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Water-Supply Paper 748

SURFACE WATER SUPPLY  
*of the* UNITED STATES

WESTERN GULF OF MEXICO BASINS

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Prepared in cooperation with the  
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ILLUSTRATION

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FIGURE 1. Typical river-measurement station showing concrete well and house for water-stage recorder and staff gages, cable, and car..	Page
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# SURFACE WATER SUPPLY OF WESTERN GULF OF MEXICO BASINS, 1933

## AUTHORIZATION AND SCOPE OF WORK

This volume is one of a series of 14 reports presenting results of measurements of flow made on streams in the United States during the year ending September 30, 1933.

The data presented in these reports were collected by the United States Geological Survey under the following authority contained in the organic law (20 Stat.L., p. 394):

*Provided, That this officer [the Director] shall have the direction of the Geological Survey and the classification of public lands and examination of the geological structure, mineral resources, and products of the national domain.*

The work was begun in 1888 in connection with special studies relating to irrigation. Since the fiscal year ending June 30, 1895, successive appropriation bills passed by Congress have carried the following items:

For gaging the streams and determining the water supply of the United States, and for the investigation of underground currents and artesian wells, and for the preparation of reports upon the best methods of utilizing the water resources.

### *Annual appropriations for the fiscal years ending June 30, 1895-1934*

1895-----	\$12, 500. 00	1911-17 ---	\$150, 000. 00	1928-----	\$147, 000. 00
1896-----	24, 500. 00	1918-----	175, 000. 00	1929-----	270, 500. 00
1897-99----	50, 000. 00	1919-----	148, 244. 10	1930-----	275, 000. 00
1900-----	70, 000. 00	1920-----	175, 000. 00	1931-----	565, 000. 00
1901-2-----	100, 000. 00	1921-23 ---	180, 000. 00	1932-----	711, 000. 00
1903-6-----	200, 000. 00	1924-25 ---	170, 000. 00	1933-----	600, 000. 00
1907-----	150, 000. 00	1926-----	165, 000. 00	1934-----	<sup>1</sup> 540, 000. 00
1908-10----	100, 000. 00	1927-----	151, 000. 00		

In the execution of the work many private and State organizations have cooperated either by furnishing data or by assisting in collecting data. Acknowledgments for cooperation of the first kind are made in connection with the description of each station affected; cooperation of the second kind is acknowledged on page 10.

Measurements of stream flow have been made at about 6,680 points in the United States and also at many points in Alaska and the Hawaiian Islands. In July 1933, 2,800 gaging stations were being maintained by the Geological Survey and the cooperating

<sup>1</sup> Only \$340,000 available for expenditure.

organizations. Many miscellaneous discharge measurements were made at other points. In connection with this work, data were also collected in regard to precipitation, evaporation, storage reservoirs, river profiles, and water power in many sections of the country and will be made available in water-supply papers from time to time.

### DEFINITION OF TERMS

The volume of water flowing in a stream—the “run-off” or “discharge”—is expressed in various terms, each of which has become associated with a certain class of work. These terms may be divided into two groups—(1) those that represent a rate of flow, as second-feet, gallons per minute, miner’s inches, and discharge in second-feet per square mile, and (2) those that represent the actual quantity of water, as run-off in inches, acre-feet, and millions of cubic feet. The principal terms used in this series of reports are second-feet, second-feet per square mile, run-off in inches, and acre-feet. They may be defined as follows:

“Second-feet” is an abbreviation for “cubic feet per second.” A second-foot is the rate of discharge of water flowing in a channel of rectangular cross section 1 foot wide and 1 foot deep at an average velocity of 1 foot per second. It is generally used as a fundamental unit from which others are computed.

“Second-feet per square mile is the average number of cubic feet of water flowing per second from each square mile of area drained, on the assumption that the run-off is distributed uniformly both as regards time and area.

“Run-off in inches” is the depth to which an area would be covered if all the water flowing from it in a given period were uniformly distributed on the surface. It is used for comparing run-off with rainfall, which is usually expressed in inches.

An “acre-foot”, equivalent to 43,560 cubic feet, is the quantity required to cover an acre to the depth of 1 foot. The term is commonly used in connection with storage for irrigation.

The following terms not in common use are here defined:

“Stage-discharge relation”, an abbreviation for the term “relation of gage height to discharge.”

“Control”, a term used to designate the natural section or stretch of the channel or artificial structure below the gage which determines the stage-discharge relation at the gage.

### EXPLANATION OF DATA

The data presented in this report cover the year beginning October 1, 1932, and ending September 30, 1933. At the beginning of January in most parts of the United States much of the precipitation in the preceding 3 months is stored in the form of snow or ice, or in ponds,



lakes, and swamps, or as underground water, and this stored water passes off in the streams during the spring break-up. At the end of September, on the other hand, the only stored water available for run-off is possibly a small quantity in the ground; therefore, the run-off for the year beginning October 1 is practically all derived from precipitation within that year.

The base data collected at gaging stations consist of records of stage, measurements of discharge, and general information used to supplement the gage heights and discharge measurements in determining the daily flow. The records of stage are obtained either from direct readings on a staff or chain gage or from a water-stage recorder that gives a continuous record of the fluctuations. Measurements of discharge are made with a current meter by the general methods outlined in standard textbooks on the measurement of river discharge. A typical gaging station, equipped with water-stage recorder and measuring cable and car, is shown in figure 1.

Rating tables giving the discharge for any stage are prepared from the discharge measurements. The application of the daily gage heights to these rating tables gives the daily discharge from which the monthly and yearly mean discharge is computed.

The data presented for each gaging station in the area covered by this report comprise a description of the station, a table showing the daily discharge of the stream, and a table of monthly and yearly discharge and run-off.

The description of the station gives information in regard to the location and type of gage, diversions that decrease the flow at the gage, artificial regulation from pondage or storage, and the accuracy of the records. Information under "Discharge" gives the maximum and minimum recorded discharges and the average discharge. The maximum does not necessarily represent the crest discharge unless a water-stage recorder was in operation or a nonrecording gage was read at the time of the crest. Likewise, the minimum may not represent the lowest discharge. The average discharge is the average of the mean annual discharges for the years indicated. It is given only for stations for which there are 10 or more complete years of record.

The table of daily discharge gives, in general, the discharge in second-feet corresponding to the daily gage height, which may be a once daily reading or the mean of twice daily readings of a non-recording gage, or the mean daily gage height obtained from a water-stage recorder graph.

At stations on streams subject to sudden or rapid diurnal fluctuation, the discharge obtained from the rating table and the mean daily gage height may not be the true mean discharge for the day. If such stations are equipped with water-stage recorders, the mean daily discharge may be obtained by averaging discharge for intervals of the

day or by using the discharge integrator, an instrument for obtaining mean daily discharge from a continuous gage-height graph and containing as an essential element the rating curve of the station. At nonrecording-gage stations the mean daily discharge during flashy floods is determined from gage-height graphs based on gage readings made once daily or oftener.

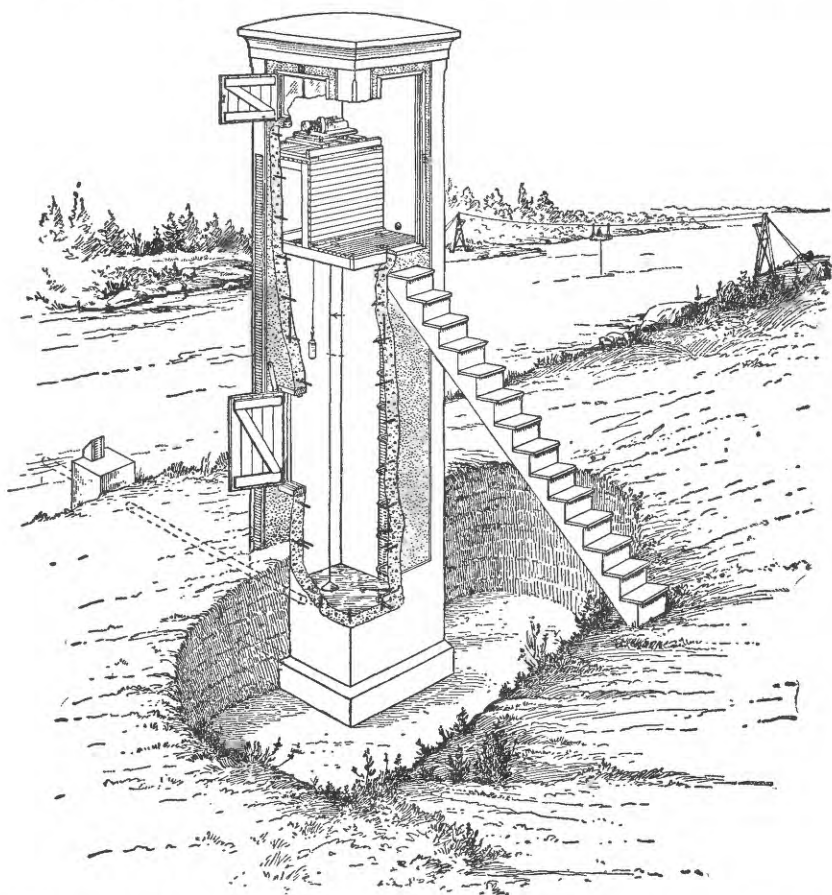


FIGURE 1.—Typical river-measurement station showing concrete well and house for water-stage recorder and staff gages, cable, and car.

In the table of monthly discharge the column headed "Maximum" gives the maximum daily discharge and not the discharge when the water surface was at crest height. Likewise, in the column headed "Minimum" the quantity given is the minimum daily discharge. The column headed "Mean" is the average flow in cubic feet per second during the month. On this average flow are based computations recorded in the remaining columns, which are defined on page 2.

## ACCURACY OF FIELD DATA AND COMPUTED RESULTS

The accuracy of stream-flow data depends primarily (1) on the permanence of the stage-discharge relation and (2) on the accuracy of observation of stage, measurements of flow, and interpretation of records.

The station description gives a statement in regard to the general accuracy of the records. "Excellent" indicates that, in general, the daily records are accurate within 5 percent; "good", within 10 percent; "fair", within 15 percent; and "poor", 20 percent or more.

The monthly means for any station may represent with high accuracy the quantity of water flowing past the gage, but the figures showing discharge per square mile and run-off in inches may be subject to gross errors caused by the inclusion of large noncontributing districts in the measured drainage area, by lack of information concerning water diverted for irrigation or other use, or by inability to interpret the effect of artificial regulation of the flow of the river above the station. "Second-feet per square mile" and "run-off in inches" are therefore not computed if such errors appear probable. The computations are also omitted for stations on streams draining areas in which the annual rainfall is less than 20 inches.

The table of monthly discharge gives a general idea of the flow at the station. The table of daily discharge allows more detailed studies of the variation in flow. It should be borne in mind, however, that the observations in each succeeding year may be expected to throw new light on data previously published.

Many gaging stations on streams in the irrigated sections of the United States are situated above most of the diversions from those streams, and the discharge recorded does not show the water supply available for further development, as prior appropriations below the station must first be satisfied.

## PUBLICATIONS

Investigation of water resources by the United States Geological Survey has consisted in large part of measurements of the volume of flow of streams and studies of the conditions affecting that flow, but it has comprised also investigation of such closely allied subjects as irrigation, water storage, water power, underground waters, and quality of waters. Most of the results of these investigations have been published in the series of water-supply papers, but some have appeared in the bulletins, professional papers, monographs, and annual reports.

The results of stream-flow measurements are now published annually in 12 parts, each part covering an area whose boundaries coincide with natural drainage features as indicated below:

- PART 1. North Atlantic slope basins (St. John River to York River).
2. South Atlantic slope and eastern Gulf of Mexico basins (James River to Mississippi River).
  3. Ohio River Basin.
  4. St. Lawrence River Basin.
  5. Hudson Bay and upper Mississippi River Basins.
  6. Missouri River Basin.
  7. Lower Mississippi River Basin.
  8. Western Gulf of Mexico basins.
  9. Colorado River Basin.
  10. The Great Basin.
  11. Pacific slope basins in California.
  12. North Pacific slope basins, in three parts:
    - A, Pacific slope basins in Washington and upper Columbia River Basin.
    - B, Snake River Basin.
    - C, Pacific slope basins in Oregon and lower Columbia River Basin.

Water-supply papers and other publications of the United States Geological Survey containing data in regard to the water resources of the United States may be obtained or consulted as indicated below.

1. Copies may be purchased at nominal cost from the Superintendent of Documents, Government Printing Office, Washington, D.C., who will, on application, furnish lists giving prices.
2. Sets of the reports may be consulted in the libraries of the principal cities in the United States.
3. Sets are available for consultation in the local offices of the water-resources branch of the Geological Survey, as follows:

Augusta, Maine, Statehouse.  
 Boston, Mass., 945 Post Office Building.  
 Hartford, Conn., 203 Federal Building.  
 Albany, N.Y., 353 Broadway.  
 Trenton, N.J., 228 Federal Building.  
 Harrisburg, Pa., 492 Education Building.  
 Charlottesville, Va., University of Virginia.  
 South Charleston, W.Va., Naval Ordnance Plant.  
 Asheville, N.C., 220 Post Office Building.  
 Columbia, S.C., 801 National Loan & Exchange Bank Building.  
 Ocala, Fla., Post Office Building.  
 Montgomery, Ala., Post Office Building.  
 Chattanooga, Tenn., 217 Post Office Building.  
 Columbus, Ohio, Engineering Experiment Station, Ohio State University.  
 Indianapolis, Ind., 319 Federal Building.  
 Urbana, Ill., 302 University New Agricultural Building.  
 Madison, Wis., 337N State Capitol.  
 St. Paul, Minn., 808 New Post Office Building.  
 Iowa City, Iowa, 402 Hydraulic Laboratory, University of Iowa.  
 St. Louis, Mo., 3 Customhouse.

Rolla, Mo., Missouri Geological Survey Building, Missouri School of Mines and Metallurgy.

Topeka, Kans., 305 Federal Building.

Fort Smith, Ark., Post Office Building.

Austin, Tex., State Highway Building.

Santa Fe., N.Mex., State Capitol.

Tucson, Ariz., 210 Post Office Building.

Denver, Colo., 403 Post Office Building.

Salt Lake City, Utah, 303 Federal Building.

Idaho Falls, Idaho, 228 Federal Building.

Boise, Idaho, 429 Federal Building.

Helena, Mont., 421 Federal Building.

Tacoma, Wash., 406 Federal Building.

Portland, Oreg., 606 Post Office Building.

San Francisco, Calif., 303 Customhouse.

Los Angeles, Calif., 510 Eighth and Figueroa Building.

Honolulu, Hawaii, 225 Federal Building.

A list of the Geological Survey publications may be obtained by applying to the Director, United States Geological Survey, Washington, D.C.

Stream-flow records have been obtained at about 6,680 points in the United States, and the data obtained have been published in the reports tabulated as follows:

*Stream-flow data in reports of the United States Geological Survey*

[A = Annual report; B = Bulletin; W = Water-supply paper]

Report	Character of data	Year
10th, A, pt. 2.....	Descriptive information only.....	
11th A, pt. 2.....	Monthly discharge and descriptive information.....	1884 to Sept. 1890.
12th A, pt. 2.....	do.....	1884 to June 30, 1891.
13th A, pt. 3.....	Mean discharge in second-feet.....	1884 to Dec. 31, 1892.
14th A, pt. 2.....	Monthly discharge (long-time records, 1871 to 1893).....	1888 to Dec. 31, 1893.
B 131.....	Descriptions, measurements, gage heights, and ratings.....	1893-94.
16th A, pt. 2.....	Descriptive information only.....	
B 140.....	Descriptions, measurements, gage heights, ratings, and monthly discharge (also many data covering earlier years).	1895.
W 11.....	Gage heights (also gage heights for earlier years).....	1896.
18th A, pt. 4.....	Descriptions, measurements, ratings, and monthly discharge (also similar data for some earlier years).	1895-96.
W 15.....	Descriptions, measurements, and gage heights, eastern United States, eastern Mississippi River, and Missouri River above junction with Kansas River.	1897.
W 16.....	Descriptions, measurements, and gage heights, western Mississippi River below junction of Missouri and Platte and western United States.	1897.
19th A, pt. 4.....	Descriptions, measurements, ratings, and monthly discharge (also some long-time records).	1897.
W 27.....	Measurements, ratings, and gage heights, eastern United States, eastern Mississippi River, and Missouri River.	1898.
W 28.....	Measurements, ratings, and gage heights, Arkansas River and western United States.	1898.
20th A, pt. 4.....	Monthly discharge (also for many earlier years).....	1898.
W 35 to 39.....	Descriptions, measurements, gage heights, and ratings.....	1899.
21st A, pt. 4.....	Monthly discharge.....	1899.
W 47 to 52.....	Descriptions, measurements, gage heights, and ratings.....	1900.
22nd A, pt. 4.....	Monthly discharge.....	1900.
W 65, 66.....	Descriptions, measurements, gage heights, and ratings.....	1901.
W 75.....	Monthly discharge.....	1901.
W 82 to 85.....	Complete data.....	1902.
W 97 to 100.....	do.....	1903.
W 124 to 135.....	do.....	1904.
W 165 to 178.....	do.....	1905.
W 201 to 214.....	do.....	1906.
W 241 to 252.....	do.....	1907-8.
W 261 to 272.....	do.....	1909.
W 281 to 292.....	do.....	1910.

*Stream-flow data in reports of the United States Geological Survey—Continued*

Report	Character of data	Year
W 301 to 312.....	Complete data.....	1911.
W 321 to 332.....	do.....	1912.
W 351 to 362.....	do.....	1913.
W 381 to 394.....	do.....	1914.
W 401 to 414.....	do.....	1915.
W 431 to 444.....	do.....	1916.
W 451 to 464.....	do.....	1917.
W 471 to 484.....	do.....	1918.
W 501 to 514.....	do.....	1919-20.
W 521 to 534.....	do.....	1921.
W 541 to 554.....	do.....	1922.
W 561 to 574.....	do.....	1923.
W 581 to 594.....	do.....	1924.
W 601 to 614.....	do.....	1925.
W 621 to 634.....	do.....	1926.
W 641 to 654.....	do.....	1927.
W 661 to 674.....	do.....	1928.
W 681 to 694.....	do.....	1929.
W 696 to 709.....	do.....	1930.
W 711 to 724.....	do.....	1931.
W 726 to 739.....	do.....	1932.
W 741 to 754.....	do.....	1933.

The records at most of the stations discussed in these reports extend over a series of years. Miscellaneous measurements at many points other than regular gaging stations have been made each year, and are published under "Miscellaneous discharge measurements" at the end of each report in the same relative order as the regular gaging stations. An index of the reports containing records obtained prior to 1904 has been published in Water-Supply Paper 119.

The following table gives, by years and drainage basins, the numbers of the papers on surface-water supply published from 1899 to 1933. The data for any particular station will as a rule be found in the reports covering the years during which the station was maintained. For example, data from 1910 to 1920 for any station in the area covered by part 3 are published in Water-Supply Papers 283, 303, 323, 353, 383, 403, 433, 453, 473, and 503, which contain records for the Ohio River Basin for those years.

*Numbers of water-supply papers containing results of stream measurements, 1889-1933*

[For basins included, see p. 6]

Year	1	2	3	4	5	6	7	8	9	10	11	12-A	12-B	12-C
1889.....	36	35, 36	36	36	36	36, 37	37	37	37, 38	38, 39	38, 39	38	38	38
1900.....	47, 48	48	48, 49	49	49	49, 50	50	50	50	51	51	51	51	51
1901.....	65, 75	65, 75	65, 75	65, 75	65, 75	66, 75	66, 75	66, 75	66, 75	66, 75	66, 75	66, 75	66, 75	66, 75
1902.....	82	82, 83	82	82	82	84	84	84	85	85	85	85	85	85
1903.....	97	97, 98	98	98	98	99	99	99	100	100	100	100	100	100
1904.....	124, 125	126, 127	128	129	128, 130	130, 131	128, 131	132	133	133, 134	134	135	135	135
1905.....	165, 166	167, 168	169	170	171	172	169, 173	174	175, 177	176, 177	177	178	178	177, 178
1906.....	201, 202	203, 204	205	206	207	208	205, 209	210	211, 213	212, 213	213	214	214	214
1907-8.....	243	242	243	244	245	246	247	248	249	250, 251	251	252	252	252
1909.....	261	262	263	264	265	266	267	268	269	270, 271	271	272	272	272
1910.....	281	282	283	284	285	286	287	288	289	290	291	292	292	292
1911.....	301	302	303	304	305	306	307	308	309	310	311	312	312	312
1912.....	321	322	323	324	325	326	327	328	329	330	331	332-A	332-B	332-C
1913.....	381	382	383	384	385	386	387	388	389	390	391	392-A	392-B	392-C
1914.....	401	402	403	404	405	406	407	408	409	410	411	412	413	414
1915.....	431	432	433	434	435	436	437	438	439	440	441	442	443	444
1916.....	451	452	453	454	455	456	457	458	459	460	461	462	463	464
1917.....	471	472	473	474	475	476	477	478	479	480	481	482	483	484
1918.....	501	502	503	504	505	506	507	508	509	510	511	512	513	514
1919-20.....	521	522	523	524	525	526	527	528	529	530	531	532	533	534
1921.....	541	542	543	544	545	546	547	548	549	550	551	552	553	554
1922.....	561	562	563	564	565	566	567	568	569	570	571	572	573	574
1923.....	581	582	583	584	585	586	587	588	589	590	591	592	593	594
1924.....	601	602	603	604	605	606	607	608	609	610	611	612	613	614
1925.....	621	622	623	624	625	626	627	628	629	630	631	632	633	634
1926.....	641	642	643	644	645	646	647	648	649	650	651	652	653	654
1927.....	661	662	663	664	665	666	667	668	669	670	671	672	673	674
1928.....	681	682	683	684	685	686	687	688	689	690	691	692	693	694
1929.....	696	697	698	699	700	701	702	703	704	705	706	707	708	709
1930.....	711	712	713	714	715	716	717	718	719	720	721	722	723	724
1931.....	726	727	728	729	730	731	732	733	734	735	736	737	738	739
1932.....	741	742	743	744	745	746	747	748	749	750	751	752	753	754

*i* Loup and Platte Rivers near Columbus, Nebr., and all tributaries below junction with Platte River.  
*k* Tributaries of Mississippi River from east.  
*l* Lake Ontario and tributaries to St. Lawrence River proper.  
*m* Hudson Bay only.  
*n* New England rivers only.  
*o* Hudson River to Delaware River, inclusive.  
*p* Susquehanna River to Yadkin River, inclusive.  
*q* Platte and Kansas Rivers.  
*r* The Great Basin in California, except Truckee and Carson River Basins.  
*s* Below junction with Gila River.  
*t* Rogue, Umpqua, and Siletz Rivers only.

*a* Rating tables and index to Water-Supply Papers 35-39 contained in Water-Supply Paper 39. Tables for monthly discharge for 1899 in Twenty-first Annual Report, pt. 4.

*b* James River only.

*c* Gallatin River.

*d* Green and Gunnison Rivers and Colorado River above Gunnison River.

*e* Mojave River only.

*f* Kings and Kern Rivers and south Pacific slope basins.

*g* Rating tables and index to Water-Supply Papers 47-52 and data on precipitation, wells, and irrigation in California and Utah contained in Water-Supply Paper 52.

Tables of monthly discharge for 1900 in Twenty-second Annual Report, pt. 4.

*h* Wissahickon and Schuylkill Rivers to James River.

*i* Scioto River.

### COOPERATION

The work in New Mexico was carried on under cooperative agreement with the State through George M. Neel, State engineer, succeeded by Thomas M. McClure.

The work in Texas was carried on under cooperative agreement with the State through the Board of Water Engineers, consisting of John A. Norris, chairman, C. S. Clark, and A. H. Dunlap.

Acknowledgments are due to the American section of the International Boundary Commission and to the United States Bureau of Reclamation for assisting in collecting the records published herein.

Assistance in collecting records was also rendered by the following organizations: In Colorado by the State engineer's office and the Marian Mining Co.; in New Mexico by the United States Indian Irrigation Service, the town of Alamogordo, Alamogordo Community Ditch, Aqua Pura Co., New Mexico Power Co., and Tularosa Community Ditch; in Texas by the cities of Corpus Christi, and Fort Worth, Dallas County, Bexar-Medina-Atascosa Counties Water Improvement District No. 1, Gulf, Colorado & Santa Fe Railway Co., San Antonio Public Service Co., Central & Southwest Utilities Co., and West Texas Utilities Co.

### DIVISION OF WORK

The data for the station in Colorado were collected and prepared for publication under the direction of Robert Follansbee, district engineer, assisted by J. H. Baily.

The data for stations in New Mexico were collected and prepared for publication under the direction of Berkeley Johnson, district engineer, assisted by E. L. Barrows, H. G. Neel, W. G. Bratschi, T. E. Yates, W. C. Smith, Russell Dallas, Mrs. Jean Teague, and Miss Dorothy Harvey.

Data for stations in Texas were collected and prepared for publication under the direction of C. E. Ellsworth, district engineer, assisted by Trigg Twichell, Seth D. Breeding, Tate Dalrymple, W. C. Dodd, N. C. Magnuson, Tinnie Schmitt, V. W. Rupp, V. L. Austin, F. C. Ames, P. H. Holland, J. M. Terry, R. W. Yarborough, Jr., and J. A. Norris, Jr.

The records were reviewed and manuscript assembled by C. V. Youngquist.



## GAGING-STATION RECORDS

## SABINE RIVER BASIN

## SABINE RIVER NEAR GLADEWATER, TEX.

LOCATION.—Chain gage at Gladewater-Tyler highway bridge 1 mile southwest of Gladewater, Gregg County. Zero of gage is 243.8 feet above mean sea level (Texas Reclamation Department datum).

DRAINAGE AREA.—2,850 square miles.

RECORDS AVAILABLE.—October 1932 to September 1933.

DISCHARGE.—Maximum during year, 6,600 second-feet Mar. 16 (gage height, 27.26 feet); minimum, 34 second-feet Oct. 25 (gage height, 4.02 feet).

REMARKS.—Records fair. Small diversions for municipal and oil-field operations.

*Discharge, in second-feet 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	38	57	72	5,020	1,250	902	3,840	3,480	2,940	53	849	128
2.....	40	73	70	5,090	1,200	1,200	3,840	3,630	3,740	52	461	105
3.....	40	72	73	5,050	1,120	1,530	3,540	3,780	4,400	52	208	88
4.....	45	62	75	4,930	983	2,070	3,240	4,210	4,770	49	179	81
5.....	48	57	73	4,800	849	2,540	2,770	4,580	4,930	48	160	78
6.....	51	60	66	4,740	1,120	3,120	2,250	4,740	4,960	48	140	69
7.....	50	63	62	4,800	1,250	3,840	1,780	4,740	4,010	46	128	66
8.....	50	65	75	5,440	1,230	4,400	1,230	4,300	2,300	46	122	62
9.....	50	62	81	5,800	929	4,860	745	3,660	668	46	116	56
10.....	128	64	88	5,900	771	5,210	596	2,880	208	46	105	51
11.....	370	62	94	5,870	875	5,470	956	2,190	160	41	88	52
12.....	350	58	100	5,700	1,040	5,700	1,200	1,500	153	38	82	94
13.....	223	54	105	5,470	1,230	5,940	1,060	823	128	38	100	153
14.....	140	59	110	5,340	1,390	6,180	1,480	456	140	40	134	160
15.....	105	60	110	5,340	1,480	6,460	1,620	370	122	45	134	153
16.....	83	62	122	5,540	1,450	6,560	1,390	330	110	49	122	116
17.....	72	59	128	5,800	1,390	6,210	1,060	310	100	51	122	94
18.....	62	53	140	5,940	1,310	5,540	797	272	100	51	208	76
19.....	56	49	146	5,940	1,230	4,830	670	255	94	3,070	128	74
20.....	50	54	153	5,730	1,060	3,720	1,660	572	116	4,490	110	70
21.....	44	57	160	5,280	902	2,130	2,160	1,120	122	4,150	105	61
22.....	42	59	193	4,830	797	1,450	1,620	1,120	122	3,510	100	60
23.....	40	69	330	4,460	670	1,250	1,230	2,130	122	2,940	88	54
24.....	38	83	678	4,210	596	1,620	849	2,650	110	3,510	83	52
25.....	34	100	902	3,900	524	1,960	572	3,180	105	2,720	74	69
26.....	35	100	929	3,570	500	2,160	1,430	3,600	94	1,550	68	78
27.....	37	94	1,060	3,180	572	1,980	2,390	3,660	88	800	64	88
28.....	38	88	1,250	2,710	720	1,730	2,830	3,390	70	456	62	105
29.....	50	79	1,670	2,250	-----	1,530	2,940	3,000	61	370	59	116
30.....	48	75	3,160	1,760	-----	1,760	3,210	2,480	54	929	72	100
31.....	52	-----	4,770	1,340	-----	3,360	-----	2,590	-----	929	82	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	370	34	80.9	4,970
November.....	100	49	67.0	3,990
December.....	4,770	62	550	33,800
January.....	5,940	1,340	4,700	289,000
February.....	1,480	500	1,020	56,600
March.....	6,560	902	3,460	213,000
April.....	3,840	572	1,840	109,000
May.....	4,740	54	2,470	152,000
June.....	4,960	54	1,170	69,600
July.....	4,490	38	976	60,000
August.....	849	59	147	9,040
September.....	160	51	87.0	5,180
The year.....	6,560	34	1,390	1,010,000

## SABINE RIVER AT LOGANSFORT, LA.

LOCATION.—Chain gage on highway bridge 200 feet above Houston East & West Texas Railway bridge and a quarter of a mile west of railway station in Logansport, De Soto Parish. Zero of gage is 147.5 feet above mean sea level.

DRAINAGE AREA.—4,860 square miles.

RECORDS AVAILABLE.—July 1903 to December 1906; and October 1923 to September 1933.

DISCHARGE.—Maximum stage during year, 34.6 feet, affected by backwater July 25 (discharge not determined); minimum, 53 second-feet Oct. 14-15, 31 (gage height, —0.1 foot).

1903-6, 1923-33: Maximum, 41,100 second-feet Feb. 23, 1932 (gage height, 35.6 feet); minimum, probably less than 27 second-feet in September 1925. Average, 10 years (1923-33), 3,060 second-feet.

Maximum stage known, 39.4 feet, present datum, reached during 1884.

REMARKS.—Records fair. Discharge estimated during backwater periods, May 4-6, 24-29, and July 23-27. Small diversions above station. Gage-height record furnished by U.S. Weather Bureau.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	68	74	226	5,650	5,700	7,740	7,300	5,550	5,650	226	14,400	496
2.....	74	81	214	5,750	4,850	8,760	8,480	5,900	5,400	240	11,600	824
3.....	74	81	191	6,050	4,570	9,060	9,140	6,300	5,050	191	9,570	800
4.....	81	81	180	6,360	3,900	8,980	9,840		4,570	180	7,790	800
5.....	81	74	169	6,090	3,540	8,340	10,900	7,180	4,210	169	5,350	754
6.....	74	68	169	6,090	3,140	7,840	10,900		4,080	159	3,060	644
7.....	74	63	159	6,580	2,860	8,020	10,400	8,020	4,210	149	2,030	556
8.....	68	68	149	6,520	3,340	8,340	9,570	8,140	4,340	139	1,920	476
9.....	68	81	149	6,580	3,850	8,620	8,340	8,200	4,520	139	1,070	398
10.....	68	88	149	6,800	3,800	8,760	6,910	8,270	4,620	129	968	312
11.....	68	103	149	7,020	3,460	8,760	5,600	8,020	4,520	120	872	282
12.....	63	111	159	7,240	3,300	8,410	5,050	7,620	3,560	120	754	282
13.....	63	103	169	7,400	3,060	8,270	4,700	7,020	2,000	120	732	328
14.....	58	95	191	7,570	3,030	7,960	3,850	6,100	1,220	120	732	380
15.....	58	88	214	7,620	4,420	7,520	3,420	4,720	920	129	872	436
16.....	159	88	240	7,620	6,150	7,130	3,540	3,030	754	214	1,020	456
17.....	226	88	268	7,520	7,080	6,860	3,800	2,100	622	517	944	496
18.....	214	81	296	7,400	7,570	6,740	3,900	1,750	536	1,190	824	456
19.....	191	81	312	7,300	7,790	6,640	3,800	1,220	476	1,470	710	416
20.....	169	74	312	7,180	8,020	6,740	4,080	1,070	456	1,360	622	350
21.....	139	74	362	7,130	8,140	6,860	4,660	992	416	1,470	536	344
22.....	129	68	476	7,180	8,080	7,080	5,000	944	380	2,140	496	296
23.....	103	88	644	7,460	7,900	7,130	5,250	1,040	328		476	254
24.....	95	111	968	7,620	7,180	7,300	5,350		312		456	214
25.....	88	129	1,400	7,620	6,300	7,460	5,150		296	14,900	398	202
26.....	81	149	1,720	7,520	5,300	7,130	4,700		296		344	191
27.....	68	180	1,920	7,400	5,000	6,420	4,440		282		312	180
28.....	68	180	1,960	7,240	6,520	5,800	4,700		268	28,400	282	169
29.....	63	214	1,960	6,960		5,200	4,900		240	24,800	282	169
30.....	63	226	2,580	6,740		5,900	5,250	6,420	226	21,300	296	180
31.....	58		4,380	6,520		6,050		6,050		17,800	344	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	226	58	95.2	5,850
November.....	226	63	103	6,130
December.....	4,380	149	724	44,500
January.....	7,620	5,650	7,000	430,000
February.....	8,140	2,860	5,280	293,000
March.....	9,060	5,200	7,480	460,000
April.....	10,900	3,420	6,100	363,000
May.....	8,270	944	5,060	311,000
June.....	5,650	226	2,160	129,000
July.....		120	5,730	352,000
August.....	14,400	282	2,260	139,000
September.....	824	169	406	24,200
The year.....		58	3,530	2,560,000

## SABINE RIVER NEAR BON WIER, TEX.

LOCATION.—Chain gage on highway bridge  $1\frac{1}{4}$  miles east of Bon Wier, Newton County. Zero of gage is 45.4 feet above mean sea level (railway datum).

DRAINAGE AREA.—8,320 square miles at present site. (Supersedes 8,390 square miles published in Water-Supply Papers 718 and 733, area at former site.)

RECORDS AVAILABLE.—October 1923 to September 1933.

DISCHARGE.—Maximum during year, 63,000 second-feet Aug. 1, 2; maximum gage height, 23.04 feet, Aug. 2; minimum, 270 second-feet Nov. 10-16.

1923-33: Maximum, that of Aug. 1, 2, 1933; minimum, 185 second-feet Sept. 11, 22, and 24, 1925. Average, 10 years, 7,130 second-feet.

REMARKS.—Records fair. No diversions below station near Longview. Gage-height record furnished by U.S. Weather Bureau.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	390	315	670	11,400	13,000	17,300	10,000	8,800	10,200	970	63,000	2,400
2.....	365	315	635	14,000	17,600	18,400	10,400	7,520	9,400	920	63,000	3,200
3.....	365	315	565	13,800	18,400	19,000	11,400	7,380	8,800	920	58,700	3,520
4.....	340	315	530	12,400	17,100	18,800	12,100	7,660	7,800	870	52,400	2,900
5.....	340	290	565	11,400	12,800	17,300	12,400	9,100	6,970	830	46,400	2,320
6.....	340	290	600	10,800	11,600	18,000	12,600	10,300	6,190	790	43,000	2,090
7.....	365	290	635	10,300	13,300	20,100	12,600	12,000	5,440	790	41,400	2,020
8.....	365	290	750	10,300	14,700	20,900	12,600	13,200	4,960	790	38,600	2,020
9.....	365	290	790	11,600	14,700	21,400	12,700	13,000	4,600	750	37,400	2,020
10.....	340	270	790	12,100	15,400	22,200	12,800	12,600	4,600	750	34,200	1,880
11.....	340	270	1,470	12,100	15,400	22,200	13,200	12,100	4,600	710	29,300	1,750
12.....	340	270	2,700	11,400	13,500	21,100	13,000	11,800	4,840	710	25,800	1,690
13.....	340	270	2,800	10,600	11,400	19,900	12,800	11,400	4,960	710	21,400	1,570
14.....	315	270	3,000	10,000	10,600	18,600	13,700	10,900	4,720	920	12,400	1,510
15.....	315	270	3,100	9,550	10,800	17,400	15,600	10,300	4,120	1,120	8,950	1,450
16.....	315	270	2,320	9,400	11,600	16,300	17,400	9,100	3,400	1,740	6,580	1,450
17.....	315	290	2,020	8,950	12,700	15,100	17,400	8,950	2,600	3,400	5,260	1,450
18.....	315	290	1,750	8,500	13,000	13,800	14,700	8,360	1,810	6,200	3,530	1,450
19.....	315	315	1,510	8,220	13,500	13,300	13,800	7,380	1,630	7,660	3,300	1,450
20.....	315	315	1,650	8,650	14,700	13,000	15,100	6,190	1,510	6,320	2,800	1,390
21.....	340	340	3,390	8,950	15,800	13,000	17,100	4,720	1,330	5,200	2,160	1,330
22.....	365	365	6,650	8,950	16,500	12,200	19,900	3,760	1,270	5,800	2,500	1,330
23.....	365	365	10,600	9,400	17,800	11,200	21,100	2,700	1,220	6,710	2,320	1,270
24.....	390	390	11,400	10,300	18,600	10,200	21,600	2,090	1,170	9,890	2,090	1,220
25.....	390	470	13,500	11,400	17,600	10,200	19,700	2,800	1,170	22,200	1,950	1,220
26.....	340	635	14,900	11,600	16,100	10,200	15,900	3,520	1,120	27,200	1,810	1,220
27.....	340	920	14,400	11,400	15,600	10,200	12,100	4,420	1,120	37,400	1,750	1,170
28.....	315	1,120	12,600	10,600	16,100	10,000	11,800	7,060	1,120	38,600	1,750	1,170
29.....	315	1,020	9,700	10,200	-----	10,000	11,000	10,300	1,070	40,000	1,690	1,120
30.....	315	790	7,660	10,300	-----	10,300	8,650	10,800	1,020	48,200	1,690	1,070
31.....	315	-----	8,220	10,900	-----	10,300	-----	10,900	-----	56,600	1,880	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	390	315	342	21,000
November.....	1,120	270	407	24,200
December.....	14,900	530	4,580	282,000
January.....	14,000	8,220	10,600	652,000
February.....	18,600	10,600	14,600	811,000
March.....	22,200	10,000	15,500	953,000
April.....	21,600	8,650	14,200	845,000
May.....	13,200	2,090	8,420	518,000
June.....	10,200	1,020	3,830	228,000
July.....	56,600	710	10,800	664,000
August.....	63,000	1,690	20,000	1,230,000
September.....	3,520	1,070	1,720	102,000
The year.....	63,000	270	8,750	6,330,000

## SABINE RIVER NEAR RULIFF, TEX.

LOCATION.—Staff gage on Kansas City Southern Railway bridge  $1\frac{1}{2}$  miles east of Ruliff, Newton County, and 5 miles below mouth of Cypress Creek. Zero of gage is 4.7 feet above mean sea level (railway datum).

DRAINAGE AREA.—9,450 square miles.

RECORDS AVAILABLE.—October 1924 to September 1933.

DISCHARGE.—Maximum during year, 68,600 second-feet Aug. 5 (gage height, 15.55 feet); minimum, 362 second-feet Nov. 15–17.

1924–33: Maximum discharge, that of Aug. 5, 1933; minimum, that of Nov. 15–17, 1932.

REMARKS.—Records for medium and high stages excellent; for low stages good. No diversions of consequence above station.

*Discharge, in second-feet, 1932–33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1-----	549	474	1,390	15,000	11,500	23,800	9,790	13,400	9,130	1,340	50,100	2,300
2-----	549	450	1,140	12,800	12,100	21,800	9,790	11,000	9,790	1,290	53,100	2,700
3-----	523	450	960	12,100	12,800	19,700	9,790	9,450	9,790	1,240	60,600	3,430
4-----	498	450	960	12,800	15,000	19,700	9,790	9,130	9,790	1,140	67,000	3,740
5-----	498	450	840	13,400	16,800	20,700	10,200	8,550	9,450	1,090	67,000	3,530
6-----	498	450	840	14,200	18,700	23,800	10,200	8,550	9,130	1,050	65,400	3,060
7-----	498	450	840	14,200	20,700	26,000	10,600	8,550	8,280	1,050	60,600	2,700
8-----	498	450	918	15,000	21,800	27,100	11,500	9,450	7,530	1,000	56,100	2,620
9-----	523	427	1,000	14,200	20,700	28,200	11,500	10,600	6,700	1,000	50,100	2,530
10-----	498	405	1,090	14,200	20,700	28,200	12,100	11,000	6,220	960	45,600	2,450
11-----	498	405	1,240	15,000	21,800	27,100	12,100	11,500	5,760	960	41,100	2,370
12-----	474	405	1,450	15,000	21,800	26,000	12,800	12,100	5,480	918	38,200	2,220
13-----	450	405	2,300	15,000	20,700	26,000	12,800	11,500	5,350	878	34,100	2,150
14-----	450	383	3,240	15,000	19,700	24,900	12,800	11,500	5,350	878	30,400	2,080
15-----	450	362	3,630	13,400	17,700	23,800	12,800	11,000	5,480	878	27,100	2,080
16-----	450	362	3,960	12,800	15,800	22,800	12,800	11,000	5,350	918	21,800	1,940
17-----	450	362	4,070	11,500	14,200	21,800	13,400	10,600	5,100	1,000	16,800	1,810
18-----	450	405	3,960	11,000	12,800	20,700	14,200	10,200	4,510	1,560	11,000	1,690
19-----	450	450	2,970	10,600	12,800	19,700	15,800	9,450	3,630	4,400	7,770	1,620
20-----	427	450	2,880	9,790	13,400	17,700	17,700	9,130	2,880	6,060	6,060	1,560
21-----	427	498	2,620	9,790	14,200	16,800	19,700	8,020	2,370	6,880	4,740	1,560
22-----	405	498	2,880	9,790	15,000	15,800	17,700	6,380	2,080	7,530	4,180	1,560
23-----	405	523	4,860	9,450	15,800	15,000	16,800	5,220	1,810	8,020	3,630	1,560
24-----	405	549	6,880	9,790	18,700	14,200	17,700	4,180	1,690	7,770	3,330	1,560
25-----	450	549	8,830	10,600	23,800	13,400	19,700	3,630	1,690	12,100	2,970	1,560
26-----	498	549	10,600	10,600	27,100	12,800	21,800	3,740	1,560	15,800	2,700	1,500
27-----	498	577	12,800	11,000	28,200	11,500	22,800	4,740	1,450	18,700	2,530	1,450
28-----	498	734	15,000	11,000	26,000	10,600	21,800	6,060	1,390	27,100	2,370	1,390
29-----	498	1,050	15,800	11,000	-----	10,200	19,700	6,880	1,450	38,200	2,300	1,390
30-----	474	1,450	16,800	11,500	-----	9,790	16,800	7,770	1,450	44,100	2,300	1,340
31-----	474	-----	16,800	11,500	-----	9,790	-----	8,550	-----	47,100	2,220	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October-----	549	405	475	29,200
November-----	1,450	362	514	30,600
December-----	16,800	840	4,950	304,000
January-----	15,000	9,450	12,400	762,000
February-----	28,200	11,500	18,200	1,010,000
March-----	28,200	9,790	19,700	1,210,000
April-----	22,800	9,790	14,600	869,000
May-----	13,400	3,630	8,800	541,000
June-----	9,790	1,390	5,050	300,000
July-----	47,100	878	8,480	521,000
August-----	67,000	2,220	27,200	1,670,000
September-----	3,740	1,340	2,120	126,000
The year-----	67,000	362	10,200	7,370,000

## NECHES RIVER BASIN

## NECHES RIVER NEAR ROCKLAND, TEX.

LOCATION.—Staff gage half a mile above Texas & New Orleans Railroad bridge 1 mile north of Rockland, Tyler County. Zero of gage is 91.3 feet above mean sea level.

DRAINAGE AREA.—3,540 square miles.

RECORDS AVAILABLE.—October 1923 to September 1933.

DISCHARGE.—Maximum during year, 8,990 second-feet Mar. 9 (gage height, 16.4 feet); minimum, 61 second-feet Oct. 31 to Nov. 8.

1923-33: Maximum, 34,200 second-feet June 1, 1929 (gage height, 26.8 feet); minimum, 3.0 second-feet Oct. 15, 1931 (gage height, -0.9 foot). Average, 10 years, 2,440 second-feet.

Maximum stage known, 28.9 feet Apr. 2, 1922 (discharge, about 45,800 second-feet).

REMARKS.—Records fair. No diversions above station. Gage-height record furnished by U.S. Weather Bureau Oct. 1 to June 30.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	103	61	211	2,730	5,160	5,770	2,440	2,400	1,190	222	1,190	286
2	103	61	253	2,680	5,710	6,190	2,780	2,210	1,270	182	879	802
3	103	61	275	2,350	6,470	6,190	3,200	2,160	1,350	182	726	957
4	88	61	275	2,030	6,260	5,910	3,600	2,260	1,470	163	504	957
5	88	61	298	1,810	5,430	5,770	4,030	2,590	1,510	163	504	726
6	103	61	298	1,590	5,090	7,730	4,290	2,940	1,550	145	504	576
7	103	61	323	1,680	5,230	8,500	4,360	3,150	1,590	145	264	438
8	103	61	323	2,400	5,030	8,780	4,220	3,040	1,590	145	242	310
9	103	74	298	2,490	4,690	8,990	4,030	2,890	1,590	145	222	264
10	103	74	323	2,160	4,820	8,850	3,660	2,680	1,590	163	201	222
11	119	88	350	1,850	4,690	8,360	3,370	2,640	1,640	163	182	201
12	119	103	323	1,810	4,620	7,800	3,200	2,590	1,640	145	163	182
13	119	136	323	1,760	4,290	7,380	3,260	2,590	1,640	128	145	163
14	119	154	350	1,760	4,160	6,680	4,030	2,680	1,510	111	128	163
15	119	154	378	1,810	4,480	5,770	5,430	2,830	1,350	111	111	145
16	119	136	407	1,850	4,550	5,030	6,260	2,990	1,150	163	111	222
17	103	119	378	1,850	4,620	4,420	6,890	3,100	957	182	163	438
18	103	119	378	1,900	4,420	3,660	7,450	3,150	726	96	242	504
19	88	119	378	2,120	4,160	3,260	7,800	3,150	576	96	242	504
20	88	119	378	2,260	4,480	2,940	8,150	3,040	504	96	264	438
21	88	119	821	2,440	4,160	2,680	8,080	2,940	438	96	201	351
22	88	103	1,640	2,780	4,160	2,730	7,590	2,780	378	128	163	264
23	88	103	1,510	2,890	3,960	2,940	6,890	2,590	378	1,670	163	201
24	88	119	2,300	2,990	3,780	3,100	6,260	2,350	336	2,300	163	182
25	88	154	1,940	3,100	3,600	3,200	5,430	2,160	310	3,900	163	145
26	88	172	1,640	3,100	3,600	3,100	4,620	2,080	310	4,620	182	145
27	74	172	1,310	2,990	4,690	2,940	4,030	1,850	286	4,960	155	128
28	74	172	1,190	2,940	5,570	2,680	3,370	1,550	286	4,820	128	120
29	74	191	1,190	2,990	-----	2,440	2,890	1,270	264	4,480	111	111
30	74	191	2,490	4,160	-----	2,300	2,590	1,150	242	3,900	128	111
31	61	-----	2,990	4,550	-----	2,440	-----	1,190	-----	2,260	128	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	119	61	96.2	5,920
November	191	61	113	6,720
December	2,990	211	824	50,700
January	4,550	1,590	2,450	151,000
February	6,470	3,600	4,710	262,000
March	8,990	2,300	5,110	314,000
April	8,150	2,440	4,810	286,000
May	3,150	1,150	2,480	152,000
June	1,640	242	987	58,700
July	4,960	96	1,160	71,300
August	1,190	111	280	17,200
September	957	111	342	20,400
The year	8,990	61	1,930	1,400,000

## NECHES RIVER AT EVADALE, TEX.

LOCATION.—Staff gage at Gulf, Colorado & Santa Fe Railway bridge at Evadale, Jasper County. Zero of gage is 7.20 feet above mean sea level (railway datum).

DRAINAGE AREA.—7,910 square miles.

RECORDS AVAILABLE.—July 1904 to December 1906; October 1923 to September 1933.

DISCHARGE.—Maximum during year, 19,900 second-feet Mar. 14 (gage height, 16.07 feet); minimum, 285 second-feet Nov. 8–14; minimum gage height, 0.60 foot Nov. 9.

1904–6, 1923–33: Maximum, 83,800 second-feet June 1, 1929 (gage height, 22.20 feet); minimum, about 148 second-feet Sept. 10, 1925. Average, 10 years (1923–33), 6,460 second-feet.

Maximum stage known, 33.4 feet in 1884, from records of Gulf, Colorado & Santa Fe Railway Co.

REMARKS.—Records good. No diversions above station.

*Discharge, in second-feet, 1932–33.*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	414	315	659	5,980	7,590	11,000	6,850	8,970	5,420	977	15,400	945
2.....	414	300	713	7,130	8,580	11,000	6,850	7,750	5,740	914	16,000	945
3.....	380	315	768	8,230	9,600	11,600	7,130	6,850	6,100	855	16,600	1,340
4.....	380	315	768	8,770	10,500	12,200	7,590	6,720	6,460	826	16,600	1,530
5.....	380	315	768	8,770	11,600	12,800	8,070	6,590	6,850	797	16,600	2,200
6.....	380	300	797	8,400	11,800	15,400	8,400	6,850	6,850	768	15,400	2,260
7.....	397	300	884	7,750	12,800	16,000	8,770	7,750	6,590	768	13,200	2,160
8.....	397	285	914	7,750	13,200	16,000	9,390	8,230	5,980	740	10,000	1,870
9.....	380	285	1,010	7,130	13,200	16,600	9,810	8,400	5,420	686	7,130	1,610
10.....	380	285	1,190	6,990	13,200	17,200	10,300	8,400	5,120	659	5,320	1,340
11.....	380	285	1,220	7,280	12,800	17,200	10,300	8,230	4,720	633	4,290	1,220
12.....	380	285	1,460	7,280	12,500	19,200	10,000	8,230	4,460	607	3,260	1,150
13.....	380	285	1,700	6,990	11,800	19,200	9,390	8,070	4,290	686	2,510	1,110
14.....	380	285	1,650	6,590	11,600	19,900	9,180	8,230	4,130	713	2,060	1,080
15.....	380	300	1,570	6,220	11,300	19,200	8,770	8,400	3,960	686	1,920	1,010
16.....	380	315	1,530	5,860	10,800	19,200	8,970	8,580	3,880	659	1,650	1,010
17.....	380	347	1,610	5,620	10,500	19,200	9,600	8,580	3,660	686	1,500	977
18.....	380	380	1,780	5,520	10,800	17,900	10,500	8,770	3,260	686	1,380	945
19.....	380	397	1,830	5,520	11,000	17,200	11,600	8,770	2,840	826	1,260	914
20.....	380	414	1,780	5,520	11,300	15,400	12,800	8,580	2,350	1,080	1,220	1,080
21.....	363	414	1,870	5,620	11,300	14,000	13,600	8,230	1,970	1,040	1,260	1,190
22.....	363	414	2,610	5,740	11,300	12,500	14,000	7,910	1,700	945	1,260	1,190
23.....	347	414	4,640	5,860	12,200	11,600	14,400	7,430	1,530	1,080	1,220	1,080
24.....	347	414	6,220	6,340	13,200	10,000	15,400	6,990	1,380	1,700	1,110	1,010
25.....	347	432	6,720	6,850	14,000	9,180	16,000	6,590	1,300	3,450	1,010	914
26.....	347	471	7,280	7,130	13,600	8,580	16,000	6,100	1,220	6,130	945	855
27.....	331	558	7,750	7,130	12,800	8,230	15,400	5,420	1,220	8,230	914	826
28.....	331	659	7,750	7,130	11,800	8,070	14,400	4,920	1,220	10,000	945	768
29.....	315	686	6,990	7,130	-----	7,910	12,500	4,920	1,150	12,200	945	713
30.....	300	659	6,100	7,130	-----	7,430	9,390	5,120	1,040	14,000	945	659
31.....	300	-----	5,420	7,130	-----	6,990	-----	5,320	-----	14,900	914	-----
Month							Maximum	Minimum	Mean		Run-off in acre-feet	
October.....	414						300	368		22,600		
November.....	686						285	381		22,700		
December.....	7,750						659	2,840		175,000		
January.....	8,770						5,520	6,850		421,000		
February.....	14,000						7,590	11,700		650,000		
March.....	19,900						6,990	13,800		848,000		
April.....	16,000						6,850	10,800		643,000		
May.....	8,970						4,920	7,420		456,000		
June.....	6,850						1,040	3,730		222,000		
July.....	14,900						607	2,870		176,000		
August.....	16,600						914	5,320		327,000		
September.....	2,250						659	1,200		71,400		
The year.....							19,900	285	5,570		4,030,000	

## ANGELINA RIVER NEAR LUFKIN, TEX.

LOCATION.—Chain gage on highway bridge 1 mile above Houston East & West Texas Railway bridge and 8 miles north of Lufkin, Angelina County.

DRAINAGE AREA.—1,580 square miles.

RECORDS AVAILABLE.—October 1923 to September 1933.

DISCHARGE.—Maximum during year, 7,100 second-feet Apr. 7 (gage height, 12.69 feet); minimum, 30 second-feet Nov. 1.

1923-33: Maximum, 38,200 second-feet Feb. 24, 1932 (gage height, 18.26 feet); minimum, 7.3 second-feet Oct. 6, 1931. Average, 10 years, 1,250 second-feet.

