	2.1	* 2.8	16	12	5.1	4.8	2.8
13	a 4	a 2	a 1.5	a 1.6	2.5	2.2	4.3	16	* 13	5.3	3.8	2.8
14	a 4	a 2	* 2.6	a 1.7	2.5	2.2	5.7	15	14	4.7	* 3.3	* 3.0
15	a 3.5	a 2.2	d 2.3	a 1.7	2.5	2.2	7.6	* 15	12	4.5	3.3	2.8
16	a 3.5	a 2	d 2.3	a 1.5	2.5	2.2	8.2	14	11	4.5	3.3	3.1
17	a 3.5	a 2	d 2	a 1.5	2.5	2.2	9.0	13	11	4.5	3.1	3.1
18	a 3.5	a 2	d 2	a 1.5	2.6	2.2	11	13	9.7	* 4.5	3.1	2.8
19	a 3	a 2	d 2	a 1.6	* 2.8	2.2	13	13	9.5	4.3	3.1	2.8
20	a 3	a 2.5	d 2	a 1.6	2.5	2.2	14	14	9.2	4.5	4.8	6.0
21	a 3	a 2.5	d 2.2	1.7	2.8	* 2.1	12	12	9.0	4.3	4.5	1.2
22	a 2.5	a 2.5	d 2.2	1.8	2.6	2.1	9.0	11	9.0	4.1	4.0	5.9
23	a 2.5	a 2.5	d 1.8	1.8	2.6	2.1	8.2	12	8.7	4.3	3.8	5.1
24	a 2.5	a 2.5	d 1.8	* b 1.6	2.4	2.1	10	* 11	8.4	4.7	3.6	6.4
25	a 2.5	a 2.5	d 1.8	b 1.5	2.4	2.1	11	11	8.2	* 4.7	3.4	5.9
26	a 2.5	a 2.5	d 2	b 1.5	2.4	2.5	9.7	11	8.2	4.3	3.3	4.9
27	a 2.7	a 2.4	* b 2	a 1.5	2.2	2.8	9.7	12	7.7	4.0	3.1	a 5
28	a 2.7	a 2.2	a 2	a 1.5	2.2	2.8	9.2	11	7.3	4.0	3.1	a 5.5
29	a 3	* 2.4	a 2	a 1.5	-	2.6	8.0	13	7.3	3.8	3.1	a 5
30	a 2.7	2.4	a 2	a 1.5	-----	2.4	6.8	11	8.0	4.0	* 3.1	a 4.5
31	* 2.6	-----	a 1.8	a 1.6	-----	2.8	-----	11	-----	4.0	3.0	-----
Total	106.6	71.8	64.2	51.1	66.5	69.8	199.0	371.2	309.2	156.1	106.2	122.6
Mean	3.44	2.39	2.07	1.65	2.38	2.25	6.63	12.0	10.3	5.04	3.43	4.09
Ac-ft	211	142	127	101	132	138	395	736	613	310	211	243

Calendar year 1961: Max 19 Min 0.2 Mean 4.85 Ac-ft 3,510
Water year 1961-62: Max 16 Min 1.3 Mean 4.64 Ac-ft 3,360

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

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

Location.--Lat 36°44'05", long 105°41'05", in N $\frac{1}{2}$ sec.20, T.29 N., R.12 E., on left bank 4 miles southwest of Cerro, 5 $\frac{1}{2}$ miles northwest 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 1962.

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

Average discharge.--14 years, 356 cfs (257,700 acre-ft per year).

Extremes.--Maximum discharge during year, 2,550 cfs May 12 (gage height, 9.28 ft); minimum, 88 cfs Aug. 21.

1948-62: 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 ice effect or doubtful or no gage-height record, which are fair. Diversions for irrigation of about 626,000 acres above station.

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

1.6	82	4.0	437	7.0	1,320
2.0	120	5.0	645	8.0	1,740
3.0	259	6.0	920	9.1	2,420

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	108	184	414	b270	311	386	408	1870	539	346	194	a133
2	107	210	414	b260	319	441	445	1610	577	*318	183	a127
3	107	375	428	b260	319	460	527	1370	600	324	176	a121
4	d105	935	441	b250	326	473	*561	1350	650	326	a170	a118
5	d103	978	429	b250	*340	471	571	1410	720	318	a160	a114
6	d100	957	386	b250	355	*507	527	1440	911	349	a155	a114
7	d100	656	333	b250	369	515	503	1720	1150	360	a160	a107
8	d103	559	319	*b260	386	541	495	*1880	1190	390	a150	a114
9	d106	511	243	b260	405	487	481	2060	1060	464	a140	a112
10	*109	483	b180	b250	437	454	519	2210	935	456	a130	a130
11	110	519	b125	b200	466	362	533	2390	917	433	a120	a130
12	111	557	b120	b200	511	358	*535	2390	974	399	a120	a123
13	111	*519	b225	b210	563	351	507	2160	992	373	a110	a123
14	133	424	*249	b220	579	309	499	1970	905	340	a105	a118
15	141	531	272	b230	591	269	551	*1880	957	330	*102	a116
16	142	477	289	b240	670	411	715	1640	1030	297	98	a107
17	143	507	282	b250	725	479	914	1180	1120	*272	96	*107
18	135	477	299	259	698	466	1220	1100	1050	243	93	106
19	129	479	323	264	*675	414	1590	971	*920	a230	94	104
20	124	485	326	259	652	397	1910	800	705	a220	90	106
21	122	445	324	270	569	*388	2220	730	587	a160	90	113
22	120	403	324	273	587	378	2400	806	497	a110	93	112
23	120	386	b320	280	575	364	2360	752	491	a100	103	111
24	120	386	b315	282	533	362	2090	595	481	a100	97	109
25	115	384	b310	290	549	339	*1720	581	416	a110	94	112
26	114	371	b305	294	a540	312	1690	547	390	a110	138	117
27	137	384	*b300	297	a450	295	1750	521	408	a120	*a135	110
28	147	414	b300	299	a370	284	1700	553	439	a140	a130	104
29	141	428	b280	300	-	297	1600	665	369	a170	a123	102
30	148	418	b280	297	-----	340	1710	688	357	*323	a125	100
31	162	-----	b280	304	-----	386	-----	585	-----	220	a125	-----
Total	3,773	14,842	9,435	8,078	13,870	12,296	33,251	40,424	22,337	8,451	3,899	3,420
Mean	122	495	304	261	495	397	1,108	1,304	745	273	126	114
Ac-ft	7,480	29,440	18,710	16,020	27,510	24,390	65,950	80,180	44,300	16,760	7,730	6,780

Calendar year 1961: Max 1,270 Min 85 Mean 271 Ac-ft 196,500
 Water year 1961-62: Max 2,400 Min 90 Mean 477 Ac-ft 345,200

Peak discharge (base, 1,000 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
5-12	1130	9.28	2,550	6-17	0630	6.75	1,180
6-7	2215	6.90	1,240				

* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

d Doubtful gage-height record.

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 1962. 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.--49 years (1912-25, 1926-62), 57.2 cfs (41,410 acre-ft per year).

Extremes.--Maximum discharge during year, about 257 cfs May 13; minimum, 8.3 cfs Jan. 11.

1930-62: 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, 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 16, June 13 to Sept. 30)

0.7	9.0	1.1	38	1.7	150
.9	20	1.4	82	2.0	245

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	34	28	22	17	18	16	23	132	a130	75	32	17
2	33	26	22	17	18	17	25	130	a130	72	29	17
3	33	18	22	17	18	17	26	128	a130	*68	28	16
4	28	21	21	19	18	16	27	*135	a130	67	28	16
5	27	23	18	19	18	*16	27	140	a130	65	26	15
6	28	22	19	18	*18	17	26	153	a130	67	25	16
7	27	22	18	18	18	17	27	167	130	79	22	18
8	28	22	18	*19	18	18	28	184	a130	68	22	19
9	*34	22	18	19	18	16	28	191	a130	62	21	18
10	35	23	17	10	18	16	26	197	a130	56	21	18
11	32	23	16	9.0	19	15	*26	197	a130	53	20	17
12	31	24	*13	12	20	16	30	220	a130	52	24	16
13	32	22	d14	17	24	16	37	245	*125	50	21	16
14	33	19	d15	19	23	15	52	230	125	49	20	*16
15	33	23	16	16	22	16	64	210	116	45	*20	16
16	30	17	17	17	22	17	92	*200	107	*44	20	16
17	26	18	16	18	22	18	96	a190	100	*44	20	17
18	26	17	16	19	19	18	120	a180	98	42	18	16
19	26	16	14	18	*17	*18	140	a175	96	39	18	16
20	26	16	14	18	19	18	164	a170	92	39	18	18
21	25	21	18	18	18	18	181	a165	92	38	19	26
22	24	18	18	18	15	18	158	a160	88	38	19	19
23	25	18	16	17	16	18	130	a155	88	38	19	19
24	24	19	16	*17	18	18	135	a155	84	38	18	25
25	25	20	16	18	18	17	148	a150	82	39	17	29
26	26	22	18	17	16	19	156	a145	80	38	16	26
27	28	22	*18	13	16	22	145	a145	79	35	16	24
28	a28	*21	17	16	14	24	153	a150	77	33	16	*25
29	a27	19	18	16	-	25	156	a140	77	32	*16	24
30	a26	22	19	17	-----	24	145	a135	79	*31	17	24
31	*24	-----	18	17	-----	20	-----	a135	-----	33	16	-----
Total	884	624	538	520.0	518	556	2,591	5,209	3,245	1,529	642	575
Mean	28.5	20.8	17.4	16.8	18.5	17.9	86.4	168	108	49.3	20.7	19.2
Ac-ft	1,740	1,240	1,070	1,030	1,030	1,100	5,140	10,330	6,440	3,030	1,270	1,140

Calendar year 1961: Max 210 Min 11 Mean 46.2 Ac-ft 33,430
Water year 1961-62: Max 245 Min 9.0 Mean 47.8 Ac-ft 34,570

Peak discharge (base, 160 cfs). --Apr. 30 (1930) 210 cfs (1.90 ft); May 13 (0900) 257 cfs (2.06 ft).

* Discharge measurement made on this day.

a No gage-height record.

d Doubtful gage-height record.

RIO GRANDE BASIN

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 $3\frac{1}{4}$ miles upstream from mouth of Cabresto Creek.

Records available. --September 1943 to September 1962 (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. --1943-62: 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 1961 to September 1962

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October	0	0	0	0
November	-	-	-	-
December	-	-	-	-
Calendar year 1961	-	-	-	-
January	-	-	-	-
February	-	-	-	-
March	-	-	-	-
April	12	0	1.56	93
May	26	8.5	16.8	1,030
June	9.3	0	2.46	146
July	22	0	1.99	122
August	0	0	0	0
September	0	0	0	0
Water year 1961-62	-	-	-	-

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 1962.

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

Average discharge.--19 years, 10.2 cfs (7,380 acre-ft per year).

Extremes.--Maximum discharge during year, 53 cfs Apr. 24 (gage height, 2.46 ft); minimum, 2.0 cfs Feb. 19.

1943-62: 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 doubtful 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 4-15)

0.2	2.0	1.1	16
.3	3.2	1.5	25
.5	5.9	2.0	38
.8	11	2.3	46

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.1	6.2	4.8	a3	b4.0	4.9	7.6	2.8	1.3	1.2	7.9	3.4
2	7.2	5.9	4.8	a3	b4.0	5.5	*7.9	2.5	1.3	1.2	6.8	3.6
3	7.1	d5.2	4.8	a3.5	b4.0	5.5	9.0	2.6	1.2	1.2	6.2	3.6
4	7.1	d5.2	4.5	a3.5	b4.0	5.2	9.8	*2.6	1.2	1.2	5.9	3.4
5	7.1	d5.8	3.3	a3.5	*b4.5	*5.5	9.2	2.6	1.2	1.0	5.5	3.6
6	7.1	d5.6	3.4	a3	4.9	5.8	8.8	2.7	1.2	1.0	5.1	3.8
7	7.0	d5.2	4.0	a3	5.3	5.5	9.2	2.5	1.2	1.0	4.8	4.6
8	7.0	d5.5	4.4	a3	5.2	5.1	9.3	2.4	1.3	9.5	4.6	5.2
9	*7.4	d5.5	3.7	*b2.5	5.2	5.1	9.2	2.2	1.3	9.5	4.6	4.6
10	8.0	d5.5	3.8	b2	5.3	4.4	8.8	2.1	1.2	9.2	4.2	4.4
11	7.4	d5.2	*4.2	a2	5.6	4.4	*8.5	2.1	1.2	8.8	4.4	4.1
12	7.2	d5.2	b2.5	a2.5	6.2	b4.5	8.7	2.1	1.2	8.8	5.5	*3.7
13	7.1	d4.1	a2.5	a3	6.6	4.6	10	2.1	*1.2	8.8	5.1	3.7
14	7.1	d3.3	a3	a3.5	6.5	b4.5	1.4	*2.0	1.2	8.4	4.6	3.7
15	7.2	d3.7	a3.5	a3	6.2	4.6	1.8	1.8	1.3	8.0	*4.5	3.8
16	7.0	d3.6	a3.5	a3	6.5	4.6	2.2	1.7	1.3	*8.0	4.6	4.0
17	6.8	d3.7	a3.5	a3	6.2	4.6	2.3	1.6	1.3	7.9	4.5	4.4
18	6.6	d3.6	a3.5	a3	5.9	4.4	2.5	1.5	1.3	1.0	4.9	4.1
19	6.5	d3.7	a3	a3	*4.9	*4.9	2.8	1.5	1.3	1.3	4.9	4.1
20	6.5	d4.0	a3	a3.5	5.5	5.1	3.2	1.4	1.3	1.2	4.4	5.2
21	6.4	d4.9	a3.5	a3.5	4.8	4.8	4.1	1.4	1.3	1.2	5.2	7.6
22	6.4	d4.5	a3.5	a3.5	4.2	4.8	4.1	1.3	1.2	1.1	4.6	5.9
23	6.4	d4.5	a3	a3	4.8	5.1	3.8	1.4	1.2	1.1	4.5	5.8
24	6.2	d4.9	a3	*b3	5.2	5.1	*4.1	*1.4	1.2	1.1	4.4	7.2
25	5.9	d5.2	a3	b3	5.5	4.8	4.5	1.3	1.2	1.1	4.4	7.9
26	5.9	d5.1	a3.5	b3	4.8	5.8	4.4	1.3	1.2	1.0	4.1	6.6
27	6.0	d5.1	a3.5	b2.5	4.6	6.5	3.8	1.2	1.2	9.5	3.8	6.4
28	6.0	*d5.0	a3.5	b3	b4.5	7.9	3.1	1.4	1.1	9.2	3.7	6.5
29	6.2	4.4	a3.5	b3	-	8.8	3.9	1.4	1.1	8.7	3.7	6.2
30	6.0	4.9	a3.5	b3.5	-----	8.5	3.2	1.3	1.1	*7.9	*3.6	5.9
31	*5.9	-----	a3	b3.5	-----	6.5	-----	1.3	-----	7.9	3.6	-----
Total	208.8	144.2	110.2	94.0	144.9	167.3	668.0	575	368	309.1	148.6	147.0
Mean	6.74	4.81	3.55	3.03	5.18	5.40	22.3	18.5	12.3	9.97	4.79	4.90
Ac-ft	414	286	219	186	287	332	1,320	1,140	730	613	295	292

Calendar year 1961: Max 35 Min 2.5 Mean 8.72 Ac-ft 6,310
Water year 1961-62: Max 45 Min 2 Mean 8.45 Ac-ft 6,110

- * 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

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

Location.--Lat 36°39'00", long 105°41'30", in NW $\frac{1}{4}$ 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 1962.

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

Average discharge.--11 years (1951-62), 84.6 cfs (61,250 acre-ft per year).

Extremes.--Maximum discharge during year, 304 cfs May 13 (gage height, 4.23 ft); minimum, 36 cfs Jan.11.

1950-62: Maximum discharge, 647 cfs Jan. 18, 1952, from rating curve extended above 500 cfs on basis of slope-area measurement at gage height 5.71 ft; 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. 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	3.0	154
2.1	67	3.5	212
2.4	93	4.0	279
2.7	123	4.5	358

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	74	66	58	52	54	53	61	186	163	118	69	53
2	73	66	58	51	54	55	*62	172	164	114	67	53
3	73	57	59	52	55	55	64	167	163	110	65	53
4	70	60	59	52	56	53	68	175	162	110	65	53
5	70	62	55	53	56	*53	68	181	161	*110	63	53
6	70	62	55	53	*56	56	68	198	163	111	61	54
7	69	60	55	54	58	55	67	218	168	117	59	59
8	69	*60	56	56	58	57	69	225	168	109	57	60
9	74	60	57	*54	58	54	69	226	164	103	57	58
10	*76	61	55	44	59	54	68	237	166	97	57	57
11	70	61	*55	39	61	51	*66	251	168	93	56	55
12	69	61	55	43	61	52	69	273	169	88	61	54
13	70	60	55	49	65	53	73	298	162	89	61	54
14	71	57	54	53	64	50	93	*288	169	89	61	55
15	69	64	54	49	61	53	118	259	155	87	60	53
16	69	57	54	49	62	54	148	250	153	86	*60	53
17	65	57	54	51	61	53	154	237	146	*85	59	55
18	63	56	54	55	58	53	180	226	143	81	57	55
19	63	54	53	55	54	*53	198	220	139	80	57	54
20	63	53	52	57	*57	54	230	217	134	79	57	58
21	62	60	53	56	55	53	242	206	135	76	57	69
22	60	57	53	55	53	53	229	200	131	73	55	61
23	62	56	53	55	54	54	199	194	130	73	57	61
24	61	58	52	54	56	53	202	192	129	73	53	65
25	61	60	52	56	53	49	*225	*187	127	74	55	73
26	63	61	52	54	54	51	230	184	124	73	56	70
27	65	61	*53	53	53	54	224	182	124	71	55	66
28	65	59	52	53	50	57	222	189	120	70	55	68
29	65	*57	53	53	-	60	232	181	118	69	55	66
30	65	59	53	*54	-----	64	220	172	121	69	*53	65
31	62	-----	53	54	-----	57	-----	168	-----	*69	53	-----
Total	2,081	1,782	1,686	1,618	1,596	1,676	4,218	6,559	4,439	2,746	1,813	1,763
Mean	67.1	59.4	54.4	52.2	57.0	54.1	141	212	148	88.6	58.5	58.8
Ac-ft	4,130	3,530	3,340	3,210	3,170	3,320	8,370	13,010	8,800	5,450	3,600	3,500

Calendar year 1961: Max 259 Min 42 Mean 87.0 Ac-ft 63,000
 Water year 1961-62: Max 298 Min 39 Mean 87.6 Ac-ft 63,430

Peak discharge (base, 220 cfs). --Apr. 20 (2200) 269 cfs (3.96 ft); May 13 (0830) 304 cfs (4.23 ft).

* Discharge measurement made on this day.

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, $\frac{1}{2}$ 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 1962.

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.--28 years, 37.1 cfs (26,860 acre-ft per year).

Extremes.--Maximum discharge during year, 125 cfs May 13 (gage height, 2.35 ft); maximum gage height, 3.62 ft Feb. 22 (ice jam); minimum daily discharge determined, 6 cfs Dec. 12, Jan. 11.

1934-62: 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 Nov. 24 to Dec. 3)

Oct. 1 to May 7

May 8 to Sept. 30

1.39	7.0	2.1	38	1.0	11	2.0	76
1.5	9.5	2.3	60	1.3	21	2.4	133
1.7	15	2.5	90	1.6	38		
1.9	24						

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	23	a17	11	b9	b10	d9	b14	55	72	48	19	14
2	23	a17	11	b7	b10	d9	15	53	70	44	19	14
3	22	a15	11	b8	b11	d9	*18	54	73	44	*18	14
4	22	a16	b10	b8	b11	d8	20	*56	75	42	18	13
5	22	a16	b9	b9	b11	d8	19	63	75	42	17	13
6	20	a16	b9	b9	*b11	d9	18	73	76	42	16	13
7	20	*15	b10	b9	12	*10	20	80	75	40	16	17
8	20	15	b10	*b9	12	9.8	20	86	74	37	16	16
9	24	15	b10	b9	12	9.5	19	91	74	36	15	15
10	25	14	b9	a8	12	9.5	18	96	74	34	15	14
11	22	14	b8	a6	12	b9	18	105	75	33	16	14
12	*22	14	b6	a8	13	b9	20	116	78	31	17	13
13	21	b11	b7	a9	14	b9	*25	122	81	31	15	13
14	20	13	b9	a10	13	b8	33	117	81	30	15	*13
15	20	13	*b12	a9	13	b9	43	110	80	29	15	13
16	20	13	b11	a8	13	b9	52	*106	77	28	*15	13
17	19	13	b10	a8	12	b10	52	101	75	*28	14	13
18	19	12	b9	a10	12	b10	61	99	73	27	14	13
19	18	b11	b8	a10	b11	*b10	74	95	70	26	14	13
20	18	b11	b9	a10	*b11	10	84	98	*68	27	17	15
21	18	12	b11	a10	b11	9.8	82	94	66	24	16	18
22	17	b11	b11	a10	b10	9.5	74	88	63	24	15	14
23	18	b11	b9	a10	b10	9.5	64	86	60	24	15	16
24	17	12	b9	a10	b10	9.8	*64	86	58	24	15	19
25	17	11	b10	*10	b9	10	71	86	58	24	15	19
26	16	11	b10	10	d9	11	73	86	55	24	15	18
27	17	11	b10	b9	d9	13	73	86	53	22	14	16
28	17	*11	b9	b8	d8	15	73	88	52	22	14	*16
29	17	12	b9	b8	-	16	71	83	50	21	14	16
30	17	12	b10	b9	-----	15	63	75	52	21	14	15
31	a17	-----	b10	b9	-----	b14	-----	73	-----	21	*14	-----
Total	608	395	297	276	312	316.4	1,351	2,707	2,063	950	482	443
Mean	19.6	13.2	9.6	8.9	11.1	10.2	45.0	87.3	68.8	30.6	15.5	14.8
Ac-ft	1,210	783	589	547	619	628	2,680	5,370	4,090	1,880	956	879

Calendar year 1961: Max 130 Min 6 Mean 29.5 Ac-ft 21,360
Water year 1961-62: Max 122 Min 6 Mean 27.9 Ac-ft 20,230

Peak discharge (base, 100 cfs).--May 13 (0600) 125 cfs (2.35 ft).

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

8-2685. 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 1¼ 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 1962. 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--46 years (1912-28, 1932-1962) 29.5 cfs (21,360 acre-ft per year).

Extremes--Maximum discharge during year, 72 cfs Apr. 20 (gage height, 1.76 ft); minimum daily, 5.7 cfs Dec. 12.

1938-62: 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, which are fair. 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)

0.8	6.0	1.2	20	1.6	53
1.0	11	1.4	34	1.8	79

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.7	*1.4	1.6	b1.3	1.7	1.5	1.8	3.8	2.4	9.8	8.1	8.9
2	1.6	1.4	1.6	b1.2	1.7	1.6	*1.7	3.0	2.4	8.9	8.1	9.2
3	1.7	1.3	1.5	b1.4	1.8	1.5	1.8	2.0	2.6	8.9	8.1	9.5
4	1.7	1.3	1.6	1.5	1.9	1.4	1.9	*1.7	3.0	8.9	7.8	9.2
5	1.7	1.3	1.5	1.7	1.8	1.4	1.8	1.8	2.2	8.6	7.8	8.9
6	1.7	1.3	1.6	1.6	1.8	1.4	1.8	2.1	1.9	9.8	7.8	8.3
7	1.6	1.2	1.6	1.3	*1.9	*1.4	1.8	1.8	1.4	9.5	7.6	1.0
8	1.4	1.2	1.7	*1.8	1.9	1.6	1.8	2.2	1.2	8.9	7.4	8.9
9	1.2	1.2	1.8	1.8	1.9	1.5	1.7	2.5	1.2	8.9	7.4	8.3
10	1.5	1.2	b1.7	b1.2	1.8	1.4	1.5	2.8	1.4	8.9	7.4	8.1
11	1.4	1.2	b1.5	1.0	1.8	1.4	1.4	3.1	1.4	8.3	8.8	7.6
12	*1.3	1.2	b.9	1.3	1.9	1.3	1.5	3.9	1.3	8.3	9.2	7.6
13	1.2	1.2	b1.1	b1.6	2.0	1.5	*1.8	5.1	1.3	8.3	8.3	7.6
14	1.3	1.4	b1.3	b1.7	1.9	1.2	2.4	5.3	1.4	8.1	8.1	*7.8
15	1.3	1.3	*2.5	1.6	1.8	1.3	3.2	4.8	1.3	8.3	7.8	7.6
16	1.3	1.4	2.3	b1.4	1.8	1.4	4.0	*4.7	1.0	*8.3	*7.8	7.6
17	1.3	1.4	2.0	b1.4	1.9	1.5	4.0	3.9	1.1	8.3	7.8	7.6
18	1.3	1.3	b1.7	1.8	1.8	1.4	4.8	3.2	1.2	8.3	8.3	7.8
19	1.5	1.3	b1.2	1.8	1.7	*1.5	5.8	3.2	1.2	8.3	8.3	7.6
20	1.5	1.4	b1.4	1.8	*1.7	1.4	6.5	3.2	*1.2	8.1	8.6	9.5
21	1.4	1.6	1.9	1.8	1.7	1.4	6.8	3.0	1.2	8.1	8.6	9.8
22	1.1	*1.7	1.8	1.8	1.5	1.4	6.1	2.8	1.1	8.3	8.6	8.9
23	1.0	1.8	1.4	1.8	1.6	1.3	5.2	2.6	1.0	8.6	8.9	1.1
24	1.1	1.7	1.5	1.8	1.6	1.2	4.9	2.5	1.0	9.8	8.9	1.2
25	1.2	1.6	1.5	1.8	1.4	1.2	5.4	2.5	1.0	8.6	8.9	1.2
26	1.2	1.6	1.6	1.8	1.5	1.3	5.4	2.6	9.8	8.9	8.9	1.2
27	1.2	1.6	1.6	1.6	1.4	1.4	5.0	2.3	1.0	8.3	8.9	1.2
28	1.2	1.6	1.4	1.5	1.3	1.6	4.7	2.5	9.8	8.1	8.9	*1.2
29	1.2	1.6	*1.4	1.5	1.9	1.9	4.7	2.6	9.5	8.1	8.9	1.2
30	1.2	1.6	1.6	*1.6	-----	2.0	4.5	2.6	1.0	8.1	8.6	1.2
31	1.4	-----	1.5	1.6	-----	1.9	-----	2.5	-----	*8.1	*8.6	-----
Total	42.4	42.3	49.8	49.3	48.5	45.2	1,05.7	92.6	423.1	266.7	257.2	281.3
Mean	13.7	14.1	16.1	15.9	17.3	14.6	35.2	29.9	14.1	8.60	8.30	9.38
Ac-ft	841	839	988	978	962	897	2,100	1,840	839	529	510	558

Calendar year 1961: Max 79 Min 5.6 Mean 19.9 Ac-ft 14,420

Water year 1961-62: Max 68 Min 7.4 Mean 16.4 Ac-ft 11,880

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

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

RIO GRANDE BASIN

67

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 1962.

Gage.--Water-stage recorder. Altitude of gage is 6,730 ft (from topographic map).

Average discharge.--5 years, 35.0 cfs (25,340 acre-ft per year).

Extremes.--Maximum discharge during year, 404 cfs Apr. 21 (gage height, 2.97 ft); minimum, 1.7 cfs Aug. 18.
1957-62: Maximum discharge, 600 cfs*May 13, 1957 (gage height, 3.72 ft); minimum daily, 1.8 cfs Sept. 11, 13, 1960.

Remarks.--Records fair except those for periods of ice effect or doubtful or no gage-height record, 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 tables, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Feb. 20-27, Mar. 16 to Apr. 29, Sept. 6-30)

Oct. 1 to May 31				June 1 to Sept. 30			
1.4	12	2.2	125	1.0	2.0	1.6	33
1.6	30	2.4	175	1.1	4.2	1.8	56
1.8	56	2.7	255	1.2	7.4	2.1	105
2.0	88	3.0	360	1.4	17	2.4	175

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	19	22	a22	b18	b24	b26	41	170	a30	8.3	*5.8	2.0
2	19	22	a22	b18	b24	27	*41	138	a32	7.1	5.8	2.0
3	19	21	a22	b18	25	25	48	117	a28	7.4	5.8	2.0
4	20	21	a21	b18	27	b24	59	115	*27	7.8	5.5	2.0
5	20	20	a20	b18	29	b24	61	119	27	9.1	5.5	2.0
6	20	*20	a19	b18	29	24	62	123	25	12	5.2	2.0
7	20	20	*19	19	35	*24	62	132	25	15	5.5	2.9
8	20	20	21	19	*48	25	d64	140	24	11	5.8	3.3
9	20	20	22	19	69	26	d66	150	23	11	5.2	3.3
10	24	20	21	*b16	53	25	d68	148	22	11	4.0	3.1
11	23	20	b20	b14	43	b24	d70	142	21	9.6	4.0	2.9
12	*22	20	b12	b15	29	b23	d74	140	21	7.8	4.5	2.7
13	22	19	b13	b16	34	25	d80	130	20	6.8	4.5	2.9
14	23	19	b15	16	31	b25	d100	117	20	5.8	5.2	*3.3
15	23	20	b18	b16	a30	b26	d130	100	19	5.5	4.2	3.5
16	23	19	a22	b17	a30	27	d160	*88	17	*5.2	3.5	3.8
17	23	19	a21	a18	a30	26	185	75	16	5.2	*2.7	4.0
18	22	19	a20	a20	a30	26	*212	66	14	5.2	2.2	3.8
19	21	19	a18	a22	a30	27	225	58	13	5.2	2.0	3.5
20	21	19	a18	a24	*32	*26	292	49	12	5.2	2.0	5.2
21	21	20	a19	a25	31	27	360	49	*12	4.8	2.4	6.8
22	21	20	a22	a25	28	26	320	43	10	5.2	2.9	4.5
23	21	a18	a19	a25	29	26	261	38	10	5.2	2.9	6.4
24	21	a19	a19	a25	30	27	222	31	7.8	5.8	3.1	9.6
25	21	a20	a20	a25	34	27	205	30	9.1	5.8	2.4	11
26	21	a21	a22	*24	31	28	208	29	9.1	5.5	2.0	9.6
27	23	a21	a20	b24	27	35	208	27	10	5.5	2.2	*9.1
28	23	a21	a18	b24	b25	48	208	29	9.6	5.5	2.0	10
29	22	a21	*19	b24	-	56	215	30	9.6	5.5	1.9	10
30	22	*a22	b20	b24	-----	52	205	a30	9.6	5.5	2.0	10
31	22	-----	b19	b24	-----	42	-----	a30	-----	5.8	*2.0	-----
Total	662	602	603	628	917	899	4,512	2,683	5,328	221.3	114.7	147.2
Mean	21.4	20.1	19.5	20.3	32.8	29.0	150	86.5	17.8	7.14	3.70	4.91
Ac-ft	1,310	1,190	1,200	1,250	1,820	1,780	8,950	5,320	1,060	439	228	292

Calendar year 1961: Max 178 Min 6.0 Mean 30.2 Ac-ft 21,840
Water year 1961-62: Max 360 Min 1.9 Mean 34.3 Ac-ft 24,840

Peak discharge (base, 130 cfs).--Apr. 21 (1000) 404 cfs (2.97 ft).

- * 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

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 1962. 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.--10 years, 19.8 cfs (14,330 acre-ft per year).

Extremes.--Maximum discharge during year, 200 cfs May 10 (gage height, 3.33 ft); minimum, 3.8 cfs Sept. 5.
1952-62: 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 doubtful 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)

1.5	3.2	2.3	42
1.6	5.2	2.6	72
1.8	11	2.9	115
2.0	21	3.3	195

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1 8	1 2	d 7	a 5	b 6	b 9	2 2	1 4 2	4 6	1 7	1 1	5.2
2	1 7	1 1	d 7	a 5	b 6	b 1 0	2 3	1 3 0	5 0	1 5	1 0	5.5
3	1 6	b 9	d 7	b 5	b 6	b 9	2 6	1 3 0	4 5	1 5	* 1 0	4.6
4	1 6	b 9	d 6	b 5	b 6	b 9	* 3 1	1 4 3	* 4 4	1 4	9.6	4.8
5	1 5	1 0	d 6	b 6	b 6	b 8	3 1	1 5 9	4 4	1 6	8.6	5.0
6	1 4	* b 8	d 6	b 6	b 7	b 8	3 1	1 7 2	4 4	1 7	7.9	7.9
7	1 4	b 8	* b 6	b 7	7.9	* 7.9	3 0	1 7 4	4 3	1 9	7.4	9.0
8	1 4	9.0	b 6	b 7	* 7.6	7.9	3 2	1 9 0	4 1	1 7	6.8	1 1
9	1 4	9.3	b 7	b 7	8.2	b 8	3 3	1 9 5	4 0	1 8	7.1	1 1
10	1 7	9.3	b 7	* b 6	8.6	b 9	3 4	1 9 3	3 7	1 5	7.1	8.6
11	1 6	9.0	b 6	b 4	9.0	b 9	3 2	1 9 0	3 5	1 4	7.6	6.8
12	1 4	9.0	b 5	a 4	9.3	b 8	3 4	1 8 6	3 3	1 4	7.9	6.6
13	* 1 3	b 8	b 5	a 5	1 2	b 9	4 6	1 8 4	3 1	1 4	7.9	* 6.3
14	1 3	7.9	b 6	a 5	1 2	b 9	5 8	1 6 8	3 0	1 3	6.8	6.3
15	1 2	8.6	b 7	a 5	1 2	b 9	8 0	1 4 9	2 8	1 2	7.1	6.6
16	1 2	b 8	b 7	a 5	1 2	b 9	9 8	* 1 4 0	2 7	1 2	7.4	6.3
17	1 2	b 8	b 7	a 5	1 1	b 9	9 8	1 2 4	2 6	* 1 2	* 7.9	6.3
18	1 1	b 8	a 6	a 5	b 1 0	b 9	* 1 1 8	1 0 9	2 5	1 2	7.1	5.5
19	1 1	b 7	a 6	a 5	b 9	b 9	1 5 1	9 9	2 3	1 2	6.6	5.7
20	1 1	b 7	a 6	a 6	* b 1 0	* 1 0	1 6 8	9 5	* 2 1	1 2	7.4	7.4
21	1 1	b 7	a 7	a 7	b 9	1 0	1 8 4	9 1	2 0	1 1	7.1	1 2
22	1 0	* b 6	a 7	a 7	b 9	9.3	1 7 2	8 6	1 9	1 1	7.4	9.6
23	1 0	b 6	a 6	a 6	b 9	9.6	* 1 5 3	7 7	1 9	1 1	6.8	9.0
24	1 0	b 7	a 6	a 6	b 9	9.6	1 4 3	7 2	1 8	1 3	6.6	1 1
25	1 0	b 7	a 6	a 6	1 0	1 1	1 5 3	6 9	1 8	1 3	6.0	1 5
26	1 0	d 7	* a 7	* b 5	b 9	1 2	1 5 7	6 5	1 7	1 2	6.0	1 4
27	1 1	d 7	a 6	b 5	b 8	1 6	1 5 1	6 2	1 6	1 1	5.2	* 1 1
28	1 1	d 7	a 6	b 5	b 9	2 1	1 5 5	6 5	1 6	1 1	5.5	1 0
29	1 1	d 7	a 6	b 5	-	2 3	1 5 9	* 6 1	1 6	1 1	5.2	1 0
30	1 1	d 7	a 6	b 5	-----	2 2	1 5 3	5 5	1 8	1 1	5.0	9.3
31	1 2	-----	a 6	b 6	-----	2 2	-----	5 1	-----	1 1	* 5.0	-----
Total	39 7	2 4 3.1	1 9 5	1 7 1	2 4 7.6	3 4 1.3	2 7 5.6	3 8 2.6	8 9 0	4 1 6	2 2 5.0	2 4 7.3
Mean	12.8	8.10	6.3	5.5	8.84	11.0	91.9	123	29.7	13.4	7.26	8.24
Ac-ft	787	482	387	339	491	677	5,470	7,590	1,770	825	446	491

Calendar year 1961: Max 143 Min 3.5 Mean 23.9 Ac-ft 17,290
Water year 1961-62: Max 195 Min 4 Mean 27.3 Ac-ft 19,760

Peak discharge (base, 75 cfs). --Apr. 21 (0500) 188 cfs (3.28 ft); May 10 (0300) 200 cfs (3.33 ft).

* 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

69

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 1/4 miles upstream from mouth.

Drainage area.--37.0 sq mi.

Records available.--March 1957 to September 1962.

Gage.--Water-stage recorder. Altitude of gage is 7,230 ft (from topographic map).

Average discharge.--5 years, 9.36 cfs (6,780 acre-ft per year).

Extremes.--Maximum discharge during year, 110 cfs Apr. 19 (gage height, 2.16 ft); minimum, 1.2 cfs Feb. 28, Mar. 4.
1957-62: 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 (momentary minimum not yet determined).

Remarks.--Records good except those for periods of ice effect 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)

1.2	1.6	1.5	8.1	1.8	28
1.3	3.0	1.6	13	2.0	58
1.4	5.0	1.7	19	2.2	110

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.1	5.5	b 3.0	b 2.3	2.3	3.9	9.9	5.5	1.8	9.0	* 6.1	2.8
2	6.1	5.2	b 3.0	b 2.3	2.5	b 4.0	1.0	5.0	2.1	7.8	5.2	2.8
3	5.8	b 4.0	b 3.0	b 2.3	2.5	4.3	1.2	5.0	1.7	7.4	5.0	2.6
4	5.8	b 4.0	b 2.5	b 2.3	2.8	3.5	1.4	5.5	* 1.6	7.8	5.0	2.6
5	5.5	b 4.0	b 2.5	b 2.3	3.0	3.9	1.3	5.6	1.5	1.1	4.8	2.8
6	5.5	* b 3.5	b 2.5	b 2.3	3.0	4.1	1.3	6.2	1.5	1.1	4.5	6.1
7	5.2	b 3.5	* b 2.5	b 2.5	3.5	* 3.9	1.3	6.0	1.4	1.2	4.3	5.0
8	5.0	b 3.5	b 2.5	b 2.5	3.7	3.9	1.3	6.7	1.4	1.1	4.1	5.8
9	5.5	b 3.5	b 2.5	b 2.5	* 3.7	3.9	1.3	6.9	1.4	1.1	4.1	5.2
10	7.4	b 3.5	b 2.5	* b 2.0	4.1	3.1	1.3	6.7	1.3	9.0	3.9	4.3
11	6.1	b 3.5	b 2.2	b 2.0	4.3	3.1	1.3	6.5	1.3	7.8	4.1	3.7
12	5.8	b 3.5	1.9	b 2.0	4.8	b 3.0	* 1.5	6.5	1.2	7.8	4.5	3.7
13	* 5.5	b 3.5	2.0	b 2.0	5.8	b 3.5	1.9	6.2	1.1	1.0	4.1	* 3.3
14	5.5	b 3.0	b 2.2	b 2.1	5.5	b 3.5	2.9	5.5	1.1	9.0	3.7	3.3
15	5.2	b 3.0	b 2.3	b 2.2	5.2	b 4.0	4.3	5.1	1.1	7.8	3.5	3.3
16	5.2	b 3.0	b 2.3	b 2.2	5.2	b 4.0	5.1	* 5.3	1.0	7.8	3.7	3.3
17	5.0	b 3.0	b 2.3	b 2.2	5.2	b 4.0	5.1	5.3	9.9	9.0	* 4.1	3.1
18	5.0	b 3.0	b 2.3	b 2.2	5.0	4.3	6.0	5.0	9.5	* 8.1	3.7	3.0
19	5.0	b 3.0	b 2.3	2.3	3.7	4.8	7.3	5.0	9.5	7.4	3.7	3.0
20	4.8	a 3.0	b 2.3	2.3	* 5.2	* 4.8	9.5	4.4	* 9.5	7.4	3.9	3.7
21	4.8	a 2.8	b 2.3	2.3	4.1	4.5	7.8	4.0	9.0	7.4	3.9	6.7
22	4.8	* a 2.5	b 2.3	2.3	3.9	4.5	6.5	3.7	8.6	6.7	3.9	4.8
23	4.8	b 2.5	b 2.3	2.2	4.3	4.5	6.2	3.3	8.1	7.1	3.7	4.3
24	4.8	b 2.8	b 2.3	2.2	4.3	4.8	6.2	3.1	7.8	8.1	3.3	5.5
25	4.8	b 3.0	b 2.3	2.5	5.0	4.8	* 6.0	2.8	8.1	7.4	3.1	8.1
26	4.5	b 3.0	* b 2.3	2.5	4.1	6.1	5.8	2.7	8.1	6.7	3.1	6.1
27	5.0	b 3.0	b 2.3	2.3	3.9	7.4	5.8	2.4	8.1	6.1	3.0	* 5.0
28	5.0	b 3.0	b 2.3	2.3	b 2.5	7.8	5.6	2.5	7.8	6.1	2.8	5.0
29	5.0	b 3.0	b 2.3	* 2.3	-	9.9	5.1	2.4	8.1	6.1	2.6	4.5
30	5.0	b 3.0	b 2.3	2.2	-----	1.1	5.3	2.2	9.0	6.1	2.6	4.3
31	5.2	-----	b 2.3	2.2	-----	7.8	-----	1.9	-----	6.4	* 2.6	-----
Total	164.7	100.3	73.9	70.1	113.1	150.6	1175.9	144.9	346.1	253.3	120.6	127.7
Mean	5.31	3.34	2.38	2.26	4.04	4.86	39.2	46.7	11.5	8.17	3.89	4.26
Ac-ft	327	199	147	139	224	299	2,330	2,870	686	502	239	253

Calendar year 1961: Max 64 Min 1.5 Mean 9.79 Ac-ft 7,080
Water year 1961-62: Max 95 Min 1.9 Mean 11.4 Ac-ft 8,220

Peak discharge (base, 35 cfs).--Apr. 19 (2100) 110 cfs (2.16 ft).

* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

RIO GRANDE BASIN

8-2760. Rio Pueblo de Taos at Los Cordovas, N. Mex.

Location.--Lat 36°23'20", long 105°38'00", in N $\frac{1}{2}$ 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 3 $\frac{1}{2}$ miles west of Taos.

Drainage area.--359 sq mi.

Records available.--April 1910 to January 1926, September 1926 to September 1962. 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.--51 years (1910-25, 1926-62), 59.7 cfs (43,220 acre-ft per year).

Extremes.--Maximum discharge during year, 630 cfs Apr. 21 (gage height, 4.20 ft); minimum, 3.6 cfs Sept. 3. 1915, 1922, 1924-25, 1927, 1929-62: 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 good 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 Aug. 31 to Sept. 30)

1.4	5.3	1.8	24	2.5	105	4.0	545
1.5	8.8	2.0	41	3.0	211	4.5	780
1.6	13	2.2	62	3.5	355		

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	34	32	32	b20	37	b31	63	323	a50	13	8.1	4.6
2	34	33	30	b20	38	b33	*66	281	a54	12	7.4	4.3
3	35	32	30	b20	41	b33	78	264	a52	12	6.7	4.3
4	34	32	30	a20	42	b30	97	276	*a48	13	6.4	4.3
5	36	31	26	a21	45	b30	99	290	a47	14	6.0	4.3
6	35	*31	25	a22	45	b31	100	311	a45	23	6.0	5.1
7	32	31	26	a23	*53	*37	94	326	42	21	6.4	a6
8	33	32	27	a25	66	41	100	349	36	18	6.7	a6
9	35	34	30	a22	88	41	102	365	35	18	6.4	a6
10	41	34	30	*a20	75	36	105	365	33	16	6.0	a6
11	40	33	29	a18	67	b30	105	365	31	16	6.7	a6
12	*38	31	a20	a18	62	b30	109	369	32	14	7.4	a6
13	37	30	a20	a20	67	b29	127	369	30	12	7.8	a6
14	35	32	a25	a23	71	b29	162	329	27	11	8.4	*a6
15	35	34	a30	a20	62	b32	216	284	27	10	7.8	6.0
16	34	32	a35	a20	59	b33	296	*234	23	9.6	6.7	6.0
17	33	31	a33	a22	56	b34	296	204	24	9.6	*6.0	6.7
18	33	32	a31	a25	52	b33	349	180	21	*10	5.3	6.7
19	33	30	*b30	a25	*47	37	*440	158	19	10	5.1	7.4
20	32	31	b30	a30	50	*40	541	139	19	10	5.1	11
21	31	36	b28	a37	44	39	604	131	*19	9.6	5.1	13
22	30	36	b25	a37	41	38	563	121	18	9.2	5.6	9.6
23	29	31	b25	a35	40	40	471	105	16	10	5.6	11
24	29	32	b25	a35	41	41	407	a99	14	11	6.0	16
25	29	36	b25	a35	44	40	418	a90	16	10	5.3	15
26	30	36	b25	*35	39	44	*436	a85	14	10	4.8	13
27	32	35	24	34	38	52	425	a75	14	9.6	4.8	*13
28	34	35	b24	36	b30	66	414	a70	14	8.4	4.8	14
29	34	33	b24	35	-	79	411	a65	15	8.4	4.8	14
30	33	*35	b23	36	-----	75	389	a60	15	8.4	4.8	13
31	31	-----	b22	36	-----	62	-----	a54	-----	*8.8	*4.8	-----
Total	1,041	983	839	825	1,440	1,246	3,083	6,736	850	375.6	188.8	250.3
Mean	33.6	32.8	27.1	26.6	51.4	40.2	269	217	28.3	12.1	6.09	8.34
Ac-ft	2,060	1,950	1,660	1,640	2,860	2,470	16,030	13,360	1,690	745	374	496

Calendar year 1961: Max 352 Min 10 Mean 52.3 Ac-ft 37,860
Water year 1961-62: Max 604 Min 4.3 Mean 62.6 Ac-ft 45,340

Peak discharge (base, 200 cfs).--Apr. 21 (0900) 630 cfs (4.20 ft).

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

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 1962.

Gage.--Water-stage recorder. Altitude of gage is 6,630 ft (from topographic map).

Average discharge.--5 years, 60.7 cfs (43,940 acre-ft per year).

Extremes.--Maximum discharge during year, 630 cfs Apr. 21 (gage height, 3.78 ft); minimum, 4.2 cfs Aug. 28.

1957-62: Maximum discharge, 2,380 cfs Aug. 24, 1957 (gage height, 5.80 ft), 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 good except those for periods of ice effect or doubtful or no gage-height record, 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)
(Shifting-control method used Apr. 10-16, May 12-23)

0.8	4.9	2.0	118
.9	8.0	2.5	195
1.0	13	3.0	320
1.2	27	3.5	490
1.5	56	3.8	630

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	34	33	33	a 21	d35	34	71	347	48	15	8.9	5.8
2	33	34	32	a 21	d37	35	* 73	299	53	14	8.0	5.8
3	35	33	30	a 21	d40	36	84	280	47	14	8.5	5.5
4	36	33	32	a 21	d40	32	104	290	* 46	15	7.7	5.5
5	37	33	29	a 21	d45	33	104	311	45	16	7.4	5.5
6	37	* 32	27	a 22	d50	37	105	323	43	19	7.1	5.5
7	36	32	27	a 23	* 58	* 40	98	332	40	26	7.1	7.1
8	36	34	29	a 25	72	43	104	347	34	18	7.7	7.4
9	36	36	32	a 23	102	45	104	359	34	18	7.4	7.4
10	42	35	30	* b 22	84	44	111	365	33	16	7.1	7.1
11	42	34	28	b 19	72	34	110	362	32	15	7.4	7.1
12	* 39	32	a 23	b 18	64	30	115	353	32	14	8.0	7.4
13	37	32	b 23	b 21	68	33	139	353	30	13	8.0	* 7.4
14	35	33	b 27	b 24	74	33	181	323	27	12	7.7	7.7
15	35	35	b 32	b 20	64	33	235	288	26	12	7.7	7.7
16	34	35	b 35	a 20	58	34	299	* 245	25	12	7.1	7.7
17	33	34	b 33	a 22	58	38	305	213	25	12	* 6.8	7.7
18	33	35	b 31	a 25	52	38	359	188	23	* 11	6.4	7.4
19	33	32	* b 30	a 25	47	39	* 442	164	18	11	5.8	7.1
20	33	32	b 30	a 30	* 48	* d40	522	147	19	11	6.1	10
21	32	38	b 28	a 35	43	d40	570	136	* 21	11	6.4	14
22	32	36	b 26	a 35	40	d40	585	126	18	11	7.1	11
23	30	30	b 25	a 35	41	d42	486	114	18	11	7.1	12
24	30	32	b 25	a 35	42	d43	410	100	15	11	7.1	15
25	30	34	b 25	a 35	46	d42	426	d90	18	10	6.4	16
26	30	36	b 25	* a 35	42	47	* 442	d80	18	10	5.5	14
27	32	35	b 24	d33	40	52	438	d75	16	10	5.5	* 14
28	34	35	b 24	d34	34	67	422	d74	17	9.9	5.2	15
29	34	34	b 24	d34	—	87	395	71	17	9.4	4.9	15
30	34	* 36	d23	d35	-----	85	395	59	18	9.4	5.5	14
31	32	-----	a 22	d35	-----	67	-----	50	-----	* 9.4	* 5.8	-----
Total	1,066	1,015	864	825	1,496	1,343	3,234	6,864	856	4,061	214.4	279.8
Mean	34.4	33.8	27.9	26.6	53.4	43.3	274	221	28.5	13.1	6.92	9.33
Ac-ft	2,110	2,010	1,710	1,640	2,970	2,660	16,330	13,610	1,700	805	425	555

Calendar year 1961: Max 341 Min 12 Mean 55.2 Ac-ft 39,950
Water year 1961-62: Max 585 Min 4.9 Mean 64.3 Ac-ft 46,520

Peak discharge (base, 230 cfs).--Apr. 21 (1630) 630 cfs (3.78 ft).

- * 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

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 1962. 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.--37 years, 760 cfs (550,000 acre-ft per year).

Extremes.--Maximum discharge during year, 3,360 cfs Apr. 21 (gage height, 6.41 ft); minimum, 240 cfs Aug. 19.

1926-62: 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 except those for period of no gage-height record, which are poor. Diversions for irrigation of about 650,000 acres above station.

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

3.5	220	5.0	1,360
4.0	500	6.0	2,680
4.5	875	7.0	4,440

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	315	370	626	494	494	*577	662	2,540	875	633	*358	265
2	305	*399	626	480	500	640	*655	2,340	892	584	348	270
3	*310	429	626	*480	507	685	739	2,050	926	*570	342	270
4	305	907	640	480	514	662	819	1,970	960	570	336	260
5	305	1,140	640	480	521	685	859	*2,050	*1,010	556	320	*255
6	300	1,160	598	480	549	708	843	2,230	1,150	570	305	260
7	295	960	570	487	570	708	787	2,380	1,400	626	295	275
8	295	771	521	480	612	755	787	2,500	1,580	605	300	275
9	295	723	507	500	655	731	771	2,660	1,450	670	295	270
10	315	692	429	a480	670	692	795	2,810	1,320	662	290	260
11	315	685	381	a400	678	640	819	3,000	1,230	648	285	275
12	315	739	295	a400	700	563	835	3,140	1,270	626	290	270
13	310	739	381	a420	755	584	851	2,970	1,350	591	280	270
14	315	619	454	a430	795	*528	875	2,740	1,250	563	280	270
15	348	692	454	a430	819	494	969	2,580	1,250	514	265	265
16	336	692	500	a440	*859	584	1,200	2,380	1,350	*500	250	260
17	336	685	487	*442	900	648	*1,440	1,930	1,430	468	250	260
18	336	685	494	454	943	708	1,800	1,670	1,450	442	245	260
19	*326	655	507	461	884	648	2,280	1,550	1,300	423	240	250
20	320	678	514	461	884	626	2,710	1,350	1,130	399	*250	260
21	320	662	514	461	*827	612	3,170	1,200	943	370	250	280
22	310	626	521	474	779	598	3,290	*1,230	851	320	250	270
23	305	591	514	480	771	591	3,190	1,230	795	295	265	275
24	305	584	514	487	747	577	2,980	1,050	795	290	270	275
25	305	591	514	494	731	563	2,640	960	755	285	255	285
26	300	584	514	494	715	542	2,520	943	700	315	260	*285
27	315	570	514	494	605	528	2,590	875	692	310	310	295
28	342	605	507	487	556	528	2,540	884	715	305	280	280
29	342	*619	500	494	-	542	2,410	1,000	700	315	270	270
30	336	633	500	500	-----	584	2,420	1,050	640	411	265	270
31	348	-----	500	*494	-----	626	-----	969	-----	423	265	-----
Total	9,825	20,485	15,862	14,538	19,540	19,157	49,246	58,231	32,159	14,859	8,764	8,085
Mean	317	683	512	469	698	618	1,642	1,878	1,072	479	283	270
Ac-ft	19,490	40,630	31,460	28,840	38,760	38,000	97,680	115,500	63,790	29,470	17,380	16,040

Calendar year 1961: Max 1,900 Min 270 Mean 515 Ac-ft 372,900
 Water year 1961-62: Max 3,290 Min 240 Mean 742 Ac-ft 537,000

Peak discharge (base, 1,600 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
4-21	2230	6.41	3,360	6-8	0700	5.22	1,610
5-12	1830	6.32	3,200				

* Discharge measurement made on this day.
 a No gage-height record.

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 1962. 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 pair at site 200 ft upstream at present datum.

Average discharge.--73 years, 1,055 cfs (763,800 acre-ft per year).

Extremes.--Maximum discharge during year, 3,980 cfs Apr. 22 (gage height, 6.98 ft); minimum, 232 cfs Sept. 19, 20. 1889-1903, 1912-62: 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)

Oct. 1 to Jan. 10

Jan. 11 to Sept. 30

2.7	330	4.0	1,050	2.3	235	4.0	1,130
3.0	470	5.0	1,800	2.8	420	5.0	2,000
3.5	740			3.4	730	7.0	4,000

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	393	445	669	525	545	*614	750	3,020	980	631	*411	262
2	380	*480	669	520	555	697	*760	2,800	973	582	388	265
3	*375	490	664	*515	565	742	862	*2,450	1,000	*545	367	262
4	375	843	674	520	576	730	973	2,300	1,020	560	359	262
5	375	1,130	669	520	587	730	1,020	2,380	*1,070	560	339	*256
6	375	1,160	636	515	598	754	994	2,590	1,190	570	321	253
7	370	1,040	620	520	620	778	931	2,700	1,450	631	307	259
8	357	836	570	525	648	820	924	2,950	1,670	620	304	265
9	370	794	570	540	680	808	924	3,190	1,550	670	304	262
10	406	752	485	520	724	754	931	3,330	1,400	680	296	259
11	398	740	450	a450	736	708	966	3,510	1,290	670	290	259
12	388	788	330	a450	772	626	987	3,650	1,310	631	300	262
13	384	800	339	a470	820	648	1,040	3,510	1,410	598	290	256
14	380	686	475	a480	862	*604	1,120	3,310	1,320	576	282	253
15	406	722	525	a480	880	587	1,270	3,030	1,300	530	276	253
16	420	752	560	a500	*917	609	1,600	2,890	1,390	*520	265	247
17	411	734	545	*500	959	724	*1,820	2,340	1,450	475	259	247
18	411	758	535	525	994	784	2,300	1,940	1,500	452	253	247
19	*393	692	530	520	938	730	2,910	1,800	1,330	434	244	241
20	384	716	560	525	938	714	3,360	1,560	1,140	411	*247	247
21	375	734	570	515	*886	686	3,780	1,350	924	388	247	282
22	370	680	576	530	814	675	3,900	*1,330	808	343	247	276
23	366	642	565	535	820	664	3,750	1,370	736	310	247	276
24	366	636	560	535	808	664	3,520	1,180	736	300	259	290
25	362	642	555	535	784	653	3,190	1,040	697	307	247	304
26	362	642	560	535	784	636	3,020	1,030	648	335	241	*296
27	366	630	560	525	680	620	3,060	966	636	335	282	296
28	406	642	540	530	636	648	3,050	973	670	321	279	293
29	420	*664	530	535	—	675	2,930	1,100	670	347	268	293
30	420	674	530	540	—	714	2,910	1,150	620	392	262	282
31	420	—	540	*540	—	724	—	1,080	—	500	259	—
Total	11,984	21,944	17,161	15,975	21,126	21,520	59,552	67,819	32,888	15,224	8,940	8,005
Mean	387	731	554	515	754	694	1,985	2,188	1,096	491	288	267
Ac-ft	23,770	43,530	34,040	31,690	41,900	42,680	118,100	134,500	65,230	30,200	17,730	15,880

Calendar year 1961: Max 2,250 Min 258 Mean 608 Ac-ft 440,100
 Water year 1961-62: Max 3,900 Min 241 Mean 828 Ac-ft 599,200

Peak discharge (base 2,000 cfs).--Apr. 22 (0130) 3,980 cfs (6.90 ft); May 12 (2300) 3,700 cfs (6.70 ft).

* Discharge measurement made on this day.

a No gage-height record.

RIO GRANDE BASIN

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 1962.

Gage.--Water-stage recorder. Altitude of gage is 7,083 ft (from river-profile map).

Average discharge.--7 years, 345 cfs (249,800 acre-ft per year).

Extremes.--Maximum discharge during year, 4,660 cfs May 8 (gage height, 5.24 ft); minimum, 16 cfs Sept. 5.

1955-62: 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 10,300 acres above station (1962 determination).

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

1.2	17	1.9	84	3.0	500	4.5	2,470
1.4	28	2.2	146	3.5	920	4.9	3,520
1.6	45	2.5	243	4.0	1,540		

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	129	217	107		b70	b70	380	2,070	706	157	65	19
2	122	163	101		b75	b80	504	2,210	730	141	55	19
3	118	116	105		b80	b80	699	2,470	722	124	48	18
4	114	149	91		b85	b80	827	2,740	714	114	45	18
5	107	149	76		b90	b85	850	2,810	682	109	42	18
6	101	134	b80		b100	b90	850	3,020	682	114	40	25
7	98	120	b80		b110	91	870	3,220	674	109	34	36
8	94	134	81		b120	89	950	3,460	634	92	32	40
9	239	134	92		b150	87	890	3,330	578	87	30	36
10	256	127	b80		b190	b85	830	3,060	563	80	30	34
11	184	122	b60		b230	b80	840	2,880	535	74	27	33
12	a190	134	a40		b270	b70	1,030	2,640	500	65	29	*30
13	*193	109	a45		b300	b60	1,280	2,380	470	61	31	28
14	213	91	a50		b310	b60	1,610	2,190	*458	59	32	28
15	193	134	a70	*a70	*b330	b70	1,920	*2,030	428	53	*29	30
16	166	107	a80		b320	*b80	2,230	1,840	375	*47	27	30
17	163	114	a70		b310	87	*2,290	1,510	340	44	26	26
18	154	107	a70		b280	89	2,460	1,520	316	44	27	25
19	136	87	a60		b250	105	2,840	1,730	290	44	32	24
20	120	101	a60		b220	120	3,070	1,450	285	47	35	27
21	116	122	a70		b200	122	3,120	1,330	264	44	36	65
22	112	92	a70		b170	124	2,760	1,150	247	45	36	66
23	112	92	a70		b140	122	2,710	1,120	228	56	32	48
24	103	94	a70		b120	116	2,840	1,130	210	78	25	52
25	101	109	a70		a100	141	3,110	1,060	193	70	23	56
26	99	114	a70		a90	208	2,990	980	190	69	23	a53
27	105	92	a70		*b80	320	2,780	1,000	177	59	22	*50
28	114	98	*a70		b70	462	2,840	1,000	*168	53	22	a60
29	107	89	a70		-	520	2,710	910	166	49	*20	a70
30	139	114	a70		-----	*422	*2,290	757	163	*50	19	a80
31	*187	-----	a70	(*)	-----	315	-----	*714	-----	69	20	-----
Total	4,385	3,570	2,268	2,170	4,860	4,530	5,370	5,971	12,688	2,307	994	1,144
Mean	141	119	73.2	70.0	174	146	1,846	1,926	423	74.4	32.1	38.1
Ac-ft	8,700	7,080	4,500	4,300	9,640	8,990	109,800	118,400	25,170	4,580	1,970	2,270

Calendar year 1961: Max 3,160 Min 20 Mean 323 Ac-ft 233,700
 Water year 1961-62: Max 3,460 Min 18 Mean 422 Ac-ft 305,400

Peak discharge (base, 2,700 cfs).--May 8 (2145) 4,660 cfs (5.24 ft).

* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

RIO GRANDE BASIN

75

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 1962 (no winter records prior to 1943). Monthly or yearly discharges only for some periods, published in WSP 1312.

Gage--Water-stage recorder. Datum of gage is 6,944.99 ft (Bureau of Reclamation datum). Prior to Oct. 1, 1937, at datum 0.79 ft higher, Apr. 19, 1949, to Aug. 8, 1951, at different datums, Aug. 9, 1951, to Sept. 30, 1960 at datum 0.41 ft higher.

Average discharge--25 years (1936-38, 1939-62), 22.3 cfs (16,140 acre-ft per year).

Extremes--Maximum discharge during year, 1,120 cfs Mar. 28 (gage height, 5.49 ft); no flow at times.

1936-62: 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 period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 29 to Apr. 16)

0.6	0	1.1	6.5	2.5	119	4.5	645
.7	.3	1.3	13	3.0	205		
.8	.9	1.6	28	3.5	320		
.9	2.0	2.0	59	4.0	465		

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	143	9		a1	a20	315	a20	4	6	6	1
2	0	48	8		a1	a21	372	a18	4	5	6	1
3	0	14	8		a1	a23	491	a16	5	4	6	1
4	0	8	6		a1	a24	405	14	6	3	5	1
5	0	5	3		a2	a25	350	12	7	3	5	1
6	0	4	2		a2	a26	287	12	9	3	4	1
7	0	4	2		a3	a26	237	11	10	2	4	2
8	0	3	1		a3	a26	247	10	11	2	3	4
9	2	4	1		a4	a26	255	9	11	2	3	2
10	15	7	1		a5	a25	204	8	10	3	2	2
11	4	10	1		a6	a23	171	7	12	3	2	2
12	2	11			a7	a21	176	7	12	3	1	*2
13	*1	9			b8	a18	174	7	12	2	2	*2
14	1	5			b9	a13	185	6	*11	3	4	2
15	0	*4		*a1	*b10	*a10	176	*6	10	3	*3	1
16	0	5			b10	a10	*167	5	9	*3	2	1
17	0	4			a9	12	a140	5	9	3	2	1
18	0	4			a9	18	a120	4	9	4	2	1
19	0	4			a8	29	a100	4	7	4	5	0
20	0	3	a1		a7	63	84	4	6	4	8	1
21	0	3			a6	89	62	4	6	4	13	6
22	0	4			a6	a60	46	5	6	4	10	4
23	0	3			a6	a55	43	6	5	5	7	7
24	0	2			a8	a50	36	4	5	6	5	9
25	0	3			a10	139	33	4	6	8	4	11
26	0	5			a12	301	36	4	5	7	4	13
27	0	6			*a15	509	34	4	6	5	3	13
28	0	6	(*)		a17	591	25	5	*6	4	*3	*16
29	0	6			-	*507	23	5	6	4	2	12
30	10	*6			-	365	*22	5	6	*3	2	6
31	50			(*)	-	241		*4		4	2	
Total	85	343	62	31	186	3,366	5,016	235	231	119	130	126
Mean	2.7	11.4	2.0	1.0	6.6	109	167	7.6	7.7	3.8	4.2	4.2
Ac-ft	169	680	123	61	369	6,680	9,950	466	458	236	258	250

Calendar year 1961: Max 306' Min 0 Mean 14.3 Ac-ft 10,320
Water year 1961-62: Max 591 Min 0 Mean 27.2 Ac-ft 19,700

Peak discharge (base, 800 cfs).--Mar. 28 (2230) 1,120 cfs (5.49 ft).

* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

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, 2.7 miles upstream from Rio Nutrias, and 13 miles southwest of Tierra Amarilla.

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

Records available.--October 1913 to November 1915, April to November 1916, March, April 1920, September 1920 to August 1924, October 1935 to September 1962. 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; 27 years (1935-62), 386 cfs (279,500 acre-ft per year), subsequent to completion of El Vado Dam.

Extremes.--Maximum discharge during year, 1,170 cfs Aug. 9 (gage height, 3.62 ft); minimum, 1.76 cfs Apr. 4.

1913-16, 1920-22, 1923-24, 1935-62: 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 or no gage-height record, which are fair. Flow regulated since 1935 by El Vado Reservoir (see p. 155). Diversions for irrigation of about 10,600 acres above station.

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

1.2	12	2.5	410
1.3	22	3.0	700
1.5	52	3.5	1,070
1.7	97	4.0	1,510
2.0	191		

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	95	87	855	a90	b80	b90	812	1.050	226	75	62	16
2	95	83	840	a90	b80	b110	812	1.050	289	85	45	16
3	92	315	833	a80	b80	b130	819	1.060	560	80	45	17
4	92	1.050	819	a80	b80	b125	470	1.070	830	92	40	166
5	92	1.050	805	a70	b80	b120	885	1.080	900	95	34	916
6	83	1.050	791	a70	b85	122	900	1.090	821	95	31	370
7	80	1.040	777	a70	87	134	900	1.100	523	95	30	385
8	80	1.040	763	a70	97	147	892	1.110	364	92	26	385
9	97	1.030	749	a70	111	144	900	1.130	460	92	186	385
10	134	1.020	728	a70	137	122	900	1.130	466	92	970	302
11	180	1.010	714	a70	170	b105	892	1.140	472	90	472	156
12	226	1.010	a690	a70	207	b95	908	1.150	478	67	514	*188
13	*250	1.010	a670	a70	400	b95	915	1.160	478	67	508	188
14	250	998	*652	a70	455	b90	930	1.090	*472	67	508	188
15	250	*990	598	*b65	*445	*b90	960	*1.050	460	56	*508	136
16	250	982	278	b65	410	b105	*982	1.050	400	*38	508	26
17	207	975	160	b70	422	137	1.020	1.060	330	34	508	25
18	177	975	131	b70	290	170	1.040	1.060	294	26	508	25
19	177	960	a105	b70	230	231	1.050	1.060	238	26	508	25
20	150	952	a100	b70	210	340	1.090	1.070	222	26	502	26
21	134	945	a95	73	188	370	1.100	1.070	218	26	311	40
22	105	938	a90	73	b160	355	1.050	1.070	214	26	34	85
23	87	930	a90	71	156	350	1.050	1.070	214	31	34	85
24	87	922	a90	71	156	278	1.050	1.070	214	50	34	125
25	85	908	a90	71	153	326	1.060	1.070	218	56	27	115
26	83	900	a90	73	131	520	1.050	972	199	81	22	97
27	83	892	a90	b75	*b115	735	1.050	822	166	60	22	*100
28	83	885	*90	b75	b100	798	1.070	777	*140	34	22	100
29	85	870	a90	b70	-	*840	1.080	592	103	32	*20	100
30	87	*862	a90	b75	-----	848	*1.050	195	78	*37	16	82
31	*87	-----	a90	*b80	-----	826	-----	*199	-----	67	16	-----
Total	4,063	26,679	13,053	2,257	5,315	8,948	28,687	30,667	11,047	1,890	7,071	4,870
Mean	131	889	421	72.8	190	289	956	989	368	61.0	228	162
Ac-ft	8,060	52,920	25,890	4,480	10,540	17,750	56,900	60,830	21,910	3,750	14,030	9,660
Calendar year 1961: Max		1,460	Min	0.3	Mean	342	Ac-ft	247,600				
Water year 1961-62: Max		1,160	Min	16	Mean	396	Ac-ft	286,700				

* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

RIO GRANDE BASIN

77

8-2865. Rio Chama above Abiquiu Reservoir, N. Mex.