REMARKS.—Records fair. No diversions above station.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	43	32	237	860	1,600	4,100	2,640	2,510	860	81	1,800	155
2.....	49	32	237	910	1,510	4,100	2,640	2,780	810	76	1,510	134
3.....	61	32	221	910	1,510	3,700	2,510	3,100	910	71	1,100	134
4.....	66	34	213	970	1,330	3,300	2,640	4,960	970	66	715	183
5.....	66	35	205	1,030	1,250	3,100	3,500	6,500	1,030	66	543	245
6.....	61	41	197	1,170	1,250	4,100	5,900	6,500	1,100	92	432	272
7.....	61	53	183	1,330	1,250	4,740	7,100	6,200	1,100	81	334	263
8.....	61	66	176	1,600	1,420	4,520	6,500	5,400	1,030	71	272	213
9.....	61	76	169	1,910	1,330	4,520	6,500	4,960	970	61	221	169
10.....	61	86	169	2,140	1,250	3,900	4,960	4,520	760	57	197	155
11.....	61	98	176	2,380	1,170	3,500	4,300	4,100	571	53	176	162
12.....	57	104	197	2,510	1,170	3,300	3,500	3,700	415	47	155	197
13.....	53	110	221	2,510	1,170	3,300	2,930	3,500	334	45	141	205
14.....	53	104	229	2,510	1,250	3,100	2,930	3,100	272	45	134	183
15.....	51	104	237	2,510	1,420	3,100	2,640	2,780	245	45	122	169
16.....	49	98	263	2,510	1,510	3,100	1,910	2,380	213	47	116	176
17.....	49	92	263	2,510	1,700	2,930	1,420	1,910	197	47	116	190
18.....	47	92	272	2,510	1,700	2,640	1,100	1,250	183	61	141	213
19.....	45	86	282	2,380	1,700	2,640	970	715	169	116	183	205
20.....	43	81	292	2,380	2,140	2,140	1,100	515	162	141	213	176
21.....	41	76	312	2,140	2,380	1,800	1,510	432	148	148	229	148
22.....	39	81	323	2,020	2,640	1,510	1,700	401	134	141	213	122
23.....	39	81	345	1,800	2,780	1,250	1,700	373	128	433	197	104
24.....	37	92	449	1,700	2,640	1,170	1,510	359	122	3,170	176	92
25.....	37	122	469	1,600	2,640	1,250	1,510	449	116	2,380	155	81
26.....	35	155	449	1,420	2,780	2,140	1,510	910	110	1,800	141	76
27.....	34	169	469	1,250	3,100	3,500	1,700	1,100	104	1,100	122	76
28.....	34	183	469	1,170	4,100	3,100	1,910	1,030	104	910	104	76
29.....	32	197	515	1,170	-----	2,380	2,020	810	98	1,100	92	71
30.....	32	221	715	1,700	-----	2,140	2,380	910	86	1,600	86	71
31.....	32	-----	810	1,700	-----	2,260	-----	910	-----	2,020	116	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	66	32	48.1	2,960
November.....	221	32	94.4	5,620
December.....	810	169	315	19,400
January.....	2,510	860	1,780	109,000
February.....	4,100	1,170	1,850	103,000
March.....	4,740	1,170	2,980	183,000
April.....	7,100	970	2,840	169,000
May.....	6,500	359	2,550	157,000
June.....	1,100	86	448	26,700
July.....	3,170	45	522	32,100
August.....	1,800	86	331	20,400
September.....	272	71	157	9,340
The year.....	7,100	32	1,160	838,000

## ANGELINA RIVER AT HORGER, TEX.

LOCATION.—Chain gage on Zavala-Jasper highway bridge a quarter of a mile east of Horger, Jasper County, and 20 miles above mouth.

DRAINAGE AREA.—3,440 square miles.

RECORDS AVAILABLE.—March 1928 to September 1933.

DISCHARGE.—Maximum during year, 14,200 second-feet July 31 (gage height, 24.80 feet); minimum, 61 second-feet Oct. 28 and Nov. 3.

1928-33: Maximum, 48,800 second-feet Feb. 24, 1932 (gage height, 36.35 feet); minimum, 35 second-feet Oct. 12, 19, 1931.

Maximum stage known, about 39.50 feet in August 1914.

REMARKS.—Records fair. There is a possibility of backwater at times from Neches River. No diversions above station.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	90	72	292		6, 630	7, 620	4, 280	2, 820	4, 750	287	12, 900	873
2	84	66	256		6, 840	7, 840	4, 490	2, 770	5, 080	277	11, 300	1, 220
3	96	61	256		6, 840	7, 480	4, 910	2, 820	5, 180	277	9, 430	1, 300
4	103	66	256	4, 300	6, 500	7, 190	5, 470	3, 750	5, 130	267	7, 120	1, 170
5	103	66	274		5, 930	7, 120	5, 870	5, 300	4, 020	248	4, 860	874
6	103	66	274		5, 300	8, 320	6, 180	5, 520	2, 960	230	3, 730	748
7	96	72	310	3, 110	5, 740	9, 350	6, 180	4, 600	2, 580	222	3, 200	580
8	110	72	330	3, 110	6, 180	10, 200	5, 760	4, 380	2, 400	222	2, 870	496
9	103	72	394	3, 440	5, 640	10, 700	5, 180	4, 540	2, 210	222	2, 160	538
10	110	72	490	3, 440	5, 470	10, 700	4, 700	4, 800	1, 970	287	1, 610	622
11	110	72	514	3, 300	5, 240	10, 300	4, 540	5, 130	1, 790	309	1, 260	517
12	110	72	514	3, 160	5, 240	9, 870	4, 540	5, 300	1, 740	267	1, 090	476
13	110	72	514	3, 010	4, 700	9, 180	4, 640	5, 580	1, 740	258	958	580
14	110	78	514	2, 920	4, 080	8, 610	6, 220	5, 700	1, 660	258	916	580
15	103	84	592	2, 870	4, 760	8, 140	7, 770	5, 580	1, 480	258	790	517
16	103	96	650	2, 870	5, 130	7, 620	8, 680	5, 520	1, 260	302	706	538
17	96	110	620	2, 820	5, 130	6, 980	8, 680	5, 180	1, 000	664	664	538
18	96	124	566	2, 820	5, 130	6, 430	8, 380	4, 590	832	580	664	476
19	90	131	514	2, 820	5, 080	5, 930	8, 070	4, 080	664	420	622	404
20	90	131	490	2, 820	5, 860	5, 520	8, 140	3, 640	622	334	622	360
21	84	124	607	2, 870	6, 240	5, 080	8, 530	3, 300	580	287	538	347
22	90	124	1, 110	3, 060	5, 520	4, 640	7, 990	3, 010	496	248	517	334
23	90	131	1, 430	3, 440	5, 080	4, 380	7, 260	2, 540	456	1, 140	476	334
24	84	146	2, 570	3, 540	4, 700	4, 180	5, 990	1, 880	538	3, 880	476	334
25	78	202	3, 150	3, 400	4, 490	4, 080	4, 960	1, 660	580	8, 930	456	309
26	78	211	2, 880	3, 400	4, 380	3, 880	4, 130	1, 520	517	13, 400	456	287
27	66	202	2, 330	3, 250	5, 160	3, 590	3, 780	2, 110	404	13, 500	456	267
28	61	229	1, 830	3, 010	6, 650	3, 350	3, 400	2, 770	388	12, 700	420	248
29	66	310	1, 510	2, 870	-----	3, 250	3, 160	3, 540	298	13, 000	404	239
30	72	330	-----	3, 870	-----	3, 200	2, 960	3, 980	309	14, 000	388	230
31	72	-----	3, 620	5, 750	-----	3, 860	-----	4, 330	-----	14, 000	456	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	110	61	92.2	5, 670
November	330	61	122	7, 260
December	-----	256	1, 070	65, 800
January	-----	-----	3, 440	212, 000
February	6, 840	4, 080	5, 490	305, 000
March	10, 700	3, 200	6, 730	414, 000
April	8, 680	2, 960	5, 830	347, 000
May	5, 700	1, 520	3, 940	242, 000
June	5, 180	298	1, 790	107, 000
July	14, 000	222	3, 270	201, 000
August	12, 900	388	2, 340	144, 000
September	1, 300	230	545	32, 400
The year	14, 000	61	2, 880	2, 080, 000



## TRINITY RIVER BASIN

## WEST FORK OF TRINITY RIVER AT LAKE WORTH DAM, ABOVE FORT WORTH, TEX.

LOCATION.—Water-stage recorder just above Lake Worth Dam and 4½ miles northwest of Tarrant County courthouse, in Fort Worth.

DRAINAGE AREA.—1,870 square miles.

RECORDS AVAILABLE.—October 1923 to September 1933.

DISCHARGE.—Maximum during year, 3,140 second-feet June 1 (gage height, 1.21 feet); no flow at times.

1923-33: Maximum, 7,600 second-feet Nov. 18, 1923 (gage height, 2.25 feet); no flow at times. Average, 10 years, 344 second-feet.

REMARKS.—Records fair except those below 100 second-feet, which are poor. Diversions for municipal use only; amount not known.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	1.0	0	1,470	43	286	985	580	3,140	87	0	30
2.....	.6	0	1,380	34	354	1,010	371	3,100	59	0	137
3.....	1.0	0	1,240	30	443	1,040	178	2,960	43	0	354
4.....	2.9	0	904	26	337	1,010	208	2,700	20	0	520
5.....	0	0	520	20	627	1,120	137	2,420	15	.6	643
6.....	0	0	286	15	931	804	79	2,020	5.9	4.2	758
7.....	0	0	354	34	904	462	71	1,600	2.1	4.2	877
8.....	0	0	620	2.1	1,180	303	38	1,290	.4	2.9	1,010
9.....	0	0	758	.6	1,560	208	38	1,070	.1	1.5	1,090
10.....	0	0	850	.6	1,880	150	26	877	0	.3	1,240
11.....	0	0	1,040	2.1	2,280	71	20	804	0	.1	1,680
12.....	0	0	958	2.9	2,380	43	18	758	0	0	1,210
13.....	0	0	877	10	2,220	43	20	643	0	0	689
14.....	0	0	758	20	1,880	48	36	443	0	0	354
15.....	0	0	540	10	1,380	20	426	462	0	0	193
16.....	0	0	406	7.8	1,120	7.8	580	620	0	1.0	125
17.....	0	0	270	18	904	5.9	804	735	0	2.9	137
18.....	0	0	193	12	904	5.9	1,120	735	0	2.1	178
19.....	0	0	150	10	758	10	1,290	735	0	1.0	163
20.....	0	0	137	12	580	20	1,380	758	0	.4	103
21.....	0	0	113	7.8	540	18	1,320	758	0	.3	59
22.....	0	0	95	12	620	26	1,010	758	0	.2	38
23.....	0	0	65	12	580	140	850	758	0	.2	23
24.....	0	0	79	15	620	382	758	758	0	.2	15
25.....	0	7.2	59	38	580	618	904	758	0	.1	7.8
26.....	0	216	65	38	560	877	827	666	0	0	5.9
27.....	0	834	38	199	560	827	958	600	0	0	12
28.....	0	1,290	30	286	643	827	1,500	500	0	0	15
29.....	0	1,600	34	-----	735	827	2,280	286	0	.3	7.8
30.....	0	1,850	38	-----	877	689	2,670	137	0	.3	4.2
31.....	0	1,920	43	-----	1,010	-----	2,960	-----	0	.6	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	2.9	0	0.18	11
December.....	1,920	0	249	15,300
January.....	1,470	30	464	28,500
February.....	286	6	32.8	1,820
March.....	2,380	286	975	60,000
April.....	1,120	5.9	420	25,000
May.....	2,960	18	757	46,500
June.....	3,140	137	1,130	67,200
July.....	87	0	7.50	461
August.....	4.2	0	.75	46
September.....	1,680	4.2	389	23,100
The year.....	3,140	0	370	268,000

NOTE.—No flow during November.

## WEST FORK OF TRINITY RIVER AT FORT WORTH, TEX.

LOCATION.—Water-stage recorder in old pump house of Fort Worth Power & Light Co.'s plant in Fort Worth, Tarrant County, 150 feet above Paddock viaduct. Zero of gage is 519.2 feet above mean sea level.

DRAINAGE AREA.—2,430 square miles.

RECORDS AVAILABLE.—October 1920 to September 1933.

DISCHARGE.—Maximum during year, 5,440 second-feet Mar. 5 (gage height, 6.29 feet); minimum, 0.1 second-foot July 29 (gage height, 0.90 foot).

1920-33: Maximum (determined by slope-area method), 85,000 second-feet Apr. 25, 1922 (gage height, 23.95 feet); no flow at times. Average, 13 years, 443 second-feet.

REMARKS.—Records good. Considerable water diverted above for municipal use. Flow partly regulated by Lake Worth Reservoir and others above station.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.-----	26	12	17	1,620	148	641	1,070	698	2,970	76	29	8.1
2.-----	37	12	15	1,530	148	620	1,090	488	2,900	49	9.5	126
3.-----	37	15	17	1,360	128	684	1,100	294	2,840	37	5.2	336
4.-----	44	12	17	1,080	156	634	1,070	353	2,640	28	3.4	560
5.-----	37	14	18	749	128	1,930	1,170	309	2,460	15	3.1	705
6.-----	29	14	18	456	114	2,880	925	168	2,100	12	3.1	843
7.-----	24	17	15	501	234	1,540	641	140	1,680	6.6	8.1	955
8.-----	20	12	17	1,250	121	1,490	401	99	1,340	5.2	6.6	1,050
9.-----	18	17	20	1,080	86	1,800	309	76	1,090	3.8	3.4	1,160
10.-----	18	12	20	1,020	92	2,040	278	67	918	3.4	3.4	1,250
11.-----	18	15	20	1,070	96	2,400	202	59	792	3.4	2.3	2,040
12.-----	15	17	20	1,040	89	2,580	132	54	778	3.1	3.1	1,450
13.-----	15	15	18	985	92	2,460	121	47	763	2.7	3.1	851
14.-----	15	15	18	858	106	2,160	211	64	590	2.7	1.6	425
15.-----	15	12	39	691	106	1,680	140	1,850	438	2.7	797	263
16.-----	14	9.5	35	560	89	1,350	96	1,180	566	2.7	109	121
17.-----	14	12	26	425	99	1,140	83	925	756	1.6	54	117
18.-----	12	14	22	364	96	1,190	86	1,100	866	.8	20	164
19.-----	6.6	15	26	353	89	1,140	86	1,170	948	2.7	14	160
20.-----	9.5	15	24	309	76	895	92	1,340	985	1.6	8.1	110
21.-----	8.1	14	24	304	67	756	86	1,300	1,010	.8	5.2	59
22.-----	8.1	12	28	358	64	785	73	1,100	1,020	.8	5.2	33
23.-----	11	57	372	258	67	778	159	925	1,000	3.4	8.1	20
24.-----	9.5	20	1,070	263	67	770	398	785	955	3.4	9.5	17
25.-----	9.5	17	387	220	103	770	658	1,450	843	3.1	6.6	15
26.-----	9.5	15	266	258	148	720	1,360	1,210	705	2.3	10	6.6
27.-----	9.5	14	814	168	1,270	720	1,070	1,000	607	1.6	8.1	33
28.-----	8.1	14	1,250	136	1,030	770	903	1,200	501	.5	3.4	29
29.-----	9.5	17	1,520	132	-----	843	918	2,590	309	.1	32	14
30.-----	11	15	1,860	136	-----	1,020	807	3,100	152	1,310	12	9.5
31.-----	18	-----	1,920	148	-----	1,270	-----	2,900	-----	695	5.2	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.-----	44	6.6	17.3	1,060
November.-----	57	9.5	15.7	934
December.-----	1,920	15	320	19,700
January.-----	1,620	132	635	39,000
February.-----	1,270	64	182	10,100
March.-----	2,880	620	1,310	80,600
April.-----	1,360	73	524	31,200
May.-----	3,100	47	905	55,600
June.-----	2,970	152	1,180	70,200
July.-----	1,310	.1	73.6	4,530
August.-----	797	1.6	38.5	2,370
September.-----	2,040	6.6	431	25,600
The year.-----	3,100	.1	471	341,000

## WEST FORK OF TRINITY RIVER AT GRAND PRAIRIE, TEX.

LOCATION.—Chain gage on highway bridge on Grand Prairie-Sowers-Irving road 1 mile northeast of Grand Prairie, Dallas County. Zero of gage is 412.99 feet above mean sea level.

DRAINAGE AREA.—2,890 square miles.

RECORDS AVAILABLE.—March 1925 to September 1933.

DISCHARGE.—Maximum during year, 6,910 second-feet Mar. 6 (gage height, 23.78 feet); minimum, 27 second-feet July 11, 18, 24–26.

1925–33: Maximum, 15,400 second-feet Jan. 23, 1932 (gage height, 25.96 feet); minimum, 3.2 second-feet June 6, 1925.

Maximum stage known, about 29 feet in April 1922.

REMARKS.—Records good. Numerous small diversions above gage. Largest diversion is by City of Fort Worth. Flow partly regulated by storage at Lake Worth Reservoir and others above station.

*Discharge, in second-feet, 1932–33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	72	76	42	1,890	239	1,610	1,320	841	2,930	171	1,730	46
2	70	53	44	1,650	239	925	1,160	876	3,000	109	298	49
3	80	43	46	1,540	214	862	1,160	496	2,930	81	130	102
4	109	42	45	1,390	205	883	1,160	401	2,760	66	95	365
5	95	46	42	1,140	239	1,670	1,140	516	2,600	54	74	556
6	82	45	43	820	214	6,120	1,220	347	2,240	49	61	716
7	68	42	46	1,160	196	4,380	988	214	1,810	41	50	862
8	63	43	44	2,160	293	1,920	596	171	1,520	33	42	967
9	59	44	46	1,880	222	1,750	439	154	1,280	33	39	1,090
10	59	40	53	1,280	180	1,750	439	122	1,070	32	38	1,180
11	55	41	65	1,200	162	2,120	365	112	904	27	37	2,270
12	51	43	60	1,200	171	2,570	257	98	799	28	33	4,990
13	48	40	52	1,110	180	2,670	205	98	799	31	33	1,670
14	48	42	50	1,050	180	2,570	180	188	757	31	33	883
15	48	40	56	883	180	2,180	222	1,680	536	30	39	477
16	47	42	75	736	171	1,650	180	3,840	477	30	308	275
17	45	46	106	596	162	1,340	162	1,310	616	28	522	205
18	43	43	71	536	162	1,320	138	1,090	799	27	138	171
19	42	45	67	516	171	1,580	130	1,220	904	29	63	205
20	39	44	65	477	154	1,240	130	1,340	988	31	43	196
21	37	44	67	556	138	946	138	1,390	1,030	31	38	154
22	39	44	74	496	138	862	138	1,300	1,050	31	34	116
23	39	46	1,200	516	130	904	138	1,090	1,050	28	32	86
24	39	104	4,960	383	138	862	205	1,140	1,030	28	45	60
25	38	81	2,580	329	154	862	275	2,740	946	28	58	59
26	37	51	616	293	214	841	3,540	2,710	841	27	38	61
27	39	49	365	275	1,270	778	2,600	1,470	696	28	124	56
28	39	46	761	239	3,510	778	1,200	1,180	576	28	74	211
29	40	42	1,350	222	-----	862	1,050	1,550	458	30	41	151
30	40	44	1,750	205	-----	925	1,010	2,700	293	764	38	71
31	54	-----	2,180	222	-----	1,140	-----	3,140	-----	5,130	51	-----
Month	Maximum				Minimum				Mean		Run-off in acre-feet	
October	109				37				53.7		3,300	
November	104				40				48.4		2,880	
December	4,960				42				549		33,800	
January	2,160				205				869		53,400	
February	3,510				130				344		19,100	
March	6,120				778				1,640		101,000	
April	3,540				130				730		43,400	
May	3,840				98				1,140		70,100	
June	3,000				293				1,260		75,000	
July	5,130				27				229		14,100	
August	1,730				32				141		8,670	
September	4,990				46				610		36,300	
The year	6,120				27				636		461,000	

## TRINITY RIVER AT DALLAS, TEX.

LOCATION.—Water-stage recorder at Commerce Street viaduct in Dallas, Dallas County. Zero of gage is 368.05 feet above mean sea level. Chain gage at Miller's Ferry bridge, 6 miles downstream, was discontinued Sept. 30, 1932.

DRAINAGE AREA.—6,000 square miles.

RECORDS AVAILABLE.—October 1898 to December 1899; July 1903 to December 1906; October 1920 to September 1933.

DISCHARGE.—Maximum during year, 17,500 second-feet Mar. 7; maximum stage, 34.68 feet Aug. 1; minimum, 125 second-feet Nov. 15, 16; minimum gage height, 12.49 feet Nov. 16.

1898-99, 1903-6, 1920-33: Maximum, 75,100 second-feet Apr. 27, 1922 (gage height, 42.35 feet); minimum, 6.8 second-feet Sept. 11, 1924 (gage height, 4.27 feet). Average, 13 years (1920-33), 1,410 second-feet.

Maximum stage known, 52.6 feet May 26, 1908. Practically no flow at times in 1917 and 1918.

REMARKS.—Records fair. Discharge partly estimated Dec. 9-23 on basis of U.S. Weather Bureau gage-height record. Only known diversions are for municipal uses. Low-water flow partly regulated by dams upstream.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	233	214	143	2, 870	492	4, 590	2, 220	1, 130	4, 640	370	12, 600	379
2.....	233	220	146	2, 310	516	1, 880	1, 880	941	4, 700	282	1, 710	370
3.....	268	192	146	1, 980	504	1, 450	1, 690	782	4, 770	254	715	363
4.....	296	192	149	1, 830	470	1, 350	1, 640	667	4, 190	214	610	602
5.....	268	197	149	1, 500	459	1, 850	1, 740	922	3, 250	247	652	816
6.....	254	192	146	1, 100	470	11, 600	1, 590	610	2, 770	226	816	941
7.....	240	187	143	1, 360	448	16, 400	1, 310	448	2, 460	214	582	1, 040
8.....	220	178	143	5, 170	438	11, 700	980	336	2, 610	226	529	1, 130
9.....	214	174	143	8, 900	481	6, 310	748	320	3, 200	240	529	1, 220
10.....	208	182	152	3, 930	428	3, 620	698	247	3, 030	254	516	1, 350
11.....	197	178	152	1, 820	379	2, 920	652	233	1, 970	220	529	2, 050
12.....	202	178	146	1, 550	379	3, 360	542	197	1, 220	214	516	6, 110
13.....	202	166	143	1, 310	388	4, 060	438	182	1, 260	226	529	4, 160
14.....	192	133	138	1, 220	428	4, 570	379	295	1, 020	220	516	1, 360
15.....	178	125	166	1, 130	667	4, 700	438	2, 860	885	226	555	871
16.....	187	1, 520	155	1, 020	732	4, 640	398	11, 000	715	240	1, 250	652
17.....	187	1, 020	275	922	715	4, 380	361	5, 790	1, 110	240	720	596
18.....	187	165	226	868	698	4, 250	304	2, 410	1, 500	220	516	555
19.....	182	140	192	816	698	3, 590	296	2, 660	1, 590	247	408	542
20.....	178	143	182	799	652	2, 610	289	2, 820	1, 690	247	353	542
21.....	178	146	202	868	596	3, 030	328	3, 080	1, 690	233	328	516
22.....	178	140	208	1, 040	442	3, 420	582	3, 250	1, 740	226	296	448
23.....	178	143	1, 410	1, 350	240	3, 360	504	3, 080	1, 740	254	296	408
24.....	178	171	11, 400	1, 080	240	3, 860	448	2, 920	1, 740	268	312	398
25.....	178	238	13, 700	782	282	3, 300	939	5, 940	1, 450	289	344	379
26.....	178	162	5, 070	652	359	3, 300	5, 460	12, 500	1, 170	379	418	379
27.....	178	155	1, 510	542	1, 920	2, 560	6, 530	10, 200	960	353	615	370
28.....	182	155	1, 350	555	8, 180	1, 310	2, 770	7, 170	782	328	980	548
29.....	182	143	1, 450	470	-----	1, 130	1, 830	4, 570	667	320	481	481
30.....	174	140	2, 150	448	-----	1, 350	1, 450	4, 640	504	498	398	428
31.....	202	-----	3, 470	448	-----	2, 030	-----	5, 100	-----	9, 670	398	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	296	174	204	12, 500
November.....	1, 520	125	243	14, 500
December.....	13, 700	138	1, 460	89, 800
January.....	8, 900	448	1, 630	100, 000
February.....	8, 180	240	811	45, 000
March.....	16, 400	1, 130	4, 130	254, 000
April.....	6, 530	289	1, 310	78, 000
May.....	12, 500	182	3, 140	193, 000
June.....	4, 770	504	2, 030	121, 000
July.....	9, 670	214	599	35, 000
August.....	12, 600	296	968	59, 500
September.....	6, 110	363	1, 000	59, 500
The year.....	16, 400	125	1, 470	1, 060, 000

## TRINITY RIVER NEAR OAKWOOD, TEX.

LOCATION.—Chain gage on Palestine-Oakwood highway bridge,  $1\frac{1}{2}$  miles above International-Great Northern Railroad bridge and 6 miles northeast of Oakwood, Leon County. Zero of gage is 175.4 feet above mean sea level (datum used by U. S. Army Engineers).

DRAINAGE AREA.—12,800 square miles.

RECORDS AVAILABLE.—October 1923 to September 1933.

DISCHARGE.—Maximum during year, 16,900 second-feet June 3 (gage height, 37.6 feet); minimum, 205 second-feet Oct. 29 and Dec. 8.

1923-33: Maximum, 84,400 second-feet May 23, 1930 (gage height, about 46.8 feet on present gage); minimum, probably less than 28 second-feet in August 1925. Average, 10 years, 4,630 second-feet.

Maximum stage known, about 54.0 feet June 4, 1908, on present gage.

REMARKS.—Records fair. Discharge partly estimated Mar. 24-27, July 11-12, and Aug. 15-16. No diversions above station except for municipal uses. Flow partly regulated by reservoirs upstream. Gage-height record furnished by U.S. Weather Bureau.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	438	280	370	13,200	2,470	2,130	8,910	12,300	16,200	1,090	438	926
2.....	404	280	310	13,500	2,970	4,540	9,750	12,600	16,800	832	540	810
3.....	387	265	265	13,200	3,120	7,290	10,800	11,600	16,900	788	2,620	540
4.....	387	265	295	12,900	2,890	9,050	8,490	8,070	16,700	680	5,720	506
5.....	404	421	280	12,200	2,670	10,200	5,620	4,920	16,100	560	6,720	472
6.....	404	560	250	10,600	2,310	11,400	3,970	3,360	15,500	472	5,970	438
7.....	455	472	220	8,000	2,010	12,400	3,240	2,890	15,000	387	4,060	404
8.....	506	387	205	9,260	1,950	12,700	2,860	2,470	14,100	340	1,690	421
9.....	660	355	235	11,100	1,750	13,000	2,570	2,500	12,800	325	1,070	404
10.....	854	340	280	12,500	1,720	13,300	2,400	1,830	9,820	325	974	521
11.....	832	310	280	13,500	2,040	13,300	2,100	1,450	6,550	325	810	1,220
12.....	640	310	295	14,200	1,950	13,500	1,690	1,220	3,960	310	744	1,320
13.....	472	295	265	14,400	1,750	13,600	1,780	1,050	3,570	295	680	1,480
14.....	387	280	265	14,100	1,690	13,400	2,190	902	3,280	310	620	2,290
15.....	370	280	404	13,900	1,830	13,600	2,670	788	2,820	370	540	4,040
16.....	340	265	506	13,600	1,750	13,700	2,470	722	2,530	560	472	4,960
17.....	325	220	523	12,600	1,890	14,100	2,220	1,050	2,130	660	700	4,080
18.....	325	265	489	9,540	1,980	14,200	1,920	3,420	1,560	523	810	2,440
19.....	295	265	472	6,020	1,980	14,100	1,610	5,720	1,350	489	902	1,430
20.....	295	768	540	3,880	1,950	12,900	1,450	7,110	1,220	421	1,050	998
21.....	265	1,120	660	3,040	1,810	10,700	1,300	7,740	1,450	355	1,020	810
22.....	280	700	680	3,480	1,670	8,420	1,170	8,350	1,750	340	744	722
23.....	265	438	1,230	3,750	1,580	6,550	1,140	8,210	1,860	325	580	680
24.....	265	370	3,040	3,750	1,530	5,380	1,120	7,480	1,920	310	506	640
25.....	265	250	3,660	3,920	1,480	5,190	854	7,800	1,920	295	438	620
26.....	250	235	4,550	4,100	1,430	5,620	878	7,870	1,920	310	387	580
27.....	280	265	5,920	3,840	1,430	5,480	3,220	8,490	1,890	325	370	523
28.....	220	295	7,540	3,360	1,750	5,150	7,480	10,300	1,830	370	355	472
29.....	205	340	8,980	3,360	-----	4,920	10,100	12,000	1,750	370	340	438
30.....	220	387	11,200	3,200	-----	4,980	11,400	13,900	1,580	404	438	404
31.....	250	-----	12,800	2,780	-----	8,280	-----	15,300	-----	438	620	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	854	205	385	23,700
November.....	1,120	220	376	22,400
December.....	12,800	205	2,160	133,000
January.....	14,400	2,780	8,730	537,000
February.....	3,120	1,430	1,980	110,000
March.....	14,200	2,130	9,780	601,000
April.....	11,400	854	3,900	232,000
May.....	15,300	722	6,240	384,000
June.....	16,900	1,220	6,560	390,000
July.....	1,090	295	449	27,600
August.....	6,720	340	1,380	84,800
September.....	4,960	404	1,190	70,800
The year.....	16,900	205	3,610	2,620,000

## TRINITY RIVER AT RIVERSIDE, TEX.

LOCATION.—Chain gage on International-Great Northern Railroad bridge at Riverside, Walker County. Zero of gage is 93.7 feet above mean sea level (railway datum).

DRAINAGE AREA.—15,500 square miles.

RECORDS AVAILABLE.—January 1903 to December 1906; October 1923 to September 1933.

DISCHARGE.—Maximum during year, 22,800 second-feet Mar. 6 (gage height, 23.8 feet); minimum, 300 second-feet Nov. 1-2.

1903-6, 1923-33: Maximum, 76,100 second-feet June 1, 1929 (gage height, 46.10 feet); minimum, 70 second-feet Aug. 20-26, Sept. 8-13, 1925, and Sept. 29 to Oct. 4, 1931. Average, 10 years (1923-33), 6,510 second-feet.

Maximum stage known, 49.7 feet June 11, 1908 (present datum).

REMARKS.—Daily records poor; monthly records fair. No diversions except for municipal uses. Gage-height record furnished by U.S. Weather Bureau.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1-----	615	325	470	15,400	9,450	11,300	9,500	9,820	13,400	1,740	505	1,080
2-----	540	300	470	15,400	7,440	10,500	11,200	11,600	14,200	1,420	470	1,080
3-----	540	300	440	15,100	5,670	8,300	12,400	12,500	15,000	1,180	505	1,020
4-----	615	409	470	14,800	4,820	6,440	13,500	14,100	15,600	1,020	575	1,020
5-----	540	635	470	15,100	4,480	10,600	13,100	13,100	16,200	875	1,270	975
6-----	505	380	440	14,700	4,140	21,700	12,100	11,000	16,500	785	5,020	875
7-----	470	380	470	13,800	4,990	21,400	9,600	7,910	16,600	740	6,780	655
8-----	470	440	440	12,800	6,010	21,200	7,000	5,580	16,400	695	6,780	575
9-----	505	575	440	11,400	5,080	18,400	4,900	4,900	15,300	575	4,820	505
10-----	540	540	410	11,100	4,220	15,600	4,060	4,400	15,200	505	2,760	615
11-----	615	505	410	12,000	3,560	14,700	3,800	3,480	14,300	470	2,030	1,180
12-----	655	440	410	13,300	2,920	14,700	3,480	2,460	12,100	440	1,300	1,080
13-----	785	410	440	14,600	3,080	14,400	3,320	1,880	8,300	410	875	2,090
14-----	785	380	470	15,200	3,240	14,300	6,750	1,540	5,560	410	785	2,020
15-----	655	350	440	15,400	3,640	14,200	8,960	1,360	4,480	410	875	1,810
16-----	540	380	440	15,400	3,800	14,100	7,170	1,180	3,970	410	1,020	2,240
17-----	440	380	440	15,200	3,720	14,100	5,330	975	3,480	410	785	3,720
18-----	440	410	470	14,800	3,320	14,600	4,220	1,130	3,160	540	740	5,080
19-----	410	380	575	14,300	3,320	16,400	3,640	2,610	2,610	575	695	4,650
20-----	380	380	655	12,600	4,740	17,000	3,560	2,760	2,020	695	785	3,120
21-----	350	380	740	9,600	4,310	16,000	3,480	5,900	1,600	615	875	1,810
22-----	350	380	740	6,410	4,310	14,800	3,640	8,010	1,420	615	1,180	1,180
23-----	350	645	975	5,160	3,640	13,500	3,080	8,100	1,540	540	1,300	a 1,050
24-----	350	1,080	1,960	5,240	2,840	10,900	2,240	8,480	1,670	695	975	785
25-----	325	1,020	2,750	5,330	2,460	8,960	1,880	8,960	1,950	655	685	830
26-----	325	785	4,560	5,160	3,290	9,050	1,670	9,980	2,020	470	655	830
27-----	325	540	5,580	5,240	7,190	9,650	1,600	12,600	2,020	440	575	785
28-----	325	470	6,100	5,240	10,800	8,580	1,880	12,400	2,020	440	540	695
29-----	325	410	7,830	5,240	-----	8,200	3,880	a 11,600	1,950	440	695	655
30-----	325	410	11,400	12,200	-----	7,740	7,880	a 11,800	1,810	440	540	615
31-----	325	-----	13,600	9,750	-----	7,740	-----	a 12,700	-----	470	655	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October-----	785	325	475	29,200
November-----	1,080	300	481	28,600
December-----	13,600	410	2,110	130,000
January-----	15,400	5,160	11,500	707,000
February-----	10,800	2,460	4,660	259,000
March-----	21,700	6,440	13,200	812,000
April-----	13,500	1,600	5,960	355,000
May-----	14,100	975	7,250	446,000
June-----	16,600	1,420	7,750	461,000
July-----	1,740	410	649	39,900
August-----	6,780	470	1,550	95,300
September-----	5,080	505	1,490	88,700
The year-----	21,700	300	4,770	3,450,000

a Estimated.

## TRINITY RIVER AT ROMAYOR, TEX.

LOCATION.—Chain gage on Gulf, Colorado & Santa Fe Railway bridge a quarter of a mile west of Romayor, Liberty County. Gage readings indicate distance from base of rail to water surface. Zero of gage (base of rail) is 89.36 feet above mean sea level (Texas Reclamation Department datum).

DRAINAGE AREA.—17,200 square miles.

RECORDS AVAILABLE.—May 1924 to September 1933.

DISCHARGE.—Maximum during year, 31,500 second-feet Mar. 7-8 (gage height, -28.05 feet); minimum, 525 second-feet Oct. 27 to Nov. 10 and Nov. 17-24. 1924-33: Maximum, 81,100 second-feet May 31, 1929 (gage height, -16.3 feet); minimum, 132 second-feet Aug. 21 and 22, 1925 (gage height, -53.46 feet).

REMARKS.—Records fair. Discharge partly estimated Oct. 2, Feb. 2-4, July 17, 19, 20. Small diversions above station.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1-----	960	525	685	12,600	13,500	15,100	7,900	4,860	11,800	2,090	1,000	960
2-----	895	525	650	16,200	10,800	15,200	9,110	6,900	12,100	2,030	960	1,050
3-----	830	525	615	16,300	8,340	13,900	11,200	9,220	13,100	1,910	870	1,340
4-----	830	525	585	15,800	6,100	10,300	12,200	12,200	14,200	1,790	790	1,550
5-----	870	525	585	15,200	5,380	9,330	13,400	14,800	15,200	1,670	790	1,340
6-----	790	525	685	14,700	5,200	18,600	13,800	14,300	15,500	1,390	1,050	1,240
7-----	790	525	755	14,200	5,110	30,200	13,100	12,900	15,800	1,290	2,510	1,190
8-----	755	525	755	13,500	6,010	30,900	11,500	9,790	16,000	1,140	4,540	1,140
9-----	720	525	790	13,100	7,400	28,400	7,800	6,100	16,000	1,100	5,650	1,100
10-----	720	525	790	11,600	6,700	24,200	5,470	5,200	15,800	960	5,110	1,050
11-----	685	585	790	11,000	5,380	20,100	4,540	4,460	14,900	870	3,560	1,000
12-----	685	585	830	11,100	4,380	17,400	3,980	4,060	14,000	830	2,650	1,000
13-----	720	585	830	11,700	4,220	16,300	3,840	3,210	13,200	790	2,030	1,000
14-----	830	585	830	13,600	5,020	14,800	4,540	2,450	9,790	790	1,610	1,190
15-----	960	555	790	14,200	6,200	14,400	8,670	2,150	7,300	755	1,440	1,910
16-----	915	555	790	14,700	6,500	14,900	11,200	2,030	4,700	720	1,290	2,270
17-----	870	525	720	15,100	6,100	15,100	9,330	1,670	4,140	702	1,240	2,330
18-----	790	525	755	15,100	5,560	15,100	6,800	1,440	3,630	685	1,340	2,450
19-----	720	525	790	14,800	5,920	14,700	5,200	1,290	3,280	662	1,550	3,070
20-----	720	525	830	14,400	6,300	17,100	4,860	1,190	2,860	638	1,340	4,060
21-----	685	525	1,100	13,600	6,600	18,900	5,650	1,790	2,650	615	1,140	3,700
22-----	685	525	1,730	12,500	6,700	18,300	5,110	3,910	2,390	615	1,050	2,790
23-----	650	525	2,270	8,690	5,920	16,600	4,460	4,860	2,150	1,100	1,140	2,030
24-----	615	525	2,930	5,920	5,020	14,400	3,980	6,900	2,090	2,150	1,240	1,670
25-----	585	585	4,220	5,290	4,460	12,300	3,210	7,300	2,090	2,790	1,390	1,390
26-----	555	1,000	3,630	5,110	6,370	10,400	2,450	8,120	2,030	2,650	1,440	1,290
27-----	525	1,000	4,220	5,020	9,440	9,440	2,270	8,780	2,030	1,850	1,340	1,240
28-----	525	790	5,110	4,860	11,600	9,000	2,090	9,220	1,910	1,390	1,190	1,140
29-----	525	755	5,920	4,860	-----	8,780	2,030	11,100	1,970	1,050	1,000	1,050
30-----	525	720	6,700	5,560	-----	8,340	3,140	11,200	2,150	1,000	790	960
31-----	525	-----	7,700	12,900	-----	8,120	-----	10,900	-----	1,000	830	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October-----	960	525	724	44,500
November-----	1,000	525	592	35,200
December-----	7,700	585	1,950	120,000
January-----	16,300	4,860	11,700	719,000
February-----	13,500	4,220	6,650	369,000
March-----	30,900	8,120	15,800	972,000
April-----	13,800	2,030	6,760	402,000
May-----	14,800	1,190	6,590	405,000
June-----	16,000	1,910	8,160	486,000
July-----	2,790	615	1,260	77,500
August-----	5,650	790	1,740	107,000
September-----	4,060	960	1,650	98,200
The year-----	30,900	525	5,300	3,840,000

## CLEAR FORK OF TRINITY RIVER AT FORT WORTH, TEX.

LOCATION.—Water-stage recorder on old masonry pier 300 feet downstream from Texas & Pacific Railway bridge 3 miles southwest of Tarrant County courthouse in Fort Worth. Zero of gage is 532.83 feet above mean sea level.

DRAINAGE AREA.—522 square miles.

RECORDS AVAILABLE.—March 1924 to September 1933.

DISCHARGE.—Maximum during year, 7,320 second-feet July 30 (gage height, 11.3 feet); no flow at times.

1924-33: Maximum stage, 20.08 feet Sept. 5, 1932 (discharge not determined); no flow at times.

REMARKS.—Records good below and poor above 2,400 second-feet, estimated periods fair. Practically all low flow diverted 800 feet below gage by Texas & Pacific Railway Co. Low flow regulated by dam just above gage.

## Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1-----	14	10	15	81	78	280	132	38	81	3.2	7.0	2.1
2-----	12	10	15	60	72	232	112	30	63	3.2	1.6	2.1
3-----	12	12	20	54	66	200	106	28	51	3.2	.8	2.1
4-----	9.0	14	20	54	84	182	102	104	45	3.2	.2	1.6
5-----	8.0	14	20	51	75	1,600	98	102	40	1.6	.1	.8
6-----	6.0	" 13	18	48	69	1,730	92	54	32	1.2	.3	0
7-----	7.0		18	82	69	550	88	38	26	1.2	.8	0
8-----	6.0		18	615	60	434	88	30	24	1.2	.3	0
9-----	6.0		18	162	57	333	84	24	22	.8	.2	0
10-----	6.0		20	144	63	270	84	24	20	.2	.5	0
11-----	5.0		20	109	66	255	78	22	20	1.2	0	97
12-----	5.0		18	92	66	255	72	20	26	.1	.2	52
13-----	6.0		18	84	66	245	69	18	98	0	.1	20
14-----	7.0		18	84	63	214	66	22	60	0	0	5.0
15-----	7.0		24	81	54	178	66	1,580	28	0	734	1.6
16-----	7.0	" 28	20	78	51	173	66	532	22	0	88	1.6
17-----	7.0		15	81	54	178	60	132	16	0	33	1.2
18-----	7.0		10	98	51	336	57	75	15	0	12	.3
19-----	8.0		10	109	51	244	57	54	14	0	7.0	.2
20-----	7.0		10	206	51	168	60	45	12	0	5.0	0
21-----	7.0		10	112	45	156	57	42	10	0	5.0	0
22-----	6.0		12	136	42	148	45	45	9.0	0	3.2	0
23-----	10		400	116	45	128	42	35	8.0	0	2.6	0
24-----	9.0		942	95	45	128	42	32	8.0	0	2.6	0
25-----	" 9.0	9.0	268	88	54	124	77	519	8.0	0	2.1	0
26-----		9.0	84	81	92	116	496	429	6.0	0	1.6	0
27-----		9.0	57	75	1,060	116	208	116	5.0	0	1.6	0
28-----		9.0	51	72	686	120	78	66	5.0	0	.8	0
29-----	9.0	9.0	45	75	-----	120	54	753	5.0	0	27	0
30-----	10	12	88	75	-----	201	45	693	3.2	1,370	7.0	0
31-----	15	-----	166	75	-----	266	-----	132	-----	386	3.2	-----
Month						Maximum	Minimum	Mean		Run-off in acre-feet		
October-----						15	5.0	8.19		504		
November-----						28	9.0	12.5		744		
December-----						942	10	79.6		4,880		
January-----						615	48	106		6,460		
February-----						1,060	42	119		6,610		
March-----						1,730	116	312		19,200		
April-----						496	42	92.7		5,520		
May-----						1,580	18	188		11,600		
June-----						98	3.2	26.1		1,550		
July-----						1,370	0	57.3		3,520		
August-----						734	0	30.6		1,880		
September-----						97	0	6.25		372		
The year-----						1,730	0	86.8		62,800		

\* Estimated.



## MOUNTAIN CREEK NEAR GRAND PRAIRIE, TEX.

LOCATION. Water-stage recorder at Grand Prairie-Duncanville highway bridge 3½ miles southeast of Grand Prairie, Dallas County.

DRAINAGE AREA.—267 square miles.

RECORDS AVAILABLE.—March 1925 to July 1933 (discontinued).

DISCHARGE.—Maximum during period, 5,700 second-feet Mar. 6 (gage height, 18.45 feet); no flow at times.

1925-33: Maximum (determined by slope-area method), 35,900 second-feet, of which 2,680 second-feet was flowing through break in levee half a mile above gage, Dec. 17, 1928 (gage height, 21.41 feet); no flow at times.

REMARKS.—Records fair except those estimated, which are poor. No diversions above station.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July
1.....	° 0.4	0	0.4	45	40	135	43	12	27	0.3
2.....	° 4	0	.4	25	28	62	27	8.8	22	.2
3.....	° 4	.1	.4	20	18	45	22	7.7	20	.1
4.....	° 3	.1	.7	18	18	36	20	150	17	0
5.....	° 3	.1	1.0	16	18	1,180	19	141	14	0
6.....	° 3	.1	1.7	14	15	3,650	17	23	12	-----
7.....	° 2	.1	1.6	1,070	18	267	14	14	9.2	-----
8.....	° 2	.1	1.7	3,340	18	72	13	8.4	7.9	-----
9.....	° 2	.1	1.9	879	15	54	13	5.8	7.0	-----
10.....	° 2	0	2.2	81	14	43	32	4.3	6.4	-----
11.....	° 2	0	2.6	53	16	37	24	3.3	6.4	-----
12.....	° 1	0	2.6	37	17	37	9.9	2.7	295	-----
13.....	.1	0	2.5	28	19	37	9.9	2.4	85	-----
14.....	0	0	2.3	25	20	33	10	195	12	-----
15.....	0	0	3.5	24	18	25	11	3,540	6.1	-----
16.....	0	0	6.9	23	15	22	9.7	2,900	° 3.1	-----
17.....	0	0		23	14	24	8.8	668	° 2.7	-----
18.....	0	.1		27	14	54	7.7	62	° 2.6	-----
19.....	0	.2		30	13	120	7.5	43	2.4	-----
20.....	0	.2		25	11	34	8.1	33	2.3	-----
21.....	0	.2		34	10	25	8.1	28	2.0	-----
22.....	0	.3	° 375	79	9.6	23	6.7	27	1.9	-----
23.....	0	.4		55	9.5	21	6.0	25	1.6	-----
24.....	0	.5		25	10	18	6.2	28	1.6	-----
25.....	0	.4		19	11	18	37	1,080	1.3	-----
26.....	0	.2		17	16	16	1,150	1,970	1.2	-----
27.....	0	.2		15	1,320	16	553	104	1.0	-----
28.....	0	.2	° 23	13	1,990	22	35	52	.8	-----
29.....	0	.2	21	13	-----	19	24	114	.7	-----
30.....	0	.3	189	14	-----	205	17	57	.5	-----
31.....	0	-----	232	24	-----	444	-----	33	-----	-----
Month	Maximum			Minimum			Mean		Run-off in acre-feet	
October.....	-----			0			0.11		6.8	
November.....	0.5			0			.14		8.3	
December.....	-----			.4			149		9,160	
January.....	3,340			13			197		12,100	
February.....	1,990			9.5			133		7,390	
March.....	3,650			16			219		13,500	
April.....	1,150			6.0			72.4		4,310	
May.....	3,540			2.4			366		22,500	
June.....	295			.5			19.1		1,140	
July 1-5.....	.3			0.0			.12		1.2	
The period.....	-----			-----			-----		70,100	

° Partly estimated or interpolated.

° Estimated.

## ELM FORK OF TRINITY RIVER NEAR CARROLLTON, TEX.

LOCATION.—Staff gage just above Carrollton Dam, 40 feet below Dallas-Denton highway bridge, and 1½ miles west of Carrollton, Dallas County.

DRAINAGE AREA.—2,540 square miles.

RECORDS AVAILABLE.—November 1923 to September 1933.

DISCHARGE.—Maximum during year, 10,900 second-feet Mar. 6 (gage height, 7.33 feet); minimum, 85 second-feet Nov. 13, 14 (gage height, 0.54 foot).

1923-33: Maximum not determined; maximum gage height, 12.75 feet Dec. 14, 1923; no flow at times.

REMARKS.—Records good. No diversion above station. Garza Dam, 20 miles upstream, regulates flow at low stages and partly regulates flow at high stages.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	157	165	105	418	173	1,030	605	200	1,730	182	684	335
2.....	157	165	105	264	173	468	505	133	1,840	182	445	335
3.....	165	165	112	214	173	418	418	119	1,830	182	390	335
4.....	165	157	112	196	169	259	570	119	346	229	390	335
5.....	165	157	112	178	165	1,640	486	119	182	229	1,230	335
6.....	165	157	112	165	165	9,610	229	119	169	229	591	335
7.....	161	157	112	560	165	6,470	209	102	157	229	475	335
8.....	157	157	112	3,490	165	3,480	209	102	1,680	239	475	335
9.....	157	157	112	2,950	165	1,460	209	98	1,950	239	475	335
10.....	157	157	112	1,180	165	1,200	209	98	1,860	239	475	335
11.....	157	157	112	760	165	1,150	186	98	1,450	239	475	1,270
12.....	157	157	112	478	165	1,630	182	98	204	239	475	725
13.....	157	85	105	311	182	2,100	182	91	204	239	475	357
14.....	157	85	105	249	448	2,270	182	122	229	239	475	390
15.....	161	496	119	229	505	2,810	161	2,210	224	234	786	335
16.....	165	1,860	119	209	505	2,810	161	3,080	395	239	522	335
17.....	165	195	119	209	505	2,810	157	970	720	239	368	390
18.....	165	105	119	209	505	2,810	153	880	760	239	330	390
19.....	165	105	119	209	505	1,120	153	1,530	760	239	318	352
20.....	165	105	119	209	505	1,060	141	1,630	760	239	302	346
21.....	165	105	119	359	390	2,690	185	1,950	760	239	302	346
22.....	165	105	122	415	117	2,810	340	2,060	760	239	302	346
23.....	165	141	3,050	775	91	2,680	280	1,950	760	239	280	335
24.....	161	122	6,890	418	116	2,680	264	2,060	680	239	318	335
25.....	149	105	3,220	239	130	2,680	214	6,190	313	390	302	335
26.....	157	105	1,000	204	204	2,680	1,120	7,820	291	390	308	335
27.....	157	105	720	186	1,320	1,010	1,120	4,700	182	390	993	335
28.....	157	105	390	173	2,750	239	475	3,400	182	390	505	335
29.....	157	105	274	165	-----	254	352	1,730	182	390	368	335
30.....	157	105	585	165	-----	224	157	1,950	182	702	357	357
31.....	169	-----	538	169	-----	599	-----	2,060	-----	3,980	346	-----
Month												
	Maximum					Minimum			Mean		Run-off in acre-feet	
October.....	169					149			161		9,900	
November.....	1,860					85			202		12,000	
December.....	6,890					105			618		38,000	
January.....	3,490					165			515		31,700	
February.....	2,750					91			385		21,400	
March.....	9,610					224			2,100		129,000	
April.....	1,120					141			327		19,500	
May.....	7,820					91			1,540		94,700	
June.....	1,950					157			725		43,100	
July.....	3,980					182			392		24,100	
August.....	1,230					280			469		28,800	
September.....	1,270					335			388		23,100	
The year.....	9,610					85			657		475,000	

## EAST FORK OF TRINITY RIVER NEAR ROCKWALL, TEX.

LOCATION.—Chain gage on Dallas-Rockwall highway bridge 3 miles southwest of Rockwall, Rockwall County. Zero of gage is 404.2 feet above mean sea level.

DRAINAGE AREA.—831 square miles.

RECORDS AVAILABLE.—November 1923 to September 1933.

DISCHARGE.—Maximum during year, 12,700 second-feet Mar. 7 (gage height, 16.8 feet); no flow at times.

1923-33: Maximum, about 42,300 second-feet Jan. 23, 1932 (gage height, 20.9 feet); no flow at times. Average, 10 years, 412 second-feet.

Maximum stage known, about 25 feet in spring of 1922.

REMARKS.—Records good below and fair above 2,000 second-feet. No diversions above station.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.5	2.6	7.2	1,700	346	3,680	726	164	3,200	8.9	390	7.2
2	6.5	9.3	6.8	1,260	346	3,060	415	134	1,070	7.5	162	4.3
3	9.1	22	6.5	375	319	1,240	219	114	274	6.8	51	1.4
4	265	11	5.5	242	212	555	191	140	205	5.9	28	.7
5	415	6.2	6.8	212	191	572	177	226	177	5.1	18	.3
6	169	5.5	6.8	184	177	2,460	292	226	152	4.1	45	.2
7	60	4.3	6.8	488	250	8,480	164	170	134	3.3	130	.2
8	29	3.6	6.8	2,190	328	7,180	152	119	124	2.7	46	.1
9	18	3.2	7.2	4,400	226	2,380	146	99	114	2.5	22	0
10	12	2.8	8.2	4,400	191	969	198	89	104	4.1	10	0
11	9.8	2.6	8.9	2,100	158	602	274	79	94	4.9	6.2	.1
12	8.6	2.0	10	699	191	497	177	74	89	4.9	4.6	51
13	7.5	2.0	10	362	242	486	134	69	160	2.8	5.2	524
14	7.2	2.0	12	283	266	465	124	115	109	1.0	3.6	170
15	6.2	2.0	17	258	242	405	129	1,960	84	.3	2.3	152
16	5.7	2.0	26	250	198	319	134	2,820	74	.2	54	114
17	5.2	2.0	46	242	170	274	124	2,480	64	.2	38	46
18	4.1	1.8	42	250	158	350	119	2,190	60	.1	18	15
19	3.3	2.3	26	258	152	754	114	609	56	.1	16	8.2
20	2.5	3.3	23	242	134	940	114	184	51	.1	6.8	5.1
21	1.9	4.4	40	534	124	524	124	134	46	0	3.9	3.2
22	1.9	3.9	96	1,400	119	283	271	114	42	0	2.1	2.0
23	1.7	4.9	497	2,280	114	250	146	109	38	.1	1.4	1.6
24	1.3	6.7	2,310	1,780	114	226	119	109	33	.2	1.0	.9
25	1.3	7.2	7,340	648	129	274	224	1,430	29	1.3	.4	.6
26	1.3	9.5	6,330	337	211	292	790	2,280	24	55	.3	.5
27	1.3	14	2,090	258	636	226	1,940	2,480	20	28	29	.4
28	1.3	12	543	234	2,420	226	1,780	4,130	17	11	11	.3
29	1.1	10	330	212	-----	226	870	2,100	13	6.5	5.2	.2
30	1.1	8.2	,170	205	-----	226	250	1,340	11	5.7	2.9	7.9
31	1.4	-----	1,700	212	-----	553	-----	2,020	-----	56	1.7	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	415	1.1	34.4	2,120
November	222	1.8	5.78	344
December	7,340	5.5	733	45,100
January	4,400	184	919	56,500
February	2,420	114	299	16,600
March	8,480	226	1,260	77,500
April	1,940	114	355	21,100
May	4,130	69	913	56,100
June	3,200	11	222	13,200
July	56	0	7.4	455
August	390	.3	36.0	2,210
September	524	0	37.2	2,210
The year	8,480	0	405	293,000

## SAN JACINTO RIVER BASIN

## SAN JACINTO RIVER NEAR HUMBLE, TEX.

LOCATION.—Chain gage at highway bridge 2,000 feet above Southern Pacific Railroad bridge and 2½ miles north of Humble, Harris County. Prior to July 16, 1933, chain gage to same datum on old highway bridge (abandoned) 2,900 feet downstream.

DRAINAGE AREA.—1,810 square miles.

RECORDS AVAILABLE.—October 1928 to September 1933.

DISCHARGE.—Maximum during year, 8,720 second-feet Mar. 9 (gage height, 10.4 feet); minimum, 30 second-feet July 15 and Aug. 30.

1928-33: Maximum, about 111,000 second-feet May 31, 1929 (gage height, 32.25 feet on former gage); minimum, 14 second-feet Sept. 8-10, 1931.

REMARKS.—Daily records poor; monthly records fair. No diversions above station.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	62	39	53	732	2,410	900	284	116	141	42	114	102
2.....	68	37	50	670	3,020	1,020	266	105	112	40	95	78
3.....	59	39	53	700	3,730	1,330	249	105	91	38	79	99
4.....	70	39	62	830	3,510	1,600	266	124	94	42	69	74
5.....	74	39	53	597	1,860	1,240	232	178	81	36	56	78
6.....	64	37	56	323	980	2,760	218	154	66	40	50	58
7.....	53	37	59	204	670	5,900	550	128	66	52	53	74
8.....	50	35	59	176	957	6,880	750	159	57	66	53	74
9.....	48	37	62	152	1,800	8,240	380	173	52	42	50	61
10.....	48	37	62	143	2,000	6,880	249	145	49	66	50	67
11.....	53	35	62	143	1,510	3,860	218	116	47	40	47	61
12.....	46	35	64	139	1,150	1,900	191	101	49	35	66	72
13.....	41	35	68	130	688	1,150	249	94	55	37	55	79
14.....	41	35	62	118	403	865	284	88	49	32	42	66
15.....	39	37	64	110	760	765	302	84	47	30	58	59
16.....	41	37	68	107	1,780	612	671	78	42	41	100	50
17.....	41	37	70	108	2,000	556	1,330	75	45	38	189	44
18.....	41	41	68	101	1,510	476	1,330	75	42	35	189	50
19.....	41	41	80	99	1,020	451	856	88	42	41	95	47
20.....	41	41	76	96	865	403	380	78	40	41	67	44
21.....	39	41	83	96	1,360	359	284	72	38	35	78	41
22.....	39	39	232	107	1,700	338	380	69	34	47	58	37
23.....	39	39	338	114	1,150	338	426	66	38	119	44	32
24.....	41	48	284	118	830	320	380	66	36	83	38	61
25.....	39	59	636	118	612	302	320	81	31	162	41	46
26.....	35	76	508	108	451	302	232	91	47	175	38	55
27.....	37	70	249	99	403	403	164	120	88	123	38	48
28.....	37	62	178	99	626	426	141	108	55	137	35	42
29.....	37	59	178	103	-----	403	128	132	45	102	33	40
30.....	37	53	284	164	-----	359	120	136	42	88	30	34
31.....	39	-----	708	1,460	-----	338	-----	178	-----	84	76	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	74	35	46.4	2,850
November.....	76	35	43.2	2,570
December.....	708	50	159	9,780
January.....	1,460	96	266	16,400
February.....	3,730	403	1,420	78,900
March.....	8,240	302	1,670	103,000
April.....	1,330	120	394	23,400
May.....	178	66	109	6,700
June.....	141	31	57.4	3,420
July.....	175	30	64.2	3,950
August.....	189	30	67.3	4,140
September.....	102	32	59.1	3,520
The year.....	8,240	30	357	259,000

## BRAZOS RIVER BASIN

## DOUBLE MOUNTAIN FORK OF BRAZOS RIVER NEAR ASPERMONT, TEX.

LOCATION.—Chain gage on Aspermont-Hamlin highway bridge 11 miles south of Aspermont, Stonewall County.

DRAINAGE AREA.—7,980 square miles, of which about 6,470 square miles is probably noncontributing.

RECORDS AVAILABLE.—December 1923 to September 1933.

DISCHARGE.—Maximum during year, 9,860 second-feet May 25 (gage height, 8.25 feet); no flow at times.

1924-33: Maximum (determined by slope-area method), about 52,000 second-feet Oct. 15, 1926 (gage height, 18.14 feet); no flow at times.

REMARKS.—Daily records too poor for publication; monthly records fair. No diversions above station.

*Discharge, in second-feet, 1932-33*

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	384	31	78.6	4,830
November.....	36	-----	15.4	916
December.....	3,320	-----	242	14,900
January.....	94	7.5	29.4	1,810
February.....	-----	2.0	9.03	502
March.....	116	.1	18.2	1,120
April.....	-----	0	.19	11
May.....	3,830	0	307	18,900
June.....	33	0	5.13	305
July.....	1,710	0	86.8	5,340
August.....	4,950	0	391	24,000
September.....	1,420	0	105	6,250
The year.....	4,950	0	109	78,900

## BRAZOS RIVER AT SEYMOUR, TEX.

LOCATION.—Water-stage recorder at highway bridge three-quarters of a mile above Wichita Valley Railway bridge and 1 mile southwest of courthouse in Seymour, Baylor County.

DRAINAGE AREA.—14,500 square miles, of which about 9,240 square miles is probably noncontributing.

RECORDS AVAILABLE.—November 1923 to September 1933.

DISCHARGE.—Maximum during year, about 33,100 second-feet Aug. 2 (gage height, 8.40 feet); no flow July 14.

1924-33: Maximum (determined by slope-area method) 79,600 second-feet June 14, 1930 (gage height, 13.0 feet); no flow at times during each year.

Maximum stage known, about 21.0 feet, occurred prior to 1916. but exact date is not known.

REMARKS.—Daily records not sufficiently accurate for publication; monthly records fair. Discharge estimated. No diversions above station.

*Discharge, in second-feet, 1932-33*

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	363	65	159	9,780
November.....	93	22	40.4	2,400
December.....	4,640	12	560	34,400
January.....	-----	-----	107	6,580
February.....	95	23	48.9	2,720
March.....	3,120	6.1	277	17,000
April.....	176	2.6	27.1	1,610
May.....	10,800	1.2	854	52,500
June.....	212	.8	36.5	2,170
July.....	308	.3	43.9	2,700
August.....	12,100	-----	1,120	68,900
September.....	2,320	23	403	24,000
The year.....	12,100	.3	310	225,000

## BRAZOS RIVER NEAR MINERAL WELLS, TEX.

LOCATION.—Chain gage on Mineral Wells-Palo Pinto highway bridge 4 miles west of Mineral Wells, Palo Pinto County.

DRAINAGE AREA.—23,100 square miles, of which about 9,240 square miles is probably noncontributing.

RECORDS AVAILABLE.—January 1924 to November 1933 (discontinued).

DISCHARGE.—Maximum during period Oct. 1, 1932, to Nov. 15, 1933, 39,100 second-feet May 26 (gage height, 15.33 feet); minimum, 15 second-feet July 11.

1924-33: Maximum, 95,600 second-feet June 16, 1930 (gage height, 28.43 feet); no flow at times.

REMARKS.—Daily records poor; monthly records fair. No large diversions above station.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1932-33												
1-----	1,440	214	132	2,330	231	484	119	281	2,330	33	103	3,140
2-----	1,370	210	129	1,800	222	359	116	181	1,370	30	81	1,680
3-----	1,370	206	122	1,500	214	317	126	119	870	25	580	1,370
4-----	1,300	197	158	1,300	210	291	239	142	655	22	9,220	1,180
5-----	1,300	206	169	1,120	206	1,320	312	135	535	22	5,340	870
6-----	1,300	252	165	915	197	2,140	512	109	449	19	3,140	698
7-----	1,240	291	162	740	181	1,720	338	1,380	370	17	2,420	520
8-----	1,180	270	158	698	173	2,240	244	915	338	17	1,720	396
9-----	965	261	150	782	158	1,720	189	484	322	17	1,240	365
10-----	825	252	139	655	135	1,070	154	312	281	17	870	333
11-----	782	248	132	618	122	915	135	252	218	311	698	338
12-----	782	222	126	542	109	740	109	189	261	317	535	1,640
13-----	740	206	119	505	101	618	92	139	301	214	449	2,710
14-----	655	189	112	491	95	498	84	154	218	158	390	1,970
15-----	618	189	106	477	116	416	76	1,310	177	122	409	1,020
16-----	535	173	101	463	181	344	68	13,300	154	106	409	1,380
17-----	491	165	95	456	181	322	63	9,750	142	95	409	2,140
18-----	456	158	92	449	189	261	58	4,220	129	791	390	1,650
19-----	422	154	87	442	197	231	53	2,920	122	505	275	2,710
20-----	376	146	103	409	189	235	51	1,880	112	307	222	1,500
21-----	349	139	142	383	181	322	48	915	98	222	185	825
22-----	328	132	189	359	173	239	46	825	92	142	154	655
23-----	307	129	409	359	165	206	635	2,450	87	98	135	505
24-----	291	126	7,980	349	158	193	370	3,910	76	165	132	390
25-----	281	122	13,000	344	150	162	609	13,600	71	173	181	328
26-----	270	122	11,100	322	197	146	3,300	38,200	65	142	235	281
27-----	261	116	8,160	307	359	132	1,700	26,800	55	122	378	244
28-----	244	109	5,460	291	655	122	1,020	12,000	44	103	3,370	218
29-----	231	112	3,360	275	-----	116	965	8,680	37	98	3,100	193
30-----	222	122	2,710	261	-----	119	416	5,700	33	87	2,140	162
31-----	218	-----	2,710	244	-----	126	-----	3,360	-----	78	3,390	-----

Day	Oct.	Nov.	Day	Oct.	Nov.	Day	Oct.	Nov.
1933			1933			1933		
1-----	139	53	11-----	53	84	21-----	505	-----
2-----	116	60	12-----	48	76	22-----	333	-----
3-----	103	81	13-----	48	71	23-----	275	-----
4-----	95	76	14-----	48	60	24-----	218	-----
5-----	84	65	15-----	48	58	25-----	169	-----
6-----	68	63	16-----	48	-----	26-----	150	-----
7-----	60	92	17-----	44	-----	27-----	135	-----
8-----	63	116	18-----	950	-----	28-----	135	-----
9-----	68	98	19-----	1,720	-----	29-----	112	-----
10-----	63	92	20-----	915	-----	30-----	92	-----
						31-----	60	-----

*Discharge, in second-feet, of Brazos River near Mineral Wells, Tex., 1932-33—Contd.*

Month	Maximum	Minimum	Mean	Run-off in acre-feet
1932-33				
October.....	1,440	218	682	41,900
November.....	291	109	181	10,800
December.....	13,000	87	1,860	114,000
January.....	2,330	244	651	40,000
February.....	655	95	194	10,800
March.....	2,440	116	585	36,000
April.....	3,300	46	408	24,300
May.....	38,200	109	4,990	307,000
June.....	2,330	33	334	19,900
July.....	791	17	148	9,100
August.....	9,220	81	1,360	83,600
September.....	3,140	162	1,040	61,900
The year.....	38,200	17	1,050	759,000
1933				
October.....	1,720	44	225	13,800
November 1-15.....	116	53	76.3	2,270
The period.....				16,100

## BRAZOS RIVER NEAR GLEN ROSE, TEX.

LOCATION.—Water-stage recorder a quarter of a mile above Glen Rose-Cleburne highway bridge and 4 miles northeast of Glen Rose, Somervell County.

DRAINAGE AREA.—24,800 square miles, of which about 9,240 square miles is probably noncontributing.

RECORDS AVAILABLE.—October 1923 to September 1933.

DISCHARGE.—Maximum during year, 36,600 second-feet May 27 (gage height, 13.19 feet); minimum, 25 second-feet July 15.

1923-33: Maximum, 68,300 second-feet June 17, 1930 (gage height, 19.60 feet); no flow Sept. 7-9, 1924, Sept. 13 to Oct. 11, 1931. Average, 10 years, 1,740 second feet.

REMARKS.—Records fair. No large diversion above station.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1-----	1,120	351	184	3,400		1,160	442	1,140	5,600	98	220	2,740
2-----	1,240	332	184	2,420		1,200	364	978	4,640	86	148	2,680
3-----	1,200	332	184	2,100		863	292	683	3,950	78	114	3,730
4-----	1,100	320	184	1,980		654	265	598	3,070	70	98	2,480
5-----	1,000	320	184	1,760		664	250	524	<sup>a</sup> 2,100	66	139	1,590
6-----	978	320	184	1,480		2,320	240	533		70	4,400	1,280
7-----	955	320	184	1,460	<sup>a</sup> 250	4,490	292	377		54	3,620	1,170
8-----	955	351	184	1,590		2,520	412	308		43	2,960	874
9-----	955	364	184	1,420		2,100	390	281		39	2,380	664
10-----	944	351	188	1,220		1,750	524	891	<sup>a</sup> 1,110	35	2,000	533
11-----	820	320	193	1,060		2,160	420	1,180		32	1,490	499
12-----	780	303	188	955		1,600	332	770		30	1,160	405
13-----	730	292	184	830		1,220	292	578	<sup>a</sup> 428	30	874	320
14-----	<sup>a</sup> 692	286	184	750	<sup>a</sup> 286	1,010	260	524	435	28	683	308
15-----	<sup>a</sup> 654	286	202		265	840	240	2,110	390	25	1,940	2,270
16-----	<sup>a</sup> 636	276	230		270	730	216	4,690	412	259	978	3,290
17-----	<sup>a</sup> 598	270	206		265	645	206	13,300	412	303	932	1,890
18-----	<sup>a</sup> 560	265	216		265	674	202	8,500	292	235	442	1,300
19-----	<sup>a</sup> 542	260	206		260	750	202	5,120	250	202	351	2,180
20-----	<sup>a</sup> 508	250	202		260	569	198	3,510	225	162	308	2,200
21-----	<sup>a</sup> 490	245	193		255	490	188	3,290	240	152	298	1,570
22-----	<sup>a</sup> 465	240	198	<sup>a</sup> 420	250	458	184	2,540	250	559	281	2,720
23-----	<sup>a</sup> 435	<sup>a</sup> 225	389		255	435	180	1,420	220	405	230	1,520
24-----	<sup>a</sup> 428	<sup>a</sup> 220	889		260	458	170	932	193	292	198	1,020
25-----	<sup>a</sup> 398	<sup>a</sup> 216	3,080		270	405	162	3,190	180	225	180	820
26-----	384	<sup>a</sup> 211	12,500		286	351	268	20,500	166	188	157	674
27-----	370	<sup>a</sup> 202	10,700		428	332	683	34,000	148	157	148	560
28-----	370	<sup>a</sup> 198	8,500		607	314	694	16,800	134	175	202	458
29-----	364	<sup>a</sup> 193	6,940			303	2,000	13,000	122	193	206	384
30-----	358	184	3,890			1,230	1,560	9,280	114	442	612	332
31-----	358		3,400			1,200		7,200		679	3,290	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October-----	1,240	358	690	42,400
November-----	364	184	277	16,500
December-----	12,500	184	1,760	108,000
January-----	3,400		954	58,700
February-----	607		276	15,300
March-----	4,490	303	1,090	67,000
April-----	2,000	162	404	24,000
May-----	34,000	281	5,120	315,000
June-----	5,600	114	1,060	63,100
July-----	679	25	175	10,800
August-----	4,400	98	1,000	61,500
September-----	3,730	308	1,420	84,500
The year-----	34,000	25	1,200	867,000

<sup>a</sup> Estimated or partly estimated.



## BRAZOS RIVER AT WACO, TEX.

LOCATION.—Water-stage recorder at Texas Electric Co.'s bridge in Waco, McLennan County. Zero of gage is 356.99 feet above mean sea level.

DRAINAGE AREA.—28,500 square miles, of which about 9,240 square miles is probably noncontributing.

RECORDS AVAILABLE.—September 1898 to December 1911; October 1914 to September 1933.

DISCHARGE.—Maximum during year, 41,100 second-feet July 30 (gage height, 23.05 feet); minimum, 50 second-feet July 18.

1898-1911, 1914-33: Maximum, about 134,000 second-feet May 25, 1908 (gage height, 36.7 feet); no flow Aug. 20, 21, 1918, and probably for several days in August 1923. Average, 32 years, 2,600 second-feet.

Maximum stage known, 39.7 feet Dec. 3, 1913.

REMARKS.—Records fair below and poor above 5,000 second-feet. Discharge estimated Aug. 20-31, Sept. 1, 29, 30. Numerous small diversions above station do not appreciably affect flow except during low stages. Flow slightly regulated by Lake Waco on the North Bosque River near Waco.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,750	435	270	3,460	548	1,520	3,100	2,100	8,070	207	3,580	445
2	1,480	430	266	3,550	524	1,080	2,050	1,800	6,260	191	1,430	2,460
3	1,480	420	263	2,940	506	1,360	1,380	1,520	4,790	179	633	2,460
4	1,560	420	260	3,110	484	1,520	1,300	1,610	3,740	165	400	2,510
5	1,520	405	260	2,150	456	2,410	1,620	1,700	3,000	148	306	2,680
6	1,430	395	256	2,050	456	2,360	897	1,080	2,400	132	256	1,900
7	1,340	390	252	2,100	456	3,330	755	818	2,000	120	1,810	1,560
8	1,330	382	249	2,510	450	5,120	685	748	1,660	108	4,790	1,380
9	1,170	372	249	3,390	435	3,000	633	620	2,620	102	3,220	1,300
10	1,150	368	249	2,330	420	3,350	811	478	1,200	98	2,620	3,920
11	1,130	400	260	2,670	372	2,490	1,180	405	985	85	2,300	2,280
12	1,120	420	260	1,520	415	2,250	945	541	825	81	2,050	2,650
13	985	400	260	1,300	410	2,400	905	1,300	762	79	1,750	1,300
14	873	364	260	1,190	420	1,900	769	969	762	68	1,520	762
15	825	342	266	1,040	415	1,610	678	925	672	64	1,300	572
16	804	338	290	961	390	1,380	602	5,300	620	58	2,760	478
17	776	342	286	881	377	1,200	506	7,660	602	56	2,890	2,150
18	734	342	298	825	346	1,790	518	12,400	542	52	2,100	2,460
19	692	342	322	797	346	1,110	484	8,080	572	318	1,010	1,800
20	646	334	286	769	330	1,150	1,690	5,120	524	338		1,300
21	626	326	282	741	330	1,130	659	3,640	435	252		1,800
22	578	326	278	776	322	865	484	3,140	382	214		1,850
23	572	322	350	1,610	314	748	405	3,300	350	173		1,690
24	542	326	690	755	306	678	450	2,920	338	162		2,650
25	518	314	2,000	699	306	620	405	25,500	346	410	400	2,360
26	506	306	4,860	678	322	614	395	16,400	314	354		1,440
27	484	294	10,800	626	364	646	896	26,300	282	278		969
28	467	286	9,420	602	552	590	920	29,200	256	221		769
29	456	282	7,540	608	-----	560	804	20,400	242	381		608
30	445	278	5,780	584	-----	2,550	1,000	19,800	228	9,390		560
1	440	-----	3,840	608	-----	15,200	-----	10,700	-----	18,600		-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	1,750	440	917	56,400
November	435	278	357	21,200
December	10,800	249	1,650	101,000
January	3,550	584	1,540	94,700
February	552	306	406	22,500
March	15,200	560	2,150	132,000
April	3,100	395	931	55,400
May	29,200	405	6,980	429,000
June	8,070	228	1,530	91,000
July	18,500	52	1,060	65,200
August	4,790	-----	1,340	82,400
September	3,920	445	1,700	101,000
The year	29,200	52	1,730	1,250,000

## BRAZOS RIVER NEAR BRYAN, TEX.

LOCATION.—Water-stage recorder 3,000 feet downstream from Pitts Bridge, 2¼ miles below mouth of Little Brazos River, and 9 miles southwest of Bryan, Brazos County. Zero of gage is 192.2 feet above mean sea level. Prior to Oct. 25, 1932, chain gage to same datum at Pitts Bridge.

DRAINAGE AREA.—38,400 square miles, of which about 9,240 square miles is probably noncontributing.

RECORDS AVAILABLE.—September 1925 to September 1933. Comparable record at former station 7½ miles downstream February 1918 to September 1925.

DISCHARGE.—Maximum during year, 40,900 second-feet May 29 (gage height, 20.82 feet); minimum, 346 second-feet July 19–21.

1925–33: Maximum stage, 47.1 feet May 20, 1930 (discharge not determined); minimum, 100 second-feet Apr. 27, 28, 1930.

Maximum stage of about 54.0 feet (present gage datum) in December 1913.

REMARKS.—Records fair. Numerous small diversions above gage do not appreciably affect the flow except during low stages.

*Discharge, in second-feet, 1932–33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	2,460	770	604	5,320	7,500	4,420	14,500	1,460	18,600	598	21,800	960
2.....	2,580	742	592	4,270	4,100	2,850	7,790	1,320	13,100	575	10,700	1,120
3.....	2,740	735	592	4,270	2,630	2,460	4,870	1,700	9,600	545	5,280	1,280
4.....	2,580	735	592	3,850	2,140	2,410	3,990	2,460	7,500	535	3,210	1,750
5.....	2,520	763	586	4,500	1,780	3,890	3,990	2,360	5,480	* 518	2,240	2,800
6.....	2,630	742	592	3,090	1,590	11,900	3,590	2,800	4,270	° 501	1,640	2,800
7.....	2,520	742	586	3,050	1,640	11,600	2,850	2,910	3,850	° 484	1,240	2,910
8.....	2,460	756	570	4,880	1,460	7,820	2,240	2,520	3,330	* 467	1,060	2,460
9.....	2,240	721	575	7,140	1,410	7,140	1,730	1,880	2,970	° 450	1,590	1,980
10.....	1,880	700	580	8,420	1,280	5,100	1,590	1,540	2,850	° 433	3,850	1,830
11.....	1,680	707	575	5,640	1,240	4,300	1,540	1,410	2,910	° 416	3,330	1,870
12.....	1,930	676	580	5,020	1,200	4,570	1,460	1,320	2,190	° 399	2,850	4,500
13.....	1,980	670	598	3,400	1,200	3,460	2,100	1,160	1,830	382	2,520	3,460
14.....	2,030	694	604	2,740	1,200	3,460	2,580	1,040	1,640	376	2,300	3,090
15.....	1,980	728	610	2,520	1,410	3,460	2,190	1,200	1,500	373	2,030	2,140
16.....	1,830	728	728	2,360	1,320	2,970	1,780	1,500	1,410	364	1,830	1,640
17.....	1,680	688	728	2,140	1,240	2,630	1,590	2,140	1,460	355	1,730	1,240
18.....	1,590	682	721	1,980	1,160	2,410	1,410	6,760	1,360	352	2,910	1,030
19.....	1,410	652	714	1,830	1,120	2,240	1,320	12,000	1,240	346	3,090	1,610
20.....	1,320	658	721	1,680	1,200	2,410	1,280	7,990	1,120	346	2,580	3,030
21.....	1,160	652	728	1,590	1,240	2,030	1,320	5,640	1,080	346	1,640	2,460
22.....	872	646	770	2,310	1,070	1,880	1,990	4,720	1,080	352	1,320	1,930
23.....	896	658	840	3,330	992	1,880	1,930	4,130	1,030	535	1,040	2,030
24.....	912	756	1,460	2,680	944	1,730	1,830	3,850	944	622	856	2,680
25.....	1,010	707	1,930	2,740	912	7,520	1,500	5,380	848	464	1,080	2,410
26.....	920	664	1,780	1,830	1,140	5,070	1,280	29,700	777	432	1,120	3,090
27.....	840	640	4,150	1,460	3,020	3,020	1,280	28,100	742	440	819	2,850
28.....	833	646	10,800	1,280	4,270	2,030	1,200	33,400	728	515	676	2,520
29.....	798	634	10,300	1,560	-----	1,730	1,120	° 40,200	688	570	586	1,640
30.....	791	616	8,940	5,340	-----	1,780	1,460	° 38,000	646	550	634	1,320
31.....	777	-----	7,500	8,720	-----	2,800	-----	° 31,100	-----	5,930	749	-----

Month	Maximum	Minimum	Mean	Run-off in acre feet
October.....	2,740	777	1,670	103,000
November.....	770	616	697	41,500
December.....	10,800	570	1,990	122,000
January.....	8,720	1,280	3,580	220,000
February.....	7,500	912	1,840	102,000
March.....	11,900	1,730	3,970	244,000
April.....	14,500	1,120	2,640	157,000
May.....	40,200	1,040	9,090	559,000
June.....	18,600	646	3,230	192,000
July.....	5,930	346	631	38,800
August.....	21,800	586	2,850	175,000
September.....	4,500	960	2,210	132,000
The year.....	40,200	346	2,880	2,090,000

° Partly estimated.

## BRAZOS RIVER AT RICHMOND, TEX.

**LOCATION.**—Water-stage recorder on highway bridge in Richmond, Fort Bend County, about 1,500 feet downstream from Galveston, Harrisburg & San Antonio Railway bridge. Zero of gage is 40.8 feet above mean sea level.

**DRAINAGE AREA.**—44,000 square miles, of which about 9,240 square miles is probably noncontributing.

**RECORDS AVAILABLE.**—June 1931 to September 1933; January 1903 to June 1906 at railroad bridge 1,500 feet upstream.

**DISCHARGE.**—Maximum during year, 34,000 second-feet May 31 (gage height, 18.70 feet); minimum, 359 second-feet July 17 (gage height, 1.36 feet).

1903-6, 1931-33: Maximum, 80,500 second-feet February 24, 1932 (gage height, 31.85 feet); minimum, that of July 17, 1933.

The flood of June 6, 1929, reached a stage of 40.6 feet, present gage datum (discharge, 120,000 second-feet). The flood of December 1913 reached a stage of 45.4 feet, present gage datum (discharge not determined).

**REMARKS.**—Records fair. Considerable water diverted above station for irrigation and municipal use. (See records of Brazos Valley Irrigation Co.'s canal near Fulshear and of Richmond Irrigation Co.'s canal near Richmond.)

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6,970	1,440	72	10,300	11,600	2,510	3,390	1,870	32,100	865	790	1,210
2	5,490	1,400	972	8,640	14,100	4,710	3,570	1,760	24,600	865	1,590	1,270
3	4,780	1,400	972	6,880	13,600	6,260	9,330	1,680	17,400	840	11,300	1,720
4	4,540	1,370	972	5,690	10,500	6,100	8,480	1,910	12,800	840	8,330	1,650
5	4,200	1,340	972	5,290	7,720	5,420	6,410	1,870	10,000	768	5,180	1,620
6	3,570	1,300	972	5,030	6,260	7,260	6,260	1,830	8,260	722	3,600	1,650
7	3,300	1,270	972	4,900	5,420	17,500	4,830	2,110	6,880	678	2,850	1,680
8	3,120	1,240	945	4,660	5,830	20,600	4,780	2,430	5,530	700	2,350	1,910
9	2,850	1,240	918	3,980	5,160	17,200	3,980	2,590	5,160	614	1,990	2,190
10	2,760	1,210	918	3,980	4,090	14,600	3,770	2,760	4,660	614	1,650	2,510
11	2,670	1,180	890	6,040	3,570	12,600	3,670	2,850	3,980	575	1,440	2,350
12	2,510	1,150	890	7,900	3,390	10,500	3,570	2,590	3,570	538	1,400	2,190
13	2,350	1,150	890	6,560	3,210	8,640	3,480	2,270	3,300	538	1,800	1,990
14	2,270	1,120	890	5,160	3,030	8,080	3,300	2,030	3,030	495	2,510	1,790
15	2,270	1,060	890	4,420	2,850	6,880	3,030	1,870	2,760	456	2,510	2,300
16	2,190	1,090	918	3,770	3,390	6,110	3,210	1,680	2,430	384	2,430	2,940
17	2,110	1,060	945	3,390	3,390	5,690	3,570	1,620	2,190	390	2,190	2,760
18	2,110	1,060	945	3,300	3,300	5,290	3,210	1,400	2,030	456	2,030	2,430
19	2,030	1,060	945	3,300	2,850	4,900	2,940	1,340	1,760	520	1,910	1,950
20	1,950	1,090	1,000	3,300	2,760	4,310	2,670	1,970	1,650	575	1,680	1,650
21	1,870	1,090	1,030	3,390	3,120	3,770	2,510	7,900	1,540	520	1,820	1,480
22	1,790	1,060	1,060	3,390	2,850	3,480	2,430	7,650	1,440	459	2,350	1,340
23	1,760	1,030	1,120	3,210	2,670	3,390	2,350	5,550	1,400	575	2,430	1,540
24	1,680	1,060	1,120	2,940	2,590	3,210	2,350	4,420	1,300	614	2,110	2,030
25	1,680	1,060	1,150	2,850	2,510	3,030	2,350	4,090	1,210	634	1,650	1,950
26	1,650	1,030	1,760	3,210	2,350	2,850	2,430	3,980	1,180	594	1,400	1,760
27	1,620	1,000	2,270	3,030	2,190	3,900	2,430	7,720	1,120	614	1,210	1,760
28	1,580	1,030	2,190	2,940	2,190	6,410	2,270	21,600	1,030	745	1,150	1,910
29	1,540	1,030	2,810	2,670		5,550	2,110	24,800	1,030	972	1,210	1,990
30	1,510	1,000	8,480	2,510		4,420	1,910	31,200	945	1,000	1,210	2,110
31	1,480		11,400	5,630		3,770		33,700		865	1,120	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	6,970	1,480	2,650	163,000
November	1,440	1,000	1,150	68,400
December	11,400	890	1,720	106,000
January	10,300	2,510	4,590	282,000
February	14,100	2,190	4,870	270,000
March	20,600	2,510	7,060	434,000
April	9,330	1,910	3,690	220,000
May	33,700	1,340	6,230	383,000
June	32,100	945	5,550	330,000
July	1,000	384	846	39,700
August	11,300	790	2,490	153,000
September	2,940	1,210	1,920	114,000
The year	33,700	384	3,540	2,560,000

• Partly estimated.

## CLEAR FORK OF BRAZOS RIVER AT NUGENT, TEX.

LOCATION.—Staff gage at highway bridge at Nugent, Jones County.

DRAINAGE AREA.—2,220 square miles.

RECORDS AVAILABLE.—February 1924 to September 1933.

DISCHARGE.—Maximum during year, 4,150 second-feet May 15 (gage height, 9.80 feet); minimum, 8.9 second-feet Aug. 24 (gage height, 1.65 feet).

1924-33: Maximum, about 47,000 second-feet Sept. 8, 1932 (gage height, 27.05 feet); no flow at times.

REMARKS.—Records poor. Discharge estimated Jan. 15-25, Jan. 27 to Mar. 14. Small diversions above station for municipal use and mining.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	233	71	64	158			260	36	82	24	17	146
2.....	233	67	64	153			182	34	75	24	469	69
3.....	220	57	64	148			88	34	65	24	240	40
4.....	220	29	64	143			61	126	61	24	48	38
5.....	206	17	64	136			59	69	57	24	36	36
6.....	176	18	64	130			56	36	54	30	29	30
7.....	150	22	64	124		54	54	32	51	122	21	25
8.....	148	27	64	124			51	30	48	79	17	22
9.....	143	29	64	98			48	29	45	34	15	20
10.....	140	34	64	98			45	28	44	28	15	20
11.....	138	40	64	94			45	27	43	27	13	18
12.....	133	43	64	94			45	27	41	27	13	17
13.....	130	41	64	90			45	25	40	24	11	15
14.....	128	48	62	90			45	253	40	24	11	84
15.....	124	82	64		64	51	43	2,540	37	56	11	110
16.....	143	80	64			51	43	888	37	25	11	62
17.....	138	80	64			51	43	140	36	23	11	40
18.....	133	80	64			51	43	94	36	22	11	28
19.....	128	76	64			51	43	90	36	22	11	20
20.....	124	76	64	83		53	40	124	34	21	11	16
21.....	119	76	65			53	40	206	33	20	11	14
22.....	102	76	98			53	40	166	32	20	9.7	14
23.....	98	69	393			53	40	128	32	20	9.7	13
24.....	98	69	2,060			53	40	559	32	18	8.9	13
25.....	94	65	1,860			53	37	2,920	30	17	9.7	12
26.....	90	65	758	76		53	37	2,560	29	17	11	12
27.....	88	65	275			53	37	2,020	29	17	13	12
28.....	86	65	220			53	37	1,440	27	16	163	11
29.....	82	65	187	73		53	37	252	27	16	233	11
30.....	80	65	201			53	37	110	25	22	586	11
31.....	76		184			226		98		18	490	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	233	76	136	8,360
November.....	82	17	56.6	3,370
December.....	2,060	62	244	15,000
January.....	158		97.9	6,020
February.....			64.0	3,550
March.....	226		58.7	3,610
April.....	260	37	57.4	3,420
May.....	2,920	25	488	30,000
June.....	82	25	41.9	2,490
July.....	122	16	28.5	1,750
August.....	586	8.9	82.8	5,090
September.....	146	11	32.6	1,940
The year.....	2,920	8.9	117	84,600

## CLEAR FORK OF BRAZOS RIVER AT FORT GRIFFIN, TEX.

LOCATION.—Water-stage recorder at old Fort Griffin-Throckmorton highway bridge half a mile east of Fort Griffin, Shackelford County.

DRAINAGE AREA.—3,970 square miles.

RECORDS AVAILABLE.—December 1923 to September 1933.

DISCHARGE.—Maximum during year, 7,140 second-feet May 26 (gage height, 18.93 feet); minimum, 2.2 second-feet Aug. 23 (gage height, 2.05 feet).

1924-33: Maximum, 33,600 second-feet Sept. 10, 1932 (gage height, 35.09 feet); no flow at times.

REMARKS.—Records good. Discharge estimated Sept. 15-16, 26-30. Small diversions above station for municipal and irrigation uses.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.	424	132	94	614	104	95	58	33	182	18	11	645
2.	389	128	92	411	104	100	666	42	149	17	12	239
3.	367	128	94	290	97	111	314	32	127	14	25	171
4.	332	128	91	246	94	99	138	25	112	12	407	109
5.	294	127	89	215	94	100	95	50	99	12	187	64
6.	275	127	91	204	94	100	84	77	87	33	94	42
7.	267	125	91	197	91	94	68	97	76	134	56	31
8.	242	123	86	187	92	107	65	76	68	29	35	25
9.	226	116	81	189	84	100	62	53	58	42	29	21
10.	217	112	84	192	89	92	59	41	53	92	27	18
11.	207	111	83	182	87	87	53	31	46	60	20	107
12.	204	109	84	169	87	84	52	29	45	34	15	40
13.	197	109	81	163	91	84	47	28	44	25	12	31
14.	192	109	83	151	91	81	45	62	40	29	9.2	27
15.	187	109	91	145	89	76	45	176	36	98	7.6	72
16.	185	106	94	142	87	70	42	1,700	35	21	6.2	159
17.	178	102	92	142	86	68	41	1,550	34	102	5.8	94
18.	173	106	92	149	87	68	46	393	30	106	5.4	92
19.	169	106	89	143	81	67	46	185	29	71	4.6	62
20.	163	106	87	142	83	65	53	136	28	54	3.4	41
21.	155	102	86	134	79	68	59	142	26	49	2.7	29
22.	153	104	98	134	78	67	60	372	25	94	2.5	22
23.	151	99	1,130	130	76	70	53	354	24	60	2.2	18
24.	153	99	4,100	128	76	65	45	1,040	22	35	15	14
25.	147	94	6,020	123	75	59	152	4,440	22	25	174	10
26.	143	95	4,880	125	76	59	133	6,630	21	18	19	3.4
27.	142	94	1,210	109	81	60	49	5,690	20	14	86	3.4
28.	140	94	752	116	89	58	44	2,650	18	11	28	3.4
29.	136	94	389	102	-----	62	44	1,460	18	9.2	16	3.4
30.	136	94	367	107	-----	62	32	670	21	8.1	452	3.4
31.	130	-----	438	104	-----	58	-----	267	-----	11	519	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	424	130	209	12,900
November	132	94	110	6,550
December	6,020	81	685	42,100
January	614	102	180	11,100
February	104	75	87.2	4,840
March	111	58	78.6	4,830
April	666	32	91.7	5,460
May	6,630	25	920	56,600
June	182	18	53.2	3,160
July	134	8.1	43.1	2,650
August	519	2.2	73.8	4,540
September	645	3.4	73.3	4,360
The year	6,630	2.2	220	159,000

## CLEAR FORK OF BRAZOS RIVER NEAR CRYSTAL FALLS, TEX.

LOCATION.—Water-stage recorder at Texas Co.'s pumping plant  $2\frac{1}{2}$  miles below Hubbard Creek and  $3\frac{1}{4}$  miles northeast of Crystal Falls, Stephens County.

DRAINAGE AREA.—5,690 square miles.

RECORDS AVAILABLE.—July 1928 to September 1932.

DISCHARGE.—Maximum during year, 13,700 second-feet May 15 (gage height, 20.47 feet); minimum, 3.8 second-feet Sept. 27 (gage height, 2.23 feet).

1928-33: Maximum, 22,700 second-feet Sept. 8, 1932 (gage height, 28.10 feet); no flow at times.

Maximum stage known, about 34.0 feet (present datum) in 1900.

REMARKS.—Records good. Large part of ordinary flow diverted above station for municipal use and mining. Low-water flow partly regulated by dams above gage.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	476	152	102	728	117	128	70	47	304	20	16	582
2.....	447	152	102	651	117	121	75	36	235	22	16	470
3.....	419	152	105	436	117	125	590	47	191	20	19	219
4.....	397	152	105	336	109	128	240	1,120	164	19	26	171
5.....	351	156	102	304	109	228	136	1,080	140	19	310	117
6.....	332	179	102	269	105	398	95	152	121	18	171	73
7.....	313	195	98	265	105	235	80	105	105	18	98	50
8.....	304	164	98	256	102	179	70	121	91	105	56	36
9.....	287	152	98	248	98	164	63	91	84	34	36	30
10.....	273	140	95	244	95	136	63	70	73	20	28	28
11.....	261	136	95	235	98	125	56	50	63	60	26	69
12.....	248	128	95	227	98	113	53	40	66	56	26	74
13.....	244	125	95	211	98	105	53	73	184	34	22	424
14.....	235	125	95	199	102	98	43	934	187	24	18	338
15.....	231	125	109	183	98	91	40	11,700	95	1,710	22	60
16.....	223	121	117	175	102	84	40	8,250	63	439	16	53
17.....	219	121	113	171	98	80	40	2,540	50	77	14	148
18.....	211	117	109	168	98	87	40	1,100	43	70	10	91
19.....	203	117	109	168	102	77	47	360	38	109	9.2	87
20.....	199	121	105	168	98	80	77	240	36	66	9.2	56
21.....	195	121	102	168	91	73	56	493	34	50	7.4	38
22.....	187	117	98	160	91	84	56	818	32	40	6.2	30
23.....	183	121	772	179	87	73	73	562	30	73	5.0	18
24.....	183	113	3,810	168	84	87	63	594	28	66	4.4	10
25.....	187	109	4,680	152	95	80	219	7,600	28	38	396	6.2
26.....	183	109	6,030	148	87	77	679	8,280	26	26	117	4.4
27.....	179	105	4,560	144	113	70	208	6,310	24	19	53	3.8
28.....	175	109	1,190	128	113	77	84	5,730	24	15	654	4.4
29.....	168	105	646	132	-----	70	60	2,420	24	16	2,060	8.0
30.....	164	102	695	121	-----	73	53	1,410	22	15	526	9.2
31.....	160	-----	1,020	121	-----	70	-----	543	-----	19	464	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	476	160	253	15,600
November.....	195	102	131	7,800
December.....	6,030	95	827	50,800
January.....	728	121	234	14,400
February.....	117	84	101	5,610
March.....	398	70	117	7,190
April.....	679	40	117	6,960
May.....	11,700	36	2,030	125,000
June.....	304	22	86.8	5,160
July.....	1,710	15	107	6,580
August.....	2,060	4.4	169	10,400
September.....	582	3.8	110	6,550
The year.....	11,700	3.8	362	262,000

## NORTH BOSQUE RIVER NEAR CLIFTON, TEX.

LOCATION.—Staff gage a quarter of a mile above Gulf, Colorado & Santa Fe Railway bridge and  $1\frac{1}{8}$  miles northwest of Clifton, Bosque County.

DRAINAGE AREA.—974 square miles.

RECORDS AVAILABLE.—November 1923 to September 1933.

DISCHARGE.—Maximum during year, 27,100 second-feet May 25 (gage height, 13.80 feet); minimum, 2.4 second-feet Aug. 14 (gage height, 0.46 foot).

1923-33: Maximum, about 34,900 second-feet (revised) Sept. 8, 1929 (gage height, 16.8 feet); no flow at times. Average, 10 years, 141 second-feet.

REMARKS.—Records good below and poor above 10,000 second-feet. Railway company pumps about 100,000 gallons a day above control dam, a third of a mile below gage.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1-----	13	7.9	9.0	105	31	187	211	26	134	6.9	24	3.4
2-----	13	6.9	9.0	55	29	83	146	23	105	6.9	13	94
3-----	13	5.8	9.0	38	29	62	105	20	86	6.9	5.8	40
4-----	14	5.8	9.0	28	29	57	86	35	72	4.4	4.4	23
5-----	14	5.8	9.0	24	26	62	75	174	60	5.8	4.4	17
6-----	14	7.9	9.0	21	24	429	69	72	53	4.4	4.1	11
7-----	13	14	9.0	101	24	211	60	49	42	4.8	3.7	6.9
8-----	11	10	9.0	498	24	112	53	33	38	4.8	3.0	5.8
9-----	10	7.9	10	108	24	86	51	26	38	4.4	2.8	4.4
10-----	9.0	6.9	11	94	24	75	698	20	35	4.4	2.8	11
11-----	7.9	6.9	11	69	24	64	102	18	35	3.7	2.6	2,560
12-----	7.9	7.9	11	53	24	60	57	18	210	3.7	2.8	285
13-----	6.9	7.9	11	40	24	60	51	17	55	3.7	2.6	79
14-----	7.9	7.9	13	37	24	57	49	17	49	3.7	2.6	35
15-----	7.9	7.9	14	33	24	55	49	1,780	42	3.4	2,430	11
16-----	7.9	6.9	15	31	26	46	44	844	35	3.0	293	23
17-----	9.0	6.9	16	35	26	44	40	161	34	2.9	68	29
18-----	7.9	7.9	16	33	23	46	37	80	21	2.9	35	18
19-----	7.9	9.0	16	31	23	42	37	53	21	3.0	21	13
20-----	6.9	9.0	16	31	23	42	53	42	18	2.9	14	10
21-----	5.8	9.0	17	33	20	64	67	38	18	2.9	7.9	7.9
22-----	5.8	9.0	17	33	17	49	57	28	17	3.4	4.8	5.8
23-----	5.8	10	429	83	18	42	49	24	17	4.4	4.8	4.4
24-----	5.8	9.0	1,000	53	18	38	40	912	16	4.4	4.8	4.4
25-----	7.9	9.0	138	42	20	35	46	11,900	14	4.1	4.1	4.1
26-----	7.9	20	80	33	20	31	178	1,060	11	3.7	3.7	4.1
27-----	6.9	16	60	29	40	31	86	206	11	3.0	2.9	3.7
28-----	5.8	11	35	24	312	31	53	122	9.0	2.8	2.9	3.4
29-----	5.8	9.0	28	23	-----	33	40	7,050	9.0	2.8	3.7	3.0
30-----	5.8	9.0	26	23	-----	5,530	31	857	6.9	19	2.9	2.8
31-----	7.9	-----	23	26	-----	4,690	-----	216	-----	17	2.9	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October-----	14	5.8	8.82	542
November-----	20	5.8	8.94	532
December-----	1,000	9.0	67.3	4,140
January-----	498	21	60.2	3,700
February-----	312	17	34.6	1,920
March-----	5,530	31	402	24,700
April-----	698	31	90.7	5,400
May-----	11,900	17	836	51,400
June-----	210	6.9	43.7	2,600
July-----	19	2.8	4.97	306
August-----	2,430	2.6	96.3	5,920
September-----	2,560	2.8	111	6,600
The year-----	11,900	2.6	149	108,000

## LEON RIVER NEAR BELTON, TEX.

LOCATION.—Water-stage recorder a quarter of a mile above Temple-Belton highway bridge and 2 miles east of Belton, Bell County.

DRAINAGE AREA.—3,550 square miles.

RECORDS AVAILABLE.—October 1923 to September 1933.

DISCHARGE.—Maximum during year, 14,000 second-feet May 25 (gage height, 10.41 feet); minimum, 5.2 second-feet Sept. 10 (gage height, 2.39 feet).

1923-33: Maximum stage, 15.35 feet Oct. 6, 1930 (discharge not determined); no flow at times. Average, 10 years, 441 second-feet.

Highest known stages, 21.0 feet in September 1921 and about 25 feet in December 1913.

REMARKS.—Records of daily discharge not sufficiently accurate for publication. Monthly records fair. Several small pumping plants divert water above station.

*Discharge, in second-feet, 1932-33*

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	183	18	52.3	3,220
November.....	53	18	34.4	2,050
December.....	255	32	73.6	4,530
January.....	1,080	115	311	19,100
February.....	282	149	167	9,280
March.....	1,030	154	343	21,100
April.....	2,040	160	512	30,500
May.....	7,080	96	1,420	87,800
June.....	3,400	44	352	20,900
July.....	1,660	14	152	9,350
August.....	105	14	32.0	1,970
September.....	223	6.0	46.3	2,760
The year.....	7,080	6.0	293	212,000



## LITTLE RIVER AT CAMERON, TEX.

LOCATION.—Chain gage on highway bridge three-quarters of a mile above Gulf, Colorado & Santa Fe Railway bridge and 2 miles southeast of Cameron, Milam County.

DRAINAGE AREA.—7,030 square miles.

RECORDS AVAILABLE.—November 1916 to September 1933.

DISCHARGE.—Maximum during year, 8,820 second-feet May 28 (gage height, 24.60 feet); minimum, 55 second-feet Sept. 11.

1916-33: Maximum (determined by slope-area method), 647,000 second-feet Sept. 10, 1921 (gage height, about 53.8 feet, present datum); minimum, 2.6 second-feet Sept. 3, 5, 7, 1918. Average, 16 years (1917-33), 1,720 second-feet.

REMARKS.—Records good except those partly estimated or interpolated, which are fair. Numerous small diversions for irrigation and municipal uses affect flow only during extremely low stages. Slight regulation caused by pumping above station.

## Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	380	146	137	* 296	2, 590	1, 080	* 1, 840	380	5, 670	143	6, 660	* 632
2	* 347	146	141	301	798	696	* 1, 330	326	4, 040	* 130	2, 190	* 564
3	314	144	141	301	663	696	1, 620	339	* 3, 260	116	468	* 352
4	326	143	* 144	278	597	630	2, 220	339	* 1, 840	112	314	246
5	352	139	148	267	* 548	* 1, 370	2, 180	480	970	109	246	184
6	301	* 146	148	352	500	6, 900	1, 150	* 730	798	99	* 206	134
7	267	153	153	663	468	3, 440	730	* 696	663	96	166	102
8	256	150	157	1, 420	* 564	1, 660	630	564	597	96	143	86
9	* 240	137	157	3, 920	468	1, 180	* 564	380	532	* 92	128	78
10	224	132	157	2, 300	408	970	532	438	468	88	125	* 66
11	214	128	* 152	1, 330	408	1, 180	597	408	* 404	84	112	55
12	214	118	146	764	* 423	* 1, 150	1, 150	352	339	74	106	820
13	214	* 128	146	597	438	970	1, 330	326	352	73	* 98	468
14	204	137	146	663	438	935	935	* 286	339	69	90	301
15	204	130	146	* 630	468	832	* 730	246	352	66	80	204
16	* 190	126	157	564	438	730	* 599	214	468	* 66	141	235
17	175	128	155	500	408	663	468	504	438	66	564	* 192
18	166	132	* 180	468	408	630	438	1, 040	* 370	66	204	150
19	157	132	204	438	* 408	* 614	408	663	301	65	107	112
20	157	* 136	184	408	408	597	438	* 468	267	65	* 92	91
21	148	139	175	390	380	564	438	* 832	256	65	76	76
22	143	137	175	* 691	352	532	630	1, 080	235	65	76	135
23	* 159	137	194	696	339	532	* 630	1, 000	214	* 65	135	184
24	175	144	544	468	339	798	630	900	224	65	141	* 148
25	166	143	* 866	380	339	1, 110	532	2, 670	* 204	65	126	112
26	157	175	630	352	* 339	* 696	500	3, 860	184	184	126	91
27	157	* 162	408	326	1, 190	597	564	6, 710	175	68	* 101	85
28	157	150	339	314	2, 140	532	438	8, 540	166	65	76	73
29	155	144	278	* 314	-----	730	* 419	8, 210	152	* 65	130	70
30	* 152	132	278	6, 090	-----	730	* 400	7, 220	150	* 271	214	66
31	150	-----	290	7, 600	-----	564	-----	7, 220	-----	4, 660	246	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	380	143	214	13, 200
November	175	118	140	8, 330
December	866	137	235	14, 400
January	7, 600	267	1, 100	67, 600
February	2, 590	339	617	34, 300
March	6, 900	532	1, 110	68, 200
April	2, 220	400	836	49, 700
May	8, 540	214	1, 850	114, 000
June	5, 670	150	814	48, 400
July	4, 660	65	239	14, 700
August	6, 660	76	442	27, 200
September	820	55	204	12, 100
The year	8, 540	55	652	472, 000

\* Interpolated or partly estimated.

## LAMPASAS RIVER AT YOUNGSPORT, TEX.

LOCATION.—Water-stage recorder 300 feet above highway bridge and half a mile southeast (corrected) of Youngsfort, Bell County.

DRAINAGE AREA.—1,240 square miles.

RECORDS AVAILABLE.—February 1924 to September 1933.

DISCHARGE.—Maximum during year, 19,400 second-feet May 25 (gage height, 16.12 feet); minimum discharge, 9.2 second-feet Aug. 14, Sept. 23.

1924–33: Maximum stage, 23.70 feet Oct. 2, 1927 (discharge not determined); no flow July 17 to Aug. 18, 1925.

Flood of Dec. 2, 1913, reached a stage of 35.1 feet; flood of September 1873 reached a stage of about 44.2 feet (present gage datum).

REMARKS.—Records below 7,000 second-feet good; above, poor. Small diversion above station for municipal uses.

*Discharge, in second-feet, 1932–33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	43	16	22	20	68	186	330	45	151	15	56	93
2	43	16	23	19	62	130	155	41	130	15	30	41
3	36	16	23	19	58	111	111	38	119	14	22	23
4	31	16	25	19	58	100	96	238	104	14	18	18
5	30	17	23	19	56	135	86	389	93	13	16	15
6	28	17	22	18	54	313	75	155	82	13	14	13
7	27	22	20	19	54	235	64	86	71	12	14	12
8	27	19	20	389	51	172	62	58	64	12	13	12
9	25	19	20	290	51	147	62	47	60	11	13	34
10	25	20	20	138	51	134	592	41	58	11	12	51
11	24	19	22	100	51	115	266	36	54	11	11	80
12	24	19	20	78	51	123	115	31	51	11	10	45
13	24	20	20	68	51	127	75	30	121	11	9.8	23
14	24	19	20	62	51	119	62	27	86	10	9.2	17
15	23	19	23	60	51	108	56	306	56	11	11	15
16	23	19	24	60	51	93	54	756	47	11	10	12
17	23	19	24	60	51	89	51	172	43	12	10	12
18	23	18	25	60	47	96	49	75	38	12	12	12
19	22	19	24	60	47	100	47	47	33	12	12	11
20	22	19	24	60	47	93	165	36	31	11	11	10
21	19	19	24	58	43	82	432	30	28	10	10	10
22	19	19	24	56	43	82	108	25	25	10	10	10
23	19	20	31	54	43	82	62	24	25	9.8	11	9.2
24	19	23	31	56	43	78	100	22	24	9.8	11	9.8
25	18	23	47	54	43	78	60	7,600	23	10	11	10
26	17	25	45	49	47	78	49	3,180	22	9.8	12	10
27	18	23	33	49	68	75	108	556	19	9.8	12	13
28	18	23	27	47	217	75	68	330	18	265	13	13
29	18	22	24	51	-----	82	56	639	16	557	14	14
30	16	22	23	60	-----	477	47	263	16	240	53	12
31	16	-----	22	86	-----	1,460	-----	181	-----	127	295	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	43	16	24.0	1,480
November	25	16	19.6	1,170
December	47	20	25.0	1,540
January	389	18	72.2	4,440
February	217	43	57.4	3,190
March	1,460	75	173	10,600
April	592	47	122	7,260
May	7,600	22	500	30,700
June	151	16	56.9	3,390
July	557	9.8	48.4	2,980
August	295	9.2	24.7	1,520
September	93	9.2	22.0	1,310
The year	7,600	9.2	96.2	69,600

## SAN GABRIEL RIVER AT CIRCLEVILLE, TEX.

LOCATION.—Chain gage on highway bridge half a mile northwest of Circleville Williamson County, and half a mile above Missouri-Kansas-Texas Railroad bridge.

DRAINAGE AREA.—602 square miles.

RECORDS AVAILABLE.—February 1924 to September 1933.

DISCHARGE.—Maximum during year, 3,850 second-feet July 30 (gage height, 12.98 feet); minimum, 1.9 second-feet July 26–28 (gage height, 1.20 feet).

1924–33: Maximum, about 53,400 second-feet May 29, 1929 (gage height, 34.20 feet); no flow Sept. 5, 6, 8, 11, 1924.

Maximum stage known, about 40.6 feet in September 1921.

REMARKS.—Records below 100 second-feet good; above, fair. Discharge partly estimated July 23 and Aug. 20. No diversions above station.