Location.--Lat 36°19'05", long 106°35'50", in NW¼ sec.14, T.24 N., R.3 E. (projected), on left bank 7.7 miles downstream from Gallina River, 10 miles northwest of Youngsville, 16 miles upstream from Abiquiu Dam and 30 miles downstream from El Vado Dam.

Drainage area.--1,600 sq mi, of which about 100 sq mi is probably noncontributing.

Records available.--August 1961 to September 1962.

Gage.--Water-stage recorder. Altitude of gage is 6,280 ft (from river-profile map).

Extremes.--1961: Maximum discharge during period August to September, 1,140 cfs Aug. 23 (gage height, 4.36 ft); minimum, 54 cfs Sept. 5.

1961-62: Maximum discharge during water year, 1,370 cfs Apr. 21 (gage height, 4.71 ft); minimum, 16 cfs Sept. 4.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Flow regulated by El Vado Reservoir (see p). Diversions for irrigation of about 15,000 acres above station.

Discharge, in cubic feet per second, 1961

Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.
1	a40	*76	7	491	72	13	373	155	19	213	393	25	236	202
2	a35	75	8	483	90	14	452	*111	20	191	536	26	234	198
3	a100	78	9	483	147	15	155	213	21	189	456	27	190	115
4	a200	63	10	475	164	16	141	106	22	141	282	28	102	108
5	a800	56	11	514	171	17	185	76	23	228	202	29	a80	109
6	a600	68	12	546	185	18	222	270	24	157	200	30	a60	149
												31	a60	—
Total													8,376	5,126
Mean													270	171
Runoff in acre-feet													16,610	10,170

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	103	233	873	91	b82	104	860	1,160	216	75	70	20
2	103	146	860	93	*b84	*112	866	1,150	256	73	62	19
3	102	102	845	87	b86	129	938	1,150	416	86	52	18
4	102	850	835	*b85	b88	126	820	1,170	688	84	49	17
5	*98	1,060	820	b85	b90	120	778	1,180	890	91	44	683
6	98	1,070	805	b80	96	127	1,000	1,200	850	*94	37	485
7	86	1,070	795	b75	108	126	1,030	1,220	688	93	*32	375
8	83	1,070	780	b75	155	149	1,040	1,230	337	89	30	372
9	129	1,060	765	b75	428	145	1,030	1,260	416	89	27	372
10	232	1,060	750	b75	526	134	*1,070	1,260	445	89	689	369
11	158	1,050	735	b75	444	104	1,010	1,260	445	89	540	169
12	189	1,030	a710	b75	412	79	1,020	1,260	453	79	491	176
13	233	1,030	a700	b75	895	102	1,030	1,260	449	68	479	*181
14	231	*1,020	a700	b75	743	100	1,050	1,220	445	66	464	183
15	231	1,020	620	b75	654	108	1,080	1,130	441	64	464	183
16	231	1,010	414	b70	*572	108	1,140	1,120	416	56	464	101
17	226	1,000	196	b70	521	167	1,170	1,110	*349	41	464	37
18	*172	998	b140	b70	354	337	1,180	1,100	310	40	468	31
19	168	992	*b110	*b70	246	377	1,210	1,100	261	30	468	30
20	166	986	b105	b75	211	486	1,230	1,090	223	30	468	33
21	133	986	b103	b80	194	420	1,320	1,080	216	28	460	91
22	127	968	102	b80	160	399	1,260	1,080	209	28	114	58
23	96	962	97	b80	147	406	*1,200	*1,080	202	30	46	93
24	91	950	97	b80	149	308	1,200	1,080	202	34	41	122
25	90	944	98	b80	151	295	1,210	1,070	198	51	40	169
26	89	938	98	b85	145	*500	1,210	1,030	*196	96	33	117
27	89	920	102	b80	109	800	1,200	884	166	93	27	137
28	87	*902	97	b80	112	993	1,180	790	143	57	*24	166
29	103	890	94	b80	—	992	1,190	780	117	37	22	103
30	140	890	94	b80	—	938	1,190	283	93	34	*22	97
31	221	—	93	b82	—	890	—	211	—	46	21	—
Total	4,417		13,638		7,962		32,712		10,736		6,712	
Mean	142	272.07	440	243.8	284	101.86	329	1,064	358	63.2	217	167
Ac-ft	8,760	53,960	27,050	4,840	15,790	20,200	64,880	65,450	21,290	3,890	13,310	9,930

Calendar year 1961: Max — Min — Mean — Ac-ft —
 Water year 1961-62: Max 1,320 Min 17 Mean 427 Ac-ft 309,400

* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

RIO GRANDE BASIN

8-2870. Rio Chama below Abiquiu Dam, N. Mex.

Location.--Lat 36°14'10", long 106°25'00", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.8, T.23 N., R.5 E., on right bank half a mile downstream from Abiquiu Dam and 6 miles northwest of Abiquiu.

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

Records available.--November 1961 to September 1962.

Gage.--Water-stage recorder. Altitude of gage is 6,040 ft (from river-profile map and topographic map).

Extremes.--Maximum discharge during period, 1,960 cfs Apr. 20 (gage height, 5.56 ft); maximum gage height, 6.30 ft Jan. 7 (back-water from ice); minimum discharge, 10 cfs Sept. 4.

Remarks.--Records fair for April and May, others poor. Flow largely controlled by El Vado Reservoir about 35 miles upstream, and Abiquiu flood control Reservoir $\frac{1}{2}$ mile upstream (gates of Abiquiu Dam will likely remain open except when Rio Grande is at flood stage in Middle Rio Grande Valley). Diversions for irrigation of about 17,600 acres above station.

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		a 220	874	b 78	b 70	111	958	1350	229	92	68	19
2		202	862	b 76	*b 80	*116	1010	1340	270	89	76	19
3		181	844	b 74	b 85	131	1080	1340	400	85	62	19
4		742	826	b 72	b 90	124	1110	1360	600	90	58	18
5	(*)	1070	814	*b 70	b 90	131	859	1390	994	101	53	479
6		1080	796	b 70	b 100	129	1200	1420	904	*111	44	675
7		1080	784	b 70	b 120	143	1210	1440	*787	94	39	389
8		1070	772	b 70	b 150	167	1250	1480	393	101	*33	396
9		1070	754	b 70	b 900	167	1230	1500	410	98	29	389
10		1070	730	b 70	b 800	d150	*1290	*1490	434	99	298	378
11		1060	718	b 60	b 750	d130	1260	1480	460	92	593	246
12		1060	b 630	b 50	718	d110	1280	1470	475	d90	565	162
13		1060	b 640	b 50	1020	d105	1330	1460	480	d80	530	199
14		*1070	b 650	b 50	892	d105	1450	1420	475	d70	515	196
15		1060	b 670	b 47	760	d110	1580	1350	465	d65	510	193
16		1050	b 500	b 45	*610	d110	1700	1300	446	d60	500	151
17		1050	b 200	b 45	530	d130	1750	1260	386	51	500	89
18		1040	b 150	b 45	392	319	1770	1240	326	39	490	70
19	(*)	1030	*b 130	*b 50	242	375	1790	1220	277	51	500	36
20		a 1020	b 130	b 60	187	450	1870	1200	229	44	500	43
21		a 1000	b 130	b 70	167	465	1820	1180	220	33	490	90
22		a 1000	b 140	b 80	151	434	1710	1150	211	31	229	74
23		a 980	b 100	b 75	141	410	*1590	1140	205	33	57	82
24		a 970	b 90	b 75	143	340	1530	1130	205	37	39	126
25		a 950	b 90	b 75	138	284	1520	1120	208	42	34	136
26		a 930	b 90	b 80	120	422	1540	*1120	*208	82	33	162
27		a 910	b 90	b 75	103	700	1490	958	187	84	26	131
28		*892	b 90	b 70	118	994	1450	820	156	60	22	170
29		886	b 80	b 70	-	1040	1450	814	124	59	20	129
30		886	b 80	b 70	-----	1010	1420	413	111	53	*19	118
31		-----	b 80	b 70	-----	952	-----	246	-----	50	19	-----
Total	—	27,689	13,534	2,032	9,667	10,364	42,497	37,601	11,275	2,166	6,951	5,384
Mean	†150	923	437	65.5	345	334	1,417	1,213	376	69.9	224	179
Ac-ft	9,220	54,920	26,840	4,030	19,170	20,560	84,290	74,580	22,360	4,300	13,790	10,680

Calendar year 1961: Max Min Mean Ac-ft
 Water year 1961-62: Max 1,870 Min 18 Mean 476 Ac-ft 344,700

* Discharge measurement made on this day.

† Estimated monthly mean to complete water year.

a No gage-height record.

b Stage-discharge relation affected by ice.

d Doubtful gage-height record.

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 dam.

Drainage area.--2,284 sq mi (revised), of which about 100 sq mi is probably noncontributing.

Records available.--October 1941 to September 1962. 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.--21 years, 408 cfs (295,400 acre-ft per year).

Extremes.--Maximum discharge during year, 2,360 cfs July 6 (gage height, 4.83 ft); minimum, 8.6 cfs Sept. 5. 1941-62: 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 or no gage-height record, which are poor. Flow regulated by El Vado Reservoir (see p 155). Diversions for irrigation of about 19,100 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 Aug. 26 to Sept. 5)

1.7	7.0	3.0	245
1.8	11	3.5	540
2.0	23	4.0	1,000
2.2	43	4.5	1,740
2.4	71	4.7	2,100
2.7	137		

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	134	259	890	a 95	b100	92	a 920	a1.400	250	88	a 30	11
2	126	245	870	a 90	b100	*108	a 940	a1.400	272	74	a 40	10
3	a116	126	870	a 90	b105	134	a1.050	a1.400	340	73	a 35	10
4	a100	510	860	*a 90	b110	137	a1.100	a1.400	612	83	a 30	10
5	a 90	978	*850	b 90	b120	144	a 900	a1.400	934	81	a 25	168
6	*88	1000	830	b 90	b120	134	a1.170	a1.500	945	*168	a 20	678
7	86	1040	820	b 90	b150	137	a1.200	a1.550	*840	130	a 20	340
8	76	1060	800	b 90	170	157	a1.250	a1.600	466	103	*a 20	358
9	83	1060	790	b 90	276	170	a1.200	a1.600	400	97	a 15	370
10	292	1060	772	a 70	722	154	*1.270	*1.560	491	90	217	*358
11	184	1050	754	a 65	536	134	1.230	1.540	491	88	672	299
12	188	1040	a 650	a 60	472	113	1.260	1.540	491	a 80	442	126
13	237	*1.010	a 660	a 60	805	110	1.340	1.530	498	a 70	456	*160
14	250	1.010	a 670	a 60	901	101	1.500	1.480	491	a 60	449	160
15	254	1.010	a 700	a 55	781	110	1.650	1.300	484	a 50	449	160
16	254	1.000	a 550	a 55	*644	*110	1.810	1.260	477	a 40	456	160
17	254	978	a 250	a 55	556	132	1.830	1.230	407	a 30	463	65
18	*213	978	a 170	a 65	449	328	1.890	1.190	340	a 25	463	38
19	184	945	a 130	*b 80	300	407	1.920	1.180	300	a 25	477	30
20	184	945	a 130	b 90	254	476	2.010	1.150	241	a 25	470	36
21	157	945	a 130	b 95	221	470	1.970	1.130	213	a 25	463	145
22	134	945	*b 140	b 90	188	435	1.830	1.120	213	a 25	312	90
23	121	945	b 115	b 90	180	428	1.670	*1.120	205	a 30	65	70
24	92	934	b 105	b 85	174	394	1.600	1.120	205	a 35	*42	136
25	92	934	a 105	b 90	170	315	1.600	1.110	198	a 40	34	174
26	92	934	a 105	b 90	163	*448	1.650	1.100	194	a 60	32	167
27	90	934	a 105	b 90	137	580	1.560	967	184	a 70	26	137
28	90	923	a 100	b 85	103	a 900	1.510	850	150	a 50	17	191
29	111	912	a 100	b 85	-	a1.100	1.530	840	132	a 40	14	137
30	238	901	a 100	b 85	-	a1.000	1.480	830	110	a 30	*12	108
31	211	-----	a 100	b 90	-----	a 950	-----	450	-----	a 30	13	-----
Total	4,821	2,611	14,221	2,505	9,007	10,408	4,383	3,847	11,574	1,915	6,279	4,902
Mean	156	887	459	80.8	322	336	1,461	1,253	386	61.8	203	163
Ac-ft	9,560	52,780	28,210	4,970	17,860	20,640	86,940	77,050	22,960	3,800	12,450	9,720
Calendar year 1961:	Max 1,800	Min 33	Mean 386	Ac-ft 279,530								
Water year 1961-62:	Max 2,010	Min 10	Mean 479	Ac-ft 346,900								

* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

RIO GRANDE BASIN

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 $\frac{1}{4}$ 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 1962.

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 $\frac{3}{4}$ 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.--30 years, 73.6 cfs (53,280 acre-ft per year).

Extremes.--Maximum discharge during year, 1,670 cfs Apr. 20 (gage height, 5.91 ft); minimum, 3.1 cfs Aug. 25.

1932-62: 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. Diversions above station for irrigation of about 3,500 acres (1962 determination).

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	13	23	17	16	23	* 24	92	370	47	4.9	6.3	3.8
2	12	27	17	16	23	28	105	395	46	5.2	4.6	3.8
3	12	24	17	16	24	29	128	484	47	5.7	4.6	3.8
4	11	23	17	* 16	25	24	158	491	43	5.7	4.1	3.8
5	11	23	* 16	16	* 25	25	139	486	36	* 5.5	4.1	4.1
6	* 8.6	22	16	16	24	27	142	498	33	7.4	3.8	4.6
7	8.0	21	16	16	26	27	148	484	30	8.3	3.8	4.6
8	8.0	20	17	16	30	28	205	458	26	7.3	* 3.8	4.6
9	9.0	20	20	16	30	25	227	427	23	7.3	3.6	4.6
10	14	20	18	16	32	24	285	356	18	6.7	3.6	5.2
11	18	20	16	14	36	23	* 283	315	* 17	6.0	4.1	4.6
12	15	20	14	13	37	23	303	279	15	6.7	4.1	4.4
13	13	* 20	15	14	49	* 25	360	240	15	6.7	4.1	4.4
14	14	18	18	15	53	24	410	199	16	6.0	4.1	4.6
15	13	18	21	15	43	26	484	169	14	5.5	4.6	4.6
16	13	20	21	15	42	28	620	148	13	4.9	4.6	4.9
17	12	20	18	15	41	29	730	128	12	4.6	4.6	5.2
18	* 12	18	18	* 15	34	30	898	116	10	4.6	4.6	* 5.5
19	12	17	17	15	32	30	1,100	110	9.7	4.4	4.6	5.5
20	12	16	17	16	34	37	1,360	100	9.0	4.4	4.4	5.7
21	12	17	18	16	34	38	1,240	89	7.6	4.4	4.4	8.6
22	12	18	18	17	28	37	876	79	6.3	4.1	4.9	6.3
23	12	17	17	17	31	41	760	74	6.0	4.1	4.9	6.3
24	12	17	17	17	31	43	832	70	6.0	* 4.4	* 4.6	7.0
25	12	18	16	17	33	46	931	* 62	* 6.0	4.9	3.8	* 7.0
26	12	18	17	17	28	* 50	* 931	56	5.7	5.5	3.6	7.0
27	13	18	17	18	25	76	720	54	4.9	4.9	3.6	7.0
28	14	18	17	19	21	110	750	54	4.6	4.6	3.6	7.6
29	17	17	16	20	-	123	674	60	4.6	4.1	3.6	7.3
30	20	17	17	* 21	-----	110	446	55	4.4	4.1	3.6	7.3
31	21	-----	17	22	-----	86	-----	* 50	-----	8.9	3.6	-----
Total	397.6	585	533	508	894	1,296	16,337	6,956	5,358	171.8	130.3	163.7
Mean	12.8	19.5	17.2	16.4	31.9	41.8	545	224	17.9	5.54	4.20	5.46
Ac-ft	789	1,160	1,060	1,010	1,770	2,570	32,400	13,800	1,060	341	258	325

Calendar year 1961: Max 829 Min 3.0 Mean 59.5 Ac-ft 43,090

Water year 1961-62: Max 1,360 Min 3.6 Mean 78.1 Ac-ft 56,540

Peak discharge (base, 600 cfs)

* Discharge measurement made on this day.

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
4-20	2400	5.91	1,670	5-3	2400	5.12	750
4-25	0030	5.11	674				

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.--3,144 sq mi (revised), of which at least 100 sq mi is probably noncontributing.

Records available.--October 1912 to September 1962. 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.--50 years, 561 cfs (406,100 acre-ft per year).

Extremes.--Maximum discharge during year, 3,870 cfs Apr. 21; maximum gage height 7.95 ft Oct. 15; minimum, 3.3 cfs Sept. 5.

1912-62: Maximum discharge, 15,000 cfs May 22, 1920; maximum gage height, 10.45 ft 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 Oct. 18-29, which are poor. Discharge measurements generally made 2 or 3 times a month. Diversions above station for irrigation of about 27,600 acres, a few hundred of which is below station. Flow partly regulated by El Vado Reservoir (see p.155), 77 miles upstream.

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	142	332	943	b100	b110	150	968	1,770	a350	138	7.3	8.7
2	145	288	943	b 95	b120	186	996	1,740	a300	105	6.2	7.0
3	142	a224	932	b100	b120	210	1,160	1,810	a350	64	4.2	4.2
4	127	356	921	b100	b120	222	1,430	1,880	a500	54	2.6	4.0
5	110	1,130	904	b100	b150	230	1,030	1,860	1,080	56	1.9	5.3
6	127	1,120	880	b100	182	230	1,430	1,920	1,160	104	1.7	7.22
7	124	1,160	870	b100	206	230	1,500	1,900	996	260	14	2.90
8	116	1,030	868	b110	242	258	1,500	1,970	549	118	11	3.15
9	113	1,020	868	b110	326	262	1,500	1,950	326	75	4.9	3.38
10	174	1,030	868	b 90	970	254	1,720	1,840	450	60	4.9	2.90
11	174	998	856	b 70	710	238	1,570	1,740	466	49	7.75	2.74
12	190	998	a 700	b 60	620	210	1,590	1,700	450	100	5.06	1.12
13	210	976	a 720	b 60	853	206	1,720	1,630	458	95	4.98	1.23
14	224	954	a 750	b 60	1,250	198	2,080	1,540	443	38	4.36	1.35
15	224	965	800	b 55	1,080	178	2,200	1,380	429	19	4.22	1.26
16	228	976	690	b 50	844	178	2,620	1,320	443	16	4.50	1.35
17	235	965	a 320	b 50	690	202	2,760	1,300	443	16	4.90	1.00
18	e235	954	a 220	b 60	548	372	2,890	1,290	320	17	4.82	3.6
19	e220	976	a 160	b 60	368	418	3,180	1,250	250	19	4.98	2.1
20	e200	976	a 150	b 80	285	476	3,540	1,250	210	11	4.90	3.2
21	e170	1,010	a 150	b105	242	548	3,520	a1,230	170	8.7	4.90	1.48
22	e150	1,050	b160	b105	202	380	2,960	1,180	166	7.6	3.97	1.28
23	e140	998	b140	b100	182	482	2,670	1,160	162	7.6	9.5	8.8
24	e120	987	b120	b 95	182	450	2,650	1,150	174	9.4	5.0	1.33
25	e110	965	b115	b 95	178	356	2,740	1,130	147	6.6	2.5	1.86
26	e110	976	b115	b100	182	484	2,690	1,130	144	8.0	8.4	2.06
27	e110	976	b115	b110	182	780	2,460	1,050	141	33	7.0	1.57
28	e120	965	b110	b100	170	1,100	2,370	a 900	115	26	6.6	2.33
29	e200	954	b105	b 90	—	1,290	2,370	a 850	108	27	6.6	2.02
30	324	954	b105	b 90	—	1,220	2,080	a 850	129	14	6.2	1.32
31	319	-----	b110	b100	-----	1,020	-----	a 600	-----	12	5.7	-----
Total	5,333	27,263	15,708	2,700	11,314	13,018	63,894	44,270	11,429	1,573.9	6,296.8	4,691.2
Mean	172	909	507	87.1	404	420	2,130	1,428	381	50.8	203	156
Ac-ft	10,580	54,080	31,160	5,360	22,440	25,820	126,700	87,810	22,670	3,120	12,490	9,300
Calendar year 1961:	Max	2,060	Min	5.2	Mean	444	Ac-ft	321,500				
Water year 1961-62:	Max	3,540	Min	4.0	Mean	568	Ac-ft	411,500				

a No gage-height record.

b Stage-discharge relation affected by ice.

e Uncertain stage-discharge relation.

RIO GRANDE BASIN

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 1962. 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.--32 years, 30.1 cfs (21,790 acre-ft per year).

Extremes.--Maximum discharge during year, 190 cfs July 17 (gage height, 2.81 ft); maximum gage height, 3.42 ft Dec. 12; minimum daily discharge, 3 cfs Dec. 12.

1930-62: 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)

1.4	2.7	2.0	32
1.5	4.9	2.2	54
1.6	8.2	2.5	102
1.8	18	2.7	148

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	15	16	12	a10	b10	14	26	89	49	21	22	6.4
2	*15	13	12	a10	b10	15	29	88	49	20	18	5.7
3	14	*11	11	a10	b10	11	37	88	47	21	16	5.7
4	14	16	9.9	*b10	b11	10	43	95	44	18	15	6.0
5	13	15	b5	b9	b11	12	40	100	42	*19	13	6.7
6	13	13	*b7.5	b8	*b11	12	38	110	42	19	13	11
7	12	14	12	b8	12	11	36	115	41	23	*12	16
8	13	14	12	b8	11	11	37	121	40	19	9.9	12
9	23	14	11	b9	11	11	36	126	42	19	9.9	13
10	27	14	12	b8	11	9.5	34	126	39	16	9.9	9.0
11	18	13	9.0	b6	12	9.0	*36	*130	*37	14	9.9	7.4
12	17	14	a3	a7	14	11	43	126	35	16	9.5	7.0
13	16	12	a6	a8	16	*10	52	126	34	16	7.8	6.4
14	16	14	a9	a9	16	11	62	126	33	15	7.4	*6.4
15	16	*14	a10	a9	16	11	73	121	30	13	7.8	7.0
16	16	12	a11	a9	16	11	82	108	30	12	7.8	6.4
17	15	14	a10	a9	16	11	82	97	29	17	9.5	6.7
18	15	10	a9	*b9	b14	11	98	91	25	17	8.6	5.7
19	*14	3.6	a9	b9	b11	12	108	86	24	16	9.5	5.4
20	14	12	a9	b8	b15	14	115	81	25	15	9.0	6.4
21	14	16	a9	b7.5	b12	13	112	78	23	16	11	8.6
22	14	11	a10	b7	b9	*13	104	74	*22	20	9.0	6.7
23	14	12	a10	b7	*b13	13	93	68	21	22	9.5	8.1
24	13	12	a10	b7	16	13	91	*65	20	*19	8.6	13
25	12	13	a10	b7	13	13	93	62	19	24	7.0	*12
26	12	12	a10	b7	12	17	*93	61	18	21	7.0	11
27	14	11	a10	b8	12	26	91	60	18	18	*6.7	9.5
28	13	11	a10	b9	10	34	93	61	18	14	6.0	9
29	14	10	a10	b9	-	37	93	60	21	13	6.0	9
30	14	13	a10	*b9	-----	34	91	54	28	20	6.7	8.2
31	16	-----	a10	b9	-----	26	-----	50	-----	23	6.4	-----
Total	455	384.6	298.4	259.5	351	466.5	2,061	2,843	945	556	309.4	251.4
Mean	15.0	12.8	9.63	8.37	12.5	15.0	68.7	91.7	31.5	17.9	9.98	8.38
Ac-ft	924	763	592	515	696	925	4,090	5,640	1,870	1,100	614	499

Calendar year 1961: Max 91 Min 3 Mean 26.6 Ac-ft 19,260
 Water year 1961-62: Max 130 Min 3 Mean 25.2 Ac-ft 18,230

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

83

8-3023. Middle Fork Tesuque Creek near Santa Fe, N. Mex.

Location.--Lat 35°46'03", long 105°48'26", on right bank in Santa Fe National Forest, 1,000 ft upstream from road culvert on State Highway No.475, 1,100 ft upstream from mouth, 13 miles northeast of Santa Fe.

Drainage area.--0.44 sq mi.

Records available.--November 1961 to September 1962.

Gage.--Water-stage recorder and 90° V-notch sharp-crested weir. Altitude of gage is 9,800 ft (from topographic map)

Extremes.--Maximum discharge during period, 1.69 cfs May 15, 1962 (gage-height, 0.85 ft); minimum daily, 0.08 cfs many days.

Remarks.--Records excellent.

Discharge, in cubic feet per second, November 1961 to September 1962												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		-	0.12	0.10	0.08	0.08	0.13	0.80	* 0.90	0.33	0.20	0.17
2		-	.12	.10	.08	.08	.18	.77	.87	.30	.19	.15
3		-	.11	.10	.09	.08	.22	.80	.84	.28	.19	.15
4		-	.11	.10	.09	.08	.22	.87	.80	.28	.19	.14
5		-	.11	.10	.09	.08	.18	.94	.74	.30	.18	*.16
6		-	.11	.10	.09	.08	.16	1.08	.71	.31	.18	.18
7		-	.11	.10	.09	.08	.16	1.20	.71	.30	.18	.17
8		-	*.11	.10	.10	.08	.18	1.24	.71	.28	.18	.16
9		-	.11	*.10	.10	.08	.18	1.32	.71	.26	.18	.15
10		-	.11	*.09	.10	.08	.18	1.36	.74	*.25	.18	.14
11		-	.12	.09	.11	.08	.20	1.45	.71	.23	.18	.13
12		-	.11	.09	.11	.08	.25	1.50	.68	.28	.19	.13
13		-	.11	.09	*.11	.08	.35	1.54	.66	.25	.19	.13
14		-	.11	.09	.11	.08	.46	1.64	.66	.23	*.19	.14
15		-	.11	.09	.10	.08	.52	1.64	.63	.22	.19	.13
16		-	.11	.09	.10	.08	.55	1.59	.60	.22	.19	.13
17		-	.11	.09	.10	.08	.55	1.50	.58	.20	.19	.13
18		-	*.11	.09	.10	.08	.68	1.41	.55	.25	.18	*.13
19		-	.11	.09	.09	.08	.80	1.32	.52	.22	.18	.19
20		-	.11	.09	*.09	.08	.84	1.24	.50	.22	.19	.18
21		-	.10	.09	.09	.08	.80	1.24	.46	.20	.20	.15
22		0.13	.10	.09	.09	.08	.71	1.20	.43	.26	.19	.15
23		.13	.10	.08	.09	*.08	.66	1.16	.41	.31	.18	.18
24		.13	.10	.08	.09	.08	.66	1.12	.39	.24	.18	.21
25		.13	.10	.08	.09	.09	.77	1.08	.39	.25	.16	.18
26		.13	.10	.08	.08	.10	.77	1.04	.35	.22	.15	.15
27		*.13	.10	.08	.08	.14	.77	1.04	.37	.23	.15	.17
28		.12	.10	.08	.08	.16	.80	1.04	.37	.19	.15	.15
29		.12	.10	.08	-	.15	.80	.97	*.35	.19	.15	.14
30		*.12	.10	.08	-----	.13	.80	.94	.39	.30	.14	.13
31		-----	.10	.08	-----	.12	-----	.90	-----	.23	.14	-----
Total		-	3.33	2.79	2.62	2.81	14.53	36.94	17.73	7.83	5.51	4.60
Mean		-	0.107	0.090	0.094	0.091	0.484	1.19	0.591	0.253	0.178	0.153
Ac-ft		-	6.60	5.53	5.20	5.57	28.82	73.27	35.17	15.53	10.93	9.12
Calendar year	: Max	Min			Mean		Ac-ft					
Water year	: Max	Min			Mean		Ac-ft					

* Discharge measurement made on this day.

RIO GRANDE BASIN

8-3041. Little Tesuque Creek near Santa Fe, N. Mex.

Location.--Lat 35°44'42", long 105°49'39", on right bank in Santa Fe National Forest, 1,200 ft upstream from East Boundary line of Hyde State park, 0.25 mile (by access road) east of State Highway 475, 9 miles north of Santa Fe.

Drainage area.--0.37 sq mi.

Records available.--June to September 1962.

Gage.--Water-stage recorder and V-notch sharp-crested weir. Altitude of gage is 9,220 ft (from topographic map).

Extremes.--Maximum discharge during period, 0.77 cfs Sept. 19 (gage height, 0.62 ft); minimum, 0.03 cfs Aug. 29.

Remarks.--Records good.

Discharge, in cubic feet per second, June to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1									-	0.14	0.12	0.07
2									-	.13	.10	.05
3									-	.12	.09	.05
4									-	.12	.08	.04
5									-	.22	.08	*.06
6									-	.16	.07	.08
7									-	.20	.07	.09
8									-	.15	.07	.09
9									-	.13	.07	.08
10									-	*.11	.07	.06
11									-	.11	.07	.05
12									-	.13	.07	.05
13									-	.12	.06	.05
14									-	.11	*.06	.06
15									-	.10	.07	.05
16									-	.10	.07	.05
17									-	.10	.06	.05
18									-	.10	.05	*.05
19									-	.10	.05	.12
20									-	.10	.07	.11
21									-	.10	.07	.07
22									-	.15	.07	.06
23									-	.18	.06	.10
24									-	.12	.05	.22
25									-	.14	.05	.13
26									-	.13	.05	.12
27									-	.19	.05	.14
28									-	.12	.04	.11
29					-				*0.13	.11	.04	.09
30									.22	.16	.04	.08
31										.15	.04	
Total									-	4.10	2.01	2.43
Mean									-	0.13	0.06	0.08
Ac-ft									-	8.13	3.99	4.82
Calendar year	: Max		Min		Mean		Ac-ft					
Water year	: Max		Min		Mean		Ac-ft					

* Discharge measurement made on this day.

RIO GRANDE BASIN

85

8-3044. Little Tesuque Creek Tributary No.2 near Santa Fe, N. Mex.

Location.--Lat 35°43'34", long 105°51'02", on right bank in Santa Fe National Forest, 300 ft upstream from mouth and State Highway No. 475, 6¼ miles northeast of Santa Fe, N. Mex.

Drainage area.--0.45 sq mi.

Records available.--June to September 1962.

Gage.--Water-stage recorder and V-notch sharp-crested weir. Altitude of gage is 7,960 ft (from topographic map).

Extremes.--Maximum discharge during period, 0.004 cfs July 1 (gage height, 0.11 ft); no flow for many days.

Remarks.--Records fair.

Discharge, in cubic feet per second, June to September 1962												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1									-	0.002	0.002	
2									-	.002	.002	
3									-	.002	.002	
4									-	.002	.002	
5									-	.002	.002	
6									-	.002	.002	
7									-	.002	.002	
8									-	.002	.002	
9									-	.002	.001	
10									-	* .002	0	
11									-	.002	0	
12									-	.002	0	
13									-	.002	0	
14									-	.002	0	
15									-	.002	0	
16									-	.002	0	
17									-	.002	0	
18									-	.002	0	
19									-	.002	0	
20									-	.002	0	
21									-	.002	0	
22									-	.002	0	
23									-	.002	0	
24									-	.002	0	
25									-	.002	0	
26									-	.002	0	
27									-	.002	0	
28									-	.002	0	
29						-			0.001	.002	0	
30					-----				.002	.002	0	
31		-----			-----		-----		-----	.002	0	-----
Total									-	0.062	0.017	0
Mean									-	0.002	0.0005	0
Ac-ft									-	0.12	0.03	0
Calendar year	: Max		Min	Mean		Ac-ft						
Water year	: Max		Min	Mean		Ac-ft						

* Discharge measurement made on this day.

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 1962. 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.--63 years (1895-1905, 1909-62), 1,583 cfs (1,146,000 acre-ft per year).

Extremes.--Maximum discharge during year, 7,400 cfs Apr. 21 (gage height, 7.04 ft); minimum, 200 cfs Sept. 1.

1895-1905, 1909-62: 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 for periods of ice effect or 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 155) 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 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	506	755	1640	714	737	798	1910	4980	1380	737	492	231
2	465	811	1630	691	767	871	1950	4870	1320	664	376	229
3	440	708	1620	686	773	936	2120	4660	1440	591	387	231
4	448	927	1610	648	811	951	2450	4480	1590	581	369	227
5	438	2180	1610	691	857	951	2220	4480	1870	586	338	236
6	431	2190	1570	680	844	989	2530	4690	2020	616	312	814
7	435	2150	1540	691	871	1000	2540	4850	2120	1140	275	689
8	419	1930	1490	725	929	1030	2590	5000	2160	830	257	616
9	427	1830	1490	731	989	1080	2580	5330	1920	811	254	675
10	568	1800	1390	632	1400	1020	2710	5350	1900	811	254	632
11	621	1740	1370	b540	1300	959	2830	5460	1840	755	812	606
12	561	1790	1200	b530	1280	850	2930	5580	1790	802	648	483
13	586	1790	1250	b560	1410	857	3070	5540	1840	837	675	431
14	611	1710	1300	b600	1910	837	3320	5210	1840	737	648	452
15	627	1710	1330	b580	1730	824	3630	4850	1740	653	632	444
16	653	1750	1360	b610	1700	792	4040	4490	1760	606	691	431
17	653	1720	1060	b620	1710	929	4440	4040	1840	642	708	415
18	648	1740	886	b640	1660	1130	4870	3480	1860	557	680	328
19	596	1710	804	b650	1440	1230	5760	3250	1650	547	691	288
20	571	1740	779	691	1360	1240	6730	3020	1490	474	680	275
21	547	1810	792	697	1280	1300	7110	2700	1250	431	680	387
22	510	1790	824	708	1140	1240	7170	2490	1050	395	658	452
23	506	1700	804	714	1140	1230	6710	2550	950	407	391	387
24	461	1680	773	725	1110	1230	6360	2440	950	382	267	427
25	444	1670	743	749	1070	1090	6020	2230	900	351	245	524
26	427	1680	743	714	1050	1090	5720	2220	850	334	225	533
27	431	1660	737	697	974	1420	5540	2120	800	347	231	501
28	465	1650	725	680	850	1780	5440	1980	800	351	231	533
29	519	1660	714	691	-	1960	5380	1980	798	347	229	596
30	652	1640	731	719	-----	2000	5100	2000	737	354	222	465
31	680	-----	737	719	-----	1900	-----	1540	-----	488	210	-----
Total	16,343	49,621	35,252	20,723	33,092	35,514	125,770	117,860	44,455	18,164	13,768	13,538
Mean	527	1,654	1,137	668	1,182	1,146	4,192	3,802	1,482	586	444	451
Ac-ft	32,420	98,420	69,920	41,100	65,640	70,440	249,500	233,800	88,180	36,030	27,310	26,860

Calendar year 1961: Max 4,200 Min 259 Mean 1,086 Ac-ft 786,000

Water year 1961-62: Max 7,170 Min 210 Mean 1,436 Ac-ft 1,039,600

Peak discharge (base, 5,200 cfs). --Apr. 21 (1000) 7,400 cfs (7.04 ft).

b Stage-discharge relation affected by ice.

RIO GRANDE BASIN

87

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 1962.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 7,000 ft (from topographic map).

Extremes.--Maximum discharge during year, 7.0 cfs Apr. 16 (gage height, 1.08 ft); minimum, 0.8 cfs Aug. 28.
1959-62: Maximum discharge, 13 cfs Apr. 7, 1960 (gage height, 1.30 ft); minimum, 0.7 cfs Jan. 19, 1960.

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

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

0.7	0.3
.8	1.0
.9	2.4
1.0	4.6
1.1	7.7

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.4	<u>1.6</u>	1.3	1.4	1.3	*b 1.6	<u>2.2</u>	<u>3.0</u>	1.5	1.8	1.4	<u>1.0</u>
2	1.3	<u>1.6</u>	1.3	1.4	1.3	1.6	<u>2.4</u>	<u>2.8</u>	1.6	1.8	1.2	<u>1.2</u>
3	1.4	1.5	1.3	* <u>1.5</u>	1.3	1.5	<u>2.8</u>	<u>2.6</u>	1.5	1.7	1.1	1.0
4	* <u>1.3</u>	1.5	1.3	1.5	1.3	1.5	<u>3.2</u>	<u>2.4</u>	1.5	1.6	1	1.0
5	<u>1.3</u>	1.5	1.3	1.5	1.3	1.5	* <u>3.6</u>	<u>2.2</u>	1.5	1.6	1	*1.2
6	1.3	1.5	1.3	1.5	*1.4	1.5	3.8	<u>2.2</u>	1.5	1.7	*.9	1.3
7	1.3	1.5	1.3	1.5	1.4	1.5	4.1	<u>2.2</u>	1.5	1.9	.9	1.3
8	1.3	1.6	*1.4	1.4	1.4	1.5	4.3	<u>2.2</u>	1.5	<u>2.2</u>	.9	1.3
9	1.6	1.6	1.4	1.4	1.5	1.4	*4.8	<u>2.2</u>	1.4	* <u>2.4</u>	.9	1.3
10	1.5	1.6	1.4	b <u>1.2</u>	1.5	1.4	5.1	<u>2.2</u>	1.4	<u>2.2</u>	.9	1.2
11	1.4	1.5	b 1.4	b 1.2	1.6	b 1.2	6.0	2.1	1.3	1.9	.9	1.0
12	1.4	1.5	b <u>1</u>	b 1.4	1.6	b 1.1	6.0	2.1	1.3	1.6	.9	1.2
13	1.4	1.5	b 1.5	b 1.5	1.6	b <u>1</u>	*6.0	2.1	1.3	1.3	1.1	1.2
14	1.4	1.5	<u>1.6</u>	1.5	<u>1.8</u>	*b <u>1</u>	6.3	2.1	1.3	<u>1</u>	1.3	1.2
15	1.3	*1.5	<u>1.6</u>	1.5	<u>1.8</u>	b 1.2	<u>6.6</u>	2.0	1.3	<u>1</u>	1.2	1.2
16	1.4	1.4	1.5	1.5	1.8	b 1.3	6.6	2.0	1.2	1	1.2	1.3
17	1.4	1.4	1.4	1.5	1.8	1.4	6.3	2.0	1.2	1	1.2	1.3
18	1.4	1.4	1.4	1.4	1.8	1.4	6.3	2.0	*1.2	1	1.2	1.3
19	1.3	<u>1.3</u>	1.4	1.4	1.8	1.4	6.3	1.8	<u>1</u>	1.2	1.3	1.2
20	*1.3	<u>1.3</u>	1.4	1.3	1.8	1.4	6.0	1.8	<u>1.2</u>	1.5	1.5	*1.2
21	1.3	1.3	1.4	1.2	1.8	1.4	5.7	*1.6	1.2	1.4	<u>1.7</u>	1.3
22	1.3	1.3	1.4	1.2	1.8	*1.4	5.1	1.6	1.2	1.3	<u>1.4</u>	1.3
23	1.4	1.3	1.4	1.2	1.8	1.4	4.8	1.6	1	1.5	*1.0	1.4
24	1.4	1.3	1.4	1.3	1.8	1.4	4.6	1.6	1	1.7	1.0	<u>1.6</u>
25	1.4	1.3	1.4	1.3	1.8	1.4	4.1	<u>1.5</u>	1.2	2.0	.9	<u>1.6</u>
26	1.4	1.3	1.4	1.3	1.8	1.5	4.1	1.5	1.6	2.3	.9	1.5
27	1.4	1.3	1.4	1.3	1.6	1.5	3.6	1.5	<u>1.8</u>	2.1	.9	1.5
28	1.4	1.3	1.4	1.3	b <u>1.2</u>	1.5	3.4	1.6	<u>1.6</u>	1.8	<u>8</u>	1.5
29	1.6	1.3	1.4	1.3	-	1.8	3.2	1.5	1.6	1.7	.9	1.4
30	<u>2.0</u>	1.3	1.4	1.3	-----	1.8	3.0	1.5	1.7	1.9	1.0	1.4
31	2.0	-----	1.4	1.3	-----	<u>2.0</u>	-----	1.5	-----	1.7	1.0	-----
Total	44.0	42.8	42.9	42.5	44.7	44.5	140.3	61.0	41.1	50.8	33.5	38.4
Mean	1.42	1.43	1.38	1.37	1.60	1.44	4.68	1.97	1.37	1.64	1.08	1.28
Ac-ft	87	85	85	84	89	88	278	121	81	101	66	76

Calendar year 1961: Max 9 Min 0.8 Mean 1.66 Ac-ft 1,200
Water year 1961-62: Max 6.6 Min 0.8 Mean 1.72 Ac-ft 1,240

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

8-3145. Rio Grande at Cochiti, N. Mex.

Location.--Lat 35°37'10", long 106°19'20", in SE 1/4 sec. 17, T. 16 N., R. 6 E., on downstream end of concrete pier near left end of highway bridge, 1 1/2 miles northeast of Cochiti, 3 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 1962. 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.--38 years, 1,355 cfs (981,000 acre-ft per year).

Extremes.--Maximum discharge during year, 7,380 cfs Apr. 21 (gage height, 7.13 ft); minimum, 76 cfs Sept. 1. 1924-62: 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, 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 eastside 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 Oct. 4-12, Dec. 4-17, Mar. 31 to Apr. 29, May 21 to Aug. 2)

Oct. 1 to July 31				Aug. 1 to Sept. 30			
3.1	258	4.5	1,480	3.6	82	4.2	460
3.5	498	5.5	3,210	3.8	148	4.4	750
4.0	930	7.5	7,550	4.0	260		

Discharge, in cubic feet per second, water year October 1961 to September 1962												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	450	634	1,650	700	758	812	1,710	4,830	1,310	731	437	152
2	398	740	1,650	680	785	812	1,790	4,800	1,280	642	254	223
3	367	695	1,610	660	776	880	1,870	4,540	1,290	534	229	151
4	350	650	1,620	630	803	860	2,120	4,340	1,380	498	277	99
5	361	1,820	1,600	670	821	840	2,010	4,430	1,660	484	320	99
6	386	2,140	1,560	670	830	900	2,190	4,540	1,890	512	229	371
7	430	2,180	1,510	680	870	920	2,270	4,630	1,970	904	158	710
8	373	2,010	1,460	722	941	900	2,350	4,690	2,040	1,020	133	504
9	344	1,920	1,430	722	996	974	2,380	4,920	1,940	634	121	660
10	386	1,890	1,380	642	1,320	952	2,460	5,010	1,800	626	114	516
11	524	1,820	1,350	580	1,390	880	2,540	5,150	1,720	570	425	426
12	464	1,830	1,300	550	1,370	830	2,570	5,330	1,610	548	690	414
13	505	1,870	1,200	520	1,440	767	2,680	5,220	1,640	650	586	286
14	594	1,870	1,250	540	1,900	740	2,960	4,940	1,680	580	488	286
15	548	1,790	1,300	560	1,780	668	3,250	4,470	1,560	563	488	328
16	534	1,870	1,330	580	1,690	650	3,800	4,170	1,610	478	488	426
17	520	1,830	1,130	600	1,710	740	4,300	3,820	1,720	424	572	368
18	527	1,850	950	600	1,640	860	4,870	3,250	1,710	434	530	241
19	478	1,820	820	630	1,470	1,070	5,850	3,070	1,550	392	675	183
20	491	1,790	800	680	1,350	1,100	6,580	2,780	1,350	327	586	158
21	527	1,790	800	700	1,320	1,150	7,050	2,600	1,080	335	530	188
22	465	1,800	820	700	1,200	1,080	7,000	2,410	930	380	558	391
23	437	1,710	820	700	1,130	1,080	6,650	2,400	812	290	402	437
24	398	1,650	780	720	1,110	1,060	6,250	2,380	860	279	198	380
25	386	1,640	750	720	1,080	974	6,050	2,140	794	305	184	380
26	356	1,620	740	713	1,040	930	5,800	2,130	686	268	229	460
27	398	1,640	730	695	996	1,130	5,610	2,100	626	263	176	460
28	478	1,620	720	695	860	1,480	5,400	1,930	626	305	110	448
29	464	1,640	700	704	-	1,780	5,330	1,870	650	367	102	630
30	484	1,640	750	722	-----	1,800	5,050	1,970	659	333	96	530
31	586	-----	750	704	-----	1,750	-----	1,560	-----	430	85	-----
Total	14,009	49,769	35,260	20,389	33,376	31,369	120,740	112,420	40,433	15,106	10,470	10,905
Mean	452	1,659	1,137	658	1,192	1,012	4,025	3,626	1,348	487	338	364
(†)	4,380	135	0	0	0	3,730	6,560	5,210	5,400	4,920	6,100	5,000
Ac-ft	2,7790	98,720	69,940	40,440	66,200	62,220	239,500	223,000	80,200	29,960	20,770	21,630

Calendar year 1961: Max 4,460 Min 147 Mean 1,033 Ac-ft 748,100
Water year 1961-62: Max 7,050 Min 85 Mean 1,354 Ac-ft 980,400

Peak discharge (base, 4,500 cfs).--Apr. 21 (1430) 7,380 cfs (7.13 ft).

† Combined monthly diversion, in acre-ft, of Sili main and Cochiti eastside canals; records of this flow are furnished by Bureau of Reclamation.

Note.--Stage-discharge relation affected by ice Dec. 18 to Jan. 7, Jan. 11-25.

RIO GRANDE BASIN

89

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 1962. 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.--49 years, 8.40 cfs (6,080 acre-ft per year).

Extremes.--Maximum discharge during year, 82 cfs May 6; (gage height, 2.84 ft); minimum, 3.0 cfs Nov. 19, 20.
1913-62: 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 155), 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	2.1	16
1.7	3.4	2.3	27
1.8	5.6	2.6	53
1.9	8.4		

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.4	3.4	3.4	4.1	4.1	3.6	3.4	25	9.4	8.1	7.0	10
2	3.4	3.4	3.4	4.1	4.3	3.6	3.4	16	10	*8.1	*6.7	11
3	3.4	3.3	3.3	*4.1	4.3	3.6	3.4	18	12	8.4	6.4	11
4	*3.4	3.3	3.3	4.1	4.3	3.6	*3.4	*20	11	8.4	6.4	11
5	3.4	3.3	*3.3	4.1	4.3	3.6	3.4	22	8.8	8.4	6.4	10
6	3.4	3.3	3.3	4.3	4.3	3.6	3.4	46	*7.6	8.8	9.6	*9.8
7	3.4	3.3	3.3	4.3	*4.3	3.6	3.4	37	7.3	8.8	12	9.8
8	3.4	3.3	3.3	4.3	4.3	3.6	3.4	17	7.3	8.4	10	9.8
9	3.4	3.1	3.3	4.1	4.3	3.6	3.4	38	7.3	8.1	9.8	9.8
10	3.4	3.1	3.3	4.1	4.1	3.6	3.4	*43	7.3	8.1	8.1	9.8
11	3.4	3.1	3.3	4.1	4.1	3.6	3.6	37	7.3	8.1	6.4	9.8
12	3.4	3.1	3.3	4.1	4.1	3.6	3.6	41	7.3	8.1	5.6	9.8
13	3.4	3.1	3.3	4.1	4.1	3.6	3.9	41	9.4	7.8	5.4	9.8
14	3.4	3.1	3.3	4.1	4.1	3.6	3.9	37	8.1	7.8	5.4	9.8
15	3.4	3.1	3.3	4.1	a4.1	3.6	3.9	31	7.3	7.6	7.6	9.8
16	3.4	*3.1	3.3	4.1	a4.0	3.6	3.9	27	7.3	7.6	11	9.4
17	3.4	3.1	3.3	4.1	a4.0	3.6	4.1	23	7.0	7.6	11	9.4
18	3.3	3.1	3.3	4.1	a4.0	3.6	4.3	21	8.1	7.6	10	9.4
19	3.3	3.0	3.3	4.1	a3.9	3.6	4.7	19	9.4	7.6	10	9.4
20	3.3	3.0	3.3	4.1	a3.9	3.6	27	19	8.8	7.6	9.8	9.8
21	3.3	3.1	3.3	4.3	a3.8	3.6	40	19	9.1	7.6	10	9.8
22	3.3	3.1	3.4	4.3	a3.8	3.6	18	18	9.1	7.3	9.8	9.8
23	3.3	3.1	3.4	4.3	a3.8	3.6	15	17	8.8	7.3	9.8	9.4
24	3.3	3.1	3.6	4.3	a3.7	3.6	16	14	8.8	7.3	9.8	9.4
25	9.5	3.1	3.9	4.3	a3.7	3.9	18	12	8.4	7.3	9.8	7.0
26	15	3.1	3.9	4.3	a3.7	3.9	40	13	8.4	7.0	9.8	3.6
27	12	3.1	4.1	4.3	a3.6	3.6	34	13	8.4	7.0	9.8	3.6
28	9.8	3.1	4.1	4.3	*3.6	3.4	15	14	8.1	7.0	10	3.6
29	7.0	3.1	4.3	4.1	-	3.4	19	13	8.1	7.0	10	3.6
30	5.2	3.3	4.1	4.1	-----	3.3	32	9.8	8.4	7.0	11	3.6
31	3.6	-----	4.1	4.1	-----	3.3	-----	8.8	-----	7.0	10	-----
Total	143.0	94.8	108.4	129.3	112.6	111.2	343.9	729.6	253.6	239.8	274.4	261.8
Mean	4.61	3.16	3.50	4.17	4.02	3.59	11.5	23.5	8.45	7.74	8.85	8.73
Ac-ft	284	188	215	256	223	221	682	1,450	503	476	544	519

Calendar year 1961: Max 22 Min 2.7 Mean 5.60 Ac-ft 4,060
Water year 1961-62: Max 46 Min 3.0 Mean 7.68 Ac-ft 5,560

*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 1962.

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.--21 years, 9.79 cfs (7,090 acre-ft per year).

Extremes.--Maximum discharge during year, 4,100 cfs July 8 (gage height, 4.26 ft); no flow on many days.

1941-62: 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 twice a month. Diversions for irrigation of about 50 acres above station.

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.1	0.5	0.1	0.4	0	0				15.2	0.8	42.5
2	1	3	1	.5	0	0				0	0	20
3	2	1	1	.4	0	0				0	0	6.3
4	2	2	0	.4	0	0				1	0	.5
5	2	1	1	.2	0	0				6.3	0	0
6	2	3	1	.2	0	0				80	0	.2
7	11	2	1	.5	0	0				8.0	0	0
8	11	5	0	0	.2	0				41.9	0	0
9	2	2	1	0	.5	0				6.6	0	0
10	2	2	3	0	1	0				1.7	0	0
11	2	3	3	0	1	0				.5	0	0
12	2	2	a.1	a.1	1	0				1	0	0
13	2	4	a.0	a.2	0	1				.8	0	0
14	11	.9	a.1	a.2	.2	0				1	0	0
15	1	2.0	a.2	a.3	0	0				1	0	0
16	1	2	a.5	a.3	0	0				0	11	0
17	1	2	.7	a.3	0	0				.3	0	0
18	1	1	.7	a.5	0	0				1	0	0
19	1	1	.8	a.7	0	0				16.7	0	0
20	1	1	.5	b.1.0	0	0				25	0	9.4
21	2	2	.4	b.8	0	0				4.7	0	6.0
22	1	1	2	b.6	0	0				16.2	0	2.6
23	2	1	1	b.3	0	0				15	0	2.1
24	1	1	3	.1	0	0				7.5	0	10
25	1	0	.6	.4	0	0				22	0	13
26	2	1	3	.2	0	0				41.1	0	3.2
27	2	1	3	.1	0	0				.6	0	1.5
28	2	1	.5	.1	0	0				0	0	12
29	3	0	.7	.1	-	0				14.4	0	4.4
30	2	1	.5	.1	-----	0				3.2	0	2.1
31	4	-----	.4	0	-----	0				30.8	0	-----
Total	5.1	8.3	9.2	9.2	1.2	0.1	0	0	0	1868.3	11.8	602.9
Mean	0.16	0.28	0.30	0.30	0.04	0.03	0	0	0	60.3	0.38	20.1
Ac-ft	1.0	1.6	1.8	1.8	2.4	0.2	0	0	0	3,710	2.3	1,200

Calendar year 1961: Max 520 Min 0 Mean 6.72 Ac-ft 4,860

Water year 1961-62: Max 425 Min 0 Mean 6.89 Ac-ft 5,000

Peak discharge (base, 3,000 cfs).--July 8 (1510) 4,100 cfs (4.26 ft).

a No gage-height record.

b Stage-discharge relation affected by ice.

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 1962. 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, adjustment of 1951. Prior to Sept. 27, 1957, at site 1,800 ft downstream at datum 5.35 ft lower, except period May 16, 1945 to Sept. 30, 1946 when it was 5.94 ft lower than present datum.

Average discharge.--37 years, 1,440 cfs (1,043,000 acre-ft per year).

Extremes.--Maximum discharge during year, 7,380 cfs Apr. 21 (gage height, 6.37 ft); minimum, 142 cfs Aug. 11, 30.
1927-62: Maximum discharge, 27,300 cfs June 26, 1937 (gage height, 11.13 ft site and datum then in use), 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 periods of ice effect or no gage-height record, and those for June 20 to July 11, 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.

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	492	634	1760	695	740	797	1710	4860	1320	664	420	534
2	464	759	1720	668	759	807	1750	4760	1330	619	312	277
3	429	740	1710	660	768	886	1830	4520	1290	602	270	220
4	416	659	1690	640	787	948	2180	4280	1330	586	291	165
5	423	1710	1690	659	816	907	2250	4360	1620	562	360	152
6	423	2280	1590	680	835	948	2170	4400	1920	594	305	175
7	464	2260	1590	695	845	959	2370	4680	2040	800	215	780
8	429	2040	1550	722	907	970	2370	4840	2230	932	191	561
9	391	1940	1470	731	970	1040	2520	5100	2090	768	168	660
10	429	1880	1430	686	1180	1040	2520	5250	1800	682	165	594
11	567	1880	1390	609	1450	948	2630	5380	1570	640	173	484
12	537	1830	a1300	583	1360	845	2650	5600	1470	627	780	462
13	514	1920	a1200	b500	1340	749	2710	5690	1540	684	605	350
14	583	1860	a1250	a520	1890	759	2900	5450	1650	660	528	326
15	583	1820	1270	a540	1820	722	3190	4900	1580	616	517	333
16	575	1890	1350	b550	1720	686	3710	4480	1610	550	517	430
17	583	1850	1140	b580	1710	759	4340	4220	1780	495	605	390
18	592	1860	855	b600	1660	866	4600	3480	1690	528	583	319
19	575	1780	768	b620	1510	1070	5450	3130	1530	529	660	254
20	545	1780	686	b680	1340	1120	6180	a3000	1400	410	638	254
21	583	1820	713	b700	1320	1170	7030	a2700	1340	380	550	231
22	529	1860	749	731	1220	1130	7200	2460	1300	440	572	333
23	507	1750	749	731	1110	1100	6770	2460	1220	340	506	484
24	450	1690	713	713	1100	1110	6260	2460	1100	305	259	440
25	443	1690	704	749	1070	1030	5930	2180	1030	340	187	440
26	410	1660	686	749	1060	959	5740	2140	900	660	226	528
27	416	1660	704	713	1030	1080	5630	2040	820	312	211	561
28	485	1690	704	677	866	1500	5430	1880	740	298	155	517
29	485	1720	651	677	-	1780	5360	1820	718	454	152	638
30	499	1730	668	695	-----	1880	5210	1920	709	440	152	594
31	617	-----	686	713	-----	1850	-----	1530	-----	526	149	-----
Total	15,438	50,642	35,136	20,466	33,183	32,415	120,590	115,970	42,667	17,043	11,422	12,486
Mean	498	1688	1133	660	1185	1046	4020	3741	1422	550	368	416
Ac-ft	30,620	100,400	69,690	40,590	65,820	64,290	239,200	230,000	84,630	33,800	22,660	24,770
Calendar year 1961:	Max 4,450	Min 197	Mean 1,072	Ac-ft 776,300								
Water year 1961-62:	Max 7,200	Min 149	Mean 1,390	Ac-ft 1,006,000								

Peak discharge (base, 5,000 cfs).--Apr. 21 (2200) 7,380 cfs (6.37 ft).

a No gage-height record.

b Stage-discharge relation affected by ice.

8-3215. Jemez River below East Fork, near Jemez Springs, N. Mex.

Location.--Lat 35°49'39", long 106°38'51", in NW¼ 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 1962.

Gage.--Water-stage recorder. Datum of gage is 6,702.7 ft above mean sea level (planetable survey).

Extremes.--Maximum discharge during year, 572 cfs Apr. 3 (gage height, 3.55 ft); minimum, 8.6 cfs Dec. 5.

1951-62: Maximum discharge recorded, 2,520 cfs Apr. 31, 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.

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

0.8	7.4	1.5	58
.9	10	2.0	130
1.0	15	2.5	231
1.2	28	3.1	405

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	14	87	27	18	20	b 23	183	62	19	16	14	10
2	13	59	25	18	21	b 24	284	58	21	14	13	10
3	13	27	23	18	22	25	390	54	22	15	13	10
4	13	30	22	18	22	b 23	*368	50	20	17	12	10
5	14	27	16	16	19	b 20	269	47	17	17	11	10
6	14	22	16	16	19	22	308	44	16	19	10	11
7	*14	24	17	20	21	22	277	43	14	17	10	12
8	14	24	18	18	22	22	348	42	14	18	10	13
9	25	30	16	18	22	18	276	*40	14	22	10	13
10	34	32	13	12	24	19	260	40	13	18	10	11
11	20	27	14	12	25	b 16	244	37	13	13	11	10
12	17	25	10	14	27	b 14	237	36	*13	13	11	10
13	16	24	10	15	31	b 18	233	34	14	*13	12	10
14	16	24	15	15	32	b 20	227	32	12	12	12	*11
15	14	25	18	12	32	b 20	*212	30	12	12	*11	12
16	14	25	17	14	*35	b 21	191	29	11	11	11	11
17	14	25	14	15	33	22	163	27	11	12	12	11
18	14	20	18	17	24	19	159	27	12	13	11	12
19	14	19	15	18	b 25	20	152	24	11	13	12	11
20	14	20	14	18	30	22	148	23	13	17	13	12
21	*14	25	16	18	25	23	134	22	13	16	15	15
22	14	18	17	18	b 24	24	123	22	13	14	13	14
23	14	21	17	18	28	25	123	21	*12	14	12	14
24	14	22	16	18	26	25	103	20	12	14	10	20
25	14	22	18	22	25	26	93	*19	13	16	10	22
26	14	23	17	19	17	31	94	19	14	20	9.8	18
27	14	32	18	18	18	38	93	19	15	18	9.8	15
28	14	29	17	18	b 16	65	79	22	16	16	*9.8	16
29	20	23	17	18	-	87	73	24	14	15	10	16
30	28	24	17	18	-----	91	68	20	14	*16	10	14
31	45	-----	16	18	-----	*110	-----	19	-----	15	10	-----
Total	526	835	524	525	685	955	5,912	1,006	428	476	3,484	384
Mean	17.0	27.8	16.9	16.9	24.5	30.8	197	32.5	14.3	15.4	11.2	12.8
Ac-ft	1,040	1,660	1,040	1,040	1,360	1,890	11,730	2,000	849	944	691	762

Calendar year 1961: Max 600 Min 10 Mean 39.6 Ac-ft 28,680

Water year 1961-62: Max 390 Min 9.8 Mean 34.5 Ac-ft 25,010

Peak discharge (base, 500 cfs).--Apr. 3 (2300) 572 cfs (3.55 ft).

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.--No gage-height record Nov. 9, Dec. 12 to Feb. 3.

8-3230. Rio Guadalupe at Box Canyon, near Jemez, N. Mex.

Location.--Lat 35°43'55", long 106°45'45", in E½ 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 1962.

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, 532 cfs Apr. 21 (gage height, 5.70 ft); minimum, 2 cfs Feb. 28.

1951-62: 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, that of Feb. 28, 1962.

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 Gregorio 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)
(Shifting-control method used Apr. 18-22)

2.9	3.1	4.0	81
3.0	4.7	4.5	183
3.2	10	5.0	316
3.4	19	5.5	496
3.7	42		

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.5	29	16	b12	13	b12	61	232	40	11	13	4.4
2	8.2	24	16	b12	13	b14	72	237	40	10	12	4.5
3	8.2	16	16	b12	14	b15	115	258	40	10	10	4.5
4	8.2	17	14	12	*14	b15	*113	278	37	10	8.8	4.7
5	7.9	16	12	b12	14	16	115	280	32	11	7.3	4.7
6	7.6	15	10	b14	15	18	117	280	28	10	6.8	5.2
7	*7.6	15	13	13	16	18	119	264	26	12	6.5	5.4
8	a8	*16	13	14	18	18	142	258	24	14	6.5	5.8
9	a20	16	*14	13	26	14	142	*237	22	14	6.5	6.3
10	a40	16	12	b8	25	17	151	217	21	12	6.3	5.6
11	a30	16	12	b8	25	16	165	197	21	10	6.1	5.4
12	a22	16	b10	b9	27	b12	183	183	*20	8.8	6.3	5.2
13	a18	16	b9	*b10	33	*b14	217	174	20	*8.5	6.3	5.4
14	a15	16	b10	b12	35	b14	258	136	18	8.5	6.8	*5.6
15	a15	18	b14	b11	35	b15	*313	111	16	7.9	*6.5	5.6
16	a13	14	18	b14	33	b16	332	96	16	7.0	6.5	5.8
17	a12	17	14	15	32	21	368	81	16	7.3	6.3	5.6
18	a11	14	14	15	24	18	418	76	15	8.2	6.3	5.4
19	a11	12	b13	13	22	20	448	70	14	11	6.1	5.4
20	a10	13	14	13	25	23	*472	65	13	13	7.6	5.6
21	*8.8	16	14	12	26	22	452	60	13	14	7.0	6.5
22	8.5	14	14	12	20	21	368	56	12	11	6.5	7.3
23	8.5	14	b13	12	23	23	313	52	*11	10	6.1	9.1
24	8.2	14	b14	12	23	21	316	49	10	11	5.6	10
25	8.2	15	b14	13	24	21	345	44	11	17	5.4	16
26	8.2	17	14	13	20	27	329	42	11	31	5.2	16
27	8.2	16	13	b12	21	37	280	42	12	18	4.7	13
28	8.2	16	14	b12	*12	49	*286	46	12	12	4.7	14
29	11	14	14	b12	-	60	286	54	10	11	*4.7	16
30	24	17	14	b12	-----	60	255	52	10	*10	4.5	14
31	25	-----	13	13	-----	*52	-----	*44	-----	12	4.5	-----
Total	408.0	485	415	377	628	719	7,551	4,271	591	361.2	207.4	228.0
Mean	13.2	16.2	13.4	12.2	22.4	23.2	252	138	19.7	11.7	6.69	7.60
Ac-ft	809	962	823	748	1,250	1,430	14,980	8,470	1,170	716	411	452

Calendar year 1961: Max 379 Min 6.0 Mean 44.8 Ac-ft 32,400
Water year 1961-62: Max 472 Min 4.4 Mean 44.5 Ac-ft 32,220

Peak discharge (base, 400 cfs).--Apr. 21 (0030) 532 cfs (5.70 ft).

* Discharge measurement made on this day.

a No gage-height record.

b State-discharge relation affected by ice.

8-3240. Jemez River near Jemez, N. Mex.

Location.--Lat 35°39'45", long 106°44'30", in NW $\frac{1}{4}$ 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 $\frac{1}{2}$ 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 1962.

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.--10 years (1936-40, 1949-50, 1953-54, 1958-62), 66.1 cfs (47,850 acre-ft per year).

Extremes.--Maximum discharge during year, 1,360 cfs Aug. 20 (gage height, 5.20 ft); minimum, 12 cfs Aug. 31. 1936-41, 1949-62: 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 except those for periods of ice effect or no gage-height record, which are fair. 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)

1.2	13	2.3	160
1.4	26	3.0	330
1.6	44	4.0	700
1.9	86		

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	23	125	46	b31	34	b40	220	300	57	21	31	14
2	22	114	45	b32	35	46	317	300	60	22	28	14
3	22	56	43	b32	37	45	452	311	66	21	27	15
4	24	55	41	b31	*38	40	*527	330	57	24	25	14
5	24	52	33	b30	36	39	450	337	51	28	22	14
6	26	45	31	b32	37	44	536	333	45	29	21	15
7	*25	45	34	36	40	44	466	319	41	31	19	18
8	24	*50	35	35	43	44	606	304	40	31	17	18
9	42	51	*36	34	49	36	508	*285	37	40	17	18
10	76	52	30	b22	51	43	440	258	35	34	17	18
11	54	51	29	b20	52	36	428	234	34	28	17	17
12	43	48	b20	b24	55	26	440	222	*31	24	17	16
13	38	46	b20	*b28	66	*b35	462	210	30	*24	17	18
14	33	46	26	b30	69	b37	500	178	27	22	17	*19
15	31	50	34	b25	69	b38	*527	150	24	22	*18	19
16	30	46	37	b30	*70	39	559	130	25	20	18	18
17	29	49	30	b32	70	41	536	115	24	18	18	18
18	28	40	34	34	56	39	583	110	25	20	18	18
19	28	35	31	33	52	42	624	100	24	28	18	18
20	28	34	30	33	60	49	*676	90	23	30	72	19
21	*26	46	32	32	57	46	636	85	23	41	28	21
22	25	36	34	32	46	46	534	80	24	34	25	22
23	25	37	b32	32	56	49	471	75	*21	27	20	23
24	25	39	b32	32	52	48	432	70	20	33	18	31
25	25	41	b34	38	55	49	453	70	21	36	18	39
26	25	43	b34	35	44	59	435	65	23	68	18	38
27	25	48	35	33	41	70	384	65	23	45	16	37
28	25	49	b32	33	b32	100	*369	70	20	32	14	35
29	34	42	b33	32	-	148	363	80	21	26	*14	37
30	70	44	b33	33	-	148	327	75	23	*29	14	33
31	69	-----	b31	34	-----	*150	-----	*63	-----	32	14	-----
Total	1,024	1,515	1,027	970	1,402	1,716	14,261	5,414	975	920	653	654
Mean	33.0	50.5	33.1	31.3	50.1	55.4	475	175	32.5	29.7	21.1	21.8
Ac-ft	2,030	3,000	2,040	1,920	2,780	3,400	28,290	10,740	1,930	1,820	1,300	1,300

Calendar year 1961: Max 881 Min 16 Mean 87.2 Ac-ft 63,120
 Water year 1961-62: Max 676 Min 14 Mean 83.6 Ac-ft 60,550

Peak discharge (base, 1,000 cfs).--Aug. 20 (1930) 1,360 cfs (5.20 ft).

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.--No gage-height record May 16-30.

8-3290. Jemez River below Jemez Canyon Dam, N. Mex.

Location.--Lat 35°23'10", long 106°31'45", in NE $\frac{1}{4}$ sec. 5, T.13 N., R.4 E., on right bank three-quarters of a mile downstream from Jemez Canyon Dam, $\frac{1}{2}$ 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 1962. 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.--20 years (1936-37, 1943-62), 52.6 cfs (38,080 acre-ft per year).

Extremes.--Maximum discharge during year, 1,630 cfs May 18 (gage height, 7.96 ft); no flow at times.

1936-38, 1943-62: 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 fair for March, April and May, others poor. Discharge measurements generally made 2 or 3 times a month. Subsequent to October 1953, flow at this station can be completely regulated by Jemez Canyon Reservoir (see p.155). 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 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	82	26	32	28	25	114	51	18	0.7	0.3	0
2	0	100	27	27	29	30	121	51	18	.7	.1	0
3	0	60	27	26	34	29	267	55	22	.7	.1	0
4	0	40	25	10	34	25	550	56	17	.6	.1	0
5	0	36	19	18	32	29	526	56	a15	.7	.1	0
6	0	42	18	22	31	34	393	56	a10	.7	.1	0
7	0	34	a20	42	37	38	356	164	8.7	.6	.1	0
8	0	34	a22	31	53	38	349	289	4.0	.6	.1	0
9	0	34	a24	b10	58	38	447	123	3.4	.5	.1	0
10	4.9	32	a20	b2	46	36	393	69	2.4	.5	.1	0
11	19	34	a9	a0	48	28	364	68	2.0	.4	.1	0
12	11	32	a2	a0	48	42	412	67	1.7	.6	.1	0
13	5.6	31	a0	a0	48	21	363	67	1.3	.4	.1	0
14	5.0	34	a0	a0	63	32	345	67	1.1	.4	.1	0
15	6.6	37	a5	a1	56	27	360	171	1.1	.3	.1	0
16	11	32	82	b5	68	27	469	710	1.0	.3	4.2	0
17	14	31	34	b3	65	36	550	1,170	1.0	.3	a.1	0
18	13	28	35	b10	56	31	540	1,380	1.0	.2	0	0
19	10	19	21	b30	53	32	268	1,570	1.0	.2	0	0
20	10	17	25	b50	57	36	39	1,360	1.0	.5	0	0
21	10	18	37	90	62	37	33	751	1.0	.2	0	0
22	11	21	38	50	54	38	33	51	.9	.5	0	0
23	10	17	28	27	49	43	33	50	.9	.9	0	0
24	11	19	26	20	60	42	34	50	.9	a.5	0	7.7
25	11	21	30	53	43	37	34	43	.8	a.3	0	.3
26	11	23	29	25	34	44	34	40	.8	a.2	0	0
27	12	20	25	22	29	43	44	35	.8	a.2	0	14
28	9.4	23	19	26	31	60	52	33	.7	a.2	0	80
29	16	25	32	24	-	79	51	32	.7	a.2	0	43
30	74	24	39	24	-	88	51	25	.7	a.2	0	7.5
31	120	-----	27	26	-----	100	-----	22	-----	1.5	0	-----
Total	405.5	1,000	771	706	1,306	1,245	7,625	8,732	1,389	14.8	6.0	152.5
Mean	13.1	33.3	24.9	22.8	46.6	40.2	254	282	46.3	0.48	0.19	5.08
Ac-ft	804	1,980	1,530	1,400	2,590	2,470	15,120	17,320	276	29	12	302

Calendar year 1961: Max 785 Min 0 Mean 67.6 Ac-ft 48,950
 Water year 1961-62: Max 1,570 Min 0 Mean 60.6 Ac-ft 43,830

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 NW¼ sec.33, T.13 N., R.4 E. (projected), in Bernalillo Grant, in reservoir 0.3 mile east of intersection of State Highways 44 and 422 and 1½ miles northeast of Bernalillo.

Drainage area.--4.1 sq mi, of which 2.0 sq mi has contouring, pitting and small dams to reduce runoff.

Records available.--September 1955 to September 1962.

Gage.--Water-stage recorder adjacent to outlet tower with fixed ports. 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.

Average outflow.--7 years, 0.015 cfs (10.9 acre-feet per year).

Extremes.--Maximum outflow during year, 9.5 cfs July 5; no inflow or outflow except that of July 5.
1955-62: Maximum outflow, 55 cfs July 19, 1956 (gage height, 11.23 ft). Maximum inflow, 2,330 cfs, July 19, 1956 (average for 5-minute interval), computed from outflow and change in reservoir contents. No inflow or outflow for most of time.

Remarks.--Records poor. Records for 1962 obtained at supplementary gage below dam, those for prior years from reservoir gage. No adjustments made for evaporation or seepage.

Reservoir is formed by earth-fill dam, completed in 1955. Capacity, 300 acre-ft (original survey, no dead storage). Outlet tower has an inside opening 3 ft square and outlet pipe through dam is 2 ft in diameter. A total of 9 port openings are spaced at 5-ft vertical intervals on upstream and sides of tower. They are 2 ft wide by 1 ft high; sill of lowest upstream port is at gage height 3.9 ft and lowest side ports at gage height 6.3 ft. Gage height of spillway crest is 27 ft, crest of dam is 35 ft.

Supplementary Gage below Bernalillo floodwater retarding reservoir No. 1

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
July 1962	0.67	0.67	0	0.02	1.33
Calendar year 1961	0.09	0.09	0	0.0002	0.18
Water year 1961-62	0.67	0.67	0	0.002	1.33

Note.--The only flow event of year occurred July 5 during the hours of 1300 - 2400.

8-3295. Rio Grande near Bernalillo, N. Mex.

Location.--Lat 35°17'05", long 106°35'45", in SE 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 1962. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder at a datum of 5,030.57 ft above mean sea level, datum of 1929, adjustment of 1951. Supplemental water-stage recorder at a site, 1,900 ft downstream used alternately 1953-58, 1961, at the same datum 1953-55, variable 1956-58 and 1.26 ft lower than primary gage in 1961.

Average discharge.--21 years, 1,132 cfs (819,500 acre-ft per year).

Extremes.--Maximum discharge during year, about 7,000 cfs Apr. 22 (gage height, 4.80 ft); no flow at times.

1941-62: 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 except those for periods of ice effect or no gage-height record or indefinite stage-discharge relation, which are poor. Discharge measurements generally made 4 or more times a month. 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. 155)

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	178	439	e1700	e670	674	802	1570	e4520	976	318	88	106
2	85	750	e1760	e660	674	741	1220	e4300	838	329	80	90
3	70	750	e1640	e630	707	802	1340	4000	945	226	21	a2
4	65	642	e1710	e620	775	895	e2000	3790	875	162	a2	a0
5	62	1470	e1640	e640	750	707	e2300	3740	1020	150	29	0
6	58	2270	1510	e650	784	724	e2110	3740	1340	186	26	0
7	62	2240	1550	e690	766	732	e2220	4110	1510	276	a10	39
8	143	2170	1510	b680	802	716	e2270	e4520	1710	775	a1	a1
9	58	2080	1410	b680	935	674	e2400	e4680	1710	1240	0	19
10	54	1970	1210	a620	1210	732	e2460	4790	1590	521	0	0
11	100	1890	1220	a400	1550	707	e2580	e5020	1250	346	0	0
12	143	1940	1180	a300	1550	432	e2690	e5260	1120	265	197	0
13	97	2050	a1000	a450	e1530	358	2800	e5500	1090	275	150	0
14	109	2000	865	a500	e1800	465	e2910	5050	1210	302	91	a1
15	250	1810	1220	a500	e1900	493	e3220	4620	1090	318	a55	0
16	126	1940	1590	a520	e1890	465	e4040	4160	1050	204	60	0
17	129	1810	1090	a540	c1850	465	e4300	e4900	1490	100	65	0
18	118	1890	e850	a600	1830	758	e4810	e4500	1410	103	50	0
19	115	1640	e700	b720	1550	811	e5200	e4340	1180	82	66	0
20	85	1940	e650	b760	1510	838	5710	e3620	965	379	80	0
21	97	1830	682	b800	1500	802	6810	e3050	775	a100	26	0
22	212	1890	766	865	1220	784	e6900	e2160	580	182	a15	0
23	58	1710	775	905	1160	741	e6300	e2080	465	91	a10	0
24	34	1830	e750	724	1070	793	e5900	2050	432	a25	a2	0
25	20	1860	e730	758	1090	820	5710	e1800	426	12	0	0
26	a17	1780	724	775	1080	750	5370	e1760	346	379	0	21
27	a15	1810	666	741	1010	802	e5250	e1850	290	91	0	38
28	22	e1710	e640	724	895	1080	e5200	e1520	245	52	0	129
29	178	e1710	e620	e740	-	1320	e5000	e1460	250	40	0	126
30	88	e1640	e640	e760	-----	1450	e4660	e1600	285	302	0	212
31	212	-----	e660	e720	-----	1570	-----	e1220	-----	308	0	-----
Total	3060	51461	33658	20342	34062	24229	115250	109710	28463	8139	1124	7030
Mean	98.7	1715	1086	656	1216	782	3842	3539	949	263	363	234
Ac-ft	6070	102100	66760	40350	67560	48060	228600	217600	56460	16140	2230	1390

Calendar year 1961: Max 4,270 Min 0 Mean 841 Ac-ft 609,300
 Water year 1961-62: Max 6,900 Min 0 Mean 1,179 Ac-ft 853,300

Peak discharge (base, 5,000 cfs).--Apr. 22 (0200) about 7,000 cfs (4.80 ft).

a No gage-height record.

b Stage-discharge relation affected by ice.

c Stage-discharge relation indefinite.

B-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), in Atrisco Grant at downstream side of Old Town 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 1962. 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.--21 years, 1,118 cfs (809,400 acre-ft per year).

Extremes.--Maximum discharge during year, 6,520 cfs Apr. 22 (gage height, 6.78 ft); minimum, 0.4 cfs Sept. 1.

1941-62: 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 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.155). 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 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	277	672	2020	795	741	822	1,620	4,940	1,210	498	133	4.8
2	219	813	1,880	723	750	860	1,560	4,690	1,050	351	64	53
3	200	890	1,840	714	795	1,010	1,840	4,440	1,090	223	40	21
4	190	741	1,740	741	822	1,020	2,310	4,200	1,160	157	29	26
5	176	1,470	1,710	705	860	822	2,760	4,250	1,240	145	24	11
6	173	2,450	1,710	732	850	777	2,270	4,250	1,440	190	29	8.0
7	180	2,500	1,650	705	795	804	2,660	4,410	1,560	251	20	11
8	204	2,330	1,710	741	822	804	2,620	4,800	1,790	738	15	18
9	181	2,200	1,650	741	930	795	2,860	4,830	1,900	1,190	11	14
10	148	2,200	1,620	636	1,160	870	2,680	4,800	1,760	432	14	17
11	142	2,200	1,620	223	1,600	940	2,580	5,000	1,470	389	13	20
12	238	2,250	1,460	215	1,530	804	2,740	5,180	1,220	301	14	42
13	226	2,290	1,220	349	1,520	768	2,720	5,480	1,170	259	91	37
14	251	2,230	1,040	505	2,000	660	2,840	5,000	1,170	360	27	41
15	296	2,250	1,120	572	2,110	620	3,200	4,740	1,170	332	24	29
16	259	2,210	1,180	620	1,980	596	3,760	4,630	1,090	248	14	27
17	272	2,160	1,260	596	2,040	558	4,440	4,920	1,400	130	12	31
18	264	2,200	995	669	1,930	696	4,720	4,520	1,370	94	14	22
19	268	2,200	804	822	1,820	687	5,270	4,300	1,310	112	11	18
20	244	2,070	759	840	1,520	910	5,540	3,960	1,060	157	22	20
21	208	2,090	786	860	1,530	930	6,090	3,550	900	109	24	22
22	311	2,090	786	900	1,380	940	6,460	2,360	797	83	28	29
23	266	1,920	795	930	1,330	910	6,050	2,420	520	130	31	35
24	190	1,820	768	840	1,300	880	5,610	2,340	438	68	41	54
25	213	1,790	768	920	1,340	910	5,540	2,090	426	45	39	64
26	231	1,920	768	910	1,180	750	5,670	1,930	349	264	26	56
27	198	2,050	777	750	1,050	786	5,670	2,050	282	199	26	72
28	255	2,090	804	777	920	1,170	5,420	1,770	215	94	18	142
29	230	1,980	786	723	-	1,530	5,300	1,790	212	52	11	212
30	264	1,930	813	750	-----	1,640	5,210	1,720	261	201	8.0	292
31	383	-----	795	804	-----	1,620	-----	1,680	-----	345	6.7	-----
Total	71,57	58,006	37,634	21,808	36,605	27,889	118,010	117,040	31,030	81,47	8,797	1,448.8
Mean	231	1,934	1,214	703	1,307	900	3,934	3,775	1,034	263	28.4	48.3
Ac-ft	14,200	115,100	74,650	43,260	72,600	55,320	234,100	232,100	61,550	16,160	1,740	2,870
(t)	13,110	1,020	948	830	736	10,860	14,320	13,340	13,500	15,630	1,725	1,523

Calendar year 1961: Max 4,200 Min 9.5 Mean 938 Ac-ft 679,100
 Water year 1961-62: Max 6,460 Min 4.8 Mean 1,276 Ac-ft 923,600

Peak discharge (base, 4,000 cfs).--Apr. 22 (0400) 6,520 cfs (6.78 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.

B-3320. Rio Grande near Bernardo, N. Mex.

Location.--Lat 34°25'00", long 106°48'00", in E½NE¼ sec. 11, T.2 N., R.1 E. (projected), in Sevilleta or Belen Grant, at bridge on U.S. Highway 60, 2 miles east of Bernardo and 4½ miles upstream from Rio Puerco.

Drainage area.--19,230 sq mi, approximately (includes 2,940 sq mi in closed basin San Luis Valley, Colo.).

Records available.--June 1936 to January 1939, October 1941 to September 1962. 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, present datum) 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.--23 years (1936-38, 1941-62), 1,073 cfs (776,800 acre-ft per year).

Extremes.--Maximum discharge during year, 6,510 cfs Apr. 23; minimum, 17 cfs Sept. 6.
1936-39, 1941-62: 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 Lower San Juan Riverside drain along left side of floodway is not included in the composite but monthly values shown below in table. Diversions for irrigation of about 740,000 acres above station.

Cooperation.--Records for Lower San Juan Riverside drain are furnished by Bureau of Reclamation.

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	155	276	1710	767	798	871	1390	4120	1060	142	39	24
2	204	465	1730	747	808	837	1400	3750	762	171	40	23
3	192	627	1620	742	783	774	1120	3740	637	164	50	20
4	155	735	1660	766	792	824	1320	3540	666	146	47	19
5	148	623	1640	738	786	813	1970	3270	615	126	41	21
6	134	1340	1620	746	820	765	2090	3640	526	101	40	19
7	116	1810	1600	726	842	771	1870	3470	591	123	35	20
8	97	1940	1560	726	835	785	2250	3660	821	145	30	21
9	129	1860	1480	726	859	760	2250	4070	829	262	31	22
10	139	1760	1430	556	932	766	2330	4050	986	485	35	26
11	140	1700	1430	506	1020	1280	2210	4400	1010	308	36	25
12	141	1700	1390	419	1630	1080	2180	4510	832	241	30	21
13	142	1750	1310	378	1430	742	2350	4330	616	213	30	20
14	173	1790	1160	419	1440	648	2220	4880	588	158	31	22
15	181	1810	1110	511	2060	539	2360	4590	607	132	29	22
16	219	1690	1310	616	1920	524	2910	3940	578	143	32	25
17	208	1760	1450	698	1820	536	3310	4280	607	90	30	25
18	156	1710	1300	678	1790	628	3670	4490	720	58	28	25
19	176	1720	980	719	1640	714	4100	4170	694	59	31	26
20	192	1700	910	869	1590	738	5130	4080	682	52	30	25
21	168	1690	889	902	1410	686	5450	3690	512	60	31	25
22	128	1720	884	1030	1320	750	6030	2510	409	56	30	21
23	235	1750	879	1040	1280	817	6350	1610	367	49	29	29
24	245	1660	878	993	1150	867	6130	1710	269	42	27	80
25	139	1630	838	890	1170	817	5090	1740	346	40	29	112
26	102	1570	818	921	1120	918	5190	1570	188	86	27	82
27	105	1580	818	921	1120	689	4840	1750	173	37	27	124
28	119	1560	798	784	1140	574	4440	1860	178	44	25	144
29	161	1530	808	788	-	577	4450	1270	153	34	24	232
30	218	1530	788	767	-	998	4290	1120	141	43	23	229
31	228	-	768	768	-	1610	-	1140	-	32	23	-
Total	5045	44986	37566	22857	34305	24698	100690	100950	17163	3842	990	1529
Mean	163	1500	1212	737	1226	797	3356	3256	572	124	319	510
Ac-ft	10010	89230	74510	45340	68040	48990	199700	200200	34040	7620	1960	3030
(†)	5500	3360	3100	2740	2940	6340	7100	7390	5670	4590	2400	1830
Calendar year 1961:	Max	4,080	Min	2.4	Mean	763	Ac-ft	552,400				
Water year 1961-62:	Max	6,350	Min	19	Mean	1,081	Ac-ft	782,700				

† Monthly discharge, in acre-feet, of Lower San Juan Riverside drain.

8-3340. Rio Puerco above Chico Arroyo, near Guadalupe, N. Mex.

Location.--Lat 35°36'05", long 107°09'55", in SW 1/4 sec. 21, T.16 N., R.3 W., on right bank 1.6 miles upstream from Chico Arroyo and 5 1/2 miles northeast of village of Guadalupe, Sandoval County.

Drainage area.--420 sq mi, approximately.

Records available.--July 1951 to September 1962.

Gage.--Water-stage recorder. Altitude of gage is 5,925 ft (by barometer).

Average discharge.--11 years, 14.7 cfs (10,640 acre-ft per year).

Extremes.--Maximum discharge during year, 1,060 cfs July 26 (gage height, 4.80 ft); no flow for many days.

1951-62: Maximum discharge, 4,540 cfs Aug. 18, 1961 (gage height, 10.60 ft), 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 ice effect or no gage-height record and those below 20 cfs, all of which are poor. Diversions for irrigation of about 3,700 acres above station in past years, but present diversion negligible.

Rating tables, except for periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-10, Mar. 14-16, Mar. 30 to Apr. 15, June 30 to July 20)

Oct. 1-31				Nov. 1 to Sept. 30			
0.35	0	0.8	5.6	0.18	0	0.6	4.5
.4	.2	.9	8.8	.2	.02	.7	8.3
.5	.7	1.0	13	.3	.2	.8	13
.6	1.7	1.2	24	.4	.7	1.0	25
.7	3.3	1.6	58	.5	2.0	1.2	40
		2.1	123				2.8 290

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.1	1.2 3	1.1	0	5	a 2	6.4	5.2	a 3	0.1		0
2	.1	8.1	1.0	0	5	a 5	7.5	4.9	a 2	0		0
3	.1	1.1	1.0	0	25	a 2	11	5.4	a 1	0		0
4	.1	* 4.0	.6	0	80	a 2	17	6.8	a.5	0		0
5	.1	1.6	.5	0	90	a 5	22	* 7.4	a.2	.1		0
6	.1	.9	.4	**0	65	a 1	22	7.8	a.1	** .1	(**)	0
7	.1	.6	.3	.1	69	a 1	* 2.3	8.1	a 0	0		0
8	.1	.4	.3	.1	130	a 7	18	8.5	** 0	0		0
9	.8	.5	.3	0	158	a 5	21	7.5	0	0		0
10	4 0	.7	.2	0	* 29.0	a 2	26	6.8	0	0		0
							22					
11	1.0	.8	.1	0	170	a 5	22	6.2	0	0		** 0
12	a.5	.7	0	0	97	a 4	22	6.3	0	0		.1
13	a.2	.7	0	0	102	a 1	31	5.7	0	0		.1
14	a.1	.9	0	0	59	*.8	38	5.7	0	0		.1
15	a.1	1.1	0	0	38	.9	5.7	* 4.4	0	0		.1
16	a 0	2.2	.1	0	* 26	.5	8.1	3.6	0	0		.1
17	** 0	3.8	.1	0	19	1.0	* 8.6	3.4	0	0		.1
18	0	1.8	0	0	18	3.7	11.2	a 3.0	0	0		0
19	0	1.4	0	0	a 10	1.5	13.7	a 2.5	0	.1		.1
20	0	.9	0	.1	a 7	1.1	* 16.1	a 2.0	0	.1		.1
21	0	1.4	* 0	.2	a 5	8.3	16.0	a 1.5	0	0		.1
22	0	1.4	0	.1	a 5	4.9	14.0	a 1.2	0	1.8		4.3
23	0	1.1	0	0	a 5	a 3	10.8	* 1.0	0	2.0	(**)	2.0
24	0	1.5	0	0	a 5	a 4	* 8.2	9.2	0	** 0		7.8
25	0	1.1	0	0	a 2	a 4	8.1	7.2	0	0		4.6
26	0	1.0	0	0	a 2	a 4	8.7	a 5	0	1.3 7		a 5
27	0	1.5	0	0	* a 2	a 4	8.0	3.5	0	1.5		a 4
28	0	* 1.6	0	0	a 2	* 4.9	6.4	5.3	0	a 1		4.0
29	.2	2.8	0	.2	-	9.7	6.3	10	0	a.2		6.6
30	1.6	1.6	.1	*.5	-----	1.3	5.9	8.3	.1	* 0	(**)	a 2
31	1.1 5	-----	0	.5	-----	1.1	-----	a 5	-----	** 0		-----
Total	174.7	253.0	6.1	6.3	1.49 1	188.0	1.844.9	1.202.5	6.9	173.7	0	142.0
Mean	5.6 4	8.4 3	0.2 0	0.2 0	5.3 2	6.0 6	6.1 5	38.8	0.2 3	5.6 0	0	4.7 3
Ac-ft	347	502	12	12	2.9 6 0	37 3	3.6 6 0	2,390	14	345	0	282

Calendar year 1961: Max 1,060 Min 0 Mean 18.9 Ac-ft 13,720
Water year 1961-62: Max 290 Min 0 Mean 15.0 Ac-ft 10,900

Peak discharge (base, 1,800 cfs).--No peak above base.

* Discharge measurement made on this day.

** Field estimate made on this day (some less than 0.05 cfs).

a No gage-height record.

Note.--Stage-discharge relation affected by ice Dec. 10 to Feb. 3 (no gage-height record Jan 10-19).

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 Cabezon.

Drainage area.--1,390 sq mi, approximately.

Records available.--November 1943 to September 1962.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 5,895 ft (by barometer).

Average discharge.--19 years, 24.1 cfs (17,450 acre-ft per year).

Extremes.--Maximum discharge during year, 598 cfs July 31 (gage height, 3.96 ft); no flow for many days.

1943-62: 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 above 200 cfs, poor below. 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	2.7	14
2.0	.3	2.8	21
2.1	.9	2.9	32
2.4	4.9	3.0	49
2.5	6.8	3.2	108
2.6	10	3.4	200

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.1	6.4	0	0	0.2	a 0.5	3.1			0	1.4	0
2	.1	4.3	0	0	0	a.5	.9			0	a 3	0
3	.1	9.7	0	0	76	a.5	.3			0	a .5	0
4	0	*3.5	0	.1	126	a.5	.1			0	a .1	0
5	.1	1.3	0	.1	110	a.5	0	(*)		0	a 0	0
6	0	.2	0	*.1	91	a.5	0			*4.8	*0	0
7	.1	.1	0	.1	77	a.5	*0			2.6	0	0
8	0	.2	0	0	72	a 1	0		(*)	a .5	0	0
9	.2	.2	0	0	108	a.8	0			a .1	0	0
10	29	.1	.1	0	*4.4	a.7	0			a 0	0	0
11	5.6	.1	0	0	23	a 1	0			a 0	0	*0
12	a 3	.1	0	0	34	a.5	0			a 0	0	0
13	a 1	.1	0	0	44	a.5	0			a 0	0	0
14	a.5	.2	0	0	29	*.5	0			a 0	0	0
15	a.2	.3	0	0	17	.3	0	(*)		a 0	0	0
16	a 1	.2	.2	0	*1.4	.2	0			a 0	0	0
17	*0	.1	.1	0	7.1	.1	*0			a 0	0	0
18	0	.1	0	0	4.3	0	0			*0	0	0
19	0	.1	0	0	3.0	0	0			0	0	0
20	0	.1	0	.1	2.7	0	0			0	0	0
21	0	.1	*0	.1	4.1	0	0		(*)	9.8	0	13
22	0	.1	0	.1	a 2	.1	0			107	0	5.1
23	0	.1	0	.2	a 1	.1	0	(*)		58	0	1.4
24	0	.1	0	.2	a 1	.1	0			*28	0	46
25	0	0	0	.2	a 1	0	0			19	0	94
26	0	0	0	.2	a 1	0	0			52	0	21
27	0	0	0	.2	a 1	0	0			a 5	0	a 5
28	0	*0	.1	.2	a 1	*1.1	0			a 1	*0	40
29	.1	0	.1	.2	-	2.9	0			a .5	0	25
30	78	0	0	*.2	-----	2.3	0			*.2	*0	a 5
31	92	-----	0	.3	-----	4.5	-----			180	0	-----
Total	210.2	124.1	0.6	2.6	894.6	76.9	4.4	0	0	511.7	17.6	255.5
Mean	6.78	4.14	0.02	0.08	32.0	2.48	0.15	0	0	16.5	0.57	8.52
Ac-ft	417	246	1.2	5.2	1,770	153	8.7	0	0	1,010	35	507

Calendar year 1961: Max 1,370 Min 0 Mean 22.5 Ac-ft 16,330

Water year 1961-62: Max 180 Min 0 Mean 5.75 Ac-ft 4,150

Peak discharge (base, 2,900 cfs).--No peak above base.

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

a No gage-height record.

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 1962.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 7,320 ft (by barometer).

Average discharge.--11 years, 1.85 cfs (1,340 acre-ft per year).

Extremes.--Maximum discharge during year, 33 cfs June 14 (gage height, 2.72 ft); minimum daily, 0.2 cfs Nov. 20 to Dec. 6. 1951-62: Maximum discharge, 58 cfs July 1-3, 1952 (gage height, 2.75 ft); no flow at times in 1955, 1957.

Remarks.--Records good. 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 Oct. 1 to Dec. 27, Jan. 3-10, Jan. 23 to Feb. 2, Feb. 15 to Apr. 3)

1.4	0.2	1.9	3.0
1.5	.4	2.0	4.5
1.6	.8	2.2	9.0
1.7	1.3	2.4	16
1.8	2.0	2.7	33

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.3	*0.3	0.2	0.3	0.3	0.5	0.7	*1.0	30	18	*23	26
2	.3	.3	.2	.3	*.3	*.6	.8	1.0	29	18	23	26
3	.3	.3	.2	.3	.3	.6	*.8	1.0	29	18	22	25
4	.3	.3	.2	.3	.3	.6	.8	1.0	30	18	22	25
5	.3	.3	.2	.3	.3	.6	.8	1.0	32	18	23	25
6	.3	.3	.2	.3	.3	.6	.8	1.0	32	18	29	24
7	.4	.3	.3	.3	.3	.6	.9	1.0	32	18	29	24
8	.4	.3	.3	.3	.4	.6	.9	1.0	32	20	29	20
9	.4	.3	.3	.3	.4	.6	.9	1.0	32	24	29	18
10	.4	.3	.3	.3	.4	.6	1.0	2.4	32	25	29	18
11	.4	.3	.3	.3	.4	.6	1.0	7.6	32	30	29	18
12	*.4	.3	.3	.3	.4	.6	1.0	9.0	32	29	29	18
13	.4	.3	.4	.3	.4	.6	1.0	12	32	28	29	*18
14	.3	.3	.4	.3	.4	.6	1.0	16	32	27	*29	17
15	.3	.3	.4	.3	.4	.6	1.0	18	31	23	28	16
16	.3	.3	.4	.3	.4	.6	1.0	20	29	26	28	15
17	.3	.3	.4	.3	.4	.6	1.0	22	26	23	28	15
18	.3	.3	.4	.3	.5	.6	1.1	24	22	22	22	15
19	.3	.3	.3	.3	.5	.6	1.1	18	22	*19	22	16
20	.3	.2	.3	.3	.5	.6	1.1	.8	*22	20	20	16
21	.3	.2	.3	.3	.5	.6	1.1	.8	22	20	21	16
22	.3	.2	.3	.3	.5	.6	1.1	*.8	22	20	22	16
23	.3	.2	.3	.3	.5	.6	1.1	24	22	20	22	16
24	.3	.2	.3	.3	.5	.6	1.1	24	22	17	23	12
25	.3	.2	.3	.3	.5	.6	1.1	25	22	17	24	3.4
26	.3	.2	.3	.3	.5	.6	1.2	26	21	17	24	.4
27	.3	.2	*.3	.3	.5	.7	1.1	26	18	17	25	1.2
28	.4	.2	.3	.3	.5	.7	1.1	26	18	18	26	4.9
29	.4	.2	.3	.3	.5	.7	1.0	27	*18	19	24	6.5
30	.4	*.2	.3	.3	.5	.7	1.0	30	18	24	25	6.5
31	.4	-----	.3	.3	-----	.7	-----	*30	-----	24	*26	-----
Total	10.4	7.9	9.3	9.3	11.6	19.0	29.6	398.4	793	655	784	477.9
Mean	0.34	0.26	0.30	0.30	0.41	0.61	0.99	12.9	26.4	21.1	25.3	15.9
Ac-ft	21	16	18	18	23	38	59	790	1,570	1,300	1,560	948

Calendar year 1961: Max 5.0 Min 0.20 Mean 0.98 Ac-ft 358
 Water year 1961-62: Max 32 Min 0.20 Mean 8.78 Ac-ft 6,360

* 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 1962. 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.--40 years (1912-15, 1916-18, 1927-62), 9.96 cfs (7,210 acre-ft per year).

Extremes.--Maximum discharge during year, 34 cfs June 7-10 (gage height, 3.57 ft); minimum, 0.4 cfs Dec. 26.

1912-18, 1927-62: 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 below 5 cfs, which are fair, and those for periods of ice effect or no gage-height record, which are poor. 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	0.8	3.2	13
2.8	2.6	3.4	22
3.0	7.2	3.6	35

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.4	* 1.8	1.6	1.8	b 1.6	2.6	a 3.0	* 5.3	3.2	2.2	* 2.4	2.6
2	1.4	1.8	1.6	2.0	b 1.8	* 2.2	a 3.1	5.3	3.1	2.1	2.3	2.6
3	1.4	1.8	1.6	b 1.8	* b 1.8	2.6	* 3.3	5.3	3.0	2.1	2.3	2.5
4	1.4	1.8	1.6	b 1.5	b 1.8	2.4	3.3	5.0	3.0	2.2	2.3	2.5
5	1.4	1.8	1.6	b 1.5	b 2.0	2.6	3.3	5.0	3.2	2.1	2.3	2.6
6	1.4	1.8	1.6	b 1.8	b 1.8	2.6	3.3	5.0	3.3	2.1	3.0	2.5
7	1.4	1.8	1.6	b 2.0	2.0	2.8	3.3	5.0	3.4	2.1	3.0	2.6
8	1.6	1.8	1.6	2.4	2.0	2.8	3.5	5.0	3.4	2.1	3.0	2.4
9	2.8	1.8	1.8	2.0	2.2	2.6	3.5	5.0	3.4	2.5	3.0	1.9
10	1.8	1.8	1.8	b * 1.0	2.0	2.6	3.7	5.0	3.4	2.6	3.0	1.9
11	1.8	1.6	2.0	b 1.2	1.8	2.4	3.9	6.2	3.3	3.0	3.0	1.9
12	* 1.8	1.6	b 1.5	b 1.5	1.6	2.4	3.9	9.7	3.3	3.1	3.0	1.9
13	1.8	1.8	b 1.8	b 1.5	1.6	2.4	4.1	10	3.3	3.0	3.0	* 1.9
14	1.6	1.8	2.0	b 1.2	1.6	2.6	4.4	17	3.3	3.0	* 3.0	1.8
15	1.8	2.0	2.2	b 1.2	1.6	2.6	4.6	18	3.3	2.4	3.0	1.7
16	1.8	2.0	2.2	b 1.5	1.6	2.6	4.6	20	3.0	2.7	3.0	1.7
17	1.8	1.8	2.0	b 1.8	1.8	2.6	4.8	21	3.0	2.4	3.0	1.6
18	1.8	1.8	2.0	b 2.0	1.8	2.6	4.8	23	2.5	2.3	2.4	1.6
19	1.8	1.6	1.8	b 2.0	2.0	a 2.6	5.0	25	2.5	* 2.0	2.3	1.6
20	1.8	1.6	2.0	b 2.0	2.4	a 2.6	5.0	8.1	* 2.6	2.1	2.2	1.8
21	2.0	1.8	2.0	b 2.0	2.4	a 2.6	5.0	4.8	2.5	2.2	2.1	1.7
22	2.0	1.8	2.0	b 1.8	2.4	a 2.6	5.0	* 4.4	2.5	2.1	2.2	1.7
23	2.0	1.6	1.8	b 1.8	2.4	a 2.6	5.0	1.4	2.5	2.2	2.3	1.8
24	2.0	1.6	1.8	b 1.8	2.4	a 2.6	5.3	2.5	2.5	1.9	2.2	1.6
25	2.0	1.6	1.8	b 1.8	2.4	a 2.8	5.5	2.5	2.5	1.8	2.4	9.4
26	2.0	1.8	2.2	b 1.7	2.4	a 2.8	5.5	2.8	2.5	1.8	2.4	3.7
27	2.0	1.6	* 2.4	b 1.6	2.6	a 3.0	5.5	2.8	2.2	1.8	2.4	3.3
28	2.0	1.6	2.6	b 1.5	2.0	a 3.0	5.3	2.8	2.1	1.9	2.6	4.8
29	2.4	1.6	2.8	b 1.5	-	a 3.0	5.3	2.9	* 2.1	1.9	2.4	7.0
30	2.4	* 1.6	2.4	b 1.5	-----	a 3.0	5.5	3.2	2.2	2.4	2.4	7.0
31	2.6	-----	2.0	b 1.5	-----	a 3.0	-----	* 3.2	-----	2.5	* 2.6	-----
Total	57.2	52.2	59.7	52.2	55.8	82.2	131.3	459.1	861	706	805	519.2
Mean	1.85	1.74	1.93	1.68	1.99	2.65	4.38	14.8	28.7	22.8	26.0	17.3
Ac-ft	113	104	118	104	111	163	260	911	1,710	1,400	1,600	1,030

Calendar year 1961 : Max 14 Min 1.0 Mean 2.17 Ac-ft 1,570
 Water year 1961-62 : Max 34 Min 1.0 Mean 10.5 Ac-ft 7,620

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

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 1962. 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.--23 years (1912-13, 1914-20, 1921-22, 1923-25, 1949-62), 5.12 cfs (3,710 acre-ft per year).

Extremes.--Maximum discharge during year, 16 cfs July 25 (gage height, 1.96 ft); no flow for most of year.

1949-62: 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 poor. 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 year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1								(*)		0	*0.3	0.1
2					(*)	(*)				0	0	.1
3							(*)			0	.1	0
4										0	0	0
5										0	.2	0
6										0	.1	0
7										0	0	0
8										0	0	.3
9										0	0	.2
10										0	0	0
11										0	.2	0
12	(*)									0	0	0
13										0	.1	*0
14										0	0	0
15										0	*0	0
16										0	.1	0
17										0	.5	0
18										0	.6	0
19										*0	.5	.1
20									(*)	0	.4	0
21										0	.4	0
22								(*)		0	1.0	.1
23										0	.2	0
24										1.7	0	0
25										4.3	0	0
26			(*)							.4	0	.6
27										.1	0	*.2
28										0	0	0
29									(*)	.1	0	0
30		(*)								0	0	0
31										0	*0	
Total	0	0	0	0	0	0	0	0	0	6.6	4.7	1.7
Mean	0	0	0	0	0	0	0	0	0	0.21	0.15	0.06
Ac-ft	0	0	0	0	0	0	0	0	0	13	9.3	3.4

Calendar year 1961: Max 1.0 Min 0 Mean 0.01 Ac-ft 10
 Water year 1961-62: Max 4.3 Min 0 Mean 0.04 Ac-ft 26

Peak discharge (base, 200 cfs).--No peak above base.

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

8-3431. Grants Canyon at Grants, N. Mex.

Note.--Records for 1962 water year have been withheld pending better definition of stage-discharge relationship. They will be published in a subsequent report.

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, approximately, of which about 1,130 sq mi does not contribute directly to surface runoff.

Records available.--June 1936 to September 1962. 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.--26 years, 6.77 cfs (4,900 acre-ft per year).

Extremes.--Maximum discharge during year, 15 cfs July 25, 26 (gage height, 1.63 ft); minimum, 4.0 cfs May 1936-62: 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 fair prior to Apr. 3, good thereafter. 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 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.6	* 5.4	4.9	5.1	4.9	5.1	4.9	* 4.3	4.0	4.9	* 4.6	4.3
2	4.6	5.4	4.9	5.1	* 4.9	* 5.1	4.9	4.3	4.0	4.9	4.6	4.3
3	4.9	5.4	4.9	4.9	4.9	5.1	* 4.6	4.6	4.0	4.9	4.9	4.3
4	4.9	5.1	4.9	4.9	5.1	5.1	4.3	4.6	4.0	4.9	4.6	4.3
5	4.9	5.1	5.1	4.6	4.9	5.1	4.9	4.6	4.0	4.6	4.6	4.3
6	5.1	5.1	5.1	4.4	4.9	4.9	4.9	4.6	4.3	4.9	4.6	4.6
7	5.1	5.1	5.4	4.9	4.9	5.1	4.9	4.3	4.3	5.7	4.6	4.6
8	5.1	5.1	5.4	4.9	4.9	5.1	5.3	4.6	4.3	5.3	4.6	4.6
9	5.1	5.1	5.4	4.9	4.9	5.1	4.9	4.6	4.3	4.9	4.6	4.6
10	5.1	5.1	5.7	4.4	5.1	5.4	4.9	4.3	4.3	4.9	4.6	4.3
11	5.4	5.1	5.4	4.2	4.9	4.9	4.9	4.3	4.3	4.9	4.9	4.3
12	* 5.4	5.1	5.4	4.4	4.6	4.9	4.9	4.3	4.3	4.9	4.9	4.3
13	4.9	5.1	5.1	4.4	4.6	5.1	4.9	4.3	4.6	4.9	4.9	* 4.3
14	4.9	5.1	5.4	4.6	4.6	5.1	5.3	4.0	4.6	4.9	4.9	4.9
15	4.9	5.1	5.4	4.6	4.4	4.9	5.3	4.3	4.6	4.9	* 4.9	4.9
16	4.9	5.1	5.4	4.6	4.4	4.9	5.3	4.3	4.6	4.9	4.9	4.9
17	4.9	5.1	5.4	4.6	4.6	4.9	4.9	4.3	4.6	4.9	4.9	4.9
18	4.9	5.1	5.1	5.1	4.6	4.9	4.6	4.3	4.6	4.9	4.9	4.9
19	5.1	5.1	5.1	5.1	4.6	4.9	4.3	4.3	4.6	* 4.9	4.9	4.9
20	5.1	4.9	4.9	5.4	4.6	4.9	4.3	4.3	* 4.6	4.9	4.9	4.9
21	5.1	4.9	4.9	5.4	4.6	4.9	4.3	4.3	4.6	4.9	4.9	4.9
22	5.1	4.9	5.1	4.9	4.6	4.9	4.3	* 4.3	4.3	4.9	4.9	4.9
23	5.1	4.9	4.9	4.9	4.6	4.9	4.3	4.3	4.3	4.9	4.9	4.9
24	4.9	4.9	4.9	5.7	4.6	4.9	4.3	4.0	4.3	4.9	4.6	4.9
25	4.9	4.9	4.9	5.7	4.6	4.9	4.6	4.0	4.6	6.5	4.6	4.9
26	5.1	4.9	* 4.9	5.1	4.6	4.9	4.6	4.0	4.6	11	4.6	4.6
27	5.1	4.9	4.9	5.4	4.6	4.9	4.9	4.0	4.6	11	4.6	5.3
28	5.1	4.9	4.9	5.7	4.9	4.9	4.6	4.0	4.6	7.0	4.6	5.3
29	5.1	4.9	4.9	5.7	-	4.9	4.3	4.0	* 4.6	4.9	4.6	4.9
30	5.1	* 4.9	5.1	5.1	-----	4.6	4.3	4.0	4.6	4.6	* 4.6	4.9
31	5.4	-----	5.1	5.1	-----	4.9	-----	* 4.0	-----	4.9	4.3	-----
Total	155.8	151.7	158.8	153.8	132.4	154.1	141.7	132.4	132.0	168.4	146.5	140.9
Mean	5.03	5.06	5.12	4.96	4.73	4.97	4.72	4.27	4.40	5.43	4.73	4.70
Ac-ft	309	301	315	305	263	306	281	263	262	334	291	279

Calendar year 1961: Max 30 Min 3.7 Mean 4.92 Ac-ft 3,560
 Water year 1961-62: Max 11 Min 4.0 Mean 4.85 Ac-ft 3,510

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

* Discharge measurement made on this day.

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, approximately, of which about 1,130 sq mi does not contribute directly to surface runoff.

Records available.--April 1943 to September 1962. 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.--19 years, 11.6 cfs (8,400 acre-ft per year).

Extremes.--Maximum discharge during year, 995 cfs July 30 (gage height, 3.42 ft); no flow for many days.

1943-62: 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 ice effect or 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 groundwater withdrawals for irrigation of about 7,800 acres above station.

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0.3		0	b6	b1.5	0.5			13	a30	0
2	0	*0		0	b5	b3.0	0			*0	a10	0
3	*0	0		0	4.8	b1.0	.4			0	a5	0
4	0	0		0	5.4	b.5	1.3		(*)	0	a2	0
5	0	0		0	4.8	b2.0	.1			0	a1	0
6	0	0		0	4.8	4.8	0			0	a0	0
7	0	0		0	6.1	4.8	0			2.5	*0	0
8	0	0		*1.4	6.1	4.8	0			0	0	0
9	0	0		3.8	6.1	4.0	0			0	0	0
10	0	0		a1.0	4.8	b2.5	0			0	0	0
11	0	0		a0	4.3	1.5	*0			0	0	0
12	0	0		a0	4.3	2.0	0			0	0	0
13	0	0		a0	4.3	a2	0			0	0	*0
14	0	0		a0	4.8	b3	0	(*)		0	0	0
15	0	0		a0	*3.8	*7.7	0			0	0	0
16	*0	0		a0	4.3	8.8	0			*0	0	0
17	0	0		a0	3.8	8.0	0			0	0	0
18	0	0	(*)	b2	3.8	6.2	0		(*)	0	0	0
19	0	0		b3	*3.8	6.2	0			0	0	0
20	0	0		b6	4.3	5.7	0			0	0	0
21	0	0		b10	4.8	6.2	0			0	0	0
22	.2	0		b7	4.3	6.2	0			0	11	0
23	0	0		b8	4.3	6.2	0			0	13	0
24	0	0		b9	3.8	5.7	0			0	.8	0
25	0	0		b10	3.8	4.8	0			3.4	0	0
26	0	0		b8	3.0	4.8	0			30	0	0
27	0	*0		b7	2.6	.8	0			21	*0	200
28	0	0		b6	b2.0	0	0			2.0	0	*61
29	0	0		*b5	-	*0	0			0	0	39
30	.1	0		b6	-----	0	0			*266	0	10
31	1.6	-----		b6	-----	1.9	-----			100	0	-----
Total	1.9	0.3	0	99.2	124.0	116.6	2.3	0	0	437.9	72.8	310
Mean	0.06	0.01	0	3.20	4.43	3.76	0.08	0	0	14.1	2.35	10.3
Ac-ft	3.8	0.6	0	197	246	231	4.6	0	0	869	144	615

Calendar year 1961: Max 210 Min 0 Mean 2.35 Ac-ft 1,700
 Water year 1961-62: Max 266 Min 0 Mean 3.19 Ac-ft 2,310

Peak discharge (base, 800 cfs).--July 30 (0420) 995 cfs (3.42 ft); Sept. 27 (0615) 869 cfs (3.31 ft).

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

a No gage-height record.

b Stage-discharge relation affected by ice.

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, 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 1962. 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.--28 years (1934-62), 62.9 cfs (45,540 acre-ft per year).

Extremes.--Maximum discharge during year, 1,550 cfs Sept. 29 (gage height, 2.50 ft); no flow for many days.

1934-62: 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 18 ft (conditions prior to destruction of railroad bridge) and a discharge of 37,700 cfs, from reports of State engineer. The flood of Aug. 12, 1929, reached a stage of about 16 ft (by weir formula) and a discharge of 31,300 cfs, from reports of State engineer.

Remarks.--Records fair except below 5 cfs and those for periods of no gage-height record, which are poor. 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 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	180	0.8	0.3	5.2	a 0.5	a 6	a 28		0	90	0
2	0	*161	.8	.2	5.5	a 1	a 4	*26		0	47	0
3	0	113	.8	0	5.5	a 1	a 3	22		0	21	0
4	0	27	.8	0	21	a .5	a 2	22		0	4.6	0
5	0	18	.6	0	*188	a .5	a 4	25		49	a 1	0
6	.1	*12	.5	0	166	a 2	a 5	41		39	a 0	0
7	0	8.6	.6	2.1	145	a 3	a 6	46		0	0	.7
8	0	6.1	.9	*1.6	120	a 3	a 6	60		0	0	0
9	0	4.3	.9	.3	*125	a 3	a 6	a 50		0	0	0
10	0	2.5	.8	0	196	a 2	a 5	a 45		0	0	0
11	0	1.8	.8	0	286	a 1	a 4	a 35		0	0	0
12	0	1.0	.2	0	*172	a 1	5.2	a 30		0	0	0
13	0	.8	.1	0	a 90	a 1	5.8	a 25		0	0	0
14	0	1.0	0	0	a 100	a 1	5.5	*21		0	0	0
15	1.2	2.0	.7	0	*87	*a 2	5.2	24		0	0	0
16	*.9	1.0	1.5	0	38	a 4	*6.9	21		0	0	.6
17	.4	1.0	.8	0	25	a 7	21	a 12		0	0	1.9
18	.3	.8	*.5	0	21	a 10	48	a 6		0	0	0
19	.3	.9	.1	0	*13	a 15	46	a 3		0	0	0
20	.3	.6	0	0	10	a 12	65	a 1		0	0	0
21	.3	1.0	0	1.9	7.7	a 10	120	*a .2		0	0	0
22	.2	.6	0	6.9	6.5	a 8	110	a 0		0	0	0
23	.2	.6	0	7.3	4.3	a 6	*96	a 0		0	0	0
24	.2	.6	0	8.6	3.1	a 5	a 80	a 0		16	3.4	21
25	.2	.9	0	8.6	2.8	a 4	a 50	a 0		37	.4	13
26	.3	.8	0	9.7	2.8	a 3	a 60	0		66	0	36
27	.3	*.8	0	7.8	1.6	a 2	a 50	0		115	0	*210
28	.3	.8	1.3	6.9	.8	a .5	a 45	0		68	0	*590
29	.5	.8	.4	*5.6	-	*a 2	a 35	0		8.7	0	487
30	.38	.8	.2	5.5	-	a 2	a 30	0		*181	0	100
31	.22	-	.4	4.3	-	a 8	-	0		121	0	-
Total	12.0	551.1	14.5	77.6	1848.8	119.2	935.6	543.2	0	700.7	167.4	1460.2
Mean	0.39	18.4	0.47	2.50	66.0	3.85	31.2	17.5	0	22.6	5.40	48.7
Ac-ft	24	1090	29	154	3670	236	1860	1080	0	1390	332	2900

Calendar year 1961: Max 1,680 Min 0 Mean 31.0 Ac-ft 22,420
 Water year 1961-62: Max 590 Min 0 Mean 17.6 Ac-ft 12,760

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., on bridge on former U.S. Highway 85 and $\frac{1}{4}$ mile upstream from Interstate Highway 25, 1.2 miles southwest of Bernardo, 3 miles upstream from mouth, and 18 miles south of Belen.

Drainage area.--7,350 sq mi, approximately, of which at least 1,130 sq mi does not contribute directly to surface runoff.

Records available.--November 1939 to September 1962. 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.--22 years (1940-62), 53.4 cfs (38,660 acre-ft per year).

Extremes.--Maximum discharge during year, 900 cfs Sept. 29 (gage height, 6.50 ft); no flow for extended periods.

1939-62: 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).

Rating tables (gage-height, in feet, and discharge,
in cubic feet per second)
(Shifting-control method used July 24-31, Sept. 27-28)

Oct. 1 to July 5

July 6 to Sept. 30

0.7	0	1.2	6.0	2.4	80	0.7	0	1.2	6.0	2.4	68	4.0	245
.8	.4	1.4	11	3.0	155	.8	.4	1.4	11	3.0	126	5.0	430
.9	1.2	1.8	31	4.0	320	.9	1.2	1.8	29	3.5	177		

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0			0		0	15		0	82	0
2		204			0		0	16		0	68	0
3		130			0		0	16		0	32	0
4		68			0		0	10		0	16	0
5		31			13		0	9		0	5.2	0
6		18			145		0	8		58	2.6	0
7		10			130		0	17		19	1.1	0
8		7.6			103		0	24		3.0	.4	0
9		5.2			86		0	32		27	0	0
10		3.4			114		0	36		1.8	0	0
11		2.3			287		0	31		.3	0	0
12		1.1			160		0	26		0	0	0
13		.4			98		0	20		0	0	0
14		.6			68		0	14		0	0	0
15		1.0			100		0	15		0	0	0
16		.3			51		0	16		0	0	0
17		0			30		0	13		0	0	0
18		0			22		2.1	10		0	0	0
19		0			19		36	8		0	0	0
20		0			9.2		47	5		0	0	0
21		0			7.4		70	2		69	0	0
22		0			4.8		99	1		6.0	0	0
23		0			3.9		109	0		3.0	0	0
24		0			2.7		96	0		87	0	4.9
25		0			1.5		63	0		14	0	22
26		0			.6		44	0		39	0	8.9
27		0			0		48	0		28	0	77
28		0			0		49	0		81	0	430
29		0			-		36	0		28	0	426
30		0			-		22	0		8.9	0	285
31		- - - -			- - - -		- - - -	0		178	0	- - - -
Total	0	482.9	0	0	1,456.1	0	721.1	344	0	651.0	207.3	1,253.8
Mean	0	16.1	0	0	52.0	0	24.0	11.1	0	21.0	6.69	41.8
Ac-ft	0	95.8	0	0	2,890	0	1,430	682	0	1,290	411	2,490

Calendar year 1961: Max 1,190 Min 0 Mean 23.7 Ac-ft 17,170
Water year 1961-62: Max 430 Min 0 Mean 14.0 Ac-ft 10,150

Peak discharge (base, 3,000 cfs).--No peak above base.

a No gage-height record.

RIO GRANDE BASIN

109

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 1962.

Gage.--Water-stage recorder. Datum of gage is 4,710.68 ft above mean sea level, datum of 1929.

Average discharge.--15 years, 12.7 cfs (9,190 acre-ft per year).

Extremes.--Maximum discharge during year, 6,820 cfs Aug. 21 (gage height, 11.98 ft); no flow for most of time.

1947-62: Maximum discharge, 16,600 cfs Sept. 25, 1954 (gage height, 12.80 ft), from rating curve extended above 2,800 cfs on basis of slope-area measurements at gage heights 11.25 and 11.9 ft; no flow for most of time.

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 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1									0	0	*86	*210
2									0	0	a7	*50
3									0	0	*a3	a0
4									a1	0	a1	a0
5									*0	0	a0	a0
6	(*)		(*)						0	7.0	a0	a0
7									0	180	a0	*40
8									0	a30	a0	5.0
9		(*)					(*)		0	*a1	0	0
10									0	0	*0	0
11									0	0	0	0
12									0	100	0	0
13									0	a10	0	0
14						(*)			0	a0	0	*0
15									0	a0	0	a10
16				(*)					0	*0	0	a5
17									0	0	0	*17
18									0	0	0	0
19									0	0	0	0
20									0	0	0	0
21									0	0	190	0
22									0	0	*73	0
23									0	a1	a10	0
24									0	*320	a5	*820
25									0	a25	a1	*920
26									0	*172	a0	a40
27									0	*4.0	a0	*460
28									0	14	a0	a40
29									0	60	a0	a5
30									0	a20	a0	a0
31									0	a50	a0	
Total	0	0	0	0	0	0	0	0	1	994.0	376	2,577.0
Mean	0	0	0	0	0	0	0	0	0.03	32.1	12.1	85.9
Ac-ft	0	0	0	0	0	0	0	0	2	1,970	746	5,110

Calendar year 1961: Max 1,240 Min 0 Mean 12.6 Ac-ft 9,100
 Water year 1961-62: Max 920 Min 0 Mean 10.8 Ac-ft 7,830

Peak discharge (base, 3,000 cfs).--Aug. 21 (2020) 6,820 cfs (11.98 ft); Sept. 24 (1430) 3,680 cfs (11.58 ft).

* 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 1962.

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.--1936-62: 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. Alamillo Acequia and 3 other smaller ditches divert water from canal above station for irrigation of about 400 acres. Alamillo Acequia diverted 4,070 acre-ft in 1962, from records obtained by Bureau of Reclamation.

Monthly discharge, in cubic feet per second, water year October 1961 to September 1962

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October	190	25	130	7,960
November	0	0	0	0
December	0	0	0	0
Calendar year 1961	218	0	93.9	67,950
January	0	0	0	0
February	6	0	.61	33.7
March	192	86	137	8,450
April	213	173	199	11,830
May	208	156	192	11,780
June	212	162	192	11,450
July	229	70	147	9,060
August	140	3	60.5	3,720
September	73	0	30.9	1,840
Water year 1961-62	229	0	91.3	66,120

Note.--No gage-height record Apr. 19-24, July 19-21, Aug. 5-7, Sept. 9, 10, 25.

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 1962

Gage.--Water-stage recorders. There are two recorders here, one on the conveyance channel designed to carry 2,000 cfs, 0.8 mile below heading established February 1959 at elevation of 4,652.5 ft above mean sea level (from U.S.B.R. specifications). The other recorder is 0.7 mile downstream from heading on floodway or main channel at elevation of 4,658.10 ft above mean sea level, datum of 1929. Prior to Mar. 19, 1953 floodway gage at site 0.5 mile upstream, which from Apr. 16, 1936, to July 24, 1941, and Nov. 29 to Dec. 14, 1946, at datum 4.46 ft higher and July 25, 1941, to Nov. 28, 1946, and Dec. 15, 1946, to Mar. 18, 1953, was at datum 2.06 ft higher than present datum. Prior to about October 1958, all flow in floodway.

Average discharge.--26 years, 1,121 cfs (811,600 acre-ft per year).

Extremes.--Maximum discharge during year, 7,920 cfs Apr. 24; minimum, 0.2 cfs Sept. 15.

1936-62: 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 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	108	363	1,680	790	774	935	1,330	3,740	1,060	33	67	115
2	106	584	1,670	811	780	820	1,420	3,680	802	33	26	42
3	132	698	1,630	803	768	684	1,010	3,540	550	34	5.6	5.6
4	119	762	1,680	788	786	705	1,070	3,400	595	34	2.4	4.6
5	111	690	1,660	751	786	788	1,590	2,990	520	35	2.3	3.7
6	91	1,090	1,640	745	960	690	1,910	3,330	412	57	1.1	2.3
7	83	1,800	1,620	742	1,010	645	1,640	3,090	413	339	1.1	6.6
8	59	1,860	1,570	739	990	680	2,040	3,420	584	43	1.0	4.8
9	35	1,880	1,550	745	951	672	2,100	3,800	704	116	.9	1.6
10	52	1,780	1,480	619	1,040	625	2,190	3,880	792	221	.9	1.5
11	72	1,720	1,450	616	1,230	902	2,040	3,940	908	189	.8	.5
12	63	1,710	1,440	442	1,740	1,060	1,810	3,910	778	193	.8	.5
13	68	1,740	1,370	400	1,560	740	1,700	4,240	518	102	.7	1.6
14	82	1,800	1,230	445	1,550	663	1,820	4,780	446	29	.7	2.0
15	98	1,840	1,100	523	1,900	524	2,060	4,450	424	6.4	.6	2.8
16	111	1,780	1,290	604	1,980	473	2,650	3,990	448	16	.8	.5
17	141	1,800	1,420	676	1,830	475	2,950	4,140	461	8.0	1.0	.4
18	108	1,770	1,410	670	1,760	490	3,440	4,520	558	4.4	2.2	.4
19	93	1,760	1,100	676	1,760	586	4,140	4,220	583	3.2	1.9	.4
20	98	1,750	961	793	1,620	670	4,980	3,820	517	3.0	1.9	.4
21	100	1,720	877	900	1,470	610	5,220	3,590	434	21	.99	.4
22	91	1,750	850	951	1,420	707	5,420	2,560	267	30	.86	.4
23	63	1,780	889	1,110	1,360	770	5,970	1,730	190	15	2.8	1.5
24	106	1,700	892	1,040	1,190	835	6,150	1,610	149	218	2.2	412
25	84	1,660	872	979	1,210	776	5,260	1,550	126	39	.6	986
26	26	1,630	842	931	1,170	792	5,110	1,490	85	150	.6	175
27	10	1,640	829	967	1,180	634	4,540	1,560	33	55	.6	620
28	21	1,640	817	840	1,200	471	4,360	1,680	33	49	.5	528
29	32	1,660	829	807	-	415	4,260	1,240	34	63	.5	664
30	119	1,690	814	786	-----	832	4,040	1,100	33	14	.5	605
31	156	-----	787	780	-----	1,510	-----	1,020	-----	138	.6	-----
Total	2,638	46,047	38,249	23,469	35,975	22,179	94,220	96,010	13,457	2,291.0	313.6	4,189.5
Mean	85.1	1,535	1,234	757	1,285	715	3,141	3,097	449	73.9	10.1	140
Ac-ft	5,230	91,330	75,870	46,550	71,360	43,990	186,900	190,400	26,690	4,540	622	8,310
(†)	4,510	89,020	75,500	46,440	69,690	42,480	54,990	49,190	23,710	3,210	326	6,930

Calendar year 1961: Max 3,880 Min 1.1 Mean 748 Ac-ft 541,200
 Water year 1961-62: Max 6,150 Min 0.4 Mean 1,038 Ac-ft 751,800

† 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 ½ miles upstream from Bosque del Apache Grant and ¼ miles south of San Antonio.

Records available.--April 1937 to July 1938 (published as "at end near San Antonio"), March 1948 to September 1962.

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 ½ miles downstream at different datums. March 1948 to November 1951 at site 30 ft upstream at datum 7.29 ft higher.

Extremes.--1937-38, 1948-62: Maximum daily discharge, 50 cfs Apr. 23, 1958, and Aug. 18, 1961; no flow at times.

Remarks.--Records good except those for periods of indefinite stage-discharge relation or no gage-height record, which are poor. Discharge measurements generally made 3 to 4 times a month during irrigation season. Diversions made at San Acacia into Socorro main canal north are the main source of water but may be supplemented by diversions from the conveyance channel at 3 points and from San Antonio Riverside drain, 2 miles upstream. Some diversions occur 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 1961 to September 1962

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October	37	11	26.1	1,600
November	15	0	.5	30
December	0	0	0	0
Calendar year 1961	50	0	14.8	10,750
January	0	0	0	0
February	0	0	0	0
March	40	0	18.9	1,160
April	41	3.4	23.7	1,410
May	46	12	27.5	1,690
June	35	3.0	20.0	1,190
July	37	1.9	23.5	1,440
August	40	0	9.48	583
September	35	.2	8.59	511
Water year 1961-62	46	0	13.3	9,610

Note.--No gage-height record July 8, 9, July 24 to Aug. 6, Sept. 27-30.
Stage-discharge relation indefinite June 17-26.

8-3565. San Antonio Riverside drain near San Antonio, N. Mex.

Location.--Lat 33°53'00", long 106°51'05", in SW¼ sec.9, T.5 S., R.1 E., on left bank 1 mile east of U.S. Highway 85, and 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 1962. 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.--1948-62: 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. Reduction in flow occurred after conveyance channel was completed in about 1957.

Monthly discharge, in cubic feet per second, water year October 1961 to September 1962

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October	13	3.7	8.88	546
November	15	9.2	10.8	641
December	13	7.3	10.5	648
Calendar year 1961	76	0	11.4	8,280
January	8.1	5.5	6.58	404
February	12	6.5	9.14	508
March	19	7.7	11.4	704
April	39	15	29.9	1,780
May	39	3.1	25.8	1,590
June	43	11	21.6	1,290
July	48	3	17.0	1,040
August	43	2.4	8.93	549
September	43	.8	6.36	378
Water year 1961-62	48	.8	13.9	10,080

8-3570. Elmendorf interior drain near San Antonio, N. Mex.

Location.--Lat 33°51'50", long 106°51'25", in NE¹ 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 1962.

Gage.--Water-stage recorder and metal 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.--1948-62: Maximum daily discharge, 51 cfs June 3, 1956, June 18, 1961, and July 24, 1962; no flow at times in February and March 1961.

Remarks.--Records fair. Discharge measurements generally made 3 to 4 times a month. Flow past station represents 1 of 3 channels of inflow to wildlife refuge.

Monthly discharge, in cubic feet per second, water year October 1961 to September 1962

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October	34	12	22.3	1,370
November	23	.4	1.31	78
December	.4	.2	.30	18
Calendar year 1961	51	0	14.8	10,710
January	.3	.1	.18	11
February	4	.2	.34	19
March	34	.2	20.3	1,250
April	46	14	30.9	1,840
May	49	20	34.8	2,140
June	42	14	29.8	1,770
July	51	7.4	32.7	2,010
August	24	2.4	7.20	443
September	27	2.7	11.8	703
Water year 1961-62	51	.1	16.1	11,650

8-3575. San Antonio Riverside drain near San Marcial, N. Mex.

Location.--Lat 33°44'45", long 106°55'15", in Bosque del Apache Grant (wildlife refuge), on left bank 1.0 mile upstream from outlet to Rio Grande conveyance channel, 5 miles northeast of San Marcial, and 12 miles south of San Antonio.

Records available.--March 1948 to September 1962.

Gage.--Water-stage recorder. Datum of gage is 4,489.12 ft above mean sea level, datum of 1929. Mar. 19, 1948, to July 28, 1960, water-stage recorder at present site and datum. July 28, 1960, to May 14, 1962, water-stage recorder 0.4 mile downstream and at datum 3.42 ft lower.

Extremes.--1948-62: Maximum daily discharge, 226 cfs May 22, 1957; no flow at times.

Remarks.--Records good except for periods of no gage-height record, which are poor. Discharge measurements generally made 3 to 4 times a month. Flow represents surface outflow from wildlife refuge. Diversion for irrigation of a few hundred acres above station.

Monthly discharge, in cubic feet per second, water year October 1961 to September 1962

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October	39	25	31.8	1,960
November	30	5	15.8	942
December	17	3	14.5	893
Calendar year 1961	76	.3	29.1	21,050
January	16	.7	8.40	516
February	15	11	12.3	682
March	55	12	34.4	2,120
April	96	36	71.4	4,250
May	107	68	85.9	5,280
June	74	38	59.1	3,520
July	100	31	72.5	4,450
August	107	.7	27.9	1,710
September	24	1.2	6.82	406
Water year 1961-62	107	.7	36.9	26,730

Note.--No gage-height record Nov. 4-11, Dec. 30 to Jan. 3, Jan. 10-15, Mar. 19-21.

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 1962.

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.--66 years (1896-1962), 1,353 cfs (979,500 acre-ft per year).

Extremes.--Maximum discharge during year, 5,350 cfs Apr. 25; minimum, 7.1 cfs Sept. 21.
1895-1962: 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 about 15,000 acre-ft diverted from conveyance channel, as based on weekly measurements, data furnished by Bureau of Reclamation).

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	208	290	1,620	824	813	1,030	1,300	4,280	1,040	186	264	13
2	180	456	1,620	820	810	900	1,400	3,940	938	208	332	13
3	190	693	1,600	824	813	876	1,050	3,810	722	206	220	14
4	200	728	1,580	806	827	810	938	3,610	750	200	190	23
5	182	728	1,610	782	824	866	1,360	3,300	690	194	166	22
6	180	693	1,610	774	918	743	1,540	3,210	590	188	139	17
7	160	1,440	1,590	746	974	726	1,150	3,600	530	250	117	15
8	153	1,650	1,580	774	988	722	1,280	3,310	606	223	85	14
9	139	1,690	1,550	771	950	768	1,410	3,620	774	150	55	13
10	123	1,680	1,490	700	1,010	776	1,650	3,750	822	260	41	12
11	132	1,610	1,430	652	1,120	799	1,780	3,800	1,000	430	37	12
12	139	1,570	1,470	530	1,490	1,170	1,790	3,840	934	450	35	12
13	137	1,640	1,430	470	1,500	932	1,820	3,840	714	454	33	11
14	139	1,650	1,280	450	1,470	820	1,840	4,340	598	232	30	11
15	150	1,660	1,170	540	1,570	698	1,730	4,280	570	225	25	10
16	158	1,670	1,180	610	1,770	570	1,880	3,920	558	220	19	9.0
17	168	1,700	1,390	684	1,750	538	2,400	3,730	598	190	18	9.0
18	192	1,700	1,470	712	1,710	578	2,740	4,120	654	147	21	9.0
19	190	1,710	1,250	704	1,680	622	3,060	3,990	682	123	23	9.0
20	162	1,700	1,020	746	1,660	658	3,390	3,580	666	106	23	8.0
21	175	1,700	953	894	1,510	678	3,960	3,440	630	83	23	8.0
22	185	1,680	900	914	1,390	710	4,350	3,160	490	115	22	8.0
23	155	1,690	928	1,030	1,390	702	4,710	2,140	450	126	16	9.0
24	146	1,680	918	1,050	1,260	850	5,070	1,590	430	188	15	13
25	180	1,640	928	1,010	1,200	842	5,220	1,540	342	263	14	637
26	180	1,610	894	942	1,190	814	4,760	1,520	350	179	14	355
27	119	1,600	883	995	1,190	790	4,840	1,440	206	239	14	349
28	110	1,610	872	925	1,170	570	4,550	1,560	206	153	14	364
29	110	1,610	862	848	-	470	4,330	1,630	194	141	14	684
30	110	1,630	852	830	-----	542	4,340	1,200	192	155	14	544
31	158	-----	834	820	-----	1,310	-----	987	-----	178	13	-----
Total	4,910	43,108	38,764	24,177	34,947	23,880	81,638	96,077	17,926	6,462	2,046	3,227.0
Mean	158	1,437	1,250	780	1,248	770	2,721	3,099	598	208	66.0	108
Ac-ft	9,740	85,500	76,890	47,950	69,320	47,370	161,900	190,600	35,560	12,820	4,060	6,400
(†)	9,740	85,500	76,890	47,950	69,320	47,370	161,900	190,600	35,560	12,820	4,060	6,400

Calendar year 1961: Max 3,950 Min 18 Mean 752 Ac-ft 544,500
 Water year 1961-62: Max 5,220 Min 8.0 Mean 1,033 Ac-ft 748,100

† 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 1/4 sec. 31, T.8 S., R.7 W., on left bank at Alamosa damsite and below 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 1962. 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.--14 years (1931-41, 1958-62), 8.18 cfs (5,920 acre-ft per year).