*Discharge, in second-feet, 1932–33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	26	17	13	22	106	78	71	26	29	4.2	79	106
2	26	10	14	21	89	75	71	25	23	3.7	31	69
3	26	10	14	19	83	70	66	24	20	3.7	15	25
4	21	11	14	19	78	69	61	50	17	3.7	9.0	15
5	20	14	14	17	70	70	50	67	14	3.2	8.2	10
6	18	14	14	17	70	161	54	43	13	3.2	6.7	8.2
7	20	14	13	636	70	156	53	29	11	3.2	6.0	7.1
8	20	11	13	211	58	120	56	25	8.2	3.7	6.0	6.0
9	21	11	14	110	63	106	56	23	5.2	3.7	6.7	6.0
10	20	11	13	205	74	91	53	22	4.7	3.2	6.0	5.2
11	18	13	14	56	56	88	56	17	7.5	2.4	6.0	5.2
12	17	11	15	38	63	92	48	14	9.0	2.7	5.2	20
13	17	11	17	39	69	91	48	20	8.2	2.7	6.0	6.7
14	18	13	17	39	69	87	45	18	7.5	2.7	34	5.2
15	17	11	17	36	63	79	43	20	4.7	2.7	31	5.2
16	17	14	18	40	61	79	43	60	6.7	2.7	9.0	5.2
17	15	15	20	40	58	79	40	43	6.0	3.7	5.6	5.2
18	15	17	20	40	56	76	38	25	6.0	3.7	5.0	4.7
19	14	17	18	36	56	79	36	17	6.7	3.2	15	4.2
20	14	15	18	36	56	67	58	15	6.0	2.5	17	3.7
21	14	14	20	37	53	71	58	13	6.7	3.2	12	3.4
22	14	17	20	41	58	71	45	13	5.2	10	5.2	3.2
23	13	18	33	39	58	69	48	9.0	5.2	10	3.7	2.7
24	12	28	74	37	50	75	38	6.7	5.0	3.7	6.0	2.2
25	11	18	46	32	61	76	35	410	4.7	2.2	5.2	9.0
26	13	13	30	30	75	69	35	308	4.2	1.9	5.2	7.5
27	13	14	22	32	80	69	33	70	4.2	1.9	4.7	6.7
28	14	13	21	30	78	121	29	44	5.2	1.9	4.7	6.0
29	14	14	22	166	-----	113	28	99	4.7	105	6.0	8.2
30	14	13	27	197	-----	79	26	106	3.7	2,470	8.2	7.5
31	14	-----	24	134	-----	79	-----	58	-----	883	45	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	26	11	17.0	1,050
November	28	10	14.1	839
December	74	13	20.9	1,290
January	636	17	79.1	4,860
February	106	50	67.2	3,730
March	161	67	87.3	5,370
April	71	26	47.4	2,820
May	410	6.7	55.5	3,410
June	29	3.7	8.74	520
July	2,470	1.9	115	7,070
August	79	3.7	13.3	818
September	106	2.4	12.6	750
The year	2,470	1.9	44.9	32,500

## YEGUA CREEK NEAR SOMERVILLE, TEX.

LOCATION.—Chain gage on Gulf, Colorado & Santa Fe Railway bridge 2 miles south of Somerville, Burleson County. Gage reading gives distance between water surface and base of rail. Zero of gage (base of rail) is 233.52 feet above mean sea level (railway datum).

DRAINAGE AREA.—990 square miles.

RECORDS AVAILABLE.—May 1924 to September 1933.

DISCHARGE.—Maximum during year, 4,400 second-feet Jan. 31 (gage height, —25.0 feet); no flow at times.

1924–33: Maximum discharge, about 33,600 second-feet May 30, 1929 (gage height, —17.02 feet); no flow at times.

REMARKS.—Monthly records fair. Gage read about 3 times a week; discharge estimated for days when gage was not read. Record of daily discharge not sufficiently accurate for publication. No diversions above station.

*Discharge, in second-feet, 1932–33*

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	725	0.1	47.8	2,940
November.....	3.0	.1	.72	43
December.....	78	.1	23.8	1,460
January.....	4,400	8.5	396	24,300
February.....	4,120	72	734	40,800
March.....	1,450	30	480	29,500
April.....	363	8.5	66.2	3,940
May.....	795	0	92.8	5,710
June.....	107	0	18.4	1,090
July.....	116	0	19.8	1,220
August.....	195	0	33.1	2,040
September.....	195	0	16.9	1,010
The year.....	4,400	0	158	114,000

## NAVASOTA RIVER NEAR EASTERLY, TEX.

LOCATION.—Water-stage recorder at highway bridge 3,000 feet above Missouri Pacific Railroad bridge and 6 miles northeast of Easterly, Robertson County. Zero of gage is 276.42 feet above mean sea level.

DRAINAGE AREA.—949 square miles.

RECORDS AVAILABLE.—March 1924 to September 1933.

DISCHARGE.—Maximum during year, 5,110 second-feet Apr. 1 (gage height, 15.35 feet); minimum, 1.3 second-feet Aug. 29.

1924-33: Maximum, about 48,500 second-feet Sept. 5, 1932 (gage height, 21.9 feet); no flow during several periods.

REMARKS.—Records for very low stages fair; others good. No diversions above station.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	19	6.3	8.4	643	196	616	3,420	65	400	3.7	3.4	3.2
2	18	6.2	9.1	584	176	632	3,260	166	323	3.7	3.4	2.8
3	16	6.3	10	334	213	462	1,750	100	131	3.5	3.1	2.7
4	14	6.6	11	119	231	188	554	86	81	3.4	3.0	3.2
5	13	7.0	11	68	131	212	187	106	41	3.2	2.9	34
6	11	7.2	12	50	81	624	121	260	32	3.1	2.8	22
7	10	7.2	11	68	67	982	91	246	26	3.1	3.2	12
8	9.6	7.6	10	700	63	1,510	74	130	22	3.0	3.8	6.8
9	9.4	7.6	9.9	1,400	79	1,600	66	64	19	3.0	3.6	5.1
10	9.4	7.6	9.9	2,680	114	670	61	41	16	2.9	3.4	5.2
11	8.9	7.2	10	2,680	77	218	62	32	15	2.9	3.1	23
12	8.4	7.0	11	1,120	57	136	53	27	20	2.9	2.9	4.9
13	8.4	6.6	12	286	52	105	74	23	21	2.8	2.8	3.9
14	8.2	6.8	14	136	58	89	213	20	19	2.8	2.8	4.0
15	8.0	7.2	15	94	122	77	118	19	14	2.7	2.6	15
16	7.8	7.2	26	76	117	69	136	17	12	2.7	2.5	32
17	7.6	7.4	29	87	136	63	207	16	9.6	2.6	2.5	34
18	7.2	7.8	29	131	161	60	154	15	8.6	2.5	2.7	20
19	6.6	7.6	25	191	114	59	81	14	7.8	2.5	2.5	12
20	6.3	7.6	24	186	131	54	87	12	7.0	2.4	2.3	7.2
21	6.3	7.8	33	165	83	50	236	11	6.3	2.4	2.1	5.4
22	6.2	8.2	38	285	60	48	341	10	5.8	2.4	2.0	4.3
23	6.0	11	67	700	53	48	141	9.9	5.4	2.4	2.1	3.7
24	6.3	34	358	1,080	50	106	78	9.6	5.1	2.4	1.9	3.5
25	6.8	23	400	1,070	48	748	54	304	4.7	2.4	1.7	3.5
26	8.0	17	536	470	93	1,340	44	2,050	4.5	2.4	1.6	3.5
27	9.1	13	458	164	430	708	40	4,070	4.3	2.4	1.5	3.5
28	9.9	11	160	101	664	236	40	3,930	4.0	2.4	1.4	3.8
29	8.6	9.4	80	85	-----	121	41	2,440	3.9	2.7	1.8	3.6
30	7.8	8.6	450	156	-----	85	36	947	3.8	2.9	6.5	3.4
31	7.0	-----	552	186	-----	669	-----	415	-----	3.5	3.4	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	19	6.0	9.32	573
November	34	6.2	9.50	565
December	552	8.4	111	6,820
January	2,680	50	519	31,900
February	664	48	138	7,660
March	1,600	48	406	25,000
April	3,420	36	394	23,400
May	4,070	9.6	505	31,100
June	400	3.8	42.4	2,520
July	3.7	2.4	2.83	174
August	6.5	1.4	2.75	169
September	34	2.7	9.71	578
The year	4,070	1.4	180	130,000

## BRAZOS VALLEY IRRIGATION CO.'S CANAL NEAR FULSHEAR, TEX.

LOCATION.—Water-stage recorder 1 mile below point of diversion and 3 miles south of Fulshear, Fort Bend County.

RECORDS AVAILABLE.—October 1931 to September 1933.

DISCHARGE.—Maximum during year, 249 second-feet May 21 (gage height, 9.47 feet); no flow at times.

1931-33: Maximum, 280 second-feet July 11, 1932; maximum stage, 9.47 feet May 21, 1933; no flow at times.

REMARKS.—Daily records fair; monthly records good. Station above all diversions from canal. Flow controlled by pumping plant. Canal diverts from left bank of Brazos River 14½ miles above Richmond. Water used for irrigation near Sugarland.

*Discharge, in second-feet, 1932-33*

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1.....	0	100	118	120	15	25	16.....	0	101	73	244	75	0
2.....	0	97	124	120	117	0	17.....	0	99	63	169	119	0
3.....	0	61	126	65	140	0	18.....	0	96	53	98	94	0
4.....	0	0	117	119	139	0	19.....	0	112	66	0	23	0
5.....	0	0	111	119	134	0	20.....	0	153	118	15	0	0
6.....	0	0	183	120	152	0	21.....	0	249	119	119	0	0
7.....	0	0	178	119	164	0	22.....	0	167	118	75	19	0
8.....	0	0	188	158	123	49	23.....	0	169	122	0	103	0
9.....	0	0	188	131	120	33	24.....	6.9	161	117	10	52	0
10.....	0	8.9	185	123	119	0	25.....	39	106	116	0	119	0
11.....	0	105	230	123	73	0	26.....	93	0	117	0	119	0
12.....	0	34	119	123	78	0	27.....	116	0	116	0	166	0
13.....	0	0	112	123	79	0	28.....	84	0	117	0	134	0
14.....	0	3.8	117	123	119	0	29.....	36	0	118	0	120	0
15.....	0	97	114	163	46	0	30.....	54	0	117	0	68	0
							31.....		13		0	56	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April.....	116	0	14.3	851
May.....	249	0	62.3	3,830
June.....	230	53	125	7,440
July.....	244	0	83.2	5,120
August.....	166	0	93.1	5,720
September.....	49	0	3.57	212
The year.....	249	0	32.0	23,200

NOTE.—No flow during months omitted.

## RICHMOND IRRIGATION CO.'S CANAL NEAR RICHMOND, TEX.

LOCATION.—Water-stage recorder 600 feet below crossing of Richmond-Rosenberg highway, about 1½ miles below point of diversion, and 1½ miles west of Richmond, Fort Bend County.

RECORDS AVAILABLE.—October 1931 to September 1933.

DISCHARGE.—Maximum during year not determined; no flow at times.

1932-33: Maximum not determined; no flow at times.

REMARKS.—Records fair. Discharge estimated May 3-10 and Aug. 19 to Sept. 2. Station above all diversions from canal. Flow controlled by pumping plant. Canal diverts from right bank of Brazos River 5 miles above Richmond. Water used for irrigation south of Richmond. Records Oct. 1 to Apr. 18 furnished by Richmond Irrigation Co.

*Discharge, in second-feet, 1932-33*

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1-----	0	80	137	17	0	16-----	74	182	175	137	71
2-----	0	108	160	94	12	17-----	69	178	130	122	69
3-----	65	94	137	116	0	18-----	72	164	119	119	58
4-----		116	137	119	0	19-----	80	164	134		41
5-----		119	134	130	0	20-----	83	175	119	50	36
6-----		119	134	148	0	21-----	91	171	108		32
7-----	100	186	122	137	0	22-----	64	152	78		22
8-----		194	126	141	0	23-----	53	145	18		0
9-----		194	186	145	0	24-----	60	171	49		0
10-----		194	130	141	15	25-----	31	156	0		0
11-----	102	190	130	141	85	26-----	0	122	0	100	0
12-----	98	178	126	167	88	27-----	0	126	16		0
13-----	98	167	134	202	88	28-----	0	130	88		0
14-----	65	175	126	145	79	29-----	0	122	51		0
15-----	56	178	134	145	80	30-----	17	134	0		0
						31-----	62		0	42	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May-----		0	62.6	3,850
June-----	194	80	153	9,100
July-----	186	0	101	6,210
August-----	202	17	112	6,890
September-----	88	0	25.9	1,540
The year-----	202	0	38.1	27,600

NOTE.—No flow during months omitted.

## COLORADO RIVER BASIN

## COLORADO RIVER AT BALLINGER, TEX.

LOCATION.—Water-stage recorder at Ballinger-Paint Rock highway bridge in Ballinger, Runnels County. Zero of gage is 1,594.4 feet above mean sea level.

DRAINAGE AREA.—16,800 square miles, of which about 11,500 square miles is probably noncontributing.

RECORDS AVAILABLE.—December 1915 to September 1933.

DISCHARGE.—Maximum during year, 4,700 second-feet May 29; maximum gage height, 7.18 feet May 15; minimum, 1.3 second-feet July 2-4, 7-9; minimum gage height, 1.08 feet July 4, 7-9.

1916-33: Maximum, about 33,500 second-feet June 14, 1930 (gage height, 27.45 feet); no flow at times. Average, 18 years (1915-33), 407 second-feet.

REMARKS.—Records good except those estimated, which are poor. Discharge partly estimated Dec. 27 to Jan. 11, Aug. 7-9, Sept. 6-12. During periods of heavy local rains backwater from Elm Creek below gage affects records. Diversions for irrigation above station affect low flow.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	598	85	58	214	54	60	40	14	113	1.4	3.5	825
2.....	483	82	58	202	54	58	33	14	80	1.3	1,650	420
3.....	410	93	58	189	54	56	30	12	63	1.3	837	243
4.....	352	93	58	176	56	54	27	9.4	48	1.3	430	165
5.....	298	90	58	169	56	58	25	7.6	38	1.4	218	120
6.....	262	85	58	158	56	56	25	7.6	32	1.4	126	96
7.....	248	82	58	184	56	52	25	7.6	25	1.3	77	75
8.....	223	75	56	228	56	50	25	6.8	21	1.3	65	58
9.....	206	72	54	107	56	50	24	6.4	18	59	58	48
10.....	193	72	54	93	54	48	24	6.4	15	200	44	46
11.....	180	68	56	82	54	46	24	6.0	11	99	32	42
12.....	173	65	56	77	52	46	22	6.0	11	58	24	40
13.....	162	65	56	75	52	46	21	5.6	11	40	19	150
14.....	184	65	54	72	50	44	21	200	8.0	28	14	432
15.....	150	65	58	70	50	40	19	*1,110	8.0	19	7.6	152
16.....	143	65	60	70	50	38	19	216	7.6	15	7.2	113
17.....	136	65	58	70	52	38	19	70	6.8	12	5.2	121
18.....	133	65	56	70	50	38	21	40	6.0	85	8.7	314
19.....	123	65	56	68	50	36	22	30	5.2	176	8.0	228
20.....	113	65	58	65	48	36	18	24	4.8	319	12	143
21.....	107	65	60	65	46	40	18	18	4.0	143	5.2	88
22.....	107	63	63	63	44	38	56	15	3.2	65	3.0	65
23.....	104	63	104	63	44	36	38	26	2.7	50	1.9	52
24.....	104	60	1,390	60	46	36	33	*488	2.4	36	2.2	42
25.....	102	60	2,140	58	50	35	33	189	2.2	25	2.2	33
26.....	96	60	1,080	56	60	33	28	60	2.2	18	8.8	30
27.....	93	60	589	54	72	32	27	1,270	1.9	8.0	26	25
28.....	90	60	392	54	82	32	24	778	1.7	5.2	1,790	22
29.....	90	60	283	54	-----	765	21	2,020	1.4	3.7	2,540	18
30.....	88	60	314	54	-----	126	16	498	1.4	3.0	2,090	15
31.....	88	-----	283	56	-----	54	-----	194	-----	3.2	1,200	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	598	88	188	11,600
November.....	93	60	69.8	4,150
December.....	2,140	54	253	15,600
January.....	228	54	99.2	6,100
February.....	82	44	53.7	2,980
March.....	765	32	70.2	4,320
April.....	56	16	25.9	1,540
May.....	2,020	5.6	237	14,600
June.....	113	1.4	18.5	1,100
July.....	319	1.3	47.8	2,940
August.....	2,540	1.9	365	22,400
September.....	825	15	141	8,390
The year.....	2,540	1.3	132	95,700

\* Estimated.



## COLORADO RIVER NEAR MILBURN, TEX.

LOCATION.—Combination staff and chain gage at steel highway bridge  $1\frac{1}{2}$  miles northwest of Milburn, McCullough County. Zero of gage is 1,254.61 feet above mean sea level.

DRAINAGE AREA.—24,600 square miles, of which about 11,800 square miles is probably noncontributing.

RECORDS AVAILABLE.—November 1923 to September 1933.

DISCHARGE.—Maximum during year, 23,100 second-feet May 25 (gage height, 28.00 feet); minimum, 0.7 second-foot July 15.

1923-33: Maximum, 76,100 second-feet Oct. 15, 1930 (gage height, 48.71 feet); no flow Aug. 8-10 and Sept. 1-5, 1929.

REMARKS.—Records good. Diversions for irrigation and municipal use above station.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,240	208	208	751	224	248	260	56	578	3.4	20	1,100
2	1,060	197	204	606	216	260	156	46	352	3.0	17	924
3	873	204	212	474	212	248	112	42	256	2.6	14	606
4	782	260	212	424	208	236	92	216	197	2.4	816	399
5	720	578	212	424	204	232	80	85	162	2.2	594	268
6	662	606	212	399	212	232	71	71	136	1.8	374	204
7	578	370	208	399	204	232	65	57	116	1.6	264	153
8	525	288	204	552	208	240	60	56	100	1.4	182	121
9	449	302	204	634	204	220	59	55	81	1.3	133	98
10	424	347	204	525	200	200	57	70	68	1.2	102	83
11	399	338	197	399	197	193	54	96	59	1.1	83	68
12	399	334	197	365	197	193	55	62	50	1.0	83	59
13	370	293	204	338	197	193	55	56	41	.9	71	66
14	356	244	204	311	204	186	48	149	35	.8	59	448
15	365	236	212	302	204	179	60	7,560	30	22	444	138
16	474	240	228	298	204	175	56	5,930	26	57	281	322
17	449	236	228	293	204	172	55	1,230	22	47	56	224
18	424	232	220	284	200	165	56	525	18	44	43	153
19	374	236	220	280	197	159	74	329	17	36	40	150
20	356	236	212	268	200	153	76	212	14	32	24	162
21	329	232	204	268	190	153	73	147	12	27	17	260
22	302	224	204	260	182	153	71	119	11	100	14	182
23	293	200	232	248	179	147	182	102	11	197	12	131
24	293	197	399	240	179	147	128	933	11	126	11	100
25	288	193	1,440	232	182	144	200	16,300	9.6	90	9.2	80
26	288	190	2,250	228	197	133	244	1,720	7.8	65	155	68
27	280	190	1,400	220	248	124	153	578	6.7	50	249	55
28	264	182	934	216	232	114	116	324	5.6	41	138	47
29	252	190	720	220	-----	106	89	1,020	4.4	36	1,490	41
30	252	204	812	236	-----	163	70	1,600	3.7	30	2,960	36
31	236	-----	812	228	-----	552	-----	1,060	-----	24	2,050	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	1,240	236	463	28,500
November	606	182	266	15,300
December	2,250	197	439	27,000
January	751	216	352	21,600
February	248	179	203	11,300
March	552	106	195	12,000
April	260	48	97.6	5,810
May	16,300	42	1,320	81,200
June	578	3.7	81.4	4,840
July	197	.8	33.8	2,080
August	2,960	9.2	349	21,500
September	1,100	36	225	13,400
The year	16,300	.8	338	245,000

## COLORADO RIVER NEAR SAN SABA, TEX.

LOCATION.—Water-stage recorder at Red Bluff crossing, 5.7 miles below confluence with San Saba River and 9.2 miles east of San Saba, San Saba County.

DRAINAGE AREA.—30,600 square miles, of which about 11,800 square miles is probably noncontributing.

RECORDS AVAILABLE.—August 1930 to September 1933.

DISCHARGE.—Maximum during year, 26,600 second-feet May 26 (gage height, 20.14 feet); minimum, 51 second-feet July 8, 9.

1930-33: Maximum, 78,900 second-feet Oct. 17, 1930 (gage height, 39.90 feet); minimum, 40 second-feet Oct. 13, 1931.

Flood of Sept. 25, 1900, reached a stage of about 57.5 feet. Flood of Apr. 6, 1922, reached a stage of about 54 feet.

REMARKS.—Records good. Discharge partly estimated Sept. 2, 3. Diversions above station for irrigation and municipal use.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	2,290	489	370	2,300	384	511	1,000	198	1,380	64	90	2,340
2.....	1,740	472	375	1,620	380	425	582	179	770	62	83	1,480
3.....	1,460	450	380	1,160	370	404	370	167	550	61	74	1,160
4.....	1,300	435	375	826	365	404	291	215	430	59	68	826
5.....	1,120	484	375	717	356	394	252	389	365	59	298	555
6.....	1,040	629	375	675	346	389	433	346	314	58	722	420
7.....	956	1,100	370	699	341	389	274	226	282	56	522	332
8.....	900	676	365	2,140	337	394	248	182	248	51	370	265
9.....	839	555	365	1,600	332	384	346	167	218	1,280	278	226
10.....	774	484	365	1,040	332	370	332	155	198	439	222	202
11.....	735	533	370	949	332	360	245	3,960	188	142	185	176
12.....	711	561	365	742	332	351	222	4,850	192	105	158	173
13.....	687	573	360	651	322	346	1,260	563	167	94	142	150
14.....	669	538	365	597	332	332	278	233	152	81	132	134
15.....	651	489	370	561	332	323	198	3,110	145	72	145	516
16.....	627	445	380	538	332	314	179	9,300	134	62	529	384
17.....	705	430	384	528	332	318	173	8,130	129	59	536	229
18.....	693	425	389	528	332	314	170	1,930	122	56	277	386
19.....	681	425	389	506	328	305	179	861	122	56	173	309
20.....	645	420	394	462	323	300	400	520	117	62	137	248
21.....	615	420	380	445	328	291	376	375	112	105	117	215
22.....	603	420	384	440	328	278	215	501	103	92	105	222
23.....	573	420	414	430	323	278	300	550	92	77	101	282
24.....	544	409	561	425	323	274	380	287	83	72	96	241
25.....	528	394	1,390	409	318	269	309	8,790	81	151	92	211
26.....	522	384	2,840	394	328	269	433	25,000	79	170	85	185
27.....	516	380	2,870	384	425	269	1,220	9,500	74	139	83	167
28.....	641	375	1,900	375	591	265	365	1,350	68	117	81	152
29.....	585	375	1,340	370	-----	256	265	912	66	101	210	145
30.....	511	375	1,000	384	-----	395	222	1,580	64	96	1,560	134
31.....	494	-----	2,150	399	-----	1,170	-----	2,180	-----	94	2,970	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	2,290	494	818	50,300
November.....	1,100	375	486	28,900
December.....	2,870	360	732	45,000
January.....	2,300	370	751	46,200
February.....	591	318	350	19,400
March.....	1,170	256	366	22,500
April.....	1,260	170	384	22,800
May.....	25,000	155	2,800	172,000
June.....	1,380	64	235	14,000
July.....	1,280	51	136	8,300
August.....	2,970	68	343	21,100
September.....	2,340	134	416	24,800
The year.....	25,000	51	657	475,000

## COLORADO RIVER NEAR TOW, TEX.

LOCATION.—Water-stage recorder at highway bridge  $1\frac{1}{4}$  miles northeast of Tow, Llano County.

DRAINAGE AREA.—31,100 square miles, of which about 11,800 square miles is probably noncontributing.

RECORDS AVAILABLE.—October 1923 to September 1933.

DISCHARGE.—Maximum during year, 25,300 second-feet May 26 (gage height, 15.83 feet); minimum, 62 second-feet July 9 (gage height, 5.40 feet).

1923-33: Maximum 69,900 second-feet Oct. 17, 1930 (gage height, 22.53 feet); minimum, 20 second-feet Aug. 5, 1930 (gage height, 4.93 feet). Average, 10 years, 1,430 second-feet.

Maximum stage known, 28.4 feet in April 1900.

REMARKS.—Records good except those estimated, which are fair. Numerous small diversions above station.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3,200	470	383	2,940	448	772	1,530	254	2,220		107	2,330
2	2,010	462	383	1,890	441	627	1,060	212	1,280		100	1,990
3	1,660	441	383	1,540	426	515	704	197	861		96	1,340
4	1,420	433	390	1,180	419	485	478	240	636	70	88	1,150
5	1,260	515	390	940	412	515	364	240	500		76	780
6	1,150	515	397	843	390	492	303	469	419		200	562
7	1,070	832	383	890	383	462	528	426	364	64	712	412
8	990	1,110	383	1,410	370	462	339	270	339	64	508	326
9	940	738	377	2,140	364	470	292	201	333	62	377	264
10	870	610	370	1,410	370	441	552	178	326	1,230	286	245
11	780	515	383	1,160	377	433	426	428	320	464	226	197
12	738	594	383	1,040	370	412	292	7,080	309	193	189	169
13	704	636	405	861	370	397	628	1,980	314	130	162	156
14	670	644	412	763	377	383	984	572		104	142	150
15	644	602	412	695	377	358	352	727		94	130	130
16	610	515	419	670	377	352	230	8,240		84	130	472
17	594	478	426	636	377	345	197	10,000		76	445	426
18	712	448	419	627	370	345	178	3,810		69	538	254
19	695	441	419	610	377	333	178	1,500		66	314	320
20	661	441	441	594	370	314	205	950		66	189	314
21	610	433	455	546	358	309	440	670	156	66	147	264
22	570	433	470	522	345	303	470	508		64	124	208
23	554	441	492	508	345	292	339	719		104	109	189
24	530	478	508	485	339	292	405	652		107	100	250
25	500	455	678	478	339	292	470	6,530		92	104	240
26	485	405	2,280	455	352	281	390	21,900		92	98	205
27	485	397	3,140	441	455	286	920	16,500		186	86	175
28	485	390	2,400	419	586	292	909	2,470		166	78	153
29	689	383	1,710	405		292	455	1,360		140	73	140
30	554	383	1,340	419		687	320	1,340		127	108	124
31	485		1,130	419		931		1,780		118	3,000	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	3,200	485	881	54,200
November	1,110	383	521	31,000
December	3,140	370	728	44,800
January	2,940	405	901	55,400
February	586	339	389	21,600
March	931	281	425	26,100
April	1,530	178	498	29,600
May	21,900	178	2,980	183,000
June	2,220		362	21,500
July	1,230	62	143	8,790
August	3,000	73	292	18,000
September	2,330	124	464	27,600
The year	21,900	62	721	522,000

\* Partly estimated.

† Estimated.

## COLORADO RIVER AT AUSTIN, TEX.

LOCATION.—Water-stage recorder at Congress Avenue Viaduct, in Austin, Travis County. Zero of gage is 421.77 feet above mean sea level.

DRAINAGE AREA.—38,200 square miles, of which about 11,800 square miles is probably noncontributing.

RECORDS AVAILABLE.—February 1898 to September 1933.

DISCHARGE.—Maximum during year, 44,200 second-feet May 27 (gage height, 10.80 feet); minimum not determined.

1898-1933: Maximum, about 236,000 second-feet a few minutes after failure of Austin Dam, Apr. 7, 1900 (gage height, 33.5 feet). At time of failure the depth of water over dam was 11.07 feet (computed discharge, 151,000 second-feet); the flood appeared to be practically at its crest when dam failed. Minimum, 13 second-feet Aug. 18, 1918. Average, 35 years, 2,560 second-feet.

REMARKS.—Records good. Discharge partly estimated May 10-12. About 36,000 acres irrigated above station. Low-water flow affected by diversions of the Austin city pumping plant.

## Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4,310	890	693	2,150	916	942	638	994	2,750	210	737	1,020
2	5,880	878	682	1,830	890	1,490	830	759	2,780	196	490	1,340
3	4,850	818	693	2,660	866	1,650	1,360	616	3,050	182	354	2,350
4	3,770	794	693	2,750	866	1,600	1,610	605	2,430	168	266	2,300
5	2,880	806	682	2,320	830	1,490	1,410	530	1,850	154	210	1,890
6	2,430	794	693	1,960	818	1,290	1,060	500	1,480	147	189	1,540
7	2,170	818	693	1,830	842	1,360	842	470	1,200	140	175	1,270
8	2,000	854	693	1,680	737	1,560	759	426	1,010	96	168	981
9	1,870	916	693	2,140	682	1,484	660	480	866	154	161	770
10	1,720	1,270	682	3,770	704	1,270	682	616	759	119	154	616
11	1,630	1,320	693	3,640	693	1,170	671	540	693	119	298	490
12	1,540	1,080	693	2,800	682	1,110	572	460	627	112	418	418
13	1,480	903	682	2,130	704	1,040	627	504	594	178	410	370
14	1,390	830	693	1,850	715	1,010	682	4,240	540	500	370	330
15	1,310	854	704	1,600	704	890	583	3,040	500	490	450	282
16	1,220	854	759	1,440	704	854	649	2,000	470	434	426	258
17	1,170	854	748	1,290	715	782	878	7,660	480	370	338	234
18	1,110	854	759	1,240	715	782	737	12,200	470	306	282	196
19	1,080	806	782	1,170	726	759	583	9,120	434	234	330	175
20	1,060	770	770	1,120	715	704	520	4,740	418	189	394	250
21	1,100	759	782	1,110	704	671	442	2,820	402	154	520	354
22	1,060	737	782	1,110	715	671	418	1,950	394	182	520	362
23	1,040	798	866	1,060	726	649	442	1,490	378	196	442	362
24	968	770	866	994	715	664	490	1,160	370	189	370	410
25	968	748	878	981	770	649	638	1,100	354	168	306	354
26	890	748	1,240	968	770	616	759	2,880	330	154	258	378
27	866	748	1,480	890	854	616	878	33,200	298	154	234	354
28	842	737	2,000	818	842	671	818	28,700	274	140	242	322
29	842	726	3,380	959	-----	704	748	10,900	250	175	210	322
30	830	704	3,280	968	-----	693	878	5,430	226	1,150	203	290
31	830	-----	2,600	955	-----	682	-----	3,640	-----	770	432	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	5,880	830	1,780	109,000
November	1,320	704	848	50,500
December	3,380	682	1,040	64,000
January	3,770	818	1,680	103,000
February	916	682	761	42,300
March	1,650	616	984	60,500
April	1,610	418	762	45,300
May	33,200	426	4,640	285,000
June	3,050	226	899	52,900
July	1,150	96	256	15,700
August	737	154	334	20,500
September	2,350	175	686	4,800
The year	33,200	96	1,230	890,000

## EVAPORATION AT AUSTIN, TEX.

LOCATION.—In State Capitol grounds at Austin, Travis County.

RECORDS AVAILABLE.—April 1916 to September 1933.

EQUIPMENT.—One land evaporation pan with auxiliary equipment consisting of hook gage, rain gage, anemometer, and maximum and minimum thermometers.

REMARKS.—Records fair. Observations made daily at 8:00 a.m. Computations made by U.S. Weather Bureau.

*Evaporation at Austin, Tex., 1932-33*

Month	Temperature (°F.)			Mean relative humidity (percent)	Average wind velocity (miles per hour)	Rainfall (inches)	Evapo- ration (inches)
	Mean maximum	Mean minimum	Mean				
October.....	82.2	54.2	68.2	79	0.8	0.07	5.113
November.....	69.9	40.3	55.1	73	.8	1.31	3.595
December.....	57.2	37.8	47.5	88	1.1	3.00	1.398
January.....	67.7	45.2	56.4	80	1.1	4.94	2.251
February.....	60.1	37.8	49.0	83	1.5	2.17	2.020
March.....	75.0	51.3	63.2	80	1.7	1.68	4.682
April.....	82.3	55.3	68.8	80	1.3	1.26	6.434
May.....	90.1	67.2	78.6	84	1.3	4.05	7.923
June.....	93.6	68.0	80.8	78	1.1	.41	8.972
July.....	96.3	74.7	85.5	84	1.2	7.29	9.475
August.....	93.1b	73.2	83.2a	88	.9	.58	8.171
September.....	93.7h	73.1h	83.4h	90	1.0	3.17	6.458
The year.....	80.1	56.5	68.3	82	1.2	29.93	66.492

NOTE.—Relative humidity given for regular U.S. Weather Bureau station 2,000 feet away, 129 feet aboveground, and 82 feet above evaporation pan. Letters following figures indicate number of days of missing record; a, 1 day; b, 2 days, etc.

## COLORADO RIVER AT SMITHVILLE, TEX.

LOCATION.—Water-stage recorder 800 feet above highway bridge at Smithville, Bastrop County. Zero of gage is 270.01 feet above mean sea level.

DRAINAGE AREA.—39,600 square miles, of which about 11,800 square miles is probably noncontributing.

RECORDS AVAILABLE.—July 1930 to September 1933.

DISCHARGE.—Maximum during year, 31,200 second-feet May 28 (gage height, 15.47 feet); minimum, 193 second-feet July 15, 16 (gage height, 0.95 foot).

1930-33: Maximum, 67,500 second-feet Oct. 9, 19, 1930 (gage height, 21.40 feet); minimum, 111 second-feet Aug. 17, 18, 1930 (gage height, 0.74 foot).

Maximum stage known, about 47.4 feet in December 1913.

REMARKS.—Records excellent except those for partly estimated periods, Oct. 8-10, Jan. 9, 10, which are good. Diversions above station for irrigation and municipal uses.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4,440	1,070	905	2,530	1,560	1,650	1,100	793	4,180	314	3,380	681
2	4,180	1,090	882	2,200	1,330	1,160	1,000	936	3,140	303	1,420	466
3	5,460	1,140	875	1,900	1,200	1,200	912	968	2,820	291	1,040	920
4	4,860	1,110	868	2,060	1,140	1,510	1,160	860	2,940	280	741	1,580
5	3,920	1,100	860	2,530	1,100	1,850	1,600	890	2,640	272	567	2,000
6	3,140	1,060	852	2,260	1,060	3,920	1,600	734	2,200	265	464	1,900
7	2,700	1,060	852	1,950	1,030	2,340	1,380	609	1,800	253	396	1,600
8	2,480	1,050	845	7,460	984	1,560	1,200	562	1,560	246	358	1,420
9	2,260	1,060	845	3,490	976	1,600	1,020	510	1,330	235	322	1,240
10	2,100	1,130	838	1,950	928	1,600	920	479	1,200	222	291	1,020
11	2,000	1,200	845	2,970	905	1,510	890	494	1,140	211	276	860
12	1,900	1,460	845	3,270	912	1,380	905	593	1,100	211	257	741
13	1,800	1,420	868	2,760	905	1,290	845	556	944	208	250	655
14	1,700	1,290	860	2,310	905	1,240	1,060	494	826	202	387	567
15	1,650	1,160	875	2,000	920	1,160	1,230	1,590	754	196	426	504
16	1,560	1,070	920	1,850	960	1,150	826	2,940	679	312	418	459
17	1,510	1,130	936	1,700	960	1,090	709	2,100	649	459	464	426
18	1,460	1,140	920	1,560	936	1,060	500	5,060	609	504	464	409
19	1,420	1,130	920	1,460	928	1,030	976	10,300	598	418	482	375
20	1,380	1,100	928	1,380	898	992	890	8,410	572	371	422	346
21	1,330	1,050	944	1,330	875	944	767	5,040	536	326	350	318
22	1,330	1,010	944	1,330	845	890	685	3,200	504	291	371	308
23	1,330	1,020	992	1,420	826	868	593	2,360	609	265	454	375
24	1,290	1,010	1,060	1,290	819	875	556	1,850	440	930	530	431
25	1,290	1,060	1,290	1,200	812	1,070	655	2,830	413	3,920	494	479
26	1,240	984	1,100	1,160	819	1,380	722	2,360	392	1,070	426	567
27	1,200	960	1,110	1,150	1,480	936	754	2,790	375	493	383	530
28	1,160	952	1,420	1,110	3,580	1,580	832	26,300	358	350	334	469
29	1,130	944	1,560	1,120	-----	2,530	920	21,900	338	322	307	444
30	1,100	928	2,540	6,020	-----	1,140	852	11,400	330	581	658	404
31	1,100	-----	2,880	3,480	-----	1,090	-----	6,110	-----	12,100	504	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	5,450	1,100	2,110	130,000
November	1,460	928	1,100	65,500
December	2,880	838	1,080	66,400
January	7,460	1,110	2,260	139,000
February	3,580	812	1,090	60,500
March	3,920	868	1,410	86,700
April	1,600	556	945	56,200
May	26,300	479	4,070	250,000
June	4,180	330	1,190	70,800
July	12,100	196	852	52,400
August	3,380	250	570	35,000
September	2,000	303	750	44,600
The year	26,300	196	1,460	1,060,000

## COLORADO RIVER NEAR EAGLE LAKE, TEX.

LOCATION.—Water-stage recorder at Lakeside Irrigation Co.'s pumping plant, 1 mile below San Antonio & Aransas Pass Railway bridge and 5 miles southwest of Eagle Lake, Colorado County.

DRAINAGE AREA.—40,900 square miles, of which about 11,800 square miles is probably noncontributing.

RECORDS AVAILABLE.—September 1930 to September 1933.

EXTREMES.—Maximum during year, 28,200 second-feet May 29 (gage height, 13.00 feet); minimum not determined.

1930-33: Maximum, 57,500 second-feet Oct. 21, 1930 (gage height, 20.48 feet); minimum not determined.

Maximum stage known, about 32.0 feet in December 1913.

REMARKS.—Records good except those for estimated periods, which are fair.

Discharge tables include flow of Lakeside Irrigation Co.'s canal. Diversions above station for irrigation and municipal uses. Lakeside Irrigation Co. furnished pump records of canal that were used in estimating missing canal records.

## Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.		
1-----	^ 7, 190	^ 1, 190	^ 954	2, 380	6, 210	^ 2, 680	^ 1, 470	} ^ 1, 090	7, 680	} ^ 463	5, 250	620		
2-----	^ 5, 970	^ 1, 150	^ 942	2, 850	3, 040	3, 220	1, 210		5, 410		6, 460	954		
3-----	^ 5, 040	^ 1, 120	^ 930	2, 610	2, 300	^ 1, 860	^ 1, 120		3, 990		2, 600	716		
4-----	} ^ 5, 480	^ 1, 100	^ 919	2, 220	2, 080	^ 1, 390	^ 1, 040		3, 110		1, 510	626		
5-----		^ 1, 100	^ 897	1, 960	1, 790	^ 1, 820	^ 1, 220		2, 870		1, 180	635		
6-----	} ^ 4, 230	^ 1, 120	^ 875	2, 080	1, 580	8, 010	^ 1, 750	} ^ 1, 020	3, 010	} ^ 348	1, 110	1, 120		
7-----		^ 1, 120	^ 853	2, 610	^ 1, 450	7, 880	^ 1, 620		2, 550		822	1, 720		
8-----		^ 3, 520	^ 1, 100	^ 831	2, 380	^ 1, 320	4, 520		864		2, 270	637	1, 720	
9-----		^ 3, 010	^ 1, 090	^ 831	4, 080	^ 1, 220	^ 2, 850		^ 1, 520		738	1, 970	533	1, 510
10-----		^ 2, 690	^ 1, 080	^ 842	6, 460	^ 1, 140	2, 690		^ 1, 310		689	1, 670	477	1, 340
11-----	^ 2, 530	^ 1, 080	^ 842	3, 130	^ 1, 090	2, 530	^ 1, 090	653	1, 420	} ^ 307	} ^ 454	1, 210		
12-----	^ 2, 300	^ 1, 080	^ 842	2, 300	^ 1, 080	2, 300	^ 942	649	1, 430			1, 030		
13-----	^ 2, 220	^ 1, 080	^ 842	3, 260	1, 050	2, 220	^ 842	622	1, 740			^ 331	^ 908	
14-----	^ 2, 080	^ 1, 080	^ 853	3, 430	} ^ 1, 140	2, 100	^ 792	644	1, 320			^ 322	801	
15-----	^ 1, 970	^ 1, 120	^ 864	2, 930		1, 960	^ 1, 260	663	} ^ 930			734		
16-----	1, 900	1, 140	919	1, 2, 530	} ^ 1, 140	1, 680	1, 970	643	} ^ 1, 020	} ^ 262	} ^ 380	653		
17-----	1, 860	1, 150	908	1, 2, 220		1, 450	^ 1, 350	1, 080				892	325	601
18-----	1, 800	1, 170	908	1, 2, 100		1, 360	^ 1, 150	2, 550				866	327	558
19-----	^ 1, 720	1, 150	919	2, 040		1, 310	1, 090	2, 230				821	^ 410	520
20-----	^ 1, 610	1, 140	942	1, 930		1, 310	^ 978	8, 450				808	^ 380	490
21-----	^ 1, 510	1, 140	942	1, 830		} ^ 1, 140	1, 300	} ^ 930	9, 620	753	535	512	461	
22-----	^ 1, 440	1, 140	954	1, 760			1, 260		6, 740	731	501	520	426	
23-----	^ 1, 390	1, 130	1, 000	1, 660	1, 210		4, 590		703	484	475	405		
24-----	^ 1, 360	1, 140	1, 100	1, 590	1, 150		3, 260		682	439	440	386		
25-----	^ 1, 340	^ 1, 120	1, 120	1, 540	1, 130		2, 610		642	474	447	405		
26-----	^ 1, 310	^ 1, 050	1, 100	1, 510	} ^ 2, 380	1, 090	} ^ 2, 380	5, 410	591	908	550	454		
27-----	^ 1, 310	^ 1, 000	1, 100	1, 470		1, 060		5, 800	} ^ 463	2, 640	626	498		
28-----	^ 1, 300	^ 990	1, 120	1, 410		1, 080		3, 870		1, 430	535	520		
29-----	^ 1, 280	^ 978	1, 120	1, 380		} ^ 2, 380		23, 900		^ 463	886	498	576	
30-----	^ 1, 270	^ 954	1, 170	1, 720				19, 400		671	475	528		
31-----	^ 1, 240	-----	^ 1, 310	4, 090	-----	-----	-----	11, 800	-----	558	454	-----		

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	7, 190	1, 240	2, 670	164, 000
November.....	1, 190	954	1, 100	65, 500
December.....	1, 310	831	960	59, 000
January.....	6, 460	1, 380	2, 430	149, 000
February.....	6, 210	-----	1, 520	84, 400
March.....	8, 010	1, 060	2, 310	142, 000
April.....	1, 970	-----	1, 160	69, 000
May.....	23, 900	622	4, 040	248, 000
June.....	7, 680	-----	1, 730	103, 000
July.....	2, 640	-----	569	35, 000
August.....	6, 460	-----	991	60, 900
September.....	1, 720	386	771	45, 900
The year.....	23, 900	-----	1, 690	1, 230, 000

\* Estimated or partly estimated.

## ELM CREEK AT BALLINGER, TEX.

LOCATION.—Water-stage recorder 1,000 feet above city water-supply storage dam in Ballinger, Runnels County, and  $1\frac{1}{4}$  miles above confluence with Colorado River. Zero of gage is 1,618.37 feet above mean sea level.

DRAINAGE AREA.—458 square miles.

RECORDS AVAILABLE.—April 1932 to September 1933.

DISCHARGE.—Maximum during year, 4,760 second-feet May 15 (gage height, 3.35 feet); no flow at times.

1932-33: Maximum stage, 9.40 feet July 3, 1932 (discharge not determined); no flow at times.

REMARKS.—Low-stage daily records poor; medium-stage daily records and monthly records good. Discharge partly estimated Mar. 19, 20, 31, Apr. 5, 6, 13-17.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Sept.
1-----	8.7	5.0	5.0	48	6.6	17	2.7	0	14	0
2-----	8.7	5.0	5.0	36	6.6	11	2.7	0	8.7	0
3-----	8.7	6.6	5.0	25	8.7	8.7	2.7	0	8.7	0
4-----	5.0	6.6	5.0	21	8.7	8.7	2.7	0	6.6	0
5-----	5.0	5.9	3.7	14	6.6	6.6	2.7	0	5.0	0
6-----	5.0	14	3.7	11	6.6	3.7	1.9	0	3.7	0
7-----	5.0	6.6	2.7	17	2.7	8.7	1.2	0	2.7	0
8-----	5.0	3.7	3.7	14	5.0	8.7	1.2	0	1.9	0
9-----	5.0	6.6	3.7	17	6.6	8.7	1.2	0	1.9	0
10-----	5.0	6.6	3.7	17	5.0	6.6	1.2	0	1.2	0
11-----	5.0	3.7	3.7	11	6.6	6.6	1.2	0	.7	0
12-----	5.0	5.0	3.7	11	6.6	6.6	1.2	0	.7	0
13-----	5.0	6.6	3.7	11	6.6	5.0	.9	0	1.2	0
14-----	5.0	6.6	3.7	11	6.6	1.2	.9	120	8.7	0
15-----	5.0	3.7	5.0	11	6.6	3.7	.9	3,120	6.6	2.0
16-----	5.0	3.7	5.0	8.7	5.0	3.7	.9	196	2.7	1.2
17-----	5.0	3.7	5.0	11	5.0	3.7	.9	54	.9	.3
18-----	6.6	3.7	5.0	11	5.0	2.7	.9	25	.3	0
19-----	5.0	3.7	5.0	11	3.7	2.7	.9	11	0	0
20-----	5.0	3.7	5.0	11	3.7	2.7	.9	8.7	0	0
21-----	3.7	3.7	5.0	11	3.7	2.7	.7	5.0	0	0
22-----	3.7	3.7	6.6	8.7	5.0	2.7	2.7	3.7	0	0
23-----	3.7	1.9	25	11	5.0	2.7	2.7	8.7	0	0
24-----	3.7	2.7	324	3.7	5.0	2.7	1.9	1,710	0	0
25-----	1.9	3.7	82	8.7	5.0	2.7	1.9	253	0	0
26-----	1.9	3.7	30	2.7	8.7	2.7	.7	48	0	0
27-----	2.7	3.7	17	6.6	11	2.7	.5	25	0	0
28-----	5.0	3.7	14	6.6	11	2.7	.5	14	0	0
29-----	5.0	3.7	11	6.6	-----	2.7	.1	151	0	0
30-----	5.0	3.7	75	6.6	-----	2.7	0	82	0	0
31-----	5.0	-----	220	6.6	-----	2.7	-----	25	-----	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October-----	8.7	1.9	4.97	306
November-----	5.9	1.9	6.60	393
December-----	324	2.7	28.9	1,780
January-----	48	2.7	13.1	806
February-----	11	2.7	6.18	343
March-----	17	1.2	5.05	311
April-----	2.7	0	1.38	82
May-----	3,120	0	189	11,600
June-----	14	0	2.54	151
September-----	2.0	0	.12	7.1
The year-----	3,120	0	21.8	15,800

NOTE.—No flow during months omitted.



## SOUTH CONCHO RIVER AT CHRISTOVAL, TEX.

LOCATION.—Water-stage recorder at Panhandle & Santa Fe Railway bridge in Christoval, Tom Green County. Zero of gage is 2,010.2 feet above mean sea level (railway datum).

DRAINAGE AREA.—434 square miles.

RECORDS AVAILABLE.—February 1930 to September 1933.

DISCHARGE.—Maximum during year, 278 second-feet May 14 (gage height, 2.24 feet); minimum, 5.0 second-feet Sept. 28.

1930-33: Maximum stage, 20.20 feet Oct. 13, 1930 (discharge not determined); minimum discharge, 2.8 second-feet Sept. 27-28, 1930 (gage height, 0.73 foot).

Flood of Aug. 6, 1906, reached a stage of about 20.0 feet, but the discharge was probably greater than in the flood of Oct. 13, 1930, because the railroad dump did not confine flow in 1906.

REMARKS.—Records good. Diversions for irrigation above station.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	50	40	38	29	31	28	22	18	14	8.5	10	9.4
2.....	50	42	38	32	31	28	22	18	14	7.6	11	9.4
3.....	50	43	38	32	31	28	23	18	14	8.5	11	9.4
4.....	50	44	38	32	31	28	24	17	14	8.5	11	8.5
5.....	50	58	38	32	32	29	20	17	14	8.5	11	8.5
6.....	50	46	37	32	32	28	20	17	14	9.4	12	8.5
7.....	50	45	37	34	31	28	18	17	14	9.4	11	8.5
8.....	50	44	37	33	31	28	17	17	14	9.4	10	8.5
9.....	50	43	37	32	31	28	17	17	14	9.4	10	8.5
10.....	00	43	36	32	31	28	17	18	13	9.4	8.5	8.5
11.....	50	43	36	32	32	28	17	16	13	9.4	7.6	8.5
12.....	50	43	36	32	32	29	17	13	12	9.4	9.4	8.5
13.....	50	43	36	32	32	29	17	12	11	9.4	9.4	8.5
14.....	50	42	35	32	29	29	17	44	10	9.4	10	8.5
15.....	49	42	35	33	27	29	17	22	9.4	9.4	10	8.5
16.....	49	42	34	34	27	29	17	19	9.4	9.4	9.4	8.5
17.....	49	42	34	40	28	30	17	19	10	10	9.4	8.5
18.....	47	42	34	39	29	30	18	18	10	10	9.4	7.6
19.....	48	42	33	36	29	30	19	16	10	11	9.4	7.6
20.....	47	42	33	27	29	29	18	16	10	11	9.4	7.6
21.....	47	40	33	30	29	26	19	16	9.4	9.4	9.4	7.6
22.....	47	40	33	31	29	26	19	16	9.4	9.4	9.4	7.6
23.....	47	40	37	31	29	27	21	17	9.4	9.4	9.4	7.6
24.....	42	39	34	30	29	27	20	17	9.4	9.4	11	7.6
25.....	38	39	34	30	29	27	19	18	9.4	9.4	11	7.6
26.....	37	39	34	29	30	27	18	18	9.4	9.4	11	7.6
27.....	37	39	34	28	30	27	19	18	9.4	10	11	6.8
28.....	37	39	30	30	29	27	19	18	9.4	11	10	5.0
29.....	36	38	28	31	-----	26	19	17	10	11	10	5.9
30.....	36	38	31	32	-----	25	18	15	10	11	10	6.8
31.....	37	-----	29	32	-----	23	-----	14	-----	12	10	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	50	36	46.1	2,830
November.....	58	38	42.1	2,510
December.....	38	28	34.7	2,130
January.....	40	27	32.0	1,970
February.....	32	27	30.0	1,670
March.....	30	23	27.8	1,710
April.....	24	17	18.8	1,120
May.....	44	12	17.8	1,090
June.....	14	9.4	11.3	672
July.....	12	7.6	9.63	592
August.....	12	7.6	10.0	615
September.....	9.4	5.0	8.00	476
The year.....	58	5.0	24.0	17,400

## SOUTH CONCHO RIVER AT SAN ANGELO, TEX.

LOCATION.—Water-stage recorder at highway bridge half a mile south of San Angelo, Tom Green County, and 1 mile above confluence with North Concho River.

DRAINAGE AREA.—2,690 square miles, of which about 152 square miles is non-contributing.

RECORDS AVAILABLE.—October 1931 to September 1933.

DISCHARGE.—Maximum during year, 237 second-feet Nov. 6 (gage height, 2.59 feet); no flow Aug. 2 to Sept. 30.

1932-33: Maximum stage, 10.98 feet May 10, 1932 (discharge not determined); no flow at times.

REMARKS.—Records good. Diversions above station for irrigation, municipal, and power uses. Flow partly regulated by reservoirs above station.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
1.....	192	91	108	174	99	91	8.1	48	54	0.7	0.5
2.....	192	95	108	174	99	91	11	43	51	.8	0
3.....	201	104	108	161	99	91	7.0	51	29	.9	0
4.....	201	104	108	154	99	91	23	74	24	1.0	0
5.....	154	108	115	154	104	95	15	48	8.1	1.0	0
6.....	104	167	108	148	104	95	7.0	45	4.0	.9	0
7.....	104	201	104	134	99	91	22	43	1.8	.8	0
8.....	104	192	104	128	99	95	35	45	1.4	.7	0
9.....	115	192	104	128	99	91	18	43	1.0	.8	0
10.....	108	148	104	121	99	86	26	29	.9	.8	0
11.....	104	128	104	121	99	86	22	24	1.0	.7	0
12.....	161	128	104	121	99	91	31	11	1.5	.8	0
13.....	219	134	104	121	99	91	48	14	1.8	72	0
14.....	210	134	104	121	99	86	24	26	2.0	135	0
15.....	201	128	108	104	99	82	29	33	1.5	20	0
16.....	174	128	104	104	104	82	28	40	1.5	18	0
17.....	167	128	104	104	99	82	43	45	1.0	14	0
18.....	148	128	104	104	95	82	54	43	1.4	15	0
19.....	128	95	104	104	95	78	62	43	2.0	15	0
20.....	128	95	108	104	95	69	69	40	1.8	11	0
21.....	128	95	104	108	99	69	65	43	1.3	12	0
22.....	128	99	104	108	95	54	62	45	.9	11	0
23.....	121	95	134	104	95	37	57	43	.7	14	0
24.....	115	95	192	115	95	22	15	51	.7	12	0
25.....	115	95	167	104	99	17	16	54	.9	11	0
26.....	108	104	148	108	95	12	20	54	1.0	10	0
27.....	104	108	148	104	95	8.1	15	51	.9	9.2	0
28.....	78	108	148	104	95	8.1	12	57	.8	9.2	0
29.....	65	108	148	99	-----	9.2	61	54	.7	6.0	0
30.....	74	108	161	99	-----	11	28	51	.7	6.5	0
31.....	91	-----	161	99	-----	10	-----	51	-----	.7	0

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	219	65	137	8,420
November.....	201	91	121	7,200
December.....	192	104	120	7,380
January.....	174	99	121	7,440
February.....	104	95	98.2	5,450
March.....	95	8.1	64.6	3,970
April.....	69	7.0	31.1	1,850
May.....	74	11	43.3	2,660
June.....	54	.7	6.64	395
July.....	135	.7	13.3	818
August.....	.5	0	.02	1.2
The year.....	219	0	63.0	45,600

NOTE.—No flow during September.

## CONCHO RIVER NEAR SAN ANGELO, TEX.

LOCATION.—Water-stage recorder half a mile below confluence of North Concho and South Concho Rivers and  $1\frac{1}{4}$  miles southeast of San Angelo, Tom Green County. Zero of gage is 1,776.8 feet above mean sea level.

DRAINAGE AREA.—4,490 square miles; of which about 275 square miles is probably noncontributing.

RECORDS AVAILABLE.—September 1915 to September 1933.

DISCHARGE.—Maximum during year, 286 second-feet Dec. 24 (gage height, 2.36 feet); minimum, 0.3 second-foot Sept. 17 (gage height, 0.47 foot).

1915-33: Maximum, about 139,000 second-feet Apr. 26, 1922 (gage height, 36.8 feet); no flow Nov. 29, 1921. Average, 18 years, 151 second-feet.