Extremes.--Maximum discharge during year, 1,780 cfs July 25 (gage height, 5.90 ft), from rating curve extended as explained below; minimum, 5.8 cfs Sept. 2, 3.

1931-42, 1956-62: 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 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.6	6.4	7.5	7.0	6.6	6.2	6.2	6.4	6.6	6.6	13	6.0
2	6.4	6.4	7.5	7.0	6.6	6.2	6.2	6.4	6.6	6.2	9.2	5.8
3	6.4	6.6	7.5	7.0	6.6	6.2	6.2	6.4	6.6	7.5	9.9	5.8
4	6.2	6.8	7.3	7.0	6.6	6.2	6.2	6.4	6.6	7.0	7.0	6.0
5	6.0	6.8	7.5	7.0	6.6	6.2	6.2	6.4	6.6	6.8	7.0	6.0
6	6.0	6.8	7.5	7.0	6.6	6.2	6.2	6.4	6.6	9.0	7.0	6.0
7	* 6.0	6.8	7.5	7.0	6.6	6.2	6.4	6.4	6.6	7.0	6.8	6.2
8	6.2	7.3	7.5	7.0	6.6	6.2	6.2	6.2	6.6	7.0	6.8	6.2
9	6.2	7.3	7.3	7.0	6.6	6.4	6.4	6.2	6.6	7.0	6.8	6.2
10	6.2	7.3	7.3	6.8	6.6	6.4	6.4	6.2	6.6	6.8	6.8	6.2
11	6.4	7.0	7.0	6.8	6.6	6.2	* 6.4	6.2	6.6	7.0	6.8	6.4
12	6.4	7.0	7.0	* 7.0	6.6	6.4	6.2	* 6.2	6.6	7.5	6.6	6.2
13	6.4	7.0	7.3	7.0	6.6	6.4	6.4	6.2	6.8	7.3	6.8	6.2
14	6.2	7.0	7.5	7.0	6.6	6.4	6.4	6.2	6.8	7.0	6.8	6.8
15	6.0	7.0	7.5	7.0	6.6	* 6.4	6.6	6.2	6.6	7.0	6.8	6.0
16	6.2	7.0	7.3	7.0	6.4	6.4	6.6	6.2	6.6	7.0	6.8	6.3
17	6.0	7.0	7.0	7.0	6.4	6.2	6.6	6.2	6.6	7.0	6.6	5.6
18	6.2	6.8	7.0	7.0	6.4	6.2	6.6	6.2	6.6	7.0	6.6	3.1
19	6.2	6.6	7.0	6.8	6.4	6.2	6.8	6.2	6.6	4.8	6.6	1.0
20	6.2	6.4	7.5	6.8	6.4	6.2	7.0	6.2	6.6	7.5	6.4	7.8
21	6.2	6.8	7.5	6.2	6.4	6.0	6.8	6.4	6.6	5.3	7.4	7.5
22	6.2	* 7.0	7.3	6.0	6.4	6.2	6.8	6.4	6.6	7.0	6.4	7.3
23	6.2	7.5	7.0	6.2	6.4	6.2	6.8	6.4	6.6	8.0	6.0	7.3
24	6.2	7.8	7.5	6.2	6.4	6.2	* 7.0	6.4	6.6	7.7	6.0	2.1
25	6.2	7.8	7.5	6.4	6.2	6.2	7.0	6.4	* 6.6	5.3	6.4	1.2
26	6.4	7.5	7.5	6.2	6.2	6.2	7.0	6.4	6.6	4.7	6.2	8.0
27	6.4	7.8	7.8	6.2	6.4	6.2	6.8	6.4	6.4	* 7.3	6.0	7.8
28	6.2	7.8	7.8	6.2	6.4	6.2	6.8	6.6	6.8	7.5	6.0	8.0
29	6.2	8.0	7.5	* 6.4	-	6.2	6.6	6.4	6.6	8.0	6.0	7.5
30	6.2	8.0	7.5	6.6	-----	6.2	6.6	6.4	6.6	2.5	6.0	7.3
31	6.2	-----	7.3	6.6	-----	6.2	-----	6.4	-----	8.0	* 6.2	-----
Total	193.0	213.3	228.7	208.4	181.8	193.4	196.4	196.0	211.0	414.7	215.7	296.8
Mean	6.23	7.11	7.38	6.72	6.49	6.24	6.55	6.32	7.03	13.4	6.96	9.89
Ac-ft	383	423	454	413	361	384	390	389	419	823	428	589

Calendar year 1961: Max 55 Min 6.0 Mean 7.68 Ac-ft 5,560

Water year 1961-62: Max 56 Min 5.8 Mean 7.53 Ac-ft 5,460

Peak discharge (base, 1,000 cfs)

* Discharge measurement made on this day.

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
7-21	1150	5.60	1,530	7-26	1745	5.48	1,430
7-25	1600	5.90	1,780	9-17	1530	5.53	1,470

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 $1\frac{1}{2}$ 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 1962.

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.--46 years, 1,056 cfs (764,500 acre-ft per year).

Extremes.--Maximum daily discharge during year, 2,050 cfs July 3-4; minimum, 2.1 cfs for many days.
1916-62: 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.155). Diversion for irrigation of about 800,000 acres above station.

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a6	2.8	2.5	2.8	1.150	1.840	1.810	2.010	2.020	2.030	909	950
2	a6	2.1	2.5	3.5	1.190	1.830	1.820	2.020	2.010	2.030	896	948
3	2.6	2.1	2.5	6.1	1.200	1.830	2.000	2.020	1.990	2.050	904	959
4	a6	2.8	3.1	6.1	1.200	1.830	2.000	2.020	1.990	2.050	902	959
5	a6	2.1	4.7	8.8	1.200	1.830	1.990	2.010	1.970	2.040	908	903
6	a5	2.1	2.5	11	1.200	1.850	1.970	1.840	1.960	2.030	912	14
7	a5	2.5	2.5	10	1.200	1.820	1.980	1.840	1.960	2.040	918	11
8	a5	3.1	2.8	10	1.200	1.820	1.780	2.010	1.960	2.020	930	11
9	a5	3.5	3.1	7.7	1.200	1.820	1.780	2.010	1.960	2.000	936	10
10	5.2	2.1	3.1	7.1	1.200	1.820	1.990	2.000	1.960	1.990	931	9.4
11	5.2	2.1	2.8	8.8	1.200	1.820	1.980	1.960	1.960	1.680	944	9.4
12	5.2	2.5	2.8	10	1.180	1.810	1.990	1.750	1.970	1.270	936	7.1
13	4.7	3.5	2.5	12	1.200	1.810	1.970	1.740	1.980	1.250	927	9.4
14	5.2	5.6	2.5	9.4	1.200	1.790	1.960	1.770	1.980	1.260	892	10
15	5.2	3.1	2.8	8.2	1.200	1.790	1.750	1.770	1.990	920	924	10
16	5.2	2.5	3.1	8.8	1.200	1.790	1.760	1.960	1.990	1.240	926	10
17	5.2	2.5	3.1	a9	1.220	1.790	1.980	1.960	2.000	1.260	926	10
18	5.2	2.5	2.5	a9	1.200	1.790	1.970	1.960	2.010	1.260	933	10
19	6.1	2.1	2.5	a9	1.200	1.790	1.960	1.960	2.010	1.270	930	10
20	4.3	2.1	3.5	a9	1.210	1.800	1.990	1.800	2.000	1.250	934	g10
21	5.2	2.1	3.9	a9	1.220	1.800	1.990	1.800	2.000	1.270	948	g10
22	4.7	2.1	3.5	a9	1.220	1.790	1.780	2.000	2.000	946	934	g10
23	4.7	2.1	2.5	a9	1.210	1.810	1.810	2.000	2.000	1.280	928	g10
24	4.7	2.1	2.5	a9	1.210	1.820	2.030	2.000	2.010	1.280	926	g10
25	4.7	2.1	2.5	a9	1.220	1.810	2.040	2.010	2.010	1.300	930	g10
26	5.2	2.5	3.1	2.2	1.230	1.810	2.040	2.000	2.030	1.290	928	g10
27	5.6	2.5	3.1	a11	1.200	1.830	2.030	1.830	2.030	1.310	924	g10
28	6.6	2.5	3.1	a11	1.210	1.820	2.040	1.820	2.020	1.320	1.230	g10
29	6.6	2.5	3.1	a11	-	1.820	1.840	2.020	2.030	998	924	g10
30	5.2	2.8	2.8	18	-----	1.830	1.800	2.030	2.030	1.290	932	g10
31	3.9	-----	3.1	a11	-----	1.840	-----	2.040	-----	1.290	933	-----
Total	183.8	77.0	90.6	295.3	336.70	562.50	578.30	599.60	598.30	4651.4	28955	4970.3
Mean	5.93	2.57	2.92	9.53	1.202	1.815	1.928	1.934	1.994	1.500	934	16.6
Ac-ft	36.5	15.3	18.0	58.6	66.780	111.600	114.700	118.900	118.700	92.260	57.430	9.860

Calendar year 1961: Max 1,880 Min 2.1 Mean 797 Ac-ft 577,200
Water year 1961-62: Max 2,050 Min 2.1 Mean 955 Ac-ft 691,500

a No gage-height record.

g Computed from once-daily staff gage readings.

RIO GRANDE BASIN

117

8-3625. Rio Grande below Caballo Dam, N. Mex.

Location.--Lat 32°53'05", long 107°17'30", in NE¼SW¼ sec.30, T.16 S., R.4 W., on left bank 600 ft upstream from Bojarquez Bridge, 4,200 ft downstream from Caballo Dam, 1¼ miles downstream from Apache Canyon, 1 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 1962.

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.--24 years, 942 cfs (682,000 acre-ft per year).

Extremes.--Maximum daily discharge during year, 2,910 cfs Aug. 10; minimum daily, 1.0 cfs Dec. 7-10, Jan. 15, 16, Feb. 1-3.

1938-62: 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 1961 to September 1962												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.3	1.3	1.1	1.1	1.0	1.3	2,390	752	1,590	2,360	996	2,450
2	1.3	1.3	1.1	1.1	1.0	1.3	2,220	848	1,640	2,280	1,000	2,450
3	1.3	1.3	1.1	1.1	1.0	1.3	2,050	844	1,660	1,990	1,160	2,450
4	1.3	1.3	1.1	1.2	1.1	1.3	1,940	883	1,610	1,890	1,370	2,030
5	1.3	1.3	1.1	1.2	1.1	266	1,910	943	1,530	1,850	1,380	1,090
6	1.3	1.3	1.1	1.1	1.1	1,610	1,700	936	1,500	1,700	1,470	788
7	1.3	1.3	1.0	1.1	1.2	1,810	1,500	913	1,490	1,580	2,010	899
8	1.3	1.3	1.0	1.1	1.2	1,900	1,400	1,010	1,690	1,550	2,530	1,210
9	1.3	1.4	1.0	1.1	1.2	1,910	1,230	1,130	1,870	1,450	2,740	1,030
10	1.4	1.4	1.0	1.1	1.2	1,920	1,150	1,150	1,860	1,540	2,910	566
11	1.4	1.4	1.1	1.1	1.2	1,910	1,120	1,190	1,860	1,780	2,900	269
12	1.3	1.4	1.1	1.1	1.2	2,000	1,070	1,240	1,980	1,790	2,880	77
13	1.3	1.4	1.1	1.1	1.2	2,150	943	1,230	2,090	1,840	2,890	61
14	1.3	1.4	1.1	1.1	1.2	2,080	864	1,210	2,100	1,880	2,740	38
15	1.3	1.4	1.1	1.0	1.2	1,990	843	1,160	2,270	1,900	2,590	2.8
16	1.4	1.4	1.1	1.0	1.2	2,250	822	1,180	2,420	1,930	2,590	2.8
17	1.4	1.4	1.1	1.1	1.2	2,500	918	1,200	2,400	2,050	2,440	2.8
18	1.4	1.4	1.1	1.2	1.3	2,500	1,050	1,130	2,320	2,090	2,290	2.8
19	1.3	1.4	1.1	1.2	1.3	2,500	1,050	1,080	2,260	1,900	2,270	2.8
20	1.3	1.3	1.1	1.2	1.3	2,610	1,070	1,080	2,170	1,870	2,260	2.5
21	1.3	1.2	1.1	1.2	1.3	2,750	1,060	1,090	2,140	1,980	2,100	2.2
22	1.3	1.1	1.2	1.1	1.3	2,750	989	1,140	2,240	1,980	1,940	2.2
23	1.3	1.1	1.2	1.1	1.2	2,750	862	1,190	2,350	1,980	1,900	2.1
24	1.3	1.1	1.2	1.1	1.2	2,760	793	1,180	2,340	1,980	1,990	2.0
25	1.3	1.1	1.2	1.1	1.2	2,760	714	1,250	2,310	1,890	2,080	2.1
26	1.3	1.1	1.2	1.1	1.3	2,750	714	1,350	2,080	1,750	2,070	2.3
27	1.3	1.1	1.2	1.1	1.3	2,650	704	1,360	1,980	1,710	2,060	2.4
28	1.3	1.2	1.1	1.2	1.3	2,470	704	1,350	2,120	1,650	2,170	2.3
29	1.3	1.2	1.1	1.2	-	2,350	686	1,480	2,230	1,050	2,280	2.3
30	1.3	1.1	1.1	1.2	-----	2,390	695	1,560	2,270	344	2,280	2.2
31	1.3	-----	1.1	1.2	-----	2,420	-----	1,560	-----	986	2,360	-----
Total	40.8	38.4	34.3	34.9	33.5	60,711.2	35,161	35,619	60,370	66,646	15,446.6	
Mean	1.32	1.28	1.11	1.13	1.20	1,958	1,172	1,149	2,012	1,759	2,150	515
Ac-ft	81	76	68	69	66	120,400	69,740	70,650	119,700	108,100	132,200	30,640
(†)	0	0	0	0	0	194	41	135	135	119	274	67
Calendar year 1961:	Max	2,820	Min	0.8	Mean	776	Ac-ft	561,700				
Water year 1961-62:	Max	2,910	Min	1.0	Mean	900	Ac-ft	651,800				

† 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.

Location.--Lat 32°18'55", long 106°45'00", in SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.9, T.23 S., R.2 E., (projected), on left bank in Dona Ana Bend Colony Grant, $\frac{1}{2}$ miles northeast of Las Cruces City Hall, and 100 ft upstream from Interstate Highway 25.

Drainage area.--13.5 sq mi, approximately.

Records available.--May 1958 to September 1962.

Gage.--Water-stage recorder. Altitude of gage is 4,035 ft (from topographic map). Prior to Aug. 17, 1960, at two sites about 670 ft upstream at datum 11.96 ft higher.

Extremes.--1960-61: Maximum discharge during water year, 120 cfs July 2 (gage height, 1.82 ft); no flow for most of time.

1961-62: Maximum discharge during water year, 403 cfs July 21 (gage height, 2.10 ft), by slope-area method; no flow for most of time.

1958-62: Maximum discharge, 1,060 cfs Aug. 23, 1959 (gage height, 4.05 ft, site and datum then in use), from rating curve extended above zero flow on basis of slope-area measurement at gage height 3.3 ft and logarithmic plotting; no flow for most of time.

Greatest flood since about 1934 occurred Sept. 21, 1941 (discharge, 2,630 cfs, as determined by Corps of Engineers from newspaper accounts and rainfall-runoff studies). Another flood of about 1,900 cfs occurred Aug. 30, 1935.

Remarks.--Records poor.

Discharge, in cubic feet per second, water years October 1960 to September 1962

June 14, 1961.	2	July 21, 1962.	*11
15.	.1	22.	.6
July 2.	4	26.	6
31.	.3	27.	.1
Aug. 13.	.8		
18.	.2		
Sept. 13.	.4		

Note.--No other flow during the two years

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in Acre-feet
Calendar year 1960.	12.8	6.6	0	0.036	25
June 1961.	2.1	2	0	.07	4.2
July	4.3	4	0	.14	8.5
August	1.0	.8	0	.03	2.0
September.	.4	.4	0	.01	.8
Water year 1960-61.	7.8	4	0	.021	15.5
July 1962.	17.7	11	0	.57	35
Calendar year 1961.	7.8	4	0	.021	15.5
Water year 1961-62.	17.7	11	0	.048	35

* Discharge measurement made on this day.

8-3656. McKelligon Canyon at El Paso, Tex.

Location.--Lat 31°49'20", long 106°28'15", on left bank 120 ft south of McKelligon Canyon Drive, 0.5 mile south of crest of Sugarloaf Mountain, 0.2 mile west of Alabama Avenue, 1.6 miles west of U.S. Highway 54 and 4.5 miles north of El Paso post office.

Drainage area.--2.3 sq mi, approximately.

Records available.--June 1958 to September 1962.

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.

1958-62: 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 four small reservoirs upstream, with a total capacity of about 95 acre-feet.

RIO GRANDE BASIN

119

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 1962.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 3,740 ft (from topographic map).

Extremes.--Maximum discharge during year, 299 cfs Sept. 2 (gage height, 1.93 ft); no flow for most of time.
1958-62: Maximum discharge, 550 cfs Sept. 11, 1958 (gage height, 2.64 ft), from rating curve extended above 148 cfs on basis of slope-area measurement of peak flow; no flow for most of time.

Remarks.--Records good above 25 cfs and fair below.

Discharge, in cubic feet per second, water year October 1961 to September 1962

Nov. 8. 0.6	Dec. 7. 2.0	July 5. 0.2	Sept. 5. *41
13. * .8	16.1	6.1	6.7
14. *1.8	Jan. 24. 1.6	12. 1.0	7.1
15.1	25. * .7	24.1	8. 1.5
21. 1.2	Feb. 14. 3.4	25. 1.0	
22. 0.3	July 2.9	Sept. 2. 38	

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
November 1961.	4.8	1.8	0	0.16	9.5
December	2.1	2.0	0	.07	4.2
January 1962	2.3	1.6	0	.07	4.6
February	3.4	3.4	0	.12	6.7
July	3.3	1.0	0	.11	6.5
September.	81.3	41	0	2.71	161
Calendar year 1961	49.8	19	0	.14	98.6
Water year 1961-62	97.2	41	0	.27	192.5

Peak discharge (base, 100 cfs).--Sept. 2 (0215) 299 cfs (1.93 ft); Sept. 5 (1100) 175 cfs (1.42 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 1962. 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.--43 years, 101 cfs (73,120 acre-ft per year).

Extremes.--Maximum discharge during year, 566 cfs May 12 (gage height, 3.64 ft); minimum daily, 10 cfs Dec. 12, Jan. 10.
1919-62: 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 table, 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	3.3	375
2.4	92	3.6	540

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	60	51	33	27	29	25	67	322	170	76	80	26
2	58	42	33	29	28	23	74	318	167	69	* 65	26
3	*58	*39	33	27	28	23	92	326	159	65	64	25
4	57	48	28	29	28	23	*107	348	148	67	55	24
5	55	45	* 22	32	28	23	94	390	143	72	49	25
6	54	47	20	31	27	25	92	425	*141	72	47	49
7	52	44	20	33	*30	26	88	425	138	78	44	47
8	52	47	20	*30	34	26	96	458	133	72	44	39
9	72	45	19	20	35	*22	94	480	131	69	44	36
10	86	45	18	10	37	24	107	504	126	*58	41	30
11	62	42	12	15	40	20	119	522	121	52	41	27
12	57	42	10	20	44	17	146	540	116	52	42	26
13	54	37	13	25	47	20	175	534	110	58	41	26
14	51	41	18	20	43	18	229	480	107	49	37	26
15	51	42	25	22	40	20	286	430	103	47	39	26
16	49	*36	23	24	33	22	322	390	99	45	41	25
17	*48	36	18	25	35	25	302	348	94	47	45	24
18	48	33	16	25	27	30	*352	322	90	55	37	24
19	47	31	15	25	29	31	415	298	88	51	36	*23
20	45	29	25	27	28	32	436	286	84	60	37	25
21	45	35	* 30	24	*28	32	442	276	80	58	42	27
22	45	32	27	28	28	32	395	*258	76	67	* 36	25
23	45	35	27	30	28	*34	330	242	70	92	35	27
24	42	36	27	*29	28	35	322	229	69	76	31	35
25	42	34	27	20	28	35	348	219	69	103	29	37
26	41	37	29	25	28	44	366	210	67	76	29	37
27	45	35	31	27	25	55	348	204	64	64	28	33
28	42	33	32	27	20	72	357	207	*67	65	27	31
29	45	32	30	27	-	84	370	198	69	65	26	29
30	47	35	27	29	-----	78	348	184	84	65	26	27
31	54	-----	22	30	-----	64	-----	172	-----	72	25	-----
Total	1,609	1,166	730	792	883	1,040	7,319	10,545	3,183	2,017	1,263	887
Mean	51.9	38.9	23.5	25.5	31.5	33.5	244	340	106	65.1	40.7	29.6
Ac-ft	3,190	2,310	1,450	1,570	1,750	2,060	14,520	20,920	5,310	4,000	2,510	1,760

Calendar year 1961: Max 474 Min 10 Mean 108 Ac-ft 78,460
Water year 1961-62: Max 540 Min 10 Mean 86.1 Ac-ft 62,350

Peak discharge (base, 310 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
4-20	2300	3.53	498	5-12	2300	3.64	566

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 3, Nov. 16 to Mar. 22.

8-3792. Tecolote Creek near San Pablo, N. Mex.

Location.--Lat 35°33'10", long 105°22'10", in Las Vegas Grant, on left bank 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 1962.

Gage.--Water-stage recorder. Altitude of gage is 6,730 ft (from topographic map).

Extremes.--Maximum discharge during year, 636 cfs July 9 (gage height, 4.12 ft), from rating curve extended above 320 cfs as explained below; minimum daily, 0.3 cfs June 25.

1960-62: Maximum discharge, 10,900 cfs Aug. 17, 1961 (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, that of June 25, 1962.

Remarks.--Records good except those for periods of ice effect, 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 Nov. 24 to Dec. 4, Dec. 8, 9)

Oct. 1 to Dec. 31

Jan. 1 to Sept. 30

0.6	1.7	0.3	0.3	0.8	12
.7	3.4	.4	1.1	1.1	27
.8	5.8	.5	2.9	1.4	48
.9	9.0	.6	5.3	1.8	90

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.0	7.4	4.8	b 4.8	b 3.1	b 5.1	1.0	2.0	4.0	3.1	7.3	3.9
2	8.0	5.8	5.1	b 4.8	b 3.4	*b 5.3	1.1	1.9	4.6	2.0	* 8.1	7.7
3	8.4	5.3	5.1	b 4.8	b 3.6	b 5.3	1.1	1.8	4.8	2.7	4.1	3.9
4	8.0	5.3	4.8	b 4.3	b 3.9	b 4.6	1.3	1.7	3.1	1.6	2.8	2.4
5	* 7.7	5.1	b 4.4	b 4.1	b 4.1	b 4.1	1.3	1.6	2.5	2.2	2.3	2.2
6	7.7	5.1	b 3.9	b 4.3	b 4.3	b 4.3	1.4	1.5	2.2	7.0	1.8	2.2
7	7.1	5.3	*b 3.6	b 4.3	5.1	4.6	1.3	1.4	2.0	3.6	1.5	5.9
8	7.1	5.1	4.4	b 3.9	5.1	4.3	1.3	1.3	2.0	2.9	1.3	3.4
9	7.7	5.3	4.4	b 3.1	* 5.9	4.1	1.3	1.3	2.5	6.8	* 1.0	2.5
10	8.7	* 5.8	b 3.9	b 2.8	5.9	b 3.1	1.5	1.2	2.2	2.2	7.2	2.2
11	7.7	5.3	b 3.9	b 3.0	7.5	b 3.3	1.8	1.1	2.2	1.6	6.2	* 2.0
12	7.4	5.3	b 3.0	b 4.0	9.1	b 3.6	* 1.8	9.9	* 2.0	1.5	5.9	1.8
13	6.8	5.3	b 3.5	b 4.5	1.1	b 3.0	1.9	9.1	1.8	1.2	6.2	1.5
14	6.8	5.6	b 4.0	b 3.5	1.1	b 3.6	2.3	8.4	1.3	1.1	5.6	1.3
15	6.4	6.1	b 4.4	b 4.5	1.1	b 3.9	2.5	7.8	1.1	9.9	5.3	1.5
16	6.1	5.8	b 4.5	b 4.5	1.0	b 4.3	2.9	* 7.2	.9	9.9	4.6	1.3
17	6.1	5.6	b 4.0	b 4.0	1.0	4.3	3.0	6.8	.8	1.1	4.3	6.4
18	5.8	b 5.1	b 4.5	b 3.6	b 7.5	4.3	3.3	6.2	.7	1.5	3.9	2.0
19	5.6	b 4.4	b 4.0	*b 4.1	b 7.2	4.3	3.4	5.6	.8	1.5	3.1	1.3
20	5.8	b 4.6	b 4.5	b 3.4	b 6.8	4.3	3.5	5.6	.8	1.8	3.1	3.1
21	5.6	5.3	b 4.8	b 3.6	b 6.5	4.3	3.4	4.3	.7	1.5	6.8	2.7
22	5.6	b 4.8	b 5.0	b 3.1	b 5.9	4.1	3.4	3.1	.6	1.4	5.3	2.0
23	5.6	5.1	b 5.0	b 2.9	b 5.6	* 4.3	3.1	2.5	.5	1.4	4.1	2.0
24	5.6	5.1	b 4.5	b 2.9	b 5.6	4.8	2.8	2.4	.5	1.6	3.4	2.9
25	5.3	5.1	b 4.7	3.4	b 5.9	4.6	2.6	2.0	.3	3.6	3.1	3.9
26	5.6	5.1	b 5.0	b 3.4	b 5.6	5.1	* 2.6	1.8	.5	2.8	2.7	2.9
27	5.6	5.6	b 4.5	b 3.1	b 4.6	5.6	2.5	1.6	1.4	2.8	2.4	2.7
28	5.3	5.3	b 4.5	b 3.1	b 4.8	6.8	2.3	1.8	* 4.5	6.5	2.2	2.5
29	5.6	5.1	*b 5.0	b 3.1	-	8.1	2.2	2.0	* 9.9	4.9	1.6	2.2
30	6.4	5.1	b 5.0	b 3.1	-----	9.5	2.1	1.5	1.3	5.4	1.3	1.8
31	7.4	-----	b 4.8	b 3.1	-----	9.1	-----	1.5	-----	6.3	1.3	-----
Total	2 06.5	1 60.2	1 37.5	1 15.1	1 80.0	1 50.0	6 60	2 59.1	8 6.8	6 29.9	3 91.6	1 19.2
Mean	6.6	5.3	4.4	3.7	6.4	4.8	2.2	8.3	2.8	20.3	12.6	3.9
Ac-ft	4 10	3 18	2 73	2 28	3 57	2 98	1 310	5 14	1 72	1 250	7 77	2 36

Calendar year 1961: Max 943 Min 2.2 Mean 22.2 Ac-ft 16,090
Water year 1961-62: Max 81 Min 0.3 Mean 8.48 Ac-ft 6,140

Peak discharge (base, 250 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
7- 9	1530	4.12	636	8-1	2350	2.73	258
7-28	1615	2.92	305	9-1	0330	3.60	481

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

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 1962. 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--49 years (1910-15, 1916-24, 1926-62), 142 cfs (102,800 acre-ft per year).

Extremes--Maximum discharge during year, 4,330 cfs Sept. 2 (gage height, 8.45 ft); no flow Aug. 15, 20-22, Aug. 28 to Sept. 1. 1911-62: 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. Divisions 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 1961 to September 1962

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
Oct. 3	12.0	Jan. 19	0	Apr. 18	27.1	June 27	18.3
26	20.6	Feb. 7	0	27	39.4	July 24	26.3
Nov. 22	5.53	27	21.0	May 14	0	Aug. 7	18.7
Dec. 18	9.94	Mar. 21	0	29	21.2	22	4.44
Jan. 12	0	Apr. 10	0	June 11	4.86	Sept. 7	19.9

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.9	3.1	3.4	2.4	3.5	1.7	10.6	3.54	1.36	1.28	2.20	a 0
2	4.9	3.5	3.5	2.0	3.6	1.9	9.0	3.30	1.41	4.3	* 6.79	a 9.00
3	* 5.0	3.5	3.6	2.4	3.7	4.2	8.8	3.20	1.45	7.6	2.59	a 1.50
4	4.9	3.2	3.4	2.3	3.8	4.2	9.9	3.20	1.30	4.0	a 1.15	a 5.0
5	4.8	2.6	3.2	2.5	3.7	4.0	14.3	3.27	1.04	a 2.0	a 3.5	a 2.5
6	4.6	3.4	3.1	2.1	4.2	3.8	1.56	3.72	9.2	4.7	a 1.5	a 1.5
7	4.5	3.1	2.8	2.5	* 4.2	3.6	14.7	4.06	8.8	4.2	* 9	* 1.2
8	4.3	2.8	2.6	2.0	4.2	3.8	1.39	3.96	8.5	4.71	5	9
9	4.3	3.0	3.0	1.5	4.3	3.8	1.30	4.34	8.8	2.42	3	1.0
10	4.2	3.4	2.6	1.2	4.3	3.7	* 1.39	4.42	8.5	1.75	1	1.1
11	5.9	3.2	1.5	1.0	3.1	2.2	1.52	4.66	* 8.3	a 9.0	1	5
12	6.0	3.0	1.0	7	3.0	2.0	1.80	4.82	7.9	1.13	2	1
13	4.9	3.0	1.5	5.5	3.2	3.1	1.97	5.06	5.8	a 8.0	1	2
14	4.3	3.1	2.0	5.0	4.0	4.0	2.12	* 5.34	5.8	a 4.0	1	1
15	4.3	2.9	2.5	4.5	4.3	4.0	2.67	4.58	5.2	a 3.0	0	2
16	4.3	2.9	3.5	4.5	4.6	4.0	3.44	3.92	5.0	a 2.5	1	2
17	4.2	3.1	3.5	4.5	4.5	4.1	3.92	3.58	3.8	a 2.0	6	1
18	4.0	3.1	* 2.6	4.5	4.6	3.8	* 3.86	3.07	3.1	a 1.5	1	1
19	4.2	3.1	2.2	* 4.0	4.3	3.6	4.58	2.82	2.3	a 10.0	2	1
20	4.1	3.1	3.0	4.0	3.5	3.6	5.34	2.50	3.5	a 5.0	0	7.04
21	4.1	3.6	3.3	3.5	3.4	* 3.7	5.66	2.44	3.1	a 3.5	0	12.1
22	3.7	* 4.0	3.5	3.5	3.4	3.8	5.48	2.25	2.6	a 3.0	* 0	4.9
23	2.8	4.2	2.3	3.8	3.2	3.6	4.82	2.10	2.1	2.04	4	2.2
24	2.7	3.7	2.5	4.8	2.8	3.8	4.00	1.97	1.8	* 8.8	5	3.1
25	2.8	3.8	2.4	4.8	2.9	4.0	3.82	1.77	1.1	1.65	1	7.2
26	* 2.8	3.8	2.7	4.2	3.0	3.6	4.03	1.65	a 5	1.81	1	3.6
27	2.8	3.7	2.8	4.0	* 3.2	3.2	* 4.14	1.63	* 2.60	1.16	1	3.2
28	2.6	3.8	2.8	3.4	2.1	3.6	3.89	1.54	5.3	1.16	0	5.6
29	2.6	3.8	2.7	3.1	-	5.6	3.86	* 1.49	a 1.8	1.87	0	2.9
30	2.8	3.6	2.4	3.0	-----	9.9	3.89	1.45	a 1.3	4.44	a 0	2.7
31	2.9	-----	2.0	3.5	-----	1.22	-----	1.28	-----	* 6.97	a 0	-----
Total	1.252	1.001	8.39	1.007	1.026	1.261	8.718	9.693	2.057	4.110	1.368	2.377
Mean	4.04	3.34	27.1	32.5	36.6	40.7	2.91	3.13	68.6	133	44.1	7.92
Ac-ft	2,480	1,990	1,660	2,000	2,040	2,500	1,7290	1,9230	4,080	8,150	2,710	4,710

Calendar year 1961: Max 3,150 Min 5 Mean 144 Ac-ft 104,100
Water year 1961-62: Max 900 Min 0 Mean 95.1 Ac-ft 68,840

Peak discharge (base, 3,000 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
7- 8	1845	7.79	3,170	9- 2	unknown	8.45	4,330
7-30	2220	7.77	3,140	9-20	1810	8.08	3,660

* Discharge measurement made on this day.
a No gage-height record.
Note.--Stage-discharge relation affected by ice Dec. 10 to Jan. 22, Feb. 28, Mar. 1, 11-14.

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 1962. 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.--46 years (1916-62), 20.7 cfs (14,990 acre-ft per year).

Extremes.--Maximum discharge during year, 252 cfs July 30 (gage height, 2.79 ft); minimum daily, 2.6 cfs Aug. 30.

1915-62: 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 or no gage-height record, 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 July 31

Aug. 1 to Sept. 30

0.4	3.5	1.2	41	0.4	2.6	1.0	28
.6	8.9	1.7	81	.5	4.8	1.4	56
.8	17	2.3	152	.7	12	1.8	91

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	15	15	11	b 11	8.0	b 8.9	16	44	12	5.2	87	5.5
2	15	13	11	b 11	8.3	b 9.3	17	43	15	7.1	71	6.0
3	15	12	11	b 10	8.6	b 8.6	18	44	17	7.4	53	5.4
4	15	12	10	b 9	9.7	b 8.0	20	42	14	4.9	38	4.8
5	* 15	11	8.3	b 8.5	9.7	b 8.6	20	43	12	14	30	4.8
6	14	10	* 8.0	b 9.5	9.7	10	21	48	8.9	20	23	4.8
7	14	11	a 8	b 9	10	10	21	44	8.9	33	19	5.4
8	14	10	a 8.5	b 8	* 10	9.7	23	45	9.3	18	* 16	6.0
9	15	* 11	a 7.5	b 6	10	8.3	21	50	8.9	16	14	5.1
10	22	12	a 6.5	b 4	12	7.7	24	50	8.9	13	11	4.2
11	16	12	a 5	b 5	13	b 7	* 29	50	* 8.0	8.7	11	* 4.0
12	15	12	a 4	b 7	16	b 6	31	49	8.3	9.7	8.1	4.0
13	13	11	a 5	b 7	18	b 5	36	47	7.7	7.7	8.1	3.7
14	14	11	a 6	b 6	19	b 7	42	42	7.4	7.4	8.1	3.7
15	13	11	a 8	b 8	17	b 8.3	52	* 38	6.5	6.5	7.0	3.7
16	12	12	a 7	b 7	16	b 8.3	59	31	6.5	6.5	6.7	3.5
17	12	12	a 7	b 9	16	8.3	56	27	7.1	10	7.0	3.7
18	12	11	a 7	* b 11	12	8.6	62	25	6.8	30	6.4	4.0
19	12	9.7	b 7	b 11	12	8.9	72	24	6.8	20	4.8	3.3
20	12	10	b 9	b 10	13	9.3	79	23	7.4	23	4.8	5.1
21	11	12	b 10	8.0	12	8.6	77	20	5.9	16	8.9	4.8
22	11	10	b 9	8.0	10	9.3	73	17	3.5	15	8.1	3.7
23	10	12	b 11	7.7	11	* 9.7	60	18	4.0	15	5.4	4.0
24	10	11	b 12	7.4	11	9.7	50	16	4.0	15	4.8	4.5
25	10	11	b 13	8.0	12	8.6	50	16	4.7	21	4.8	6.4
26	10	12	b 11	7.7	9.3	10	* 54	15	5.4	36	3.1	6.4
27	10	12	b 9	b 6.8	b 8.6	12	51	15	* 8.0	24	3.7	6.0
28	10	12	* b 10	b 6.5	* b 8.3	14	50	13	8.3	36	4.2	5.4
29	10	10	b 13	b 6.8	-	16	52	11	6.8	62	3.1	4.5
30	13	12	b 11	b 7.1	-----	17	50	10	7.1	114	2.6	4.5
31	15	-----	b 9.5	7.7	-----	15	-----	10	-----	* 138	3.1	-----
Total	405	342.7	273.3	248.7	330.2	295.7	1286	970	245.1	761.1	485.8	140.9
Mean	13.1	11.4	8.82	8.02	11.8	9.54	42.9	31.3	8.17	24.6	15.7	4.70
Ac-ft	803	680	542	493	655	587	2550	1920	486	1510	964	279

Calendar year 1961: Max 619 Min 4 Mean 38.4 Ac-ft 27,810
 Water year 1961-62: Max 138 Min 2.6 Mean 15.8 Ac-ft 11,470

Peak discharge (base, 250 cfs).--July 30 (2200) 252 cfs (2.79 ft).

* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

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 1962.

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.--58 years (1904-62), 19.8 cfs (14,330 acre-ft per year).

Extremes.--Maximum discharge during year, 428 cfs Aug. 1 (gage height, 4.81 ft); minimum daily, 2.0 cfs June 23-26, Sept. 13.

1904-62: 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)

(Shifting-control method used Aug. 27-31; stage-discharge relation affected by ice Dec. 12, 13, Jan. 10-14, Mar. 10, 11, 13)

Oct. 1 to Mar. 31			Apr. 1 to Aug. 27			Aug. 27 to Sept. 30		
3.14	3.2		3.09	2.0	3.6	38	4.13	2.0
3.2	5.8		3.2	6.4	3.8	70	4.2	3.4
3.3	12		3.3	12	4.0	118	4.3	6.8
3.4	21		3.4	18	4.3	214		

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	14	13	8.6	8.0	5.3	9.3	17	39	6.4	2.8	*11.4	4.9
2	19	6.3	9.3	8.0	5.8	11	18	38	11	3.1	8.1	4.9
3	19	9.3	8.6	6.8	6.3	8.6	18	38	14	4.7	5.2	4.9
4	17	11	8.6	7.4	7.4	7.4	19	36	10	3.1	3.8	3.4
5	*15	9.3	6.3	8.6	8.0	7.4	18	38	8.4	9.5	2.3	3.4
6	8.6	9.3	*5.8	8.6	7.4	8.6	18	44	5.1	1.8	2.0	3.2
7	8.0	10	6.8	10	8.6	8.6	18	42	3.5	2.9	1.6	3.0
8	8.6	10	6.8	8.6	*8.6	8.6	19	39	4.7	1.5	1.3	2.8
9	9.3	*10	7.4	8.0	10	6.8	18	45	4.3	1.3	*1.1	2.8
10	17	11	6.3	5.0	11	5.8	*21	45	5.1	1.0	8.9	4.9
11	11	11	4.8	4.0	12	4.8	25	44	*4.3	5.6	6.4	*4.5
12	10	10	4.0	5.0	16	5.3	26	45	6.4	5.6	6.4	2.2
13	10	9.3	6.0	5.5	20	5.8	36	44	5.1	5.1	4.7	2.0
14	9.3	8.6	8.6	5.0	21	6.3	41	38	4.3	3.5	5.6	2.4
15	11	10	10	5.3	19	5.8	51	*34	3.9	3.5	4.3	2.4
16	14	13	10	6.3	18	5.8	57	27	3.5	3.1	4.3	2.4
17	16	12	6.8	6.3	18	5.8	48	24	4.3	2.8	4.7	2.4
18	15	9.3	8.0	*6.3	13	5.8	56	23	4.3	2.3	4.3	2.4
19	15	7.4	5.3	6.3	12	6.3	95	22	4.3	1.6	3.9	2.6
20	13	8.6	8.0	6.3	15	7.4	92	20	3.9	1.8	6.0	2.8
21	8.0	11	8.0	5.8	13	6.8	90	18	3.1	1.3	5.1	2.4
22	6.3	8.6	8.6	5.3	8.6	*6.8	77	16	2.8	1.1	5.6	2.4
23	6.3	10	7.4	5.3	4.8	3.6	54	15	2.0	1.1	3.9	2.2
24	6.8	9.3	7.4	5.3	6.3	3.6	44	14	2.0	1.1	3.5	2.4
25	6.8	9.3	8.0	5.3	6.3	3.2	41	12	2.0	2.5	3.9	2.4
26	6.8	10	10	5.8	4.4	4.4	*46	11	2.0	4.4	2.8	2.8
27	8.8	11	10	5.3	4.0	6.8	44	11	*3.1	2.5	2.8	3.0
28	6.8	11	7.4	4.8	*6.3	10	44	9.4	4.3	3.0	2.8	2.8
29	6.3	9.3	*8.6	4.4	-	12	45	7.4	2.8	6.0	2.8	2.8
30	10	9.3	8.0	4.8	-----	15	45	6.0	3.1	1.52	2.8	2.6
31	14	-----	8.0	5.3	-----	15	-----	5.1	-----	2.12	2.8	-----
Total	346.7	297.2	237.4	192.7	296.1	228.4	1,241	849.9	144.0	788.4	466.3	90.1
Mean	11.2	9.91	7.66	6.22	10.6	7.37	41.4	27.4	4.80	25.4	15.0	3.00
Ac-ft	688	589	471	382	587	453	2,460	1,690	286	1,560	925	179

Calendar year 1961: Max 567 Min 2.6 Mean 37.5 Ac-ft 27,180
 Water year 1961-62: Max 212 Min 2.0 Mean 14.2 Ac-ft 10,270

Peak discharge (base, 200 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
7-30	2400	4.74	395	8-1	2150	4.81	428

* Discharge measurement made on this day.

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 1962.

Gage.--Water-stage recorder. Datum of gage is 5,928 ft above mean sea level (levels from planetable bench mark).

Average discharge.--11 years, 14.7 cfs (10,640 acre-ft per year).

Extremes.--Maximum discharge during year, 3,930 cfs July 28 (gage height, 7.82 ft); minimum daily, 3.1 cfs June 16, 29.

1951-62: Maximum discharge, 6,680 cfs Aug. 17, 1961 (gage height 9.40 ft), from rating curve extended above 2,100 cfs on basis of slope-area measurement of peak flow; 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 and those for period April 27 to July 31, which are poor. Diversions for irrigation of about 6,600 acres (1959 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 May 6 to July 16)

Oct. 1 to July 26

July 27 to Sept. 30

1.6	3.1	2.5	42	1.7	5.6	3.0	98
1.7	4.9	2.9	82	1.9	12	3.5	179
1.9	10	3.4	156	2.2	25	4.0	292
2.2	22			2.5	46	4.5	455

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	15	14	9.2	8.9	8.0	* b6.5	9.2	5.1	10	5.4	* 3.2	20.2
2	16	11	8.6	9.4	8.0	7.8	8.0	5.6	11	3.6	3.36	60
3	18	10	8.3	8.9	8.0	7.9	8.3	6.5	9.4	6.5	3.4	30
4	18	10	8.3	b8.5	7.5	8.0	7.0	6.0	4.5	3.8	20	14
5	18	9.7	8.0	b7.5	7.5	7.2	7.5	5.1	3.6	4.4	15	11
6	* 18	10	8.0	9.2	7.2	7.2	7.5	4.9	3.5	10	12	10
7	15	11	* 8.0	8.9	7.2	7.2	7.5	5.4	3.6	9.7	10	11
8	14	11	8.3	9.4	7.2	7.0	7.0	5.4	4.7	6.3	9.2	10
9	14	* 11	8.9	b7	* 7.5	7.0	6.5	6.5	5.1	6.3	* 8.5	8.5
10	17	11	b7	b6	7.2	6.0	6.5	7.8	5.8	6.3	7.6	7.9
11	17	11	b6.5	b5.5	7.0	5.3	6.3	5.1	5.8	4.9	7.3	* 7.6
12	17	11	b5	b8	6.7	b5	* 6.7	4.7	6.5	4.9	7.3	7.6
13	14	11	b8	b8	6.7	b5	7.2	4.4	* 6.3	5.6	6.8	7.9
14	11	11	b9.5	b7	7.2	b5	8.0	4.4	4.5	4.9	7.0	7.9
15	10	13	12	b6.5	7.5	b6	10	4.5	3.3	4.0	6.8	7.6
16	11	14	12	b7	7.2	7.5	11	4.7	3.1	23	9.9	7.9
17	11	12	11	* b7.5	7.0	7.2	9.2	4.9	3.5	24	7.0	7.6
18	11	11	12	b8	7.5	6.7	5.8	4.5	3.3	8.0	6.5	8.5
19	10	11	9.7	b8.5	6.7	6.0	5.1	4.7	4.2	7.5	6.5	14
20	11	10	9.7	b8	6.5	6.0	5.1	4.9	4.4	15	6.2	19.1
21	10	10	10	b9.5	6.7	* 5.8	4.7	4.9	4.0	8.6	7.0	18
22	10	10	11	b9.5	6.5	6.0	5.1	4.5	3.8	7.8	8.5	12
23	10	10	11	10	6.5	6.3	5.1	5.4	3.3	34	7.6	10
24	11	9.7	10	10	6.3	7.0	5.4	5.8	3.3	24	7.9	12
25	11	9.7	10	11	6.5	7.8	4.9	6.3	3.6	14	6.5	18
26	11	9.2	11	10	6.0	7.0	* 5.1	6.0	3.6	146	6.5	14
27	11	8.3	* 10	8.6	b5.5	6.5	4.9	6.0	* 4.4	221	6.8	11
28	11	8.6	9.4	8.6	b6	6.3	4.9	* 6.7	4.4	428	6.8	11
29	11	8.9	9.4	7.8	-	6.0	5.4	7.0	3.1	90	6.5	9.9
30	12	8.6	9.2	7.5	-----	6.7	4.9	7.5	3.3	180	7.3	9.2
31	15	-----	9.4	8.0	-----	8.6	-----	7.8	-----	95	8.5	-----
Total	409	316.7	288.4	257.6	195.3	205.5	199.8	173.0	142.9	1412.5	635.5	757.1
Mean	13.2	10.6	9.30	8.31	6.98	6.63	6.66	5.58	4.76	4.56	20.5	25.2
Ac-ft	811	628	572	511	387	408	396	343	283	2800	1260	1500

Calendar year 1961: Max 933 Min 3.7 Mean 27.6 Ac-ft 20,010
Water year 1961-62: Max 428 Min 3.1 Mean 13.7 Ac-ft 9,900

Peak discharge (base, 1,100 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
7-26	2230	7.05	2,800	8-2	0200	6.37	1,900
7-28	1645	7.82	3,930	9-1	0515	6.23	1,740
7-30	1900	6.05	1,540				

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

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 1962.

Gage.--Water-stage recorder. Altitude of gage is 4,940 ft (from river-profile map).

Average discharge.--11 years, 18.7 cfs (13,540 acre-ft per year).

Extremes.--Maximum discharge during year, 1,960 cfs July 23 (gage height, 8.00 ft); no flow for many days.

1951-62: 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 26,700 cfs (revised) by slope-area measurement made in 1951. A flood of about the same magnitude occurred Sept. 29-30, 1904.

Remarks.--Records poor. Diversion for irrigation of about 7,000 acres (1959 determination) above station.

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	10	3	1	1						0	* 136	0
2	9	3	1	1		(*)				0	* 399	89
3	8	4	1	1						0	131	52
4	7	3	1	1						0	60	40
5	7	2	1	0						0	30	14
6	* 6	2	0	0						0	15	7
7	6	2	0	0	(*)					1	10	* 4
8	6	2	0	0						38	7	3
9	5	3	0	0			(*)			171	5	2
10	4	3	0	0			(*)			22	* 3	1
11	4	3	0	0						2	2	1
12	4	2	0	* 0						0	1	1
13	5	2	0	0					(*)	1	0	0
14	5	2	0	0						7	0	0
15	4	3	0	0						1	0	0
16	2	3	0	0						0	0	0
17	1	3	0	0						43	0	0
18	0	4	* 0	0						19	0	0
19	0	4	1	0						6	0	0
20	0	3	3	0						1	0	51
21	0	* 3	3	0		(*)				0	0	87
22	0	2	2	0						0	0	30
23	0	2	2	0						164	0	14
24	0	2	3	0						157	0	50
25	0	2	3	0						98	0	39
26	0	2	2	0						151	0	18
27	0	2	2	0					(*)	282	0	14
28	0	2	2	0				(*)		109	0	11
29	0	2	2	0						416	0	6
30	0	2	2	0	-----		-----			113	0	5
31	2	-----	2	0	-----		-----		-----	304	0	-----
Total	95	77	34	4	0	0	0	0	0	2,106	799	539
Mean	3.1	2.6	1.1	0.1	0	0	0	0	0	67.9	25.8	18.0
Ac-ft	188	153	67	7.9	0	0	0	0	0	4,180	1,580	1,070

Calendar year 1961: Max 1,080 Min 0 Mean 26.2 Ac-ft 18,980

Water year 1961-62: Max 416 Min 0 Mean 10.0 Ac-ft 7,250

Peak discharge (base 1,700 cfs).--July 23 (2230), 1,960 cfs (8.00 ft).

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

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 1962. 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.--46 years (1912-24, 1928-62), 151 cfs (109,300 acre-ft per year).

Extremes.--Maximum discharge during year, 2,300 cfs July 25 (gage height, 5.35 ft); minimum daily, 20 cfs Jan. 10.

1930-62: 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, 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 except those for periods of no gage-height record and those subsequent to Apr. 10, which are fair. Discharge measurements made two or more times a month. Diversions for irrigation of about 12,000 acres (1959 determination) above station.

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	41	37	35	34	32	30	28	259	38	32	408	a 30
2	40	35	34	34	32	30	28	208	38	35	686	a 170
3	40	36	35	33	31	28	27	194	36	55	585	a 650
4	38	36	34	33	31	28	27	181	32	118	a 220	a 140
5	38	36	34	33	31	28	28	178	30	53	a 120	a 65
6	38	37	34	32	31	28	27	175	28	42	a 75	a 40
7	38	37	35	33	31	28	33	225	28	31	48	33
8	38	37	41	34	30	28	52	259	30	35	44	31
9	38	37	42	a 25	28	28	52	251	31	500	40	30
10	38	36	37	a 20	28	28	46	295	31	232	36	28
11	37	35	24	a 30	28	25	48	299	31	123	35	27
12	37	36	a 25	a 45	28	34	48	329	33	80	35	26
13	36	36	a 30	42	28	35	53	342	130	42	35	26
14	36	40	46	40	30	34	63	346	63	58	34	25
15	36	40	45	35	30	30	82	374	33	40	34	25
16	36	38	44	35	30	28	126	299	28	35	33	26
17	36	38	34	37	30	28	214	247	28	35	33	32
18	35	38	34	36	31	28	278	208	28	33	33	25
19	35	38	35	35	31	28	290	162	28	36	32	26
20	35	38	35	34	31	28	379	148	28	116	41	419
21	35	38	34	38	31	28	429	118	27	124	74	311
22	35	37	34	25	31	28	429	97	27	44	33	136
23	35	38	33	34	31	28	403	84	26	40	31	58
24	36	37	34	44	31	31	355	69	27	382	30	45
25	36	37	34	38	31	30	286	58	86	311	30	44
26	37	37	33	35	32	28	262	49	73	520	30	61
27	37	36	34	32	30	28	278	37	55	251	30	49
28	37	36	33	32	31	27	278	35	118	425	28	38
29	37	36	34	32	-	27	247	35	118	706	30	41
30	38	35	34	32	-----	28	270	34	41	455	30	36
31	40	-----	34	32	-----	28	-----	34	-----	929	a 30	-----
Total	1,149	1,108	1,084	1,054	850	893	5,169	5,629	1,350	5,918	2,983	2,693
Mean	37.1	36.9	35.0	34.0	30.4	28.8	172	182	45.0	191	96.2	89.8
Ac-ft	2,280	2,200	2,150	2,090	1,690	1,770	10,250	11,160	2,680	11,740	5,920	5,340

Calendar year 1961: Max 3,080 Min 18 Mean 122 Ac-ft 88,360
 Water year 1961-62: Max 929 Min 20 Mean 81.9 Ac-ft 59,270

Peak discharge (base, 4,000 cfs).--No peak above base.

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.6N., 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 1962.

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.--24 years, 233 cfs (168,700 acre-ft per year).

Extremes.--Maximum discharge during year, 3,840 cfs June 13 (gage height, 4.55 ft); minimum daily, 78 cfs Aug. 24, 26.

1938-62: 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	2.1	414
1.5	146	2.5	709
1.8	257	3.0	1,240

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	118	138	126	124	118	101	90	320	106	111	637	82
2	116	124	132	*126	121	101	94	320	111	106	518	82
3	121	118	129	126	121	104	92	*290	284	121	830	661
4	124	118	129	126	118	106	94	271	200	174	391	295
5	126	121	*124	129	116	101	96	253	104	159	266	204
6	132	124	121	125	113	106	96	249	94	*167	150	*129
7	126	124	121	126	113	101	96	257	*96	146	120	108
8	124	124	132	129	113	101	108	309	94	111	110	101
9	126	135	156	118	111	104	124	304	101	443	100	92
10	129	129	129	90	106	108	126	325	101	330	100	90
11	126	126	120	110	111	113	118	346	99	215	95	88
12	124	126	115	130	108	108	118	356	109	168	95	84
13	*118	126	115	125	106	108	*116	368	335	130	93	84
14	116	140	121	115	101	108	132	379	314	110	*92	*86
15	116	143	143	105	*99	*108	143	414	130	105	90	84
16	118	138	140	105	99	104	168	414	100	100	88	86
17	118	126	143	110	96	101	*249	309	95	95	*84	88
18	111	129	135	118	92	101	320	304	95	95	84	90
19	113	138	129	132	99	99	325	253	95	157	88	146
20	*113	132	132	129	108	99	351	219	95	*149	86	263
21	118	135	135	129	111	101	440	*196	110	240	86	607
22	113	138	129	124	111	101	452	168	*84	156	86	280
23	116	138	132	115	111	99	459	159	80	121	80	189
24	113	132	135	124	108	104	391	152	80	543	78	150
25	113	126	135	138	111	99	346	138	172	817	80	196
26	111	126	129	132	108	101	340	124	*200	1140	78	140
27	*116	129	129	121	106	94	*340	111	116	433	80	130
28	116	126	132	118	*104	90	346	104	116	541	80	*124
29	118	*126	129	121	-	90	325	96	*203	570	80	111
30	124	124	126	*118	-----	90	320	101	149	608	80	108
31	*140	-----	126	118	-----	92	-----	96	-----	859	*80	-----
Total	3,713	3,879	4,029	3,756	3,039	3,143	6,815	7,705	4,068	9,220	5,005	4,978
Mean	120	129	130	121	109	101	227	249	136	297	161	166
Ac-ft	7,360	7,690	7,990	7,450	6,030	6,230	13,520	15,280	8,070	18,290	9,930	9,870

Calendar year 1961: Max 2,680 Min 80 Mean 207 Ac-ft 149,500
 Water year 1961-62: Max 1,140 Min 78 Mean 163 Ac-ft 117,700

Peak discharge (base, 5,500 cfs).--No peak above base.

* Discharge measurement made on this day.

Note.--No gage-height record Dec. 12, 13, Jan. 10-14, June 15-21, July 13-18, Aug. 6-13, Sept. 24, 26, 27.

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 1962. 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--23 years (1912-25, 1926-36, corrected), 236 cfs (170,900 acre-ft per year), prior to completion of Alamogordo Dam; 26 years (1936-62, corrected), 229 cfs (165,800 acre-ft per year).

Extremes--Maximum discharge during year, 2,320 cfs Aug. 29 (gage height, 3.65 ft); minimum daily, 6.8 cfs Sept. 26, 27. 1912-62: 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. Diversion for irrigation of about 12,500 acres (1959 determination) above station. Flow regulated by Alamogordo Reservoir (see p. 155).

Rating tables, water year 1961-62 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 6-21)

Oct. 1 to Mar. 31

Apr. 1 to Sept. 30

0.3	5.8	2.0	142	Note.--Same as preceding table below 2.9 ft.	
.4	9.3	2.4	215		
.7	24	2.6	330		
1.0	44	2.9	620		
1.5	86	3.3	1,100		
				2.9	620
				3.2	980
				3.4	1,500

Discharge, in cubic feet per second, water year October 1961 to September 1962											
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Sept.
1	99	31	30	23	18	18	68	76	1,190	23	* 1,430
2	92	29	31	* 23	18	18	67	76	1,160	88	1,400
3	93	28	31	24	19	18	67	* 75	1,160	84	1,360
4	95	29	30	20	18	18	66	76	1,160	94	1,360
5	99	27	* 31	17	18	19	67	81	1,160	101	* 940
6	103	27	30	16	18	19	66	82	* 1,160	101	81
7	101	28	29	15	17	661	50	87	1,120	94	84
8	101	28	29	16	14	992	40	102	1,140	90	84
9	101	29	29	15	14	952	53	102	1,140	90	84
10	101	31	28	14	15	940	69	99	1,140	89	84
11	102	31	26	14	16	928	86	99	1,120	71	84
12	102	31	23	16	16	940	86	100	784	69	84
13	103	29	23	16	16	952	84	100	102	69	84
14	104	28	23	16	15	952	83	98	* 102	70	* 97
15	105	29	23	16	* 16	952	85	97	103	70	87
16	95	29	25	15	17	* 1,010	85	98	103	76	89
17	88	28	24	15	17	1,070	* 84	98	102	104	93
18	96	29	22	16	17	1,070	80	97	100	97	93
19	98	29	* 21	15	17	1,050	64	97	100	* 93	92
20	99	29	23	15	18	1,050	76	98	100	97	92
21	100	29	24	14	18	1,060	85	85	100	99	94
22	99	31	25	14	18	628	84	* 74	100	100	94
23	99	31	25	14	18	62	82	74	100	101	94
24	98	31	25	14	17	66	80	74	100	102	74
25	97	32	25	14	18	75	62	765	100	104	44
26	97	31	24	14	18	96	58	1,120	86	44	* 6.8
27	97	30	23	14	18	95	57	1,140	8	11	6.8
28	97	29	23	14	18	96	62	1,160	8	11	7.2
29	97	* 29	23	15	-	75	70	1,160	* 7.9	11	7.5
30	58	29	23	* 17	-----	* 65	79	1,160	8.2	11	7.5
31	* 31	-----	23	18	-----	68	-----	1,160	-----	12	-----
Total	2,947	881	3,794	499	477	1,6015	2,145	9,810	14,864.1	2,276	3,224.8
Mean	95.1	29.4	25.6	16.1	17.0	51.7	71.5	316	495	73.4	27.4
Ac-ft	5,850	1,750	1,570	990	946	31,770	4,250	19,460	29,480	4,510	16,310

Calendar year 1961: Max 1,300 Min 21 Mean 208 Ac-ft 150,600
Water year 1961-62: Max 1,970 Min 6.8 Mean 187 Ac-ft 135,600

* Discharge measurement made on this day.

RIO GRANDE BASIN

8-3850. Fort Sumner main canal near Fort Sumner, N. Mex.

Location (corrected).--Lat 34°30'10", long 104°16'40", in NW¼ sec.12, T.3 N., R.25 E., on right bank 160 ft downstream from bridge, 0.45 mile downstream from diversion dam on Pecos River, and 2¼ 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 1962.

Gage.--Water-stage recorder. Altitude of gage is 4,033 ft (from Bureau of Reclamation profile map of canal).

Extremes.--1939-40, 1954-62: Maximum daily discharge, 125 cfs Aug. 10, 1956; no flow at times.

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 1961 to September 1962

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	91	0	78.0	4,790
November.....	0	0	0	0
December.....	0	0	0	0
Calendar year 1961.....	100	0	55.2	39,950
January.....	0	0	0	0
February.....	0	0	0	0
March.....	100	0	37.5	2,310
April.....	83	41	70.1	4,170
May.....	102	67	86.8	5,340
June.....	98	0	83.1	4,950
July.....	106	0	68.5	4,210
August.....	102	0	79.2	4,870
September.....	96	0	72.4	4,310
Water year 1961-62.....	106	0	48.3	34,950

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 1962. 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.--25 years (1937-62), 220 cfs (159,300 acre-ft per year).

Extremes.--Maximum discharge during year, 4,970 cfs July 27 (gage height, 7.32 ft), from rating curve extended above 2,300 cfs by logarithmic plotting; no flow for several days.

1937-62: 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 except those for periods of ice effect or no gage-height record, which are poor. Discharge measurements generally made two or more times a month. Flow regulated by Alamogordo Reservoir (see p. 155). Diversions for irrigation of about 20,000 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 Mar. 10, 11, May 24, Aug. 10-16)

Oct. 1 to Mar. 9		Mar. 10 to May 26		May 27 to Sept. 30	
3.1	4	2.9	0	4.1	105
3.2	8	3.0	1	4.4	197
3.3	14	3.1	3	4.7	360
3.4	22	3.3	10	5.0	615
3.6	47	3.5	22	5.4	1,100
3.9	113	3.8	51	3.8	28
4.2	225			4.0	59
4.5	400				

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5	22.5	4.9	3.2	2.9	1.7	5.7	a 14	935	38	126	1.110
2	5	14.8	4.7	3.4	2.5	1.9	5.6	14	1,000	52	189	1.260
3	9	10.5	4.7	4.0	2.4	1.8	5.7	12	987	34	49	1.210
4	13	8.0	4.7	3.7	2.2	1.9	5.7	11	935	14	a 30	1.150
5	19	6.3	4.7	3.6	2.0	1.9	5.7	10	974	49	a 22	1.180
6	19	5.6	4.4	3.3	2.0	1.9	5.8	8	948	38	a 19	1.150
7	28	5.1	4.6	3.3	1.9	1.9	4.7	8	1,000	10	a 17	5.58
8	29	5.1	4.9	3.3	1.9	2.0	3.9	8	935	25	a 15	2.88
9	23	6.0	4.9	2.0	1.8	3.70	3.5	8	987	1,390	a 14	1.37
10	24	5.6	4.9	5	1.7	7.20	3.1	8	948	494	9	8.1
11	28	5.1	5.8	5	1.7	7.89	3.0	7	872	186	6	6.3
12	39	4.4	6.7	7	1.8	8.24	2.6	6	987	92	5	4.9
13	34	6.1	6.1	1.0	1.8	8.24	2.3	4	1,470	63	4	4.1
14	37	8.0	4.4	1.1	2.8	8.48	2.2	3	1,050	49	5	3.5
15	36	1.00	4.3	1.3	4.9	8.98	1.9	2	375	2.8	4	3.0
16	4.1	8.5	6.3	1.5	3.6	9.22	1.8	1	201	2.0	2	2.4
17	3.0	7.6	6.7	2.0	3.1	8.85	1.8	0	1.30	2.3	0	1.9
18	2.8	6.3	5.4	2.8	2.5	9.22	1.7	0	8.9	a 4	0	3.8
19	4.4	5.4	4.6	3.9	2.1	9.74	1.7	0	6.6	a 1	0	2.0
20	5.2	4.7	4.1	6.9	1.7	8.85	1.7	2.7	5.0	6.1	0	1.2
21	4.0	4.7	3.6	4.9	1.4	8.98	2.1	2.3	3.5	3.4	0	8
22	3.4	4.7	3.6	4.7	1.6	8.35	3.4	9	2.5	4.5	0	6
23	2.4	4.3	3.4	3.9	1.4	8.35	2.2	2	2.0	a 20	0	6
24	2.2	4.1	3.4	4.1	1.5	4.35	1.8	0	1.6	a 15	0	1.3
25	2.2	4.1	3.6	5.4	1.6	2.02	1.6	0	1.6	4.2	0	1.19
26	2.2	4.1	3.6	5.2	1.8	1.15	1.7	0	2.7	2.74	0	1.09
27	2.8	4.1	3.4	4.3	1.7	9.4	a 20	1.11	1.5	1.310	0	1.20
28	3.1	4.3	3.6	4.1	1.7	7.9	a 27	7.20	8.4	2.36	0	7.9
29	3.3	4.6	3.6	3.7	-	6.8	a 20	8.35	8.4	1.48	4.16	6.6
30	1.70	4.7	3.4	3.3	-----	6.0	a 17	8.48	6.8	1.37	1.730	5.2
31	3.54	-----	3.3	3.1	-----	6.2	-----	9.10	-----	1.91	1.080	-----
Total	1.323	1.993	1.403	9.87	6.00	1.3694	9.13	3.609	15.329	5.323	3.742	9.033
Mean	4.2.7	6.64	4.53	31.8	21.4	4.42	30.4	1.16	5.11	1.72	1.21	3.01
Ac-ft	2.620	3.950	2.780	1.960	1.190	2.7160	1.810	7.160	30.400	10.560	7.420	17.920

Calendar year 1961: Max 1,740 Min 1 Mean 167 Ac-ft 121,200
Water year 1961-62: Max 1,730 Min 0 Mean 159 Ac-ft 114,900

Peak discharge (base, 2,500 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
6-13	1215	6.76	3,680	7-27	0315	7.32	4,970
7-9	0415	6.50	3,110				

a No gage-height record.

Note.--Stage discharge relation affected by ice Jan. 9-18 (no gage-height record Jan. 10-15).

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 1962.

Gage.--Water-stage recorder and concrete control. Datum of gage is 6,366.42 ft above mean sea level, datum of 1929. Prior to Oct. 14, 1961, at datum 0.70 ft lower. Oct. 14, 1961, to Mar. 8, 1962, at datum 0.40 ft lower.

Average discharge.--9 years, 10.4 cfs (7,530 acre-ft per year).

Extremes.--Maximum discharge during year, 189 cfs July 21 (gage height, 2.64 ft); minimum daily, 2.4 cfs Sept. 13.

1953-62: 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 fair prior to Mar. 8, good thereafter. 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.