REMARKS.—Records good. Diversions above station for municipal and irrigation uses. Low flow affected by diversions and storage above gage.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	230	103	125	179	111	108	11	51	51	1.2	2.0	1.0
2.....	230	106	122	179	108	106	14	50	48	1.4	1.5	1.0
3.....	234	117	122	179	108	106	12	53	27	2.2	1.7	1.0
4.....	230	114	122	176	108	108	25	77	22	2.2	1.7	1.0
5.....	175	114	128	176	108	114	20	54	10	2.5	1.5	.9
6.....	103	202	125	154	114	106	13	51	5.0	3.6	1.1	.6
7.....	108	248	122	143	106	103	27	48	4.0	4.3	1.5	.5
8.....	111	240	120	140	106	103	45	50	2.8	3.8	1.5	.7
9.....	114	240	120	137	103	103	27	45	2.5	3.3	.8	1.7
10.....	106	180	122	137	106	103	31	31	2.2	4.8	1.0	.8
11.....	103	140	122	134	106	103	30	27	2.2	2.5	2.3	.8
12.....	171	140	122	134	108	103	37	13	2.8	2.3	3.6	.6
13.....	248	146	122	134	108	103	58	23	3.0	.72	3.8	.5
14.....	248	146	120	128	108	101	31	40	3.8	173	2.5	.7
15.....	234	143	125	108	103	99	39	39	3.6	20	1.4	.6
16.....	188	143	122	106	111	99	35	47	2.5	16	1.1	.5
17.....	188	143	120	108	103	101	52	51	2.3	14	.7	.4
18.....	172	143	120	111	103	101	63	48	2.5	15	.9	.7
19.....	146	101	120	108	103	99	78	47	3.0	15	1.0	.7
20.....	143	103	120	108	101	87	81	46	3.0	12	1.0	.6
21.....	143	99	120	111	103	90	71	46	2.6	13	1.4	.6
22.....	143	101	122	108	103	69	67	51	2.3	12	1.4	.7
23.....	140	99	203	106	103	57	65	45	2.2	13	1.0	1.0
24.....	128	99	265	114	106	32	25	52	2.3	13	2.9	.6
25.....	125	96	248	106	108	34	21	55	2.2	11	2.5	1.1
26.....	120	111	201	114	114	27	30	54	2.3	12	1.4	1.0
27.....	117	122	188	106	117	21	23	53	2.2	12	1.8	.8
28.....	80	122	182	106	111	21	20	57	1.7	10	1.7	.7
29.....	71	122	182	108	-----	21	70	58	1.5	7.8	2.3	.6
30.....	80	122	188	108	-----	20	37	53	1.5	9.2	1.4	.6
31.....	103	-----	182	111	-----	15	-----	52	-----	4.3	1.0	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	248	71	153	9,410
November.....	248	96	137	8,150
December.....	265	120	146	8,980
January.....	179	106	128	7,870
February.....	117	101	107	5,940
March.....	114	15	79.5	4,890
April.....	81	11	38.6	2,300
May.....	77	13	47.3	2,910
June.....	51	1.5	7.47	444
July.....	173	1.2	15.8	972
August.....	3.8	.7	1.66	102
September.....	1.7	.4	.77	46
The year.....	265	.4	71.8	52,000

## CONCHO RIVER NEAR PAINT ROCK, TEX.

LOCATION.—Water-stage recorder at Concho, San Saba & Llano Valley Railroad bridge 2 miles northwest of Paint Rock, Concho County.

DRAINAGE AREA.—5,530 square miles, of which about 275 square miles are probably noncontributing.

RECORDS AVAILABLE.—September 1915 to September 1933.

DISCHARGE.—Maximum during year, 4,570 second-feet May 14 (gage height, 6.93 feet); no flow at times.

1915-33: Maximum stage, 27.5 feet Apr. 27, 1922 (discharge not determined); no flow at times. Average, 18 years, 205 second-feet.

REMARKS.—Records good except those for estimated periods, which are fair. Discharge estimated Oct. 1-10; partly estimated Oct. 26, 27. Diversions above station for irrigation and municipal uses. Low-water flow materially affected by diversions and storage above station.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		98	126	194	113	113	50	47	50	0	0	0.2
2		110	129	194	110	110	50	31	46	0	0	.2
3		118	131	190	110	110	48	36	45	0	0	.2
4		126	129	190	108	108	46	37	40	0	0	.1
5		182	126	131	190	113	46	42	30	0	0	.1
6		120	134	186	108	113	45	62	20	0	0	.1
7		180	134	194	110	110	42	43	14	0	0	.1
8		239	129	167	108	110	42	43	9.4	0	0	0
9		232	129	151	108	108	40	43	6.0	0	0	0
10	110	236	123	145	108	106	39	37	4.2	0	0	0
11	110	197	126	145	108	103	37	32	2.5	0	0	0
12	108	145	129	137	110	108	37	24	1.8	0	0	0
13	120	143	129	137	113	110	37	17	1.8	0	0	0
14	222	145	131	137	113	110	37	1,510	1.8	0	0	.2
15	236	148	134	134	113	103	46	830	1.2	0	0	.2
16	232	140	137	118	113	100	46	120	.9	0	0	1.1
17	186	140	137	116	116	98	46	64	.8	0	0	.6
18	180	140	137	116	113	100	46	54	.8	0	0	.3
19	180	140	137	118	110	100	46	51	.6	9.3	0	.2
20	143	118	137	116	110	100	60	46	.5	8.2	0	.2
21	131	110	143	116	108	96	78	45	.4	3.8	0	.1
22	134	108	140	116	110	96	74	43	.3	1.5	0	0
23	137	106	151	113	110	94	72	45	.3	1.1	0	0
24	137	106	218	113	113	91	72	60	.3	.8	0	0
25	134	106	277	116	110	89	54	43	.3	.4	0	0
26	131	103	261	116	110	78	32	50	.2	.3	14	0
27	129	108	218	113	113	64	19	54	.2	.2	28	0
28	129	120	204	113	116	58	18	62	.2	.2	9.0	0
29	108	123	197	113	-----	56	17	158	.1	.1	3.9	0
30	98	126	214	110	-----	54	12	80	.1	.1	.5	0
31	91	-----	204	113	-----	53	-----	58	-----	0	.3	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	-----	-----	156	9,590
November	239	98	139	8,270
December	277	123	157	9,650
January	194	110	140	8,610
February	116	108	111	6,160
March	113	53	95.5	5,870
April	78	12	44.5	2,650
May	1,510	17	125	7,690
June	50	.1	9.32	555
July	9.3	0	.84	52
August	28	0	1.80	111
September	1.1	0	.13	7.7
The year	1,510	0	81.6	59,200

## MIDDLE CONCHO RIVER NEAR TANKERSLY, TEX.

LOCATION.—Water-stage recorder at Twelvemile Bridge, 3 miles northeast of Tankersly, Tom Green County, and 7½ miles above confluence with Spring Creek. Zero of gage is 1,919.5 feet above mean sea level.

DRAINAGE AREA.—1,280 square miles, of which about 152 square miles is probably noncontributing.

RECORDS AVAILABLE.—February 1930 to September 1933.

DISCHARGE.—Maximum during year, 63 second-feet Dec. 23 (gage height, 1.96 feet); no flow at times.

1930-33: Maximum, 12,500 second-feet May 11, 1932 (gage height, 22.45 feet); no flow at times.

REMARKS.—Records good. Small diversions for irrigation above station affect low flow.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1.....	44	17	16	25	21	23	15	7.4	3.2
2.....	42	16	16	24	20	21	15	6.0	2.7
3.....	40	18	18	23	19	19	14	5.5	1.6
4.....	32	20	18	23	19	19	15	6.0	.8
5.....	29	23	18	23	19	20	15	6.0	.6
6.....	27	16	18	23	20	19	15	6.4	.3
7.....	25	17	17	27	19	19	15	6.0	0
8.....	25	17	17	29	19	18	14	5.5	0
9.....	24	17	16	25	19	18	14	5.5	0
10.....	23	16	17	24	19	17	14	5.1	0
11.....	23	16	18	23	19	18	12	3.8	0
12.....	23	15	18	21	19	18	12	3.5	0
13.....	23	16	18	21	19	18	12	23	0
14.....	23	17	18	21	19	17	11	10	0
15.....	23	15	18	23	19	16	12	11	0
16.....	23	14	20	23	19	16	12	10	0
17.....	23	14	19	24	19	16	12	9.4	0
18.....	21	15	19	24	20	16	12	8.1	0
19.....	19	14	19	23	20	16	12	6.8	0
20.....	17	16	19	23	19	16	11	6.0	0
21.....	17	16	18	23	19	16	9.4	5.1	0
22.....	19	16	18	23	17	16	9.4	4.7	0
23.....	20	16	40	21	17	16	11	4.7	0
24.....	20	14	56	21	18	17	12	4.4	0
25.....	19	13	42	21	25	17	10	4.1	0
26.....	19	15	29	20	27	16	10	4.4	0
27.....	18	15	23	20	32	17	10	4.7	0
28.....	17	16	20	20	25	17	10	4.4	0
29.....	17	15	20	20	-----	17	9.4	4.4	0
30.....	17	15	38	21	-----	17	8.1	4.1	0
31.....	17	-----	30	23	-----	14	-----	3.8	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	44	17	23.5	1,440
November.....	23	13	16.0	952
December.....	56	16	22.3	1,370
January.....	29	20	22.7	1,400
February.....	32	17	20.2	1,120
March.....	23	14	17.4	1,070
April.....	15	8.1	12.1	720
May.....	23	3.5	6.45	397
June.....	3.2	0	.31	18
The year.....	56	0	11.7	8,490

NOTE.—No flow during months omitted.

## SPRING CREEK NEAR TANKERSLY, TEX.

LOCATION.—Water-stage recorder  $2\frac{3}{4}$  miles above confluence with Middle Concho River and  $6\frac{1}{2}$  miles east of Tankersly, Tom Green County. Zero of gage is 1,874.6 feet above mean sea level.

DRAINAGE AREA.—734 square miles.

RECORDS AVAILABLE.—February 1930 to September 1933.

DISCHARGE.—Maximum during year, 233 second-feet May 13 (gage height, 2.68 feet); no flow Aug. 10 to Sept. 28.

1930-33: Maximum, 17,000 second-feet May 10, 1932 (gage height, 17.70 feet); no flow at times.

REMARKS.—Records excellent. Several small diversions above station for irrigation.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	76	64	52	60	51	37	20	22	7.4	0.3	0.2	0
2.....	78	64	54	58	51	36	20	20	5.5	.3	.2	0
3.....	78	70	51	58	51	34	20	19	5.2	.3	.2	0
4.....	73	64	51	58	54	34	18	15	4.2	.3	.2	0
5.....	72	64	60	58	52	36	17	14	4.9	.3	.2	0
6.....	72	61	55	58	51	37	15	13	4.6	.3	.2	0
7.....	72	60	52	66	51	35	16	13	3.9	.3	.2	0
8.....	72	58	51	64	49	35	18	14	3.4	.3	.1	0
9.....	72	57	52	60	49	33	17	13	2.9	.3	.1	0
10.....	73	58	60	58	51	33	17	11	2.4	.3	0	0
11.....	73	55	66	57	50	32	19	8.8	2.2	.3	0	0
12.....	73	55	64	57	51	32	19	8.0	2.1	.3	0	0
13.....	74	57	64	57	49	32	16	81	2.0	.3	0	0
14.....	74	58	63	58	41	30	13	34	1.8	.3	0	0
15.....	76	58	64	58	37	28	14	24	1.6	.3	0	0
16.....	76	57	64	58	36	31	17	21	1.4	.4	0	0
17.....	73	57	63	58	35	30	20	19	1.4	.4	0	0
18.....	70	58	63	60	35	31	17	22	1.2	.6	0	0
19.....	72	58	61	54	34	26	17	20	1.0	.6	0	0
20.....	73	60	58	54	34	26	19	18	1.0	.6	0	0
21.....	74	58	57	57	34	23	18	18	.8	.5	0	0
22.....	74	58	58	57	40	21	15	18	.8	.4	0	0
23.....	72	58	88	55	42	21	18	18	.8	.3	0	0
24.....	72	58	80	57	37	23	23	18	.7	.3	0	0
25.....	73	57	63	52	35	23	23	19	.6	.3	0	0
26.....	72	57	60	54	38	26	21	21	.6	.2	0	0
27.....	72	60	60	47	43	24	25	20	.6	.1	0	0
28.....	68	57	60	47	41	25	23	17	.4	.1	0	0
29.....	68	54	60	54	-----	23	20	17	.4	.1	0	.2
30.....	67	52	70	55	-----	22	21	14	.4	.1	0	.8
31.....	66	-----	63	54	-----	23	-----	9.2	-----	.1	0	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	78	66	72.6	4,460
November.....	70	52	58.7	3,490
December.....	88	51	60.9	3,740
January.....	66	47	56.7	3,490
February.....	54	34	43.6	2,420
March.....	37	21	29.1	1,790
April.....	25	13	18.5	1,100
May.....	81	8.0	19.3	1,190
June.....	7.4	.4	2.21	132
July.....	.6	.1	.31	19
August.....	.2	0	.05	3.1
September.....	.8	0	.03	1.8
The year.....	88	0	30.2	21,800

## NORTH CONCHO RIVER NEAR CARLSBAD, TEX.

LOCATION.—Water-stage recorder just above State Sanatorium Dam and 2 miles above Carlsbad, Tom Green County.

DRAINAGE AREA.—1,530 square miles, of which about 123 square miles is probably noncontributing.

RECORDS AVAILABLE.—March 1924 to September 1933.

DISCHARGE.—Maximum during year, 101 second-feet Dec. 24 (gage height, 4.83 feet); no flow at times.

1924-33: Maximum, about 35,600 second-feet May 30, 1925 (gage height, 14.45 feet); revised maximum for June 13, 1930, 26,700 second-feet (gage height, 12.9 feet), supersedes figures previously published; no flow at times.

REMARKS.—Records good. Discharge partly estimated Sept. 13, 14. Diversions by pumping above station affect low-water flow; pump capacity, 40 second-feet. Low-water flow partly regulated by small reservoir above gage.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Aug.	Sept.
1.....	8.3	12	15	16	12	13	10	7.5	5.4	0	1.5
2.....	8.3	12	15	15	12	13	10	7.5	4.8	0	.6
3.....	9.2	13	15	15	12	13	10	7.5	3.8	0	.2
4.....	7.5	13	13	15	12	13	10	6.7	3.3	0	0
5.....	7.5	13	13	15	12	13	10	6.7	2.8	0	0
6.....	7.5	13	13	15	12	13	10	6.7	2.0	0	0
7.....	7.5	13	12	16	12	13	10	6.0	1.5	0	0
8.....	7.5	12	12	16	12	13	10	5.4	1.8	0	0
9.....	7.5	12	12	15	12	13	10	5.4	2.0	0	0
10.....	7.5	12	11	15	13	13	10	5.4	1.5	0	0
11.....	7.5	12	12	16	13	13	10	6.0	1.1	0	0
12.....	7.5	11	12	15	13	13	10	6.0	.9	0	0
13.....	7.5	12	12	15	13	13	10	6.0	.8	0	.2
14.....	8.3	12	13	15	11	12	8.3	6.0	.9	0	.1
15.....	8.3	12	15	15	10	12	8.3	6.7	.9	0	0
16.....	9.2	11	13	15	11	12	9.2	7.5	.7	0	0
17.....	11	11	13	15	11	12	9.2	7.5	.6	0	0
18.....	11	12	13	15	11	12	9.2	7.5	.6	0	0
19.....	11	12	15	13	11	12	9.2	6.7	.5	0	0
20.....	10	12	15	13	11	11	9.2	6.0	.5	0	0
21.....	10	12	15	13	11	11	8.3	6.0	.4	0	0
22.....	12	12	15	13	10	11	8.3	5.4	.3	0	0
23.....	11	12	37	12	10	11	11	6.0	.2	0	0
24.....	12	12	72	12	11	11	12	5.4	.1	0	0
25.....	11	12	46	12	13	11	11	5.4	.1	0	0
26.....	12	12	26	12	13	11	9.2	6.0	.1	0	0
27.....	12	13	19	12	15	11	9.2	5.4	0	0	0
28.....	12	13	17	12	15	11	8.3	5.4	0	50	0
29.....	12	15	16	12	-----	11	8.3	4.8	0	29	0
30.....	13	15	19	12	-----	11	8.3	4.8	0	8.3	0
31.....	13	-----	16	12	-----	10	-----	5.4	-----	4.3	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	13	7.5	9.66	594
November.....	15	11	12.3	732
December.....	72	11	18.1	1,110
January.....	16	12	14.0	861
February.....	15	10	11.9	661
March.....	13	10	12.0	738
April.....	12	8.3	9.55	568
May.....	7.5	4.8	6.15	378
June.....	5.4	0	1.25	74
August.....	50	0	2.95	181
September.....	1.5	0	.09	5.4
The year.....	72	0	8.17	5,900

NOTE.—No flow during July.

## PECAN BAYOU AT BROWNWOOD, TEX.

LOCATION.—Water-stage recorder at Fort Worth & Rio Grande Railway bridge 1 mile north of Brownwood, Brown County, three-eighths of a mile above city dam, and 10 miles below Brownwood Reservoir. Zero of gage is 1,319.2 feet above mean sea level.

DRAINAGE AREA.—1,610 square miles.

RECORDS AVAILABLE.—May 1917 to June 1918; October 1923 to September 1933.

DISCHARGE.—Maximum during year, 6,930 second-feet May 11 (gage height, 7.15 feet); no flow over control dam at times; minimum seepage past control estimated as 0.2 second-foot.

1917-18, 1923-33: Maximum, 52,700 second-feet Oct. 14, 1930 (gage height, 16.92 feet); no flow at times.

The flood of July 3, 1932, probably the greatest known, reached a discharge of about 235,000 second-feet as it entered Brownwood Reservoir (computed from rate of storage in reservoir, data furnished by engineers of Brown County Water Improvement District No. 1).

REMARKS.—Records good except those above 3,000 second-feet, which are fair, and those estimated, which are poor. Seepage past control dam, estimated as 0.2 second-foot Oct. 1 to July 31, 0.3 second-foot Aug. 1 to Sept. 4, 2.6 second-feet Sept. 5-30, included in mean daily discharge. Flow regulated by storage in Brownwood Reservoir (capacity, 140,000 acre-feet).

## Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	63	1.3	0.2		0.2	0.2	0.2	0.2	2.0	0.2	0.3	0.3
2.....	63	.2			.2	.2	.2	.2	8.3	.2	.3	.3
3.....	54	.4	.2		.2	.2	.2	.2	.9	.2	.3	.3
4.....	51	1.3	.2		.2	.2	407	.2	.2	.2	.3	.3
5.....	51	2.9	.2	a 196	.2	.2	67	.2	.2	.2	.3	2.6
6.....	48	1.3	.2		.2	.2	60	.2	.2	.2	.3	2.6
7.....	43	.5	.2		.2	.2	234	.2	.2	551	.3	2.6
8.....	40	.2	.2		.2	.2	167	.2	.2	1,520	.3	2.6
9.....	40	93	.2		.2	.2	57	.2	.2	34	.3	2.6
10.....	34	64	.2	b 154	.2	.2	54	484	.2	12	.3	2.6
11.....	32	98	.2	118	.2	.2	1,260	1,160	.2	.2	3.0	2.6
12.....	27	48	.2	96	.2	.2	222	4.1	.2	.2	5.4	2.6
13.....	.6	27	.2	89	.2	.2	2.9	.7	.2	.2	4.2	2.6
14.....	.2	4.1	.2	78	.2	.2	.6	718	.2	.2	.3	2.6
15.....	.2	1.3	.2	74	.2	.2	.2	141	.2	.2	.3	2.6
16.....	.2	.4	.2	74	.2	.2	.2	15	.2	.2	.3	2.6
17.....	.2	.2	.2	57	.2	.2	.2	4.1	.2	.2	.3	2.6
18.....	.2	.2	.2	6.7	.2	.2	.2	2.0	.2	.2	.3	2.6
19.....	.2	.2	.2	2.0	.2	.2	.2	.9	.2	.2	.3	2.6
20.....	.2	.2	.2	.9	.2	.2	.2	.3	.2	.2	.3	2.6
21.....	.2	.2	.2	.9	.2	.2	.2	199	.2	.2	.3	2.6
22.....	.2	.2	.2	.7	.2	.2	.2	17	.2	.2	.3	2.6
23.....	.2	.2	.2	.4	.2	.2	.2	1.3	.2	.2	.3	2.6
24.....	.2	.2	2,080	.2	.2	.2	.2	21	.2	.2	.3	2.6
25.....	.2	.2	1,210	.2	.2	.2	.6	1,570	.2	.2	.3	2.6
26.....	25	.2	274	.2	.2	.2	19	43	.2	.2	.3	2.6
27.....	306	.2	159	.2	.2	.2	.2	183	.2	.2	.3	2.6
28.....	20	.2	135	.2	.2	.2	.2	173	.2	.2	.3	2.6
29.....	20	.2		.2	.2	.2	.2	174	.2	.2	.3	2.6
30.....	20	.2		.2	.2	.2	.2	16	.2	.2	6.8	2.6
31.....	17			.2	.2	.2		2.9		.2	5.8	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	306	0.2	30.9	1,900
November.....	98	.2	11.6	600
December.....		.2	242	14,900
January.....		.2	81.2	4,990
February.....	.2	.2	.20	11
March.....	.2	.2	.20	12
April.....	1,260	.2	85.2	5,070
May.....	1,570	.2	159	9,780
June.....	8.3	.2	.55	33
July.....	1,520	.2	68.5	4,210
August.....	6.8	.3	1.06	65
September.....	2.6	.3	2.29	136
The year.....		.2	57.7	41,800

\* Estimated.

° Partly estimated.



## SAN SABA RIVER AT MENARD, TEX.

LOCATION.—Staff gage 1,000 feet above highway bridge in Menard, Menard County, and half a mile below mouth of Las Moras Creek.

DRAINAGE AREA.—1,150 square miles.

RECORDS AVAILABLE.—September 1915 to September 1933.

DISCHARGE.—Maximum during year, 123 second-feet Dec. 30 (gage height, 2.42 feet); minimum, 3.5 second-feet Aug. 11.

1915-33: Maximum stage, 18.3 feet Oct. 6, 1930 (discharge not determined); no flow at times. Average, 18 years, 47.1 second-feet.

Maximum stage known, 25.4 feet June 5, 6, 1899.

REMARKS.—Records good. Low-water flow during irrigation season regulated by diversions to Noyes Canal, 4 miles above Menard. About 4,300 acres above and about 7,700 acres below gage have been declared irrigated.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1-----	55	41	38	45	39	49	31	22	18	5.6	7.3	27
2-----	50	40	38	45	39	49	30	22	17	6.9	7.8	15
3-----	47	40	38	45	39	49	34	24	16	7.3	6.5	10
4-----	50	40	38	45	39	49	33	22	16	8.9	6.9	11
5-----	53	40	39	45	39	49	31	21	16	9.9	6.9	11
6-----	44	49	39	45	39	49	31	21	14	9.4	7.3	9.4
7-----	44	45	39	45	39	49	31	21	12	8.3	7.3	9.9
8-----	42	42	38	45	39	49	29	21	12	7.3	5.6	10
9-----	43	40	38	45	47	51	27	21	12	7.8	6.5	10
10-----	42	40	39	45	47	51	27	21	12	7.3	6.5	13
11-----	42	39	39	45	46	49	31	21	12	7.3	4.4	24
12-----	42	39	38	45	47	48	26	21	12	4.8	6.0	27
13-----	41	39	38	45	47	47	25	21	13	6.0	6.5	27
14-----	41	39	38	45	47	47	26	64	12	7.3	5.2	25
15-----	41	39	39	45	47	47	25	71	12	6.5	6.9	11
16-----	41	39	41	45	47	47	25	56	12	8.3	7.8	9.4
17-----	41	39	39	45	47	50	25	47	11	8.3	7.8	9.9
18-----	40	39	38	45	47	47	24	39	12	7.3	7.8	8.3
19-----	40	39	38	45	39	47	26	31	12	7.3	7.3	8.3
20-----	41	39	39	45	39	47	25	21	12	9.9	7.8	7.3
21-----	41	40	39	45	39	46	27	21	12	8.3	7.3	6.9
22-----	41	39	39	45	39	45	29	20	12	7.3	6.9	6.0
23-----	41	39	38	43	39	45	27	20	11	10	7.3	6.9
24-----	41	40	38	40	40	46	29	21	27	9.4	7.8	7.9
25-----	41	40	38	40	40	46	28	22	21	8.3	7.8	24
26-----	41	40	38	40	46	46	26	22	10	8.9	8.3	22
27-----	41	38	38	40	50	36	25	20	9.9	20	8.9	8.3
28-----	41	38	38	40	49	35	25	20	8.3	19	8.9	6.5
29-----	41	38	38	40	-----	35	25	20	6.9	18	12	6.5
30-----	41	38	89	41	-----	35	22	18	5.6	8.3	12	6.5
31-----	41	-----	50	40	-----	33	-----	18	-----	7.8	22	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October-----	55	40	42.9	2,640
November-----	49	38	39.9	2,370
December-----	89	38	40.8	2,490
January-----	45	40	43.7	2,690
February-----	50	39	42.9	2,380
March-----	51	33	45.7	2,810
April-----	34	22	27.5	1,640
May-----	71	18	26.8	1,650
June-----	27	5.6	13.0	774
July-----	20	4.8	8.94	550
August-----	22	4.4	7.91	486
September-----	27	6.0	12.8	762
The year-----	89	4.4	29.3	21,200

## SAN SABA RIVER AT SAN SABA, TEX.

LOCATION.—Water-stage recorder at San Saba-Chadwick Mill highway bridge three-quarters of a mile northeast of San Saba, San Saba County, and 15 miles above confluence with Colorado River. Zero of gage is 1,152.4 feet above mean sea level.

DRAINAGE AREA.—3,050 square miles.

RECORDS AVAILABLE.—August 1930 to September 1933. Comparable records obtained at site  $4\frac{1}{2}$  miles upstream December 1904 to December 1906 and September 1915 to August 1930.

DISCHARGE.—Maximum during year, 7,350 second-feet May 25 (gage height, 24.51 feet); minimum, 14 second-feet July 28 (gage height, 3.18 feet).

1904-6, 1915-33: Maximum stage, 42.1 feet (present datum) Apr. 26, 1922, possibly affected by backwater from Colorado River (discharge not determined); no flow Aug. 9, 10, 1918. Average, 18 years (1915-33), 230 second-feet.

REMARKS.—Records good. Diversions above station for irrigation and municipal use.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	193	124	112	155	120	166	296	63	111	35	32	88
2.....	180	124	114	156	118	155	153	60	100	34	29	73
3.....	174	121	115	142	114	145	115	59	98	37	28	68
4.....	167	121	117	133	113	137	103	88	96	37	28	59
5.....	158	153	114	127	112	136	98	73	91	39	27	47
6.....	151	231	114	125	112	144	94	66	87	39	28	41
7.....	150	301	114	130	112	145	93	62	82	38	28	38
8.....	145	177	113	150	106	136	92	63	74	36	28	37
9.....	144	138	114	190	106	132	90	60	70	36	27	37
10.....	141	123	114	158	109	125	95	71	67	37	28	37
11.....	138	114	117	146	108	124	92	420	68	32	27	35
12.....	136	110	117	136	110	126	85	104	73	30	27	33
13.....	135	110	117	129	112	126	82	74	75	28	28	33
14.....	132	110	118	125	114	121	78	67	76	27	31	33
15.....	132	111	118	121	112	115	73	1,230	73	28	119	33
16.....	132	109	125	123	110	117	74	1,060	67	31	133	33
17.....	132	109	124	125	112	118	73	297	65	35	48	39
18.....	131	109	123	125	110	118	71	166	62	34	40	49
19.....	130	110	121	124	108	120	70	138	63	39	37	81
20.....	126	111	120	123	108	110	112	118	61	41	36	58
21.....	125	111	119	124	106	106	81	109	50	37	35	47
22.....	129	112	123	127	106	106	70	102	42	30	34	41
23.....	126	113	154	129	104	105	100	98	41	29	34	38
24.....	127	114	183	131	105	105	84	93	39	35	35	37
25.....	127	117	171	119	105	108	73	2,890	38	30	34	36
26.....	125	114	137	115	111	105	71	3,060	39	29	35	36
27.....	123	111	130	114	164	106	68	520	35	26	38	36
28.....	123	112	125	114	220	109	68	266	34	21	36	35
29.....	120	112	120	115	-----	114	66	182	33	28	34	34
30.....	119	112	124	125	-----	168	64	145	34	32	34	33
31.....	124	-----	132	125	-----	391	-----	125	-----	35	34	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	193	119	139	8,550
November.....	301	109	128	7,620
December.....	183	112	124	7,620
January.....	190	114	132	8,120
February.....	220	104	116	6,440
March.....	391	105	134	8,240
April.....	296	64	92.8	5,520
May.....	3,060	59	385	23,700
June.....	111	53	64.8	3,860
July.....	41	21	33.1	2,040
August.....	133	27	38.5	2,370
September.....	88	53	44.2	2,630
The year.....	3,060	21	120	86,700

## SAN SABA RIVER SEEPAGE INVESTIGATION

During the investigations the river was at a constant stage, and measurements represent natural conditions.

*Discharge measurements of San Saba River to determine seepage from Fort McKavett, Tex., to mouth of Brady Creek, Tex., 1933*

Date	Stream or diversion	Location	Dis- tance from initial point (miles)	Discharge (second-feet)				
				Main stream	Trib- utary	Div- er- sion	Gain or loss in sec- tion	Total gain or loss
July 27	San Saba River.....	¼ mile above Fort McKavett.	0	9.7				
27	Government Spring...	Mouth, near Fort McKavett	.5		2.0			
27	San Saba River.....	First McKavett-Menard road crossing.	1.0	14.2			+2.5	+2.5
27	Mears pump.....	Near Fort McKavett.....	4.0			1.7		
27	McKnight pump.....	do.....	6.0			1.9		
27	San Saba River.....	Third McKavett-Menard road crossing.	8.0	11.1			+5	+3.0
27	Rocky Creek.....	Mouth.....	10.0		.2			
27	Clear Creek.....	do.....	13.0		14.1			
27	San Saba River.....	½ mile below mouth of Clear Creek.	13.5	25.1			-3	+2.7
27	do.....	Just above Noyes Canal head gate.	17.0	24.4			-7	+2.0
28	Noyes Canal.....	Head gate.....	17.0			0		
28	Waddell pump.....	Below Noyes Canal head gate.	17.8			0		
28	Placker pump.....	2 miles above Menard.....	19.0			2.1		
28	San Saba River.....	Menard.....	21.0	20.7			-1.6	+4
28	do.....	First Menard-Mason road crossing.	26.0	21.8			+1.1	+1.5
28	Kitchen Canal.....	5½ miles below Menard.....	26.5			9.9		
28	San Saba River.....	Second Menard-Mason road crossing.	31.0	7.9			-4.0	-2.5
28	do.....	Matthews tract.....	35.0	5.3			-2.6	-5.1
28	do.....	Brady-Hext road crossing.....	41.0	2.2			-3.1	-8.2
28	do.....	Grey ranch.....	50.0	1.4			-8	-9.0
28	Calf Creek.....	Mouth.....	51.0		0			
29	San Saba River.....	Camp San Saba.....	60.0	1.5			+1	-8.9
29	do.....	¼ mile above Voca.....	64.0	2.1			+6	-8.3
29	do.....	1,500 feet above mouth of Lost Creek.	69.0	2.0			-1	-8.4
29	Lost Creek.....	Mouth.....	69.3		.2			
29	San Saba River.....	Campbell crossing.....	72.0	1.3			-9	-9.3
29	Deer Creek.....	Mouth.....	73.0		0			
29	San Saba River.....	Mouth of Deer Creek.....	73.0	0			-1.3	-10.6
29	Deep Creek.....	Mouth.....	78.5		0			
29	San Saba River.....	300 feet above mouth of Brady Creek.	80.0	18.3			+18.3	+7.7
29	Brady Creek.....	1,000 feet above mouth.....	80.0		4.5			
29	San Saba River.....	Below mouth of Brady Creek.....	80.1	* 22.8			0	+7.7

\* Discharge obtained by adding discharge of Brady Creek to river discharge as measured above mouth of creek.

## NOYES CANAL AT MENARD, TEX.

LOCATION.—Staff gage 1,000 feet above highway bridge in Menard, Menard County, and 4 miles below head gates.

RECORDS AVAILABLE.—March 1924 to September 1933.

DISCHARGE.—Maximum during year, 20 second-feet May 31; maximum gage height, 1.64 feet Sept. 16; no flow at times.

1924-33: Maximum, about 58 second-feet Feb. 2, 1931 (gage height, 2.70 feet); no flow at times.

REMARKS.—Records fair. Canal diverts from right bank of San Saba River 4 miles above Menard. Water used for irrigation near Menard; 10 acres irrigated above station.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	5.8	7.8	9.1	14	10	0.6	17	18	19	17	17	0.9
2.....	6.7	8.6	9.1	11	10	.1	17	17	17	16	15	14
3.....	7.1	9.7	9.1	10	10	.1	16	19	15	8.6	16	15
4.....	7.4	9.9	9.1	10	10	.1	16	18	14	11	18	14
5.....	7.2	10	9.5	10	10	.1	15	17	18	14	14	14
6.....	7.6	10	10	10	9.9	.1	15	17	13	19	17	12
7.....	7.6	9.9	10	10	9.7	.1	14	17	14	19	17	13
8.....	7.6	9.7	10	10	8.4	.2	14	17	16	19	15	14
9.....	7.6	9.5	10	10	1.0	.4	15	16	18	19	16	14
10.....	7.6	9.5	10	10	1.0	.6	18	16	18	19	12	8.3
11.....	7.6	9.5	10	9.9	1.0	.3	18	16	19	19	14	0
12.....	7.6	9.5	9.9	9.9	1.0	.1	17	14	19	15	16	0
13.....	7.8	9.7	9.9	9.9	1.0	.1	17	8.4	19	15	16	0
14.....	8.0	9.5	10	9.9	1.0	0	18	5.5	19	14	16	0
15.....	8.0	9.3	11	9.9	1.0	0	17	3.3	19	16	17	18
16.....	8.0	9.3	11	9.9	1.0	0	17	.7	19	15	16	19
17.....	8.0	9.3	9.5	9.9	1.4	0	17	.6	18	16	16	18
18.....	8.0	9.3	9.5	9.9	1.8	0	17	.5	19	16	16	18
19.....	8.0	9.3	9.5	9.9	5.6	0	17	6.4	19	16	16	15
20.....	8.0	9.3	9.9	9.9	5.6	0	17	17	18	18	15	14
21.....	7.8	9.7	10	9.9	5.6	0	16	17	17	16	14	16
22.....	7.8	9.7	9.9	9.9	6.0	0	16	17	14	9.7	13	16
23.....	7.8	9.5	9.5	9.9	6.5	0	16	17	12	16	14	15
24.....	7.8	9.7	9.5	9.9	6.5	0	16	18	.1	19	13	11
25.....	7.8	9.7	9.5	9.5	6.5	0	16	19	11	19	14	0
26.....	7.8	9.7	9.5	9.9	7.1	0	17	19	18	8.8	14	4.5
27.....	7.8	9.5	9.5	10	7.1	14	16	19	17	.1	14	16
28.....	7.8	9.1	9.9	10	7.1	19	16	19	17	.1	13	16
29.....	7.8	9.1	9.9	10	-----	16	17	19	17	5.7	12	18
30.....	7.8	9.1	15	10	-----	16	19	19	17	16	12	16
31.....	7.8	-----	14	10	-----	17	-----	20	-----	16	3.3	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	8.0	5.8	7.65	470
November.....	10	7.8	9.45	562
December.....	15	9.1	10.1	621
January.....	14	9.5	10.1	621
February.....	10	1.0	5.46	303
March.....	19	0	2.74	168
April.....	19	14	16.5	982
May.....	20	.5	14.4	885
June.....	19	.1	16.3	970
July.....	19	.1	14.5	892
August.....	18	3.3	14.6	898
September.....	19	0	11.7	696
The year.....	20	0	11.1	8,070

## NORTH LLANO RIVER NEAR JUNCTION, TEX.

**LOCATION.**—Water-stage recorder 500 feet above remains of old Wilson Dam and 3 miles northwest of Junction, Kimbrie County. Zero of gage is 1,699.9 feet above mean sea level.

**DRAINAGE AREA.**—914 square miles.

**RECORDS AVAILABLE.**—September 1915 to September 1933.

**DISCHARGE.**—Maximum during year, 18,600 second-feet May 25 (gage height, 11.56 feet); minimum, 2.7 second-feet Sept. 30 (gage height, 1.02 feet).

1915-33: Maximum stage, 23 feet April 24, 1923 (discharge not determined); no flow at times. Average, 18 years, 62.6 second-feet.

**REMARKS.**—Records good below 5,000 second-feet; poor above. Diversions above station for irrigation materially reduce low-water flow.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	92	39	38	39	36	33	26	16	111	18	8.0	8.6
2	86	39	38	38	36	32	26	16	98	18	8.0	8.0
3	83	39	38	38	36	30	28	16	92	18	8.0	7.3
4	80	39	38	38	36	30	28	15	83	17	7.3	7.3
5	78	59	38	38	36	29	26	14	78	20	7.3	6.0
6	75	52	38	36	36	29	26	14	72	21	7.3	6.0
7	72	45	36	38	36	29	26	13	69	20	6.7	5.5
8	72	47	36	43	34	28	25	12	64	19	5.5	5.0
9	72	47	36	43	34	28	25	9.3	62	19	5.0	4.6
10	72	47	36	41	33	28	25	9.3	59	17	5.0	4.6
11	72	47	36	41	33	28	24	9.3	54	17	4.6	4.6
12	72	47	36	41	33	28	24	9.3	52	17	4.6	4.6
13	72	47	36	39	33	28	23	10	47	15	4.6	4.6
14	69	47	36	39	33	28	23	1,650	45	14	4.1	4.6
15	67	45	36	39	33	26	21	982	43	16	4.1	4.6
16	67	45	36	41	32	26	21	181	39	15	4.1	4.6
17	67	45	36	41	32	26	20	89	36	15	4.6	5.0
18	62	45	36	39	32	26	20	64	38	15	4.6	5.0
19	59	45	36	39	32	26	20	52	36	15	5.0	5.0
20	59	45	36	41	32	26	23	45	32	15	5.0	5.0
21	57	45	36	39	32	26	21	39	28	14	5.0	4.6
22	52	41	36	43	30	26	21	38	28	14	4.6	4.1
23	52	39	36	43	30	26	21	36	28	13	4.1	4.1
24	52	39	36	41	30	26	21	33	26	13	4.1	4.1
25	49	39	36	39	30	26	20	7,020	24	13	4.1	3.6
26	47	39	36	39	32	26	20	2,270	23	11	3.6	3.6
27	47	39	36	39	36	26	19	356	23	9.3	3.6	3.6
28	45	39	36	38	34	26	19	217	20	8.0	3.6	3.6
29	45	39	33	38		26	17	173	19	8.6	6.0	3.3
30	41	39	47	38		26	16	141	18	8.0	6.7	3.0
31	39		41	36		26		120		8.0	8.0	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	92	39	63.7	3,920
November	59	39	43.6	2,590
December	47	33	36.8	2,260
January	43	36	39.5	2,430
February	36	30	33.3	1,850
March	33	26	27.4	1,680
April	28	16	22.5	1,340
May	7,020	9.3	441	27,100
June	111	18	48.2	2,870
July	21	8.0	14.9	916
August	8.0	3.6	5.38	331
September	8.6	3.0	4.94	294
The year	7,020	3.0	65.7	47,600

## LLANO RIVER NEAR JUNCTION, TEX.

LOCATION.—Water-stage recorder 100 feet north of Kerrville-Junction road, 3 miles below confluence of North Llano and South Llano Rivers, and 3½ miles east of Junction, Kimble County.

DRAINAGE AREA.—1,760 square miles.

RECORDS AVAILABLE.—September 1915 to September 1933.

DISCHARGE.—Maximum during year, 15,800 second-feet May 25 (gage height, 10.68 feet); minimum, 46 second-feet Aug. 23, 24 (gage height, 1.45 feet).

1915-33: Maximum, about 106,000 second-feet Sept. 1, 1932 (gage height, 27.15 feet); minimum, 13 second-feet Aug. 23-28, 1918 (gage height, 1.32 feet). Average, 18 years, 211 second-feet.

REMARKS.—Records excellent. About 2,500 acres above and 1,300 acres below station have been declared irrigated. Diversions slightly reduce low-water flow. Slight regulation by water power on South Llano River.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	379	167	136	132	121	118	95	76	242	88	71	65
2.....	359	167	136	128	121	111	95	76	218	88	68	65
3.....	340	167	136	125	121	108	95	76	208	88	68	62
4.....	322	167	136	125	121	108	92	74	193	85	65	62
5.....	297	193	136	128	121	111	92	74	184	85	65	60
6.....	292	193	136	128	121	111	92	74	176	88	62	60
7.....	286	180	132	132	118	108	92	74	172	88	62	60
8.....	280	176	132	139	114	104	92	74	163	85	60	60
9.....	275	172	132	136	114	104	92	74	154	82	60	60
10.....	264	172	132	136	114	101	92	74	150	79	60	60
11.....	253	172	132	132	114	101	88	74	146	79	57	60
12.....	248	172	128	132	114	101	88	74	143	79	57	60
13.....	242	172	128	132	114	101	88	71	139	79	54	60
14.....	237	172	128	132	114	101	88	4,550	136	79	54	60
15.....	232	172	128	132	114	98	88	3,400	128	76	54	60
16.....	227	172	128	132	114	98	85	742	125	76	54	60
17.....	222	172	128	132	118	98	85	373	121	76	52	60
18.....	218	172	128	132	118	98	85	258	118	76	52	60
19.....	213	172	128	132	118	98	88	213	121	79	52	60
20.....	193	163	128	132	114	95	104	180	114	79	52	57
21.....	189	159	128	132	114	95	92	163	111	76	49	54
22.....	184	159	128	136	114	95	88	150	111	76	49	52
23.....	184	159	125	132	114	95	85	136	108	76	46	52
24.....	184	154	125	128	114	95	85	132	108	76	49	52
25.....	180	150	125	125	114	95	85	5,970	104	74	49	52
26.....	180	146	125	121	114	95	85	4,540	101	74	54	52
27.....	180	146	121	121	128	95	79	1,080	98	71	54	52
28.....	176	143	121	121	128	95	79	523	95	71	52	49
29.....	176	139	121	121	-----	95	76	393	95	71	54	49
30.....	176	136	136	121	-----	95	76	316	92	71	54	49
31.....	172	-----	132	121	-----	95	-----	270	-----	71	60	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	379	172	237	14,600
November.....	193	136	165	9,820
December.....	136	121	130	7,990
January.....	139	121	129	7,930
February.....	128	114	117	6,500
March.....	118	95	101	6,210
April.....	104	76	88.2	5,250
May.....	5,970	71	786	48,300
June.....	242	92	139	8,270
July.....	88	71	78.7	4,840
August.....	71	46	56.4	3,470
September.....	65	49	57.5	3,420
The year.....	5,970	46	175	127,000

## LLANO RIVER NEAR CASTELL, TEX.

LOCATION.—Water-stage recorder 4 miles above mouth of Hickory Creek and 6 miles east of Castell, Llano County.

DRAINAGE AREA.—3,510 square miles.

RECORDS AVAILABLE.—November 1923 to September 1933.

DISCHARGE.—Maximum during year, 22,800 second-feet May 25 (gage height, 11.93 feet); minimum, 41 second-feet Aug. 23 (gage height, 0.86 foot).

1924-33: Maximum, about 89,800 second-feet Oct. 6, 1930 (gage height, 22.3 feet); minimum, 16 second-feet Aug. 17, Sept. 4, 5, 1929 (gage height, 0.59 foot).

REMARKS.—Records good except those partly estimated, Sept. 17-20, and those estimated, Sept. 21-30, which are fair. Small diversions above station slightly reduce low-water flow.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	579	230	185	218	179	284	151	94	430	90	65	96
2	521	226	186	202	171	240	142	90	370	87	63	78
3	487	222	186	192	166	222	137	88	326	83	59	68
4	447	224	186	188	164	214	134	102	295	82	56	68
5	408	353	185	186	162	242	130	168	273	83	54	71
6	380	385	183	185	160	265	126	116	249	85	53	66
7	367	302	181	218	158	236	122	95	228	85	52	60
8	357	265	177	349	153	210	121	87	216	82	51	59
9	346	232	173	317	149	196	122	81	204	87	48	64
10	334	220	173	258	149	186	122	81	194	83	45	66
11	321	212	179	226	154	183	118	82	186	78	43	57
12	312	210	181	204	156	185	115	83	192	75	43	53
13	304	208	181	190	158	186	112	81	190	72	50	51
14	298	208	179	188	160	175	108	176	188	70	47	51
15	293	208	183	186	160	164	103	7,600	175	68	48	50
16	291	202	196	186	158	158	102	3,170	164	68	53	56
17	289	200	196	188	156	158	103	1,120	154	70	53	203
18	280	200	190	188	156	158	105	624	149	75	59	82
19	278	200	185	188	154	153	110	439	144	88	60	60
20	276	202	181	185	151	145	140	334	138	80	56	57
21	267	198	179	188	145	144	149	273	134	74	48	53
22	262	196	201	200	144	142	160	236	132	71	44	
23	260	202	292	196	145	142	400	210	124	68	42	
24	258	206	364	190	147	144	263	192	120	64	61	
25	256	198	285	181	147	142	149	7,210	115	63	52	
26	251	194	222	171	201	140	124	10,100	110	63	56	
27	247	192	202	168	525	142	115	3,210	105	62	48	
28	245	190	190	164	394	147	109	1,490	102	60	74	
29	238	188	183	169	-----	149	103	842	99	60	77	
30	236	186	194	181	-----	153	99	624	94	63	66	
31	234	-----	230	181	-----	154	-----	510	-----	66	94	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	579	234	320	19,700
November	385	186	222	13,200
December	364	173	200	12,300
January	349	164	201	12,400
February	525	144	179	9,940
March	284	140	179	11,000
April	400	99	136	8,090
May	10,100	81	1,280	78,700
June	430	94	187	11,100
July	90	60	74.4	4,570
August	94	42	55.5	3,410
September	203	-----	64.9	3,860
The year	10,100	42	260	188,000

## PEDERNALES RIVER AT STONEWALL, TEX.

LOCATION.—Staff gage at Stonewall, Gillespie County, 2 miles below mouth of South Grape Creek. Zero of gage is 1,418.85 feet above mean sea level.

DRAINAGE AREA.—647 square miles.

RECORDS AVAILABLE.—July 1924 to September 1933.

DISCHARGE.—Maximum during year, 3,140 second-feet May 25 (gage height, 4.22 feet); minimum, 2.8 second-feet Aug. 9–13, Sept. 12–16, 23, 24.

1924–33: Maximum, about 28,300 second-feet May 28, 1929 (gage height, 14.25 feet); minimum, 1.8 second-feet July 30, 31, 1925 (gage height, 0.33 foot).

Maximum stage known, about 24.0 feet in 1900.

REMARKS.—Records good. No diversions above station.

*Discharge, in second-feet, 1932–33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	55	27	26	a 37	55	68	55	31	32	6.5	4.3	27
2	51	27	26	36	53	63	53	31	27	7.2	4.3	9.8
3	47	27	26	34	55	63	49	27	24	7.2	3.9	5.8
4	45	27	26	34	55	63	47	79	24	7.2	3.9	5.0
5	39	38	26	32	51	75	47	41	22	6.5	3.9	3.9
6	39	38	26	32	55	111	47	32	21	6.5	3.5	3.9
7	39	34	26	174	55	80	45	27	18	6.1	3.2	3.9
8	38	31	24	1,010	51	71	43	23	16	5.8	3.2	3.5
9	38	31	26	227	47	71	47	22	15	5.8	2.8	3.5
10	38	31	26	117	51	68	47	22	15	5.8	2.8	3.2
11	36	27	29	104	51	66	41	21	16	5.8	2.8	3.2
12	36	27	29	88	51	a 67	41	20	15	5.4	2.8	2.8
13	36	27	29	78	51	68	39	20	15	5.0	2.8	2.8
14	34	27	29	73	53	63	38	20	15	4.6	3.2	2.8
15	34	27	29	68	57	63	36	39	14	5.4	3.2	2.8
16	32	26	34	71	71	61	36	31	13	6.5	3.2	2.8
17	32	26	34	68	61	63	36	24	13	5.8	3.2	3.9
18	32	26	a 33	68	53	63	32	22	12	108	4.6	3.9
19	32	26	32	63	51	63	32	20	12	a 34	3.2	3.5
20	29	26	29	61	49	59	47	17	12	11	3.2	3.2
21	29	26	29	61	47	55	47	16	12	7.2	3.2	3.2
22	29	26	29	194	47	55	39	15	10	6.1	3.2	3.2
23	29	27	374	73	51	55	302	13	10	5.8	3.2	2.8
24	29	27	565	66	53	55	47	13	9.1	5.4	3.9	2.8
25	29	26	98	59	53	55	39	1,770	9.1	5.0	5.4	3.9
26	27	26	61	55	55	53	36	679	8.4	5.0	8.4	4.3
27	29	26	51	55	91	57	36	130	7.8	4.6	7.8	3.5
28	29	26	47	55	80	61	32	71	7.8	4.3	4.6	3.5
29	29	26	43	57	-----	61	32	49	7.8	4.3	11	3.5
30	29	26	43	63	-----	61	31	43	7.2	13	10	3.5
31	29	-----	38	59	-----	61	-----	36	-----	5.0	14	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	55	27	34.8	2,140
November	38	26	27.9	1,660
December	565	24	62.7	3,860
January	1,010	32	106	6,520
February	91	47	55.5	3,080
March	111	53	64.5	3,970
April	302	31	50.0	2,980
May	1,770	13	110	6,760
June	32	7.2	14.7	875
July	108	4.3	10.4	640
August	14	2.8	4.60	283
September	27	2.8	4.51	268
The year	1,770	2.8	45.6	33,000

a Partly estimated or interpolated.



## PEDERNALES RIVER NEAR SPICEWOOD, TEX.

LOCATION.—Staff gage in Travis County, 2½ miles below mouth of Fall Creek and 8 miles southeast of Spicewood, Burnet County. Zero of gage is 624.8 feet above mean sea level.

DRAINAGE AREA.—1,290 square miles.

RECORDS AVAILABLE.—November 1923 to September 1933.

DISCHARGE.—Maximum during year, 2,020 second-feet May 26 (gage height, 5.65 feet); no flow July 12–15.

1924–33: Maximum, about 155,000 second-feet May 28, 1929 (gage height, 40.4 feet); no flow at times.

REMARKS.—Records good. No diversions above station.

*Discharge, in second-feet, 1932–33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	90	31	41	67	99	92	77	32	50	1.8	19	14
2.....	77	31	41	64	92	101	74	29	35	1.7	24	26
3.....	72	31	42	59	79	88	70	25	31	1.5	18	29
4.....	65	33	44	59	76	81	65	36	26	1.4	14	17
5.....	59	33	44	57	76	90	62	35	24	1.2	10	16
6.....	55	33	44	55	76	92	60	44	21	.9	7.5	16
7.....	50	33	44	79	76	119	57	76	18	.7	5.5	13
8.....	47	37	44	232	74	133	54	55	16	.6	4.1	9.5
9.....	44	41	44	789	72	110	54	40	15	.4	2.9	7.5
10.....	44	42	44	392	72	92	55	33	13	.2	1.9	6.0
11.....	44	37	44	190	67	86	55	30	12	.2	1.7	4.7
12.....	42	36	44	156	67	84	50	27	12	0	1.5	3.5
13.....	41	35	47	128	67	84	48	23	12	0	210	3.8
14.....	41	33	50	115	67	84	45	20	12	0	87	5.5
15.....	40	33	54	106	70	81	44	564	22	0	32	5.0
16.....	38	33	60	104	72	77	41	249	27	4.0	25	5.0
17.....	37	33	65	102	74	77	41	102	18	3.2	17	4.7
18.....	36	33	67	99	74	77	40	65	15	1.4	14	3.5
19.....	35	33	67	87	76	74	38	41	12	32	8.5	1.9
20.....	33	37	65	95	72	74	41	31	11	94	6.5	1.9
21.....	33	41	62	95	65	70	40	24	9.0	41	5.0	1.6
22.....	33	44	59	90	60	69	40	21	7.0	26	4.1	1.3
23.....	32	47	64	106	59	69	38	18	6.5	19	3.2	1.0
24.....	32	47	67	163	59	65	86	16	6.0	14	2.6	1.0
25.....	33	48	282	111	59	64	131	25	5.0	10	3.2	1.3
26.....	32	54	202	93	59	64	79	1,010	4.7	8.5	10	1.7
27.....	31	50	140	83	70	64	59	609	4.1	6.5	6.5	2.3
28.....	31	47	92	79	77	64	45	205	3.5	5.0	4.7	3.8
29.....	31	42	83	77	-----	69	38	129	2.6	34	18	3.8
30.....	31	41	76	117	-----	74	35	92	1.9	73	42	2.6
31.....	31	-----	72	108	-----	74	-----	69	-----	22	56	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	90	31	43.2	2,660
November.....	54	31	38.3	2,280
December.....	282	41	70.8	4,350
January.....	789	55	135	8,300
February.....	99	59	71.6	3,980
March.....	133	64	82.0	5,050
April.....	131	35	55.4	3,300
May.....	1,010	16	122	7,500
June.....	50	1.9	15.2	904
July.....	94	0	13.0	799
August.....	210	1.5	21.5	1,320
September.....	29	1.0	7.13	424
The year.....	1,010	0	56.4	40,900

## GUADALUPE RIVER BASIN

## GUADALUPE RIVER NEAR SPRING BRANCH, TEX.

**LOCATION.**—Water-stage recorder at New Braunfels-Blanco highway bridge 4 miles southeast of Spring Branch, Comal County. Zero of gage is 947.37 feet above mean sea level.

**DRAINAGE AREA.**—1,430 square miles.

**RECORDS AVAILABLE.**—June 1922 to September 1933.

**DISCHARGE.**—Maximum during year, 4,120 second-feet May 26 (gage height, 8.78 feet); minimum, 36 second-feet Sept. 16.

1922-33: Maximum, 121,000 second-feet July 3, 1932 (gage height, 42.10 feet); minimum, about 4.7 second-feet Aug. 18, 1923 (gage height, about 1.74 feet). Average, 11 years, 229 second-feet.

**REMARKS.**—Records good. About 400 acres has been declared irrigated above station. Slight regulation during low-water periods caused by operation of water-power plants upstream.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	462	192	163	201	261	268	215	150	212	68	84	86
2	416	190	161	192	252	248	206	145	192	68	66	73
3	384	187	161	190	248	242	201	140	179	66	62	93
4	366	187	161	187	248	238	198	145	163	66	53	55
5	344	190	161	187	248	245	198	145	148	64	51	60
6	320	195	161	187	242	248	195	145	137	66	51	55
7	308	206	163	250	242	265	192	148	132	62	48	53
8	290	198	161	727	242	261	184	135	130	62	46	51
9	275	184	158	1,160	232	248	184	127	122	62	44	48
10	268	176	156	670	226	242	184	125	120	62	43	44
11	261	174	156	540	229	232	187	120	117	62	43	43
12	252	174	161	475	226	235	179	120	125	62	43	41
13	252	171	161	416	226	238	176	117	135	62	43	40
14	245	171	161	389	223	242	176	117	145	60	44	37
15	242	174	163	358	229	238	171	256	137	56	48	37
16	238	174	163	340	238	223	169	255	127	53	48	37
17	235	171	171	340	248	220	169	163	120	55	51	46
18	232	169	174	336	245	223	163	140	115	56	56	98
19	223	169	169	332	232	229	166	132	110	55	55	75
20	220	169	161	324	226	226	190	122	108	64	51	60
21	215	169	156	312	220	220	252	113	105	68	50	55
22	209	166	158	316	215	218	187	108	101	64	46	50
23	206	166	170	324	212	215	176	103	96	60	46	46
24	203	169	635	293	212	212	184	103	91	68	46	46
25	203	169	503	282	212	215	169	117	89	119	44	46
26	201	166	336	272	212	209	229	1,610	81	81	43	66
27	198	161	261	268	232	206	179	811	79	56	64	56
28	198	163	235	258	268	209	166	430	79	51	55	56
29	195	163	218	255	-----	212	158	324	75	55	58	44
30	195	163	212	265	-----	218	158	275	71	86	43	44
31	195	-----	209	272	-----	220	-----	238	-----	84	56	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	462	195	260	16,000
November	206	161	176	10,500
December	635	156	204	12,500
January	1,160	187	352	21,600
February	268	212	234	13,000
March	268	206	231	14,200
April	252	158	185	11,000
May	1,610	103	232	14,300
June	212	71	121	7,200
July	119	51	65.3	4,020
August	84	43	51.0	3,140
September	98	37	54.7	3,250
The year	1,610	37	181	131,000

## GUADALUPE RIVER ABOVE COMAL RIVER, AT NEW BRAUNFELS, TEX.

LOCATION.—Water-stage recorder at New Braunfels, Comal County, 1.1 miles above Comal River. Zero of gage is 586.56 feet above mean sea level.

DRAINAGE AREA.—1,600 square miles.

RECORDS AVAILABLE.—December 1927 to September 1933.

DISCHARGE.—Maximum during year, 3,000 second-feet May 27 (gage height, 4.72 feet); minimum, 44 second-feet Aug. 28, 29 (gage height, 1.19 feet).

1928-33: Maximum, 95,200 second-feet July 3, 1932 (gage height, 32.48 feet); minimum, 14 second-feet July 19, 20, 1928 (gage height, 0.28 foot).

Maximum stage known, about 38 feet in 1869 and December 1913.

REMARKS.—Records good. Small diversions above station for irrigation. Slight regulation during low-water periods caused by operation of small power plants upstream.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	535	208	177	220	307	296	249	168	224	77	111	199
2.....	486	205	180	216	296	302	245	165	205	65	92	113
3.....	431	205	180	212	291	291	232	162	188	69	88	99
4.....	409	205	180	208	285	280	228	174	171	69	73	89
5.....	372	205	180	205	280	285	237	162	162	66	66	91
6.....	350	205	180	202	278	302	224	160	154	66	62	78
7.....	329	208	180	208	275	285	216	162	136	65	60	69
8.....	314	212	177	296	264	296	212	162	134	64	56	65
9.....	307	205	177	1,050	264	291	212	154	129	65	55	62
10.....	296	198	174	995	264	280	212	148	122	62	53	61
11.....	291	191	174	670	258	269	212	141	120	60	51	57
12.....	285	188	177	535	253	269	208	136	154	59	50	53
13.....	275	184	180	469	258	269	205	134	141	62	49	53
14.....	269	184	180	423	264	269	205	131	136	61	48	50
15.....	264	184	180	401	264	258	194	129	138	60	49	50
16.....	264	184	191	394	280	258	194	189	138	62	49	50
17.....	258	184	191	379	275	253	191	269	129	66	50	54
18.....	253	184	184	372	280	253	194	180	122	60	50	90
19.....	253	184	184	357	285	253	191	157	113	57	49	99
20.....	245	184	184	357	264	249	224	143	109	56	84	99
21.....	237	184	180	350	253	245	212	141	105	57	61	82
22.....	232	184	177	336	249	245	269	124	102	62	54	68
23.....	228	188	184	321	245	245	216	114	95	69	51	61
24.....	228	188	191	329	245	245	234	109	94	95	50	60
25.....	224	184	703	314	245	241	256	169	91	102	53	69
26.....	220	184	469	307	249	237	194	160	86	80	50	74
27.....	216	180	350	296	264	237	245	1,590	82	107	50	68
28.....	212	180	280	291	269	241	205	672	80	83	48	70
29.....	212	180	253	291	-----	241	194	438	77	84	59	69
30.....	212	177	241	302	-----	245	180	357	76	184	275	65
31.....	212	-----	228	207	-----	249	-----	253	-----	162	271	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	535	212	288	17,700
November.....	212	177	191	11,400
December.....	703	174	221	13,600
January.....	1,050	202	375	23,100
February.....	307	245	268	14,900
March.....	302	237	264	16,200
April.....	269	180	216	12,900
May.....	1,590	109	237	14,600
June.....	224	76	127	7,560
July.....	184	56	76.0	4,670
August.....	275	48	73.1	4,490
September.....	199	50	74.6	4,500
The year.....	1,590	48	201	146,000

## GUADALUPE RIVER BELOW CUERO, TEX.

LOCATION.—Water-stage recorder three-quarters of a mile upstream from Heards Bridge, on Arneckville road, and 2½ miles southeast of Cuero, DeWitt County. Zero of gage is 125.45 feet above mean sea level.

DRAINAGE AREA.—5,070 square miles.

RECORDS AVAILABLE.—August 1916 to September 1933. Comparable records at Schleicher Bridge, 4 miles upstream, December 1902 to December 1906, August 1915 to August 1916.

DISCHARGE.—Maximum during year, 9,340 second-feet Aug. 2 (gage height, 12.67 feet); minimum not determined.

1902-6, 1915-33: Maximum, about 101,000 second-feet May 30, 1929 (gage height, 35.2 feet); minimum, about 80 second-feet Nov. 1, 1917 (gage height, 0.58 foot). Average, 13 years (1920-33), 1,400 second-feet.

Maximum stage known, 37.6 feet Nov. 4, 1913.

REMARKS.—Records good. Flow not materially affected by numerous small diversions above station. Low-water flow regulated by operation of water-power plants upstream.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	1,920	590	727	891	1,120	1,020	684	739	1,230	394	6,780	891
2.....	1,540	721	771	988	1,060	923	796	752	988	384	9,000	1,160
3.....	1,360	739	809	988	1,020	783	764	721	764	354	5,220	1,160
4.....	1,470	714	777	891	988	821	821	764	746	405	988	846
5.....	1,430	690	923	859	846	1,310	783	631	666	421	619	660
6.....	1,090	714	783	891	828	5,860	777	790	702	477	690	578
7.....	1,060	764	666	859	859	3,420	891	709	672	471	613	527
8.....	956	631	714	956	1,430	3,020	834	727	637	443	752	510
9.....	923	714	796	859	1,190	1,840	828	654	631	400	721	584
10.....	956	714	802	1,230	956	1,290	771	783	533	369	465	637
11.....	956	690	771	1,580	923	709	859	637	666	432	505	411
12.....	859	690	783	1,430	859	923	714	578	1,230	449	567	572
13.....	853	783	783	1,230	783	923	684	549	1,020	334	488	631
14.....	809	739	783	1,470	783	891	721	572	891	384	421	449
15.....	859	702	684	1,400	733	923	648	578	619	354	549	411
16.....	777	746	771	1,290	802	859	1,060	613	660	400	510	411
17.....	891	672	758	1,260	1,060	923	1,360	590	637	379	527	471
18.....	714	752	714	1,090	1,260	891	802	631	601	400	619	438
19.....	815	752	790	1,160	1,120	891	721	549	555	427	684	460
20.....	828	771	666	1,090	1,020	777	696	648	596	421	567	416
21.....	690	758	714	988	923	1,120	678	607	631	364	471	454
22.....	727	678	714	1,060	891	739	771	625	601	359	578	510
23.....	702	764	790	1,060	891	846	809	625	572	443	493	544
24.....	721	771	859	1,020	796	891	752	690	590	400	619	505
25.....	771	739	923	1,020	891	796	796	733	432	384	923	421
26.....	771	733	988	1,120	1,090	790	988	1,260	471	411	727	815
27.....	666	746	1,120	1,060	1,060	1,060	1,330	4,080	505	613	859	1,400
28.....	764	660	1,060	796	1,120	988	988	4,020	471	549	988	1,290
29.....	666	733	1,160	891	-----	1,090	790	1,920	427	510	584	746
30.....	714	834	988	1,120	-----	859	790	1,330	432	1,500	956	510
31.....	821	-----	1,020	1,090	-----	834	-----	1,400	-----	3,260	834	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	1,920	666	938	57,700
November.....	834	590	723	43,000
December.....	1,160	666	826	50,800
January.....	1,580	796	1,090	67,000
February.....	1,430	733	975	54,100
March.....	5,860	709	1,260	77,500
April.....	1,360	648	830	49,400
May.....	4,080	549	984	60,500
June.....	1,230	427	673	40,000
July.....	3,260	334	545	33,500
August.....	9,000	421	1,270	78,100
September.....	1,400	411	647	38,500
The year.....	9,000	334	897	650,000

## COMAL RIVER AT NEW BRAUNFELS, TEX.

LOCATION.—Water-stage recorder 200 feet upstream from San Antonio Street viaduct in New Braunfels, Comal County. Zero of gage is 582.61 feet above mean sea level.

RECORDS AVAILABLE.—December 1927 to September 1933.

DISCHARGE.—Maximum during year, 1,020 second-feet May 25 (gage height, 4.78 feet); minimum, 200 second-feet Feb. 15 (gage height, 2.80 feet).

1928-33: Maximum stage, 29.51 feet July 3, 1932, affected by backwater from Guadalupe River (discharge not determined); minimum, about 142 second-feet Dec. 11, 1928 (gage height, 2.12 feet).

Maximum stage known, 35.4 feet December 1913 (probably some backwater from Guadalupe River).

REMARKS.—Records excellent except those estimated, which are fair. Flow partly regulated by steam power plant half a mile above station.

## Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	326	318	315	} 318	304	304	322	336	297	329	308	318
2.....	326	311	315		308	300	322	336	300	329	300	315
3.....	322	315	315		311	304	322	336	297	329	300	315
4.....	329	318	315	} 315	308	300	326	344	297	322	304	311
5.....	326	322	315		304	308	329	344	297	329	300	311
6.....	329	318	315	315	304	304	336	336	304	322	300	315
7.....	326	318	315	315	304	308	340	333	300	326	300	311
8.....	322	322	311	315	300	308	336	329	297	322	308	315
9.....	322	322	315	318	297	308	336	336	304	318	308	311
10.....	318	322	315	315	300	308	333	333	300	318	304	311
11.....	308	318	322	315	300	308	340	333	297	322	311	311
12.....	315	318	326	311	300	308	340	329	300	318	308	315
13.....	322	315	322	308	297	308	344	329	294	311	308	315
14.....	329	318	322	308	297	315	347	326	297	318	308	315
15.....	329	315	326	311	297	315	351	326	290	318	304	315
16.....	326	315	322	311	294	311	347	329	290	318	311	315
17.....	329	311	322	311	294	315	347	329	294	315	308	311
18.....	326	315	326	311	290	311	351	322	297	315	308	311
19.....	326	311	322	308	290	311	347	326	300	311	308	311
20.....	326	315	326	308	294	308	351	322	304	308	304	311
21.....	322	} 315	326	308	294	315	354	322	300	311	308	311
22.....	322		326	304	294	308	347	318	304	311	304	311
23.....	322		333	304	297	311	344	322	326	311	304	311
24.....	322		326	304	300	315	344	322	322	318	304	308
25.....	326		326	304	297	311	347	555	322	318	304	308
26.....	322		326	308	297	311	344	336	326	315	304	308
27.....	326	} 315	322	308	297	315	340	318	326	311	304	308
28.....	326		311	300	329	340	304	322	329	308	308	308
29.....	326		308	308	322	340	300	318	333	308	304	304
30.....	326	315	318	308	315	336	297	326	413	308	308	304
31.....	322	-----	318	304	-----	318	-----	300	-----	308	315	-----
Month						Maximum		Minimum		Mean		Run-off in acre-feet
October.....						329		308		324		19,900
November.....						-----		-----		316		18,800
December.....						-----		-----		321		19,700
January.....						-----		-----		311		19,100
February.....						311		290		299		16,600
March.....						329		300		311		19,100
April.....						354		322		340		20,200
May.....						555		297		333		20,500
June.....						326		290		305		18,100
July.....						413		308		322		19,800
August.....						315		300		306		18,800
September.....						318		304		311		18,500
The year.....						555		-----		317		229,000

\* Partly estimated or interpolated.

† Estimated.

## SAN MARCOS RIVER AT OTTINE, TEX.

LOCATION.—Water-stage recorder at highway bridge a quarter of a mile southwest of Ottine, Gonzales County. Zero of gage is 285.1 feet above mean sea level.

DRAINAGE AREA.—1,250 square miles.

RECORDS AVAILABLE.—June 1915 to September 1933.

DISCHARGE.—Maximum during year, 5,820 second-feet July 31 (gage height, 22.72 feet); minimum, 41 second-feet June 23.

1915-33: Maximum (determined by extension of rating curve), about 202,000 second-feet May 29, 1929 (gage height, 43.32 feet); no flow July 29, 1923, Mar. 31, 1925, June 24, 1926. Average, 18 years, 438 second-feet.

Maximum stage known, about 44.0 feet in December 1913.

REMARKS.—Records good except those for estimated period, which are fair. Discharge partly estimated Aug. 3-16. Small diversions above station for irrigation and municipal uses. Low-water flow regulated by operation of several small power plants above station. Most of normal flow from large springs near San Marcos.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1. ....	120	139	123	128	151	230	157	123	119	97	3,030	472
2. ....	129	105	122	121	148	187	156	114	106	130	327	311
3. ....	124	140	127	120	152	163	148	115	127	103	230	230
4. ....	119	121	127	136	154	157	147	252	120	128		181
5. ....	129	133	123	124	152	199	166	213	114	105		136
6. ....	122	152	125	135	152	528	145	131	109	129		140
7. ....	131	127	136	130	156	394	160	133	118	98		145
8. ....	122	129	124	394	151	202	145	129	115	129		139
9. ....	134	114	116	270	129	182	158	121	104	100		139
10. ....	108	116	130	156	160	152	164	130	106	127	140	140
11. ....	135	130	124	137	141	156	213	125	134	95		419
12. ....	123	124	118	182	151	152	202	117	147	125		145
13. ....	122	114	127	155	148	156	166	143	161	104		143
14. ....	121	128	125	140	154	157	247	122	146	105		125
15. ....	124	128	119	143	152	152	1,130	119	115	119		124
16. ....	123	127	136	145	235	150	202	127	88	108	121	127
17. ....	127	122	141	143	223	154	140	121	121	133	181	129
18. ....	124	127	118	140	159	181	127	165	119	112	137	114
19. ....	122	140	131	140	174	254	135	174	143	110	118	112
20. ....	123	125	129	145	167	167	208	140	142	113	114	111
21. ....	121	131	125	142	166	146	266	120	122	110	105	122
22. ....	122	134	128	135	159	141	145	128	101	114	106	119
23. ....	124	133	159	146	156	154	124	122	90	116	112	128
24. ....	120	167	268	142	164	157	121	116	129	106	127	139
25. ....	129	160	172	147	164	184	676	296	113	236	137	210
26. ....	121	120	142	142	170	175	251	820	114	344	134	297
27. ....	128	134	130	124	222	156	161	250	123	177	125	310
28. ....	135	128	123	201	380	148	151	188	166	128	115	105
29. ....	125	113	137	124	-----	170	124	147	112	271	145	137
30. ....	130	143	125	118	-----	161	124	160	120	1,660	166	131
31. ....	119	-----	126	147	-----	160	-----	140	-----	4,690	390	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October .....	135	108	124	7,620
November .....	167	105	130	7,740
December .....	268	116	134	8,240
January .....	394	118	153	9,410
February .....	380	129	171	9,500
March .....	528	141	188	11,600
April .....	1,130	121	215	12,800
May .....	820	114	171	10,500
June .....	161	88	120	7,140
July .....	4,690	95	330	20,300
August .....	3,030	105	245	15,100
September .....	472	105	176	10,500
The year .....	4,690	88	180	130,000

## BLANCO RIVER AT WIMBERLEY, TEX.

LOCATION.—Water-stage recorder 800 feet below mouth of Cypress Creek and a quarter of a mile south of Wimberley, Hays County.

DRAINAGE AREA.—378 square miles.

RECORDS AVAILABLE.—August 1924 to September 1926; June 1928 to September 1933.

DISCHARGE.—Maximum during year, 573 second-feet Aug. 29 (gage height, 1.86 feet); minimum, 7.4 second-feet June 20 (gage height, 0.21 foot).

1924-26, 1928-33: Maximum (by slope-area method), 113,000 second-feet

May 28, 1929 (gage height, 31.10 feet); minimum, 4.0 second-feet Sept. 20, 1928 (gage height, 0.30 foot).

REMARKS.—Records excellent. No diversions above station.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	24	20	18	15	26	32	36	29	27	13	34	109
2.....	24	20	18	15	26	32	36	27	26	13	32	40
3.....	23	20	18	16	27	32	36	27	24	13	29	30
4.....	23	20	18	15	27	32	36	36	24	13	26	26
5.....	23	20	18	15	26	40	36	27	21	13	24	23
6.....	23	20	18	15	27	38	34	23	21	13	23	21
7.....	23	20	18	34	27	36	30	21	21	12	21	20
8.....	23	21	18	50	26	36	30	20	21	13	20	17
9.....	23	21	18	63	27	36	29	18	20	12	18	15
10.....	21	21	18	52	27	36	30	17	18	11	18	15
11.....	21	23	18	40	27	36	30	16	20	9.2	18	14
12.....	20	21	18	34	27	36	30	14	26	10	17	14
13.....	20	21	17	34	27	36	29	14	23	10	17	14
14.....	20	21	17	32	26	36	29	12	21	10	16	13
15.....	20	21	17	30	27	36	27	115	21	10	15	13
16.....	20	21	17	30	30	36	27	98	20	10	15	13
17.....	20	21	17	29	29	36	27	38	18	11	16	14
18.....	18	21	17	29	29	36	27	26	17	11	17	14
19.....	18	20	17	27	29	36	27	23	17	10	16	14
20.....	18	18	17	27	29	36	34	21	13	10	14	14
21.....	18	18	17	27	29	34	32	21	12	9.2	14	13
22.....	18	18	18	27	29	36	32	21	14	9.2	13	12
23.....	18	18	20	27	27	34	34	20	17	9.2	13	12
24.....	17	20	20	26	27	34	65	21	15	71	12	16
25.....	17	18	16	24	29	34	42	75	17	26	13	18
26.....	17	18	16	24	30	34	40	34	14	16	14	16
27.....	17	18	16	24	34	34	34	32	14	15	14	14
28.....	18	18	16	23	32	34	34	30	14	16	14	13
29.....	18	18	17	26	-----	34	32	30	14	58	67	13
30.....	18	18	16	27	-----	34	32	30	13	102	105	12
31.....	20	-----	15	26	-----	36	-----	29	-----	44	153	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	24	17	20.0	1,230
November.....	23	18	19.8	1,180
December.....	20	15	17.4	1,070
January.....	63	15	28.5	1,750
February.....	34	26	28.9	1,600
March.....	40	32	35.1	2,160
April.....	65	27	33.2	1,980
May.....	115	12	31.1	1,910
June.....	27	12	18.8	1,120
July.....	102	9.2	19.4	1,190
August.....	153	12	27.0	1,660
September.....	109	12	19.7	1,170
The year.....	153	9.2	24.9	18,000

## PLUM CREEK NEAR LULING, TEX.

LOCATION.—Water-stage recorder at highway bridge 2 miles above Southern Pacific Railroad bridge and about 3 miles northeast of Luling, Caldwell County. Zero of gage is 326.5 feet above mean sea level.

DRAINAGE AREA.—356 square miles.

RECORDS AVAILABLE.—March 1930 to September 1933.

DISCHARGE.—Maximum during year, 3,370 second-feet July 31 (gage height, 16.33 feet); minimum, 1.7 second-feet May 22.

1930-33: Maximum, 4,270 second-feet June 16, 1930; maximum gage height, 16.83 feet Jan. 5, 1932; minimum discharge, 1.5 second-feet Sept. 29, 1931 (gage height, -0.23 foot).

A stage of 22.0 feet has been reached.

REMARKS.—Records fair. No diversions above station.

## Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	4.9	4.3	6.4	7.5	8.6	34	6.0	2.9	3.3	2.1	858	284
2.....	4.4	4.3	6.6	7.5	8.8	11	6.0	2.7	2.8	2.1	20	290
3.....	4.1	4.4	7.0	7.5	8.6	7.5	5.8	2.4	2.7	2.1	12	5.8
4.....	4.6	4.6	7.3	7.8	8.8	6.2	5.6	2.2	2.7	2.1	8.8	4.3
5.....	4.7	22	7.3	7.8	8.8	12	6.4	5.6	2.7	2.1	7.5	3.5
6.....	4.6	24	7.3	7.8	8.6	410	6.6	3.3	2.7	2.0	6.8	3.2
7.....	4.4	6.0	7.5	17	8.6	131	6.0	2.8	2.7	2.0	6.4	2.9
8.....	4.3	5.1	7.0	319	8.3	20	5.3	2.9	2.8	2.1	6.0	2.8
9.....	4.4	4.7	7.0	63	7.5	11	5.4	2.8	2.8	2.2	5.8	2.7
10.....	4.4	4.7	6.8	16	8.0	8.6	5.4	2.8	2.7	2.1	5.8	125
11.....	4.3	4.7	7.0	10	8.6	7.3	47	2.7	2.8	2.1	5.8	213
12.....	4.1	4.7	7.3	7.8	8.6	6.8	30	2.7	4.0	2.1	6.0	6.0
13.....	4.1	4.7	7.3	7.0	8.0	6.6	23	2.7	4.6	2.0	5.8	4.1
14.....	4.4	4.9	7.3	6.8	8.3	6.4	389	2.4	3.7	2.0	5.8	3.3
15.....	4.4	5.6	7.3	6.8	8.3	6.2	369	2.3	3.2	2.0	5.6	2.9
16.....	4.3	5.1	10	6.8	42	6.2	13	2.4	2.8	2.1	5.8	2.8
17.....	4.1	5.1	10	7.0	32	6.6	7.0	2.3	2.7	2.0	41	2.7
18.....	4.0	5.6	8.6	7.0	11	7.0	6.0	2.4	2.7	1.9	11	2.6
19.....	4.0	5.8	7.5	7.0	9.4	7.3	5.8	2.3	2.6	1.9	7.8	2.6
20.....	4.0	5.8	7.3	7.0	8.0	6.8	68	2.0	2.6	1.9	9.7	2.6
21.....	3.8	5.6	7.3	7.0	7.0	6.6	26	2.0	2.4	2.0	6.8	2.5
22.....	4.1	5.6	8.0	6.8	6.4	6.8	6.4	2.0	2.3	2.0	6.0	2.5
23.....	4.0	6.2	23	6.8	6.2	7.3	4.9	1.9	2.2	1.9	6.0	2.4
24.....	4.0	20	96	6.8	6.2	7.8	4.6	1.9	2.4	2.0	6.0	2.6
25.....	4.0	14	20	6.6	6.2	12	44	14	2.3	137	13	11
26.....	4.0	6.6	9.1	6.6	6.8	9.4	45	186	2.2	37	11	111
27.....	3.8	6.0	8.3	6.6	39	7.3	5.1	12	2.2	4.1	7.3	128
28.....	4.0	6.0	7.8	6.8	171	7.0	3.8	4.4	2.1	2.7	6.6	9.4
29.....	4.3	6.2	7.5	7.0	-----	7.0	3.3	7.4	2.1	196	8.1	5.3
30.....	4.3	6.2	7.8	8.3	-----	6.8	2.9	12	2.1	878	85	4.1
31.....	4.3	-----	7.8	9.1	-----	6.6	-----	4.6	-----	2,510	338	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	4.9	3.8	4.23	260
November.....	24	4.3	7.28	433
December.....	96	6.4	11.4	701
January.....	319	6.6	19.8	1,220
February.....	171	6.2	17.1	950
March.....	410	6.2	25.9	1,590
April.....	389	2.9	38.7	2,300
May.....	186	1.9	10.4	640
June.....	4.6	2.1	2.73	162
July.....	2,510	1.9	123	7,560
August.....	858	5.6	49.5	3,040
September.....	284	2.4	32.8	1,950
The year.....	2,510	1.9	28.8	20,800



## PEACH CREEK NEAR DILWORTH, TEX.

LOCATION.—Water-stage recorder at San Antonio & Aransas Pass Railway bridge  $1\frac{1}{2}$  miles west of Dilworth, Gonzales County.

DRAINAGE AREA.—445 square miles.

RECORDS AVAILABLE.—March 1930 to May 1933 (discontinued).

DISCHARGE.—Maximum during year, 870 second-feet Mar. 7 (gage height, 10.64 feet); no flow at times.

1930-33: Maximum, 5,310 second-feet Jan. 6, 1932 (gage height, 21.1 feet); no flow at times. Maximum stage known, 23 feet (discharge, about 10,400 second-feet).

REMARKS.—Records good. No diversions above station.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
1.....	63	0.3	0.6	1.2	28	82	5.5	0.7
2.....	23	.3	.5	1.1	13	28	5.2	.6
3.....	12	.3	.5	1.1	7.4	17	4.6	.6
4.....	38	.3	.5	1.1	4.9	12	4.1	3.7
5.....	28	4.3	.5	1.1	4.1	30	4.4	3.5
6.....	9.8	17	.5	1.0	6.1	700	3.5	2.6
7.....	5.8	7.4	.4	1.0	52	734	3.2	4.1
8.....	4.4	2.6	.4	1.2	26	156	3.2	2.2
9.....	2.9	2.0	.4	1.2	17	46	3.5	1.0
10.....	2.4	1.2	.5	1.1	15	24	3.5	.7
11.....	1.7	.8	.5	1.2	9.4	16	2.9	.5
12.....	1.2	.6	.5	1.2	6.5	14	15	.4
13.....	1.2	.5	.6	1.2	5.5	13	17	.3
14.....	1.1	.4	.6	1.1	4.9	12	9.4	.2
15.....	1.0	.3	.7	1.0	4.6	10	5.2	.1
16.....	1.0	.2	1.7	1.0	104	10	3.8	.1
17.....	.9	.3	1.5	1.0	190	8.4	2.9	0
18.....	.9	.3	1.7	1.0	63	7.8	2.6	0
19.....	.8	.3	2.2	1.1	27	68	2.2	-----
20.....	.7	.3	2.2	1.4	19	177	1.9	-----
21.....	.6	.3	2.4	1.5	14	41	1.5	-----
22.....	.6	.3	2.4	1.5	10	18	1.2	-----
23.....	.6	.3	2.0	1.2	8.8	13	1.7	-----
24.....	.5	.3	17	1.4	7.8	10	10	-----
25.....	.5	.3	24	1.2	7.1	9.1	3.8	-----
26.....	.4	1.2	24	1.2	6.8	8.1	2.0	-----
27.....	.3	1.0	10	1.1	50	8.4	1.2	-----
28.....	.3	.8	5.8	1.0	210	9.1	1.0	-----
29.....	.3	.8	3.2	1.1	-----	7.8	1.0	-----
30.....	.3	.6	2.6	4.4	-----	7.1	.8	-----
31.....	.3	-----	1.9	23	-----	6.8	-----	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	63	0.3	6.60	406
November.....	17	.2	1.52	90
December.....	24	.4	3.62	223
January.....	23	1.0	1.96	121
February.....	210	4.1	32.9	1,830
March.....	734	6.8	74.3	4,570
April.....	17	.8	4.26	253
May 1-18.....	4.1	0	1.18	42
The period.....	-----	-----	-----	7,540

## SANDIES CREEK NEAR WESTHOFF, TEX.

LOCATION.—Water-stage recorder at Westhoff-Cheapside highway bridge 2 miles northeast of Westhoff, DeWitt County.

DRAINAGE AREA.—493 square miles.

RECORDS AVAILABLE.—March 1930 to September 1933.

DISCHARGE.—Maximum during year, 5,320 second-feet Aug. 1 (gage height, 21.50 feet); minimum, 0.2 second-foot July 26, 27.

1930-33: Maximum, 5,780 second-feet Apr. 30, 1932 (gage height, 21.79 feet); no flow Aug. 11, 1932.

Maximum stage known, about 25.1 feet in 1913 (discharge, about 18,000 second-feet).

REMARKS.—Records fair. No diversions above station.

## Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	20	0.9	2.6	2.4	27	14		1.3	10	0.3	4,680	62
2	8.4	.9	2.4	2.2	14	7.9	* 3.0	1.0	6.8	.3	1,770	70
3	5.6	1.0	2.3	2.2	9.6	5.8		.8	4.7	.3	126	30
4	5.1	1.0	2.3	2.2	6.5	9.3	* 2.5	.8	3.2	.3	31	16
5	5.7	1.1	2.3	2.2	5.0	362		.7	2.4	.3	20	8.9
6												
7	11	1.3	2.3	2.1	5.0	1,070	2.3	.7	2.0	.3	14	5.7
8	11	1.4	2.2	2.2	129	645	2.2	.6	1.8	.3	12	40
9	6.0	1.5	1.9	2.6	216	220	2.4	.8	1.5	.3	9.7	3.4
10	3.8	1.8	1.9	2.7	40	59	2.8	1.0	1.4	.3	8.1	3.1
11	3.0	1.7	1.8	2.8	20	24	2.9	.8	1.1	.3	7.2	2.8
12												
13	2.4	1.5	1.8	2.8	12	14	4.1	.6	.9	.3	6.6	2.5
14	1.9	1.3	1.8	2.8	8.6	10	9.0	.5	8.6	.3	5.5	2.3
15	1.7	1.0	1.9	2.6	7.2	7.9	28	.4	15	.3	5.2	2.2
16	1.5	1.0	2.1	2.4	6.0	6.5	16	.4	70	.3	6.2	2.2
17	1.3	1.0	2.4	2.4	5.4	5.3	6.4	.4	38	.3	7.0	2.2
18												
19	1.2	1.0	2.9	2.4	36	5.2	4.0	.3	39	.3	7.7	2.1
20	1.1	1.0	3.4	2.4	147	5.1	3.0	.3	14	.3	5.5	2.1
21	1.1	1.0	3.6	2.5	52	5.0	2.2	.3	8.0	.3	5.0	2.1
22	1.1	1.1	3.9	2.5	22	4.8	1.7	.3	4.2	.3	7.9	2.0
23	1.1	1.2	4.0	2.7	16	4.4	1.7	.3	3.7	.3	11	2.0
24												
25	1.0	1.3	3.7	2.8	10	4.3	1.5	.3	2.7	.3	6.4	2.0
26	1.0	1.5	4.2	2.8	6.9		1.3	.3	2.4	.3	4.0	2.0
27	1.0	1.8	6.0	2.8	5.4		1.3	.3	1.6	.6	3.1	1.8
28	1.0	2.2	7.4	2.8	4.7		14	.3	1.1	.4	2.8	1.8
29	1.0	2.1	8.0	2.8	4.2		38	1.7	.7	.3	35	7.8
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Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	20	0.8	3.37	207
November	6.3	.9	1.69	101
December	8.0	1.8	3.38	208
January	99	2.1	7.33	451
February	216	4.2	30.0	1,670
March	1,070		81.5	5,010
April	38	1.3	6.40	381
May	678	.3	45.0	2,770
June	70	.3	8.22	489
July	2,470	.3	121	7,440
August	4,680	2.8	248	15,200
September	462	1.8	43.6	2,590
The year	4,680	.3	50.5	36,500

\* Estimated.

\* Partly estimated.

## COLETO CREEK NEAR SCHROEDER, TEX.

LOCATION.—Staff gage about 1 mile below Schroeder-Nursery highway bridge 1 mile east of Schroeder, Goliad County, and about 15 miles above Galveston, Harrisburg & San Antonio Railway bridge.

DRAINAGE AREA.—365 square miles.

RECORDS AVAILABLE.—January 1930 to December 1933 (discontinued).

DISCHARGE.—Maximum during period Oct. 1, 1932, to Dec. 31, 1933, 7,700 second-feet Mar. 5 (gage height, 7.30 feet); minimum, 2.8 second-feet July 25.

1930-33: Maximum (by slope-area method), 28,600 second-feet Jan. 4, 1932 (gage height, 14.14 feet); minimum, 1.4 second-feet Sept. 7, 8, 19, 1930.

REMARKS.—Records fair except those for high-water periods, which are poor. No diversions above station.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1932-33												
1-----	6.0	5.4	6.5	7.1	12	13	12	6.4	5.7	3.9	92	92
2-----	5.4	5.4	8.7	7.6	9.2	13	12	5.9	5.0	3.4	48	40
3-----	5.4	5.4	8.2	8.7	1,950	13	12	5.7	4.6	3.4	36	22
4-----	13	5.4	7.6	8.2	518	42	10	8.8	4.1	3.4	28	15
5-----	244	5.7	7.6	8.7	73	1,140	14	7.0	3.3	3.2	27	12
6-----	63	5.4	8.7	8.2	45	1,220	12	5.7	3.3	3.2	23	10
7-----	26	8.2	7.6	8.7	37	307	9.6	5.2	3.3	4.1	19	10
8-----	22	5.4	7.6	8.7	34	65	10	5.7	3.1	11	19	8.8
9-----	15	5.7	6.5	16	29	41	11	5.7	3.2	16	18	16
10-----	12	5.4	7.6	13	26	32	11	5.7	3.1	9.2	55	14
11-----	10	5.4	8.7	9.8	22	29	10	5.4	3.3	7.2	120	10
12-----	10	5.4	8.2	8.7	19	75	9.6	5.2	1,250	5.4	22	7.7
13-----	11	5.4	8.7	8.7	20	31	8.8	4.8	242	3.9	18	11
14-----	10	5.7	8.7	8.7	18	23	10	4.6	49	3.9	16	8.0
15-----	10	6.0	9.2	8.7	16	19	8.8	4.6	25	3.7	16	11
16-----	9.2	5.4	10	11	26	18	8.0	4.6	16	3.4	42	8.4
17-----	8.2	6.0	10	9.8	59	18	7.5	4.3	12	3.4	18	7.7
18-----	7.6	6.5	8.7	9.8	29	18	8.0	3.9	10	3.4	20	6.7
19-----	7.1	5.4	9.2	10	24	39	8.0	3.5	9.2	3.2	17	6.4
20-----	7.1	6.0	9.8	9.8	17	51	8.8	3.9	8.4	3.1	14	6.4
21-----	7.1	6.0	9.8	9.2	15	21	7.7	3.5	7.7	3.1	12	5.7
22-----	6.0	6.0	11	9.2	15	17	7.2	3.3	6.7	3.1	11	5.0
23-----	7.6	6.0	12	8.2	14	16	7.5	3.3	6.2	3.1	11	5.7
24-----	6.5	6.5	9.8	8.7	12	21	7.5	3.5	5.4	3.0	11	6.2
25-----	7.6	18	11	8.2	13	18	7.5	137	5.2	3.1	19	734
26-----	7.1	12	9.8	8.2	16	16	7.5	70	4.1	3.3	18	2,080
27-----	6.0	11	9.2	7.1	19	14	6.7	29	4.8	4.3	18	427
28-----	5.4	8.7	8.7	7.6	17	14	6.4	24	4.4	3.9	12	637
29-----	5.7	7.1	9.8	9.2	-----	14	6.2	26	4.3	5.0	21	256
30-----	5.7	6.5	8.2	26	-----	13	6.7	13	4.1	1,300	272	35
31-----	6.0	-----	7.6	18	-----	13	-----	7.7	-----	588	224	-----

Day	Oct.	Nov.	Dec.	Day	Oct.	Nov.	Dec.	Day	Oct.	Nov.	Dec.
1933											
1-----	27	5.7	5.7	11-----	10	6.0	5.7	21-----	8.2	5.7	6.5
2-----	23	6.0	7.6	12-----	10	41	5.7	22-----	9.2	6.5	6.5
3-----	22	6.0	7.1	13-----	9.2	11	6.0	23-----	8.2	6.0	6.5
4-----	18	5.7	6.5	14-----	10	8.7	6.0	24-----	6.5	5.0	6.0
5-----	15	5.4	6.0	15-----	9.2	7.6	6.0	25-----	6.0	6.5	6.5
6-----	14	8.7	6.5	16-----	9.2	6.0	7.1	26-----	6.0	4.4	6.0
7-----	13	13	6.0	17-----	10	5.0	6.5	27-----	8.7	5.4	6.5
8-----	11	7.6	6.5	18-----	8.2	4.4	6.5	28-----	7.1	5.7	7.6
9-----	10	7.1	6.0	19-----	7.6	4.1	6.0	29-----	6.5	5.7	7.6
10-----	9.2	7.6	5.7	20-----	8.2	6.5	6.5	30-----	6.0	6.0	7.6
								31-----	6.0	-----	7.1

*Discharge, in second-feet, of Coleta Creek near Schroeder, Tex., 1932-33—Continued*

Month	Maximum	Minimum	Mean	Run-off in acre-feet
1932-33				
October.....	244	5.4	18.5	1,140
November.....	18	5.4	6.75	402
December.....	12	6.5	8.86	545
January.....	26	7.1	9.98	614
February.....	1,950	9.2	111	6,160
March.....	1,220	13	109	6,700
April.....	14	6.2	9.07	540
May.....	137	3.3	13.8	848
June.....	1,250	3.1	57.2	3,400
July.....	1,300	3.0	65.2	4,010
August.....	272	11	41.8	2,570
September.....	2,080	5.0	150	8,930
The year.....	2,080	3.0	49.6	35,900
1933				
October.....	27	6.0	10.7	658
November.....	41	4.1	7.67	456
December.....	7.6	5.7	6.45	397
The period.....				1,510

## SAN ANTONIO RIVER NEAR FALLS CITY, TEX.

LOCATION.—Water-stage recorder at highway bridge half a mile above Scared Dog Creek and 3.4 miles southwest of Falls City, Karnes County.

DRAINAGE AREA.—2,070 square miles.

RECORDS AVAILABLE.—April 1925 to September 1933.

DISCHARGE.—Maximum during year, 5,990 second-feet July 30 (gage height, 7.64 feet); minimum, 78 second-feet July 24, 27, 28.

1925-33: Maximum, 10,100 second-feet May 29, 1929 (gage height, 11.15 feet); minimum, 36 second-feet May 11, 12, 1928 (gage height, 0.97 foot).

Maximum stage known, 28.36 feet in 1913.

REMARKS.—Records good. Slight regulation caused by operation of Medina Dam. Medina Canal diverts above station.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	285	139	153	148	251	192	121	116	157	95	719	262
2.....	218	202	153	139	285	167	108	108	153	95	172	428
3.....	187	162	157	139	187	162	108	112	148	95	130	177
4.....	192	187	162	202	177	162	103	112	144	95	108	116
5.....	335	229	172	279	330	167	166	116	134	99	99	103
6.....	452	177	172	207	257	167	633	139	134	95	103	99
7.....	358	148	172	148	192	172	251	130	130	95	116	99
8.....	240	144	167	144	192	172	116	125	130	91	103	95
9.....	182	148	153	148	192	157	108	125	116	91	95	99
10.....	172	144	153	148	182	157	108	125	108	91	91	99
11.....	167	139	153	148	182	157	112	130	108	87	91	99
12.....	157	139	268	148	279	157	112	139	108	87	87	99
13.....	153	125	296	148	268	148	112	134	134	87	82	99
14.....	153	134	279	148	187	144	112	125	296	87	82	99
15.....	153	134	202	148	187	207	99	121	720	87	87	99
16.....	153	139	197	153	192	285	116	116	483	87	170	95
17.....	162	144	177	153	361	177	112	116	218	87	617	95
18.....	167	148	187	162	398	139	103	112	162	87	296	218
19.....	162	148	162	167	335	148	108	116	144	87	121	153
20.....	153	153	153	162	218	139	108	112	139	87	103	112
21.....	153	157	157	162	167	125	108	112	139	82	95	108
22.....	148	162	157	162	162	125	144	108	130	82	91	108
23.....	148	162	167	162	162	125	121	103	125	82	87	108
24.....	144	172	167	162	162	192	157	108	116	78	91	103
25.....	148	167	192	167	162	251	125	820	116	82	116	103
26.....	153	162	167	167	157	162	162	1,120	108	82	305	328
27.....	274	246	157	162	157	112	177	490	108	78	240	579
28.....	274	223	153	162	167	112	157	246	108	78	112	313
29.....	246	153	148	167	-----	116	134	187	108	336	99	207
30.....	240	157	148	167	-----	121	121	172	103	2,540	116	148
31.....	167	-----	148	177	-----	121	-----	167	-----	1,250	103	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	452	144	203	12,500
November.....	246	125	161	9,580
December.....	296	148	176	10,800
January.....	279	139	163	10,000
February.....	398	157	220	12,200
March.....	285	112	159	9,780
April.....	633	99	144	8,570
May.....	1,120	103	196	12,100
June.....	720	103	168	10,000
July.....	2,540	78	212	13,000
August.....	719	82	159	9,780
September.....	579	95	162	9,640
The year.....	2,540	78	177	128,000

## MEDINA RIVER NEAR PIPE CREEK, TEX.

LOCATION.—Water-stage recorder  $3\frac{1}{2}$  miles above mouth of Pipe Creek and 4 miles southwest of Pipe Creek post office, Bandera County.

DRAINAGE AREA.—412 square miles.

RECORDS AVAILABLE.—December 1922 to September 1933.

DISCHARGE.—Maximum during year not determined; minimum, 8.5 second-feet Aug. 15, 16 (gage height, 0.65 foot).

1922-33: Maximum (determined by slope-area method), 64,000 second-feet

July 1, 1932 (gage height, 33.8 feet); minimum, 2.2 second-feet Sept. 9, 1927.

Average, 10 years (1923-33), 111 second-feet.

Maximum stage known, about 42 feet in 1919.

REMARKS.—Records good except those estimated, which are fair. No diversions above station.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	304	143	108	132	165	147	120	79	77	29	19	<sup>b</sup> 68
2.....	297	142	108	130	162	143	118	74	71	<sup>a</sup> 27	17	<sup>a</sup> 51
3.....	285	142	106	127	161	142	117	74	66	17	17	31
4.....	270	139	104	125	162	142	117	74	60	16	27	23
5.....	258	141	106	124	158	141	117	77	57	17	17	27
6.....	250	141	108	120	155	145	113	74	54	<sup>b</sup> 26	16	19
7.....	244	137	106	199	158	145	113	71	48	17	17	17
8.....	237	135	106	<sup>a</sup> 487	153	143	113	69	48	19	17	17
9.....	228	132	104	<sup>a</sup> 349	153	143	113	66	35	<sup>a</sup> 24	17	16
10.....	223	132	104	274	153	138	101	66	35	24	21	14
11.....	217	130	104	246	153	138	106	57	38	23	21	14
12.....	210	127	104	224	153	141	103	51	60	21	21	13
13.....	205	<sup>a</sup> 127	103	219	153	142	99	48	60	23	17	13
14.....	200	<sup>a</sup> 127	103	210	138	99	58	60	21	13	13	13
15.....	196	127	104	202	132	99	254	57	21	8.5	14	14
16.....	193	124	110	202	<sup>b</sup> 150	131	101	82	43	19	8.5	<sup>a</sup> 14
17.....	187	121	110	196	132	99	89	40	21	13	13	13
18.....	180	120	104	193	133	99	82	38	21	11	11	13
19.....	175	120	99	193	130	99	63	40	19	69	19	13
20.....	171	<sup>a</sup> 120	99	190	<sup>a</sup> 139	128	136	54	40	19	19	<sup>b</sup> 18
21.....	168	121	99	188	137	130	104	45	38	21	14	14
22.....	166	120	117	<sup>a</sup> 188	137	128	99	38	35	19	13	13
23.....	165	115	184	187	137	125	97	<sup>a</sup> 35	33	19	13	<sup>a</sup> 14
24.....	163	117	264	182	136	125	97	29	27	11	14	14
25.....	161	117	196	179	133	124	112	27	27	11	14	14
26.....	159	113	161	175	137	120	104	<sup>b</sup> 110	31	<sup>b</sup> 23	11	23
27.....	159	<sup>a</sup> 112	<sup>a</sup> 153	172	155	118	97	29	29	13	19	19
28.....	158	<sup>a</sup> 110	147	172	153	125	91	29	29	13	19	19
29.....	154	108	141	172	127	91	<sup>a</sup> 103	27	27	<sup>a</sup> 17	19	19
30.....	149	108	137	172	127	<sup>a</sup> 84	93	27	27	<sup>a</sup> 27	<sup>a</sup> 24	19
31.....	148	135	169	169	124	84	84	23	23	<sup>b</sup> 40	19	19

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	304	148	203	12,500
November.....	143	108	126	7,500
December.....	264	99	124	7,620
January.....	487	120	197	12,100
February.....	-----	-----	150	8,330
March.....	147	118	134	8,240
April.....	136	84	106	6,310
May.....	-----	-----	81.0	4,980
June.....	77	27	44.4	2,640
July.....	-----	-----	23.1	1,420
August.....	40	8.5	18.0	1,110
September.....	68	-----	20.4	1,210
The year.....	-----	8.5	102	74,000

<sup>a</sup> Partly estimated or interpolated.

<sup>b</sup> Estimated.

## MEDINA RIVER NEAR RIOMEDINA, TEX.

LOCATION.—Water-stage recorder just above Medina Valley Irrigation Co.'s diversion dam 6 miles northwest of Riomedina, Medina County.

DRAINAGE AREA.—606 square miles.

RECORDS AVAILABLE.—January 1922 to September 1933.

DISCHARGE.—Maximum over dam during year, 69 second-feet Oct. 4 (gage height, 0.82 foot); no flow over dam except Oct. 2-7.

1922-33: Maximum, about 11,800 second-feet Apr. 21, 1926 (gage height, 5.17 feet); no flow over dam at times. Average, 11 years, 25.8 second-feet.

REMARKS.—Yearly seepage record fair; monthly records not sufficiently accurate for publication. Water to irrigate about 5,000 acres is diverted to Medina Canal above gage. See "Medina Canal near Riomedina." Flow regulated by storage dam 4 miles upstream except when reservoir is full and water flows over spillway.

Seepage past diversion dam measured at Haby's crossing, 1 mile downstream, was 20,500 acre-feet (mean of 7 discharge measurements well distributed throughout year) for year ending Sept. 30, 1933. Flow over dam was 242 acre-feet. Total discharge past station was 20,700 acre-feet.

## MEDINA CANAL NEAR RIOMEDINA, TEX.

LOCATION.—Water-stage recorder just above upper end of flume 1, a third of a mile below head of canal, and 6 miles north of Riomedina, Medina County.

RECORDS AVAILABLE.—March 1922 to September 1933.

DISCHARGE.—Maximum stage during year, 2.40 feet Oct. 17 (discharge not determined); no flow at times.

1922-33: Maximum, that of Oct. 17, 1932 (discharge not determined); no flow at times. Average, 11 years, 28.3 second-feet.

REMARKS.—Records fair. Discharge partly estimated Dec. 12-18, Jan. 26 to Feb. 15, July 16 to Sept. 16. Station is above all diversions from canal. Canal diverts from Medina River for irrigation near Lacoste and Natalia.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	0	32	25	7.3	5.9	4.7	24	42	25	82	34	29
2.....	0	32	25	8.1	5.9	0	29	54	26	88	37	29
3.....	0	32	19	8.1	10	0	31	62	40	87	48	29
4.....	0	32	22	11	13	0	37	65	50	88	48	29
5.....	0	24	25	12	13	0	33	66	52	87	51	29
6.....	16	14	25	12	13	0	30	64	57	83	52	30
7.....	31	14	25	7.4	12	13	30	62	72	86	52	38
8.....	22	14	24	5.2	8.1	22	30	64	77	86	54	49
9.....	23	14	24	15	10	22	30	69	78	85	64	49
10.....	22	14	24	4.0	15	22	30	75	78	84	74	56
11.....	22	14	24	21	21	21	29	77	78	82	70	63
12.....	21	14	22	21	21	30	31	77	75	83	64	75
13.....	22	14	12	18	15	40	38	83	40	83	67	75
14.....	22	20	12	8.1	8.4	37	35	83	23	83	74	77
15.....	25	24	12	7.8	7.6	37	28	82	16	84	74	82
16.....	0	24	7.4	16	7.1	18	29	83	16	74	74	77
17.....	8.4	23	5.5	20	6.4	5.2	40	84	16	74	74	66
18.....	15	23	6.9	18	6.6	8.4	35	85	16	74	74	66
19.....	38	23	4.8	8.7	12	10	35	85	16	74	72	65
20.....	35	23	7.6	8.7	13	33	48	85	16	74	64	66
21.....	22	23	7.6	8.7	13	43	39	87	16	73	71	66
22.....	25	23	7.6	7.1	13	35	41	90	16	77	74	62
23.....	38	23	7.8	7.3	4.0	27	53	89	16	82	74	56
24.....	36	18	6.8	7.8	0	27	59	92	16	82	72	52
25.....	19	13	5.7	7.1	8.1	27	44	58	51	82	65	50
26.....	0	13	5.5	17	19	27	41	15	74	82	62	43
27.....	8.5	21	5.5	21	8.4	27	41	15	71	82	49	41
28.....	47	27	7.2	21	9.5	26	40	15	73	82	49	41
29.....	64	26	14	21	-----	24	40	15	81	8.0	49	43
30.....	64	25	14	21	-----	24	40	15	79	56	49	44
31.....	43	-----	8.4	11	-----	24	-----	19	-----	34	45	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	64	0	22.2	1,360
November.....	32	13	21.2	1,260
December.....	25	4.8	13.9	855
January.....	21	4.0	12.5	769
February.....	21	0	10.7	594
March.....	43	0	20.5	1,260
April.....	59	24	36.3	2,160
May.....	92	15	63.1	3,880
June.....	81	16	45.3	2,700
July.....	88	8.0	76.8	4,720
August.....	74	34	60.6	3,730
September.....	82	29	52.6	3,130
The year.....	92	0	36.5	26,400



## GIBOLO CREEK NEAR FALLS CITY, TEX.

LOCATION.—Water-stage recorder 200 feet downstream from Cestohowa Bridge, 6 miles above confluence with San Antonio River, and 6 miles northeast of Falls City, Karnes County.

DRAINAGE AREA.—831 square miles.

RECORDS AVAILABLE.—November 1930 to September 1933.

DISCHARGE.—Maximum during year, 6,390 second-feet July 30 (gage height, 21.5 feet); minimum, 6.8 second-feet May 24.

1930-33: Maximum, that of July 30, 1933; minimum, 6.8 second-feet Oct. 31, Nov. 1, 1931, May 24, 1933.