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.6	a 4.5	3.4	5.7	1.2	1.7	3.7	4.6	9.2	7.3	5.8	5.5
2	6.4	4.1	3.1	7.7	1.3	1.7	4.1	* 4.5	1.1	10	9.1	6.6
3	6.1	3.4	4.4	7.0	1.4	1.7	4.8	4.6	1.1	10	9.4	6.6
4	6.1	3.1	* 7.7	7.0	1.6	1.6	4.6	4.7	8.8	9.6	7.7	7.0
5	5.9	3.4	5.7	6.7	1.7	1.6	4.3	4.7	8.0	1.1	6.1	1.0
6	5.7	3.4	5.4	5.7	1.8	1.7	5.0	5.1	8.0	1.2	4.8	8.3
7	5.5	3.1	6.0	7.0	2.0	1.7	4.6	5.6	8.0	2.2	3.7	6.2
8	5.3	3.7	1.8	6.7	2.0	* 1.6	3.8	5.9	7.6	2.1	* 3.1	5.2
9	5.3	4.1	1.1	6.4	2.1	* 1.5	* 3.9	* 6.0	7.3	2.3	2.5	4.8
10	5.3	3.7	1.0	a 3.5	2.8	1.3	* 5.2	5.6	6.6	* 2.0	2.1	4.8
11	5.0	3.1	9.0	a 4.0	3.3	1.1	6.8	5.2	6.3	2.6	1.8	4.1
12	5.2	3.1	7.4	a 5.5	3.6	1.2	7.5	5.1	6.3	2.2	1.5	3.0
13	* 5.0	4.4	6.7	a 6.0	3.9	1.2	8.0	5.4	6.3	1.8	1.4	2.4
14	5.0	3.1	* 7.4	a 7.0	3.9	1.1	8.8	4.8	* 5.6	1.7	1.2	2.7
15	4.7	3.4	7.0	* 6.0	4.0	1.4	9.4	* 3.9	5.6	1.4	1.3	3.0
16	4.7	* 4.7	7.0	6.5	3.8	1.2	9.9	3.4	5.2	1.4	1.4	3.8
17	4.4	5.4	6.4	6.7	3.6	1.2	* 10.8	3.0	4.9	1.3	1.0	3.8
18	4.7	4.7	5.4	7.4	3.4	1.1	10.4	2.4	4.7	1.2	9.6	4.1
19	5.4	4.4	5.0	6.7	3.1	1.1	11.1	2.1	4.7	1.5	9.1	4.8
20	5.4	4.1	5.0	6.4	2.9	1.2	11.8	2.0	5.2	1.6	8.7	* 4.1
21	4.4	4.7	6.0	6.0	2.7	* 1.2	9.9	1.9	4.7	3.7	1.2	3.0
22	3.7	4.4	6.4	6.0	2.6	1.2	8.2	1.8	4.2	1.8	9.1	3.8
23	3.7	3.7	5.7	6.7	2.4	1.2	6.8	1.6	3.9	1.7	8.3	5.2
24	3.7	4.1	5.7	* 7.4	2.2	1.2	6.1	1.4	3.9	1.7	7.9	3.4
25	* 3.1	3.4	7.0	1.3	2.1	1.2	* 5.9	1.3	4.9	2.9	7.0	* 3.5
26	3.4	3.1	7.4	1.3	* 2.1	1.4	* 5.9	1.2	4.4	3.7	7.0	3.0
27	a 3.5	4.1	7.4	1.1	1.9	2.0	5.3	1.2	5.6	4.4	6.2	3.9
28	a 4.0	3.7	7.0	1.1	1.7	* 2.6	4.6	* 1.3	6.3	4.1	5.8	3.7
29	a 3.5	3.4	7.4	1.0	-	3.6	4.7	1.3	5.6	5.2	5.6	5.3
30	a 3.5	3.4	7.7	1.0	-----	3.9	5.0	1.2	5.6	* 5.3	* 5.5	5.0
31	a 3.5	-----	7.4	1.1	-----	3.8	-----	1.1	-----	5.0	5.5	-----
Total	147.7	114.9	216.1	230.7	71.1	51.2	200.9	103.9	189.4	707.9	746.5	390.8
Mean	4.76	3.83	6.97	7.44	2.54	1.65	6.70	3.35	6.31	22.8	24.1	13.0
Ac-ft	293	228	429	458	141.0	102.0	398.0	206.0	376	1400	1480	775
(+)	33	30	19	29	25	3.0	53	71	130	103	38	71

Calendar year 1961: Max 37 Min 1.1 Mean 5.67 Ac-ft 4,100
 Water year 1961-62: Max 118 Min 2.4 Mean 19.2 Ac-ft 13,910

Peak discharge (base, 100 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
4-20	0645	2.22	124	7-29	2245	2.01	104
7-21	1210	2.64	189				

* Discharge measurement made on this day.

+ Diversion in acre-feet, by F. Herrera ditch-S.

a No gage-height record.

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 June 1962 (discontinued as a continuous record station; converted to a crest-stage partial-record station).

Gage.--Water-stage recorder and crest-stage gage. Datum of gage is 4,945.49 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 2,680 cfs Aug. 1 (gage height, 12.45 ft), from rating curve extended above 1,200 cfs on basis of slope-area measurement at gage height 13.22 ft; no flow at times.

1956-62: Maximum discharge, 3,510 cfs May 14, 1958 (gage height, 13.30 ft), from rating curve extended above 300 cfs as explained above; no flow at times in 1959-62.

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 fair. 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, October 1961 to June 1962

Date	Discharge	Date	Discharge	Date	Discharge
Oct. 25	6.20	Jan. 25	7.11	Apr. 10	8.81
Nov. 17	7.85	Feb. 27	3.68	26	12.2
Dec. 14	8.69	Mar. 21	2.10	May 1	8.23
Jan. 16	5.51	29	6.84		

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

5.1	0	5.6	11
5.2	.3	5.8	27
5.3	1.0	6.0	43
5.4	2.4	6.6	103
5.5	5.4	7.2	185

Discharge, in cubic feet per second, October 1961 to June 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.6	1.6	9.2	6.8	6.8	14	33	*60	3.4			
2	.7	1.0	9.9	5.0	5.8	13	35	62	.5			
3	.9	.7	8.6	5.4	5.8	9.2	32	62	.5			
4	.7	.7	8.6	5.4	5.8	11	35	56	0			
5	.9	.9	7.9	5.8	6.2	16	37	48	0			
6	1.1	2.0	7.9	6.8	6.2	17	39	48	0			
7	.7	2.8	7.9	5.8	5.8	12	47	52	0			
8	1.0	4.3	5.4	4.3	3.4	13	45	55	0			
9	1.0	5.8	4.6	4.0	4.3	9.9	39	51	0			
10	.6	6.8	4.6	4.3	4.0	12	*41	53	0			
11	.6	6.2	5.0	4.6	3.6	18	46	50	0			
12	.5	6.2	5.0	4.3	33	13	58	48	0			
13	.4	7.3	5.0	4.3	43	11	66	41	0			
14	.4	7.9	*4.6	4.6	60	21	68	43	*0			
15	.5	7.9	5.0	4.6	74	17	90	35	0			
16	.6	7.9	4.6	*9.9	72	16	98	34	0			
17	.7	*7.9	4.6	13	59	14	102	34	0			
18	.8	7.9	5.4	13	55	8.6	127	33	0			
19	.8	7.9	8.6	14	51	9.9	177	29	0			
20	.8	7.9	6.8	14	46	11	162	30	0			
21	.7	7.9	5.8	13	36	*11	179	28	0			
22	1.5	7.3	4.3	12	28	11	157	22	0			
23	1.5	7.3	3.4	10	25	9.9	132	17	0			
24	1.2	7.3	3.1	10	20	8.6	113	14	0			
25	*.8	6.8	2.8	*9.2	19	5.0	90	13	75			
26	.6	7.3	2.4	8.6	21	6.8	*89	9.9	10			
27	.5	7.9	2.4	7.3	*21	6.2	94	9.2	*5.4			
28	.9	7.9	4.6	6.2	17	4.0	86	7.3	6.8			
29	1.1	7.9	7.9	6.2	-	*5.4	75	*8.6	2.0			
30	.7	8.6	6.8	6.8	-	13	70	7.9	1.3			
31	2.0	-----	6.2	6.8	-----	29	-----	5.8	-----			
Total	25.8	177.8	178.9	236.0	737.7	376.5	2,462	1,066.7	104.9			
Mean	0.83	5.93	5.77	7.61	26.3	12.1	82.1	34.4	3.50			
Ac-ft	51	353	355	468	1,460	747	4,880	2,120	208			

Calendar year 1961: Max 150 Min 0 Mean 8.80 Ac-ft 6,370

Water year 1961-62: Max - Min - Mean - Ac-ft -

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

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

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 1962.

Gage.--Water-stage recorder. Altitude of gage is 4,185 ft (from topographic map).

Average discharge.--23 years, 27.2 cfs (19,690 acre-ft per year).

Extremes.--Maximum discharge during year, 1,880 cfs Aug. 1 (gage height, 15.30 ft); no flow for most of year.

1939-62: 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.

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

3.3	0	4.5	37
3.4	1	5.0	74
3.6	2	6.0	190
3.8	6	8.0	480
4.0	13		

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1					0			* 28	0	* 0	4 59	0
2					0			26	0	* 0	* 205	0
3					0			26	0	7	* 152	0
4					0			21	0	a 0	122	* 0
5					0			18	0	60	95	0
6					0		0	13	0	108	a 70	0
7					0		0	15	0	a 60	* 52	10
8					0		0	20	0	a 10	43	a 1
9					0		0	20	0	* 8	33	0
10					0		* 0	* 15	0	5	* 26	0
11					0		0	10	0	3	19	0
12					0		* 0	9	0	22	12	0
13					0		0	8	0	110	8	0
14			(*)		0		0	8	* 0	a 15	5	0
15					12		0	* 4	0	a 10	a 0	0
16				(*)	38		16	3	0	83	0	0
17		(*)			30		* 33	0	0	a 50	* 0	0
18					21		47	0	0	a 20	0	0
19					19		121	0	0	70	0	0
20					16	(*)	106	0	0	a 60	0	* 0
21					12		141	0	0	a 45	0	0
22					8		127	0	0	a 40	0	0
23					4		a 60	0	0	* 35	0	0
24	(*)				a 0		a 40	0	0	50	* 0	0
25					0		a 40	0	* 0	* 17	0	* 87
26					0		42	0	50	12	0	54
27					* 0		* 52	0	* 3	29	0	* 43
28					0		51	0	a 0	74	0	48
29					-	(*)	39	* 0	0	88	0	44
30					-----		34	0	0	* 96	* 0	56
31		-----			-----		-----	0	-----	* 410	0	-----
Total	0	0	0	0	160	0	949	244	53	1,597	1,301	343
Mean	0	0	0	0	5.7	0	31.6	7.9	1.8	51.5	42.0	11.4
Ac-ft	0	0	0	0	317	0	1,880	484	105	3,170	2,580	680

Calendar year 1961: Max 116 Min 0 Mean 2.2 Ac-ft 1,570
 Water year 1961-62: Max 459 Min 0 Mean 12.7 Ac-ft 9,220

Peak discharge (base, 1,000 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
7-31	0145	11.62	1,130	8-1	2215	15.30	1,880
7-31	2315	14.74	1,760				

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

a No gage-height record.

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 1962.

Gage.--Water-stage recorder. Altitude of gage is 3,570 ft (from topographic map).

Extremes.--Maximum discharge during year, 43 cfs Sept. 24 (gage height, 2.97 ft), from rating curve extended above 9 cfs by logarithmic plotting; no flow for most of year.

1958-62: Maximum discharge, that of Sept. 24, 1962; no flow for most of time.

Remarks.--Records poor. No diversions above station.

Discharge, in cubic feet per second, water year October 1961 to September 1962

Sept. 24.....1.4

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
September 1962.....	1.4	1.4	0	0.05	2.8
Calendar year 1961.....	-	.2	0	.0005	.4
Water year 1961-62.....	-	1.4	0	.004	2.8

Note.--Flow also occurred on Aug. 1, Sept. 2, 25, but daily discharge was less than 0.05 cfs. 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 1962. 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.--23 years (1939-62), 17.6 cfs (12,740 acre-ft per year).

Extremes.--Maximum discharge during year, 7,120 cfs July 31 (gage height, 16.75 ft); no flow for most of year.

1939-62: 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 (adjusted 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 fair. Diversions for irrigation of about 350 acres (1959 determination) above station.

Discharge, in cubic feet per second, water year October 1961 to September 1962

July 18..... 6	Aug. 3..... *34	Sept. 3..... 48
29..... 100	4..... 12	4..... *1
30..... *1,090	5..... 6	26..... 13
31..... *1,170	6..... 4	27..... 4
Aug. 1..... 486	Sept. 2..... 453	30..... 14
2..... *383		

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
July 1962.....	2,366	1,170	0	76.3	4,690
August.....	925	486	0	29.8	1,830
September.....	533	453	0	17.8	1,060
Calendar year 1961.....	-	934	0	2.7	1,940
Water year 1961-62.....	-	1,170	0	10.5	7,580

Peak discharge (base, 500 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
7-30	0715	12.81	2,770	8-2	0530	12.20	2,350
7-31	1310	16.75	7,120	9-2	0700	11.55	1,960
8- 1	1045	10.60	1,460				

* Discharge measurement made on this day.

Note.--Flow occurred only on days listed above. Observations 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 1962.

Gage.--Water-stage recorder and rock control. Datum of gage is 3,327.07 ft above mean sea level, datum of 1929.

Average discharge.--24 years, 297 cfs (215,000 acre-ft per year).

Extremes.--Maximum discharge during year, 3,800 cfs July 31 (gage height, 7.30 ft); no flow Aug. 26.

1938-62: 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, 1962.

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 except those for periods of no gage-height record, which are fair. Flow partly regulated by Alamogordo Reservoir (see p. 155). Diversions and ground-water withdrawals for irrigation of about 124,000 acres (1959 determination) above station.

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

1.2	0	2.4	89
1.4	2	2.7	170
1.6	6	3.0	278
1.8	16	3.5	510
2.0	30	4.0	790
2.2	53	5.2	1,700

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	18	320	106	81	75	43	48	30	811	56	*889	909
2	20	235	111	83	*73	50	58	32	860	55	682	1,700
3	21	155	108	91	71	52	52	43	902	32	*342	1,300
4	24	126	106	87	71	53	49	46	916	50	180	*1,070
5	21	111	103	85	63	50	46	40	874	41	111	1,070
6	23	103	101	85	59	37	52	36	916	31	83	1,140
7	27	94	101	85	58	38	56	38	881	35	*56	1,010
8	30	91	101	83	56	45	59	26	*874	48	36	460
9	35	101	103	81	55	40	46	24	881	62	17	262
10	37	99	103	40	58	269	39	17	902	*1,060	4	*158
11	29	101	101	a35	58	659	32	21	937	388	1	111
12	24	106	a95	a60	59	724	*38	21	944	210	5	83
13	28	106	a95	a80	61	754	33	19	1,040	118	*6	66
14	32	113	a100	a100	67	766	32	17	*1,450	79	5	*59
15	37	124	*106	a95	71	832	37	*14	856	66	3	52
16	46	129	103	*89	69	*825	36	10	378	55	2	41
17	45	*137	99	69	75	804	36	13	210	*21	*3	34
18	48	137	101	66	73	811	33	8	140	32	2	28
19	53	137	106	69	67	881	*24	4	89	34	2	*20
20	48	135	103	75	63	*881	23	4	61	14	2	30
21	50	126	99	87	59	846	24	8	38	15	2	33
22	66	124	89	106	58	839	18	5	30	27	2	25
23	64	116	87	106	50	825	37	17	28	45	3	28
24	*56	113	87	101	52	797	30	21	28	25	*3	33
25	53	111	87	*101	55	401	32	*16	25	36	1	38
26	46	111	87	96	53	*214	27	9	27	*24	0	114
27	39	111	87	111	53	129	*22	12	24	697	1	149
28	39	108	87	106	*43	94	25	14	21	572	1	*137
29	48	108	87	99	-	81	35	430	19	286	2	135
30	53	108	85	87	-----	59	40	*659	29	*1,220	464	126
31	85	-----	85	79	-----	49	-----	682	-----	1,120	1,240	-----
Total	1,245	3,796	3,019	2,618	1,725	12,948	1,119	2,336	15,191	6,554	4,150	10,421
Mean	40.2	127	97.4	84.5	61.6	418	37.3	75.4	506	211	134	347
Ac-ft	2,470	7,530	5,990	5,190	3,420	25,680	2,220	4,630	30,130	13,000	8,230	20,670

Calendar year 1961: Max 2,030 Min 12 Mean 184 Ac-ft 133,100
 Water year 1961-62: Max 1,700 Min 0 Mean 178 Ac-ft 129,200

Peak discharge (base, 2,500 cfs).--July 31 (0830) 3,800 cfs (7.30 ft).

* Discharge measurement made on this day.
 a No gage-height record.

8-3960. Cottonwood Creek near Lake Arthur, N. Mex.

Location.--Lat 32°54'55", long 104°22'00", in SW¼SE¼ sec.15, T.16 S., R.26 E., on right bank 75 ft upstream from road bridge, 1½ 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 1962. 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.--28 years (1932-34, 1935-36, 1937-62), 5.97 cfs (4,320 acre-ft per year).

Extremes.--Maximum discharge during year, 2.4 cfs July 16 (gage height, 1.67 ft); minimum daily, 0.1 cfs for many days.
1932-62: 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 poor. 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.

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.1	0.2	0.2	0.2	0.3	0.4	0.5	0.2	0.3	0.1	0.2	0.1
2	.1	.1	.2	.2	.3	.4	.5	.2	.3	.1	.2	.1
3	.1	.1	.3	.2	.3	.4	.5	.2	.3	.1	.2	.1
4	.1	.1	.3	.2	.4	.5	.5	.2	.3	.1	.2	.1
5	.1	.2	.2	*.3	.4	.4	.5	.2	.3	.1	.2	.2
6	.1	.2	.3	.3	.3	.4	.6	.2	.3	.1	.2	.2
7	.1	.2	.3	.3	.3	.5	.5	.2	.3	.1	*.2	.3
8	.1	.2	.3	.3	.4	.5	.4	.2	.3	.1	.2	.4
9	.1	.2	.3	.3	.4	.5	.4	.3	.3	.1	.2	.4
10	.1	.2	.3	.3	.4	.5	.4	*.3	.2	.1	.2	.4
11	.1	.2	.3	.3	.3	.6	.4	.2	.2	.1	.2	.4
12	.1	.2	.3	.3	.4	.5	*.3	.2	.2	.1	.2	.4
13	.1	.3	.3	.3	.3	.5	.3	.2	.2	.1	.2	.4
14	.1	.3	.3	.2	.4	.5	.3	.2	.2	.1	.2	*.3
15	.1	.3	*.3	.2	.4	.6	.3	.2	.2	.1	.2	.3
16	.1	.3	.3	*.3	.4	.6	.3	.2	.1	*.5	.1	.2
17	.1	.3	.3	.3	.5	.6	.4	.5	.1	.7	.2	.1
18	.1	.3	.3	.3	.5	.6	.4	.9	.1	.5	.2	.1
19	.1	.3	.2	.3	.5	.6	*.4	.8	.1	.1	.1	.2
20	.1	*.3	.2	.3	.5	.7	.3	.8	.1	.1	.2	.1
21	.1	.3	.2	.3	.5	.6	.4	.8	.1	.1	.1	.1
22	.1	.3	.2	.3	.5	*.6	.4	.6	.1	.1	.1	.1
23	.1	.3	.2	.3	.5	.6	.4	.4	.1	.1	.1	.1
24	*.1	.3	.2	.3	.5	1.0	.3	.4	.1	.1	.1	.1
25	.1	.3	.2	*.3	.4	.6	.2	*.4	*.1	.1	.1	.1
26	.1	.3	.2	.4	.4	.5	.3	.4	.1	*.1	.1	.1
27	.1	.2	.2	.3	.4	.5	.3	.4	.1	.1	.1	.1
28	.1	.2	.2	.3	*.4	.5	.3	.4	.1	.1	.1	.1
29	.1	.2	.2	.3	-	.5	.2	.3	.1	.3	.1	.2
30	.1	.2	.2	.3	-----	.5	.2	.3	.1	.4	*.1	.2
31	.1	-----	.2	.3	-----	.5	-----	.3	-----	.3	.1	-----
Total	3.1	7.1	7.7	8.8	11.3	16.7	11.2	11.1	5.4	5.2	4.9	6.0
Mean	0.10	0.24	0.25	0.28	0.40	0.54	0.37	0.36	0.18	0.17	0.16	0.20
Ac-ft	6.1	14	15	17	22	33	22	22	11	10	9.7	12

Calendar year 1961: Max 3.6 Min 0.1 Mean 0.81 Ac-ft 586
 Water year 1961-62: Max 1.0 Min 0.1 Mean 0.27 Ac-ft 194

* Discharge measurement made on this day.

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 1962. 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; 26 years (1936-62), 320 cfs (231,700 acre-ft per year).

Extremes.--Maximum discharge during year, 3,260 cfs Aug. 1 (gage height, 10.43 ft); minimum daily discharge, 1 cfs Aug. 22-29. 1905-62: 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 in August 1893 and October 1904 damaged McMillan Dam and washed out Avalon Dam.

Remarks.--Records fair. Flow partly regulated by Alamogordo Reservoir (see p. 155) since August 1937. Diversions and ground-water withdrawals for irrigation of about 154,000 acres (1959 determination) above station. Discharge represents inflow to Lake McMillan which is part of the storage system for the irrigation of about 25,000 acres of the Carlsbad project.

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	19	* 187	103	87	89	46	45	45	749	36	* 1,280	860
2	* 17	276	102	86	* 83	46	* 50	38	800	* 62	* 766	1,450
3	18	172	104	91	80	50	62	39	839	49	* 450	1,440
4	18	132	106	96	77	51	56	51	* 893	37	* 254	* 1,100
5	20	108	104	* 89	74	55	56	51	845	51	120	1,040
6	19	102	103	89	67	50	54	42	878	45	97	1,120
7	19	98	104	87	65	* 42	62	37	851	33	* 64	* 1,070
8	22	91	107	86	66	43	65	39	* 854	37	52	650
9	24	99	107	85	64	46	67	* 31	860	49	36	285
10	27	102	108	65	61	56	51	26	884	* 785	22	* 168
11	29	99	108	50	66	484	* 39	23	932	515	9	117
12	27	106	106	60	64	* 685	45	23	899	* 236	5	90
13	23	110	107	70	64	756	49	22	* 1,030	134	* 4	* 67
14	25	119	112	84	70	780	49	20	* 1,400	70	8	49
15	29	121	* 117	90	76	828	48	20	1,060	51	8	52
16	34	128	115	75	76	* 834	57	18	421	56	4	44
17	40	135	110	* 97	76	822	48	15	226	* 41	* 4	39
18	39	142	107	75	79	819	56	20	156	20	3	34
19	44	140	112	72	75	882	54	16	* 108	29	2	* 28
20	45	* 140	113	77	71	872	* 34	11	73	29	2	24
21	43	133	108	85	68	844	33	7	57	12	2	32
22	47	129	102	98	65	828	35	8	42	11	1	31
23	55	124	98	113	61	* 810	29	* 7	32	25	1	27
24	55	120	98	108	58	804	45	13	30	32	1	30
25	53	116	97	* 111	53	550	41	19	34	23	1	38
26	49	115	96	104	51	263	45	18	30	* 34	1	45
27	47	111	95	108	52	* 151	38	13	29	157	1	146
28	44	108	95	113	* 55	105	30	10	30	782	1	126
29	46	107	95	106	-	84	34	133	28	344	1	138
30	51	* 103	91	103	-----	65	* 45	* 612	27	1,130	34	126
31	56	-----	87	93	-----	50	-----	674	-----	* 557	* 1,100	-----
Total	1,084	3,773	3,217	2,753	1,906	1,280	1,422	2,101	15,097	5,472	4,334	10,466
Mean	35.0	126	104	88.8	68.1	41.3	47.4	67.8	503	177	140	349
Ac-ft	2,150	7,480	6,380	5,460	3,780	2,530	2,820	4,170	29,940	10,850	8,600	20,760

Calendar year 1961: Max 1,680 Min 5 Mean 181 Ac-ft 131,200
 Water year 1961-62: Max 1,450 Min 1 Mean 177 Ac-ft 127,800

Peak discharge (base, 2,000 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
7-30	1615	9.24	2,150	9-2	1830	9.71	2,260
8-1	0115	10.43	3,260				

* 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, July to September 1962 (annual maximum only), October 1956 to June 1962 (discontinued).

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 (1956-61), 5.84 cfs (4,230 acre-feet per year).

Extremes.--Maximum discharge during year, 7,070 cfs July 29 (gage height, 12.10 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.

1952-62: 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.

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

1.7	0	2.0	3.3
1.8	.3	2.1	7.0
1.9	1.2	2.2	12

Discharge, in cubic feet per second, October 1961 to June 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.9	1.9	3.6	4.6	8.5	7.0	4.6	1.5	0			
2	3.6	1.5	3.6	5.0	8.0	6.6	3.3	* 1.2	0			
3	2.8	2.8	3.0	5.0	8.0	6.2	3.0	.6	0			
4	2.1	2.5	3.3	5.0	7.0	6.6	3.6	.6	0			
5	1.9	2.8	3.9	5.8	7.0	6.6	3.6	.6	0			
6	1.5	2.3	3.6	5.8	7.5	6.2	3.9	.4	0			
7	1.2	1.9	3.9	5.4	7.0	3.9	4.2	.7	0			
8	1.5	2.3	3.9	5.8	7.0	3.9	2.3	.2	0			
9	1.4	2.1	3.9	5.4	6.6	4.6	* 1.9	** .1	0			
10	1.2	1.7	3.6	a 5.0	7.0	6.6	2.1	0	0			
11	1.2	1.7	3.6	a 5.5	7.0	8.0	1.7	0	0			
12	1.2	2.1	3.9	a 6.0	7.0	5.8	1.7	0	0			
13	1.5	5.3	* 3.9	6.2	7.0	4.2	1.9	.2	0			
14	1.9	1.0	3.9	6.2	7.5	6.6	1.7	0	0			
15	1.2	7.2	3.9	* 6.2	7.0	6.6	3.3	0	* 0			
16	1.5	* 3.3	3.9	a 6.0	7.0	6.6	3.3	0	0			
17	1.5	3.6	4.2	a 6.0	7.0	6.6	3.3	0	0			
18	1.5	3.6	4.6	a 6.5	6.6	6.2	2.5	0	0			
19	1.7	3.3	4.6	a 6.5	6.6	6.2	2.1	0	0			
20	1.5	3.6	4.2	a 6.5	6.6	5.8	2.1	0	0			
21	1.2	3.6	3.9	a 7.0	6.6	4.6	1.9	0	0			
22	1.1	3.6	3.9	a 7.0	6.6	* 3.0	2.1	0	0			
23	1.0	3.6	3.9	a 7.5	6.6	3.6	1.9	0	0			
24	1.0	3.3	4.2	* 7.5	6.2	4.2	1.2	0	0			
25	* 1.0	3.3	4.2	7.5	6.2	5.8	* 1.1	0	0			
26	1.5	3.3	4.6	7.5	* 6.2	3.9	1.4	0	0			
27	1.5	3.3	4.6	7.5	6.6	3.0	1.5	0	9.0			
28	1.9	3.6	5.0	8.0	7.0	2.8	1.5	* 0	0			
29	1.5	3.6	4.2	8.0	-	3.0	1.9	0	0			
30	1.7	3.6	4.2	8.0	-----	* 3.6	2.3	0	0			
31	1.7	-----	4.6	8.5	-----	3.6	-----	0	-----			
Total	50.9	100.3	124.3	198.4	194.9	161.9	72.9	6.1	9.0			
Mean	1.64	3.34	4.01	6.40	6.96	5.22	2.43	0.20	0.30			
Ac-ft	101	199	247	394	387	321	145	12	18			

Calendar year 1961: Max 72 Min 0 Mean 3.34 Ac-ft 2,420
 Water year 1961-62: Max - Min - Mean - Ac-ft -

Peak discharge (base, 300 cfs).--No peak above base.

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

** Field estimate made on this day.

a No gage-height record.

RIO GRANDE BASIN

8-3985. Rio Penasco at Dayton, N. Mex.

Location--Lat 32°44'30", long 104°22'30", in SW¼SW¼ 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, ¾ miles upstream from mouth, and 7 miles southeast of Artesia.

Drainage area--1,070 sq mi, approximately.

Records available--April 1951 to September 1962. 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--11 years, 5.4 cfs (3,910 acre-ft per year).

Extremes--Maximum discharge during year, 7,310 cfs Aug. 2 (gage height, 5.57 ft); no flow most days.

1951-62: 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.

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

0.4	0	1.0	133
.5	4	1.3	317
.6	15	1.6	603
.7	33	2.0	1,180
.8	58		

Discharge, in cubic feet per second, water year October 1961 to September 1962

Apr. 6.....	4	June 14.....	17	Aug. 2.....	*1,120
19.....	1	July 29.....	613	3.....	43
June 12.....	107	30.....	*1,000	4.....	*4
13.....	459	31.....	**11		

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
April 1962.....	5	4	0	0.2	9.9
June.....	583	459	0	19.4	1,160
July.....	1,624	1,000	0	52.4	3,220
August.....	1,167	1,120	0	37.6	2,310
Calendar year 1961.....	-	275	0	.8	545
Water year 1961-62.....	-	1,120	0	9.3	6,700

Peak discharge (base, 750 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
6-12	0030	1.78	833	7-30	0630	4.36	5,110
6-13	0945	4.18	4,820	8- 2	0330	5.57	7,310
7-29	1845	4.14	4,750				

* Discharge measurement made on this day.

** Field estimate made on this day.

Note--Flow occurred only on days listed above. Observation of no flow generally made 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 1962. 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.--12 years, 169 cfs (122,400 acre-ft per year).

Extremes.--Maximum daily discharge during year, 1,810 cfs Sept. 3; no flow Aug. 18-30.

1950-62: Maximum daily discharge, 2,920 cfs July 12, 1960; no flow at times in most years.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Flow partly regulated by Alamogordo Reservoir (see p. 155). 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 Mar. 11-25, Apr. 11 to May 31)

Oct. 1 to May 31

June 1 to Aug. 30

Aug. 31 to Sept. 30

0.3	6	-0.15	0	0.1	21
.4	12	0	2	.4	51
.6	30	.2	8	.8	126
.9	72	.4	24	1.5	298
1.5	201	.7	63	3.0	770
2.5	505	1.0	116	5.0	1,580
3.5	860	1.5	235		
		5.0	1,460		

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	11	*107	101	81	88	50	48	45	696	a 17	*1180	821
2	*13	294	101	79	*83	48	*41	37	771	*42	798	1200
3	11	191	103	81	81	53	59	36	822	48	*540	1570
4	13	134	103	*92	77	55	56	41	870	26	*322	*1110
5	14	105	101	86	76	56	58	48	*836	34	186	1030
6	16	92	100	83	70	58	58	41	846	34	a 130	1100
7	13	90	98	83	66	49	59	37	839	27	*93	*1080
8	16	79	101	81	67	43	66	38	829	17	69	734
9	18	86	101	79	69	50	69	*31	849	28	50	a 350
10	22	92	103	b 60	64	48	56	28	856	624	27	*205
11	23	90	103	b 45	66	388	42	23	910	533	a 12	*137
12	23	92	103	b 50	66	662	42	22	893	*249	a 6	99
13	18	101	101	b 65	66	722	48	22	948	155	*3	*72
14	16	107	105	76	70	732	46	21	*1270	81	2	54
15	19	109	115	70	79	774	45	20	1070	52	3	46
16	24	120	115	76	77	*785	46	18	a 460	43	*3	50
17	30	124	107	*92	76	778	50	16	a 240	50	1	42
18	30	134	103	81	77	771	48	18	a 175	*21	0	46
19	34	132	107	69	79	802	52	19	*112	14	0	*31
20	38	*137	115	70	72	832	*41	14	83	24	0	26
21	36	132	109	77	70	828	34	9	52	14	0	26
22	36	126	103	88	66	810	34	6	39	6	0	35
23	48	122	92	105	64	799	32	9	27	3	0	28
24	49	115	92	107	61	792	38	6	a 24	27	0	26
25	45	111	92	105	58	628	38	17	a 24	17	0	39
26	41	111	92	103	53	a 320	38	17	25	25	0	36
27	37	109	90	98	53	*176	38	14	a 22	22	0	119
28	32	105	88	115	*59	117	32	9	a 23	914	0	137
29	31	*103	88	109	-	96	28	68	a 21	363	0	141
30	38	101	85	103	-----	76	*36	*550	a 19	931	*0	130
31	43	-----	81	98	-----	55	-----	648	-----	630	991	-----
Total	838	3,551	3,098	2,607	1,953	12,453	1,378	1,928	14,651	5,075	4,415	10,520
Mean	27.0	118	99.9	84.1	69.8	402	45.9	62.2	488	164	142	351
Ac-ft	1,660	7,040	6,140	5,170	3,870	24,700	2,730	3,820	29,060	10,070	3,760	20,870

Calendar year 1961: Max 1,480 Min 0 Mean 175 Ac-ft 126,400
Water year 1961-62: Max 1,570 Min 0 Mean 171 Ac-ft 123,900

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

a No gage-height record.

b Stage-discharge relation affected by ice.

8-4000. Four Mile Draw near Lakewood, N. Mex.

Location.--Lat 32°40'22", long 104°22'10" in SE¼NE¼SW¼ sec.10, T.19 S., R.26 E., on right bank 50 ft upstream from ford on Lakewood-Dayton road, 1.8 miles downstream from U. S. Highway 285, 2.8 miles north of Lakewood, 3¼ miles upstream from mouth, and 11½ miles south of Artesia.

Drainage area.--265 sq mi, approximately.

Records available.--October 1951 to September 1962.

Gage.--Water-stage recorder. Datum of gage is 3,305.22 ft above mean sea level, datum of 1929. Prior to June 19, 1962, at site 1.8 miles upstream at datum 24.53 ft higher.

Average discharge.--11 years, 1.53 cfs (1,110 acre-ft per year).

Extremes.--Maximum discharge during year, 1,880 cfs June 14 (gage height, 10.10 ft), from rating curve extended above 560 cfs on basis of logarithmic plotting; no flow for most of time.

1951-62: 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 poor. No known diversions above station.

Discharge, in cubic feet per second, water year October 1961 to September 1962

June 9	*12	July 31	19
13	34	Aug. 1	1
14	*320	2	*354
15	80	3	*30
July 30	*61	4	*6

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
June 1962.....	446	320	0	14.9	885
July.....	80	61	0	2.6	159
August.....	391	354	0	12.6	776
Calendar year 1961.....	-	.4	0	.001	.8
Water year 1961-62.....	-	354	0	2.5	1,820

Peak discharge (base, 200 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
6-13	1915	4.15	301	7-30	1730	3.75	360
6-14	1740	10.10	1,880	8- 2	1215	6.22	1,720

* Discharge measurement 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 1962 (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.--17 years (1906-7, 1939-40, 1947-62), 109 cfs (78,910 acre-ft per year).

Extremes.--Maximum discharge during year, 1,540 cfs Aug. 29 (gage height, 5.93 ft); no flow for many days.

1939-40, 1947-62: 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. 155). No flow over McMillan Dam spillways during year. 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)

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 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	(*)			0	0	171	58	0	117	0	500
2	**0				0	0	*422	58	62	*115	0	346
3	91				0	0	514	58	107	145	0	128
4	117			(*)	0	0	496	58	159	175	0	0
5	90				0	0	467	58	*230	244	0	*0
6	88				0	0	458	58	256	259	0	3
7	26				0	0	446	58	213	236	0	4
8	0				0	0	410	87	190	141	0	0
9	0				0	0	410	*185	118	113	0	0
10	0				0	0	410	183	0	173	0	0
11	27				0	0	410	183	0	206	260	0
12	91				0	0	376	183	0	241	403	0
13	59				0	0	241	183	0	185	458	*0
14	40				0	0	211	183	0	125	483	0
15	39				0	0	208	183	0	113	479	0
16	39				0	0	271	180	0	113	475	0
17	39				*0	0	290	178	60	224	303	*63
18	13				0	0	256	175	265	403	277	104
19	0				*0	0	256	116	227	399	344	161
20	0				0	0	426	0	219	365	376	195
21	0				0	0	492	0	253	224	300	195
22	0				287	0	246	0	284	193	268	253
23	0				284	0	*0	0	300	193	306	224
24	0				280	0	0	0	333	216	450	163
25	0				280	262	0	0	422	172	434	50
26	0				280	442	0	0	391	104	306	0
27	0				*92	366	0	0	344	102	337	0
28	0				0	139	0	0	265	35	426	0
29	0	(*)			-	113	112	0	185	0	770	0
30	0				-----	113	*88	0	133	0	259	0
31	0	-----			-----	113	-----	*0	-----	0	249	-----
Total	759	0	0	0	1,503	1,548	8,087	2,425	5,016	5,331	7,963	2,389
Mean	24.5	0	0	0	53.7	49.9	270	78.2	167	172	257	79.6
Ac-ft	1,510	0	0	0	2,980	3,070	16,040	4,810	3,950	10,570	15,790	4,740

Calendar year 1961: Max 657 Min 0 Mean 120 Ac-ft 86,680

Water year 1961-62: Max 770 Min 0 Mean 95.9 Ac-ft 69,460

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

** Field estimate made on this day.

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 1962.

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.--19 years, 184 cfs (133,200 acre-ft per year).

Extremes.--Maximum discharge during year, 4,420 cfs Sept. 3 (gage height, 6.35 ft); minimum daily, 30 cfs Nov. 2.

1939-40, 1944-62: 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 no gage-height record, which are fair. Flow regulated by Alamogordo Reservoir and Lake McMillan (see p. 155). Diversions and ground-water withdrawals for irrigation of about 173,000 acres (1959 determination) above station. Discharge represents inflow to Lake Avalon.

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

Oct. 1 to Feb. 4				Feb. 5 to Sept. 30			
0.1	26	0.1	26	1.5	360		
.3	49	.4	60	2.0	580		
.5	81	.7	113	3.0	1,160		
1.0	196	1.0	190	4.0	1,940		

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	49	*33	40	45	45	54	159	103	*32	150	*49	500
2	*45	30	40	46	45	53	*392	*103	36	150	*144	404
3	61	31	40	46	45	50	537	103	105	*173	88	1,440
4	180	32	40	*45	45	50	537	101	144	208	46	113
5	130	32	40	45	*46	50	495	101	220	266	45	48
6	128	32	41	46	46	50	500	99	249	300	45	*42
7	110	32	42	46	45	48	491	99	246	286	45	43
8	48	33	42	45	45	45	446	97	202	214	45	44
9	44	34	41	45	45	46	446	205	205	159	45	38
10	42	34	42	44	46	45	442	220	60	190	46	37
		33										
11	41	33	45	44	46	44	442	217	43	246	166	38
12	112	32	44	44	46	45	434	214	40	272	408	38
13	119	36	44	45	48	45	315	214	38	252	451	39
14	81	36	45	46	49	45	259	214	37	184	495	39
15	81	32	44	46	48	44	255	214	37	157	491	41
16	81	33	44	48	48	44	297	211	36	154	491	42
17	81	34	44	46	45	43	341	211	40	182	413	58
18	76	34	41	45	48	44	304	208	290	413	308	136
19	42	34	44	45	48	44	300	780	260	421	341	159
20	39	34	44	45	48	43	413	178	250	413	396	214
21	37	34	44	45	48	43	523	41	280	290	350	214
22	36	35	44	45	202	45	418	39	310	223	320	249
23	36	35	44	45	300	44	74	38	330	220	330	266
24	36	35	44	45	304	45	68	36	340	217	490	205
25	35	36	44	45	300	157	66	34	450	252	480	140
26	34	36	44	45	304	442	64	34	420	165	390	55
27	34	36	45	45	*211	425	62	33	400	173	360	51
28	33	39	45	45	57	211	57	32	340	464	470	51
29	33	*39	45	45	-	152	94	32	230	724	800	51
30	33	39	45	45	-----	152	159	32	180	1,410	380	49
31	33	-----	45	45	-----	152	-----	32	-----	260	*149	-----
Total	1,970	1,025	1,336	1,402	2,653	2,800	9,390	4,275	5,850	9,188	9,077	4,844
Mean	63.5	34.2	43.1	45.2	94.8	90.3	313	138	195	296	293	161
Ac-ft	3,910	2,030	2,650	2,780	5,260	5,550	18,620	8,480	11,600	18,220	18,000	9,610

Calendar year 1961: Max 654 Min 30 Mean 173 Ac-ft 125,300
 Water year 1961-62: Max 1,440 Min 30 Mean 147 Ac-ft 106,700

Peak discharge (base, 1,700 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
5-19	1945	5.45	3,380	7-30	1110	5.69	3,640
7-29	1720	5.13	3,030	9-3	1000	6.35	4,420

* Discharge measurement made on this day.

Note.--No gage-height record Jan. 7 to Feb. 4, May 24 - 31, June 12 to July 2, Aug. 21-30.

8-4035. Carlsbad main canal at head, near Carlsbad, N. Mex.

Location.--Lat 32°29'28", long 104°15'08", in N $\frac{1}{2}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ 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 1962.

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, 1951-62: 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 1961 to September 1962

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	117	0	63.3	3,890
November.....	0	0	0	0
December.....	0	0	0	0
Calendar year 1961	439	0	134	97,160
January.....	0	0	0	0
February.....	342	0	111	6,180
March.....	316	0	64.9	3,990
April.....	451	66	282	16,810
May.....	215	46	119	7,330
June.....	336	0	175	10,410
July.....	352	73	214	13,190
August.....	467	84	325	20,000
September.....	311	48	146	8,720
Water year 1961-62	467	0	125	90,520

3-4040. 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 1962.

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.--11 years (1951-62), 41.2 cfs (29,830 acre-ft per year).

Extremes.--Maximum discharge during year, 142 cfs July 31 (gage height, 5.22 ft); no flow for most days.

1951-62: 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 fair. Flow regulated by Alamogordo Reservoir, Lake McMillan and Lake Avalon (see p.). Diversions and ground-water withdrawals above station for irrigation of about 198,000 acres (1959 determination). Station bypassed by Carlsbad main canal.

Discharge, in cubic feet per second, water year October 1961 to September 1962

July 31..... 23
Aug. 1..... *1

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
July 1962.....	23	23	0	0.7	46
August.....	1	1	0	.03	2.0
Calendar year 1961.....	-	310	0	15.6	11,310
Water year 1961-62.....	-	24	0	.07	48

* Observation of no flow made on this day.

Note.--Flow occurred only on days listed above. Observations of no flow generally made at least once a month.

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 1962 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--19 years (1903-4, 1905-6, 1914-15, 1920-36, corrected), 255 cfs (184,600 acre-feet per year), prior to completion of Alamogordo Dam; 26 years (1936-62, corrected), 203 cfs (147,000 acre-ft per year).

Extremes--Maximum discharge during year, about 650 cfs June 9 (gage height, 3.48 ft, backwater from inflow of side arroyo); minimum daily, 0.7 cfs Sept. 15.

1903-6, 1914-15, 1920-62: Maximum discharge probably exceeded 90,000 cfs Oct. 2, 1904 (gage height, 23.44 ft, from floodmarks); minimum daily, that of Sept. 15, 1962.

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 fair. Flow regulated by Alamogordo Reservoir, Lake McMillan, and Lake Avalon (see p. 155), 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)
(Shifting-control method used Oct. 1-4, 27, Dec. 29 to Jan. 3, Jan. 8)

0.42	0.7	0.7	5.3	1.1	24
.5	1.4	.8	8.5	1.4	44
.6	3.0	.9	13	1.8	77

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	58	* 29	30	22	27	29	25	26	* 22	17	a 18	9.8
2	* 56	30	12	25	27	* 30	* 40	* 28	22	19	a 25	27
3	54	29	27	25	29	30	42	28	18	* 21	a 10	25
4	37	15	28	* 28	29	30	29	34	19	23	a 15	26
5	1.6	23	28	29	* 27	29	27	20	19	23	a 17	30
6	1.8	23	29	28	27	30	26	20	19	33	a 17	32
7	1.1	33	30	27	28	32	27	27	17	30	a 15	37
8	1.1	29	38	14	27	30	27	36	18	30	* 11	31
9	* 1.2	29	34	23	27	30	13	30	70	15	23	30
10	1.8	28	34	23	27	32	19	* 18	34	30	27	14
11	1.0	28	25	23	27	29	22	27	23	29	27	32
12	1.2	28	34	25	26	29	23	20	21	15	26	32
13	14	17	33	27	26	29	27	10	22	32	16	56
14	17	23	34	27	27	30	27	20	22	30	29	* 24
15	20	23	34	26	26	30	25	28	33	30	32	.7
16	20	28	35	27	26	30	25	29	27	15	29	3.2
17	22	29	35	27	27	30	25	13	27	20	28	20
18	23	28	27	28	25	30	25	13	7.7	30	28	30
19	21	28	37	* 27	26	31	26	27	19	15	27	30
20	23	28	36	27	27	30	27	30	* 20	6.9	11	4.3
21	23	28	34	28	27	29	26	16	19	16	20	41
22	23	16	34	28	35	29	27	19	20	16	27	11
23	21	23	33	28	33	30	* 27	20	19	a 16	14	28
24	23	29	33	29	33	27	30	20	19	a 16	30	26
25	22	29	32	35	33	26	27	20	19	a 17	30	27
26	22	29	32	31	33	27	25	20	18	a 17	22	24
27	34	29	31	28	* 27	27	23	20	18	a 17	1.6	25
28	30	29	29	28	29	27	23	20	18	a 17	33	25
29	29	* 29	12	13	-	25	23	22	18	a 18	29	27
30	17	30	15	23	-----	26	26	22	17	a 18	15	25
31	25	-----	23	26	-----	25	-----	22	-----	a 18	* 33	-----
Total	6 44.8	7 99	928	8 05	7 88	8 98	7 84	7 05	6 64.7	6 49.9	6 85.6	7 53.0
Mean	20.8	26.6	29.9	26.0	28.1	29.0	26.1	22.7	22.2	21.0	22.1	25.1
Ac-ft	1 280	1 580	1 840	1 600	1 560	1 780	1 560	1 400	1 320	1 290	1 360	1 490

Calendar year 1961: Max 337 Min 0.8 Mean 51.3 Ac-ft 37,140
Water year 1961-62: Max 70 Min 0.7 Mean 24.9 Ac-ft 18,060

* Discharge measurement made on this day.
a No gage-height record.

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 1961 to January 1962 (discontinued). Periodic measurements of discharge from springs published as miscellaneous measurements, 1953-60. Miscellaneous measurements during period February to September 1962 published in table below.

Gages.--Water-stage recorders and Parshall flumes on ditches Nos. 1 and 2. Staff gage and V-notch weir 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, 2.48 cfs Jan. 18; minimum daily, 1.32 cfs Oct. 1
1961-62: Maximum daily discharge, 2.73 cfs Mar. 3, 1961; minimum daily, 0.17 cfs July 25, 1961.

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 February to September 1962

Date	Discharge	Date	Discharge	Date	Discharge
Feb. 7	*2.67	May 1	a0.88	Aug. 8	a1.40
26	*2.63	28	*1.07	Sept. 6	a.84
Apr. 3	a.76	June 29	*.11		

* Base flow.

a Flow affected by pumpage for Carlsbad Caverns Water Supply.

Discharge, in cubic feet per second, October 1961 to January 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.32	2.06	2.31	2.20								
2	1.45	2.08	2.30	2.26								
3	1.57	2.08	2.33	2.28								
4	1.65	2.13	2.31	2.30								
5	1.72	2.10	2.26	2.39								
6	1.74	2.11	2.04	2.39								
7	1.74	2.09	2.16	2.37								
8	1.76	2.13	2.25	2.42								
9	1.74	2.11	2.18	2.45								
10	1.80	2.15	2.21	2.40								
11	1.79	2.13	2.26	2.45								
12	1.80	2.17	2.26	2.46								
13	1.85	2.18	2.27	2.43								
14	1.85	2.15	2.09	2.38								
15	1.90	2.20	2.18	2.43								
16	1.95	2.21	2.25	2.43								
17	1.90	2.22	2.29	2.43								
18	1.95	2.20	2.29	2.43								
19	1.93	2.23	2.29	2.43								
20	1.91	2.22	2.28	2.35								
21	1.95	2.26	2.28	2.37								
22	1.98	2.21	2.27	2.34								
23	1.99	2.25	2.27	2.32								
24	2.03	2.25	2.25	2.29								
25	1.98	2.27	2.27	2.33								
26	2.03	2.29	2.33	2.30								
27	2.05	2.29	2.31	2.33								
28	1.97	2.29	2.29	2.36								
29	2.00	2.26	2.33	2.35								
30	2.02	2.29	2.30	2.38								
31	2.06	-----	2.30	2.37								
Total	57.38	656.1	700.1	734.5								
Mean	1.85	2.19	2.26	2.37								
Ac-ft	114	130	139	146								

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 1962.

Gage.--Water-stage recorder. Altitude of gage is 3,070 ft (from topographic map). March to December 1940 water-stage recorder and Cippoletti weir at site 0.3 mile downstream at different datum.

Average discharge.--15 years (1947-62), 12.6 cfs (9,120 acre-ft per year).

Extremes.--Maximum discharge during year, 2,230 cfs July 30 (gage height, 6.04 ft); minimum daily, 2.1 cfs Mar. 29, 30.

1946-62: 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, that of Mar. 29, 30, 1962.

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, except those above 100 cfs, which are good. Diversions and ground-water withdrawals for irrigation of about 1,000 acres (1959 determination) above station.

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

Oct. 1 to Feb. 8

Feb. 9 to Sept. 30

0.73	3.4	0.69	2.1	1.6	55
.8	5.5	.8	4.8	2.0	110
.9	9.4	.9	8.1	2.5	220
1.1	19	1.0	12	3.0	380
1.3	31	1.3	29	3.5	580
1.6	62				

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.9	4.9	6.6	7.0	5.2	3.5	5.7	* 6.3	5.1	4.0	*1.8	6.0
2	3.6	4.9	6.6	7.4	7.4	3.5	6.3	6.3	5.4	4.0	1.5	6.3
3	* 3.6	4.9	6.6	* 7.4	9.0	3.5	*6.3	6.3	5.7	1.3	1.0	6.7
4	3.6	4.9	6.6	7.4	9.0	3.5	7.0	6.3	5.7	6.8	8.1	* 6.7
5	3.6	5.2	6.6	7.0	*9.4	3.5	7.0	6.0	5.4	7.5	7.4	8.1
6	3.9	5.2	6.6	7.0	9	3.5	7.0	5.7	4.8	3.3	6.3	8.9
7	3.9	5.2	7.0	7.4	7	3.5	7.7	5.7	4.8	1.4	6.0	7.7
8	3.9	5.5	7.0	7.4	5	3.2	7.4	6.0	4.8	7.4	5.7	6.7
9	3.6	7.0	7.0	7.4	4.2	3.2	7.4	5.7	*4.2	5.4	5.4	6.3
10	3.6	6.2	6.6	7.0	4.0	3.2	6.7	5.7	1.7	5.1	5.1	6.3
11	3.4	5.9	6.6	7.0	4.0	2.7	7.0	5.7	7.7	4.5	4.8	6.3
12	4.6	5.9	6.6	7.0	3.7	2.3	7.0	5.4	7.0	*2.1	4.5	6.3
13	5.9	5.9	6.6	7.0	3.7	2.3	7.4	5.4	5.4	*1.8	4.8	6.3
14	5.3	7.0	6.6	7.0	4.0	2.7	7.4	5.1	5.1	1.3	4.8	6.3
15	2.2	6.6	7.0	7.0	4.0	3.0	7.4	5.4	4.5	7.0	4.8	6.3
16	9.0	6.2	7.0	6.6	4.0	2.7	7.4	5.4	4.0	5.4	4.5	6.3
17	6.2	6.2	6.6	6.2	3.7	2.5	7.4	5.4	3.7	4.5	4.8	6.3
18	5.5	5.9	6.6	6.2	3.5	2.3	7.4	5.4	4.0	4.5	5.1	7.0
19	4.9	5.9	6.6	6.2	3.5	2.3	7.7	7.5	4.0	5.7	5.4	1.9
20	4.6	5.9	6.6	5.9	3.5	2.3	7.7	7.7	4.2	9.7	5.1	9.3
21	4.6	6.2	6.6	5.9	3.5	2.3	7.4	6.7	4.2	5.7	4.8	7.0
22	4.2	6.2	7.0	5.9	3.5	2.3	7.0	5.7	4.0	4.8	4.8	6.7
23	3.9	6.2	7.0	5.9	3.5	2.3	7.0	5.4	4.2	4.5	4.8	6.3
24	3.9	6.2	7.0	5.9	3.5	2.3	7.0	5.4	4.2	1.70	4.8	6.3
25	3.9	6.2	6.6	6.2	3.5	2.3	7.0	5.1	4.2	1.50	4.8	8.9
26	* 3.9	6.2	7.0	5.9	*3.2	2.5	6.7	4.8	4.2	2.1	4.8	7.7
27	4.2	6.2	7.0	5.5	3.2	2.7	6.7	5.1	4.2	*3.1	5.1	7.4
28	4.2	* 6.2	7.0	5.2	3.2	2.3	6.7	* 4.8	4.2	1.1	5.1	7.0
29	3.9	6.2	7.0	5.2	-	2.1	6.3	4.8	* 4.2	*1.86	5.4	7.0
30	3.9	6.6	7.0	4.9	-----	2.1	6.3	5.1	3.7	4.35	5.7	6.7
31	4.2	-----	7.0	4.9	-----	2.7	-----	5.1	-----	2.8	6.0	-----
Total	201.1	177.7	210.2	199.9	133.9	85.1	210.4	176.4	191.6	952.5	191.7	220.1
Mean	6.49	5.92	6.78	6.45	4.78	2.75	7.01	5.69	6.39	30.7	6.18	7.34
Ac-ft	399	352	417	396	266	169	417	350	380	1890	380	437

Calendar year 1961: Max 53 Min 2.8 Mean 6.16 Ac-ft 4,460
 Water year 1961-62: Max 435 Min 2.1 Mean 8.08 Ac-ft 5,850

Peak discharge (base, 450 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
7-29	0910	4.41	1,050	7-30	0340	6.04	2,230

* 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 1962. 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.--16 years (1920-36, corrected), 274 cfs (198,400 acre-ft per year), prior to completion of Alamogordo Reservoir; 26 years (1936-62, corrected), 249 cfs (180,300 acre-ft per year).

Extremes.--Maximum discharge during year, 1,240 cfs July 30 (gage height, 6.44 ft); minimum daily, 17 cfs Mar. 22, Aug. 10.

1920-62: 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 except those for periods of no gage-height record, which are fair. Flow regulated by storage in Alamogordo Reservoir, Lake McMillan, and Lake Avalon (see p. 155), 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)

1.8	15	3.0	152
2.0	28	3.5	239
2.3	55	4.3	440
2.6	91		

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	166	70	68	56	57	42	31	20	27	30	a 35	33
2	91	71	70	60	65	*27	34	22	33	a 28	*49	34
3	*71	68	70	*66	70	24	*36	22	31	a 28	a 37	36
4	65	68	66	70	70	22	31	27	29	34	a 36	34
5	60	70	62	71	*70	22	33	37	29	32	a 35	35
6	58	48	63	67	64	22	34	40	25	27	a 36	40
7	68	32	64	71	64	22	28	36	23	34	a 31	45
8	68	27	66	71	66	20	24	31	23	a 30	a 27	39
9	*47	32	66	72	67	21	23	24	33	a 27	a 20	38
10	*39	30	70	64	62	31	21	23	252	28	a 17	35
11	38	30	70	a 58	62	26	23	21	205	25	a 20	37
12	*37	29	70	a 60	64	23	23	20	101	a 25	a 24	45
13	36	30	66	a 62	64	*23	27	20	71	a 26	a 27	34
14	35	30	66	64	66	24	26	19	62	a 25	a 30	30
15	63	30	67	66	70	23	27	20	54	a 25	39	32
16	51	41	68	64	67	22	30	20	52	a 25	41	29
17	57	58	68	65	63	20	30	20	53	27	30	29
18	60	65	67	64	68	21	30	24	62	a 25	29	30
19	63	70	66	65	64	22	33	42	64	a 24	30	30
20	63	68	60	64	62	20	30	52	45	a 22	30	35
21	63	68	65	64	65	20	25	57	33	26	29	29
22	64	71	68	65	66	19	25	38	a 25	a 24	28	27
23	64	68	67	65	64	17	22	26	a 26	a 23	29	27
24	60	63	67	65	67	18	22	24	a 25	a 21	34	28
25	*62	60	70	68	63	25	20	24	a 24	42	30	33
26	63	65	71	74	65	27	20	27	a 24	*43	31	38
27	63	68	70	73	65	28	21	28	a 24	29	*30	33
28	64	*68	70	68	63	25	20	26	a 23	32	30	31
29	70	68	71	67	-	23	20	*24	*27	121	33	32
30	70	68	70	65	-----	24	*20	24	42	433	30	31
31	70	-----	64	58	-----	34	-----	24	-----	74	30	-----
Total	1,949	1,634	2,086	2,032	1,823	737	789	862	1,547	1,415	957	1,009
Mean	62.9	54.5	67.3	65.5	65.1	23.8	26.3	27.8	51.6	45.6	30.9	33.6
Ac-ft	3,670	3,240	4,140	4,030	3,620	1,450	1,560	1,710	3,070	2,810	1,900	2,010

Calendar year 1961: Max 414 Min 24 Mean 73.0 Ac-ft 52,840
 Water year 1961-62: Max 433 Min 17 Mean 46.1 Ac-ft 33,420

Peak discharge (base, 1,800 cfs).--No peak above base.

* Discharge measurement made on this day.
 a No gage-height record.

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., on right bank 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 1962.

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.--14 years, 219 cfs (158,500 acre-ft per year).

Extremes.--Maximum discharge during year, 963 cfs July 30 (gage height, 3.47 ft), from rating curve extended above 330 cfs by logarithmic plotting; minimum daily, 17 cfs June 7, 8, Aug. 10.

1938-41, 1951-62: 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 except those for period of no gage-height record, which are fair. Flow regulated by storage in Alamogordo Reservoir, Lake McMillan, and Lake Avalon (see p.155), 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)

0.9	16
1.0	26
1.2	51
1.5	108
2.0	262
2.5	471

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	192	75	75	65	65	56	38	18	23	40	59	35
2	95	73	77	65	71	36	38	19	28	36	62	38
3	* 80	73	77	* 71	74	29	* 45	23	29	32	48	43
4	69	71	73	73	74	27	38	28	26	32	38	38
5	65	73	67	75	* 75	26	40	41	30	44	37	40
6	62	64	69	73	73	26	41	45	27	36	41	47
7	65	44	71	73	69	26	35	41	17	38	35	51
8	77	35	75	75	71	25	31	37	17	41	34	44
9	57	40	75	73	73	25	31	29	36	34	26	44
10	* 45	37	77	69	73	32	29	23	194	32	17	40
11	43	36	78	62	69	38	29	22	281	37	18	36
12	* 44	36	75	64	73	30	28	21	135	28	27	47
13	41	37	73	66	71	* 27	31	22	73	30	29	38
14	40	38	71	68	73	* 29	37	25	64	31	38	34
15	61	37	75	70	75	29	36	23	56	30	45	34
16	59	40	77	68	75	29	40	24	54	28	49	35
17	61	59	75	70	71	30	37	26	52	32	35	35
18	65	69	73	68	73	32	32	29	57	29	29	29
19	67	75	73	70	69	34	37	39	62	28	30	34
20	67	75	69	68	67	35	35	39	52	24	31	37
21	67	75	71	68	67	29	35	52	* 35	27	29	34
22	69	78	77	69	69	28	28	52	27	32	30	30
23	71	77	75	71	65	27	28	34	28	29	29	34
24	69	71	73	72	69	23	26	28	28	23	32	37
25	* 67	69	80	74	69	28	21	26	27	36	32	43
26	69	71	80	78	67	35	20	27	26	* 64	29	45
27	69	75	80	77	69	37	19	30	24	48	* 35	43
28	69	* 75	78	74	67	36	19	30	23	38	27	40
29	71	75	78	72	-	30	18	* 27	25	64	34	38
30	73	75	78	70	-----	29	* 18	24	41	464	31	37
31	71	-----	73	67	-----	38	-----	22	-----	135	29	-----
Total	2,120	1,828	2,318	2,178	1,976	961	940	976	1,597	1,622	1,065	1,160
Mean	68.4	60.9	74.8	70.3	70.6	31.0	31.3	31.5	53.2	52.3	34.4	38.7
Ac-ft	4,200	3,630	4,600	4,320	3,920	1,910	1,860	1,940	3,170	3,220	2,110	2,300

Calendar year 1961: Max 386 Min 26 Mean 77.5 Ac-ft 56,100
 Water year 1961-62: Max 464 Min 17 Mean 51.3 Ac-ft 37,180

* Discharge measurement made on this day.

Note.--No gage-height record Jan. 12 to Feb. 4.

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 1962.

Gage.--Water-stage recorder. Datum of gage is 2,850.05 ft above mean sea level, datum of 1929.

Average discharge.--25 years (1937-62), 236 cfs (170,900 acre-ft per year).

Extremes.--Maximum discharge during year, 1,260 cfs July 26 (gage height, 6.08 ft); minimum daily, 17 cfs May 1, 2.

1937-62: 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 except those for periods of no gage-height record, which are fair. Flow regulated by storage in Alamogordo Reservoir, Lake McMillan and Lake Avalon (see p. 155), 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)

2.7	12	3.7	152
3.0	36	4.1	256
3.3	73	4.5	388

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	144	78	73	63	57	62	38	17	26	37	103	27
2	124	78	73	59	56	*45	37	17	29	33	137	31
3	*87	78	75	*63	66	35	*38	18	35	31	52	35
4	73	76	72	67	69	31	43	21	34	30	38	37
5	69	76	66	67	*67	29	39	25	34	35	31	36
6	64	73	64	69	67	28	41	37	36	36	35	40
7	62	55	67	66	63	27	38	37	29	34	35	41
8	75	44	70	69	62	27	31	32	24	37	31	40
9	69	42	72	69	64	27	30	28	25	34	29	37
10	*51	43	72	69	63	26	29	23	94	32	23	36
11	45	41	75	62	60	36	29	21	302	31	19	33
12	*44	38	73	60	62	35	27	20	*262	31	20	33
13	43	38	73	63	63	31	26	19	92	27	26	39
14	41	40	69	63	64	29	32	21	69	28	29	31
15	44	40	72	64	66	31	35	22	56	29	39	30
16	64	39	72	64	66	30	33	20	51	28	44	32
17	56	48	72	62	63	31	37	24	50	29	41	31
18	63	64	72	63	62	31	35	31	51	29	30	31
19	67	72	70	63	69	33	32	25	55	27	29	28
20	67	76	69	63	62	34	35	96	54	26	31	31
21	67	76	66	64	60	32	33	48	40	24	30	33
22	67	76	70	64	62	30	31	52	*30	29	29	30
23	69	78	72	66	63	27	28	37	26	27	29	29
24	67	73	70	66	63	28	27	28	27	26	30	31
25	*66	69	72	69	67	25	23	25	25	35	31	38
26	67	69	75	72	64	31	20	25	25	207	30	40
27	69	73	75	73	67	33	19	26	25	*54	*29	40
28	70	*75	75	70	66	34	18	26	23	36	30	37
29	72	73	75	67	-----	33	18	*28	22	92	26	37
30	78	73	75	66	-----	31	*18	27	23	385	30	35
31	76	-----	72	64	-----	31	-----	25	-----	247	28	-----
Total	2,120	1,874	2,218	2,029	1,783	993	920	901	1,674	1,786	1,144	1,029
Mean	68.4	62.5	71.5	65.5	63.7	32.0	30.7	29.1	55.8	57.6	36.9	34.3
Ac-ft	4,200	3,720	4,400	4,020	3,540	1,970	1,820	1,790	3,320	3,540	2,270	2,040

Calendar year 1961: Max 381 Min 25 Mean 77.8 Ac-ft 56,340
 Water year 1961-62: Max 385 Min 17 Mean 50.6 Ac-ft 36,630

Peak discharge (base, 1,800 cfs).--No peak above base.

* Discharge measurement made on this day.

Note.--No gage-height record Apr. 14-29, July 2-23.

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 1962. 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.--25 years (1937-62), 14.2 cfs (10,280 acre-ft per year).

Extremes.--Maximum discharge during year, 2,150 cfs Aug. 1 (gage height, 4.96 ft); no flow at times.

1912-13, 1914-15, 1937-62: 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. No diversion above station.

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

0.1	0	1.1	6.5	2.3	64
.3	.2	1.3	10	2.6	133
.5	.7	1.5	14	2.9	240
.7	1.8	1.8	23		
.9	3.7	2.1	38		

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0	1.5	1.6	1.7	1.5	1.3	0.6		0	22.0	0
2	0	.8	1.5	1.7	1.7	*1.5	1.2	.6		0	*4.6	0
3	*0	.7	1.5	*1.7	1.7	1.5	*1.2	.6		0	7.8	0
4	0	.7	1.5	1.7	1.7	1.5	1.5	.6		0	3.8	*0
5	0	.6	1.4	1.6	*1.7	1.4	1.6	.5		0	2.4	2.7
6	0	.7	1.4	1.6	1.7	1.5	1.6	.4		0	1.5	3.2
7	0	.9	1.5	1.6	1.7	1.5	1.6	.3		7.3	1.2	1.1
8	0	1.1	1.6	1.6	1.7	1.5	1.5	.2		.6	.8	.4
9	0	2.1	1.5	1.5	1.7	1.5	1.4	.2		.1	.5	.1
10	0	1.7	1.5	1.5	1.6	1.5	1.2	.1		.7	.3	0
11	0	1.4	1.6	1.5	1.6	1.4	1.3	0		.1	.2	0
12	0	1.1	1.5	1.5	1.6	1.4	1.3	0		1.6	.1	0
13	0	1.1	1.5	1.5	1.7	1.4	1.3	0		3.8	.1	0
14	0	1.3	1.5	1.6	1.7	1.5	1.3	0		2.6	0	0
15	3.3	1.4	1.5	1.7	1.7	1.7	1.2	0		.5	0	2.6
16	4.0	1.4	1.5	1.9	1.7	1.7	1.2	0		*.6	0	1.4
17	1.4	1.4	1.5	1.9	1.6	1.6	1.2	0		.5	0	4.8
18	.4	1.4	1.5	2.0	1.5	1.5	1.2	0		.2	0	2.8
19	.1	1.4	1.5	1.9	1.5	1.5	1.4	.6		0	0	5.0
20	0	1.4	1.5	1.8	1.5	1.5	1.3	.1		0	0	1.7
21	0	1.5	1.5	1.7	1.5	1.5	1.2	0		0	0	1.0
22	0	1.5	1.5	1.7	1.5	1.4	1.0	0	(*)	0	0	.6
23	0	1.4	1.6	1.7	1.6	1.3	.9	0		0	0	.4
24	0	1.4	1.6	1.8	1.6	1.2	.9	0		0	0	.3
25	*0	1.4	1.6	2.2	1.5	1.2	1.0	0		0	0	.5
26	0	1.4	1.6	2.1	1.5	1.2	1.0	0		*1.90	0	.7
27	0	1.4	1.6	1.9	1.5	1.3	1.0	0		*3.5	*0	.9
28	0	*1.4	1.6	1.7	1.5	1.3	.9	0		1.1	0	.9
29	0	1.4	1.7	1.7	-	1.2	.8	*0		8.3	0	.9
30	0	1.5	1.7	1.7	-----	1.2	*.7	0		6.1	0	.7
31	0	-----	1.6	1.7	-----	1.2	-----	0	-----	2.1	0	-----
Total	9.2	36.9	47.6	53.3	45.2	44.1	36.2	48.0	0	453.8	284.7	93.9
Mean	0.30	1.23	1.54	1.72	1.61	1.42	1.21	0.15	0	14.6	9.18	3.13
Ac-ft	18	73	94	106	90	87	72	9.5	0	900	565	186

Calendar year 1961: Max 115 Min 0 Mean 2.23 Ac-ft 1,620

Water year 1961-62: Max 220 Min 0 Mean 3.04 Ac-ft 2,200

Peak discharge (base, 1,700 cfs).--Aug. 1 (2245) 2,150 cfs (4.96 ft).