REMARKS.—Records fair. No large diversions above station.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	30	9.0	} • 12	14	14	11	11	14	} • 26	} • 156	} • 8.1	} • 8.1
2.....	21	8.8		13	14	11	10	12				
3.....	13	8.8		12	14	11	9.2	11				
4.....	17	8.8		12	14	11	9.2	11				
5.....	11	9.2		12	14	33	11	9.5				
6.....	10	9.5	} • 13	13	14	18	76	9.2	10	} • 8.8	} • 30	} • 8.3
7.....	11	9.5		13	16	13	32	13	10			
8.....	10	9.5		14	14	12	15	12	9.8			
9.....	9.8	9.5		14	13	12	13	10	10			
10.....	9.2	9.2		14	13	12	11	9.8	9.8			
11.....	8.8	9.5	} • 13	13	13	12	11	9.0	9.8	} • 8.8	} • 30	} • 8.3
12.....	8.7	9.5		14	13	12	10	8.8	10			
13.....	8.7	9.5		13	13	12	10	8.7	12			
14.....	8.7	10		13	14	12	11	8.5	14			
15.....	8.7	10		13	14	11	10	8.5	13			
16.....	8.7	11	} • 13	14	18	11	10	8.5	19	} • 8.8	} • 30	} • 8.3
17.....	8.5	10		14	17	11	9.8	8.1	12			
18.....	8.5	11		14	16	12	9.8	8.1	10			
19.....	8.5	11		14	16	13	9.8	7.9	9.8			
20.....	8.5	12		14	16	11	9.8	7.9	9.2			
21.....	8.5	11	} • 13	14	15	11	9.8	7.9	9.0	} • 8.8	} • 30	} • 8.3
22.....	8.5	12		14	14	11	9.5	7.9	8.8			
23.....	8.5	12		14	14	11	9.8	7.8	8.7			
24.....	8.7	11		13	14	12	18	7.2	8.7			
25.....	8.7	13		13	14	12	52	1,560	8.5			
26.....	8.7	12	} • 11	13	14	12	103	3,800	8.7	} • 8.7	} • 973	} • 4,350
27.....	8.7	12		12	14	12	46	450	8.8			
28.....	8.7	12		12	14	12	22	84	8.8			
29.....	8.7	12		13	14	12	15	40	8.7			
30.....	9.0	12		15	14	12	12	25	8.7			
31.....	9.2	12	} • 13	14	14	12	12	18	1,960	} • 8.7	} • 4,350	} • 1,960
1.....	30	9.0		14	14	12	12	18	1,960			
2.....	21	8.8		13	14	11	10	12	10			
3.....	13	8.8		12	14	11	9.2	11	9.2			
4.....	17	8.8		12	14	11	9.2	11	9.2			
5.....	11	9.2		12	14	33	11	9.5	11			
6.....	10	9.5	} • 13	13	14	18	76	9.2	10	} • 8.8	} • 30	} • 8.3
7.....	11	9.5		13	16	13	32	13	10			
8.....	10	9.5		14	14	12	15	12	9.8			
9.....	9.8	9.5		14	13	12	13	10	10			
10.....	9.2	9.2		14	13	12	11	9.8	9.8			
11.....	8.8	9.5	} • 13	13	13	12	11	9.0	9.8	} • 8.8	} • 30	} • 8.3
12.....	8.7	9.5		14	13	12	10	8.8	10			
13.....	8.7	9.5		13	13	12	10	8.7	12			
14.....	8.7	10		13	14	12	11	8.5	14			
15.....	8.7	10		13	14	11	10	8.5	13			
16.....	8.7	11	} • 13	14	18	11	10	8.5	19	} • 8.8	} • 30	} • 8.3
17.....	8.5	10		14	17	11	9.8	8.1	12			
18.....	8.5	11		14	16	12	9.8	8.1	10			
19.....	8.5	11		14	16	13	9.8	7.9	9.8			
20.....	8.5	12		14	16	11	9.8	7.9	9.2			
21.....	8.5	11	} • 13	14	15	11	9.8	7.9	9.0	} • 8.8	} • 30	} • 8.3
22.....	8.5	12		14	14	11	9.5	7.9	8.8			
23.....	8.5	12		14	14	11	9.8	7.8	8.7			
24.....	8.7	11		13	14	12	18	7.2	8.7			
25.....	8.7	13		13	14	12	52	1,560	8.5			
26.....	8.7	12	} • 11	13	14	12	103	3,800	8.7	} • 8.7	} • 973	} • 4,350
27.....	8.7	12		12	14	12	46	450	8.8			
28.....	8.7	12		12	14	12	22	84	8.8			
29.....	8.7	12		13	14	12	15	40	8.7			
30.....	9.0	12		15	14	12	12	25	8.7			
31.....	9.2	12	} • 13	14	14	12	12	18	1,960	} • 8.7	} • 4,350	} • 1,960
1.....	30	9.0		14	14	12	12	18	1,960			
2.....	21	8.8		13	14	11	10	12	10			
3.....	13	8.8		12	14	11	9.2	11	9.2			
4.....	17	8.8		12	14	11	9.2	11	9.2			
5.....	11	9.2		12	14	33	11	9.5	11			
6.....	10	9.5	} • 13	13	14	18	76	9.2	10	} • 8.8	} • 30	} • 8.3
7.....	11	9.5		13	16	13	32	13	10			
8.....	10	9.5		14	14	12	15	12	9.8			
9.....	9.8	9.5		14	13	12	13	10	10			
10.....	9.2	9.2		14	13	12	11	9.8	9.8			
11.....	8.8	9.5	} • 13	13	13	12	11	9.0	9.8	} • 8.8	} • 30	} • 8.3
12.....	8.7	9.5		14	13	12	10	8.8	10			
13.....	8.7	9.5		13	13	12	10	8.7	12			
14.....	8.7	10		13	14	12	11	8.5	14			
15.....	8.7	10		13	14	11	10	8.5	13			
16.....	8.7	11	} • 13	14	18	11	10	8.5	19	} • 8.8	} • 30	} • 8.3
17.....	8.5	10		14	17	11	9.8	8.1	12			
18.....	8.5	11		14	16	12	9.8	8.1	10			
19.....	8.5	11		14	16	13	9.8	7.9	9.8			
20.....	8.5	12		14	16	11	9.8	7.9	9.2			
21.....	8.5	11	} • 13	14	15	11	9.8	7.9	9.0	} • 8.8	} • 30	} • 8.3
22.....	8.5	12		14	14	11	9.5	7.9	8.8			
23.....	8.5	12		14	14	11	9.8	7.8	8.7			
24.....	8.7	11		13	14	12	18	7.2	8.7			
25.....	8.7	13		13	14	12	52	1,560	8.5			
26.....	8.7	12	} • 11	13	14	12	103	3,800	8.7	} • 8.7	} • 973	} • 4,350
27.....	8.7	12		12	14	12	46	450	8.8			
28.....	8.7	12		12	14	12	22	84	8.8			
29.....	8.7	12		13	14	12	15	40	8.7			
30.....	9.0	12		15	14	12	12	25	8.7			
31.....	9.2	12	} • 13	14	14	12	12	18	1,960	} • 8.7	} • 4,350	} • 1,960
1.....	30	9.0		14	14	12	12	18	1,960			
2.....	21	8.8		13	14	11	10	12	10			
3.....	13	8.8		12	14	11	9.2	11	9.2			
4.....	17	8.8		12	14	11	9.2	11	9.2			
5.....	11	9.2		12	14	33	11	9.5	11			
6.....	10	9.5	} • 13	13	14	18	76	9.2	10	} • 8.8	} • 30	} • 8.3
7.....	11	9.5		13	16	13	32	13	10			
8.....	10	9.5		14	14	12	15	12	9.8			
9.....	9.8	9.5		14	13	12	13	10	10			

## NUECES RIVER BASIN

## NUECES RIVER AT LAGUNA, TEX.

LOCATION.—Water-stage recorder 1 mile northeast of Laguna, Uvalde County.  
DRAINAGE AREA.—764 square miles.

RECORDS AVAILABLE.—October 1923 to September 1933.

DISCHARGE.—Maximum during year, 572 second-feet Oct. 1 (gage height, 5.17 feet); minimum, 12 second-feet Aug. 29, 30.

1923-33: Maximum, about 47,500 second-feet June 15, 1930 (gage height, 20.1 feet); minimum, 8.9 second-feet Sept. 9-11, 1924. Average, 10 years, 132 second-feet.

The floods of 1913 and Sept. 21, 1923, reached a stage of 26.5 feet (discharge, by slope-area method, 74,500 second-feet). Flood of 1903 reached a slightly higher stage.

REMARKS.—Records good. No diversions above station.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	555	254	166	129	116	107	89	69	67	37	21	20
2.....	537	251	166	129	115	106	89	67	67	37	21	18
3.....	520	248	166	128	116	106	88	67	65	36	20	18
4.....	499	245	164	128	115	104	92	67	63	36	20	18
5.....	473	251	164	126	115	104	95	64	62	36	20	17
6.....	464	254	162	126	115	104	88	64	60	34	21	16
7.....	440	241	162	133	115	102	87	64	59	33	20	15
8.....	426	232	160	140	115	102	85	63	58	32	19	15
9.....	413	229	158	140	115	101	84	63	55	30	19	15
10.....	404	224	156	136	115	100	81	62	55	30	18	17
11.....	396	221	156	133	115	100	80	60	55	29	19	20
12.....	383	218	154	131	115	100	78	60	55	29	19	20
13.....	375	215	149	131	115	100	77	60	59	28	18	21
14.....	367	212	147	131	115	98	77	60	55	28	18	21
15.....	363	209	149	129	115	98	76	60	54	27	22	22
16.....	355	204	147	129	115	96	74	59	54	26	21	22
17.....	347	202	143	129	115	96	74	58	54	26	18	22
18.....	343	202	141	129	112	95	74	55	52	25	18	22
19.....	335	199	140	129	108	95	76	55	52	25	17	22
20.....	328	194	140	129	107	95	76	55	50	24	16	21
21.....	316	192	138	129	106	94	72	55	48	24	15	21
22.....	301	189	140	126	106	92	73	54	47	24	15	20
23.....	297	186	147	124	106	92	77	52	46	25	15	20
24.....	290	182	145	123	104	92	74	54	45	33	15	19
25.....	286	180	141	123	104	92	74	77	43	27	15	20
26.....	282	177	138	121	107	91	73	76	42	24	14	19
27.....	282	175	136	121	108	91	72	67	41	22	13	19
28.....	275	173	133	120	107	91	72	65	39	21	13	19
29.....	268	171	131	120	-----	91	71	71	39	21	13	18
30.....	264	169	133	118	-----	91	69	68	38	22	24	18
31.....	258	-----	131	118	-----	91	-----	68	-----	21	27	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	555	258	369	22,700
November.....	254	169	210	12,500
December.....	166	131	148	9,100
January.....	140	118	128	7,870
February.....	116	104	112	6,220
March.....	107	91	97.3	5,980
April.....	95	69	78.9	4,690
May.....	77	52	62.5	3,840
June.....	67	38	52.6	3,130
July.....	37	21	28.1	1,730
August.....	27	13	18.2	1,120
September.....	22	15	19.2	1,140
The year.....	555	13	111	80,000

## NUECES RIVER NEAR UVALDE, TEX.

LOCATION.—Water-stage recorder at Tom Nunn crossing, 6 miles south of Southern Pacific Railroad bridge and 9 miles west of Uvalde, Uvalde County.

DRAINAGE AREA.—1,930 square miles, a large part of which is noncontributing at low stages, owing to water entering fault a few miles above gage.

RECORDS AVAILABLE.—October 1927 to September 1933.

DISCHARGE.—Maximum during year, 643 second-feet Oct. 1 (gage height, 2.15 feet); minimum, 13 second-feet Aug. 14–22 (gage height, 0.68 foot).

1927–33: Maximum (determined by slope-area method), 188,000 second-feet Sept. 1, 1932 (gage height, 23.25 feet); minimum not determined, but probably less than 0.3 second-foot.

Maximum stage known, 26.4 feet in December 1913.

REMARKS.—Records good. No diversions above station.

*Discharge, in second-feet, 1932–33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	616	254	150	85	77	57	32	30	25	19	16	17
2	572	250	147	85	74	57	32	30	25	19	16	17
3	535	250	143	85	72	57	32	30	25	17	15	17
4	510	250	140	85	69	54	32	30	25	17	15	17
5	474	264	136	85	69	52	32	30	23	17	15	17
6	434	268	136	83	69	52	32	30	23	17	15	17
7	422	259	136	97	67	52	32	30	23	17	15	17
8	417	246	133	111	64	52	32	30	21	17	15	17
9	406	246	130	105	64	50	32	30	21	17	15	17
10	400	246	130	102	67	50	32	30	21	17	15	17
11	379	242	130	105	67	45	34	30	20	17	15	17
12	368	234	127	99	67	45	34	30	20	17	15	16
13	363	230	127	97	67	45	32	30	20	17	14	16
14	358	226	127	91	67	45	32	28	20	17	13	15
15	358	222	124	91	67	43	32	28	20	17	13	15
16	353	214	130	88	69	43	32	26	20	17	13	17
17	347	210	127	88	72	41	32	26	20	16	13	16
18	347	202	120	88	67	41	32	26	20	16	13	16
19	342	202	114	88	64	41	32	26	20	16	13	16
20	342	199	114	85	62	41	30	26	19	16	13	16
21	342	195	114	85	59	39	30	26	19	15	13	16
22	328	187	114	85	57	39	30	26	19	15	13	15
23	328	180	114	85	57	39	30	26	19	16	14	15
24	318	176	111	85	57	39	30	26	19	16	15	15
25	309	168	111	85	54	39	30	28	19	15	15	15
26	300	168	108	85	54	39	30	26	19	15	15	15
27	304	165	105	83	57	39	30	26	19	15	15	15
28	286	158	102	80	57	37	30	25	19	15	15	15
29	277	154	99	80	-----	37	30	25	19	15	14	14
30	268	154	94	83	-----	34	30	25	19	16	21	14
31	259	-----	91	80	-----	32	-----	25	-----	16	17	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	616	259	376	23, 100
November	268	154	214	12, 700
December	150	91	122	7, 500
January	111	80	89.0	5, 470
February	77	54	64.7	3, 590
March	57	32	44.4	2, 730
April	34	30	31.4	1, 870
May	30	25	27.7	1, 700
June	25	19	20.7	1, 230
July	19	15	16.4	1, 010
August	21	13	14.6	898
September	17	14	16.0	952
The year	616	13	86.8	62, 800

## NUECES RIVER AT COTULLA, TEX.

LOCATION.—Staff gage 100 feet upstream from Farmer Dam, half a mile below International-Great Northern Railroad bridge, and 1.9 miles from post office at Cotulla, LaSalle County. Zero of gage is 376.36 feet above mean sea level.

DRAINAGE AREA.—5,260 square miles, a large part of which is noncontributing at low stages, owing to water entering a fault near Uvalde.

RECORDS AVAILABLE.—October 1923 to September 1933.

DISCHARGE.—Maximum during year, 4,520 second-feet Oct. 1 (gage height, 4.10 feet); no flow at times.

1923-33: Maximum, about 49,500 second-feet June 3, 1925; maximum gage height, 16.05 feet Sept. 7, 1932; no flow at times. Average, 10 years, 299 second-feet.

REMARKS.—Records of daily discharge not sufficiently accurate for publication. Monthly records fair. Most of low-water flow is diverted by pumping above station. Low-water flow partly regulated by storage reservoirs above station.

*Discharge, in second-feet, 1932-33*

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	4,520	282	941	57,900
November.....	304	178	237	14,100
December.....	168	140	150	9,220
January.....	216	110	155	9,530
February.....	280	82	125	6,940
March.....	110	21	69.3	4,260
April.....	192	17	53.9	3,210
May.....	72	.2	18.0	1,110
June.....	17	0	4.30	256
The year.....	4,520	0	147	107,000

NOTE.—No flow during months omitted.

## NUECES RIVER NEAR THREE RIVERS, TEX.

LOCATION.—Water-stage recorder 100 feet below San Antonio, Uvalde & Gulf Railroad bridge, half a mile below Frio River, and 2 miles southeast of Three Rivers, Live Oak County. Zero of gage is 101.08 feet above mean sea level.

DRAINAGE AREA.—15,600 square miles, a part of which is noncontributing at low stages, owing to water entering faults near Uvalde.

RECORDS AVAILABLE.—July 1915 to September 1933.

DISCHARGE.—Maximum during year, 5,980 second-feet Oct. 5 (gage height, 23.18 feet); no flow at times.

1915-33: Maximum, about 85,000 second-feet Sept. 18, 1919 (gage height, 46.0 feet); no flow at times. Average, 13 years (1920-33), 703 second-feet.

REMARKS.—Records good. Discharge partly estimated Oct. 18-25. About 10,000 acres irrigated above station. At very low stages flow is regulated for short periods by railroad pumping plant just above control.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	5,080	416	192	190	168	138	61	45	223	1.9	842	455
2.....	5,180	394	190	196	162	134	58	86	240	1.7	147	658
3.....	4,680	372	186	186	324	136	57	73	160	1.5	58	359
4.....	4,500	350	186	174	296	136	56	76	100	1.4	32	136
5.....	5,440	350	217	164	257	134	57	80	60	1.3	19	245
6.....	3,780	513	196	162	210	140	209	40	41	1.2	19	284
7.....	3,350	394	180	167	265	146	254	30	31	1.1	9.0	234
8.....	3,870	372	174	202	269	148	144	26	24	1.1	6.0	238
9.....	4,590	405	170	164	248	144	86	22	17	.9	4.6	647
10.....	4,710	361	168	156	267	140	63	29	13	.8	24	827
11.....	4,370	328	170	146	248	130	49	25	16	15	29	996
12.....	3,940	318	174	142	215	128	42	19	549	12	97	1,180
13.....	3,500	328	174	132	186	128	40	17	2,350	6.9	38	1,400
14.....	3,040	328	172	162	178	126	38	18	2,980	4.1	158	1,530
15.....	2,540	269	168	202	166	126	38	18	1,580	2.9	231	554
16.....	1,800	231	168	223	168	118	50	49	200	1.9	307	146
17.....	1,240	269	172	234	180	114	37	21	77	1.4	783	375
18.....	1,050	282	178	229	176	110	133	14	60	1.0	881	569
19.....	922	276	182	221	168	112	153	13	49	.7	597	199
20.....	874	267	188	217	170	146	92	19	37	.6	689	92
21.....	827	259	186	215	166	174	61	13	34	.4	323	78
22.....	758	244	186	212	148	136	44	9.3	22	.2	84	100
23.....	712	231	192	210	138	106	37	7.4	15	.1	41	69
24.....	666	229	192	202	140	88	33	8.0	10	0	31	102
25.....	620	217	188	204	144	82	28	12	6.9	0	646	108
26.....	562	217	188	196	146	73	31	498	4.8	0	1,260	58
27.....	540	215	190	188	150	68	29	445	3.9	12	234	71
28.....	505	212	186	182	146	64	27	318	3.4	113	63	100
29.....	482	200	174	172	-----	64	26	304	2.9	350	35	156
30.....	460	192	180	172	-----	63	32	284	2.5	2,820	32	136
31.....	449	-----	184	172	-----	61	-----	126	-----	2,980	181	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	5,440	449	2,420	149,000
November.....	513	192	301	17,900
December.....	217	168	182	11,200
January.....	234	132	187	11,500
February.....	324	138	196	10,900
March.....	174	61	117	7,190
April.....	254	26	68.8	4,090
May.....	498	7.4	88.5	5,440
June.....	2,980	2.5	297	17,700
July.....	2,980	0	204	12,500
August.....	1,260	4.6	255	15,700
September.....	1,530	58	403	24,000
The year.....	5,440	0	396	287,000

## NUECES RIVER AT CALALLEN, TEX.

LOCATION.—Staff gage at old pump house for city of Corpus Christi, half a mile northwest of Calallen, Nueces County, and half a mile above tidewater and breakwater dam.

DRAINAGE AREA.—16,900 square miles.

RECORDS AVAILABLE.—August 1915 to September 1933; records of discharge only from 1915 to 1918.

EXTREMES.—Maximum during year, 7.55 feet Oct. 5, 6, 8; minimum, 3.35 feet July 1, 21.

1915-33: During September 1919 river reached a stage of about 12 feet as determined from flood marks on gage. This stage probably exceeds any that occurred for many years prior to establishment of this station. No flow Aug. 23-29, 1918.

REMARKS.—Discharge not computed. Gage-height record furnished by the city of Corpus Christi.

*Daily gage height, in feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	6.90	4.48	4.15	4.10	4.10	4.05	3.90	3.75	4.30	3.48	6.50	4.08
2.....	7.02	4.42	4.12	4.10	4.10	4.05	3.90	3.70	4.12	3.62	7.15	4.05
3.....	7.22	4.40	4.15	4.08	4.18	4.05	3.90	3.68	4.08	3.50	6.75	4.58
4.....	7.42	4.40	4.15	4.10	4.15	4.05	3.90	3.75	4.20	3.48	4.75	4.65
5.....	7.55	4.35	4.12	4.10	4.45	4.05	3.90	3.82	4.12	3.50	4.10	4.82
6.....	7.52	4.38	4.10	4.12	4.48	4.30	3.90	3.82	4.02	3.48	3.95	4.30
7.....	7.50	4.35	4.10	4.10	4.32	4.58	3.88	3.88	3.92	3.52	3.85	4.25
8.....	7.52	4.45	4.12	4.10	4.22	4.15	3.90	3.88	3.90	3.80	3.80	4.38
9.....	7.22	4.42	4.10	4.12	4.20	4.02	4.20	3.75	3.82	3.72	3.75	4.32
10.....	6.98	4.35	4.10	4.12	4.25	4.05	4.12	3.75	3.80	3.70	3.75	4.10
11.....	7.05	4.35	4.10	4.08	4.20	4.05	4.02	3.70	3.82	3.62	3.85	4.48
12.....	7.22	4.38	4.10	4.08	4.20	4.00	3.92	3.70	3.85	3.60	3.95	4.82
13.....	7.32	4.35	4.10	4.05	4.25	4.00	3.90	3.68	5.62	3.60	3.88	4.98
14.....	7.28	4.28	4.10	4.05	4.20	4.00	3.90	3.80	6.70	3.58	3.82	5.12
15.....	7.10	4.30	4.10	4.05	4.20	3.98	3.85	3.68	7.02	3.60	3.92	5.28
16.....	6.78	4.28	4.10	4.05	4.15	3.95	3.90	3.62	6.85	3.58	4.05	5.42
17.....	6.32	4.30	4.10	4.05	4.15	3.95	3.95	3.62	6.50	3.60	4.45	5.18
18.....	5.78	4.22	4.10	4.15	4.10	3.95	3.95	3.58	5.08	3.60	4.55	4.40
19.....	5.25	4.18	4.10	4.20	4.10	3.95	3.98	3.65	4.22	3.60	4.65	4.22
20.....	5.08	4.25	4.10	4.20	4.10	4.15	3.98	3.70	4.02	3.50	4.88	4.60
21.....	5.00	4.22	4.10	4.20	4.10	4.15	4.08	3.75	3.88	3.42	4.68	4.32
22.....	4.92	4.20	4.10	4.20	4.10	4.05	4.08	3.58	3.80	3.48	4.65	4.05
23.....	4.88	4.20	4.15	4.18	4.10	4.02	3.98	3.55	3.75	3.55	4.45	3.90
24.....	4.82	4.20	4.15	4.18	4.10	4.05	3.90	3.55	3.70	3.55	4.10	3.90
25.....	4.78	4.18	4.15	4.20	4.05	4.00	3.82	3.65	3.75	3.55	3.90	3.92
26.....	4.72	4.15	4.15	4.18	4.05	4.00	3.85	3.75	3.62	3.62	3.90	4.08
27.....	4.65	4.15	4.15	4.15	4.05	3.92	3.85	3.80	3.58	3.78	4.25	4.28
28.....	4.58	4.12	4.15	4.12	4.05	3.90	3.78	4.02	3.55	3.65	4.98	4.10
29.....	4.55	4.12	4.12	4.10	-----	3.90	3.72	4.65	3.50	3.75	4.58	3.92
30.....	4.55	4.15	4.10	4.15	-----	3.90	3.80	4.32	3.50	3.82	4.10	3.85
31.....	4.50	-----	4.10	4.12	-----	3.90	-----	4.20	-----	5.32	4.05	-----

## NUECES RIVER SEEPAGE INVESTIGATIONS

During the investigations the river was at a constant stage, and measurements represent natural conditions.

*Discharge measurements of Nueces River to determine seepage from gaging station at Laguna, Tex., to former gaging station near Cinonia, Tex., 1932-33*

Date	Location	Distance (miles) from initial point	Discharge (second-feet)		
			Measured	Gain or loss in section	Total gain or loss
Nov. 1	Laguna.....	0	244		
1	6.8 miles above West Fork.....	6.2	247	+3	+3
1	2.6 miles above West Fork.....	10.4	298	+51	+54
1	Mouth of West Fork.....	13.0	* 240	-58	-4
2	Southern Pacific Railroad bridge.....	18.0	218	-22	-26
2	Uvalde-Del Rio road crossing.....	20.6	218	0	-26
2	Gaging station near Uvalde.....	22.7	251	+33	+7
2	Uvalde-Eagle Pass road crossing.....	28.2	262	+11	+18
3	San Antonio, Uvalde & Gulf Railroad bridge.....	31.6	249	-13	+5
3	Old Uvalde-La Pryor road crossing.....	36.3	256	+7	+12
3	Gas well 5 miles northeast of La Pryor.....	39.6	246	-10	+2
4	La Pryor-Batesville road crossing.....	44.8	b 244	-2	0
4	3.5 miles above Cinonia bridge.....	53.0	c 255	+11	+11
4	Former gaging station near Cinonia.....	56.5	d 272	+17	+28
July 23	Laguna.....	0	23.1		
23	5.2 miles above West Fork.....	7.8	22.9	- .2	- .2
23	2.6 miles above West Fork.....	10.4	0	-22.9	-23.1
23	Mouth of West Fork.....	13.0	* 0	0	-23.1
23	Southern Pacific Railroad bridge.....	18.0	0	0	-23.1
23	Uvalde-Del Rio road crossing.....	20.6	0	0	-23.1
23	Gaging station near Uvalde.....	22.7	16.3	+16.3	-6.8
24	Uvalde-Eagle Pass road crossing.....	28.2	20.6	+4.3	-2.5
24	San Antonio, Uvalde & Gulf Railroad bridge.....	31.6	16.3	-4.3	-6.8
24	Old Uvalde-La Pryor road crossing.....	36.3	11.3	-5.0	-11.8
25	Gas well 5 miles northeast of La Pryor.....	39.6	* 7.2	-4.1	-15.9
26	La Pryor-Batesville road crossing.....	44.8	4.1	-3.1	-19.0
26	3.5 miles above Cinonia bridge.....	53.0	13.9	+9.8	-9.2
26	Former gaging station near Cinonia.....	56.5	14.4	+1.5	-8.7

\* No flow in West Fork at mouth.

b 3 second-feet diverted by pump just above station added to measurement.

c 7 second-feet diverted by pumps above station added to measurement.

d 7 second-feet diverted by pumps above station added to measurement; small amount pumped just above not added.

\* From observation and local information, pumps below this point not operating.

## FRIO RIVER AT CONCAN, TEX.

LOCATION.—Water-stage recorder half a mile below Concan post office, Uvalde County.

DRAINAGE AREA.—485 square miles.

RECORDS AVAILABLE.—October 1923 to September 1933.

DISCHARGE.—Maximum during year, 584 second-feet Oct. 1 (gage height, 2.59 feet); minimum, 29 second-feet Aug. 29.

1924-33: Maximum (by slope area method) 162,000 second-feet July 1, 1932 (gage height, 34.44 feet); minimum, 8.1 second-feet, Aug. 2, 3, 1928.

REMARKS.—Records good. No diversions above station.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1	577	b 246	a 230	130	120	103	84	72	78	39	36	50	
2	551			127	120	103	81	72	75	39	36	43	
3	538			127	113	103	81	69	75	39	36	41	
4	512			127	113	103	81	72	72	39	36	41	
5	486	b 132	a 127	120	113	103	84	72	69	39	34	39	
6	473			217	120	113	103	81	72	66	39	34	39
7	454			213	137	113	103	81	69	66	37	34	39
8	440			200	147	107	100	81	66	64	37	34	39
9	428			196	154	107	100	81	66	64	37	34	37
10	414			196	154	107	97	81	66	66	36	34	37
11	395			192	151	107	97	75	64	66	36	34	36
12	388			a 188	144	107	97	75	64	66	34	34	36
13	376			184	144	107	97	75	64	72	34	34	36
14	369			177	144	107	94	72	61	66	34	32	36
15	362	a 173	144	107	91	72	58	61	34	34	37		
16	350	169	144	113	91	72	61	58	34	36	39		
17	336	166	140	110	91	72	61	58	104	34	43		
18	324	a 159	137	107	91	69	58	55	43	34	41		
19	318	a 152	137	107	87	69	58	58	41	32	39		
20	307	a 146	137	107	87	78	55	55	41	30	39		
21	289	140	123	133	103	87	75	55	50	41	30	39	
22	284	140	127	130	103	87	75	55	48	39	30	37	
23	278	140	140	130	103	87	78	55	48	37	30	37	
24	272	137	144	130	100	87	78	52	45	37	30	37	
25	263	a 137	140	127	100	87	78	139	45	39	30	37	
26	b 246	b 132	140	127	103	84	75	107	43	37	36	37	
27			137	123	110	84	75	97	43	36	30	37	
28			137	123	107	87	75	97	41	36	30	37	
29			133	123		87	75	91	41	36	29	37	
30			133	123		87	75	84	39	36	72	36	
31				130	123		84		81		36	84	
Month						Maximum	Minimum	Mean		Run-off in acre-feet			
October						577		363		22,300			
November								177		10,500			
December								133		8,180			
January						154	120	134		8,240			
February						120	100	108		6,000			
March						103	84	93.2		5,730			
April						84	69	76.8		4,570			
May						139	52	71.4		4,390			
June						78	39	58.4		3,480			
July						104	34	39.5		2,430			
August						84	29	35.9		2,210			
September						50	36	38.6		2,300			
The year						577	29	111		80,300			

a Interpolated or partly estimated.

b Estimated.



## FRIO RIVER NEAR DERBY, TEX.

LOCATION.—Water-stage recorder at International-Great Northern Railroad bridge 900 feet below mouth of Leona River and 4 miles south of Derby, Frio County. Zero of gage is 449.3 feet above mean sea level.

DRAINAGE AREA.—3,490 square miles, a large part of which is noncontributing at low stages, owing to water entering fault near Uvalde.

RECORDS AVAILABLE.—August 1915 to September 1933.

DISCHARGE.—Maximum during year, 1,000 second-feet Oct. 1 (gage height, 3.23 feet); minimum, 1.3 second-feet July 20, 21.

1915-33: Maximum (determined by slope-area method), 230,000 second-feet July 4, 1932 (gage height, 29.45 feet); no flow at times. Average, 18 years, 158 second-feet.

REMARKS.—Records good. Diversions for irrigation above station.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	905	78	36	33	54	36	31	14	24	5.0	5.0	4.4
2.....	805	80	36	31	52	38	30	13	18	4.4	5.0	6.4
3.....	730	75	36	31	60	36	30	15	14	3.8	5.0	7.1
4.....	680	75	31	29	56	38	27	15	13	3.8	5.0	18
5.....	630	139	30	29	50	36	19	14	12	4.4	5.0	13
6.....	560	104	29	34	48	35	18	19	12	4.4	5.0	7.9
7.....	510	76	26	34	46	34	19	20	8.7	4.4	5.0	6.4
8.....	485	72	26	35	45	34	20	18	6.4	5.0	5.7	5.7
9.....	456	67	26	39	45	34	18	15	6.4	5.0	6.4	5.7
10.....	432	59	25	118	45	31	18	15	6.4	4.4	6.4	5.0
11.....	400	54	25	119	44	31	18	14	6.4	4.4	7.9	4.4
12.....	372	52	25	95	45	34	17	15	7.1	4.4	7.9	4.4
13.....	332	51	25	84	46	42	19	14	8.7	4.4	8.7	4.4
14.....	314	51	25	75	52	45	22	11	7.9	3.2	7.9	4.4
15.....	299	50	26	72	56	39	23	11	7.1	3.2	7.1	4.4
16.....	281	50	27	70	60	38	23	16	6.4	3.2	7.9	4.4
17.....	272	50	26	68	62	38	21	16	7.1	3.2	8.7	5.7
18.....	260	50	27	68	60	38	22	16	7.9	2.7	8.7	5.7
19.....	233	48	29	68	54	35	22	16	7.9	2.7	8.7	6.4
20.....	218	45	29	65	51	34	22	15	6.4	2.2	7.9	11
21.....	192	45	29	60	51	34	22	15	6.4	1.7	7.1	11
22.....	175	46	30	59	46	34	22	13	7.1	2.2	6.4	8.7
23.....	160	48	33	57	44	34	21	12	7.1	2.7	5.7	8.7
24.....	150	45	33	52	41	33	20	11	8.7	8.3	5.0	7.9
25.....	135	42	31	51	39	31	17	11	7.9	9.3	4.4	7.1
26.....	125	38	29	52	36	31	15	12	6.4	7.1	3.8	7.1
27.....	112	38	36	51	38	30	16	14	5.0	7.1	3.8	6.4
28.....	104	36	51	51	36	30	16	20	5.0	7.9	2.2	6.4
29.....	100	36	50	51	-----	30	15	21	4.4	6.4	1.7	6.4
30.....	89	36	42	51	-----	30	15	24	4.4	5.7	3.8	6.4
31.....	83	-----	36	52	-----	30	-----	23	-----	5.0	4.4	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	905	83	342	21,000
November.....	139	36	57.9	3,450
December.....	51	25	31.1	1,910
January.....	119	29	57.5	3,540
February.....	62	36	48.6	2,700
March.....	45	30	34.6	2,130
April.....	31	15	20.6	1,230
May.....	24	11	15.4	947
June.....	24	4.4	8.54	508
July.....	9.3	1.7	4.57	281
August.....	8.7	1.7	5.91	363
September.....	18	4.4	7.03	418
The year.....	905	1.7	53.2	38,500

## FRIO RIVER AT CALLIHAM, TEX.

LOCATION.—Water-stage recorder at Calliham-Whitsett highway bridge half a mile below mouth of San Miguel Creek and 1 mile north of Calliham, McMullen County. Zero of gage is 153.47 feet above mean sea level.

DRAINAGE AREA.—5,450 square miles, a large part of which is noncontributing at low stages, owing to water entering a fault near Uvalde.

RECORDS AVAILABLE.—October 1924 to April 1926; April 1932 to September 1933.

DISCHARGE.—Maximum during year, 2,340 second-feet Oct. 4 (gage height, 12.74 feet); no flow July 24–29.

1924–26, 1932–33: Maximum (determined by slope-area method), 109,000 second-feet July 6, 1932 (gage height, 39.2 feet); no flow at times.

REMARKS.—Records good. Discharge partly estimated Oct. 1–25.

Diversions for irrigation above station.

*Discharge, in second-feet, 1932–33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,640	118	37	53	54	42	30	15	31	2.2	80	77
2	1,450	112	37	53	54	41	28	12	21	2.4	27	145
3	1,310	103	36	50	85	42	27	12	21	2.4	12	112
4	1,380	96	36	46	136	41	27	14	19	2.1	6.8	44
5	1,190	165	40	42	101	40	29	14	18	1.8	4.5	29
6	770	212	37	42	74	42	28	12	16	1.4	4.5	130
7	664	116	37	41	78	42	27	14	14	1.6	4.0	92
8	614	151	37	42	82	41	25	12	12	1.7	2.9	46
9	562	160	37	41	74	40	23	12	11	1.7	2.2	22
10	523	114	36	40	65	39	20	11	10	279	3.1	12
11	510	88	36	40	56	37	18	11	9.6	14	5.4	11
12	484	78	34	39	54	37	18	9.6	117	8.7	5.8	9.6
13	454	72	34	58	54	36	18	14	330	5.2	3.4	7.1
14	439	65	33	120	52	36	19	13	397	2.9	2.4	5.2
15	415	61	33	114	52	33	20	11	76	1.9	2.1	4.3
16	391	58	33	101	53	31	26	11	31	1.3	80	6.8
17	363	56	31	92	54	31	22	11	22	1.0	558	596
18	344	56	31	84	60	30	20	11	19	.8	132	132
19	320	54	34	82	60	30	21	11	10	.6	36	41
20	302	53	35	80	60	61	23	10	19	.5	16	27
21	275	53	35	76	60	60	22	8.7	11	.3	14	29
22	252	53	36	74	60	42	21	9.6	10	.2	11	16
23	226	52	37	72	56	37	21	11	7.5	.1	6.8	10
24	206	50	37	70	52	35	21	11	5.2	0	4.3	9.1
25	184	48	36	69	50	34	21	32	4.3	0	102	7.8
26	166	48	36	65	48	33	21	68	4.3	0	80	6.2
27	156	47	37	61	47	33	21	24	3.8	0	23	9.6
28	147	46	37	58	42	33	20	35	3.4	0	10	5.8
29	140	42	37	56	-----	30	19	45	2.9	0	5.8	6.2
30	131	41	36	56	-----	29	18	80	2.4	178	4.0	6.5
31	125	-----	39	56	-----	30	-----	65	-----	346	11	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	1,640	125	520	32,000
November	212	41	82.3	4,900
December	40	31	35.7	2,200
January	120	39	63.6	3,910
February	136	42	63.3	3,520
March	61	29	37.7	2,320
April	30	18	22.5	1,340
May	80	8.7	20.3	1,250
June	397	2.4	41.9	2,490
July	346	0	27.7	1,700
August	558	2.1	40.6	2,500
September	596	4.3	55.2	3,280
The year	1,640	0	84.8	61,400

## FRIO RIVER SEEPAGE INVESTIGATION

*Discharge measurements of Frio River to determine seepage from Concan to Uvalde-Sabinal highway crossing, Tex., 1932*

Date	Location	Approximate distance from initial point (miles)	Discharge (second-feet)		
			Main stream	Gain or loss in section	Total gain or loss
Nov. 5	Gaging station at Concan.....	0	233		
5	1.2 miles below Concan station.....	1.2	226	-7	-7
5	3 miles below Concan station.....	3.0	253	+27	+20
6	¼ mile above Uvalde-Concan road crossing.....	5.0	220	-33	-13
6	Uvalde-Sabinal highway crossing.....	18.5	0	-220	-233
Dec. 20	Gaging station at Concan.....	0	124		
20	1.2 miles below Concan station.....	1.2	108	-16	-16
20	3 miles below Concan station.....	3.0	123	+15	-1
20	¼ mile above Uvalde-Concan road crossing.....	5.0	98.8	-24.2	-25.2
20	Uvalde-Sabinal highway crossing.....	18.5	0	-98.8	-124

\* River fell 0.04 foot during night at this point.

NOTE.—No diversions from portion of river covered by measurements; no inflow from tributaries.

## LEONA RIVER SEEPAGE INVESTIGATION

During the investigations the river was at a constant stage, and measurements represent natural conditions.

*Discharge measurements of Leona River near Uvalde, Tex., to determine seepage Nov. 7, 1932*

Location	Approximate distance from initial point (miles)	Discharge (second-feet)		
		Main stream	Gain or loss in section	Total gain or loss
Highway bridge 1.7 miles southeast of Uvalde.....	0	18.6		
At. S. L. Gilbert ranch.....	5.5	40.8	+22.2	+22.2
Below Kincaid Dam.....	8.4	40.1	-.7	+21.5
Hackberry crossing.....	17.0	39.8	-.3	+21.2

NOTE.—No diversions from river or inflow from tributaries during seepage investigation.

## ATASCOSA RIVER AT WHITSETT, TEX.

LOCATION.—Water-stage recorder 0.9 mile west of Whitsett, Live Oak County, and 4 miles below mouth of La Parita Creek.

DRAINAGE AREA.—1,170 square miles.

RECORDS AVAILABLE.—September 1924 to May 1926; May 1932 to September 1933.

DISCHARGE.—Maximum during year, 1,800 second-feet Oct. 4 (gage height, 15.65 feet); minimum not determined.

1924-26, 1932-33: Maximum, about 2,780 second-feet July 12, 1925 (gage height, 17.3 feet, old gage datum); no flow at times.

Flood of Apr. 29-30, 1932, reached a stage of 20 feet, present gage datum (discharge, 2,850 second-feet). Maximum stage known, 32.1 feet (present datum) in April 1922.

REMARKS.—Low-stage records poor; others fair. No diversions above station.

## Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	10	2.0	5.5	9.0	11	5.2	3.6				139	193
2	8.3	1.8	4.9	9.0	11	5.2	3.0	a 1.5			29	221
3	6.6	1.8	4.7	7.9	25	5.2	2.8				12	48
4	676	1.7	21	7.9	26	14	2.3	25			5.5	14
5	104	2.1	22	9.0	14	7.6	3.2	4.9			6.2	38
6	28	2.6	7.4	8.6	15	8.3	147		a 2.0			29
7	10	2.5	6.3	9.0	35	7.1	61					12
8	6.3	2.9	6.3	12	34	5.7	21				a 2.5	5.7
9	5.0	3.0	6.0	10	23	5.7	14					4.1
10	4.4	3.0	6.6	8.6	15	5.2	10					b 3.3
11	3.9	3.0	6.3	7.9	14	4.6	7.9		3.5		28	b 2.5
12	3.3	2.8	7.1	10	12	4.4	6.8		b 3.9		63	
13	3.2	2.6	7.6	10	12	4.4	6.0		32		126	
14	2.8	2.8	7.9	10	14	4.2	5.2		158	a 1.2	12	a 3.0
15	2.6	2.9	7.9	9.0	13	4.2	4.7	a 1.5	45		25	
16	2.5	3.5	8.6	10	39	3.9	4.6		8.3		18	
17	2.5	3.6	10	10	47	3.8	4.2		3.3		253	30
18	2.3	4.2	11	10	21	3.5	4.1		b 2.0		89	142
19	2.3	4.1	9.4	11	13	43	3.9		5.1		28	24
20	2.3	4.4	9.4	11	9.4	69	3.8		b 2.6		10	4.9
21	2.2	5.0	9.0	11	7.6	38	3.2		b 2.9		5.0	b 2.2
22	2.0	5.2	9.0	11	6.3	13	2.6					
23	2.0	5.0	10	10	6.0	6.8	b 2.3				a 3.5	a 1.0
24	1.9	5.7	10	9.8	5.7	4.9	b 2.1					
25	1.9	5.2	12	10	6.0	4.4	b 3.2	6.1			584	
26	2.1	4.6	11	8.6	5.5	3.5	b 2.8	293	a 2.5		663	25
27	2.0	4.7	10	8.3	5.5	3.3	b 2.9	195		b 2	64	13
28	2.0	4.7	9.4	8.3	5.5	3.6		39		a 2	23	2.6
29	2.0	5.2	8.6	8.3		3.6	a 2.0	14			14	b 4
30	2.0	5.7	9.8	8.6		3.8		7.1			227	b 4
31	2.0		9.4	9.4		4.2		4.2			798	15

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	676	1.9	29.3	1,800
November	5.7	1.7	3.61	215
December	22	4.7	9.16	565
January	12	7.9	9.46	582
February	47	5.5	16.1	594
March	69	3.3	9.78	601
April	147		11.5	684
May	293		20.0	1,230
June	158		10.3	513
July	798		34.5	2,120
August	663		72.2	4,440
September	221		27.8	1,650
The year	798		21.3	15,400

a Estimated.

b Partly estimated or interpolated.

## RIO GRANDE BASIN

## RIO GRANDE AT TAOS JUNCTION BRIDGE, NEAR TAOS, N. MEX.

LOCATION.—Water-stage recorder in Gijosa grant, at bridge on Taos-Taos Junction highway, 800 feet below mouth of Rio Taos and about 10 miles southwest of Taos, Taos County.

DRAINAGE AREA.—9,150 square miles.

RECORDS AVAILABLE.—October 1930 to September 1933. Records 1925–30 published by State engineer.

DISCHARGE.—Maximum during year, 2,620 second-feet June 4 (gage height, 4.91 feet); minimum recorded, 222 second-feet Sept. 1.

1930–33: Maximum, 6,950 second-feet May 25, 1932 (gage height, 8.56 feet); minimum (estimated), 140 second-feet Aug. 21, 1931.

REMARKS.—Records good except those estimated, which are fair. Diversions for irrigation above station.

*Discharge, in second-feet, 1932–33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	324	468	583	488	472	496	444	348	2,100	775	250	229
2	320	456	592	496	452	516	440	352	2,200	700		288
3	316	456	592	468	452	547	432	364	2,460	670	275	278
4	316	488	574	464	452	574	420	400	2,460			264
5	316	504	583	452	456	574	412	448	2,300	264		
6	313	512	570	464	460	529	408	436	2,070	257		
7	313	508	524	456	452	588	404	428	1,930	500	275	264
8	313	496	444	468	436	642	396	412	1,790			268
9	316	500	396	472	420	637	400	408	1,550	400	250	246
10	313	492	416	476	408	664	396	404	1,340			236
11	313	480	448	480	404	745	388	396	1,340	330	246	229
12	310	452	384	468	420	850	376	396	1,490			232
13	310	428	400	496	404	825	372	400	1,800	400	250	240
14	316	472	488	496	396	825	372	404	1,620			271
15	313	547	508	496	400	750	364	404	1,580	330	246	271
16	313	578	512	484	416	715	364	388	1,430			444
17	320	583	496	476	408	696	368	380	1,430	400	254	356
18	328	583	504	472	408	650	368	376	1,580			296
19	328	588	504	468	416	628	364	384	1,680	400	254	296
20	332	688	504	492	420	592	356	416	1,720			302
21	336	592	492	464	428	578	356	632	1,820	330	246	310
22	360	596	496	468	440	560	344	1,160	2,140			243
23	372	601	492	480	440	538	344	1,600	2,070	400	254	292
24	376	588	496	464	436	508	344	1,500	2,000			292
25	376	574	500	460	432	520	348	1,190	1,820	320	240	296
26	336	565	468	480	444	504	360	1,130	1,680			292
27	376	552	464	460	476	496	360	1,250	1,490	250	232	292
28	492	552	464	476	476	480	348	1,340	1,340			285
29	574	556	480	468		472	352	1,520	1,100	250	232	285
30	565	570	472	468		472	344	1,750	925			288
31	496		452	476		456		1,950		229		

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	574	310	355	21,800
November.....	601	428	531	31,600
December.....	592	384	493	30,300
January.....	496	452	474	29,100
February.....	476	396	433	24,000
March.....	850	456	601	36,900
April.....	444	344	378	22,500
May.....	1,950	348	741	45,600
June.....	2,460	925	1,740	104,000
July.....	-----	-----	421	25,900
August.....	-----	-----	253	15,500
September.....	444	229	283	16,800
The year.....	2,460	-----	558	404,000

\* Estimated.

## RIO GRANDE AT EMBUDO, N.MEX.

LOCATION.—Water-stage recorder in SW $\frac{1}{4}$  sec. 23, T. 23 N., R. 9 E., a quarter of a mile below depot at Embudo and about 2 $\frac{1}{4}$  miles below Embudo Creek.

DRAINAGE AREA.—10,000 square miles.

RECORDS AVAILABLE.—January 1889 to December 1903; September 1912 to September 1916; October 1930 to September 1933. Records 1916–30 published by State engineer.

DISCHARGE.—Maximum during year, 4,300 second-feet June 13 (gage height, 6.64 feet); minimum, 223 second-feet Aug. 16, 17.

1930–33: Maximum, 8,360 second-feet May 25, 1932 (gage height, 9.35 feet); minimum, 166 second-feet Aug. 22, 1931.

REMARKS.—Records good. Discharge estimated for periods of ice effect, Jan. 2–6, Feb. 9–14. Diversions for irrigation above station.

*Discharge, in second-feet, 1932–33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	344	486	623	468	495	560	476	376	2,200	945	247	271
2.....	336	463	640	470	490	601	468	388	2,310	808	278	310
3.....	336	463	634		476	628	458	422	2,420	689	334	313
4.....	332	495	623		490	667	440	458	2,580	718	422	285
5.....	340	510	640		490	662	422	540	2,420	550	505	268
6.....	332	515	634	476	500	640	388	510	2,100	570	368	264
7.....	332	515	565		500	656	384	505	1,950	555	320	278
8.....	332	495	505		458	724	388	490	1,860	535	274	247
9.....	332	495	440		476	760	388	495	1,630	481	278	300
10.....	328	500	418	490	430	778	364	505	1,380	454	302	400
11.....	324	486	490	486		826	348	505	1,460	436	271	370
12.....	324	463	409	481		945	324	515	1,760	427	257	350
13.....	324	418	418	486		912	332	505	2,100	432	244	380
14.....	328	463	520	481	912	340	500	1,950	432	238	370	370
15.....	332	530	560	468	436	862	344	486	2,000	392	226	450
16.....	328	585	555	476	440	808	336	454	1,680	376	223	422
17.....	336	585	530	481	454	784	414	468	1,580	400	223	344
18.....	340	606	530	486	440	736	384	468	1,810	430	226	336
19.....	348	601	555	468	458	718	388	486	2,000	364	229	348
20.....	348	612	575	495	445	678	368	545	1,950	336	232	340
21.....	348	612	565	472	463	645	376	700	2,050	344	232	352
22.....	384	618	570	476	476	623	372	1,220	2,530	350	235	332
23.....	400	628	545	486	476	606	384	1,630	2,530	450	235	332
24.....	427	612	530	481	486	565	384	1,760	2,580	427	241	332
25.....	445	601	550	468	486	570	392	1,340	2,310	372	244	336
26.....	409	596	515	486	505	570	392	1,260	2,150	368	241	328
27.....	352	585	505	468	530	570	380	1,340	1,950	332	241	320
28.....	481	596	510	490	545	540	376	1,500	1,720	288	271	316
29.....	596	601	520	500	-----	505	380	1,680	1,420	271	268	316
30.....	623	606	505	486	-----	510	380	1,950	1,150	260	264	320
31.....	540	-----	481	510	-----	495	-----	2,100	-----	247	274	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	623	324	377	23,200
November.....	628	418	545	32,400
December.....	640	409	537	33,000
January.....	510	463	479	29,500
February.....	545	-----	469	26,000
March.....	945	495	679	41,800
April.....	476	324	386	22,900
May.....	2,100	376	842	51,800
June.....	2,580	1,150	1,980	118,000
July.....	945	247	453	27,800
August.....	505	223	272	16,700
September.....	450	247	331	19,700
The year.....	2,580	223	612	443,000

• Estimated.

## RIO GRANDE AT OTOWI BRIDGE, NEAR SAN ILDEFONSO, N.MEX.

LOCATION.—Water-stage recorder in San Ildefonso Pueblo grant, at Denver & Rio Grande Western Railroad bridge 2 miles southwest of San Ildefonso and 3 miles below Tesuque Creek.

DRAINAGE AREA.—13,800 square miles.

RECORDS AVAILABLE.—February 1895 to December 1905; June 1909 to December 1914; October 1930 to September 1933. Records 1915–30 published by State engineer.

DISCHARGE.—Maximum during year, 6,400 second-feet May 22 (gage height, 6.63 feet); minimum, 150 second-feet Aug. 17.

1930–33: Maximum, 14,500 second-feet May 20, 1932 (gage height, 9.84 feet); minimum, that of Aug. 17, 1933.

REMARKS.—Records good. Diversions for irrigation above station.

*Discharge, in second-feet, 1932–33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	492	763	833	* 630	714	840	819	1,520	4,980	1,330	504	269
2.....	487	742	875	* 650	700	875	826	1,380	5,080	1,200	676	260
3.....	492	707	847	664	646	903	896	1,570	4,790	1,040	438	320
4.....	470	707	854	707	622	974	950	1,620	4,700	896	714	300
5.....	487	749	868	714	676	982	1,010	2,170	4,240	903	998	256
6.....	498	756	819	676	742	934	918	2,360	3,820	934	2,000	* 270
7.....	465	749	714	664	700	942	805	2,300	3,490	910	982	298
8.....	476	721	694	664	544	1,010	777	2,180	3,180	840	910	300
9.....	482	707	598	670	640	1,050	798	1,720	2,820	847	784	360
10.....	476	728	556	688	728	1,070	812	1,670	2,480	791	592	1,070
11.....	470	682	538	700	604	1,150	784	1,520	2,420	646	504	652
12.....	482	670	568	670	664	1,330	728	1,470	2,420	590	404	532
13.....	492	640	526	652	682	1,330	763	1,380	2,820	563	335	622
14.....	482	640	610	676	664	1,240	833	1,330	3,260	592	315	580
15.....	476	688	682	658	634	1,200	854	1,240	3,040	646	237	1,570
16.....	465	798	634	682	664	1,110	770	1,150	2,890	688	191	1,040
17.....	476	784	610	714	700	1,050	847	1,240	2,890	1,050	161	640
18.....	476	826	* 610	728	670	998	910	1,780	2,890	1,040	278	544
19.....	482	819	* 640	670	676	966	1,110	2,890	3,110	670	274	492
20.....	526	833	* 650	700	652	926	1,280	3,900	3,410	514	260	526
21.....	509	847	* 640	707	700	861	1,150	4,790	3,570	460	246	604
22.....	610	833	* 650	676	728	819	1,070	5,870	3,730	454	220	592
23.....	616	833	* 630	700	728	805	1,050	4,790	3,820	874	233	538
24.....	688	812	* 600	700	777	805	990	4,510	4,070	1,450	505	550
25.....	868	805	* 620	688	756	784	950	4,510	3,410	616	251	509
26.....	756	791	* 600	694	791	770	1,050	4,420	2,890	586	246	465
27.....	694	777	* 590	658	777	770	1,110	4,510	2,550	882	377	438
28.....	728	770	* 580	714	812	833	1,280	4,790	2,230	487	604	404
29.....	826	791	* 590	742	-----	819	1,780	4,880	1,940	350	345	394
30.....	896	805	* 600	707	-----	896	1,830	5,080	1,620	315	320	399
31.....	840	-----	* 620	714	-----	942	-----	5,170	-----	305	310	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	896	465	570	35,100
November.....	847	640	759	45,200
December.....	875	526	660	40,600
January.....	742	630	686	42,200
February.....	812	544	693	38,500
March.....	1,330	770	967	59,500
April.....	1,830	728	992	59,000
May.....	5,570	1,150	2,870	177,000
June.....	5,080	1,620	3,290	195,000
July.....	1,450	305	757	46,500
August.....	2,000	161	491	30,200
September.....	1,570	256	526	31,300
The year.....	5,570	161	1,110	800,000

\* Estimated.

## RIO GRANDE AT COCHITI, N.MEX.

LOCATION.—Water-stage recorder at highway bridge 1 mile northeast of Cochiti, Sandoval County, 4 miles north of Pena Blanca, and 8 miles above mouth of Galisteo Creek.

DRAINAGE AREA.—14,300 square miles.

RECORDS AVAILABLE.—October 1930 to September 1933. Records for 1925-30 published by State engineer.

DISCHARGE.—Maximum during year, 5,250 second-feet May 21 (gage height, 6.67 feet); minimum, 252 second-feet Sept. 10.

1930-33: Maximum, 13,000 second-feet Sept. 24, 1931, and May 22, 1932; minimum (estimated), 130 second-feet July 15-17, 1931.

REMARKS.—Records good except those estimated, which are fair. Stage-discharge relation affected by ice Dec. 15-31, Jan. 17-19, Feb. 11, 12. Diversions for irrigation above station.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	518	690	767	707	690	908	985	1,190	4,400	1,190	486	328
2.....	495	678	809	713	678	945	950	1,100	4,290	1,020	570	300
3.....	490	678	822	707	661	950	985	1,190	4,180	1,020	495	307
4.....	477	678	815	707	620	1,020	1,020	1,290	3,960	880	625	314
5.....	468	713	809	701	646	1,020	1,060	1,580	3,750	936	761	288
6.....	464	725	785	690	701	985	1,020	1,840	3,450	887	1,520	276
7.....	450	743	767	690	690	985	901	1,840	3,260	901	1,020	267
8.....	450	737	719	684	570	1,020	884	1,460	3,070	828	797	270
9.....	450	737	673	695	615	1,060	884	1,520	2,810	834	740	288
10.....	450	765	651	725	725	1,100	834	1,520	2,720	797	620	677
11.....	450	749	651	737	620	1,100	809	1,460	2,480	707	531	620
12.....	446	737	640	731	660	1,240	719	1,400	2,400	615	442	550
13.....	454	731	625	737	701	1,340	668	1,340	2,640	605	410	550
14.....	454	719	646	737	688	1,190	690	1,400	2,980	585	363	504
15.....	450	743		737	684	1,140	713	1,340	2,720	610	342	963
16.....	450	809		731	673	1,100	701	1,240	2,560	755	342	880
17.....	454	828		707	707	1,100	646	1,290	2,480	707	314	625
18.....	454	887		760	700	1,190	690	1,840	2,400	1,100	321	526
19.....	454	901		760	690	1,060	749	2,480	2,480	701	291	468
20.....	450	867		713	690	1,020	908	3,350	2,640	540	366	454
21.....	459	841		707	720	985	922	4,180	2,810	526	324	531
22.....	560	841		707	750	950	854	4,400	2,810	495	342	477
23.....	560	840	670		790	894	841	4,070	2,980	580	294	438
24.....	640	835			860	880	797	3,750	2,980	1,240	510	442
25.....	780	834			867	915	737	4,180	2,640	767	508	394
26.....	680	822		700	894	950	797	4,070	2,260	690	418	356
27.....	640	822			908	922	834	3,960	2,040	815	500	338
28.....	660	803			908	943	929	4,180	1,840	595	646	310
29.....	750	809				985	1,240	4,180	1,520	482	430	307
30.....	820	779		684		1,020	1,340	4,400	1,290	422	346	310
31.....	760			690		1,060		4,400		414	342	-----
Month	Maximum					Minimum		Mean		Run-off in acre-feet		
October.....	820					446		534		32,800		
November.....	901					678		778		46,300		
December.....	822					-----		696		42,800		
January.....	-----					-----		713		43,900		
February.....	-----					908		570		39,800		
March.....	-----					1,340		880		63,200		
April.....	-----					1,340		646		51,600		
May.....	-----					4,400		1,100		154,000		
June.....	-----					4,400		1,290		168,000		
July.....	-----					1,240		414		46,100		
August.....	-----					1,520		291		31,800		
September.....	-----					963		267		26,500		
The year.....	-----					4,400		267		1,030		

\* Estimated.