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

Reservoirs in Rio Grande basin

8-2539. Costilla Lake.--Month-end contents published as a supplement to Costilla Creek below Costilla Dam.

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 1962. 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 0800 during year, 133,500 acre-ft June 4 (gage height, 6,880.9 ft); minimum, 2,430 acre-ft Dec. 21 to Mar. 27 (gage height, 6,775.0 ft). Maximum contents during period 1935-62, 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 0800. 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 NE¼SW¼ sec.24, T.17 N., R.10 E., on outlet tower at McClure Dam on Santa Fe River, 2½ 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 1962. 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 2400 during year, 3,090 acre-ft Apr. 25 (gage height, 103.0 ft); minimum, 1,780 acre-ft Sept. 30. Maximum contents during period 1947-62, 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 2400. 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 E½NE¼ 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, 2½ miles downstream from McClure Dam, and 3½ miles east of Santa Fe, N. Mex. Drainage area, 22.8 sq mi. Records available, December 1942 to September 1962. Water-stage recorder. Datum of gage is 7,313.2 ft above mean sea level, datum of 1929. Maximum contents at 2400 during year, 707 acre-ft May 9, 11-13 (gage height, 167.7 ft); minimum, 152 acre-ft Apr. 19 (gage height, 141.5 ft). Maximum contents during period 1943-62, 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 2400. 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 SW¼SW¼ sec.32, T.14 N., R.4 E., at corner of outlet works control tower of Jemez Canyon Dam, about 2¼ miles upstream from mouth and 6 miles north of Bernalillo, N. Mex. Drainage area, 1,034 sq mi. Records available, October 1953 to September 1962. Water-stage recorder. Datum of gage is at mean sea level (levels by Corps of Engineers). Maximum contents during year, 14,000 acre-ft May 15 (elevation, 5,173.2 ft); no contents for most of year. Maximum contents during period 1953-62, 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). Flood of spillway is at elevation 5,232.0 ft (capacity, 133,900 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 denton 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 SE¼ 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, 16,540 acre-ft Apr. 28 (elevation, 7,386.5 ft); minimum observed, 5,830 acre-ft Feb. 4 (elevation, 7,371.9 ft). Maximum contents determined during period 1927-50, 47,100 acre-ft in 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 0800 prior to Jan. 27, 1961, and from recorded gage heights at 2400 thereafter.

8-3605. Elephant Butte Reservoir.--Lat 33°09'15", long 107°11'30", in NW¼ 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 1962. Water-stage recorder. Datum of gage is 43.3 ft above mean sea level, datum of 1929. Maximum daily contents during year, 460,900 acre-ft May 23 (gage height, 4,329.80 ft); minimum daily, 202,300 acre-ft Oct. 1 (gage height, 4,304.38 ft). Maximum daily contents during period 1915-62, 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. 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 SE¼SW¼ 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 5¼ 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 1962. Water-stage recorder. Datum of gage is 43.3 ft above mean sea level, datum of 1929. Maximum daily contents during year, 143,000 acre-ft June 8 (gage height, 4,160.18 ft); minimum daily, 13,200 acre-ft Oct. 1 (gage height, 4,129.21 ft). Maximum daily contents during period 1938-62, 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 SW¼ 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 1962. Staff gage. Datum of gage is at mean sea level, Bureau of Reclamation datum. Maximum contents at 0800 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 1939-62, 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 August 1937. 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 0800. 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 SE¼ sec.2, T.20 S., R.26 E., near gates at 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 1962. Gage heights since January 1918 published in reports of Pecos River Commission. Float-tape gage. Datum of gage is 3,241.6 ft above mean sea level, Bureau of Reclamation datum. Maximum contents at 0800 during year, 33,440 acre-ft Mar. 25 (gage height, 25.00 ft); minimum, 246 acre-ft Aug. 31 (gage height, 14.45 ft). Maximum contents observed 1939-62, 68,500 acre-ft Sept. 26, 1941 (gage height, 29.95 ft); no storage at times in 1944-54 (corrected), 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 ft (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. No storage allocated to flood control. Figures given herein represent usable contents and are computed from daily gage readings at 0800. 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 SW¼ sec.12, T.21 S., R.26 E., on headwall at outlet gate of 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 1962. Gage heights since January 1919 published in reports of Pecos River Commission. Staff gage. Datum of gage is 3,157.0 ft above mean sea level, Bureau of Reclamation datum. Maximum contents at 0800 during year, 5,170 acre-ft July 31 (gage height, 20.50 ft); minimum, 510 acre-ft Oct. 31 (gage height, 13.40 ft). Maximum contents observed during period 1939-62, 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 of 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. No storage allocated to flood control. Figures given herein represent usable contents and are computed from daily gage readings at 0800. 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 1962. 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, 63,500 acre-ft Mar. 1, 6, 12, 18 (gage height, 2,808.0 ft); minimum observed, 30,300 acre-ft Sept. 29, 30 (gage height, 2,796.0 ft). Maximum contents observed during period 1937-62, 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. Red Bluff Water Power Control District furnished gage-height record and capacity curve, which was based on U. S. Geological Survey topographic map surveyed in 1925.

RIO GRANDE BASIN

155

Reservoirs in Rio Grande basin--Continued

Month-end elevations and contents, water year October 1961 to September 1962

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	6,846.6	66,370	-	98.8	2,700	-	160.6	507	-
Oct. 31	6,846.6	66,370	0	96.7	2,620	-150	155.8	394	-113
Nov. 30	6,812.2	25,020	-41,350	95.7	2,550	-70	153.9	354	-40
Dec. 31	6,775.0	2,430	-22,590	94.6	2,470	-80	151.8	313	-41
Calendar	-	-	+490	-	-	+600	-	-	+57
year 1961	-	-	-	-	-	-	-	-	-
Jan. 31	6,775.0	2,430	0	93.4	2,390	-80	150.2	283	-30
Feb. 28	6,775.0	2,430	0	93.9	2,420	+30	150.4	286	+3
Mar. 31	6,783.5	5,660	+3,230	94.0	2,430	+10	149.3	268	-18
Apr. 30	6,849.2	70,400	+64,740	102.3	3,030	+600	159.9	488	+220
May 31	6,879.8	130,800	+60,400	102.9	3,080	+50	167.0	685	+197
June 30	6,880.7	133,000	+2,200	100.6	2,910	-170	158.8	463	-222
July 31	6,880.6	132,800	-200	98.2	2,730	-180	155.7	391	-72
Aug. 31	6,875.4	120,200	-12,600	91.2	2,240	-490	149.2	266	-125
Sept. 30	6,872.1	112,800	-7,400	84.0	1,780	-460	158.0	444	+178
Water year 1961-62	-	-	+46,430	-	-	-990	-	-	-63
	Jemez Canyon Reservoir			Bluewater Lake			Elephant Butte Reservoir		
Sept. 30	0	0	-	7,373.2	6,490	-	4,304.30	201,600	-
Oct. 31	5,143.3	564	+564	7,372.7	6,230	-260	4,305.09	208,000	+6,400
Nov. 30	0	0	0	7,372.4	6,080	-150	4,314.00	285,800	+77,800
Dec. 31	0	0	0	7,372.1	5,930	-150	4,321.30	360,900	+75,100
Calendar	-	-	0	-	-	-2,130	-	-	-78,700
year 1961	-	-	-	-	-	-	-	-	-
Jan. 31	0	0	0	7,371.9	5,830	-100	4,325.03	403,200	+42,300
Feb. 28	0	0	0	7,376.2	8,250	+2,420	4,325.18	405,100	+1,800
Mar. 31	5,144.1	679	+679	7,381.0	11,700	+3,450	4,319.34	339,700	-65,300
Apr. 30	5,168.1	10,200	+9,521	7,386.4	16,440	+4,740	4,323.50	385,600	+45,900
May 31	0	0	-10,200	7,384.8	14,910	-1,530	4,329.02	451,200	+65,600
June 30	0	0	0	7,382.2	12,670	-2,240	4,321.54	363,500	-87,700
July 31	0	0	0	7,379.9	10,860	-1,810	4,313.80	283,900	-79,600
Aug. 31	0	0	0	7,376.9	8,700	-2,160	4,307.70	229,400	-54,500
Sept. 30	0	0	0	7,374.9	7,440	-1,260	4,307.39	226,800	-2,600
Water year 1961-62	-	-	0	-	-	+950	-	-	+25,200
	Caballo Reservoir			Alamogordo Reservoir			Lake McMillan		
Sept. 30	4,129.10	12,900	-	4,273.95	117,400	-	18.70	8,440	-
Oct. 31	4,130.19	15,080	+2,090	4,275.00	122,100	+4,700	17.80	6,010	-2,430
Nov. 30	4,131.41	17,610	+2,530	4,274.80	121,200	-900	19.90	12,140	+6,130
Dec. 31	4,132.30	19,560	+1,950	4,275.05	122,300	+1,100	20.85	15,430	+3,290
Calendar	-	-	+3,200	-	-	+13,700	-	-	-17,490
year 1961	-	-	-	-	-	-	-	-	-
Jan. 31	4,133.40	22,100	+2,540	4,275.05	122,300	0	21.45	17,630	+2,200
Feb. 28	4,150.16	81,570	+59,470	4,275.00	122,100	-200	20.25	13,320	-4,310
Mar. 31	4,146.60	65,090	-16,480	4,275.00	122,100	0	24.55	31,130	+17,810
Apr. 30	4,154.12	103,000	+37,910	4,275.00	122,100	0	19.85	11,980	-19,150
May 31	4,159.68	139,400	+36,400	4,275.00	122,100	0	17.55	5,380	-6,600
June 30	4,158.17	128,900	-10,500	4,271.15	105,600	-16,500	22.10	20,140	+14,760
July 31	4,155.90	113,900	-15,000	4,258.80	62,620	-42,980	20.75	15,070	-5,070
Aug. 31	4,140.24	41,100	-72,800	4,266.20	86,840	+24,220	14.45	246	-14,824
Sept. 30	4,135.91	28,380	-12,720	4,269.35	98,480	+11,640	20.95	15,790	+15,544
Water year 1961-62	-	-	+15,390	-	-	-18,920	-	-	+7,350

RIO GRANDE BASIN

Reservoirs in Rio Grande basin--Continued

Month-end elevations and contents, water year October 1961 to September 1962

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.	14.80	1,100	-	2,804.0	50,000	-			
Oct. 31.	13.40	510	-590	2,803.9	49,700	-300			
Nov. 30.	16.10	1,800	+1,290	2,805.0	53,000	+3,300			
Dec. 31.	17.50	2,700	+900	2,806.2	57,200	+4,200			
	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -
Calendar year 1961	-	-	-2,710	-	-	-55,600			
	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -
Jan. 31.	18.70	3,590	+890	2,807.2	60,700	+3,500			
Feb. 28.	14.90	1,140	-2,450	-	a63,500	+2,800			
Mar. 31.	15.80	1,620	+480	2,807.2	60,700	-2,800			
Apr. 30.	15.25	1,320	-300	2,805.2	53,700	-7,000			
May 31.	15.50	1,460	+140	-	a48,800	-4,900			
June 30.	15.60	1,510	+50	-	a46,700	-2,100			
July 31.	20.50	5,170	+3,660	2,799.8	38,520	-8,180			
Aug. 31.	14.80	1,100	-4,070	2,797.2	32,720	-5,800			
Sept. 30.	14.55	978	-122	2,796.0	30,300	-2,420			
Water year 1961-62	-	-	-122	-	-	-19,700			

a No gage-height record.

MIMBRES RIVER BASIN

157

8-4770. Mimbres River near Mimbres, N. Mex.

Location.--Lat 32°52'30", long 107°59'00", in NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 33, T.16 S., R.11 W., on left bank a quarter of a mile downstream from Bear Canyon and $1\frac{1}{2}$ miles northwest of Mimbres.

Drainage area.--152 sq mi.

Records available.--June 1921 to September 1930 (fragmentary), October 1930 to September 1962. 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 of 0.1 ft lower.

Average discharge.--32 years, 9.92 cfs (7,180 acre-ft per year).

Extremes.--Maximum discharge during year, 372 cfs July 31 (gage height, 4.90 ft); minimum, 1.9 cfs Oct. 7.

1930-62: 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)

2.1	1.8	3.0	26
2.3	3.0	3.1	37
2.5	4.6	3.4	93
2.7	7.3	4.0	230
2.8	11		

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.0	2.1	3.9	3.9	9.9	19	20	20	9.0	9.0	37	5.9
2	3.0	2.1	3.7	3.9	9.9	19	20	19	9.0	9.4	48	9.9
3	2.5	2.0	3.6	3.9	10	19	23	17	9.0	11	24	9.9
4	2.0	2.1	3.7	3.9	11	18	25	16	7.7	11	16	10
5	2.0	2.0	3.7	3.8	14	18	27	19	8.0	13	13	9.4
6	2.0	2.1	3.7	3.8	17	18	29	19	10	12	12	9.4
7	2.0	2.2	3.7	3.8	19	20	32	18	15	12	10	9.9
8	2.0	2.4	4.4	3.7	21	20	33	17	20	10	9.4	9.9
9	2.1	2.1	5.0	3.6	26	19	35	17	23	9.9	7.7	7.7
10	2.1	2.1	4.3	3.6	39	20	37	14	20	9.0	6.8	6.7
11	2.2	2.0	4.5	3.6	50	18	32	10	16	9.9	6.4	6.0
12	2.2	2.1	4.3	3.8	64	17	35	7.7	13	10	5.8	6.6
13	2.2	2.0	4.2	3.9	89	17	37	9.0	9.9	9.4	5.4	7.2
14	2.3	2.1	4.3	3.9	104	17	39	14	11	6.8	5.3	7.7
15	2.4	3.1	4.7	4.0	108	16	40	14	10	6.6	10	6.8
16	2.3	3.7	5.4	4.1	89	16	43	15	9.9	6.0	15	6.4
17	2.2	3.7	5.3	4.1	74	16	43	14	10	5.0	16	6.6
18	2.2	3.6	4.8	4.1	59	15	43	11	11	3.7	17	7.3
19	2.3	3.6	4.3	4.2	47	16	42	11	13	3.9	16	7.7
20	2.3	3.6	4.0	4.2	37	17	42	13	17	4.8	12	7.2
21	2.3	3.7	3.9	4.2	32	17	43	11	18	5.1	8.6	7.0
22	2.4	3.6	3.9	4.2	28	16	39	9.0	17	6.6	9.4	6.7
23	2.5	3.6	3.9	4.6	24	17	36	8.3	14	6.6	9.4	7.3
24	2.5	3.7	4.0	6.1	23	16	33	11	6.7	6.7	6.0	8.0
25	2.2	3.7	4.0	4.1	23	16	30	11	5.7	6.8	4.2	7.7
26	2.2	3.6	4.0	18	22	17	32	10	4.5	8.3	4.7	2.3
27	2.1	3.7	4.0	14	21	19	29	9.9	3.3	10	4.5	2.0
28	2.1	3.7	3.9	12	20	20	25	10	3.1	11	5.0	1.7
29	2.0	3.8	3.9	12	-	21	24	9.9	2.9	20	4.7	1.4
30	2.1	3.8	3.9	10	-----	21	21	9.0	5.5	5.7	4.4	9.9
31	2.1	-----	3.9	9.9	-----	21	-----	9.0	-----	11.0	4.2	-----
Total	69.8	87.6	128.8	213.8	1,090.8	556	989	402.8	332.2	420.5	357.9	278.8
Mean	2.25	2.92	4.15	6.90	39.0	17.9	33.0	13.0	11.1	13.6	11.5	9.29
Ac-ft	138	174	255	424	2,160	1,100	1,960	799	659	834	710	553

Calendar year 1961: Max 29 Min 1.0 Mean 3.03 Ac-ft 2,190

Water year 1961-62: Max 110 Min 2.0 Mean 13.5 Ac-ft 9,770

Peak discharge (base, 290 cfs).--July 30 (1300) 355 cfs (4.75 ft); July 31 (1400) 372 cfs (4.90 ft).

8-4776. San Vicente Arroyo at Silver City, N. Mex.

Location.--Lat 32°46'15", long 108°16'30", in NW¼SE¼ 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 1962.

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.--9 years, 0.81 cfs (586 acre-ft per year).

Extremes.--Maximum discharge during year, 1,410 cfs July 26 (gage height, 4.30 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.

1953-62: 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 1956 (probably occurred Sept. 9, 1938).

Remarks.--Records fair above 100 cfs and poor below. 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 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a 0	0	a 0	0	0	0	0	0		1.3	46	0.1
2	a 0	0	a 0	0	0	0	0	0		1.9	2.9	.2
3	a 0	0	a 0	0	0	0	0	0		0	.2	a .1
4	a 0	0	a 0	0	0	0	0	0		25	.2	a .1
5	0	0	a 0	0	0	0	0	0		.1	.2	a .1
6	0	0	a 0	0	0	0	0	0		13	.2	a .1
7	0	.7	a 0	0	0	.3	0	0		.4	.2	.1
8	0	5.0	2.0	0	0	.2	0	.1		a .2	.2	.1
9	2.2	a 1	2.0	0	0	0	0	.1		a .1	.2	.1
10	a 0	a 0	0	0	0	.1	0	.1		a .1	.2	.1
11	0	a 0	1.5	0	0	0	0	.1		a .1	.2	.1
12	0	a 0	.2	0	0	0	0	.1		a .1	.2	.1
13	0	a 0	0	0	0	0	0	0		a .1	.2	.1
14	0	a 0	.6	0	.2	0	0	0		a .1	.3	.1
15	0	a 0	7.7	0	0	0	0	0		a .1	.2	.1
16	0	a 0	6.0	0	0	0	0	0		a .1	.2	.1
17	0	a 0	.4	.3	0	0	0	0		.1	.2	.1
18	0	a 0	0	.1	0	0	0	0		.1	.2	.1
19	0	a 0	0	0	0	0	0	0		0	.2	.1
20	0	a 0	0	0	0	0	0	0		35	.2	.1
21	0	a 0	0	0	0	0	0	0		32	.2	.1
22	0	a 0	0	0	0	0	0	0		16	.2	.1
23	0	a 0	0	.1	0	0	0	0		4.4	.2	.1
24	0	a 0	0	17	0	0	0	0		.1	.2	.1
25	0	a 0	0	57	0	0	0	0		5.3	.2	.1
26	0	a 0	0	2.2	0	0	.1	0		57	.2	10
27	0	a 0	0	.2	0	0	0	0		a 1	.2	a .1
28	0	a 0	0	0	0	0	0	0		21	.1	a .2
29	0	a 0	0	0	-	0	0	0		a 5	.1	a .2
30	0	a 0	0	0	-----	0	0	0		a .2	.1	a .1
31	0	-----	0	0	-----	0	-----	0		15	.1	-----
Total	2.2	6.7	20.4	76.9	0.2	0.6	0.1	0.5	0	234.9	54.4	26.2
Mean	0.07	0.22	0.66	2.48	0.007	0.019	0.003	0.016	0	7.58	1.75	0.87
Ac-ft	4.4	1.3	4.0	15.3	0.4	1.2	0.2	1.0	0	46.6	10.8	5.2

Calendar year 1961: Max 65 Min 0 Mean 4.73 Ac-ft 341

Water year 1961-62: Max 57 Min 0 Mean 1.16 Ac-ft 839

Peak discharge (base, 500 cfs)

a No gage-height record.

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
7-4	1620	3.25	528	7-21	1800	3.30	670
7-6	1850	3.31	560	7-26	1710	4.30	1,410
7-20	1500	3.63	828	8-1	1950	3.60	860

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 1962.

Gage--Water-stage recorder and concrete control. Altitude of gage is 5,450 ft (from topographic map).

Average discharge--14 years (1948-62), 9.74 cfs (7,050 acre-ft per year).

Extremes--Maximum discharge during year, 1,860 cfs Aug. 1 (gage height, 3.86 ft, from floodmark), from rating curve extended above 160 cfs on basis of slope-area measurement of peak flow; minimum daily, 3.1 cfs Aug. 26.

1947-62: 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)

2.27	3.1	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 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.5	7.3	10	10	11	13	7.3	8.2	6.5	4.4	7.5	8.2
2	6.5	8.2	10	10	11	13	8.2	*8.2	6.5	4.4	12	8.2
3	6.5	8.2	10	10	11	13	9.1	5.7	5.0	4.4	11	7.3
4	6.5	8.2	*10	10	12	13	9.1	5.0	5.0	8.2	10	5.0
5	6.5	8.2	10	10	12	13	7.3	4.4	4.4	9.1	10	8.2
6	6.5	8.2	10	10	12	13	6.5	3.9	5.7	9.1	10	7.3
7	6.5	8.2	11	10	12	13	6.5	4.4	5.7	8.2	9	6.5
8	5.7	9.1	12	10	11	13	3.9	5.0	6.5	13	*7.3	5.0
9	5.7	9.1	11	11	11	12	*4.4	*10	5.7	5.7	4.4	7.3
10	5.7	7.3	12	6.5	10	10	5.7	10	5.7	*6.5	3.9	5.7
11	7.3	7.3	11	7	10	8.2	10	10	4.4	7.3	4.4	5.0
12	7.3	7.3	10	10	11	9.1	9.1	10	10	7.3	4.4	9.1
13	6.5	8.2	*10	12	11	10	10	10	5.7	7.3	3.5	9.1
14	7.3	9.1	11	11	12	10	10	6.5	5.0	5.7	4.4	10
15	7.3	8.2	11	*11	11	10	11	*4.4	*5.7	5.0	6.5	9.1
16	7.3	*9.1	10	11	11	10	9.1	5.7	5.7	4.4	5.7	9.1
17	7.3	10	10	11	11	10	*7.3	7.3	5.7	4.4	5.0	6.5
18	7.3	10	10	11	11	9.1	9.1	6.5	6.5	12	5.0	5.7
19	7.3	9.1	11	10	11	9.1	8.2	6.5	7.3	13	5.0	6.5
20	7.3	9.1	11	10	10	10	7.3	4.4	9.1	16	12	*4.4
21	6.5	9.1	10	10	11	10	7.3	3.9	10	13	7.3	6.5
22	6.5	9.1	10	10	12	*10	7.3	4.4	9.1	13	7.3	6.5
23	5.7	9.1	10	10	11	10	6.5	9.1	9.1	10	8.2	7.3
24	5.7	10	11	*11	12	10	6.5	10	9.1	10	5.7	2.3
25	*6.5	10	11	10	11	8.2	*11	10	8.2	13	5.0	*10
26	8.2	10	11	9.1	*11	5.7	11	9.1	7.3	11	3.1	13
27	8.2	10	11	9.1	10	6.5	14	10	8.2	9.1	4.4	11
28	8.2	10	11	9.1	13	7.3	14	*7.3	6.5	12	5.0	12
29	9.1	10	11	9.1	-	7.3	13	5.0	9.8	17	9.1	12
30	7.3	10	11	9.1	-----	7.3	9.1	9.1	13	*11	8.2	12
31	6.5	-----	11	10	-----	8.2	-----	5.7	-----	10	*8.2	-----
Total	213.2	265.8	329	308.0	313	312.0	258.8	219.7	212.1	284.5	280.0	256.5
Mean	6.83	8.86	10.6	9.94	11.2	10.1	8.63	7.09	7.07	9.18	9.03	8.55
Ac-ft	423	527	653	611	621	619	513	436	421	564	555	509

Calendar year 1961: Max 95 Min 2.4 Mean 8.76 Ac-ft 6,340
 Water year 1961-62: Max 75 Min 3.1 Mean 8.91 Ac-ft 6,450

Peak discharge (base, 125 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
6-30	1740	2.85	195	8-20	0500	3.00	320
8-1	unknown	3.86	1,860	9-24	1645	2.90	230

* Discharge measurement made on this day.

SAN JUAN RIVER BASIN

9-3464. San Juan River near Carracas, Colo.

Location.--Lat 37°00'47", long 107°18'39", in SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.17, T.32 N., R.4 W., on right bank at river mile 178.8 just above flow line of Navajo Reservoir and 3 miles northwest of Carracas, Colo., 7.2 miles upstream from Piedra River.

Drainage area.--1,230 sq mi, approximately.

Records available.--October 1961 to September 1962.

Gage.--Water-stage recorder. Altitude of gage is 6,090 ft (from river-profile map).

Extremes.--Maximum discharge during period, 3,920 cfs Apr. 20 (gage height, 5.55 ft); maximum gage height, 6.58 ft Feb. 19 (ice jam); minimum discharge, about 5 cfs Dec. 10, result of freezeup.

Maximum flood known occurred Oct. 5, 1911. Major floods occurred Sept. 5 or 6, 1909 and June 29, 1927.

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 11,000 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. 26, Mar. 28 to July 6				Feb. 27 to Mar. 27, July 7 to Sept. 30			
1.9	156	3.5	1,070	1.1	37	2.5	440
2.3	270	4.5	2,190	1.5	127	3.0	700
2.7	480	5.5	3,830	2.0	255	3.2	830

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	-	486	a205	b100	b130	b120	772	1,640	1,380	1,120	237	66
2	-	450	a190	b100	b140	b140	1,010	1,620	1,560	1,030	210	66
3	-	274	a200	b100	b140	b160	1,330	1,770	1,690	932	190	59
4	-	252	a170	b100	b150	b170	1,580	2,040	1,950	844	180	46
5	-	252	a150	b100	b150	170	1,410	2,490	2,240	772	172	44
6	-	242	a140	b110	b150	190	1,440	2,710	2,370	788	152	41
7	-	226	a130	b110	b160	220	1,340	3,070	2,460	788	141	63
8	-	242	120	b110	b200	246	1,410	3,280	2,260	700	125	120
9	-	252	b110	b110	b300	249	1,300	3,410	2,220	646	125	141
10	-	249	b80	b100	b500	208	1,300	3,460	2,300	580	109	120
11	-	252	b50	b95	b450	188	1,160	3,480	2,380	505	104	104
12	-	266	b40	b95	b450	158	1,240	3,510	2,400	467	134	88
13	-	263	b70	b95	b600	170	1,440	3,040	2,460	458	165	83
14	-	220	b110	b110	b700	168	1,920	2,730	2,420	440	148	72
15	-	229	b125	b110	a650	158	2,370	2,250	2,200	388	136	70
16	-	226	b125	b110	a550	170	3,060	1,870	1,840	344	122	61
17	-	229	b125	b110	a450	195	3,140	1,600	1,540	316	111	63
18	355	226	b125	b110	a350	228	3,220	1,480	1,450	299	106	68
19	320	202	b120	b120	a300	296	3,330	1,390	1,500	276	127	70
20	306	189	b120	b125	a250	404	3,460	1,510	1,670	279	158	77
21	294	211	b115	b125	a220	392	3,240	1,570	1,770	261	143	178
22	278	195	b110	b125	a210	348	2,490	1,450	1,710	243	143	302
23	298	170	b110	b125	a200	360	2,160	1,510	1,710	255	132	243
24	263	184	b110	b125	a200	324	2,420	1,770	1,590	276	125	a200
25	246	200	b110	b125	a170	454	2,790	1,920	1,500	288	104	a170
26	235	211	b110	b125	a150	677	2,780	1,750	1,400	273	88	a210
27	235	200	b110	b120	b140	792	2,440	1,890	1,350	267	83	190
28	238	197	b105	b120	b120	1,290	2,380	1,730	1,240	240	81	222
29	229	a195	b100	b120	-	1,320	2,220	1,490	1,160	215	74	270
30	278	a200	b100	b120	-----	1,070	1,920	1,330	1,170	200	66	215
31	358	-----	b100	b120	-----	647	-----	1,360	-----	237	63	-----
Total	-	7,190	3,685	3,470	8,180	11,682	6,207.2	6,612.0	5,489.0	14,727.7	4,054.4	3,722.2
Mean	333	240	119	112	292	377	2,069	2,133	1,830	475	131	124
Ac-ft	20,450	14,260	7,310	6,880	16,220	23,170	123,100	131,100	108,900	29,210	8,040	7,380

Calendar year 1961: Max 3,510 Min 40 Mean 685 Ac-ft 496,000
 Water year 1961-62: Max 3,510 Min 40 Mean 685 Ac-ft 496,000

Peak discharge (base, 2,500 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
4-20	0430	5.55	3,920	6-7	0600	4.83	2,700
5-10	0700	5.45	3,740				

a No gage-height record.

b Stage-discharge relation affected by ice.

Note.--Monthly figures for October are partly estimated on basis of associated records, to complete water year.

SAN JUAN RIVER BASIN

161

9-3498. Piedra River near Arboles, Colo.

Location. --Lat 37°05'17", long 107°23'52", in NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.21, T.33 N., R.5 W., on left bank 3 miles downstream from Ignacio Creek, 5.2 miles northeast of Arboles Post Office, 8 miles upstream from mouth.

Drainage area. --629 sq mi.

Records available. --August to September 1962. Gage operated 1895-1899, 1910-1927 at a site 7 $\frac{1}{2}$ miles downstream at altitude 6,000 ft. Low flow records probably not equivalent.

Gage. --Water-stage recorder. Datum of gage is 6,147.52 ft above mean sea level (from Colorado State Highway Department bench mark).

Extremes. --Maximum discharge during period, 136 cfs Sept. 21 (gage height, 1.94 ft); minimum daily, 26 cfs Sept. 4-6. Major floods occurred Oct. 5, 1911, and Sept. 5 or 6, 1909.

Remarks. --Records good. Diversions for irrigation of about 2,800 acres above station.

Discharge, in cubic feet per second, period August to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1											-	35
2											-	35
3											-	28
4											-	26
5											-	26
6											-	*26
7											-	28
8											-	32
9											-	42
10											-	42
11											-	39
12											-	39
13											-	35
14											-	*35
15											-	32
16											-	32
17											-	32
18											-	32
19											-	*32
20											-	37
21											-	71
22											-	110
23											-	102
24											-	*86
25											-	79
26											-	102
27											-	86
28					-						*46	113
29					-----						44	122
30		-----			-----		-----		-----		40	105
31											37	-----
Total											-	1,641
Mean											-	54.7
Ac-ft											-	3,250

* Discharge measurement made on this day.

SAN JUAN RIVER BASIN

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 1962. 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.--53 years (1896-97, 1910-62), 1,215 cfs (879,600 acre-ft per year).

Extremes.--Maximum discharge during year, 6,330 cfs Apr. 20 (gage height, 6.54 ft); minimum, 44 cfs Dec. 10.

1920-62: 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 or doubtful or no gage-height record, 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)
(Shifting-control method used July 11-15, Aug. 17 to Sept. 10)

1.0	58	1.6	168	2.5	489	3.5	1,170	5.5	3,990
1.3	104	2.0	285	3.0	780	4.5	2,320	6.3	5,750

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	428	696	303	a150	b200	b190	1170	2600	2050	1790	361	97
2	393	653	285	a150	b200	b240	1540	2530	2310	1620	314	92
3	373	446	289	a150	b210	b250	1950	2680	2630	1460	278	81
4	353	389	278	b155	b220	b220	2350	3130	2960	1350	259	71
5	346	397	237	b160	b240	249	2080	3740	3350	1270	d240	71
6	332	377	b190	b170	b270	278	2220	4090	3570	1270	d220	66
7	314	353	b165	b180	b320	346	2190	4700	3690	1220	d210	84
8	310	377	b150	b180	b400	373	2320	5050	3380	1090	d190	131
9	1180	397	b140	b180	b600	377	2350	5200	3320	990	d180	179
10	1170	389	b110	b170	690	321	2220	5380	3400	894	d170	146
11	696	401	b70	b170	614	b200	2030	5290	3490	780	d160	131
12	721	415	b60	b160	619	b150	2150	5440	3570	708	d180	117
13	625	410	b60	b160	708	b150	2610	4650	3620	702	243	115
14	642	353	b90	b160	823	b150	3380	4150	3570	665	217	102
15	659	365	b140	b160	754	b150	3990	3490	3330	575	214	101
16	671	357	b200	b160	714	b150	4850	2930	2760	494	a165	96
17	665	373	b200	b170	b600	b200	5030	2520	2290	446	163	96
18	653	373	b200	b180	b550	b270	5250	2260	2100	415	161	101
19	619	335	b200	b190	b480	393	5490	2100	2150	381	166	101
20	597	296	b190	b200	b420	575	5700	2250	2440	397	225	110
21	569	339	b190	b210	b350	569	5290	2420	2610	365	198	245
22	547	314	b180	b210	b300	441	4090	2180	2550	328	214	510
23	530	259	b180	b210	b250	479	3560	2240	2550	353	203	406
24	494	278	b180	b200	b250	393	3810	2600	2350	397	192	310
25	451	314	b180	b200	b250	580	4410	2770	2220	423	156	268
26	437	332	b180	b190	b200	858	4370	2600	2080	419	134	374
27	419	314	b180	b190	b200	1220	3900	2790	2010	401	129	346
28	432	292	a160	b190	b150	1680	3780	2630	1940	353	121	415
29	410	285	a150	b190	-	1860	3640	2250	1800	317	110	510
30	479	299	a150	b190	-----	1620	3100	2010	1850	292	102	406
31	552	-----	a150	b200	-----	1060	-----	2010	-----	350	99	-----
Total	17,117	11,179	5,437	5,535	11,582	15,992	100,820	100,680	81,940	22,515	5,974	5,878
Mean	552	373	175	179	414	516	3,361	3,248	2,731	726	193	196
Ac-ft	33,950	22,170	10,780	10,980	22,970	31,720	200,000	199,700	162,500	44,660	11,850	11,660

Calendar year 1961: Max 3,950 Min 60 Mean 803 Ac-ft 581,700

Water year 1961-62: Max 5,700 Min 60 Mean 1,054 Ac-ft 762,900

Peak discharge (base, 4,000 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
4-20	0530	6.54	6,330	6-7	0730	5.51	4,010
5-12	0715	6.29	5,730				

a No gage-height record.

b Stage-discharge relation affected by ice.

d Doubtful gage-height record.

SAN JUAN RIVER BASIN

163

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, 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 1962. 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.--12 years, 196 cfs (141,900 acre-ft per year).

Extremes.--Maximum discharge during year, 1,730 cfs Apr. 21 (gage height, 5.92 ft); minimum, 36 cfs Nov. 3 (may have been lower during freezeup of Jan. 10).

1950-62: 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 good 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 Oct. 1 to Dec. 11, Aug. 15 to Sept. 30)

3.2	38	3.6	112	4.5	480	5.5	1,280
3.4	64	4.0	240	5.0	830	6.0	1,810

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	233	71	180	a 50	b 60	a 110	308	1,020	180	191	129	120
2	194	46	177	a 50	b 65	a 120	340	528	164	180	123	120
3	194	41	180	a 45	b 65	a 130	340	456	140	184	146	123
4	184	58	174	a 45	b 65	a 110	365	462	132	177	155	126
5	167	60	177	a 45	b 65	a 110	365	589	118	177	146	120
6	167	64	174	a 50	b 70	134	365	547	118	170	149	129
7	164	62	164	a 50	b 70	152	365	468	110	161	129	146
8	170	66	167	a 55	b 90	155	380	414	110	146	126	152
9	420	69	184	b 60	b 100	158	385	400	104	149	120	149
10	288	69	164	b 55	b 120	143	400	380	110	123	107	143
11	244	66	b 150	b 45	a 110	b 130	375	375	110	118	107	143
12	158	69	a 100	b 45	a 100	b 120	375	355	100	143	123	143
13	143	66	a 120	b 50	a 100	b 115	380	375	107	143	132	143
14	140	62	a 110	b 50	a 100	b 120	405	380	107	143	126	155
15	134	126	a 90	b 45	a 100	132	420	350	112	129	118	137
16	134	155	a 70	a 40	a 95	134	444	360	137	126	137	129
17	140	155	a 60	a 45	a 90	330	444	405	146	123	158	126
18	137	174	a 55	a 45	a 80	360	498	405	146	143	140	126
19	134	177	a 50	a 50	a 80	370	915	360	137	137	137	123
20	134	180	a 50	a 55	a 90	380	1,550	240	134	129	137	149
21	134	188	b 55	a 55	82	385	1,710	226	132	120	152	233
22	137	180	b 60	a 50	78	370	1,710	248	134	120	143	191
23	134	180	b 55	b 50	82	375	1,680	309	134	132	146	180
24	132	180	b 55	b 45	80	355	1,620	134	132	132	137	191
25	132	180	b 55	b 50	82	375	1,570	126	137	155	132	180
26	134	188	b 55	b 55	b 75	390	1,550	132	137	177	123	164
27	143	184	b 50	b 50	b 90	400	1,510	177	132	158	126	205
28	143	180	a 50	b 50	b 70	365	1,490	212	132	146	123	256
29	146	180	a 50	b 50	-	370	1,490	191	158	132	110	191
30	167	184	a 50	b 55	-----	335	1,410	174	191	143	118	146
31	120	-----	a 55	b 60	-----	308	-----	184	-----	155	115	-----
Total	5,201	3,660	3,186	1,545	2,354	7,541	25,159	10,982	3,941	4,562	4,070	4,639
Mean	168	122	103	49.8	84.1	243	839	354	131	147	131	155
Ac-ft	10,320	7,260	6,320	3,060	4,670	14,960	49,900	21,780	7,820	9,050	8,070	9,200

Calendar year 1961: Max 900 Min 40 Mean 159 Ac-ft 115,100
Water year 1961-62: Max 1,710 Min 40 Mean 211 Ac-ft 152,400

a No gage-height record.

b Stage-discharge relation affected by ice.

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 1962. 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. --12 years, 28.3 cfs (20,490 acre-ft per year).

Extremes. --Maximum discharge during year, 188 cfs Oct. 9 (gage height, 2.67 ft); minimum daily, 1 cfs for several days during period of ice effect.

1951-62: 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 periods of ice effect in 1960-62.

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)

0.5	0.6	1.0	12
.6	1.3	1.2	22
.7	2.6	1.6	54
.8	4.6	2.0	98

Discharge, in cubic feet per second, water October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	20	40	4.0	a 2	b 3	b 1	2.6	3 3	8 4	5 4	5 9	5 0
2	18	31	4.2	a 2	b 3	b 2	3.2	3 1	7 9	5 2	5 4	4 8
3	17	26	4.2	a 2	b 3	b 3	4.0	2 8	7 2	4 9	5 6	4 9
4	17	14	b 4	a 2	b 3	b 4	6.4	2 2	6 7	4 8	5 9	4 8
5	21	8.6	b 4	a 2	b 4	b 4	5.2	2 1	6 0	5 4	5 9	5 0
6	2 2	7.9	b 4	a 2	b 6	4.4	4.4	2 6	4 9	5 3	5 6	5 1
7	20	7.3	b 4	a 3	b 6.5	6.4	4.0	3 1	5 0	5 3	4 9	6 1
8	23	7.3	b 4	a 3	b 8	6.1	4.0	2 8	5 0	5 3	4 3	6 4
9	9 8	8.4	b 3	b 3	b 20	4.4	5.2	2 5	4 9	5 4	4 3	6 1
10	2 7	7.3	b 3	b 2	b 2 5	b 3	9.9	2 9	4 1	5 0	4 3	5 6
11	2 3	6.7	b 3	b 1.5	b 2 3	b 1	5.8	3 2	4 1	5 0	4 3	5 3
12	2 5	6.4	b 1	b 1	b 20	b 1	3.8	2 9	4 1	4 9	4 9	5 4
13	5 0	5.5	b 2	b 2	b 1 9	b 2	3.2	3 1	4 6	5 4	5 1	5 7
14	5 0	b 5	b 2	b 1.5	b 1 8	b 2	3.4	3 1	4 9	5 1	5 1	6 0
15	5 5	b 4	b 2	b 1	b 1 7	b 2.5	3.8	3 3	4 6	5 5	5 3	5 0
16	5 4	b 5	b 4	b 1	b 1 5	b 3	4.2	4 3	4 2	5 3	5 0	4 2
17	5 3	5.5	b 3	b 1.5	b 10	b 3	4.2	5 1	4 5	4 8	5 3	4 1
18	5 3	b 5	b 3	b 1.5	b 6	b 3	3.6	4 5	4 8	4 6	5 0	4 0
19	5 2	b 4	b 2.5	b 2	b 5	b 3	3.2	3 9	4 3	4 9	4 8	3 9
20	5 3	b 5	b 3	a 3	b 5	3.4	3.2	3 8	4 7	5 8	5 0	4 9
21	5 2	5.5	b 3.5	a 4	b 5	3.8	2.6	4 3	4 3	5 3	5 6	9 4
22	5 1	b 5	d 3.5	a 3	b 5	4.2	2.3	4 6	4 1	4 8	5 1	7 4
23	5 1	b 5	d 3	b 3	b 5	3.4	2.1	5 6	4 0	5 5	5 3	6 3
24	5 1	b 4	d 3	b 2	b 5	3.8	1 7	3 1	4 3	6 0	4 9	6 5
25	5 2	4.6	a 3	b 3	b 5	3.0	4 0	4 3	4 6	7 0	5 1	6 1
26	5 1	5.2	a 2	b 4	b 4	4.2	1 7	5 2	4 4	8 2	5 0	7 2
27	4 7	b 5	a 2	b 2	b 3	5.5	2 7	6 7	5 3	6 5	5 1	7 7
28	4 6	b 4.5	a 2	b 2	b 1	7.0	3 4	7 7	5 2	6 4	4 9	6 2
29	4 8	b 4	a 2	b 2.5	-	6.1	3 4	7 2	5 5	5 7	4 9	5 4
30	6 0	4.0	a 2	b 2.5	-----	4.4	3 4	7 3	6 0	5 9	5 0	4 3
31	9 3	-----	a 3	b 3	-----	3.2	-----	8 3	-----	6 2	4 8	-----
Total	1,353	2,567	929	700	2,525	1,108	2,973	1,289	1,526	1,708	1,576	1,688
Mean	43.6	8.56	3.00	2.26	9.02	3.57	9.91	41.6	50.9	55.1	50.8	56.3
Ac-ft	2,680	509	184	139	501	220	590	2,560	3,030	3,390	3,130	3,350

Calendar year 1961: Max 114 Min 1 Mean 31.6 Ac-ft 22,900
 Water year 1961-62: Max 98 Min 1 Mean 28.0 Ac-ft 20,280

Peak discharge (base, 120 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
10- 9	1300	2.67	188	9-21	1100	2.27	134
10-31	1045	2.28	134				

a No gage-height record.

b Stage-discharge relation affected by ice.

d Doubtful gage-height record.

SAN JUAN RIVER BASIN

165

9-3551. Navajo Reservoir near Archuleta, N. Mex.

Location.--Lat 36°48'35", long 107°36'35", in SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.18, T.30 N., R.7 W., in gate shaft of outlet works structure near right abutment of Navajo Dam on San Juan River, 5 $\frac{1}{2}$ miles east of Archuleta and 33 miles east of Farmington.

Drainage area.--3,230 sq mi, approximately.

Records available.--June to September, 1962.

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

Extremes.--Maximum contents during period, 37,800 acre-ft July 17-19 (elevation, 5,805.8 ft); minimum, 12,400 acre-ft June 30 (elevation, 5,774.6 ft).

Remarks.--Reservoir is formed by earth-rock-fill dam, completed in June 1963; storage began June 30, 1962. Capacity, 1,709,000 acre-ft between elevations 5,720 ft (upstream toe of dam) and 6,085 ft (crest of spillway). Usable capacity, 1,036,000 acre-ft above elevation 5,990.0 ft (minimum operating level). Reservoir will not usually be drawn below elevation 5,882.5 ft (sill of intake structure), leaving a minimum pool or dead storage of 175,200 acre-feet. Figures given herein are total contents and are based on daily elevations at 0800. Reservoir is used for irrigation storage, river regulation, desilting, flood control, and recreation.

Cooperation.--Records furnished by Bureau of Reclamation.

Capacity table (elevation, in feet, and contents,
in acre-feet)

5,774	12,100	5,795	27,400
5,780	15,700	5,800	32,000
5,785	19,300	5,805	36,900
5,790	23,100	5,810	42,300

Contents, in thousands of acre-feet, during period July to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1										16.4	36.9	32.0
2										19.3	36.8	32.0
3										22.1	36.6	31.9
4										24.5	36.3	31.9
5										26.9	36.0	31.7
6										28.6	35.6	31.7
7										30.5	35.2	31.7
8										32.2	34.8	31.7
9										33.4	34.3	31.7
10										34.7	33.8	31.7
11										35.6	33.3	31.7
12										36.2	32.8	31.7
13										36.5	32.3	31.6
14										36.9	32.0	31.5
15										37.5	31.8	31.6
16										37.7	31.8	31.7
17										37.8	32.0	31.8
18										37.8	32.0	31.9
19										37.8	32.0	32.0
20										37.7	32.0	32.0
21										37.6	32.0	32.0
22										37.3	32.0	32.5
23										37.1	32.0	33.4
24										36.9	32.0	33.9
25										36.9	32.0	34.4
26										37.1	32.0	34.8
27										37.1	32.0	35.4
28										37.2	32.0	36.1
29										37.2	32.0	36.9
30										37.2	32.0	37.9
31										37.1	32.0	-
(†)									5,774.6	5,805.2	5,800.0	5,805.9
(‡)									-	+24.7	-5.1	+7.9

† Elevations, in feet, at 0800 on last day of month.

‡ Change in contents, in thousands of acre-feet.

SAN JUAN RIVER BASIN

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 1962.

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.--7 years, 1,304 cfs (944,100 acre-ft per year).

Extremes.--Maximum discharge during year, 8,230 cfs Apr. 21 (gage height, 8.22 ft); minimum, 12 cfs June 28.

1954-62: Maximum discharge, 18,900 cfs July 27, 1957 (gage height, 11.00 ft, site and datum then in use); minimum, that of June 28, 1962.

Remarks.--Records good 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 regulation by Vallecito Reservoir (capacity, 126,280 acre-feet) on Los Pinos River and subsequent to June 1962 flow at this station can be completely regulated by Navajo Reservoir (capacity, 1,709,000 acre-feet) on San Juan River. Diversions above station for irrigation of about 47,000 acres. Archuleta ditch bypasses gage on left bank for irrigation below, but part or all of flow may be wasted back to River. Discharges in cfs, for water year are as follows: April 10, no flow; May 2, no flow; June 26, 1.37 cfs.

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

2.1	9	2.8	122	4.0	750	7.0	5,050
2.2	16	3.1	226	5.0	1,730	8.0	1,600
2.5	55	3.5	420	6.0	3,130	9.0	10,540

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	750	894	545	b210	b260	274	1,400	3,930	2,300	432	666	315
2	666	830	519	b210	b280	438	1,600	3,220	2,420	404	666	315
3	638	a700	493	b210	b300	474	2,060	3,050	2,720	456	638	315
4	610	a600	500	b220	b350	444	2,370	3,270	3,000	512	638	315
5	571	a600	444	b230	b400	426	2,640	3,780	3,400	558	631	315
6	564	a570	438	b240	b500	414	2,660	4,290	3,620	584	631	310
7	545	a540	387	b250	b600	456	2,660	4,710	3,800	a620	624	315
8	532	a550	b300	b260	b800	545	2,740	5,230	3,820	a635	624	310
9	1,190	a560	b200	b260	1,100	584	2,780	5,680	3,610	645	624	315
10	2,260	a530	b150	b250	1,250	571	2,780	5,700	3,560	652	610	325
11	1,330	a540	b130	b240	1,250	456	2,620	5,800	3,640	652	610	297
12	1,000	a540	b120	b230	1,150	409	2,490	5,940	3,690	666	604	301
13	973	a520	b150	b220	b1,450	398	2,730	5,800	3,750	673	604	301
14	886	480	b200	b230	b1,550	409	3,270	5,100	3,820	666	597	306
15	928	468	b270	b230	b1,200	392	3,890	4,270	3,770	652	512	306
16	928	584	b300	b240	b1,150	398	4,600	3,570	3,420	645	345	310
17	910	558	b300	b250	b1,200	519	5,190	3,160	3,000	645	345	310
18	910	584	b290	b270	b1,000	680	5,490	2,820	2,550	638	345	310
19	886	564	b285	b280	b750	862	5,680	2,580	2,340	645	345	320
20	854	526	b280	b290	b700	1,170	5,650	2,600	2,610	638	345	315
21	822	532	b280	b300	b650	1,140	7,520	2,550	2,800	638	355	330
22	782	578	b290	b300	b550	1,080	7,010	2,560	2,740	638	450	335
23	790	493	b290	b300	b530	982	5,750	2,620	2,730	652	500	335
24	758	480	b270	b280	b500	878	5,070	2,760	2,670	694	315	340
25	715	532	b270	b270	450	902	5,230	3,000	2,520	680	315	340
26	687	584	b270	b250	387	1,160	5,580	3,160	2,400	687	315	345
27	673	652	b265	b250	340	1,500	5,610	3,130	1,710	687	320	345
28	680	545	b250	b250	301	1,960	5,210	3,250	158	687	320	330
29	673	512	b250	b250	-	2,220	4,940	2,790	214	687	325	283
30	736	506	b210	b250	-----	2,090	4,600	2,420	248	680	320	283
31	862	-----	b210	b250	-----	1,670	-----	2,200	-----	680	315	-----
Total	26,109	17,152	9,136	7,770	20,948	25,901	12,1820	114,940	83,030	19,428	14,854	9,492
Mean	842	572	295	251	748	836	4,061	3,708	2,768	627	479	316
Ac-ft	51,790	34,020	18,120	15,410	41,550	51,370	241,600	228,000	164,700	38,530	29,460	18,830

Calendar year 1961: Max 4,430 Min 120 Mean 1,036 Ac-ft 749,900

Water year 1961-62: Max 7,520 Min 158 Mean 1,289 Ac-ft 933,400

Peak discharge (base, 4,700 cfs).--Apr. 21 (0200) 8,230 cfs (8.22 ft); May 11 (0425) 6,450 cfs (7.58 ft).

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 NW¼ 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 1962. 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.--11 years 91910-11, 1927-31, 1956-62, 1,549 cfs (1,121,000 acre-ft per year).

Extremes.--Maximum discharge during year, 7,200 cfs Apr. 21 (gage height, 7.11 ft); minimum, June 28 or 29 (discharge unknown).

1910-11, 1927-31, 1955-62: 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 Hammond Main Canal bypasses gage on left bank; bypass flow not included in record. Land formerly irrigated by Kutz Canyon diversion is now irrigated by Hammond Main Canal.

Discharge measurements, in cubic feet per second, of Citizens ditch,
water year October 1961 to September 1962

Date	Discharge	Date	Discharge	Date	Discharge
Oct. 11	0	Dec. 27	0	June 12	47.1
18	28.4	Apr. 4	0	July 13	48.1
Nov. 22	23.9	10	31.4	Sept. 18	0
Dec. 14	0	May 23	44.8		

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	825	795	562	d230	d260	a250	1460	4500	2300	357	523	180
2	752	780	523	d230	d270	357	1710	3630	2320	414	523	220
3	627	696	498	d230	d280	a450	2340	3200	2590	368	486	220
4	598	498	486	d240	d310	a400	2720	3370	2850	426	462	220
5	575	486	438	d250	d370	a400	a2900	3870	3200	426	462	220
6	562	575	438	d260	d450	a400	a2900	4330	3490	438	450	190
7	549	654	438	d270	d550	a430	a2900	4780	3680	450	450	200
8	588	562	402	d280	810	a480	a2950	5170	3750	450	450	230
9	1310	682	b300	d280	1120	510	a2950	5410	3490	438	438	220
10	2760	588	d200	d280	1400	601	3060	5480	3490	450	426	210
11	1710	536	d150	d260	1420	b486	2850	5480	3490	462	438	210
12	1160	523	d130	d250	1300	b440	2670	5560	3610	462	450	171
13	1070	601	d150	d240	1190	b425	2850	5590	3660	474	450	240
14	978	523	d230	d240	1400	b390	3370	5070	3700	498	474	230
15	930	414	d300	d250	1350	b370	4090	4540	3630	510	474	250
16	840	523	d320	d260	1210	368	4810	3850	3340	523	250	240
17	890	486	d320	d270	1240	414	5410	3370	a3000	510	220	250
18	915	523	d310	d280	1090	562	5610	2890	a2500	510	240	241
19	885	575	d310	d290	825	855	5740	2670	2300	498	250	200
20	810	562	d300	d300	682	1110	6210	2500	2340	450	240	220
21	710	523	d300	d310	a600	1260	7070	2610	2610	438	220	220
22	696	575	d320	d310	a520	1120	6710	2650	2740	486	250	200
23	627	536	d320	d310	a500	1010	5540	2560	2740	474	536	230
24	682	498	d300	d300	a450	1030	5300	2610	2700	536	270	280
25	654	549	d300	d280	a400	962	5510	2760	2520	510	200	270
26	627	627	d300	d270	a350	1230	5770	2890	2430	536	220	302
27	614	710	d300	d260	a300	1560	5850	2810	2230	523	220	335
28	614	738	d270	d260	a270	1930	5560	a3000	a700	523	210	324
29	640	640	d250	d260	-	2320	5300	a2800	99	523	190	250
30	668	627	d230	d260	-----	2320	5100	a2500	260	523	180	210
31	780	-----	d230	d260	-----	1990	-----	2300	-----	523	171	-----
Total	26636	17605	9925	8270	20917	26500	127210	114750	81759	14709	10823	6983
Mean	859	587	320	267	747	855	4240	3702	2725	474	349	233
Ac-ft	52,830	34,920	19,690	16,400	41,490	52,560	252,300	227,600	162,200	29,170	21,470	13,850

Calendar year 1960: Max 4,290 Min 130 Mean 1,028 Ac-ft 744,000

Water year 1961-62: Max 7,070 Min 99 Mean 1,277 Ac-ft 924,500

Peak discharge (base, 6,000 cfs).--Apr. 21 (2300) 7,200 cfs (7.11 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 1962. 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.--29 years, 912 cfs (660,300 acre-ft per year).

Extremes.--Maximum discharge during year, 4,690 cfs May 12 (gage height, 7.31 ft); minimum daily, 150 cfs Jan. 11.

1933-62: 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 fair 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 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)
(Shifting-control method used June 12-16, Sept. 2-27)

Oct. 1 to Feb. 19,
Sept. 2-30

Feb. 20 to Sept. 1

3.6	150	4.7	810	3.2	268	5.0	1,340
3.8	213			3.6	394	6.0	2,580
4.0	305			4.0	548	7.0	4,210
4.3	480			4.5	860	7.2	4,590

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	598	480	a350	b210	b250	a290	535	1,660	1,620	2,940	680	278
2	508	460	a350	b200	b260	b320	577	1,630	1,890	2,550	639	260
3	467	434	a340	b200	b270	b310	650	1,730	2,310	2,240	607	251
4	448	373	a330	a210	a290	b310	704	2,100	2,340	2,120	577	247
5	422	385	a320	a210	a290	b320	738	2,680	2,660	1,990	567	234
6	397	373	a300	a210	a320	b320	752	2,980	2,920	1,850	531	230
7	373	355	a290	a230	a320	b320	796	3,370	3,220	1,850	514	230
8	367	367	a290	a230	a340	b320	804	3,560	2,760	1,770	483	265
9	759	379	a290	a230	a340	b310	773	3,820	2,890	1,700	464	265
10	666	403	a270	a200	a340	b300	738	4,230	3,210	1,590	449	251
11	522	385	b250	b150	a350	b290	704	4,340	3,320	1,520	434	247
12	529	391	b200	b200	a370	b280	710	4,440	3,560	1,480	430	238
13	543	403	b240	b230	a380	b290	887	4,140	3,650	1,480	430	230
14	574	397	b250	b230	a380	b280	1,200	3,540	3,730	1,330	430	230
15	622	385	b280	b220	a350	b300	1,630	2,760	3,270	1,180	394	230
16	675	403	b280	b210	a350	b300	2,120	2,200	2,570	1,080	405	226
17	711	397	b250	b220	a350	b300	2,380	1,850	2,020	1,020	367	226
18	729	403	b250	b230	a340	b300	2,600	1,540	1,660	977	357	230
19	702	a380	b230	a240	a320	b300	2,960	1,400	1,890	977	360	221
20	657	a380	b230	a230	b330	b300	3,300	1,510	2,720	1,000	394	247
21	639	a390	b240	a230	b320	b310	3,290	1,760	3,140	968	405	335
22	606	a380	b230	a210	b310	b300	2,640	1,620	2,970	923	394	480
23	598	a370	b220	a210	b310	b310	2,330	1,530	3,000	887	391	550
24	529	a370	b210	b210	b310	b320	2,550	1,730	2,760	896	377	448
25	508	a370	b210	b230	b310	b350	3,110	2,060	2,670	914	360	428
26	487	a370	b210	b240	b300	b400	3,110	1,850	2,610	950	350	409
27	480	a360	b210	b240	b300	b450	2,700	1,950	2,700	804	328	434
28	467	a350	b200	b240	a290	b460	2,580	1,930	2,670	738	325	508
29	448	a350	b210	b240	-	b475	2,440	1,660	2,500	686	310	508
30	448	a350	b220	b240	-----	b500	2,060	1,510	2,880	674	298	448
31	494	-----	b220	b240	-----	b480	-----	1,510	-----	692	292	-----
Total	16,973	11,593	8,010	6,820	8,990	10,415	52,368	74,590	82,100	41,776	13,342	9,384
Mean	548	386	258	220	321	336	1,746	2,406	2,737	1,348	430	313
Ac-ft	33,670	22,990	15,890	13,530	17,830	20,660	103,900	147,900	162,800	82,860	26,460	18,610

Calendar year 1961: Max 4,460 Min 166 Mean 789 Ac-ft 571,500
Water year 1961-62: Max 4,440 Min 150 Mean 922 Ac-ft 667,100

Peak discharge (base, 4,000 cfs).--May 12 (1400) 4,690 cfs (7.31 ft); June 14 (1030) 4,230 cfs (7.11 ft).

a No gage-height record.

b Stage-discharge relation affected by ice.

SAN JUAN RIVER BASIN

169

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 1962. 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).

Extremes.--Maximum discharge during year, 4,250 cfs May 12 (gage height, 5.40 ft); minimum, 45 cfs Aug. 30.

1904-5, 1912-62: 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 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. Diversions for irrigation of about 30,000 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 Aug. 31 to Sept. 30)

2.1	48	2.9	340	4.5	2,350
2.3	86	3.4	760	5.0	3,350
2.6	182	4.0	1,500	5.5	4,500

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	530	546	389	a290	285	218	514	1,490	1,330	2,650	474	56
2	490	538	382	a270	297	248	522	1,320	1,520	2,330	450	55
3	450	522	375	a250	297	269	579	1,360	1,840	1,950	410	53
4	434	458	382	a250	340	274	615	1,600	2,020	1,780	389	58
5	426	458	347	a260	450	269	680	1,950	2,140	1,680	340	67
6	403	450	334	a290	382	269	651	2,240	2,480	1,700	322	67
7	382	442	334	a320	389	291	660	2,500	2,770	1,490	263	69
8	382	426	310	a320	482	297	710	2,810	2,600	1,520	237	71
9	670	442	316	a290	522	297	710	3,010	2,500	1,440	191	89
10	730	442	316	b250	538	303	660	3,520	2,810	1,310	174	96
11	588	434	b300	b230	490	269	588	3,740	3,010	1,200	167	102
12	546	442	b270	b220	474	248	530	3,960	3,160	1,150	167	96
13	562	458	b165	b270	522	232	606	3,740	3,270	1,090	178	96
14	546	450	b290	b300	506	258	826	3,180	3,460	1,080	182	94
15	579	442	b340	b300	442	227	1,260	2,580	3,240	892	152	91
16	597	442	b330	b270	396	253	1,590	2,020	2,480	837	141	89
17	651	442	b330	a270	426	258	1,880	1,710	2,020	760	138	89
18	680	442	b320	a300	368	269	2,240	1,460	1,540	740	128	107
19	690	442	b275	a330	316	269	2,430	1,220	1,520	670	99	107
20	660	410	b285	a330	316	279	2,560	1,180	2,120	680	107	107
21	633	403	b300	a320	354	328	2,640	1,360	2,690	670	122	141
22	633	434	b320	a300	310	316	2,260	1,440	2,640	651	138	243
23	615	410	b300	a280	297	297	1,900	1,260	2,650	651	128	506
24	579	389	b270	b280	269	297	1,980	1,360	2,600	615	112	506
25	554	389	b250	b300	274	297	2,290	1,680	2,410	651	107	434
26	538	410	b250	b300	269	310	2,370	1,730	2,330	660	96	482
27	530	418	b270	b300	269	347	2,180	1,600	2,350	624	82	498
28	530	396	b270	b300	258	418	1,950	1,710	2,350	538	69	482
29	530	396	b280	285	-	514	1,900	1,490	2,260	506	65	538
30	514	389	b300	285	-----	562	1,780	1,320	2,480	442	56	466
31	530	-----	a300	291	-----	530	-----	1,240	-----	490	50	-----
Total	17,182	13,162	9,500	8,851	10,538	9,513	42,061	62,780	72,590	33,447	5,734	5,955
Mean	554	439	306	286	376	307	1,402	2,025	2,420	1,079	185	198
Ac-ft	34,080	26,110	18,840	17,560	20,900	18,870	83,430	124,500	144,000	66,340	11,370	11,810

Calendar year 1961: Max 4,010 Min 58 Mean 712 Ac-ft 515,300

Water year 1961-62: Max 3,960 Min 50 Mean 798 Ac-ft 577,800

Peak discharge (base, 4,000 cfs). --May 12 (1930) 4,250 cfs (5.40 ft).

a No gage-height record.

b Stage-discharge relation affected by ice.

SAN JUAN RIVER BASIN

9-3650. San Juan River at Farmington, N. Mex.

Location.--Lat 36°43'25", long 108°13'30", in SE $\frac{1}{4}$ 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 1962. 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 $\frac{1}{2}$ 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.--50 years (1912-62), 2,563 cfs (1,856,000 acre-ft per year).

Extremes.--Maximum discharge during year, 10,400 cfs Apr. 21 (gage height, 5.34 ft); minimum, 206 cfs Aug. 17.

1912-62: 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 fair. 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 1961 to September 1962

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
Oct. 10	*77.1	Feb. 12	87	Apr. 9	107	May 14	125	July 2	138
20	70	23	*83.6	16	*110	22	*118	20	0
Nov. 13	54	Mar. 19	0	23	116	31	107	25	0
24	*73.0	26	0	30	*111	June 8	3	Aug. 1	142
Dec. 4	0	Apr. 2	108	May 7	123	15	0	Sept. 3	*45.9
						25	137	10	72

* Result of discharge measurement.

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,290	1,140	784	b 520	b 600	570	1,930	5,810	3,580	2,840	943	241
2	1,030	1,110	766	b 510	b 600	616	2,030	5,070	3,720	2,620	870	268
3	997	1,110	830	b 480	b 630	675	2,360	4,630	4,410	2,240	830	284
4	986	890	820	480	b 680	682	2,900	4,990	4,880	2,110	790	252
5	920	850	775	500	b 730	668	3,310	5,710	5,280	2,040	760	252
6	920	880	721	530	b 800	689	3,210	6,380	5,940	1,930	730	252
7	870	811	694	b 550	b 880	734	3,340	7,320	6,520	1,860	674	272
8	890	811	667	b 580	b 1,150	703	3,340	8,330	6,420	1,860	620	284
9	1,380	920	658	b 540	b 1,600	774	3,520	8,910	6,130	1,810	580	300
10	2,890	964	b 550	b 520	2,140	914	3,440	9,490	6,290	1,750	556	292
11	2,280	850	b 450	b 500	1,850	790	3,310	9,620	6,660	1,720	572	300
12	1,620	840	b 350	b 500	1,580	734	3,130	9,580	6,950	1,530	548	292
13	1,500	920	b 350	b 550	1,450	703	3,210	9,540	7,020	1,520	572	309
14	1,450	811	b 450	b 550	1,590	703	3,870	8,330	7,210	1,490	526	317
15	1,450	820	b 650	b 530	1,650	710	4,960	6,830	6,840	1,350	519	330
16	1,460	784	b 650	b 530	1,520	718	6,060	5,970	5,970	1,290	414	338
17	1,560	860	b 650	b 530	1,630	790	7,030	4,960	4,930	1,220	260	321
18	1,570	880	b 650	b 550	1,420	974	7,730	4,350	3,960	1,160	270	334
19	1,600	820	b 630	b 600	1,150	1,070	8,490	3,810	3,720	1,130	270	296
20	1,500	802	b 630	b 580	1,040	1,320	9,330	3,490	4,440	1,130	260	309
21	1,460	784	b 630	b 580	890	1,450	10,250	3,740	5,200	1,120	245	387
22	1,440	820	b 630	b 580	840	1,490	9,410	3,960	5,340	1,150	250	420
23	1,380	802	b 630	b 580	790	1,350	7,770	3,620	5,250	1,220	393	670
24	1,390	784	b 600	b 550	790	1,310	7,100	3,760	5,200	1,180	386	728
25	1,240	766	b 580	b 550	710	1,230	7,540	4,230	4,880	1,220	220	722
26	1,230	820	b 550	b 550	696	1,350	8,130	4,540	4,670	1,210	220	664
27	1,070	820	b 550	b 550	654	1,630	8,050	4,260	4,590	1,080	245	796
28	1,110	775	b 550	b 550	616	2,070	7,470	4,700	3,120	965	256	752
29	1,150	793	b 530	b 560	-	2,470	7,170	4,360	2,400	954	244	790
30	975	830	b 530	b 570	-----	2,850	6,720	3,810	2,670	890	237	675
31	1,100	-----	b 530	b 580	-----	2,570	-----	3,440	-----	932	229	-----
Total	41,708	25,867	19,035	16,830	30,676	35,307	166,110	177,540	154,190	46,521	14,489	12,447
Mean	1,345	862	614	543	1,096	1,139	5,537	5,727	5,140	1,501	467	415
Ac-ft	82,730	51,310	37,760	33,380	60,840	70,030	329,500	352,100	305,800	92,270	28,740	24,690

Calendar year 1961: Max 7,840 Min 306 Mean 1,721 Ac-ft 1,246,000

Water year 1961-62: Max 10,250 Min 220 Mean 2,029 Ac-ft 1,469,000

Peak discharge (base, 8,000 cfs).--Apr. 21 (1345) 10,400 cfs (5.34 ft); May 10 (2230) 9,790 cfs (5.19 ft).

b Stage-discharge relation affected by ice.

SAN JUAN RIVER BASIN

171

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 1962.

Gage.--Water-stage recorder. Altitude of gage is 5,215 ft (from river-profile map).

Average discharge.--24 years, 26.6 cfs (19,260 acre-ft per year).

Extremes.--Maximum gage height during year, 5.81 ft Feb. 6, ice jam (discharge not determined); no flow for many days.

1938-62: 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 except those for periods of ice effect or doubtful or no gage-height record, which are poor. 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 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1	5	4	b3	b5	b4	28	a4	2	1		0
2	1	5	4	b3	b6	b6	28	a3	2	0		0
3	1	3	4	b3	b7	b7	30	a2	2	0		0
4	1	3	b4	b3	b9	b6	33		2	0		0
5	1	2	b4	b4	b10	b6	45	3	2	1		0
6	1	3	b4	b4	b11	b7	54	3	2	d0		0
7	1	3	b4	b4	b12	8	51	3	2	d0		0
8	1	3	b4	b6	b13	9	62	2	2	d0		0
9	30	3	b4	b6	a15	8	66	2	1	d0		0
10	24	4	b4	b5	a20	8	66	3	1	d0		0
11	9	3	b2	a3	a50	8	66	2	1	a1		0
12	a6	4	a1	a3	69	7	54	2	1	0		0
13	a5	3	b3	a4	86	7	53	2	1	0		0
14	a5	4	b4	a4	a50	7	56	2	1	0		0
15	a5	3	b4	a4	a30	7	88	3	2	0		0
16	5	3	b5	a3	a20	a8	132	3	2	d0		0
17	4	4	b5	a3	a15	a9	132	4	2	d0		0
18	6	5	b5	a4	a12	a10	146	3	2	d0		0
19	d3	5	b4	b6	a11	11	136	3	2	d0		0
20	d3	6	b5	b6	a11	11	94	3	2	d0		0
21	d3	5	b6	b5	a12	11	45	3	1	d0		1
22	d2	5	b5	b5	a11	9	32	3	1	d0		0
23	d2	6	b5	b5	a10	9	a25	3	1	d0		0
24	a1	5	b4	b5	a11	9	a20	3	2	d0		0
25	a1	4	b4	b5	a11	8	a15	3	1	0		0
26	a0	4	b3	b4	10	9	a15	3	1	0		0
27	a0	4	b3	b4	8	11	a15	3	1	0		2
28	a0	4	b3	b4	b5	39	a10	4	1	0		28
29	a0	5	b3	b5	-	66	a8	3	1	1		a18
30	d1	5	b3	b5	-----	54	a6	2	1	0		a10
31	5	-----	b3	b5	-----	30	-----	2	-----	0		-----
Total	178	121	120	135	540	409	1,611	86	45	4	0	59
Mean	5.7	4.0	3.9	4.4	19.3	13.2	53.7	2.8	1.5	0.1	0	2.0
Ac-ft	353	240	238	268	1,070	811	3,200	171	89	7.9	0	117

Calendar year 1961: Max 205 Min 0 Mean 7.9 Ac-ft 5,690
 Water year 1961-62: Max 146 Min 0 Mean 9.1 Ac-ft 6,560

a No gage-height record.

b Stage-discharge relation affected by ice.

d Doubtful gage-height record.

SAN JUAN RIVER BASIN

9-3680, San Juan River at Shiprock, N. Mex.

Location.--Lat 36°47'35", long 108°43'55", in SW¼ 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 1962. 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.--36 years (1926-62), 2,370 cfs (1,716,000 acre-ft per year).

Extremes.--Maximum discharge during year, 10,000 cfs Apr. 21 (gage height, 6.16 ft); minimum, 47 cfs Sept. 5. 1927-62: 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 4 to 8 times a month except during extreme winter period. Diversions for irrigation of about 118,000 acres above station.

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,380	1,620	934	520	b600	680	2,230	6,030	3,180	2,710	695	62
2	1,160	1,640	923	b500	b600	666	2,110	5,050	3,280	2,520	575	88
3	1,000	1,590	901	b500	b600	755	2,370	4,690	3,790	2,290	652	128
4	923	1,260	890	b500	b650	811	2,920	4,660	4,460	2,040	527	109
5	879	1,070	890	b520	700	795	3,320	5,290	4,720	1,960	457	52
6	835	1,010	879	b540	b800	803	3,500	6,360	5,510	1,880	494	132
7	795	1,030	699	b570	b950	811	3,720	6,980	5,950	1,760	445	180
8	745	989	663	b600	b1,100	878	3,740	8,120	6,250	1,770	433	188
9	1,020	1,030	637	b580	b1,600	938	3,640	8,410	5,730	1,710	388	159
10	3,270	1,000	b600	b560	b2,400	956	3,520	9,000	5,880	1,630	335	155
11	3,630	1,000	b550	b530	2,500	920	3,360	9,330	6,320	1,540	335	125
12	2,180	956	b450	b530	2,240	835	3,080	9,250	6,400	1,430	310	132
13	1,560	989	b400	b550	2,020	787	3,030	9,250	6,660	1,500	315	118
14	1,450	1,000	b500	b560	2,110	779	3,450	8,490	6,810	1,400	325	143
15	1,460	868	b600	b560	2,160	779	4,790	7,320	6,660	1,240	292	143
16	1,510	805	b700	b530	1,930	771	5,730	5,770	5,920	1,150	292	139
17	1,400	956	b650	b540	1,930	771	6,980	4,760	4,890	1,060	234	135
18	1,420	1,010	b650	b550	1,690	878	7,490	4,230	4,050	974	135	115
19	1,480	1,080	b650	b580	1,320	1,050	8,280	3,630	3,450	903	102	135
20	1,460	1,070	b630	b600	1,160	1,220	9,000	3,420	3,990	860	74	155
21	1,350	1,030	b630	b600	1,090	1,420	9,460	3,450	5,050	878	72	579
22	1,320	1,030	b650	b600	1,040	1,500	9,380	3,930	5,290	903	69	469
23	1,260	1,000	b650	b600	938	1,310	7,860	3,790	5,080	912	105	457
24	1,280	934	b620	b550	894	1,290	6,730	3,470	5,020	894	224	763
25	1,190	945	b600	b550	844	1,210	7,020	3,760	4,790	929	188	819
26	1,090	978	b580	b550	886	1,290	7,700	4,230	4,560	912	112	1,240
27	1,070	1,040	b550	b550	811	1,520	7,820	4,020	4,290	852	94	1,030
28	1,070	978	b550	b550	725	1,850	7,490	4,360	3,600	740	82	929
29	1,040	956	b530	b550	-----	2,360	7,020	4,050	2,630	666	74	1,000
30	1,040	956	b530	b600	-----	2,780	6,730	3,600	2,330	596	69	878
31	1,310	-----	b530	b600	-----	2,650	-----	3,300	-----	645	64	-----
Total	4,257.7	3,182.0	2,021.6	1,722.0	3,628.8	1,634.7	1,720.0	1,465.4	4,125.4	8,568	10,757	359
Mean	1,373	1,061	652	555	1,296	1,163	5,449	4,885	1,331	276	359	359
Ac-ft	84,450	63,110	40,100	34,160	71,980	71,530	324,200	341,200	290,700	81,830	16,990	21,340

Calendar year 1960: Max 7,710 Min 77 Mean 1,725 Ac-ft 1,249,000

Water year 1960-62: Max 9,460 Min 52 Mean 1,991 Ac-ft 1,442,000

Peak discharge (base, 8,500 cfs).--Apr. 21 (1205) 10,000 cfs (6.16 ft); May 13 (0630) 9,670 cfs (6.06 ft).

b Stage-discharge relation affected by ice.

LITTLE COLORADO RIVER BASIN

173

9-3860.5. Largo Creek near Mangas, N. Mex.

Location.--Lat 34°08'30", long 108°30'05", in SW $\frac{1}{4}$ sec.10, T.2 S., R.16 W., on right bank at El Caso Ranch, half a mile upstream from Sawmill Canyon, 10 $\frac{1}{2}$ miles southwest of Mangas, and 14 miles south of Quemado.

Drainage area.--63 sq mi, approximately.

Records available.--September 1959 to September 1962.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 7,600 ft (from topographic map).

Extremes.--Maximum discharge during year, 143 cfs Feb. 11 (gage height, 2.14 ft); minimum, 0.03 cfs Nov. 13.
1959-62: Maximum discharge, 181 cfs May 8, 1960 (gage height, 2.30 ft); minimum daily, 0.02 cfs July 25-27, 1961.

Remarks.--Records good. No diversion above station.

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

0.1	0.01	0.7	8.2
.2	.2	.8	12
.3	.9	1.0	20
.4	2.0	1.3	40
.5	3.5	1.6	68
.6	5.5		

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.07	0.6	*0.2	0.2	0.4	1.1	9.6	0.6	0.6	0.5	0.2	0.09
2	.07	.2	.1	.2	.6	.8	1.2	.6	.6	.4	.2	.09
3	*.07	.2	.2	.2	.6	.6	1.5	.6	.6	.4	.2	.09
4	.07	.2	.2	.2	.6	.6	*1.5	.6	.6	.5	.2	.09
5	.07	.2	.2	.2	.6	.5	1.3	.6	.6	.6	.1	.09
6	.07	.2	.2	.2	.6	.4	1.3	.6	.6	.5	.1	.09
7	.07	.2	.2	.2	.6	.4	1.2	.6	.6	.4	.1	.09
8	.2	.2	.2	.2	*.7	.6	1.1	.6	.6	*.4	.1	.09
9	1.3	.2	.2	.3	1.3	.5	1.1	.6	.6	.4	.1	.09
10	.2	.2	.2	.2	3.7	1.2	1.1	.6	.6	.4	.1	*.09
11	.1	.2	.2	.2	4.6	.8	8.5	.6	.6	.4	.1	.07
12	.1	.2	.2	.2	6.7	.4	7.1	.6	.6	.4	.1	.09
13	.09	0.9	.2	.2	4.7	.5	6.0	.5	.6	.3	.1	.2
14	.09	.2	.2	.2	3.0	.6	5.3	.5	.6	.3	.1	.3
15	.09	.2	.2	.2	3.4	.6	4.5	.5	.6	.3	.1	.1
16	.09	.5	.2	.2	2.4	.6	3.7	.5	.6	.3	.1	.1
17	.09	.3	.2	.2	*1.6	1.0	3.2	.5	*.6	.3	.1	.1
18	.09	.2	.2	.2	9.6	.9	2.5	.5	.6	.4	.1	.1
19	.09	.2	.2	.2	5.6	.7	2.0	*.5	.6	.4	.1	.1
20	.09	.2	.2	.2	3.5	1.1	1.6	.6	.6	.4	.1	.1
21	.09	.2	.2	.3	2.6	2.0	*1.2	.6	.5	.4	.1	.1
22	.1	.2	.1	.3	2.2	1.8	1.0	.6	.5	.6	.1	.1
23	.1	.2	.1	.3	1.4	4.5	.9	.6	.5	.4	.1	.3
24	.1	.2	.1	.4	1.1	3.0	.8	.6	.5	.3	.1	.5
25	.1	.2	.1	.4	.8	3.0	.7	.6	.5	.3	.09	.3
26	.1	.2	.1	.3	.7	2.0	1.5	.6	.5	.3	.09	.2
27	.1	.2	.1	.3	.4	2.5	1.1	.6	.5	.3	.09	.2
28	.1	.2	.2	.3	.6	2.3	.9	.6	.5	.3	.09	.1
29	.2	.2	.2	.3	-	2.2	.7	.6	.5	*.3	.09	.2
30	1.1	.2	.2	.3	1.6	1.6	.6	.6	.5	.3	.09	.1
31	.9	-----	.2	.3	-----	1.0	-----	.6	-----	.2	.09	-----
Total	6.10	6.79	5.5	7.6	302.2	144.2	176.4	17.9	17.0	11.7	3.43	4.26
Mean	0.20	0.23	0.18	0.25	10.8	4.65	5.88	0.58	0.57	0.38	0.11	0.14
Ac-ft	12	13	11	15	599	286	350	36	34	23	6.8	8.4

Calendar year 1961: Max 1.5 Min 0.02 Mean 0.17 Ac-ft 119

Water year 1961-62: Max 67 Min 0.07 Mean 1.93 Ac-ft 1,390

Peak discharge (base, 30 cfs).--Feb. 11 (2020) 143 cfs (2.14 ft); Mar. 26 (2300) 47 cfs (1.40 ft).

* Discharge measurement made on this day.

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 Mogollon Creek, and 7 miles northeast of Gila.

Drainage area.--1,864 sq mi.

Records available.--April to December 1914, December 1927 to September 1962. 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.--35 years, 124 cfs (89,770 acre-ft per year).

Extremes.--Maximum discharge during year, 5,040 cfs Aug. 2 (gage height, 8.07 ft); minimum, 32 cfs Oct. 1 and 2.
1929-62: Maximum discharge, 25,400 cfs Sept. 29, 1941 (gage height, 17.2 ft, from floodmark), from rating curve extended above 3,900 cfs on basis of velocity-area studies and logarithmic plotting; minimum daily, 17 cfs July 6, 7, 1956.

Remarks.--Records good. Discharge measurements generally made 2 to 4 times a month. Diversions for irrigation of about 500 acres above station.

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

Oct. 1 to Feb. 13

Feb. 14 to Aug. 1

Aug. 2 to Sept. 30

2.7	28	3.7	300	2.6	36	4.0	480	2.2	40	4.0	590
2.9	56	4.3	560	3.0	116	5.0	1,080	2.4	65	5.0	1,175
3.2	125	5.0	960	3.5	270	6.0	1,920	2.8	145	6.0	1,950
								3.4	330		

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	32	60	145	260	292	210	448	242	80	61	511	42
2	32	60	140	252	296	204	440	232	82	57	1,850	47
3	33	62	137	244	308	197	453	221	82	57	704	47
4	33	60	134	228	332	192	471	214	80	53	362	48
5	33	60	125	213	372	184	471	218	78	64	242	61
6	33	60	122	196	404	178	471	232	76	64	176	48
7	33	62	117	185	442	181	466	252	74	68	140	47
8	34	76	125	199	496	204	453	263	70	89	120	46
9	43	92	179	228	692	218	476	266	68	72	103	49
10	298	112	176	256	1,020	221	495	266	64	70	90	47
11	210	160	199	230	1,220	210	495	260	62	59	75	44
12	160	163	192	210	1,360	192	480	252	59	53	67	43
13	120	142	166	190	1,540	181	453	249	59	50	61	49
14	99	134	163	200	1,700	175	444	242	57	46	74	51
15	83	145	213	170	1,770	172	448	224	55	43	62	59
16	74	140	424	150	1,330	166	462	200	53	39	59	65
17	68	137	360	169	1,020	163	471	181	50	39	55	57
18	62	140	256	179	810	161	476	166	48	38	51	52
19	60	137	210	166	654	163	480	152	48	51	51	51
20	56	131	199	154	540	181	476	136	46	55	52	59
21	53	125	216	148	458	192	466	121	44	55	51	55
22	53	125	272	148	404	194	426	116	41	62	51	50
23	51	122	300	157	354	197	363	114	39	72	51	50
24	51	122	300	213	313	207	309	111	36	68	51	62
25	51	122	292	914	288	204	284	107	36	116	48	127
26	51	120	292	670	274	210	317	98	36	141	48	468
27	50	120	304	450	260	235	329	93	41	216	44	806
28	48	122	300	380	238	298	284	89	51	169	43	500
29	50	137	284	336	-	399	249	89	59	321	42	354
30	54	142	276	312	-----	466	246	87	53	278	41	264
31	58	-----	272	300	-----	466	-----	82	-----	318	40	-----
Total	2,166	3,390	6,890	8,107	19,187	6,821	12,602	5,575	1,727	2,944	5,415	3,748
Mean	69.9	113	222	262	685	220	420	180	57.6	95.0	175	125
Ac-ft	4,300	6,720	13,670	16,080	38,060	13,530	25,000	11,060	3,430	5,840	10,740	7,430

Calendar year 1961: Max 424 Min 24 Mean 80.2 Ac-ft 58,090
Water year 1961-62: Max 1,850 Min 32 Mean 215 Ac-ft 155,900

Peak discharge (base, 600 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
1-25	1330	5.26	1,120	8-2	0215	8.07	5,040
2-15	1100	5.95	1,830	9-27	0930	4.63	932
7-27	0030	4.37	672				

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 1962. 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.--35 years (1927-62), 163 cfs (118,000 acre-ft per year); median of yearly mean discharges, 130 cfs (94,100 acre-ft per year).

Extremes.--Maximum discharge during year, 3,920 cfs Sept. 26 (gage height, 11.20 ft); minimum daily, 4.4 cfs Sept. 1. 1927-62: Maximum discharge, 41,700 cfs Sept. 29, 1941 (gage height, 25.78 ft); minimum, 1 cfs July 14, 1934.

Remarks.--Records good except for those periods of no gage-height record which are poor. 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 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12	45	163	446	497	298	632	298	73	19	579	4.4
2	11	51	163	431	497	280	632	276	70	19	2,320	119
3	11	57	163	407	537	274	632	243	70	17	1,260	64
4	10	55	162	395	572	261	674	222	70	21	660	56
5	9.7	49	162	375	600	250	698	218	62	145	382	150
6	9.4	52	158	348	642	241	694	232	56	89	283	70
7	9.4	53	155	348	680	230	708	243	52	74	230	50
8	9.4	66	155	320	702	237	736	241	52	63	187	73
9	13	128	170	330	786	243	754	239	52	63	155	49
10	170	137	230	362	1,180	254	750	224	51	63	135	48
11	243	150	258	362	1,600	247	778	214	50	50	116	48
12	163	169	303	330	1,890	239	764	208	46	50	95	47
13	122	172	272	310	1,970	228	722	208	41	47	82	48
14	94	178	265	305	2,190	218	663	220	37	41	72	82
15	76	176	538	287	2,280	214	635	214	33	41	66	76
16	60	172	1,530	261	2,020	200	652	198	30	39	55	67
17	56	165	1,040	243	1,570	196	660	179	29	34	42	60
18	50	160	494	241	1,310	194	663	176	26	33	31	60
19	44	162	388	230	1,070	194	656	160	27	36	27	56
20	42	156	360	220	894	194	638	148	29	37	24	47
21	41	151	378	206	758	212	600	137	28	34	22	35
22	38	148	446	198	666	216	582	117	26	453	a 20	36
23	42	153	506	198	568	214	527	107	23	94	a 15	38
24	42	151	524	214	497	220	455	103	20	110	a 15	46
25	37	155	515	2,090	431	226	402	100	19	186	a 15	88
26	36	151	506	1,640	395	226	380	91	18	285	a 10	1,870
27	37	151	530	865	358	235	405	88	17	242	a 10	1,390
28	35	150	534	624	328	269	362	98	15	183	a 5	691
29	33	151	506	534	-	375	335	95	15	338	a 5	452
30	38	158	476	500	-----	527	320	90	15	464	a 5	340
31	40	-----	464	497	-----	614	-----	84	-----	320	4.6	-----
Total	1,633.9	3,872	12,514	14,117	27,488	8,026	18,109	5,471	1,152	3,690	6,927.6	6,260.4
Mean	52.7	129	404	455	982	259	604	176	38.4	119	223	209
Ac-ft	3,240	7,680	24,820	28,000	54,520	15,920	35,920	10,850	2,280	7,320	13,740	12,420

Calendar year 1961: Max 1,530 Min 6.0 Mean 102 Ac-ft 73,520
 Water year 1961-62: Max 2,320 Min 4.4 Mean 299 Ac-ft 216,700

Peak discharge (base, 1,900 cfs)

a No gage-height record.

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
12-15	2200	8.40	1,930	8- 2	1600	10.30	3,270
1-25	1430	10.32	3,280	9-26	1430	11.20	3,920
2-15	2000	8.83	2,340				

GILA RIVER BASIN

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 1962. 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, 1936-62: Maximum daily discharge, 62 cfs Sept. 21, 22, 1929; no flow at times.

Remarks.--Records are excellent for discharges above 5 cfs, others good. Canal diverts from right bank of Gila River in SW $\frac{1}{4}$ NW $\frac{1}{4}$ 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	0.02	0.5	8.2
.1	.4	.8	18
.2	1.7	1.2	34
.3	3.5	1.6	51

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.7	13	14	0.4	0	27	41	40	14	12	30	0.7
2	5.2	*6.6	*14	.1	0	27	41	40	14	14	30	2.8
3	6.6	5.7	15	0	0	24	41	39	14	13	30	9.4
4	5.2	4.4	15	0	0	18	42	38	14	14	32	15
5	5.4	0	15	0	0	18	42	38	14	30	28	19
6	4.3	0	15	0	0	*21	*42	39	14	32	35	16
7	3.9	0	15	0	0	28	42	43	14	30	35	16
8	3.5	0	14	0	0	34	42	49	14	31	27	13
9	5.9	0	15	9.7	0	35	38	43	14	33	16	12
10	8.9	0	16	14	0	36	40	40	7.2	34	15	16
11	0	0	16	4.9	0	36	41	34	7.4	21	14	15
12	0	0	17	.1	0	36	38	33	*6.6	12	12	14
13	0	0	14	0	0	36	34	32	5.4	12	13	11
14	0	0	13	0	0	36	32	32	10	12	13	6.4
15	0	0	13	0	0	36	26	*36	16	13	6.6	9.7
16	0	0	14	0	0	36	27	38	18	17	5.9	14
17	0	0	19	0	0	35	35	39	18	22	6.6	12
18	0	0	15	0	0	9.35	39	39	18	20	6.9	6.2
19	0	0	14	0	0	9.36	40	29	19	17	13	6.2
20	4.0	0	14	0	0	9.36	42	27	21	17	18	10
21	8.8	0	*14	0	2.6	9.37	42	29	21	17	17	11
22	6.9	0	14	0	12	9.37	39	27	21	19	13	6.2
23	6.6	0	14	0	*22	9.37	41	17	19	15	9.4	5.7
24	*6.9	0	14	0	25	38	42	17	16	15	10	5.9
25	6.6	0	14	0	24	36	*42	18	14	17	11	10
26	11	0	14	0	24	38	42	17	13	19	8.2	15
27	15	0	14	0	24	38	41	16	12	18	7.9	17
28	14	6.6	14	0	26	38	41	17	*10	27	6.9	18
29	15	14	14	0	-	40	39	17	9.1	20	4.7	9.9
30	15	14	15	0	-----	41	41	14	10	20	*1.0	2.9
31	15	-----	9.9	0	-----	41	-----	14	-----	*27	1.2	-----
Total	179.4	64.3	447.9	29.2	159.6	104.7	117.5	95.1	417.7	620	477.3	326.0
Mean	5.79	2.14	14.4	0.94	5.70	33.8	39.2	30.7	13.9	20.0	15.4	10.9
Ac-ft	356	128	888	58	317	2080	2330	1890	828	1230	947	647

Calendar year 1961: Max 35 Min 0 Mean 8.03 Ac-ft 5,810
 Water year 1961-62: Max 49 Min 0 Mean 16.1 Ac-ft 11,700

* Discharge measurement made on this day.

g Computed from once-daily staff gage readings.

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 1962. 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, 1936-62: Maximum daily discharge, 74 cfs Sept. 9, 1930; no flow at times.

Remarks.--Records good. 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. For additional history and gage data, see page 599 of WSP 1313.

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	1.1	34
.4	6.6		

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	8.2	0	0		0	23	27	0	0	3.2	0
2	0	*12	*0	0		0	27	26	0	0	2.4	0
3	0	2.9	0	0		0	27	26	0	0	4.9	0
4	0	2.2	0	0		0	30	27	0	0	.2	0
5	0	0	0	0		0	32	27	0	0	0	0
6	0	0	0	0		*0	*31	29	0	0	0	0
7	0	0	0	0		0	32	30	0	0	0	0
8	0	0	0	*0		7.2	32	30	0	0	0	0
9	0	0	0	0		17	27	29	0	0	0	0
10	0	0	0	0		20	28	28	0	0	0	0
11	*0	0	0	0		18	27	26	0	0	0	0
12	8.4	0	0	0		16	25	24	*0	0	0	0
13	12	0	0	0		22	26	30	0	0	0	0
14	11	0	0	0		27	26	31	.1	0	0	0
15	10	0	0	0		28	26	*29	1.6	0	0	0
16	9.1	0	0	0		29	21	25	.5	0	0	0
17	8.5	0	0	*0		28	21	24	1.8	0	0	0
18	7.9	0	4.7	0		30	28	20	.4	0	0	0
19	7.7	0	.7	0		30	28	20	0	0	0	0
20	5.6	*0	0	0		30	23	18	0	0	0	0
21	0	0	0	0		29	23	16	0	0	0	0
22	0	0	0	0		28	23	17	0	0	0	0
23	0	0	0	0	(*)	*28	23	6.0	0	0	0	0
24	*4.9	0	0	0		29	23	2.0	0	.5	0	0
25	7.4	0	0	8.4		30	*26	2.5	0	6.1	0	0
26	6.6	0	0	4.0		32	28	2.1	0	4.5	0	2.6
27	5.9	0	0	0		32	27	2.5	*0	12	0	0
28	5.4	0	0	0		30	22	2.6	0	15	0	0
29	5.4	0	0	0		29	20	1.3	0	0	0	0
30	6.6	0	0	0		23	24	0	0	14	*0	0
31	6.9	-----	0	0	-----	27	-----	0	-----	*28	0	-----
Total	129.3	71.2	5.4	12.4	0	619.2	779	578.0	4.4	80.1	61.1	2.6
Mean	4.17	2.37	0.17	0.40	0	20.0	26.0	18.6	0.15	2.58	1.97	0.09
Ac-ft	256	141	11	25	0	1,230	1,540	1,150	8.7	159	121	5.2

Calendar year 1961: Max 47 Min 0 Mean 5.24 Ac-ft 3,790
 Water year 1961-62: Max 32 Min 0 Mean 6.42 Ac-ft 4,650

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

9-4426.8 San Francisco River near Reserve, N. Mex.

Location.--Lat 33°44'30", long 108°46'15", in SW $\frac{1}{4}$ NE $\frac{1}{4}$ 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 1962.

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, 386 cfs Feb. 13 (gage height, 2.19 ft); minimum, 2.0 cfs Dec. 12.

1959-62: 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.

A flood of unknown date and discharge reached a stage of about 15 ft at present gage, determined from old floodmarks in 1962.

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)
(Shifting-control method used Mar. 29, Apr. 4, 5)

0.5	2.9	1.0	43
.6	7.2	1.2	81
.7	14	1.6	190
.8	21	2.0	320

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.8	16	32	19	23	48	118	27	6.6	7.8	8.5	4.2
2	3.5	9.9	33	24	27	46	122	25	6.6	6.6	7.2	4.2
3	3.5	7.2	30	20	29	43	125	24	6.6	6.6	15	4.2
4	3.5	7.2	26	17	32	42	130	22	6.6	7.8	7.8	4.2
5	3.5	6.6	24	17	36	45	125	20	6.6	7.8	6.0	4.2
6	3.5	6.6	18	17	40	50	128	19	6.0	6.6	5.5	5.5
7	3.5	6.6	20	26	50	55	122	18	6.0	6.0	5.5	4.6
8	14	7.8	20	25	58	50	120	18	5.5	5.5	5.0	4.6
9	39	9.9	20	26	88	45	118	17	5.5	5.0	4.6	5.0
10	6.0	11	19	25	174	42	115	15	5.0	4.2	4.6	4.6
11	4.6	9.9	16	8.5	250	31	115	14	4.6	4.2	5.0	4.2
12	4.2	9.2	5.4	15	270	30	105	13	4.6	7.2	4.6	4.6
13	3.8	9.2	11	22	320	38	98	12	4.2	5.5	4.6	6.8
14	3.8	7.8	21	19	250	36	98	11	4.2	4.6	4.6	11
15	3.8	8.5	20	14	257	29	88	9.9	3.8	4.2	4.2	6.6
16	3.8	9.9	22	17	235	31	86	9.9	3.8	4.2	4.2	6.0
17	3.8	11	15	23	220	32	81	9.2	3.8	3.8	4.2	5.5
18	4.2	11	13	24	163	35	77	9.2	3.8	4.6	4.2	5.5
19	3.8	14	13	21	133	45	70	8.5	3.8	5.0	4.2	6.0
20	3.8	13	14	20	115	53	66	7.2	3.5	5.0	4.2	6.0
21	3.8	16	18	20	103	55	58	6.6	3.5	6.6	6.4	5.0
22	3.8	16	19	20	100	48	53	7.2	3.2	7.2	8.5	5.0
23	4.2	14	20	23	86	57	48	6.6	3.5	7.2	6.0	8.4
24	4.2	15	22	29	81	46	42	6.6	3.5	6.6	5.5	12
25	4.2	16	22	38	73	53	38	6.6	3.5	5.5	5.0	13
26	4.2	18	26	25	57	66	50	7.2	3.5	5.0	5.0	9.2
27	5.0	23	25	20	48	93	50	7.2	4.2	4.6	5.0	8.5
28	4.6	31	22	20	41	110	39	7.8	5.5	4.6	4.6	7.2
29	6.0	31	21	20	-	130	33	8.5	5.5	5.0	4.2	7.8
30	11	31	20	20	-	128	30	7.8	7.8	15	4.2	6.6
31	23	-	21	22	-	118	-	6.6	-	8.5	3.8	-
Total	197.4	403.3	628.4	656.5	335.9	1730	2548	387.6	144.8	188.0	171.9	190.2
Mean	6.37	13.4	20.3	21.2	120	55.8	84.9	12.5	4.83	6.06	5.55	6.34
Ac-ft	392	800	1,250	1,300	6,660	3,430	5,050	769	287	373	341	377

Calendar year 1961: Max 39 Min 1.7 Mean 8.86 Ac-ft 6,420
Water year 1961-62: Max 320 Min 3.2 Mean 29.1 Ac-ft 21,030

Peak discharge (base, 200 cfs).--Oct. 9 (0130) 208 cfs (1.66 ft); Feb. 13 (0520) 386 cfs (2.19 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 1962. 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.--35 years, 62.9 cfs (45,540 acre-ft per year).

Extremes.--Maximum discharge during year, 1,460 cfs Feb. 13 (gage height, 4.90 ft); minimum, 6.0 cfs Aug. 19.

1927-62: 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.

A major flood probably occurred Jan. 19, 1916, when a discharge of 90,000 cfs was computed (by slope-conveyance method) for station at Clifton, Ariz. On Nov. 26, 1905, a peak of 25,000 cfs was measured (by float-area method) at station at Alma (about 12 miles upstream, drainage area, 1,560 sq mi); a similar measurement of 21,000 cfs was made at the Alma station for peak of Dec. 3, 1906.

Remarks.--Records fair except those for periods of no gage height record, which are poor. Discharge measurements generally made 1 to 6 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 Nov. 6-21, Feb. 10-17)

1.9	8.6	2.2	37	2.7	148	3.5	475	5.0	1,350
2.0	15	2.4	70	3.1	297	4.0	735		

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.9	65	56	100	100	130	310	130	27	23	35	13
2	9.9	54	56	102	102	124	314	113	27	23	36	12
3	11	44	59	102	110	118	336	115	32	23	26	8.6
4	12	40	56	90	127	113	354	115	31	25	22	11
5	17	35	54	81	148	108	367	110	25	27	21	11
6	14	31	52	77	171	102	358	118	24	26	17	11
7	15	29	49	77	206	108	362	118	25	25	14	12
8	35	31	49	83	256	118	358	124	24	24	14	26
9	49.3	43	56	90	394	118	358	121	26	23	15	26
10	133	50	56	100	831	115	362	108	27	22	14	26
11	49	42	70	a90	1080	113	362	105	29	23	13	23
12	30	37	72	a80	1110	97	344	92	26	22	11	23
13	26	37	54	a70	1250	88	323	95	21	20	11	22
14	25	40	57	a70	1080	95	314	81	25	17	11	21
15	26	40	105	a60	984	90	314	65	25	14	12	29
16	26	46	421	a60	818	83	323	56	25	14	11	30
17	25	57	203	a70	680	83	318	52	31	11	11	30
18	27	56	124	a80	a550	81	314	44	27	14	11	21
19	30	48	113	83	a450	83	297	37	26	14	9.2	15
20	25	43	113	74	a400	92	289	36	26	27	11	21
21	27	48	151	70	a350	108	268	37	26	20	11	11
22	30	77	213	68	a300	113	229	36	17	a40	12	12
23	30	70	229	70	a250	110	195	36	14	a30	12	19
24	30	50	203	85	a220	118	174	31	14	a27	12	27
25	30	48	174	50.3	a190	113	164	32	17	a25	16	43
26	30	48	148	250	a160	115	174	35	16	a35	20	211
27	29	52	148	155	a140	133	171	35	22	a30	21	172
28	29	56	130	124	142	181	161	32	20	a25	19	74
29	32	59	118	113	-	264	151	29	15	a25	18	66
30	33	59	110	102	-----	336	145	29	21	29	11	44
31	43	-----	105	100	-----	331	-----	27	-----	35	9.9	-----
Total	1381.8	1435	3604	3279	12599	3981	8509	2194	711	737	487.1	1070.6
Mean	44.6	47.8	116	106	450	128	284	70.8	23.7	23.8	15.7	35.7
Ac-ft	2,740	2,850	7,150	6,500	24,990	7,900	16,880	4,350	1,410	1,460	966	2,120

Calendar year 1961: Max 500 Min 4.1 Mean 37.0 Ac-ft 26,800
 Water year 1961-62: Max 1,250 Min 8.6 Mean 110 Ac-ft 79,320

Peak discharge (base, 800 cfs).--Oct. 9 (0010) 862 cfs (4.23 ft); Feb. 13 (1100) 1,460 cfs (4.90 ft).

a No gage-height record.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

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 column headed "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 1962

Discharge measurements made at low-flow partial record stations during water year 1965						
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	1953-62	12-14-61	3.49
					3-21-62	7.49
					6-14-62	5.22
					9-21-62	2.55
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	1953-62	12-14-61	2.45
					3-21-62	3.96
					6-14-62	2.54
					9-21-62	2.59

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.

(To avoid added delay in publication of the 1962 State report, crest-stage data were withheld for publication in a subsequent report. These data will be available in the district office).

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 asterick (*); 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 1962

Discharge measurements made at miscellaneous sites during water year 1962						
Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
Rio Grande basin						
Costilla Creek	Rio Grande	Below Plaza de Arriba ditch heading, $\frac{1}{2}$ mile below diversion dam, $1\frac{1}{2}$ miles east of Costilla, N. Mex.	198	-	6-12-62	15.1
do	do	Below Plaza del Medio ditch, 1 mile below diversion dam and 1 mile east of Costilla, N. Mex.	199	-	6-12-62	14.0
Anderson ditch	Rio Pueblo de Taos	Lat 36°23'30", long 105°37'30", 0.1 mile below station on Rio Pueblo de Taos near Ranchito, 2.1 miles southwest of Ranchito, N. Mex.	-	1957	4- 2-62	Dry
Rio Chama	Rio Grande	W $\frac{1}{2}$ sec.8, T.23 n., R.5 E., above Canones Creek, above Abiquiu Dam, 7 miles northwest of Abiquiu, N. Mex.	-		8-30-62	25.3
do	do	Lat 36°12'45", long 106°19'30", below Gonzales ditch, $\frac{1}{4}$ mile below U.S. Highway 84, $\frac{1}{2}$ mile northwest of Abiquiu, N. Mex.	-		8-30-62	12.8
Santa Fe River	do	NW $\frac{1}{4}$ sec.19, T.17 N., R.11 E., at former gaging station at Monument Rock, 1 mile upstream from McClure Dam and 7 miles east of Santa Fe, N. Mex.	a14	1910-11†	9- 6-62	*1.99
do	do	NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.24, T.17 N., R.10 E., at head of McClure Reservoir, $6\frac{1}{2}$ miles east of Santa Fe, N. Mex.	a15	1931-59	5-10-62	34.6
Unnamed	Tijeras Arroyo	SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.12, T.10 N., R.5 E., at culvert on U.S. Highway 66, 1.3 mi. southeast of Cedar Crest.	0.31		7-15-60	†307
do	do	NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.13, T.10 N., R.5 E., above culvert on U.S. Highway 66, 1.3 mi. southeast of Cedar Crest.	0.15		7-15-60	†142
San Lorenzo Arroyo	Rio Grande	Lat 34°13'30", long 106°55'05", 500 ft below bridge on U. S. Highway 85, 1.3 mi. north of Polvadera.	27.9		9-19-60	†b11,730
San Acacia drainage canal	Lemitar riverside drain	Lat 34°14'10", long 106°54'40", in Sevilleta Grant, near crossing of Socorro main canal north, $\frac{1}{2}$ mile above mouth, $1\frac{1}{2}$ miles southwest of San Acacia.		1961	6-29-62 7-25-62 8- 8-62 9- 4-62	10.2 1.54 10.3 3.45
Alamosa River	Rio Grande	SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.26, T.9 S., R.7 W., above San Mateo Canyon, 8 miles northwest of Monticello, N. Mex.	-	1961	5-12-62 6- 8-62 6-26-62 8- 1-62 8-22-62 8-31-62	*5.54 *2.63 *3.19 *3.49 *3.42 *2.24
do	do	E $\frac{1}{2}$ sec.1, T.10 S., R.7 W., below Shipman Canyon, 6 miles northwest of Monticello, N. Mex.	-	1961	4-24-62 5-12-62 6- 8-62 6-26-62 8- 1-62 8-22-62 8-31-62	*5.87 *5.31 *5.08 *5.22 *4.24 *5.68 *4.43

Note.--Symbols and footnotes are at end of list.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Measurements at miscellaneous sites

Discharge measurements made at miscellaneous sites during the water year 1962

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
Rio Grande basin						
Cuchillo Negro Creek	Rio Grande	N½ sec.20, T.12 S., R.6 W., ½ mile above diversion, 7 miles west of Cuchillo, N. Mex.	-	1961	4-24-62 5-12-62 6- 7-62 6-26-62 7-13-62 8-21-62 8-31-62	*1.96 *1.70 *1.18 *1.79 *3.08 *4.86 *3.22
Palomas River	do	Sec. 4, T.13 S., R.6 W., at box canyon, above diversion, about 13 miles northwest of Truth or Consequences, N. Mex.	-	1961	4-23-62 5-11-62 6- 7-62 6-26-62 7-13-62 8-22-62 9- 6-62	8.29 *5.74 *3.63 *3.32 *2.74 *3.73 *3.02
do	do	SW¼ sec.5, T.14 S., R.5 W., above Palomas Community ditch, about 7 miles west of Truth or Consequences, N. Mex.	-	1961	4-23-62 5-11-62 6- 7-62 6-26-62 7-13-62 8-22-62 9- 6-62	*2.01 *1.92 *1.52 *1.41 *2.03 *1.68 *1.71
Inlet to Fort Bliss sump area	do	Lat 31°50'40", long 106°25'15", downstream from culvert and channel from northeast, 0.6 mile northeast from former gaging station and 5½ miles northeast of El Paso business district.			9- 2-62	†755
do	do	Lat 31°50'20", 106°25'23", at culvert No. 1303.10 under 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 district.	3.5	1961-62†	9- 2-62 d	†c461
Unnamed	Arroyo San Juan de Dios	NE¼NE¼ sec.13, T.7 N., R.22 E., at two culverts on U.S. Highway 84, 4 mi. east of Puerto de Luna.	a1		1959	1,050
do	Salado Creek	SW¼SE¼ sec.20, T.3 N., R.18 E., at culvert on U.S. Highway 285, 2.3 mi. southwest of Joffre.	b0.6		7- 5-60	871
do	Conejos Creek	Center of boundary common to sec.22 and sec. 27, T.1 S., R.24 E., about 0.8 mile below dip on State Highway 20, and 10½ mi. northeast of Dunlap.	12		unknown 7- 6-60	4,680 2,190
Arroyo de la Mora	Pecos River	NE¼NE¼ sec.7, T.3 S., R.23 E., 1.5 mi above dip on State Highway 20, and 2.2 mi southwest of Dunlap.	430		7- 6-60	5,860
Carrizo Creek	Rio Ruidoso	SW¼ sec.33, T.11 S., R.13 E., at Mescalero Apache Indian Reservation boundary, 2 miles above mouth and 1½ miles south of Ruidoso.	-	1961	12-14-61 3-21-62 6-14-62 9-21-62	*1.08 2.25 *1.55 *1.40
Cedar Creek	do	SW¼ sec.26, T.11 S., R.13 E., at mouth at Ruidoso, N. Mex.	-	-	2-26-62	e.75
Unnamed	Rio Penasco	NW¼NW¼ sec.11, T.16 S., R.16 E., at culvert on State Highway 83, and 2 miles east of Elk.	a0.2		8-11-60	336
do	do	S½NE¼ sec.11, T.16 S., R.16 E., 300 ft below dip on State Highway 83, and 3 mi east of Elk.	2.0		8-11-60	1,150

Measurements at miscellaneous sites

Discharge measurements made at miscellaneous sites during water year 1962

Discharge measurements made at miscellaneous sites during water year 1962						
Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
Rio Grande basin						
Silver Springs Canyon	Elk Canyon	SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.15, T.15 S., R.13 E., at Mescalero Apache Indian Reservation boundary, 6.2 miles northeast of Cloudcroft, N. Mex.	-	1958-61	12-13-61 3-22-62 6-15-62 9-20-62	*.34 *.10 *.19 *.40
do	do	SE $\frac{1}{4}$ NE $\frac{1}{4}$ 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.	-	1961	12-13-61 3-22-62 6-15-62 9-20-62	0 *.15 *.57 .91
do	do	SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.34, T.14 S., R.14 E., $\frac{3}{4}$ mile above mouth, 12.2 miles northeast of Cloudcroft, N. Mex.	-	1958-61	12-13-61 3-22-62 6-15-62 9-20-62	0 *.33 0 0
Old Ranch Canyon	Rocky Arroyo	SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.6, T.22 S., R.24 E., at culvert on State Highway 137, and 18 $\frac{1}{2}$ mi. west of Carlsbad, N. Mex.	2.05		7- 6-60	1,990
Chinaberry Draw	Black River	SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.25, T.24 S., R.25 E., at two culverts on U.S. Highway 62, and 2 mi northeast of White City, N. Mex.	1.83		7- 6-60	957
Black River	Pecos River	NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.3, T.26 S., R.24 E., below Mayes Ranch, 10 miles southwest of White City, N. Mex.	-	1953-61	10- 3-61 10-26-61 11-24-61 12-27-61 1-18-62 2-26-62 4- 3-62 5- 1-62 5-28-62 6-29-62 8- 8-62 9- 6-62	f.46 f.48 f.54 f.51 f.56 f.70 f.54 f.47 f.45 f.44 f.46 f.73
Blue Springs	Black 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 1952-61	10- 3-61 10-26-61 11-24-61 12-27-61 1-18-62 2-26-62 4- 3-62 5- 1-62 5-28-62 6-29-62 8- 8-62 9- 6-62	f9.21 f9.54 f10.1 f10.2 f10.3 f10.3 f10.5 f9.66 f8.86 f7.83 f9.00 f8.76
Tularosa Valley basin						
Cottonwood Springs	Rio Tularosa	NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.14, T.14 S., R.10 E., above entrance to Rio Tularosa, 4 $\frac{1}{2}$ miles northeast of Tularosa, N. Mex.	-	-	5- 2-62	e.20
Rio Tularosa	-	NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.15, T.14 S., R.10 E., above diversion dam 3 $\frac{1}{2}$ miles northeast of Tularosa, N. Mex.	-	1934	4- 9-62 4-17-62 4-25-62 5- 2-62 5- 9-62 5-15-62 5-28-62	3.48 8.42 9.88 9.53 8.35 3.45 7.51
San Juan River basin						
San Juan River	Colorado River	SE $\frac{1}{4}$ sec.18, T.29 N., R.9 W., at river mile 125, at State Highway 17, 1 mile east of Blanco, N. Mex.	3,560	1927-1955†	7-10-62 9-11-62	459 179

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Measurements at miscellaneous sites

Discharge measurements made at miscellaneous sites during water year 1962

Discharge measurements made at miscellaneous sites during water year 1962						
Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
San Juan River basin						
San Juan River	Colorado River	Sec.27, T.29 N., R.12 W., at river mile 107, 5½ miles southwest of Bloomfield and 7 miles southeast of Farmington, N. Mex.	-	-	7-10-62 9-11-62	457 253
do	do	SE¼ sec.21, T.29 N., R.13 W., at river mile 99, above mouth of Animas River, 1 mile south of Farmington, N. Mex.	a5,880	-	7-10-62 9-11-62 9-12-62	476 271 250
do	do	SE¼ sec.12, T.29 N., R.14 W., at river mile 95, below mouth of La Plata River, 3 miles west of Farmington, N. Mex.	a7,830	-	9-12-62	202
do	do	NE¼ sec.8, T.29 N., R.16 W., at river mile 75, below Hogback diversion, 7½ miles east of Shiprock, N. Mex.	-	-	9-12-62	55.7
Gila River basin						
Sapillo Creek	Gila River	NW¼NE¼NW¼ sec.2, T.15 S., R.13 W., 5 ft above fence above gage, about 12 miles north of Pinos Altos, N. Mex.	-	-	5-23-62	*2.04
do	do	NW¼NW¼NW¼ sec.2, T.15 S., R.13 W., 25 ft below Fish & Game recording gage and about 12 miles north of Pinos Altos, N. Mex.	-	-	5-23-62	*3.89
do	do	SW¼NE¼NW¼ sec.2, T.15 S., R.13 W., above Cottonwood tree, about 12 miles north of Pinos Altos, N. Mex.	-	-	5-23-62	*0.45
do	do	SW¼SE¼SE¼ sec.34, T.14 S., R.13 W., 1,300 ft below damsite, about 12 miles north of Pinos Altos, N. Mex.	-	-	5-23-62	*4.09
do	do	SW¼SE¼ sec.33, T.14 S., R.13 E., above diversion to Hart Bar Hdgr Ranch, about 12 miles north of Pinos Altos, N. Mex.	-	-	5-23-62	*4.33
New Model Canal g/	do	In NE¼SW¼ sec.6, T.19 S., R.21 W., 500 ft above New Mexico-Arizona State line and 2¾ miles west of Virden, N. Mex.	-	1939-53† 1953-62	10-11-61 10-24-61 11- 2-61 11-20-61 12- 2-61 12-21-61 1- 8-62 1-17-62 2-23-62 3- 6-62 3-23-62 4- 6-62 4-25-62 5-15-62 6-12-62 6-28-62 7-31-62 8-30-62	0 0 2.60 0 0 0 0 0 0 0 0 25.2 14.2 19.6 0 0 24.9 0

* Base flow.

† Peak flow.

‡ Operated as a continuous-record gaging station.

a Approximately.

b Includes 2,180 cfs in secondary channel.

c From floodmark (3.7 ft) and former rating curve.

d A smaller peak occurred Sept. 5 or 6.

e Estimated (if discharge, field estimate).

f Spring flow.

g Published as Moddle Canal at New Mexico-Arizona State line near Virden, N. Mex. 1939-53.

Rio Ojo Caliente Seepage Investigation

A series of discharge measurements was made May 31, 1962, covering a reach from the U. S. G. S. gaging station at Lat 36°20'59", long 106°02'08", 400 ft upstream from bridge on State Highway 111 to the mouth.

"Total" represents entire surface flow across the river valley.

Overlapping measurements were made at sites Nos. 3 and 7; results are listed one above the other. The discharge shown above the line was measured last by the engineer working downstream to this site, and the discharge shown below the line was measured first by the engineer working downstream from this site.

Gage heights as recorded by the gage at the head of the reach for May 31 are:

<u>Time</u>	<u>Gage height (in feet)</u>
000	3.18
600	3.18
1200	3.17
1800	3.16

Site No. *	Stream and Location	Discharge in cubic per second	
		Measured discharge	Total discharge
1	Rio Ojo Caliente at La Madera (gaging station)	47.4	47.4
2	At lat 36°20'45", long 106°02'35", NE $\frac{1}{4}$ sec. 1, T. 24 N., R. 8 E., 3 ... miles downstream from confluence of Rio Vallecitos and Rio Tusas (old gaging station). Lucero ditch	44.6 1.67	
	Gallegos and Jaramillo ditch	1.24	47.5
3	At SCS District Headquarters, 1.8 road miles downstream from present gaging station	33.4 41.9	
	Rio Ojo Caliente ditch	9.63	
		9.44	
	Lucero ditch	0.18	43.2
		0.06	51.4
4	At Ojo Caliente Hotel and Highway bridge, 4.1 road miles downstream from gage.	39.5	
	Rio Ojo Caliente ditch	4.77	44.3
5	At south end of General Store in Ojo Caliente, 5.1 road miles from ... gage	33.7	
	Duran ditch Wasteway	1.47	
	Duran ditch	6.03	
	Rio Ojo Caliente ditch	3.18	44.4
6	At Gavilan ditch heading, 5.9 road miles from gage.	27.8	
	Gavilan ditch	6.89	
	Duran ditch	6.78	41.5
7	Below Gavilan ditch tailend wasteway, 8.9 road miles from gage	35.0 39.6	35.0 39.6
8	Below Mesa Prieta ditch heading, 10.8 road miles from gage	32.5	
	Mesa Prieta ditch	2.66	35.2
9	At cattle guard on State Highway 111, 13.4 road miles from gage	35.5	35.5
10	At small arroyo (5 culverts) crossing, 15.8 road miles from gage	34.9	34.9
11	At about $\frac{1}{4}$ mile upstream from mouth, 19.6 road miles from gage	34.1	34.1

* Refers to State Engineer map.

Note.--The only right bank diversion is Antonio de Abeyta Grant ditch which is not being used and its former heading is located about 0.4 mile downstream from site No. 7. On the right bank a pump is used to raise water from the river for irrigation of farm land formerly irrigated by said ditch. Pump not in operation during this seepage study.

PECOS RIVER SEEPAGE INVESTIGATION
Colonias to Alamogordo Reservoir, N. Mex.

A series of discharge measurements was made Oct. 19-20, 1961, to study gains and losses on the Pecos River from a point about 1½ 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 12 miles. All known tributaries and diversions were measured. All ditches shown in the tabulation divert from tributaries except Puerto de Luna east ditch which diverts directly from the Pecos River at mile 251.8. This water was being returned to the river at mile 249.7. No other direct surface return from diversions was noted. Pecos River measurements from mile 253.4 to mile 245.4 do not include water flowing in adjacent ditches. Gains or losses through this reach do not include this bypass flow.

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.

Records of chemical analyses of water samples obtained during this investigation are published in WSP 1944.

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.

A previous seepage investigation of this reach was made in March 1961; results are published in "Surface Water Records of New Mexico, 1961."

Indicated gains and losses may be in error because of only fair to good measuring conditions. Weather conditions were ideal with no appreciable precipitation recorded for several weeks prior to the investigation. Fluctuation in stage of the river during the period of this investigation was near minimum as recorded by regular gages at river mile 257.1 and 228.1 and temporary recorders at river mile 278.0 and 245.4. Overall results of the investigation are classed as good.

Pecos River mile	Stream	Location	Time	Water temp. °F	Discharge, in cubic feet per second		
					Main stream	Tributary or Diversion	Indicated gain or loss
Oct. 19, 1961							
286.7	Pecos River	Anton Chico Grant, 1.4 miles southeast of Colonias.	0830	-	0	-	-
284.8	do.	Anton Chico Grant, 2.7 miles southeast of Colonias.	0930	60	8.06	-	+8.06
283.2	do.	Anton Chico Grant, 3.8 miles southeast of Colonias.	1025	64	14.1	-	+6.04
281.8	do.	NW½ sec.24, T.10 N., R.20 E.....	1125	64	28.9	-	+14.8
281.0	do.	SE½ sec.24, T.10 N., R.20 E.....	1225	67	30.1	-	+1.2
279.7	do.	NE½ sec.25, T.10 N., R.20 E.....	1350	68	31.0	-	+9
278.0	do.	NW½ sec.32, T.10 N., R.21 E., at Walker Ranch (River Ranch) (temporary recorder)	<u>1510</u> 1020	<u>68</u> 57	<u>32.5</u> 38.4	- -	<u>+1.5</u> -
276.4	do.	NW½ sec.33, T.10 N., R.21 E.....	1130	58	30.3	-	-8.1
271.8	do.	Perea Grant, 8.5 miles north of Santa Rosa, above mouth of Esteros Creek	1340	65	35.6	-	+5.3
267.7	do.	Perea Grant, 6.8 miles north of Santa Rosa, above unnamed arroyo from left, west of Asphalt pit.	<u>1500</u> 0820	<u>63</u> 50	<u>34.2</u> 31.4	- -	<u>-1.4</u> -
262.4	do.	Perea Grant, 3.5 miles north of Santa Rosa, 4.0 miles below Los Esteros damsite.	0940	55	27.4	-	-4.0
260.6	do.	SW½ sec.26, T.9N., R.21 E., below Rattlesnake Canyon	1150	62	31.6	-	+4.2
259.5	Spring*	NE½ sec.34, T.9N., R.21 E. at mouth.....	1225	63	-	.66	-
259.4	Pecos River	SE½ sec.34, T.9N., R.21 E.....	1250	64	32.9	-	+6
258.2	do.	NW½ sec.3, T.8N., R.21 E.....	1435	67	32.4	-	-.5
257.1	do.	SE½ sec.3, T.8N., R.21 E., at Santa Rosa (regular gaging station)	<u>1520</u> 0810	<u>66</u> 52	<u>35.7</u> 35.2	- -	<u>+3.3</u> -
256.2	Santa Rosa swamp ditch†	NW½ sec.11, T.8N., R.21 E., at mouth.....	1140	62	-	.73	-
255.7	Unnamed Tributary*	SW½ sec.11, T.8N., R.21 E., at mouth.....	0740	60	-	1.24	-
255.6 ⁺ (mouth)	Casaus ditch*	SW½ sec.11, T.8N., R.21 E., at road crossing at Gallegos Ranch	0810	52	-	.98	-
-	Sewage effluent	SE½ sec.11, T.8N., R.21 E., at entrance to Rio Agua Negra Chiquita	0925	65	-	(.31)	-
255.4	Rio Agua Negra Chiquita†	SW½ sec.11, T.8N., R.21 E., at mouth.....	0950	61	-	29.0	-
255.0	Pecos River	NE½ sec.14, T.8N., R.21 E., below Rio Agua Negra Chiquita	1100	61	77.4	-	+10.2
255.0	Spring†	NE½ sec.14, T.8N., R.21 E., at mouth.....	1230	62	-	.30	-
254.5 ⁺ (mouth)	Spill from Casaus ditch*	SE½ sec.14, T.8N., R.21 E., at road crossing 0.1 mile from river.	0830	61	-	.18	-

PECOS RIVER SEEPAGE INVESTIGATION
Colonias to Alamogordo Reservoir, N. Mex.--Continued

187

Pecos River mile	Stream	Location	Time	Water temp. °F	Discharge, in cubic feet per second		
					Main stream	Tributary or Diversion	Indicated gain or loss
Oct. 19, 1961--Continued							
254.2	Spill from Labandie ditch†	SW½ sec.13, T.8N., R.21 E., at mouth.....	0920	63	-	2.17	-
253.9† (mouth)	Spill from Ortega ditch*	SW½ sec.13, T.8N., R.21 E., below road crossing....	1010	64	-	6.80	-
-	Ortega ditch*	SW½ sec.13, T.8N., R.21 E., below spill to river...	1040	64	-	(.43)	-
253.5	Spring*	NE½ sec.24, T.8N., R.21 E., at mouth.....	1110	63	-	.19	-
-	Ortega ditch*	NE½ sec.24, T.8N., R.21 E., adjacent to river mile 253.4	1220	64	-	(.23)	(-0.20)
-	Labandie ditch†	NE½ sec.24, T.8N., R.21 E., adjacent to river mile 253.4	1320	64	-	(.98)	-
253.4	Pecos River	NE½ sec.24, T.8N., R.21 E.....	1245	66	96.8	-	+10.1
251.8	Puerto de Luna east ditch†	NE½ sec.30, T.8N., R.22 E., at head (diversion from Pecos River)	1350	66	-	-1.58	-
249.7	Rio Agua Negra*	NE½ sec.31, T.8N., R.22 E., at mouth.....	1440	68	-	10.5	-
249.7 (mouth)	Return from Puerto de Luna east ditch†	NE½ sec.31, T.8N., R.22 E.....	1430	59	-	1.22	-.36
-	Puerto de Luna west ditch*	SE½ sec.31, T.8N., R.22 E., adjacent to river mile 249.6	1600	66	-	(2.19)	-
249.6	Pecos River	SE½ sec.31, T.8N., R.22 E., below Pintada Canyon (Rio Agua Negra)	1530	66	111	-	+4.06
Oct. 20, 1961							
-	Puerto de Luna west ditch*	SE½ sec.31, T.8N., R.22 E., adjacent to river mile 249.6	0915	50	-	(2.18)	-
249.6	Pecos River	SE½ sec.31, T.8N., R.22 E., below Pintada Canyon (Rio Agua Negra)	0840	53	115	-	-
-	Puerto de Luna west ditch*	SE½ sec.17, T.7N., R.22 E., adjacent to river mile 245.4	1310	63	-	(.04)	(-2.14)
245.4	Pecos River	SE½ sec.17, T.7N., R.22 E., at Puerto de Luna (temporary recorder)	1045	54	112	-	-3
242.9	Unnamed tributary*	SW½ sec.29, T.7N., R.22 E., at road crossing 0.4 miles above mouth	1100	68	-	.10	-
242.6	Pecos River	SE½ sec.29, T.7N., R.22 E.....	<u>1210</u> 1010	<u>62</u> 58	<u>111</u> 105	- -	<u>-1</u> -
236.2	do.	SW½ sec.36, T.7N., R.22 E.....	1210	63	117	-	+12
230.4	do.	SW½ sec.8, T.6N., R.23 E., above mouth of San Juan de Dios Arroyo	<u>1320</u> 0850	<u>-</u> 53	<u>102</u> 107	- -	<u>-15</u> -
228.1	do.	NW½ sec.20, T.6N., R.23 E., 9 miles southeast of Puerto de Luna (regular gaging station)	1035	60	110	-	+3
224.4	do.	SW½ sec.33, T.6N., R.23 E., above head of Alamogordo Lake	1150	61	108	-	-2

Note.--Measurements not involved in the computation of gains or losses of the Pecos River are enclosed in parentheses.

* Right bank.

† Left bank.

PECOS RIVER SEEPAGE INVESTIGATION
Alamogordo Dam to Acme, N. Mex.

A series of discharge measurements was made May 22, 1962, to study gains and losses on the Pecos River from the gaging station "below Alamogordo Dam" to the gaging station "near Acme." Fort Sumner main canal was the only diversion from this reach during the period of this investigation. All known tributaries were measured.

This reach of the river was divided into four sections for this investigation, with one engineer making all of the measurements in the upper two sections and the lower section. In the remaining section two engineers alternated measurements because all sites were not accessible from the same side of the river. Overlap measurements were made at the sites at river miles 190.7 and 176.6, 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 published in WSP 1944.

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.

Previous seepage investigations of this reach were made in January 1959, June 1960, and November 1960. Results are published in the appropriate WSP or State Report.

Indicated gains or losses may be considerably in error because of fluctuations in discharge during the investigation. Discharge from Alamogordo Reservoir was practically constant for 24 hours prior to the beginning of the investigation as recorded by the regular gage at river mile 210.5. Flow at the regular gage on Fort Sumner main canal gradually decreased from a discharge of about 81 cfs twelve hours prior to the measurement at this site to a discharge of about 72 cfs six hours subsequent to the measurement. Flow at the regular gage "below Ft. Sumner" at river mile 176.6 increased from about 28 cfs to near 45 cfs several hours prior to the morning measurement at this site. Following this rise there was a general recession throughout the day with a minimum flow of about 25 cfs recorded at midnight. This peak was the result of waste from the Fort Sumner main canal. That portion of the investigation from river mile 176.6 to river mile 165.8 was probably the only portion affected by this rise.

On May 20 a rise occurred at the "near Acme" regular gage at river mile 94.0 increasing the flow from less than 1 cfs to over 40 cfs. This investigation was made on the recession from this rise with the "near Acme" gage recording "no flow" subsequent to noon on May 24, less than two days after this investigation.

A temporary recorder at river mile 128.5 showed a more moderate recession ranging from 26 cfs in the late afternoon of May 20 to 10 cfs at noon on May 23. It is reasonable to assume that the indicated gains and losses shown in the tabulation included water coming out of channel storage in the reach downstream from the "below Ft. Sumner" gage. This would indicate a smaller loss between sections than would occur under steady-flow conditions.

Measuring conditions at the individual sites were rated from fair to good. Overall results of the investigation are rated as good from "below Alamogordo Dam" to "below Ft. Sumner" and fair to poor for that reach on downstream to "near Acme."

Pecos River mile	Stream	Location	Time	Water temp. °F	Discharge, in cubic feet per second		
					Main stream	Tributary or Diversion	Indicated gain or loss
210.5	Pecos River	Lot 1, sec.2, T.4N., R.24 E., below Alamogordo Dam (regular gaging station)	0850	63	76.6	-	-
207.5	Arroyo Salado*	SW $\frac{1}{4}$ sec.10, T.4N., R.24 E., at mouth.....	1050	-	-	0.04	-
207.5	Pecos River	NE $\frac{1}{4}$ sec.16, T.4N., R.24 E., below mouth of Arroyo Salado	1145	67	73.8	-	-2.8
193.7 (head)	Ft. Sumner main canal†	NW $\frac{1}{4}$ sec.12, T.3N., R.25 E., 0.4 mile below diversion dam (regular gaging station)	1540	73	-	-74.0	-
193.6	Pecos River	SW $\frac{1}{4}$ sec.1, T.3N., R.25 E., below Ft. Sumner Diversion dam	1645	-	0	-	+2
193.4	do.	NW $\frac{1}{4}$ sec.12, T.3N., R.25 E.....	1730	79	.12	-	+1.2
190.7	do.	NW $\frac{1}{4}$ sec.19, T.3N., R.26 E., at Ft. Sumner.....	1800 0800	- 54	0 .10	- -	- -.12
187.1	Upper drain	NE $\frac{1}{4}$ sec.32, T.3N., R.26 E., at mouth.....	1000	-	-	0	-
187.1	Sewer outlet	NE $\frac{1}{4}$ sec.32, T.3N., R.26 E., at mouth.....	0945	61	-	.06	-
182.2	Pecos River	NW $\frac{1}{4}$ sec.15, T.2N., R.26 E.....	1035	64	5.53	-	+5.37
181.7	Middle drain†	NE $\frac{1}{4}$ sec.15, T.2N., R.26 E., at mouth.....	0940	59	-	12.5	-
176.8	Lower drain†	SW $\frac{1}{4}$ sec.36, T.2N., R.26 E., at mouth.....	1240	69	-	4.41	-
176.6	Pecos River	SW $\frac{1}{4}$ sec.36, T.2N., R.26 E., below Ft. Sumner (regular gaging station)	1320 0750	70 53	27.8 43.0	- -	+5.4 -
175.7	do.	SW $\frac{1}{4}$ sec.1, T.1N., R.26 E., below Taiban Creek.....	0850	57	44.8	-	+1.8
165.8	do.	NE $\frac{1}{4}$ sec.8, T.1S., R.26 E., above Arroyo Yeso.....	1010	62	29.0	-	-15.8
163.0	do.	NE $\frac{1}{4}$ sec.17, T.1S., R.26 E., below Arroyo Yeso.....	1105	67	26.9	-	-2.1
156.6	do.	NE $\frac{1}{4}$ sec.3, T.2S., R.25 E., above Conejos Creek.....	0850	55	22.3	-	-4.6
156.1	Conejos Creek*	SW $\frac{1}{4}$ sec.3, T.2S., R.25 E., at mouth.....	0815	-	-	.01	-
155.9	Pecos River	SE $\frac{1}{4}$ sec.3, T.2S., R.25 E., below Conejos Creek.....	1000	59	21.4	-	-.9
152.8	do.	NE $\frac{1}{4}$ sec.22, T.2S., R.25 E., below Cedar Creek.....	1230	72	19.3	-	-2.1
146.8	do.	NW $\frac{1}{4}$ sec.10, T.3S., R.25 E., above Arroyo de la Mora	1350	76	16.0	-	-3.3
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	1130	68	-	.04	-

PECOS RIVER SEEPAGE INVESTIGATION
Alamogordo Dam to Acme, N. Mex.--Continued

189

Pecos River mile	Stream	Location	Time	Water temp. °F	Discharge, in cubic feet per second		
					Main stream	Tributary or Diversión	Indicated gain or loss
143.0	Pecos River	NE $\frac{1}{4}$ sec.28, T.3S., R.25 E., above Wylie Draw.....	1300	73	14.2	-	-1.8
135.0	do.	NE $\frac{1}{4}$ sec.14, T.4S., R.25 E., above Hernandez Draw...	1420	76	11.2	-	-3.0
128.5	do.	SW $\frac{1}{4}$ sec.36, T.4S., R.25 E., at Benedict's pump (temporary recorder)	1600	75	10.8	-	-.4
124.6	do.	NE $\frac{1}{4}$ sec.14, T.5S., R.25 E., above Huggins Creek....	1710	71	9.74	-	-1.06
118.0	do.	NE $\frac{1}{4}$ sec.9, T.6S., R.26 E., below Crockett Draw....	0820	56	10.5	-	+7.6
113.0	do.	NW $\frac{1}{4}$ sec.33, T.6S., R.26 E., below Bosque Draw.....	1030	67	11.0	-	+5
111.0	do.	SE $\frac{1}{4}$ sec.5, T.7S., R.26 E., above Five Mile Draw....	1120	69	9.34	-	-1.66
106.6	do.	NE $\frac{1}{4}$ sec.29, T.7S., R.26 E., at Transwestern pipe- line crossing	1245	76	6.89	-	-2.45
102.9	do.	SW $\frac{1}{4}$ sec.1, T.8S., R.25 E., at El Paso pipeline crossing	1400	79	7.04	-	+1.5
97.6	do.	NW $\frac{1}{4}$ sec.35, T.8S., R.25 E., above Arroyo Atascoso..	1530	80	6.91	-	-.13
94.0	do.	NW $\frac{1}{4}$ sec.14, T.9S., R.25 E., near Acme (regular gaging station)	1630	80	7.36	-	+4.5

* Right bank.

† Left bank.

PECOS RIVER BASIN SEEPAGE INVESTIGATION
Fort Sumner Irrigation Project, N. Mex.

A series of discharge measurements was made Oct. 16-18, 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 and Westside and Wilson laterals, the main arteries of the Fort Sumner Project distribution system. The Pecos River was measured at four sites adjacent to the Project on Oct. 16 and 17. In addition the Ft. Sumner sewage effluent, and each of the three drains from the Project were measured as they entered the river. All turnouts and wasteways from the canals and laterals were checked but only those with at least 0.01 cfs flow are included in the tabulation.

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 because of inaccuracies in open-channel measurements.

Four temporary recorders were installed to supplement the regular gaging station below the head of the main canal. These were located at the check below Turnout 44 on the main canal, at the head of the Westside and Wilson laterals, and at the site on Pecos River below Ft. Sumner project.

The regular gage on the main canal and the temporary recorder below Turnout 44 showed no appreciable fluctuation for at least 10 hours prior to the investigation. There were no significant changes in diversion by the Westside or Wilson laterals. Measuring conditions ranged from fair to excellent; overall results of the main canal investigation are rated as good.

There was no evidence of any appreciable fluctuation in flow in the High Line canal during the investigation. Measuring conditions ranged from good to excellent; overall results of the High Line canal investigation are rated as good.

The temporary recorder at the head of the Westside lateral indicated no fluctuation in stage for about four hours prior to the start of the investigation. This may have caused some of the fluctuation in discharge indicated near the lower end of the lateral. Measuring conditions were generally good; overall results of the Westside lateral investigation are rated as fair.

The temporary recorder at the head of Wilson Lateral indicated considerable fluctuation in stage until about five hours prior to the first investigation. This, together with changes in turnouts from the lateral caused variable flow, especially in the lower end of the lateral. As a result of this, a second investigation was made about six hours after the first. Measuring conditions were fair to good. Overall results of the first investigation on Wilson lateral are rated as poor with the second investigation rated as fair.

The temporary recorder at Pecos River below Ft. Sumner Project showed some fluctuation. There was a gradual increase in stage during the morning of Oct. 16. Stage remained fairly constant until mid-morning of the 17th and then decreased for the remainder of the day. Measuring conditions for the river and drain measurements ranged from fair to good. Overall results of the measurements are rated fair.

Previous seepage investigations of the Ft. Sumner Project were made in August 1960, March 1961, and September 1961. Results are published in the appropriate WSP or State Report.

Records of chemical analyses of water samples obtained at selected sites during this investigation are published in WSP 1944.

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, Oct. 17, 1961

Canal Mile	Site		Time	Water temp. °F	Discharge, in cubic feet per second		
	Main Canal	Turnout			Main canal	Diversion	Indicated gain or loss
0.45	at regular gaging station.....		0810	54	51.5	-	-
2.45	above turbine.....		1520	65	53.8	-	+2.3
2.61		High Line Canal below siphon.....	0930	55	-	9.06	-
2.82	above old U. S. Rt. 60 hwy. crossing.....		1000	55	43.3	-	-1.4
3.14		Wasteway.....	0935	-	-	.01	-
3.20	below new U. S. Rt. 60 hwy. crossing.....		1035	56	44.7	-	+1.4
3.34	below siphon.....		1110	57	42.7	-	-2.0
3.68		8-R	1010	-	-	.04	-
3.69	at check below T. O. 8.....		1140	57	43.7	-	+1.0
3.89		10-R	0955	-	-	.11	-
4.47	at check below T. O. 14.....		1240	59	41.1	-	-2.5
4.87	at check below T. O. 19.....		1320	59	44.4	-	+3.3
5.33		22-R	1130	-	-	.07	-
5.66		Westside Lateral (temporary recorder)	0800	56	-	9.40	-
5.71	at check below T. O. 30.....		1350 0850	60 55	35.7 36.6	- -	+8 -
5.95	at check below T. O. 33.....		0940	56	35.4	-	-1.2
6.28	at check below T. O. 38.....		1040	58	35.6	-	+2
6.45		39a-R	1215	-	-	.02	-
6.80	at check below T. O. 42.....		1130	58	36.4	-	+8
7.16	at check below T. O. 44 (temporary recorder).		1220	60	35.3	-	-1.1
7.17		45-R	0800	-	-	a.01	-
7.28	at check below T. O. 47.....		1240	60	36.2	-	+9

PECOS RIVER BASIN SEEPAGE INVESTIGATION
Fort Sumner Irrigation Project, N. Mex.--Continued

191

Main Canal seepage investigation, Oct. 17, 1961--Continued

Canal Mile	Site		Time	Water temp., °F	Discharge, in cubic feet per second		
	Main Canal	Turnout			Main canal	Diversion	Indicated gain or loss
7.58		48-R	0815	-	-	a.02	-
7.87		51-R	0820	-	-	a.02	-
7.98	at check below T. O. 52.....		1300	60	36.4	-	+2
8.30		54-R	0850	-	-	a.01	-
8.31	above siphon.....		1330 0750	61 56	35.8 34.6	- -	-6 -
8.34	below siphon.....		0810	56	35.3	-	+7
8.60	at check below T. O. 56.....		0850	56	35.0	-	-3
8.85		58-R	0940	-	-	a.01	-
9.19		60-R	0945	-	-	a.01	-
9.20	at check below T. O. 60.....		0920	56	35.1	-	+1
9.45	at check below T. O. 61.....		0950	58	34.1	-	-1.0
9.72		63-R	1000	-	-	a.01	-
10.05	at check below T. O. 66.....		1030	58	35.5	-	+1.4
10.30	above entrance of High Line Canal.....		1105	59	35.3	-	-2
10.36	below entrance of High Line Canal.....		1130 0800	60 56	44.4 42.2	- -	+9.1 -
10.85	at check below T. O. 71.....		0855	57	43.7	-	+1.5
10.90	at check below T. O. 72.....		0930	58	44.5	-	+8
11.11	at check below T. O. 73.....		1000	59	44.7	-	+2
11.40	at check below T. O. 76.....		1040	60	42.7	-	-2.0
11.73	at check below T. O. 78.....		1130	60	44.3	-	+1.6
11.80		79-R	1130	-	-	a.02	-
11.86	at check below T. O. 80.....		1215	61	45.8	-	+1.5
11.98	at check below T. O. 81.....		1300	64	42.5	-	-3.3
12.42	at check below T. O. 82.....		1350 0820	64 56	45.0 43.3	- -	+2.5 -
12.67		Wilson Lateral (temporary recorder)	0920	57	-	8.96	-
12.71	at check below T. O. 84.....		1000	57	34.6	-	+3
13.03		85-R	1245	-	-	a.01	-
13.06	at check below T. O. 85.....		1040	58	35.2	-	+6
13.37	at check below T. O. 86b.....		1125	59	34.9	-	-3
13.80	at check below T. O. 86c.....		1210	61	34.5	-	-4
14.96	at check below T. O. 88.....		1300	62	31.2	-	-3.3
15.75	at check below T. O. 90.....		1340	63	28.8	-	-2.4
16.00	at drop structure above entrance to "lower drain".....		1425	63	29.5	-	+7

a - Estimated.

PECOS RIVER BASIN SEEPAGE INVESTIGATION
Fort Sumner Irrigation Project, N. Mex.--Continued

High Line Canal seepage investigation, Oct. 18, 1961

Canal Mile	Site		Time	Water temp. °F	Discharge, in cubic feet per second		
	High Line Canal	Turnout			Canal	Diversion	Indicated gain or loss
0.38	at head below siphon.....		0820	55	8.95	-	-
.60	above U. S. Rt. 84 and T. O. 2.....		0750	50	9.06	-	+0.11
.79	above concrete pipe section.....		0900	55	8.93	-	-.13
1.00	below concrete pipe section.....		0930	56	8.80	-	-.13
1.25		5-R	0810	-	-	a0.01	-
1.38		6-R	0815	-	-	a.03	-
1.46		7-R	0820	-	-	a.02	-
1.82	at check below T. O. 10.....		1000	58	8.92	-	+1.18
2.16		13-R	0845	-	-	a.01	-
2.18		14-R	0850	-	-	a.01	-
2.20	at check below T. O. 14.....		1040	59	9.18	-	+2.28
2.43		16-R	0900	-	-	a.01	-
2.44	at check below T. O. 16.....		1110	60	8.69	-	-.48
2.61		17-R	0910	-	-	a.01	-
2.74	above siphon under U. S. Rt. 60.....		1140	61	8.97	-	+2.29
2.76	below siphon under U. S. Rt. 60.....		<u>1220</u> 0755	<u>62</u> 55	<u>9.26</u> 8.57	- -	<u>+2.29</u> -
2.87	at check below T. O. 19.....		0825	55	8.42	-	-.15
3.12	at check below T. O. 21.....		0900	57	8.40	-	-.02
3.44	at check below T. O. 24.....		0930	58	8.44	-	+0.04
3.62	at check below T. O. 25.....		1005	60	8.72	-	+2.28
3.74	at check below T. O. 27.....		1035	60	8.63	-	-.09
4.05	at check below T. O. 29.....		1110	62	8.84	-	+2.21
4.20	at check below T. O. 30.....		1145	63	8.69	-	-.15
4.33	at check below T. O. 31.....		<u>1220</u> 0815	<u>65</u> -	<u>8.72</u> 8.69	- -	<u>+0.03</u> -
4.57	above T. O. 33.....		0900	-	8.74	-	+0.05
4.58		33-R	1025	-	-	a.02	-
5.06	above T. O. 34.....		0940	-	8.65	-	-.07
5.06		34-R	1030	-	-	a.01	-
5.18	above T. O. 35.....		1040	-	8.61	-	-.03
5.35	above T. O. 36.....		1110	-	8.56	-	-.05
5.47	above T. O. 38.....		1140	-	8.48	-	-.08
5.64	at check below T. O. 39.....		1220	-	8.69	-	+2.21
6.33	above T. O. 41.....		<u>1305</u> 0800	<u>-</u> 56	<u>8.59</u> 8.66	- -	<u>-.10</u> -
6.64	at check below T. O. 42.....		0830	56	8.26	-	-.40
6.81		43-R	1105	-	-	a.05	-
6.83	at check below T. O. 43.....		0900	56	8.57	-	+3.36
7.03		44-R	1105	-	-	a.01	-
7.04	at check below T. O. 44.....		0920	56	8.25	-	-.31
7.27	at check below T. O. 46.....		0940	58	8.23	-	-.02
7.82	at check below T. O. 47.....		1010	60	8.83	-	+6.60
8.04	at check below T. O. 48.....		1040	61	8.79	-	-.04
8.30	at entrance to Main Canal.....		1100	62	8.79	-	0

a Estimated.

PECOS RIVER BASIN SEEPAGE INVESTIGATION
Fort Sumner Irrigation Project, N. Mex.--Continued

193

Wilson Lateral seepage investigations, Oct. 16, 1961

Lat- eral Mile	Wilson Lateral	Turnout	1st Investigation					2nd Investigation				
			Time	Discharge, in cfs				Time	Discharge, in cfs			
				Water temp. °F	Lateral	Diversion	Indicated gain or loss		Water temp. °F	Lateral	Diversion	Indicated gain or loss
0.02	above weir at head (temporary recorder).....		0755	56	7.92	-	-	1500	64	7.98	-	-
.17	at second drop.....		0830	56	8.65	-	+0.73	1535	64	8.39	-	+0.41
.38	at check below T. O. 4a.....		0855	56	7.89	-	-.76	1600	64	8.05	-	-.34
.60	at intersection of sec.14, 15, 22, 23.....		0925	58	8.69	-	+80	1630	64	8.80	-	+75
.76	below T. O. 5.....		0950	59	8.30	-	-.39	1700	63	8.44	-	-.36
.85		6-R	0800	-	-	a.01	-	0800	-	-	a.01	-
.86	at check below T. O. 6.....		1015	59	8.27	-	-.02	<u>1720</u> 1500	<u>62</u> 64	<u>8.85</u> 8.60	-	<u>+42</u> -
.91	at check below T. O. 7.....		1040	60	8.16	-	-.11	1525	64	8.31	-	-.29
1.10		8-R	0820	-	-	a.01	-	0820	-	-	a.01	-
1.11	at check below T. O. 8.....		1100	60	8.86	-	+71	1555	64	8.65	-	+35
1.47		9-L	0835	-	-	a.02	-	0835	-	-	a.02	-
1.48	at check below T. O. 9.....		1135	62	8.28	-	-.56	1625	64	8.61	-	-.02
1.71	at check below T. O. 10.....		1200	62	8.20	-	-.08	1700	63	8.69	-	+08
1.77	at check below T. O. 11.....		<u>1230</u> 0730	<u>64</u> 57	<u>8.26</u> 8.82	-	<u>+06</u> -	<u>1730</u> 1455	<u>63</u> 66	<u>8.58</u> 8.59	-	<u>-.11</u> -
1.88		12-L	0930	-	-	.15	-	0930	-	-	.15	-
1.89	at check below T. O. 12.....		0755	57	8.20	-	.47	1515	66	8.57	-	+13
2.02	at check below T. O. 13.....		0815	57	8.15	-	-.05	1530	66	8.49	-	-.08
		14-L	0945	-	-	a.01	-	0945	-	-	a.01	-
2.26	at check below T. O. 14.....		0840	57	7.91	-	-.23	1550	66	8.87	-	+39
		16-L	1000	-	-	a.03	-	1000	-	-	a.03	-
2.58	at check below T. O. 16.....		0900	58	7.84	-	-.04	1610	66	8.34	-	-.50
2.84	at check below T. O. 17.....		0930	59	8.04	-	+20	<u>1635</u> 1500	<u>66</u> 66	<u>8.55</u> 8.20	-	<u>+21</u> -
2.93	at check below T. O. 18.....		0950	59	8.65	-	+61	1520	66	7.58	-	-.62
3.16	at check below T. O. 19.....		1020	60	7.86	-	-.79	1540	66	7.61	-	+03
3.26	above T. O. 20.....		-	-	-	-	-	1550	66	7.84	-	+23
3.26		20-L	1040	-	-	a.02	-	1040	-	-	a.02	-
3.27	at check below T. O. 20.....		1040	60	7.76	-	-.08	-	-	-	-	-
3.38	above T. O. 21.....		-	-	-	-	-	1630	66	8.02	-	+20
3.38		21-R	1050	-	-	a.01	-	-	-	-	-	-
3.64	above check below T. O. 22..		1100	69	8.47	-	+72	-	-	-	-	-
3.64		22-L	1120	62	-	4.53	-	-	-	-	-	-
3.65	at check below T. O. 22.....		1130	62	3.63	-	-.31	-	-	-	-	-

a Estimated.

PECOS RIVER BASIN SEEPAGE INVESTIGATION
Fort Summer Irrigation Project, N. Mex.--Continued

Westside Lateral seepage investigation, Oct. 16, 1961

Lateral Mile	Site		Time	Water temp °F	Discharge, in cubic feet per second		
	Westside Lateral	Turnout			Lateral	Diversion	Indicated gain or loss
0	below weir at head (temporary recorder).....		0800	55	9.19	-	-
.19	at check below T. O. 1.....		0840	55	8.80	-	-0.39
.45	at check below T. O. 2.....		0920	56	9.48	-	+ .68
.71		6-L	0750	-	-	0.02	-
.72	at check below T. O. 6.....		1000	57	8.86	-	- .60
.81	at check below T. O. 7.....		1030	57	9.39	-	+ .53
.94	at check below T. O. 8.....		1050	58	9.25	-	- .14
1.24	at check below T. O. 9.....		1155	60	9.27	-	+ .02
1.37	at check below T. O. 10.....		1230	61	9.18	-	- .09
1.62	at check below T. O. 12.....		1320	62	9.22	-	+ .04
1.75	at check below T. O. 13.....		1405 0800	62 55	9.17 9.25	- -	- .05 -
1.91	at check below T. O. 14.....		0840	55	9.44	-	+ .19
2.15	at check below T. O. 16.....		0920	55	9.61	-	+ .17
2.28	at check below T. O. 17.....		0950	56	9.04	-	- .57
2.41	at check below T. O. 18.....		1010	57	9.07	-	+ .03
2.49		19-R	0900	-	-	.02	-
2.49		19-L	0905	-	-	.01	-
2.50	at check below T. O. 19.....		1040	58	8.65	-	- .39
2.68	at check below T. O. 22.....		1120	60	9.27	-	+ .62
2.84	at check below T. O. 23.....		1200	60	9.22	-	- .05
2.95	at check below T. O. 24.....		1250	62	9.19	-	- .03
3.10	at check below T. O. 26.....		1320 0750	62 56	8.93 7.79	- -	- .26 -
3.24	at check below T. O. 27.....		0815	56	8.96	-	+1.17
3.37	at check below T. O. 28.....		0845	57	8.76	-	- .20
3.55	at check below T. O. 30.....		0915	57	8.31	-	- .45
3.66	at check below T. O. 31.....		0940	58	9.23	-	+ .92
3.84	at check below T. O. 32.....		1010	59	9.34	-	+ .11
3.96	at check below T. O. 34.....		1030	60	8.51	-	- .83
4.15	at check below T. O. 36.....		1110	61	8.70	-	+ .19
4.31	at end.....		1130	61	8.26	-	- .44

Pecos River and drain measurements

Stream and Location	Pecos River mile	Oct. 16, 1961				Oct. 17, 1961			
		Wtr. temp. °F	Discharge, in cfs			Wtr. temp. °F	Discharge, in cfs		
			River	Drain	Gain or loss		River	Drain	Gain or loss
Pecos River below diversion dam....	193.6	54	52.6	-	-	53	36.8	-	-
Pecos River at highway bridge.....	190.7	56	47.2	-	-5.4	54	36.3	-	-0.5
Upper Drain at mouth.....	187.1	56	-	0.30	-	54	-	0.17	-
Sewer outlet at mouth.....	187.1	62	-	.17	-	55	-	.12	-
Pecos River 1 mi. above Middle Drain	182.7	63	48.5	-	+ .8	60	42.5	-	+5.9
Middle Drain 1,000 ft above mouth..	181.7	63	-	23.3	-	64	-	13.4	-
Lower Drain at mouth.....	176.8	68	-	41.0	-	62	-	34.4	-
Pecos River below Lower Drain (temporary recorder)	176.6	69	113	-	+ .2	66	99.5	-	+9.2

PECOS RIVER SEEPAGE INVESTIGATION
Acme to Artesia, N. Mex.

195

A series of discharge measurements was made Feb. 1-2, 1962, to study gains and losses on the Pecos River from the gaging station "near Acme" to the gaging station "near Artesia." All known tributary inflow was measured. The only diversion that affected the results of this investigation was the pump at river mile 47.1.

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.

Records of chemical analyses of water samples obtained during this investigation are published in WSP 1944.

Locations of measurement sites were obtained from standard U. S. Geological Survey quadrangle maps. River mile locations were obtained from the U. S. G. S. Plan and Profile of the Pecos River, Lake McMillan to Pecos, N. Mex., maps.

Previous seepage investigations of this reach were made at least once each water year from 1953 through 1960. Results are published in the appropriate WSP.

Indicated gains and losses may be in error because of only fair to good measuring conditions. Weather conditions were ideal with no precipitation or freezing temperatures recorded immediately prior or during the investigation. Fluctuation in stage of the river during the period of this investigation was near minimum as recorded by regular gages at river mile 94.0, 30.6, and 12.4, and temporary recorders at river mile 74.5 and 58.1. The temporary recorder at mile 46.7 showed the effect of pump operation at mile 47.1. This pump was included in the tabulation. Overall results of the investigation are classed as good.

Pecos River mile	Stream	Location	Time	Water temp. °F	Discharge, in cubic feet per second		
					Main stream	Tributary or Diversion	Indicated gain or loss
Feb. 1, 1962							
94.0	Pecos River	NW¼ sec.14, T.9S., R.25 E., near Acme (regular gaging station)	0805	36	28.3	-	-
89.0	do.	SE¼SW¼SE¼ sec.27, T.9S., R.25 E., above Bitter Lakes	0910	-	30.4	-	+2.1
84.9	do.	NE¼SW¼SW¼ sec.11, T.10S., R.25 E., at Bitter Lakes above inflow	1030	44	30.2	-	-.2
84.9	Inflow*	NE¼SW¼SW¼ sec.11, T.10S., R.25 E., from old river channel at Bitter Lakes	1005	46	-	0.57	-
81.5½ (mouth)	Flowing well†	SW¼NE¼SW¼ sec.22, T.10S., R.25 E., at well.....	1155	70	-	(.04)	-
78.4	Pecos River	NE¼NE¼NE¼ sec.33, T.10 S., R.25 E., above mouth of Bitter Creek	1300	50	32.1	-	+1.3
-	Bitter Creek*	NW¼NE¼SW¼ sec.28, T.10S., R.25 E., 0.9 mile above mouth	0930	43	-	(7.85)	-
78.4	do.	NE¼NE¼NE¼ sec.33, T.10S., R.25 E., at mouth.....	1330	52	-	10.1	(+2.25)
77.5	Pecos River	NE¼SW¼SW¼ sec.34, T.10S., R.25 E., at Tatum bridge.	1420	54	44.8	-	+2.6
74.7	do.	SE¼SE¼NE¼ sec.9, T.11S., R.25 E., above Rio Hondo..	1630	54	43.4	-	-1.4
-	Hagerman Canal	NW¼SW¼NE¼ sec.31, T.10S., R.25 E., at head.....	1210	51	-	(10.3)	-
-	Roswell Drain- age District X-line	NW¼SE¼NW¼ sec.5, T.11S., R.25 E., at entrance to Hagerman Canal	1220	59	-	(.12)	-
-	South Spring Creek	SE¼SE¼SE¼ sec.8, T.11S., R.25 E., at entrance to Hagerman Canal	1345	54	-	(2.70)	-
-	Pamona Drain	NW¼NW¼SE¼ sec.22, T.11S., R.25 E., at entrance to Hagerman Canal	1555	57	-	(1.31)	-
-	Rio Hondo	NE¼SW¼SE¼ sec.32, T.10S., R.25 E., at U. S. Hwy 380 bridge	1130	49	-	(2.35)	-
-	South Spring Drain	SE¼NW¼SE¼ sec.9, T.11S., R.25 E., at road crossing (tributary to Rio Hondo)	0750	38	-	(.44)	-
74.6	Rio Hondo*	NE¼NE¼SE¼ sec.9, T.11S., R.25 E., at mouth.....	1555	52	-	7.63	(+4.84)
74.5	Pecos River	SE¼NE¼SE¼ sec.9, T.11S., R.25 E., below Rio Hondo (temporary recorder)	<u>1530</u> 0825	<u>54</u> 40	<u>51.7</u> 51.5	- -	<u>+7</u> -
74.1	East Grand Plains Drain- age District "D" line*	SE¼SW¼SW¼ sec.10, T.11S., R.25 E., at mouth.....	0845	55	-	1.20	-
73.6	East Grand Plains Drain- age District "A-B-C" line*	NW¼SW¼NE¼ sec.15, T.11S., R.25 E., at mouth.....	0815	39	-	.19	-
72.7	Gravel Pit Drain*	SE¼SE¼NW¼ sec.14, T.11S., R.25 E., at mouth.....	1445	54	-	1.59	-
71.4	Pecos River	NW¼SE¼SW¼ sec.13, T.11S., R.25 E.....	0940	43	57.7	-	+3.2

PECOS RIVER SEEPAGE INVESTIGATION
 Acme to Artesia, N. Mex.--Continued

Pecos River mile	Stream	Location	Time	Water temp. °F	Discharge, in cubic feet per second			
					Main stream	Tributary or Diversion	Indicated gain or loss	
Feb. 1, 1962--Continued								
68.0	Inflow*	NE½NE½NE½ sec.35, T.11S., R.25 E., at mouth.....	1520	56	-	0.11	-	
67.7	Pecos River	SW½NW½NW½ sec.36, T.11S., R.25 E.....	1050	46	58.9	-	+1.1	
67.5	Oasis-Miller Drain *	SW½SW½NW½ sec.36, T.11S., R.25 E., at mouth.....	1525	56	-	.37	-	
67.3 [±]	Bottomless Lakes drain† (mouth)	SW½SE½NE½ sec.36, T.11S., R.25 E., at road crossing	1145	-	-	a.02	-	
64.5	Pecos River	S½NE½NE½ sec.17, T.12S., R.26 E., at Transwestern pipeline crossing	1220	49	61.6	-	+2.3	
61.7	do.	SE½NE½SE½ sec.29, T.12S., R.26 E.....	1340	52	61.0	-	-.6	
-	Hagerman Canal wasteway	SW½SW½SW½ sec.29, T.12S., R.26 E. (tributary to Nine Mile Draw)	1030	46	-	(.35)	-	
61.4	Nine Mile Draw*	SW½SE½SE½ sec.29, T.12S., R.26 E., at mouth.....	1115	45	-	1.10	-	
60.9	Pecos River	NW½SW½NW½ sec.33, T.12S., R.26 E.....	1445	54	62.6	-	+5	
58.4	Zuber Hollow wasteway *	SE½SE½SE½ sec.4, T.13S., R.26 E., at mouth.....	1000	37	-	.78	-	
58.1	Pecos River	SW½NW½NW½ sec.10, T.13S., R.26 E., at Dexter bridge (temporary recorder)	1540 0820	54 41	66.8 67.1	-	+3.4 -	
55.5	Berry drain*	NW½NW½SW½ sec.14, T.13S., R.26 E., at mouth	0940	36	-	.51	-	
55.4	Pecos River	NE½NW½SW½ sec.14, T.13S., R.26 E.....	0915	52	69.3	-	+1.7	
53.2	do.	SW½SW½SE½ sec.23, T.13S., R.26 E.....	1040	45	75.3	-	+6.0	
52.8	Dexter-Green-field drain, "A" line*	SW½SE½SW½ sec.23, T.13S., R.26 E., at mouth.....	0900	44	-	.17	-	
52.7	Dexter-Green-field drain, "E" line*	NW½NE½NW½ sec.26, T.13S., R.26 E., at mouth.....	0830	58	-	.09	-	
51.8	Dexter-Green-field drain, "D" line*	SE½NE½SE½ sec.27, T.13S., R.26 E., at mouth.....	0800	54	-	.09	-	
50.7	Pecos River	NW½SW½NW½ sec.35, T.13S., R.26 E.....	1130	47	73.6	-	-2.0	
-	Rio Felix*	SW½SE½SE½ sec.34, T.13S., R.26 E., ½ mile above mouth	1220	55	-	(1.95)	-	
50.0	do.	NW½SW½SE½ sec.35, T.13S., R.26 E., at mouth.....	1250	52	-	2.04	(+.09)	
49.2	Pecos River	SW½SE½NW½ sec.2, T.14S., R.26 E.....	1330	52	73.9	-	-1.7	
47.4	Hagerman Drain-age District "D" line*	SE½NW½NW½ sec.12, T.14S., R.26 E., at mouth.....	1030	58	-	.14	-	
47.1	Charles Green pump *	NW½SW½NE½ sec.12, T.14S., R.26 E.....	1300 to 1900	-	-	-3.55	-	
46.7	Pecos River	SE½NE½NE½ sec.12, T.14S., R.26 E., at Hagerman bridge (temporary recorder)	1420	54	76.1	-	+5.8	
Feb. 2, 1962								
46.7	Pecos River	SE½NE½NE½ sec.12, T.14S., R.26 E., at Hagerman bridge (temporary recorder)	0845	44	78.6	-	-	
44.2	do.	SW½SW½SE½ sec.13, T.14S., R.26 E.....	0935	44	76.5	-	-2.1	
41.9	do.	NE½SW½SW½ sec.25, T.14S., R.26 E.....	1050	47	74.8	-	-1.7	
39.8	do.	SE½SE½SW½ sec.31, T.14S., R.27 E., above Buffalo Valley pump	1150 0920	49 43	76.7 76.8	-	+1.9 -	
35.1	Steve Mason drain†	NE½NW½SW½ sec.18, T.15S., R.27 E., at mouth.....	1030	45	-	.03	-	
34.5	Pecos River	NW½SW½SE½ sec.13, T.15S., R.26 E.....	1120	49	77.5	-	+7	

PECOS RIVER SEEPAGE INVESTIGATION
Acme to Artesia, N. Mex.--Continued

197

Pecos River mile	Stream	Location	Time	Water temp., °F	Discharge, in cubic feet per second		
					Main stream	Tributary or Diversion	Indicated gain or loss
Feb. 2, 1962--Continued							
30.6	Pecos River	NE $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.27, T.15S., R.26 E., near Lake Arthur (regular gaging station)	1240	53	75.2	-	-2.3
26.5	do.	SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.32, T.15S., R.26 E.....	<u>1420</u> 0930	<u>69</u> 64	<u>78.6</u> 78.3	- -	<u>+3.4</u> -
21.1	Lawrence Ranch drain*	SW $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.23, T.16S., R.26 E., at mouth.....	0930	39	-	0.12	-
20.6	Cottonwood Creek*	NE $\frac{1}{4}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.26, T.16S., R.26 E., at mouth.....	1100	43	-	.42	-
20.5	Pecos River	NE $\frac{1}{4}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.26, T.16S., R.26 E.....	1140	48	83.8	-	+5.0
16.0	do.	NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.12, T.17S., R.26 E.....	1320	50	82.0	-	-1.8
16.0	Artesia sewage effluent*	NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.12, T.17S., R.26 E., at mouth.....	1355	50	-	.91	-
12.4	Pecos River	SE $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.18, T.17S., R.27 E., near Artesia (regular gaging station)	1525	53	82.9	-	0

Note.--Measurements not involved in the computation of gains or losses of the Pecos River are enclosed in parentheses.

* Right bank.

† Left bank.

a Estimated.

PECOS RIVER BASIN SEEPAGE INVESTIGATION
Rio Hondo - Hondo to west of Roswell, N. Mex.

Two series of discharge measurements were made on Rio Hondo to study gains and losses. The first series, made March 29, included the area from Hondo (where Rio Ruidoso and Rio Bonito join to form Rio Hondo) to Diamond A Ranch, where the entire flow was diverted into storage for irrigation. The second series, made May 1, included the area from above the upper Diamond A Ranch diversion near Riverside to the site of the second diversion below Hondo Reservoir about 9½ miles southwest of Roswell. All known tributaries and surface diversions and returns were included.

Overlap measurements were made at sites 169.8 and 189. 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 at selected sites during these investigations are published in WSP 1944.

Locations of measurement sites upstream from site 185.6 were obtained from a base map furnished by the Ground Water Branch, USGS, Albuquerque. Locations of the remaining sites were obtained from standard U. S. Geological Survey quadrangle maps which are available for this area. Site numbers included in the tabulations are used to establish the downstream order of the measurements and are used only for filing purposes; they have no relation to river mile.

Previous seepage investigations of this reach were made in October 1955, June 1956, April 1958, March 1960, and November 1960. Results are published in the appropriate WSP or State Report.

Each measurement on Rio Hondo was supplemented with measurements on any ditches that bypassed the river measurement. By adding these measurements together one can determine the total surface flow at any valley cross section.

Indicated gains and losses during both investigations may be in error because of only fair to good measuring conditions. Weather conditions were ideal for both investigations. Fluctuation in discharge as recorded by the regular gaging station "at Picacho" was considerable during the first investigation, ranging from three cfs about 12 hours prior to the start of the investigation to about eight cfs at the start. This fluctuation was caused by variable diversions for irrigation in the area upstream from the gage. Because of this fluctuation in discharge throughout the reach, the indicated results of the investigation are probably no better than fair.

Fluctuation in discharge during the second investigation was near minimum as recorded by the regular gage "at Diamond A Ranch, near Roswell." Discharge ranged from 29 cfs about 12 hours prior to the start of the investigation to about 25 cfs several hours subsequent to completion of the investigation. The indicated results of this investigation are classed as good.

Mar. 29, 1962

Site No.	Stream	Location	Time	Water temp. °F	Discharge, in cubic feet per second		
					Main stream	Tributary or Diversion	Indicated gain or loss
102.85	Ditch†	NE¼SW¼ sec.4, T.11S., R.17 E., at Hondo.....	0840	51	-	(a-0.31)	-
102.9	Rio Ruidoso	NE¼SW¼ sec.4, T.11S., R.17 E., at Hondo (discontinued gaging station)	0815	54	-	7.66	-
156.5	Rio Bonito	NE¼NW¼ sec.4, T.11S., R.17 E., at Hondo (discontinued gaging station)	0900	49	-	(b.22)	-
159	Rio Hondo	NW¼NW¼ sec.10, T.11S., R.17 E., 1 mile east of Hondo	0930	59	18.7	-	+11.0
102.87	Lower ditch†	NW¼NW¼ sec.10, T.11S., R.17 E., 1 mile east of Hondo	0950	55	-	(c-.14)	-
102.88	Upper ditch†	SW¼SW¼ sec.4, T.11S., R.17 E., 1 mile east of Hondo	1010	55	-	(c-.15)	-
159.6	Rio Hondo	SW¼SW¼ sec.11, T.11S., R.17 E., above Tinnie diversion dam	1050	61	17.9	-	-.8
161-a	Tinnie diversion ditch†	NE¼SW¼ sec.11, T.11S., R.17 E., 700 ft below dam...	1130	64	-	-6.40	-
161-d	Nelson diversion ditch*	NE¼SW¼ sec.11, T.11S., R.17 E., 700 ft below dam...	1120	61	-	(+1.61)	-
165.1	Ditch*	NE¼NW¼ sec.17, T.11S., R.18 E., 1¼ mile east of Tinnie	1230	56	-	e-4.78	-
165.2	Rio Hondo	SW¼SW¼ sec.8, T.11S., R.18 E., 1¼ miles east of Tinnie	1300	58	7.12	-	+4
166.9	Ditch†	SW¼NW¼ sec.15, T.11S., R.18 E., 1 mile west of Picacho	1340	63	-	f-6.80	-
165.15	Ditch*	SE¼SE¼ sec.16, T.11S., R.18 E., 1 mile west of Picacho	1320	-	-	(fg -.04)	-
167	Rio Hondo	W¼W¼ sec.15, T.11S., R.18 E., 1 mile west of Picacho (regular gaging station)	1350	61	5.23	-	+8.69
168.1	do.	SW¼NW¼ sec.23, T.11S., R.18 E., 0.2 mile east of Picacho	1440	63	12.9	-	+7.7
169.8	do.	NE¼NW¼ sec.30, T.11S., R.19 E., ¼ mile above old Montano Dam	1530 0850	64 54	13.3 11.6	-	+4 -
173.2	Pump†	NW¼SW¼ sec.29, T.11S., R.19 E., from Rio Hondo at "Rio Frio Ranch"	1020	62	-	h-.82	-
173.4	Rio Hondo	NW¼SW¼ sec.29, T.11S., R.19 E., at "Rio Frio Ranch"	0955	55	9.79	-	-1.0
174.5	do.	SW¼ sec.21, T.11S., R.19 E., at ford 0.4 mile below Sunset	1115	58	9.46	-	-.33

PECOS RIVER BASIN SEEPAGE INVESTIGATION
Rio Hondo - Hondo to west of Roswell, N. Mex.--Continued

199

Site No.	Stream	Location	Time	Water temp. °F	Discharge, in cubic feet per second		
					Main stream	Tributary or Diversion	Indicated gain or loss
Mar. 29, 1962--Continued							
177.5	Upper Diamond A Ranch diversion*	W½NE¼ sec.27, T.11S., R.19 E., ¼ mile below Riverside, at head	1220	61	-	j-9.15	-.31
177.56	do.	NW¼ sec.33, T.11S., R.20 E., above return to Rio Hondo channel	1410	63	-	j-6.19	-2.96
185	Middle Diamond A Ranch diversion†	NW¼ sec.34, T.11S., R.20 E., at head.....	1440	65	-	j-5.67	-.52
185.6	Middle Diamond A Ranch diversion*	SW¼NW¼ sec.20, T.11S., R.21 E., above entrance to earth reservoirs	1555	61	-	j-4.10	-1.57
May 1, 1962							
177.4	Rio Hondo	W½NE¼ sec.27, T.11S., R.19 E., ¼ mile below Riverside	0840	53	63.3	-	-
177.5	Upper Diamond A Ranch diversion*	W½NE¼ sec.27, T.11S., R.19 E., ¼ mile below Riverside, at head	0925	54	-	(k-1.95)	-
184	Rio Hondo	NW¼ sec.34, T.11S., R.20 E., above middle diversion	1040	60	50.2	-	-13.1
185	Middle Diamond A Ranch diversion†	NW¼ sec.34, T.11S., R.20 E., at head.....	1110	61	-	-14.2	-
185.6	Middle Diamond A Ranch diversion*	SW¼NW¼ sec.20, T.11S., R.21 E., above entrance to earth reservoir	1340	62	-	(-13.6)	(-.6)
186.5	Rio Hondo	NE¼NE¼ sec.20, T.11S., R.21 E., at Diamond A Ranch (regular gaging station)	1230	64	26.0	-	-10.0
187	Lower Diamond A Ranch diversion*	SW¼NE¼ sec.21, T.11S., R.21 E., at head.....	1420	66	-	-1.60	-
188.5	Rio Hondo	SE¼NE¼ sec.27, T.11S., R.21 E.....	1500	66	20.9	-	-3.5
189	do.	NW¼NE¼ sec.5, T.12S., R.22 E., at ford.....	<u>1640</u> 0825	<u>67</u> 54	<u>12.7</u> 15.7	- -	<u>-8.2</u> -
191	do.	NE¼SE¼ sec.34, T.11S., R.22 E., above Hondo Reservoir diversion canal	0910	53	13.6	-	-2.1
191.2	do.	SW¼SW¼ sec.31, T.11S., R.23 E., above upper (Patterson) diversion	1050	65	6.41	-	-7.2
191.4	do.	SW¼SW¼ sec.31, T.11S., R.23 E., below upper (Patterson) diversion	1120	65	1.26	-	(m-5.15)
192	do.	NW¼NE¼ sec.5, T.12S., R.23 E., above second (Brown) diversion	1200	71	.76	-	-.50
192.2	do.	NW¼NE¼ sec.5, T.12S., R.23 E., below second (Brown) diversion	1210	-	0	-	(m-.76)

* Right bank.

† Left bank.

a Bypass of site 102.9; see sites 102.87 and 102.88.

b Flow started at 0630; no flow at mouth.

c Bypass of site 159; previously measured as one ditch at site 102.85.

d Flow returned 1 mile downstream.

e Bypass of site 165.2.

f Bypass of site 167.

g Previously measured at site 165.1

h Bypass of site 173.4; does not include 0.27 cfs in same ditch from upstream ground water diversion.

j No flow in Rio Hondo - entire flow diverted.

k All flow returned to river above middle diversion.

m Diverted to ditch.

Note.-Measurements not involved in the computation of gains and losses of Rio Hondo are enclosed in parentheses.

PECOS RIVER BASIN SEEPAGE INVESTIGATION
Rio Penasco - Mayhill to Treat (Penasco River) Ranch near Dunken, N. Mex.

A series of discharge measurements was made on Mar. 30, 1962, to study gains and losses on Rio Penasco from Mayhill to Treat (Penasco River) Ranch near Dunken where flow ceased. All known tributaries, surface diversions and returns were included.

Overlap measurements were made at site 262.16. 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 published in WSP 1944.

Locations of measurement sites are referenced to the Mayhill Quadrangle Map of the State of New Mexico prepared by the New Mexico State Highway Department. Site numbers included in the tabulation are used to establish the downstream order of the measurements and are used only for filing purposes; they have no relation to river mile.

Previous seepage investigations of this reach were made in February 1960 and November 1960. Results are published in the appropriate WSP or State Report.

Each measurement on Rio Penasco was supplemented with measurements on any ditches that bypassed the river measurements. By adding these measurements together one can determine the total surface flow at any valley cross section.

Indicated gains and losses may be in error because of fair to good measuring conditions. Weather conditions were ideal.

The entire flow of Rio Penasco was diverted for irrigation at a point 0.25 mile east of Elk (site 260.5). Flow reappeared at Lower Penasco springs, over two miles downstream from Elk.

Fluctuation in discharge as recorded by the regular gaging station "near Dunken" was considerable ranging from less than 3 cfs to more than 4½ cfs during the time of the investigation. This fluctuation was caused by variable diversions for irrigation in the area upstream from the gage. There was evidence of similar changes in diversions in the Mayhill - Elk area. Overall results of this investigation are classed as poor because of this fluctuation in discharge.

Site No.	Stream	Location	Time	Water temp. °F	Discharge, in cubic feet per second		
					Main stream	Tributary or Diversion	Indicated gain or loss
256.95	Rio Penasco	NW¼SE¼ sec.26, T.16S., R.14 E., above Upper Penasco Springs	0840	45	1.60	-	-
256.95	do.	NW¼SE¼ sec.26, T.16S., R.14 E., below Upper Penasco Springs	0900	54	6.24	-	+4.64
258.65	Diversion ditch†	NW¼NW¼ sec.19, T.16S., R.15 E., 0.8 mile below Mayhill Ranger station	1010	55	-	a-2.27	-
258.7	Rio Penasco	NW¼NW¼ sec.19, T.16S., R.15 E., below diversion 0.8 mile below Mayhill Ranger station	1000	-	b4.22	-	+2.25
258.9	do.	NE¼SE¼ sec.17, T.16 S., R.15 E., 2.7 miles below Mayhill Ranger station	1055	54	c2.79	-	-1.43
259.15	Diversion ditch*	NE¼NE¼ sec.16, T.16S., R.15 E., 3.7 mile below Mayhill Ranger station	1130	56	-	d-2.70	-
259.2	Unnamed canyon*	SW¼NE¼ sec.15, T.16 S., R.15 E., 2.8 mile above Lincoln Nat'l Forest boundary	1150	-	-	.004	-
259.8	Rio Penasco	NE¼NE¼ sec.24, T.16S., R.15 E., at Lincoln Nat'l Forest boundary	1210	56	2.18	-	+2.09
260.15	do.	NW¼NW¼ sec.20, T.16S., R.16 E., below mouth of Agua Chiquita Canyon	1300	57	2.32	-	+1.14
260.2	Diversion ditch†	NW¼NW¼ sec.20, T.16S., R.16E., below mouth of Agua Chiquita Canyon	1250	56	-	e-.83	-
260.35	do.	SE¼NW¼ sec.8, T.16S., R.16 E., at mouth of Burned Canyon, 0.25 mile above Elk	1330	59	-	-.94	-
260.5	Rio Penasco	NE¼NE¼ sec.8, T.16S., R.16 E., 0.25 mile below Elk	1350	68	.66	-	f-.72
261.6	do.	NE¼SE¼ sec.4, T.16S., R.16 E., above mouth of Mathew Canyon, 1.5 mile below Elk	-	-	0	-	-
262.1	do.	NW¼SW¼ sec.12, T.16S., R.16 E., below Lower Penasco Springs, 4.1 mile below Elk	1440	61	9.03	-	g+9.03
262.13	Diversion ditch†	NE¼SE¼ sec.12, T.16S., R.16 E., at culvert just above Penasco Falls	1030	55	-	h-1.51	-
262.16	Rio Penasco	SE¼SE¼ sec.12, T.16S., R.16 E., above diversions above Penasco Falls	1520 0910	60 52	6.79 8.45	- -	-1.73 -
262.2	Upper diversion*	SE¼SE¼ sec.12, T.16S., R.16 E., above Penasco Falls	0940	52	-	- .33	-
262.25	do.	SW¼SE¼ sec.13, T.16S., R.16 E., at Powell Ranch...	1135	-	-	(j-.28)	(-.05)
262.3	Powell-Runyan diversion*	SE¼SE¼ sec.12, T.16S., R.16 E., above Penasco Falls	1005	53	-	-3.49	-
262.35	Powell-Runyan diversion†	SE¼SE¼ sec.13, T.16S., R.16 E., at Powell Ranch headquarters	1220	58	-	(j-2.22)	(-1.27)
263.1	Spring†	SW¼NW¼ sec.18, T.16S., R.17 E., below Penasco Falls	1100	-	-	.05	-
263.2	Rio Penasco	SW¼SE¼ sec.13, T.16S., R.16 E., at Powell Ranch...	1140	55	7.28	-	k+1.09

PECOS RIVER BASIN SEEPAGE INVESTIGATION
Rio Penasco - Mayhill to Treat (Penasco River) Ranch near Dunken, N. Mex.--Continued

201

Site No.	Stream	Location	Time	Water temp. °F	Discharge, in cubic feet per second		
					Main stream	Tributary or Diversion	Indicated gain or loss
263.3	Runyan diversion†	NW¼NE¼ sec.30, T.16S., R.17 E., at head.....	1300	60	-	m-.18	-
263.4	Rio Penasco	NW¼NE¼ sec.30, T.16S., R.17 E., below Runyan diversion	1320	61	5.24	-	-1.86
263.45	do.	NE¼SW¼ sec.28, T.16S., R.17 E., above Runyan springs	1420	63	4.77	-	-.47
263.5	Runyan springs†	NE¼SW¼ sec.28, T.16S., R.17 E., at entrance to Rio Penasco	1355	61	-	3.14	-
263.8	Rio Penasco	SW¼NW¼ sec.27, T.16S., R.17 E., 1.5 miles above Rt. 24 bridge (regular gaging station)	1500	67	4.61	-	-3.30
264	do.	NE¼SE¼ sec.27, T.16S., R.17 E., at Walnut Grove...	1550	63	3.43	-	-1.18
264.2	do.	NE¼NE¼ sec. 35, T.16S., R.17 E., at Rt. 24 bridge.	1625	61	1.19	-	-2.24
264.3	do.	SE¼NW¼ sec.36, T.16S., R.17 E., ¼ mile upstream from ford at Treat Ranch	1645	61	n.14	-	-1.05

* Right bank.

† Left bank.

a Most of flow used for irrigation; impossible to measure return flow. Bypass of site 258.7.

b Includes flow of both channels (left, 2.98 cfs; right, 1.24 cfs). Channel is split with flow along either side of valley from Mayhill to a point 500 ft below this site.

c Measured 30 ft above diversion dam; est. 0.03 cfs seepage into ditch at dam. Ditch diverting between this site and site 258.7; not measured.

d Very little return flow; est. 0.6 cfs in Rio Penasco below Diversion.

e Most of flow returned ¼ mile downstream.

f Includes return from diversion at site 260.2. Entire flow diverted at this site.

g Ditch diverting from right bank above this site. Ditch not measured; all flow used above this site.

h Entire flow returns to Rio Penasco below Penasco Falls. Bypass of site 262.16.

j Bypass of site 263.2.

k Includes return from site 262.13.

m Bypass of site 263.4.

n No surface flow 200 ft downstream.

Note.-Measurements not involved in the computation of gains or losses of Rio Penasco are enclosed in parentheses.

PECOS RIVER SEEPAGE INVESTIGATION
Carlsbad to mouth of Delaware River, N. Mex.

A series of discharge measurements was made Oct. 9-10, 12, 1961, to study gains and losses on the Pecos River from the "at Carlsbad" regular gage to the mouth of Delaware River. All known tributaries and surface diversions and returns were measured. 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.

Records of chemical analyses of water samples obtained during this investigation are published in WSP 1944.

Locations of measurement sites were obtained from standard U. S. Geological Survey quadrangle maps or the Malaga Bend sheet of the U. S. G. S. Plan and Profile of the Pecos River.

Previous seepage investigations of portions of this reach were made in February 1955, March 1959, and January 1961. Results are published in the appropriate WSP or State Report. A portion of this reach was rerun in March 1962 and the results are included in this State Report.

Indicated gains and losses may be in error because of only fair to good measuring conditions. Weather conditions for this investigation were ideal.

Measurements were made in the area from the regular gage "at Carlsbad" to the regular gage "near Malaga" on Oct. 9. The stage "at Carlsbad" remained constant throughout the day while the stage "near Malaga" showed a slight recession. Water was being stored in Six Mile Dam with no spill.

On Oct. 10 measurements were made from "near Malaga" to the mouth of Delaware River. There was only a slight recession recorded by the gages "near Malaga" and "at Pierce Canyon Crossing" but the gage "at Red Bluff" showed a decrease in discharge from 59 cfs to 46 cfs during the day. On Oct. 12 this portion of the investigation was rerun with no appreciable fluctuation recorded at any of the three gages.

Results of the portions of the investigation made on Oct. 9 and 12 are classed as good. That portion made on Oct. 10 is classed as fair.

Site No.	Stream	Location	Time	Water temp. °F	Discharge, in cubic feet per second		
					Main stream	Tributary or Diversion	Indicated gain or loss
Oct. 9, 1961							
308	Pecos River	NW½SE¼ sec.6, T.22S., R.27 E., at Greene St. Bridge (regular gage)	0700	66	1.11	-	-
309.2	do.	NW½NW½ sec.8, T.22S., R.27 E., at mouth of Dark Canyon	0740	67	1.96	-	+0.85
310	do.	NW½SW½ sec.9, T.22S., R.27 E., above Carlsbad sewage inflow	0820	68	4.49	-	+2.53
310.5	Carlsbad sewage†	SE¼NW½ sec.10, T.22S., R.27 E.....	-	-	-	a3.9	-
311	Pecos River	NW½SE¼ sec.10, T.22S., R.27 E., below sewage inflow	0915	69	12.3	-	+3.9
312	C.I.D. drain "A"*	NW½NW½ sec.14, T.22S., R.27 E., at mouth.....	0750	66	-	.40	-
312.2	C.I.D. drain "B"*	SE¼SE¼ sec.14, T.22S., R.27 E., at mouth.....	0805	64	-	.08	-
313	Pecos River	NW½NE¼ sec.24, T.22S., R.27 E., below Six Mile Dam.	1010	69	-	b3.13	-
313.4	Brantley drain "A"*	SW½NE¼ sec.30, T.22S., R.28 E., at mouth.....	0925	68	-	.02	-
314	C.I.D. drain "E"*	NW½SE¼ sec.30, T.22S., R.28E., at mouth at Dickson Crossing	0955	66	-	.31	-
314.4	Pecos River	NW½SW½ sec.29, T.22S., R.28 E., below Dickson Crossing	1100	70	6.36	-	+2.90
315	Cass Draw	SE¼NW½ sec.5, T.23S., R.28 E., at mouth.....	1050	67	-	2.37	-
315.2	Pecos River	NE¼SW½ sec.5, T.23S., R.28 E., below Cass Draw.....	$\frac{1310}{0820}$	$\frac{70}{70}$	$\frac{12.8}{12.6}$	-	$\frac{+4.1}{-}$
315.6	do.	NE¼NW½ sec.9, T.23S., R.28 E., above Harroun Dam...	0910	69	21.5	-	+8.9
316	Harroun canal†	NW½SE¼ sec.11, T.23S., R.28 E., at State Engineer gage	1245	68	-	c-8.16	-
317.9	C.I.D. railroad drain*	SE¼SW½ sec.11, T.23S., R.22 E., at mouth.....	1145	71	-	.11	-
318	Pecos River	SE¼SW½ sec.11, T.23S., R.22 E., below Harroun Dam..	1020	70	12.1	-	-1.4
318.2	C.I.D. drain "C"*	NW½SW½ sec.13, T.23S., R.28 E., at mouth.....	1400	72	-	1.59	-
318.4	Pecos River	NE¼NW½ sec.30, T.23S., R.29 E., east of Loving.....	1110	70	18.2	-	+4.5
332	Black River*	SW½SE¼ sec.2, T.24S., R.28 E., ½ mile above mouth..	1500	69	-	8.14	-
333	Pecos River	SW½SW½ sec.1, T.24S., R.28 E., at Harroun's Crossing	1235	70	36.2	-	+9.9
333.5	do.	NE¼NW½ sec.19, T.24S., R.29 E., near Malaga (regular gage)	1320	70	43.5	-	+7.3

PECOS RIVER SEEPAGE INVESTIGATION
Carlsbad to mouth of Delaware River, N. Mex.--Continued

203

Site No.	Stream	Location	Oct. 10, 1961				Oct. 12, 1961			
			Time	Water temp. °F	Discharge, in cfs		Time	Water temp. °F	Discharge, in cfs	
					Main stream	Indicated gain or loss			Main stream	Indicated gain or loss
333.5	Pecos River	NE½NW¼ sec.19, T.24S., R.29 E., near Malaga (regular gage)	0815	68	39.2	-	0820	67	37.6	-
334	do.	SE½NE¼ sec.17, T.24S., R.29 E., at Fishing Rock Ford	0920	68	42.5	+3.3	0920	67	40.9	+3.3
336.9	do.	NE½NE¼ sec.20, T.24S., R.29 E., above Livingston pump	1010	69	43.4	+9	1000	70	43.6	+2.7
338.2	do.	SE½NW¼ sec.27, T.24S., R.29 E., at Pierce Canyon Crossing (regular gage)	1105	70	45.9	+2.5	1050	70	42.5	-1.1
338.3	do.	SE½SW¼ sec.27, T.24S., R.29 E.....	1200 0850	74 68	47.4 46.3	+1.5 -	1130 0830	73 68	42.5 42.4	0 -
338.5	do.	SE½NW¼ sec.33, T.24S., R.29 E., at old ford	0940	68	44.9	-1.4	0920	68	40.4	-2.0
339.5	do.	SE½SW¼ sec.32, T.24S., R.29 E., at old ford	1030	69	46.1	+1.2	1010	68	43.1	+2.7
340	do.	NW¼SE¼ sec.6, T.25S., R.29 E., at Reed's pump	1120	69	43.6	-2.5	1100	69	39.7	-3.4
341	do.	SE½SW¼ sec.13, T.25S., R.28 E., above Salt Draw	1250 0830	71 66	45.9 48.9	+2.3 -	1200 0810	69 69	42.4 42.4	+2.7 -
342	do.	NW¼NE¼ sec.1, T.26S., R.28 E., at Red Bluff (regular gage)	1030	69	52.6	+3.7	0950	68	43.9	+1.5
343	do.	SW¼SE¼ sec.5, T.26S., R.29 E., above pipeline crossing	1210	70	48.3	-4.3	1130	69	42.5	-1.4
344	do.	NW¼NE¼ sec.19, T.26S., R.29 E., at mouth of Delaware River	1405	71	50.8	+2.5	1235	69	42.4	-1.1

* Right bank.

† Left bank.

a Average discharge for day.

b No spill over dam; 95% of discharge is leakage through dam, remainder is spring inflow.

c All flow diverted to U. S. Refinery.

PECOS RIVER SEEPAGE INVESTIGATION
Malaga Bend to Guy Reed's pump, N. Mex.

A series of six discharge measurements was made at each of six sites on Mar. 13-14, 1962, to study gains and losses in the Pecos River from the lower end of Malaga Bend to Guy Reed's pump, a distance of 7.4 miles. There were no tributaries or diversions through this reach. This series of measurements was made in conjunction with an intensive water sampling program to determine the time of travel for low flows through this reach for the Malaga Bend Experimental Salinity Alleviation Project. Records of chemical analyses of water samples obtained during this investigation are published in WSP 1944.

Locations of measurement sites were obtained from standard U. S. Geological Survey quadrangle maps or the Malaga Bend sheet of the U. S. G. S. Plan and Profile of the Pecos River.

A previous seepage investigation of this reach was made in March 1959; results are published in WSP 1632. This reach was also included in the investigation of Oct. 10, 12, 1961, included in this State Report.

Indicated gains and losses may be somewhat in error because of only fair to good measuring conditions. Weather conditions for the first day were good. Moderate to heavy snow fell throughout the second day. The fluctuation in stage at the various sites is shown in the gage-height column of the tabulation. Overall results of the investigation are classed as good.

Site No.	Stream	Location	Distance, in miles	Mar. 13, 1962					Mar. 14, 1962				
				Time	Water temp. °F	Gage height	Discharge, in cfs Main stream	Indicated gain or loss	Time	Water temp. °F	Gage height	Discharge, in cfs Main stream	Indicated gain or loss
336.9	Pecos River	NE½NE¼ sec.20, T.24S., R.29 E., above Livingston pump (temporary recorder)	0	0640	46	0.50	25.1	-	0630	45	0.52	28.4	-
				0940	50	.50	25.4	-	-	-	-	-	-
				1235	57	.49	25.6	-	1205	-	.54	28.6	-
				1525	56	.49	25.8	-	-	-	-	-	-
338.2	do.	SE½NW¼ sec.27, T.24S., R.29 E., at Pierce Canyon Crossing (regular gage)	2.5	0730	49	1.01	28.0	+2.9	0720	48	1.00	26.7	-1.7
				1040	52	1.00	26.7	+1.3	-	-	-	-	-
				1320	54	1.00	26.7	+1.1	1255	49	1.02	30.0	+1.4
				1620	54	.99	25.9	+1.1	-	-	-	-	-
338.3	do.	SE½SW¼ sec.27, T.24S., R.29 E., at dry wash (staff gage)	3.6	0830	47	.67	28.0	0	0820	46	.66	26.2	-.5
				1130	54	.66	26.1	-.6	-	-	-	-	-
				1420	59	.66	25.0	-1.7	1405	47	.68	29.3	-.7
				1720	55	.66	25.0	-.9	-	-	-	-	-
338.5	do.	SE½NW¼ sec.33, T.24S., R.29 E., at old ford (temporary recorder)	4.9	-	-	-	-	-	0625	45	.45	27.8	-
				0920	47	.47	28.1	+1.1	0925	-	.45	26.8	+1.6
				-	-	-	-	-	1230	46	.47	28.7	-
				1510	59	.44	26.2	+1.2	1450	47	.48	30.6	+1.3
339.5	do.	SE½SW¼ sec.32, T.24S., R.29 E., at old ford (staff gage)	6.5	-	-	-	-	-	0715	46	.45	27.7	-.1
				1030	49	.46	27.6	-.5	1025	45	.46	26.1	-.7
				-	-	-	-	-	1320	45	.46	28.4	-.3
				1610	54	.44	26.4	+2.2	1530	46	.47	31.0	+2.4
340	do.	NW¼SE¼ sec.6, T.25S., R.29 E., at Reed's pump (temporary recorder)	7.4	-	-	-	-	-	0820	47	.45	26.0	-1.7
				1120	51	.46	27.3	-.3	1120	45	.45	27.1	+1.0
				-	-	-	-	-	1420	45	.46	28.0	-.4
				1700	54	.44	26.4	0	1600	45	.47	29.1	-1.9

Page	Page
Accuracy of field data and computed results	6
Acequia Madre at Costilla	58
Acre-foot, definition of	3
Agua Fria Creek near Holman	25
Alamogordo Reservoir, contents of	155
Alamosa River above San Mateo Canyon	181
Alamosa River below Shipman Canyon	181
Alamosa River near Monticello	115
Anderson ditch near Taos	181
Animas River at Farmington	169
near Cedar Hill	168
Arroyo de la Mora near Dunlap	182
Arroyo San Juan de Dios tributary near Puerto de Luna	182
Association ditch at Costilla	58
Bell Ranch Canal near Conchas Dam	43
Bernalillo floodwater retarding reservoir No.1 (Piedra Lisa Arroyo) near Bernalillo	96
Black River above Malaga	148
Black River near White City	183
Blue Springs near White City	183
Bluewater Creek at Grants	104
below Bluewater Dam	102
near Bluewater	103
Bluewater Lake, contents of	155
Caballo Reservoir, contents of	155
Cabresto Creek near Questa	63
Canadian River, at Logan	47
below Conchas Dam	45
near Hebron	10
near Roy	22
near Sanchez	41
Capacity, definition	3
Carlsbad main canal at head, near Carlsbad	145
Carrizo Creek (tributary to Rio Ruidoso), at Ruidoso	180
Casias Creek near Costilla	51
Cebolla River near Golondrinas	29
Cedar Creek at Ruidoso	182
Cerro Canal, at Costilla	58
near Jaroso, Colo.	58
New Mexico Branch, near Jaroso, Colo.	58
Cfs-day, definition of	3
Chinaberry Draw near White City	183
Chico Arroyo near Guadalupe	101
Cimarron Creek, at Springer	21
below Eagle Nest Dam	14
near Cimarron	15
Cimarron River, near Guy	8
Cimarron River, near Kenton, Okla.	9
Computations, accuracy of results	6
Clear Creek near Ute Park	17
Conchas canal	43
Conchas Reservoir, contents of	44
Conchas River at Variadero	42
Conejos Creek tributary near Dunlap	182
Contents, definition of	3
Control, definition of	3
Cooperation, record of	2
Costilla Creek, above Costilla Dam	50
at Garcia, Colo.	57
below Costilla Dam	53
below diversion dam, at Costilla	56
below Plaza de Arriba ditch	181
below Plaza del Medio ditch	181
diversions from	58
near Amalia	54
near Costilla	55
Costilla Lake, contents of	155
Cottonwood Creek near Lake Arthur	137
Cottonwood Springs east of Tularosa	183
Coyote Creek, above Guadalupe	32
below Black Lake	31
near Golondrinas	33
Crest-stage station. See partial record site	180
Cubic foot per second, definition of	3
Cuchillo Negro Creek above diversion	182
Data, accuracy of	6
Delaware River near Red Bluff	152
Discharge measurements made at miscellaneous sites	181-184
Drainage area, definition of	3
Eagle Nest Reservoir	13
Eastdale No.1 intake canal near Jaroso, Colo.	58
Elephant Butte Reservoir, contents of	155
Elmendorf interior drain near San Antonio	113
El Vado Reservoir, contents of	155
Farmers Mutual ditch near Farmington	170
(Supplement to San Juan River at Farmington)	
Fort Sumner main canal near Fort Sumner	130
Four Mile Draw near Lakewood	142
Gaging station, definition of	3
Galisteo Creek, at Domingo	90
Gallinas River, at Montezuma	124
near Colonias	126
near Lourdes	125
near Montezuma	123
Gila River, below Blue Creek near Virden	175
near Gila	174
Government ditch at El Paso, Tex.	119
Grants Canyon at Grants	105
Hermanas Draw tributary at Hermanas, N. Mex.	180
Inlet to Fort Bliss sump area	182
Jemez Canyon Reservoir, contents of	155
Jemez River, below East Fork near Jemez Springs	92
below Jemez Canyon Dam	95
near Jemez	94
La Cueva Canal below La Cueva	27
Lake Avalon, contents of	156
Lake Isabel feeder canal near Sapello	38
Lake McMillan, contents of	155
La Plata River near Farmington	171
Largo Creek near Mangas	173
Las Cruces Arroyo near Las Cruces	118
Latir Creek near Cerro	59
Little Tesuque Creek near Santa Fe	84
Little Tesuque Creek Tributary No.2	85
Llano ditch near Questa	62
Los Pinos River, at La Boca, Colo.	163
McClure Reservoir, contents of	155
McEvoy Creek near Eagle Nest	15
McKelligon Canyon at El Paso, Tex.	118
Manuelitas Creek near Rociada	36
Measurements at miscellaneous sites	181-184
Mesa ditch near Garcia, Colo.	58
Middle Fork Tesuque Creek near Santa Fe	83
Mimbres River near Mimbres	157
Mora River, at La Cueva	28
near Golondrinas	30
near Shoemaker	40
near Watrous	34
Navajo Reservoir	165
New Mexico Branch Cerro canal near Jaroso, Colo.	58
New Model canal, at New Mexico-Arizona State line	184
near Virden	177
Nichols Reservoir, contents of	155
North Spring River at Roswell	135
Old Ranch Canyon near Carlsbad	183
Order, downstream, and station numbers	3
Palomas River at box canyon	182
Palomas River above Palomas Community ditch	182
Partial record station, definition	180
Annual maximum discharge at	180
Pecos River at Carlsbad	146
at damsite 3, near Carlsbad	144
at Pierce Canyon Crossing, near Malaga	150
at Red Bluff	151

	Page		Page
Pecos River		San Antonio Riverside drain, near San Antonio	112
at Santa Rosa	127	near San Marcial	113
below Alamogordo Dam	129	San Francisco River near Reserve	178
below Avalon Dam	145	near Glenwood	179
below McMillan Dam	143	San Juan River, at Bloomfield	167
Kaiser Channel, near Lakewood	141	at Farmington	170
near Acme	131	at Rosa	162
near Anton Chico	122	at Shiprock	172
near Artesia	138	miscellaneous measurements	183, 184
near Lake Arthur	136	near Shiprock	166
near Lakewood	141	near Carracas	160
near Malaga	149	San Lorenzo Arroyo near Polvadera	181
near Pecos	120	San Vicente Arroyo at Silver City	158
near Puerto de Luna	128	Santa Cruz River at Cundiyo	82
seepage investigations	186-204	Santa Fe River at Monument Rock	181
Penasquito ditch at Costilla	58	at head of McClure Reservoir	181
Piedra River near Arboles	161	Santa Fe River near Santa Fe	82
Ponil Creek near Cimarron	19	Santistevan Creek near Costilla	52
Rattlesnake Springs near White City	147	Sapello Canal at Sapello	35
Rayado Creek at Sauble Ranch, near Cimarron	20	Sapello River, at Sapello	37
Red Bluff Reservoir, contents of	156	near Watrous	39
Red River at Mouth, near Questa	64	Sapillo Creek miscellaneous measurements	184
near Questa	61	Seepage investigations	185-204
Reservoirs in Rio Grande basin	153-156	Rio Ojo Caliente	185
Revuelto Creek near Logan	48	Silver Springs Canyon	183
Rio Agua Negra near Holman	23	Six Mile Creek near Eagle Nest	12
Rio Chama above Canones Creek	181	Socorro main canal north at San Acacia	110
Rio Chama above Abiquiu Reservoir	77	Socorro main canal south near San Antonio	111
Rio Chama below Abiquiu Dam	78	Spring Creek at La Boca, Colo.	164
Rio Chama, below El Vado Dam	76	Stage-discharge relation, definition of	3
near Abiquiu	79	Sunset Canal near Virden	176
below Gonzales ditch	181	Tecolote Creek near San Pablo	121
near Chamita	81	Terms and abbreviations, definitions of	3
near La Puente	74	Tijeras Arroyo tributaries	181
Rio Chiquito near Talpa	69	Tolby Creek near Eagle Nest	16
Rio de la Casa near Cleveland	26	Ute Creek near Logan	46
Rio Felix at old highway bridge, near Hagerman	135	Vermejo River near Dawson	11
Rio Grande, at Albuquerque	98	Vigil Canyon near Holman	24
at Cochiti	88	Willow Creek near Park View	75
at Embudo	73	WSP, definition of	3
at Otowi Bridge, near San Ildefonso	86		
at San Acacia	111		
at San Felipe	91		
at San Marcial	114		
below Caballo Dam	117		
below Elephant Butte Dam	116		
below Taos Junction Bridge	72		
near Bernalillo	97		
near Bernardo	99		
near Cerro	60		
Rio Grande basin, Reservoirs in	153-156		
Rio Grande de Ranchos near Talpa	68		
Rio Guadalupe at Box Canyon, near Jemez	93		
Rio Hondo at Diamond A Ranch, near Roswell	134		
at Picacho	133		
Rio Hondo (tributary to Rio Grande), at Arroyo Hondo	66		
near Valdez	65		
Rio Ojo Caliente at La Madera	80		
Rio Penasco, at Dayton	140		
near Dunken	139		
Rio Penasco tributary near Elk	182		
Rio Pueblo de Taos, at Los Cordovas	70		
below Los Cordovas	71		
near Ranchito	67		
Rio Puerco, above Chico Arroyo, near Guadalupe	100		
at Rio Puerco	107		
near Bernardo	107		
Rio Ruidoso, at Hollywood	132		
near Ruidoso	180		
Rio Salado near San Acacia	109		
Rio San Jose, at Correo	106		
near Grants	105		
Rio Tularosa near Bent	159		
Rio Tularosa northeast of Tularosa	183		
Rito de los Frijoles near Los Alamos	87		
Rocky Arroyo near Carlsbad	-		
Running Water Draw near Clovis	49		
Salado Creek tributary near Joffre	182		
San Acacia drainage canal	181		