## RIO GRANDE AT SAN FELIPE, N. MEX.

LOCATION.—Water-stage recorder in San Felipe grant at steel highway bridge 2,000 feet below mouth of Tonque Arroyo, half a mile above San Felipe Pueblo, Sandoval County, and about 12 miles northeast of Bernalillo.

DRAINAGE AREA.—15,600 square miles.

RECORDS AVAILABLE.—October 1930 to September 1933. Records 1925-30 published by State engineer.

DISCHARGE.—Maximum during year, about 7,320 second-feet June 3; maximum gage height, 7.65 feet Feb. 12 during ice jam; minimum, 193 second-feet Aug. 24, 1930-33; Maximum, 18,200 second-feet May 21, 1932; maximum gage height, 8.35 feet Jan. 26, 1932, during an ice jam; minimum, 164 second-feet June 28, 1931.

REMARKS.—Records fair for October, March, June and July; others poor. Stage-discharge relation affected by ice Jan. 2-23, Feb. 11-13. Diversions for irrigation above station.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.-----	536	° 740	790			1,090	1,170	° 1,600	° 5,100	1,530	° 500	326
2.-----	536	° 720	808			1,110	1,090	° 1,300	° 5,400	1,200	° 600	° 300
3.-----	536	° 700	844			1,230	1,080	° 1,360	° 5,780	1,110	° 550	° 330
4.-----	524	° 700	835			1,210	° 1,140	° 1,400	° 5,010	890	702	° 320
5.-----	494	° 730	° 830			1,240	° 1,200	° 1,800	° 5,160	1,160	844	° 300
6.-----	488	° 760	817			1,250	° 1,140	° 2,000	° 4,170	880	1,860	° 290
7.-----	458	° 800	742			1,320	1,070	° 2,000	° 3,700	1,050	1,480	° 280
8.-----	458	° 786	702			1,390	° 920	° 1,700	° 3,300	920	742	° 270
9.-----	476	° 780	° 700			1,870	° 920	° 1,800	° 2,860	900	702	° 290
10.-----	476	° 780	° 680		° 700	1,670	° 900	° 1,700	° 2,560	880	670	600
11.-----	464	782	° 680			1,650	835	° 1,600	° 2,560	726	595	° 595
12.-----	462	° 770	° 670			1,680	782	° 1,600	° 2,660	595	530	° 580
13.-----	482	° 750	° 660			1,650	799	° 1,500	° 3,080	567	452	° 560
14.-----	440	° 740	° 700			1,490	835	° 1,600	° 3,660	542	365	524
15.-----	434	° 780	° 740			1,490	853	° 1,500	° 3,300	548	355	° 1,000
16.-----	439	° 820	° 700	° 720		1,440	844	° 1,400	° 3,190	1,150	° 350	° 900
17.-----	439	° 840	° 690			1,320	817	° 1,400	° 3,080	799	° 330	° 800
18.-----	440	° 860	° 700			° 1,300	826	° 2,000	° 3,300	1,180	° 340	° 662
19.-----	446	853	718			1,270	853	° 3,000	° 3,420	835	° 320	° 609
20.-----	452	862	° 740		° 740	° 1,200	1,000	° 3,500	° 3,780	742	° 380	542
21.-----	482	862	° 740		° 780	° 1,180	1,020	° 3,910	° 4,040	512	° 350	° 570
22.-----	° 580	900	° 720		° 840	° 1,130	950	° 4,720	° 3,910	790	° 360	° 500
23.-----	° 600	890	° 700		° 900	° 1,060	° 920	° 5,010	° 4,440	871	° 320	° 490
24.-----	° 660	835	° 680		° 940	° 1,040	890	° 3,910	° 4,440	1,400	516	488
25.-----	° 800	817	694		° 960	° 1,060	817	° 4,040	° 3,660	853	649	440
26.-----	° 720	° 820	702		° 1,000	1,100	880	° 4,170	° 3,190	920	° 450	402
27.-----	° 660	° 820	694		1,030	° 1,050	° 950	° 4,300	° 2,970	678	° 500	° 370
28.-----	° 700	° 820	670		1,020	° 1,080	° 1,100	° 4,300	° 2,660	524	616	345
29.-----	° 800	° 810	670			° 1,110	° 1,400	° 4,500	° 2,370	476	470	330
30.-----	853	° 800	° 670			1,150	° 1,500	° 4,600	1,910	402	375	340
31.-----	808	° 670				1,180		° 4,700		412	326	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October-----	853	429	552	33,900
November-----	900	700	797	47,400
December-----	844	660	721	44,300
January-----			720	44,300
February-----	1,030		768	42,700
March-----	1,680	1,040	1,280	78,800
April-----	1,500	782	983	58,500
May-----	5,010	1,300	2,710	166,000
June-----	5,780	1,910	3,620	216,000
July-----	1,530	402	840	51,700
August-----	1,860	320	568	34,900
September-----	1,000	270	478	28,500
The year-----	5,780	270	1,170	847,000

° Estimated.

## RIO GRANDE AT SAN MARCIAL, N.MEX.

LOCATION.—Water-stage recorder in Pedro Armendaris grant 34, at Atchison, Topeka & Santa Fe Railway bridge 1.1 miles below San Marcial, Socorro County.

DRAINAGE AREA.—28,400 square miles (revised).

RECORDS AVAILABLE.—January 1895 to September 1933. Records prior to January 1922 about 0.3 mile above present site; January 1922 to Feb. 26, 1932, at highway bridge half a mile northeast of San Marcial and 1.8 miles above present site.

DISCHARGE.—Maximum during year, 20,600 second-feet June 22 (gage height, 8.87 feet); minimum, 1.0 second-foot (estimated) Sept. 10.

1895-1933: Maximum mean daily discharge, 33,000 second-feet Oct. 11, 1904; maximum discharge on Sept. 24, 1929, probably reached about same discharge as flood of 1904; no flow at times.

REMARKS.—Records good except those estimated, which are fair. Diversions for irrigation above station. Beginning July 1, 1931, complete records, except for occasional discharge measurements by the U.S. Geological Survey, were furnished by the U.S. Boundary Commission.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	253	436	558	° 290	864	642	370	163	3,810	1,380	292	156
2.....	274	534	610	° 310	760	652	390	148	3,810	1,240	378	146
3.....	281	519	629	° 406	703	627	423	835	3,670	956	683	° 76
4.....	247	498	622	° 438	712	709	405	640	3,940	788	953	° 40
5.....	227	495	668	° 474	757	666	369	815	4,180	° 631	1,800	° 20
6.....	246	514	719	° 511	754	704	287	673	3,600	° 704	2,940	° 14
7.....	189	480	701	° 694	715	942	326	648	3,170	856	2,980	° 7, 0
8.....	186	468	689	° 1,010	° 260	940	289	866	2,930	1,020	2,260	° 4, 3
9.....	179	466	636	° 926	° 225	814	272	1,680	2,520	1,120	1,390	° 1, 6
10.....	179	411	604	835	° 520	808	325	1,100	2,280	° 764	1,460	° 18
11.....	195	384	602	762	° 396	739	355	722	1,870	° 443	896	1,710
12.....	212	389	593	° 761	° 380	791	264	670	1,630	274	615	1,380
13.....	243	522	647	819	478	776	182	687	1,910	465	351	1,000
14.....	206	529	742	900	726	984	173	695	1,800	273	240	4,670
15.....	187	558	610	821	893	1,180	191	630	2,880	229	175	2,260
16.....	178	488	588	825	883	1,280	197	517	3,060	545	132	1,030
17.....	183	520	634	802	875	1,100	239	508	3,040	925	121	1,260
18.....	169	523	622	793	835	1,060	179	477	4,210	2,360	94	1,060
19.....	161	536	642	747	904	842	154	358	4,000	2,080	87	683
20.....	160	633	748	792	945	867	187	282	7,340	932	58	709
21.....	186	583	° 710	899	730	884	204	213	9,540	° 648	24	437
22.....	222	597	° 650	778	691	890	174	2,380	16,200	° 373	17	302
23.....	232	603	° 668	816	667	857	231	3,310	10,400	° 310	5, 6	1,230
24.....	265	647	° 658	810	645	667	382	4,090	6,470	° 883	6, 2	1,220
25.....	216	665	° 608	805	669	587	531	3,920	5,450	2,040	19	695
26.....	291	612	° 578	761	739	571	472	3,350	4,280	2,110	48	° 420
27.....	694	607	° 548	870	858	° 584	351	3,410	2,890	1,400	58	° 244
28.....	725	602	° 518	848	867	° 520	251	3,200	2,630	604	227	195
29.....	574	565	° 413	809	-----	° 455	166	3,350	2,360	° 784	239	189
30.....	465	575	° 308	723	-----	° 391	157	3,590	1,880	° 470	319	166
31.....	431	-----	° 269	719	-----	° 398	-----	3,700	-----	° 242	229	-----
Month	Maximum			Minimum			Mean			Run-off in acre-feet		
October.....	725			160			273			16,800		
November.....	665			384			532			31,700		
December.....	748			269			606			37,300		
January.....	1,010			290			734			45,100		
February.....	945			225			695			38,600		
March.....	1,280			391			772			47,500		
April.....	531			154			283			16,900		
May.....	4,090			148			1,540			94,500		
June.....	16,200			1,630			4,200			253,000		
July.....	2,360			229			898			55,200		
August.....	2,980			5, 6			616			37,900		
September.....	4,670			1, 6			711			42,300		
The year.....	16,200			1, 6			960			717, 0		

° Estimated.

## RIO GRANDE BELOW ELEPHANT BUTTE DAM, N.MEX.

LOCATION.—Water-stage recorder in Pedro Armendaris grant, 300 feet below Elephant Butte Dam, in sec. 25, T. 13 S., R. 4 W. (surveys by U.S. Bureau of Reclamation).

RECORDS AVAILABLE.—October 1916 to September 1933.

REMARKS.—Records good. Considerable water is diverted above station; amount not known. Flow controlled by Elephant Butte Dam, which forms reservoir having capacity of 2,638,000 acre-feet. Records furnished by U.S. Bureau of Reclamation.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	243	978	802	3	253	527	2,040	1,400	1,810	1,790	2,100	2,050
2	420	925	762	2	594	527	2,040	1,400	1,820	1,570	2,140	1,890
3	464	925	762	6	758	622	2,040	1,400	1,940	1,950	2,150	1,860
4	464	925	650	6	758	775	2,040	1,400	1,940	1,950	2,040	1,860
5	328	826	364	5	758	762	2,070	1,400	1,940	1,950	2,040	1,860
6	6	3	3	6	758	759	2,000	1,400	1,940	2,060	2,040	1,860
7	6	3	3	5	758	750	1,940	1,400	1,960	2,070	2,050	1,850
8	4	3	3	7	758	762	2,140	1,400	2,020	2,200	2,130	1,740
9	3	3	5	7	637	771	2,140	1,570	2,010	2,110	2,170	1,730
10	5	3	5	5	641	796	2,140	1,760	1,940	2,160	2,180	1,730
11	6	3	3	6	425	905	2,150	1,760	1,950	2,290	2,180	1,730
12	6	3	6	5	387	948	2,010	1,900	1,940	2,350	2,250	1,660
13	7	3	5	6	384	948	2,010	1,900	1,900	2,550	2,250	1,470
14	7	103	50	6	353	977	1,990	1,900	1,870	2,410	2,250	1,470
15	905	839	721	2	125	1,050	1,920	1,900	1,870	2,170	2,160	1,460
16	877	775	701	2	151	1,050	1,920	1,890	1,680	2,470	1,950	1,410
17	877	775	697	2	571	1,090	1,890	1,820	1,570	2,420	1,840	1,410
18	877	775	614	2	856	1,320	1,880	1,800	1,570	1,950	2,100	1,410
19	646	775	96	2	733	1,320	1,840	1,920	1,560	2,340	2,330	1,380
20	166	735	3	2	733	1,320	1,830	1,990	1,940	2,170	2,320	1,340
21	3	3	3	2	733	1,340	1,820	1,990	1,070	1,950	2,340	1,340
22	3	3	3	2	729	1,370	1,760	2,000	1,120	1,900	2,300	1,300
23	3	4	3	2	700	1,360	1,760	2,010	991	1,900	2,200	1,220
24	3	3	3	2	534	1,350	1,760	1,850	1,010	1,920	2,200	1,220
25	2	3	3	2	527	1,750	1,710	1,870	1,300	1,890	2,200	1,220
26	3	3	3	2	527	1,750	1,530	1,860	1,600	1,640	2,200	1,220
27	3	4	3	3	527	1,760	1,530	1,880	1,680	1,600	2,200	1,220
28	3	3	3	2	527	1,800	1,510	1,890	1,790	1,750	2,200	1,220
29	3	19	3	3	-----	1,970	1,400	1,890	1,790	1,990	2,180	1,190
30	5	81	3	60	-----	1,910	1,400	1,890	1,790	2,000	2,120	1,080
31	142	-----	3	289	-----	1,880	-----	1,810	-----	2,100	2,120	-----
Month	Maximum						Minimum	Mean	Run-off in acre-feet			
October	905						2	209	12,900			
November	978						3	317	18,900			
December	802						3	203	12,500			
January	289						2	14.7	904			
February	856						125	578	32,100			
March	1,970						527	1,170	71,800			
April	2,150						1,400	1,870	111,000			
May	2,010						1,400	1,750	108,000			
June	2,020						991	1,690	101,000			
July	2,550						1,570	2,060	127,000			
August	2,340						1,840	2,160	133,000			
September	2,050						1,080	1,510	90,000			
The year	2,550						2	1,130	819,000			

## ALAMOSA CREEK AT JASPER, COLO.

LOCATION.—Staff gage in NW¼ sec. 29, T. 37 N., R. 5 E., half a mile west of Jasper.

DRAINAGE AREA.—64 square miles.

RECORDS AVAILABLE.—October 1931 to June 1933 (discontinued).

DISCHARGE.—Maximum for period, 1,160 second-feet May 31 (gage height, 3.46 feet); minimum, 5.7 second-feet Dec. 8 (gage height, 0.31 foot).

1932-33: Maximum, that of May 31, 1933; minimum, that of Dec. 8, 1932.

REMARKS.—Records fair. Discharge estimated for Dec. 10-12. No diversions above station.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1.....	17	7.4	13	12	11	8.4	23	32	910
2.....	17	6.8	13	13	11	9.1	25	34	801
3.....	17	12	12	12	11	10	30	35	792
4.....	15	16	13	12	11	8.4	30	34	774
5.....	11	16	11	12	10	9.4	23	35	756
6.....	12	17	12	11	10	9.4	25	36	507
7.....	12	16	7.8	11	10	9.4	24	35	470
8.....	15	12	7.8	11	10	9.4	23	35	500
9.....	17	15	10	11	10	10	26	29	570
10.....	16	15	10	11	11	11	24	26	640
11.....	17	7.8	10	11	11	10	24	26	605
12.....	18	12	11	10	11	12	22	29	500
13.....	17	13	11	10	11	10	22	22	440
14.....	18	14	12	10	11	11	20	18	365
15.....	16	13	12	9.1	11	11	24	21	365
16.....	14	14	13	9.1	11	12	25	31	340
17.....	14	14	12	10	11	11	26	62	331
18.....	14	13	13	10	11	12	28	193	331
19.....	11	13	13	10	11	11	31	151	322
20.....	16	13	14	10	11	10	25	229	313
21.....	14	14	13	10	11	10	20	241	295
22.....	14	14	13	10	11	10	17	244	295
23.....	13	13	14	10	11	12	13	216	287
24.....	14	13	14	11	11	10	14	192	287
25.....	14	13	13	10	10	10	17	206	271
26.....	14	12	13	10	10	10	17	224	271
27.....	14	12	14	10	10	12	23	336	252
28.....	14	13	14	10	8.4	17	30	430	248
29.....	12	12	13	10	-----	19	32	494	234
30.....	14	12	12	10	-----	21	32	577	230
31.....	7.4	-----	12	11	-----	18	-----	819	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	18	7.4	14.5	892
November.....	17	6.8	12.9	798
December.....	14	7.8	12.1	744
January.....	18	9.1	10.6	652
February.....	11	8.4	10.6	589
March.....	21	8.4	11.4	701
April.....	32	13	23.8	1,420
May.....	819	18	161	9,900
June.....	919	230	443	26,400
The period.....	-----	-----	-----	42,100

RIO COLORADO<sup>2</sup> NEAR QUESTA, N. MEX.

LOCATION.—Water-stage recorder in sec. 33, T. 29 N., R. 13 E., 1¼ miles above mouth of Cabresto Creek and 2 miles east of Questa.

DRAINAGE AREA.—112 square miles.

RECORDS AVAILABLE.—October 1912 to August 1915; October 1930 to September 1933. Records 1915–30 published by State engineer.

DISCHARGE.—Maximum during year, 192 second-feet June 19 (gage height, 3.36 feet); minimum, 12 second-feet Dec. 7.

1930–33: Maximum, 827 second-feet May 24, 1932 (gage height, 4.37 feet); minimum, 6.3 second-feet Nov. 24 and 25, 1931.

REMARKS.—Records good. Discharge estimated because of ice Feb. 2–5, 12, 15, 19–21. Diversions for irrigation above station.

*Discharge, in second-feet, 1932–33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	30	27	20	18	22	20	23	36	146	91	37	25
2.....	30	25	20	19	20	20	24	32	146	87	36	25
3.....	28	25	18	21	20	20	24	32	149	85	37	25
4.....	28	25	18	22	* 20	20	25	32	152	85	48	25
5.....	28	25	17	22	17	24	32	155	84	45	24	24
6.....	29	25	17	22	21	18	22	35	155	85	38	24
7.....	28	25	14	22	19	21	24	33	149	87	35	24
8.....	28	22	16	23	22	21	24	41	132	76	33	24
9.....	30	24	17	22	22	20	25	44	124	71	31	25
10.....	30	25	18	21	21	21	24	45	124	78	32	25
11.....	29	22	* 15	21	21	21	21	49	124	76	31	26
12.....	30	21	* 16	19	20	21	22	45	124	72	30	27
13.....	32	21	* 18	20	20	21	22	46	138	72	28	29
14.....	32	23	* 20	20	* 20	20	20	44	135	68	28	28
15.....	31	22	* 20	20	* 20	20	22	44	130	61	28	29
16.....	32	22	* 18	21	21	20	24	44	140	66	28	27
17.....	30	23	* 17	20	20	21	24	52	132	89	29	26
18.....	30	21	* 16	19	20	20	25	63	135	80	30	25
19.....	29	22	* 16	20	* 20	18	26	78	168	71	31	24
20.....	28	21	16	21	* 19	18	26	95	155	71	29	24
21.....	28	21	15	20	* 19	19	25	104	146	76	28	25
22.....	30	22	16	19	19	18	26	102	168	66	28	26
23.....	30	21	16	21	18	18	25	91	155	63	28	24
24.....	29	18	18	21	18	19	25	93	143	58	28	24
25.....	28	18	16	18	18	18	27	91	138	53	28	24
26.....	28	19	15	20	18	20	26	89	127	49	29	23
27.....	28	19	16	20	18	21	26	95	119	45	28	22
28.....	28	20	17	22	18	22	26	100	111	42	28	22
29.....	28	19	18	21	-----	22	28	109	102	41	28	22
30.....	30	18	18	20	-----	23	33	116	95	40	27	22
31.....	28	-----	16	21	-----	22	-----	132	-----	38	26	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	32	28	29.3	1,800
November.....	27	18	22.0	1,310
December.....	20	14	17.0	1,060
January.....	23	18	20.5	1,260
February.....	22	18	19.8	1,100
March.....	23	17	20.0	1,230
April.....	33	20	24.6	1,460
May.....	132	32	65.9	4,060
June.....	168	95	137	8,170
July.....	91	38	65.6	4,220
August.....	48	26	31.3	1,920
September.....	29	22	24.8	1,480
The year.....	168	14	40.1	29,000

\* Estimated.

<sup>2</sup> Also known as Red River.

## RIO HONDO AT VALDEZ, N.MEX.

LOCATION.—Chain gage in Antoine Leroux grant, half a mile below old toll gate and 1 mile east of Valdez, Taos County.

DRAINAGE AREA.—38 square miles.

RECORDS AVAILABLE.—October 1930 to September 1933. Records for 1915-30 published by State engineer.

DISCHARGE.—Maximum during year, 180 second-feet June 23 (gage height, 2.90 feet); minimum, 1 second-foot Oct. 9-14, Nov. 1-10.

1930-33: Maximum discharge, 296 second-feet May 20, 1932; maximum gage height, 3.5 feet (backwater from ice) Dec. 23, 1930; no flow July 29-31, 1931.

REMARKS.—Records good except those estimated because of ice, Dec. 16, 27-31, Jan. 1, 2, 12-21, Feb. 3-12, 19, 20, which are fair. Diversions for irrigation above station.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3	1	10	10	13	8	7	10	65	38	8	5
2	3	1	10	10	13	8	7	10	70	31	8	4
3	3	1	10	11	10	10	7	11	62	29	8	3
4	3	1	10	12	10	10	7	13	68	27	8	3
5	3	1	8	12	10	10	7	13	72	22	8	3
6	2	1	8	12	10	10	7	13	72	16	8	3
7	2	1	8	12	13	10	7	14	65	15	8	3
8	2	1	8	12	10	10	6	17	65	12	8	6
9	1	1	8	12	10	10	6	19	59	11	8	9
10	1	1	8	12	10	10	6	21	59	11	8	9
11	1	6	8	10	10	10	6	22	59	11	8	9
12	1	17	8	10	10	10	6	22	53	11	8	9
13	1	16	8	10	13	10	8	19	53	10	6	9
14	1	14	8	10	12	10	10	19	48	8	4	8
15	2	13	8	10	10	10	8	19	48	8	6	7
16	5	10	9	10	10	10	10	16	48	34	8	7
17	5	10	10	10	10	10	10	13	62	32	8	7
18	5	10	10	10	13	10	11	16	111	21	8	7
19	5	10	10	10	10	10	13	21	153	14	8	5
20	4	10	10	10	13	10	13	26	153	12	9	5
21	3	10	10	10	13	9	13	34	140	10	9	5
22	3	10	10	10	10	7	13	43	148	9	9	5
23	3	10	10	7	10	10	13	48	180	10	9	5
24	3	10	10	7	8	10	13	48	153	10	9	5
25	3	10	10	7	8	10	10	38	129	10	9	5
26	3	10	10	7	8	10	10	34	107	12	9	5
27	2	10	10	7	8	10	10	38	88	12	12	3
28	2	10	10	10	8	10	10	38	72	10	12	2
29	2	10	10	13	13	8	10	43	65	10	7	2
30	2	10	10	13	13	7	10	48	59	10	5	2
31	2	10	10	13	13	7	10	53	5	8	5	2

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	5	1	2.6	161
November	17	1	7.5	448
December			9.3	569
January			10.3	633
February		8	11.5	641
March	10	7	9.5	583
April	13	6	9.1	543
May	53	10	25.8	1,580
June	180	48	86.2	5,130
July	38	8	15.6	960
August	12	4	8.0	492
September	9	2	5.3	317
The year	180	1	16.7	12,100

## RIO HONDO AT ARROYO HONDO, N.MEX.

LOCATION.—Staff gage on Antoine Leroux grant, 1 mile west of Arroyo Hondo, Taos County, and 1 mile above confluence with Rio Grande.

RECORDS AVAILABLE.—January 1932 to September 1933. Comparable record 200 yards above confluence with Rio Grande April 1910 to August 1915 (previously published as "near Arroyo Hondo"). Records 1915-28 published by State engineer.

DISCHARGE.—Maximum during year not determined; minimum, 6 second-feet Apr. 8-13, Aug. 16.

1932-33: Maximum, about 1,800 second-feet Sept. 1, 1932 (gage height, 5.0 feet); minimum, 6 second-feet Aug. 6-12, 14-16, 18, 1932, Apr. 8-13, Aug. 16, 1933.

REMARKS.—Records good except those estimated, which are fair. Diversions for irrigation above station.

## Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1	14	15	15	} * 15	15	} * 10	10	9	57	34	12	10	
2	10	15	15		15		12	10	60	33	10	10	
3	14	15	15				10	10	62	28	11	10	
4	14	15	15				8	13	59	24	14	10	
5	14	15	15					8	18	69	20	15	10
6	14	15	15	15	} * 15	} * 15	7	18	72	18	14	10	
7	14	15	15	15			7	24	72	14	14	9	
8	15	15	15	15			6	12	69	14	14	11	
9	15	15	15	15			6	17	47	14	12	10	
10	15	15	15	15			6	17	50	15	12	10	
11	15	15	15	15	15	6	17	53	14	10	10		
12	15	15	15	* 15	15	15	6	19	53	14	10	10	
13	15	15	15	15		15	6	23	53	13	9	16	
14	15	16	15	14		15	14	23	49	12	9	11	
15	15	16	15	* 14		16	15	23	42	11	9	14	
16	15	16	} 15	15	} * 15	16	16	14	42	11	6	13	
17	15	17		15		17	15	14	40	47	7	12	
18	15	16	14	17		15	14	} 150	29	7	13		
19	15	16	15	14		22	18		25	7	13		
20	15	19	* 15	15		14	23		22	15	7	13	
21	15	16		* 15	13	20	33	} * 150	18	8	12		
22	15	16	15	15	12	20	40		18	8	11		
23	15	16	14	14	12	23	53		18	9	10		
24	15	16	14	12	12	12	54		18	9	10		
25	13	16	} * 15	} * 10	10	12	48		127	17	9	10	
26	15	16			} * 14		10	12	39	127	19	9	10
27	15	16					9	12	39	108	19	10	10
28	15	15				9	10	45	60	17	11	10	
29	15	15	15		8	10	48	59	13	10	10		
30	15	15	} * 15	} * 15	8	9	57	42	13	10	9		
31	15					8		55		12	10		

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	15	10	14.6	897
November	19	15	15.6	928
December			15.0	922
January			14.7	902
February			13.9	774
March		8	13.1	803
April	23	6	11.9	710
May	57	9	27.3	1,680
June		40	84.1	5,000
July	47	11	18.9	1,160
August	15	6	10.1	619
September	16	9	10.9	649
The year		6	20.8	15,000

\* Estimated.

## RIO TAOS AT LOS CORDOVAS, N.MEX.

LOCATION.—Water-stage recorder in Martinez grant, about 50 feet below mouths of Rio Ranchos de Taos and Arroyo Seco, half a mile northeast of Los Cordovas, and 4 miles west of Taos, Taos County.

DRAINAGE AREA.—395 square miles.

RECORDS AVAILABLE.—April 1910 to August 1915; October 1930 to September 1933. Records for 1915–30 published by State engineer.

DISCHARGE.—Maximum during year, 365 second-feet June 22 (gage height, 3.20 feet); minimum, 6.8 second-feet Aug. 23.

1930–33: Maximum, 725 second-feet Sept. 24, 1931 (gage height, 4.65 feet); minimum, 3.2 second-feet July 29, 1931.

REMARKS.—Records good except those estimated, which are fair. Diversions for irrigation above station.

## Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	22	43	33	32	* 25	66	27	16	91	28	13	14
2	23	44	29	32		63	26	14	91	24	17	12
3	23	43	26	* 32		59	26	15	80	23	17	13
4	23	41	27			* 59	26	40	76	23	23	13
5	24	38	25			59	26	61	74	22	30	13
6	22	38	24	* 27	26	55	23	52	73	22	23	13
7	22	36	19		32	52	22	49	66	23	18	14
8	24	34	23		32	49	21	45	53	21	16	14
9	25	36	26		30	49	21	45	40	18	14	16
10	22	36	27		29	46	20	41	35	18	14	18
11	22	29	21	23	* 24	* 44	17	41	40	18	13	17
12	21	29	20	* 34		41	16	44	39	19	12	20
13	19	30	23			39	17	44	45	21	12	22
14	18	32	26			37	21	45	48	22	11	22
15	18	30	26			33	27	45	40	22	9.6	21
16	18	29	27	* 25	29	35	27	44	40	29	9.2	21
17	18	31	25		31	38	22	43	37	53	8.4	21
18	22	31	23		27	33	17	46	56	50	8.8	22
19	22	31	34		26	34	16	56	166	29	8.4	21
20	21	30	30		33	31	17	74	183	28	8.4	19
21	22	30	29	* 30	33	29	19	95	247	32	7.7	21
22	33	30	30		32	28	19	104	321	26	7.7	21
23	31	29	33		29	19	95	266	41	7.4	19	
24	32	28	* 38		34	29	16	93	249	40	8.0	19
25	35	28			29	15	87	226	35	9.2	19	
26	35	29	* 32	* 25	43	29	15	74	179	35	9.6	18
27	36	30			59	28	14	71	132	29	11	17
28	36	30			59	24	12	69	95	23	12	16
29	37	32			26	14	73	71	19	12	16	
30	40	33			38	15	73	52	16	12	14	
31	41					31		80		14	13	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	41	18	26.0	1,600
November	44	28	33.0	1,960
December		19	27.2	1,670
January			27.0	1,660
February	59		31.8	1,770
March	66	24	40.2	2,470
April	27	12	19.8	1,180
May	104	14	57.2	3,520
June	321	35	107	6,370
July	53	14	26.5	1,680
August	30	7.4	12.8	784
September	22	12	17.5	1,040
The year	321	7.4	35.4	25,700

\* Estimated.



## RIO LUCERO DIVERSION NEAR ARROYO SECO, N.MEX.

LOCATION.—Water-stage recorder in sec. 11, T. 26 N., R. 13 E., at head of diversion, 2 miles southeast of Arroyo Seco, 7½ miles northeast of Taos.

RECORDS AVAILABLE.—November 1932 to November 1933 (discontinued).

DISCHARGE.—Maximum during period ending Nov. 14, 1933, 82 second-feet July 16 (gage height, 2.14 feet); no flow at times.

REMARKS.—Records good except those for November 1932 to March 1933, which are poor. Record of flow represents diversion through head gate, part of which is diverted into Taos Pueblo Indian Ditch, the remainder being returned to the river.

*Discharge, in second-feet, 1932-33*

Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
1.....			° 8.5		° 5.9	° 13	15	18	6.8	22	11	8.7	6.7
2.....		° 7.6	8.7	° 5.6	6.2	14	17	17	23	23	10	9.3	6.4
3.....						15	18	19	20	25	10	9.3	6.4
4.....		8.7				15	19	20	18	28	9.9	9.3	6.7
5.....		7.5	° 7.4	5.7		12	26	18	18	28	9.6	9.6	7.3
6.....					° 6.8	12	30	18	16	28	9.3	9.3	7.0
7.....		° 8.2				11	26	18	14	26	9.3	9.0	7.0
8.....			6.2			4.2	25	18	8.7	25	9.6	9.0	7.0
9.....		9.0	° 6.2	° 5.7		.1	29	18	9.6	24	10	8.7	6.7
10.....		8.4			7.3	0	33	22	23	23	9.9	8.7	8.6
11.....		7.8	6.2			0	39	26	34	22	10	8.7	5.2
12.....		7.5		5.7		0	39	26	28	21	11	9.0	0
13.....		7.5	° 6.0			0	33	26	24	20	11	9.0	0
14.....		7.5			° 5.9	.3	24	26	23	19	10	9.9	0
15.....			° 5.9	° 6.4		.1	22	26	21	18	9.9	9.9	-----
16.....		° 7.5				0	24	26	35	17	9.0	9.0	-----
17.....				7.0		0	31	26	37	16	8.7	8.7	-----
18.....		7.5		5.7	4.5	0	41	25	15	16	9.3	8.7	-----
19.....		7.5	5.8			9.4	38	3.6	3.4	16	9.6	8.4	-----
20.....		° 7.2			° 5.2	14	24	.2	4.0	15	9.0	8.7	-----
21.....		7.0		° 5.3		13	19	0	4.5	14	11	8.7	-----
22.....			5.7			11	26	0	11	14	9.3	8.4	-----
23.....					5.9	9.9	10	0	34	13	9.0	8.1	-----
24.....		° 7.2		4.9	5.4	11	0	0	33	14	9.3	8.1	-----
25.....					5.2	12	4.1	0	24	13	9.3	8.1	-----
26.....			° 5.6										-----
27.....		7.3		° 5.4	5.7	12	14	0	15	13	9.9	8.1	-----
28.....					6.7	14	19	0	17	14	9.9	7.8	-----
29.....	° 5.4				9.3	16	17	0	26	13	10	7.8	-----
30.....	° 6.2	° 7.9	5.4		12	16	18	0	26	12	9.3	7.3	-----
31.....			° 5.5		° 13	12	16	0	24	12	9.0	6.7	-----
						17			23	11		6.7	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
1932-33				
November 28-30.....			5.93	35
December.....			7.67	472
January.....			6.24	384
February.....			5.69	316
March.....			6.71	412
April.....	13	0	8.37	498
May.....	41	0	23.0	1,420
June.....	26	0	13.2	787
July.....	37	3.4	20.0	1,230
August.....	28	11	18.5	1,140
September.....	11	8.7	9.74	579
The period.....				7,270
1933				
October.....	9.9	6.7	8.60	529
November 1-14.....	8.6	0	5.36	149
The period.....				678

• Estimated.

## EMBUDO CREEK AT DIXON, N.MEX.

LOCATION.—Water-stage recorder in sec. 29, T. 23 N., R. 10 E., 1 mile northwest of Dixon and 1½ miles above confluence with Rio Grande.

DRAINAGE AREA.—305 square miles.

RECORDS AVAILABLE.—October 1930 to September 1933. Records 1923–30 published by State engineer.

DISCHARGE.—Maximum during year, about 5,190 second-feet June 13 (gage height, 6.66 feet); minimum, 7 second-feet Aug. 2.

1930–33: Maximum, that of June 13, 1933; minimum, 1 second-foot July 23, 1932.

REMARKS.—Records fair except those estimated, which are poor. Diversions for irrigation above station.

*Discharge, in second-feet, 1932–33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	90	42	31	27	28	30	24	66	} ° 85	° 80	9	11
2.....	92	42	33	28	27	31	22	71			8	11
3.....	88	41	28	28	21	27	21	84			18	11
4.....	84	42	28	28	21	29	24	94			39	12
5.....	86	40	23	29	20	21	27	108			99	18
6.....	78	39	22	29	22	17	22	110	} ° 40	° 40	84	19
7.....	74	36	18	28	21	19	24	106			78	18
8.....	72	32	22	26	20	20	22	112			69	19
9.....	71	32	22	25	° 22	18	20	125			62	14
10.....	68	34	26	26	° 24	16	22	135			57	14
11.....	60	28	17	26	26	15	21	133	} ° 350	° 300	51	16
12.....	57	28	19	26	25	16	26	120			39	17
13.....	54	33	26	27	25	14	28	101			32	21
14.....	51	39	30	28	25	14	28	92			28	21
15.....	49	38	30	27	25	14	31	86			22	20
16.....	47	35	27	28	26	14	35	76	} ° 350	° 300	21	20
17.....	44	38	27	30	26	16	30	96			20	20
18.....	47	35	22	32	23	15	31	90			20	21
19.....	46	34	22	29	21	15	39	103			18	22
20.....	42	34	24	32	21	16	38	117			16	22
21.....	42	34	24	32	20	14	39	140	} ° 250	° 150	54	22
22.....	56	34	26	31	20	17	43	135			75	23
23.....	49	33	25	30	19	16	41	122			96	22
24.....	49	31	24	30	20	20	41	115			85	21
25.....	50	30	25	27	23	17	43	99			74	20
26.....	49	29	24	29	29	20	46	94	} ° 85	° 80	64	20
27.....	47	32	23	26	28	20	46				56	14
28.....	46	33	23	28	28	21	51				49	20
29.....	44	32	25	28		23	57				42	20
30.....	44	30	25	26		28	64				30	12
31.....	43		27	28		26				° 20	12	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	92	42	58.6	3,600
November.....	42	28	34.7	2,060
December.....	33	17	24.8	1,520
January.....	32	25	28.2	1,730
February.....	29	19	23.4	1,300
March.....	31	14	19.3	1,190
April.....	64	20	33.5	2,000
May.....	140	66	102	6,260
June.....	497	50	237	14,100
July.....	96	20	51.1	3,140
August.....	99	8	30.5	1,880
September.....	23	11	18.5	1,100
The year.....	497	8	55.1	39,900

° Estimated.

## RIO CHAMA AT PARK VIEW, N.MEX.

LOCATION.—Water-stage recorder in Tierra Amarilla grant at highway bridge, 800 feet below mouth of Rio Brazos and half a mile northwest of Park View, Rio Arriba County. On May 8 datum was raised 2.63 feet.

DRAINAGE AREA.—405 square miles.

RECORDS AVAILABLE.—November 1912 to September 1916; October 1930 to September 1933. Records 1924–30 published by State engineer.

DISCHARGE.—Maximum during year, 5,090 second-feet May 20 (gage height, 4.35 feet); minimum not determined.

1930–33: Maximum, 5,770 second-feet May 22, 1932; maximum gage height, 4.35 feet May 20, 1933; minimum, 4.0 second-feet July 30, 1931.

REMARKS.—Records good except those estimated, which are poor. Diversions for irrigation above station. Stage-discharge relation affected by ice Dec. 11 to Mar. 27.

## Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	44	46	45			60	199	700	2,480	241	60	30
2	42	58	45				242		1,870	250	60	30
3	44	59	38				287		1,650	255		28
4	44	54	40				333		1,380	255		117
5	44	50	40				254		1,400	281	343	20
6	40	51	32	40	60	217	1,180	241	212			
7	39	51	25			242	1,030	303	195			
8	40	37	34			238	1,060	260	133			
9	65	31	42			278	500	1,060	270	90	208	
10	61	38	44			242	457	1,000	208		101	
11	51	26				213	457	1,060	200	60	107	
12	46	22				238	385	1,090	191		92	
13	42	29				259	337	957	187		101	
14	40	38				202	303	1,000	155	385		
15	39	37				213	298	1,000	144	241		
16	38	33	46		70	273	444	1,200	238	50	137	
17	35	34				306	957	1,100	246		81	
18	37	39				454	1,780	1,050	170		117	
19	35	42				508	2,590	1,030	90	236		
20	44	40				379	3,420	1,120	75	137		
21	51	39				45		50	333	3,550	979	217
22	80	40	306	2,830	830				250	42		
23	78	40	301	1,910	790				226	38		
24	80	32	323	2,530	753				159	33		
25	63	34	385	2,610	568				107	35		
26	58	35				391	2,650	471	92	60	35	
27	63	40				2,740	404	84	40			
28	63	44				2,810	361	65	50			
29	59	42				181	2,590	320	45			
30	59	39				188	2,500	276	33			
31	51					158	2,380		30			

Month	Maximum	Minimum	Mean	Run-off in acre feet
October	80	35	50.8	3,120
November	59	22	40.0	2,380
December			42.9	2,640
January			45.0	2,770
February			44.6	2,480
March	188		81.6	5,020
April		199	361	21,500
May	3,550	298	1,500	92,200
June	2,480	276	1,020	60,400
July	303		182	11,200
August	343	30	76.2	4,680
September	385		96.5	5,740
The year	3,550		296	214,000

a Estimated.

## RIO CHAMA AT CHAMITA, N.MEX.

LOCATION.—Water-stage recorder in San Juan Pueblo grant, at Denver & Rio Grande Western Railroad bridge 1,000 feet above confluence with Rio Grande and half a mile south of Chamita railroad station, Rio Arriba County.

DRAINAGE AREA.—3,320 square miles.

RECORDS AVAILABLE.—October 1912 to June 1915; October 1930 to September 1933. Records 1915-30 published by State engineer.

DISCHARGE.—Maximum during year, 5,410 second-feet May 21 (gage height, 5.70 feet); minimum not determined.

1930-33: Maximum, 7,700 second-feet May 20, 1932 (gage height, 6.40 feet); no flow at times.

REMARKS.—Records for October, November, March, April and June fair; others poor. Diversions for irrigation above station. Stage-discharge relation affected by ice Dec. 10 to Feb. 24.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	83	112	87		73	158	396		3,290	396		
2	78	110	90		57	178	412		3,290	385		
3	73	106	94		66	201	493		2,770		a 300	a 100
4	65	100	104		68	204	557		2,340			
5	52	104	90		78	217	612	a 1,300	1,910			
6	46	106	83		100	186	469		1,760			
7	44	104	57		53	198	385		1,700			148
8	46	102	57	a 70	31	198	355		1,440	a 350	a 600	156
9	66	92	57		87	208	385		1,200			
10	66	96			70	230	360		1,170			
11	70	76			87	252	370		1,150			
12	74	74			94	279	313		1,160			146
13	71	78			90	283	300		1,250	a 180	a 100	146
14	66	74			100	238	396	a 800	1,310			151
15	63	56			102	217	375		1,200			
16	62	59		65	106	195	295		1,210			
17	59	63		66	114	195	322		1,420			a 400
18	56	63	a 60	78	102	204	396	1,510	1,260			
19	56	63		74	98	204	577	2,590	1,850	a 480	a 15	
20	60	68		73	94	208	720	3,730	1,440			
21	62	71		80	96	192	557	4,550	1,720			
22	87	87		73	73	189	463	4,310	1,120			
23	92	83		74	73	192	457	2,750	1,170		a 60	a 200
24	134	78		66	70	189	401	2,550	1,350			
25	238	71		62	83	169	445	3,060	1,010		74	
26	198	70		57	110	178	550	3,180	a 800	a 400		
27	172	65	66	70	110	204	598	3,400	a 600			a 50
28	144	62		80	116	283	845	3,620	a 500			
29	132	78	a 70	76		355	1,510	3,730	412		a 100	38
30	125	80		73		475	1,430	3,510	401			40
31	118			74		499		3,510				41
Month							Maximum	Minimum	Mean	Run-off in acre-feet		
October							238	44	89.0	5,470		
November							112	56	81.7	4,860		
December									67.3	4,140		
January									70.7	4,350		
February							116	31	85.8	4,760		
March							499	158	232	14,200		
April							1,510	295	524	31,200		
May							4,550		2,080	128,000		
June							3,290	401	1,420	84,700		
July									358	22,000		
August									193	11,900		
September									201	11,900		
The year							4,550		453	327,000		

a Estimated.

## EL RITO CREEK NEAR EL RITO, N.MEX.

LOCATION.—Water-stage recorder in J. J. Lobato grant, 3 miles northwest of El Rito, Rio Arriba County.

RECORDS AVAILABLE.—May 1931 to September 1933.

DISCHARGE.—Maximum during year, 203 second-feet May 20 (gage height, 2.94 feet); minimum, 0.4 second-foot Sept. 13.

1931-33: Maximum, 398 second-feet May 19, 1932 (gage height, 4.16 feet); minimum, 0.4 second-foot Aug. 30, 31, 1931, Sept. 13, 1933.

REMARKS.—Records good except those estimated, which are poor. One small diversion for irrigation above station. Stage-discharge relation affected by ice Nov. 12-14, 17, 19, 23-30, Dec. 1-31, Jan. 1-21, 29-31, Feb. 1-27, Mar. 1, 2, 5-7.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.5	2.2				* 3	12	38	48	4.0	3.0	0.8
2	1.5	2.5					15	49	38	3.7	2.2	.9
3	1.9	1.9				3.7	18	44	31	3.5	2.8	.8
4	1.7	1.6				4.2	20	50	27	4.0	4.2	.7
5	1.7	1.6					14	67	24	6.1	5.5	.6
6	1.7	1.6				* 4.5	6.7	54	22	7.8	4.6	.6
7	1.5	1.5					13	44	20	8.5	2.7	.6
8	1.1	1.6			* 1.5	4.6	12	47	16	5.3	2.2	1.0
9	2.0	2.3				2.8	16	46	15	4.4	1.5	1.3
10	1.6	2.2				3.3	15	38	14	3.7	1.5	1.3
11	1.5	2.0	* 1.7			3.7	12	34	12	3.7	1.6	.6
12	1.5			* 1.6		4.8	13	31	11	6.7	1.4	.5
13	1.5					4.2	14	29	12	5.3	1.3	.5
14	1.5					4.2	12	26	14	4.2	1.1	.7
15	1.5	1.7				3.5	11	26	13	4.0	.9	1.2
16	1.5	1.3				4.0	14	34	13	4.2	1.0	.5
17	1.6	* 1.4				4.2	20	58	14	4.0	.7	.6
18	1.6	1.6				3.0	28	91	12	3.5	1.2	1.2
19	1.6	* 1.5				3.7	27	119	11	4.2	1.6	1.5
20	2.0	1.4				2.5	18	132	11	5.1	1.4	1.1
21		1.4				2.8	18	127	17	4.4	1.2	1.1
22	4.0	1.6	1.8		* 2	3.0	16	90	30	8.2	1.1	1.5
23	3.7					1.5	16	67	19	3.5	1.0	1.4
24	4.2			1.5			24	84	14	3.0	.8	1.2
25	3.7						26	80	11	2.2	1.0	1.1
26	3.0	* 1.6	* 1.8			* 6	27	85	8.2	1.7	1.2	1.2
27	3.5			* 1.5			41	77	7.6	2.0	3.3	1.0
28	3.7				2.8		52	70	6.1	1.6	1.9	1.0
29	3.0						45	61	4.8	1.1	1.1	.9
30	2.7					11	36	58	4.4	1.1	1.0	1.0
31	2.5					8.8		51		1.4	.9	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	4.2	1.1	2.21	136
November			1.70	101
December			1.73	107
January			1.57	97
February			1.76	98
March	11	1.5	4.48	276
April	52	6.7	20.4	1,210
May	132	26	61.5	3,780
June	48	4.4	16.7	992
July	8.5	1.1	4.07	250
August	5.5	.7	1.84	113
September	13	.5	1.34	80
The year	132	.5	10.0	7,240

\* Estimated.

## RIO OJO CALIENTE AT LA MADERA, N.MEX.

LOCATION.—Water-stage recorder in SE¼ sec. 25, T. 25 N., R. 8 E., just below confluence of Rio Vallecitos and Rio Tulas and about half a mile southeast of La Madera.

RECORDS AVAILABLE.—April 1932 to September 1933.

DISCHARGE.—Maximum during year, about 1,600 second-feet July 15 (gage height, 7.60 feet); minimum, not determined.

1932-33: Maximum, about 1,700 second-feet Aug. 28, 1932; maximum gage height, 7.60 feet July 15, 1933; minimum not determined.

REMARKS.—Records poor. Diversions for irrigation above station.

## Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	7	13					40	°150	259	13		
2.....	7	12		°13			48	°180	233	11	°20	
3.....	7	12					64	°200	173	11		
4.....	7	11		13			66	°180	°140	16	56	°2
5.....	7	12					45	°210	124	21	48	
6.....	7	11					48	°270	112	21	26	
7.....	7	12					48	°220	°100	60	17	
8.....	7	9					50	°180	°90	38	15	1.
9.....	8				°20	°20	59	°200	°85	28	9	4.
10.....	9						54	°170	°80	23	6	11
11.....	10		°10	°12			38	°150	°70	23	4	8
12.....	10						44	°130	°65	17	2	11
13.....	8						45	°110	°60	31	2	9
14.....	7	°10					34	°150	°70	18	3	5
15.....	7						30	°200	°80	80	5	26
16.....	6						47	°280	°70		4	14
17.....	7			10		25	63	°400	°70		3	8
18.....	6			10	23	19	110	°550	°80		4	8
19.....	6					16	136	742	95	°15	3	7
20.....						14	99	712	144		3	7
21.....		12				14	92	667	173		2	8
22.....		11	14			13	92	550	214		2	8
23.....	°10	11				14	89	412	165		2	8
24.....		8			°20	11	89	452	102		34	6
25.....		8		°15		12	112	412	77			5
26.....		5	°14			14	110	412	°50	°10		4
27.....	17					16	°130	439	°40			4
28.....	18	°5				27	°170	399	°30		°5	4
29.....	20					33	°220	368	26			4
30.....	17					26	°190	328	22			4
31.....	16					26		288				

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	20	6	9.6	591
November.....			9.6	569
December.....			11.3	694
January.....			13.3	815
February.....			20.1	1,120
March.....			19.4	1,190
April.....	220	30	82.1	4,880
May.....	742	110	326	20,100
June.....	259	22	103	6,160
July.....	80		19.4	1,190
August.....	56	2	11.1	684
September.....	26		6.3	373
The year.....	742		52.9	38,400

° Estimated.

## RIO SANTA CRUZ AT CUNDIYO, N.MEX.

LOCATION.—Water-stage recorder in SE¼NW¼ sec. 17, T. 20 N., R. 10 E., 100 feet below highway bridge at junction of Rio Medio and Rio Frijoles to form Rio Santa Cruz and a quarter of a mile northwest of Cundiyo.

RECORDS AVAILABLE.—September 1931 to September 1933. Records 1915–27, at present site and 1928–31 at station 1½ miles downstream, called “near Chimayo”, published by State engineer.

DISCHARGE.—Maximum during year, about 1,260 second-feet Aug. 24 (gage height, 3.80 feet); minimum not determined.

1931–33: Maximum, about 2,610 second-feet Sept. 24, 1931 (gage height, 8.20 feet); minimum, 3 second-feet Feb. 3, 1932.

REMARKS.—Records good except those estimated, which are poor. Stage-discharge relation affected by ice Dec. 10 to Mar. 9. Diversions for irrigation above station.

*Discharge, in second-feet, 1932–33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	18	12	12				14	16	49	44	17	
2.....	17	14	11				16	27	46	40	22	°15
3.....	17	14	12			°13	16	26	42	44	43	
4.....	17	12	13				18	25	40	44	52	
5.....	17	12	12				14	30	38	41	40	°10
6.....	17	13	11				11	41	45	81	30	
7.....	16	12	10			°12	14	36	41	74	27	9.4
8.....	16	6.2	10		°8	°12	12	43	35	62	24	13
9.....	20	14	10	°8			16	49	32	48	°23	25
10.....	17	11				10	16	50	29	39	°22	16
11.....	16	6.8				12	12	44	27	33	°24	22
12.....	16	6.2	°10			13	14	40	23	39		27
13.....	15	11				11	14	34	28	31		29
14.....	16	15				10	11	25	42	28		18
15.....	14	13				10	13	22	50	25	°22	36
16.....	14	12				10	16	29	39	29		19
17.....	14	12				10	16	39	49	28		17
18.....	15	12		7	°10	9.4	22	43	42	25	°20	17
19.....	14	12				8.6	21	51	53	20	°18	18
20.....	16	12			11	9.0	12	56	57	20	°19	16
21.....	18	12				8.6	14	61	70	23		17
22.....	24	11	°9			9.0	14	57	88	20	°20	17
23.....	18	9.6				8.6	14	48	156	32		14
24.....	19	9.6				8.2	16	45	126	32	°55	12
25.....	17	12		°8	°12	8.2	20	42	103	28	30	12
26.....	16	14				9.0	17	44	92	37	24	12
27.....	17	14				11	19	45	82	22	23	11
28.....	16	12	10			13	22	45	68	17	22	9.8
29.....	15	12				15	21	43	56	15		9.8
30.....	14	12	°9			15	17	43	51	14	°20	9.8
31.....	14					11		44		16		

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	24	14	16.5	1,010
November.....	15	6.2	11.7	695
December.....			9.9	607
January.....			8.0	490
February.....			9.5	530
March.....		8.2	11.1	680
April.....	22	11	16.7	936
May.....	61	16	40.1	2,470
June.....	156	23	56.6	3,370
July.....	81	14	33.9	2,080
August.....	55	17	25.4	1,560
September.....	36		16.1	956
The year.....	156		21.3	15,400

• Estimated.

## NAMBE CREEK NEAR NAMBE, N.MEX.

LOCATION.—Water-stage recorder in Nambé Pueblo grant, about 1,000 feet below diversion dam for Nambé Canal and 2½ miles southeast of Nambé, Santa Fe County.

RECORDS AVAILABLE.—October 1932 to September 1933.

DISCHARGE.—Maximum discharge during year, 56 second-feet May 17; maximum gage height, 2.25 feet Aug. 10; practically no flow during part of Aug. 28.

REMARKS.—Records for June to September fair; others poor. One diversion for irrigation above station. Stage-discharge relation affected by ice Dec. 31, Jan. 1, 2, 11-31, Feb. 1, 2, 4, 9-11, 15, 16, 18-23.

## Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12	5	°2	°4	°3	2	6	°13	18	12	10	6
2	13	5	°2	°3	°3	2	7		21	11	9	5
3	15	5	1	3	3	2	9		23	10		3
4	8	5		3	°2	2	10		18	11		2
5	5	5		3	2	2	9		15	11	°8	2
6	7	5		3	3	3	5	15	20	13		1
7	7			3	3	7	5	16	23	13	8	1
8	7			3	3	5	3	24	26	12		1
9	7			3	°3	5	4	20	23	10	°8	4
10	3	°5	°2	3	°3	3	3	13	24	9		5
11	3			°3	°3	3	3	10	24	8	8	9
12	3	5		°3	3	4	3	10	22	6	4	8
13	4	6		3	3	3	4	12	23	6	3	13
14	5	8		°3	5	5	3	23	29	6	3	12
15	5	9	2	°3		3	3	29	28	6	4	14
16	5	7	2	°3	°5	3	3	33	27	6	4	14
17	5	7	3	°3	5	3	3	24	34	8	4	14
18	5	7	3	°3		3	5	29	29	7	5	15
19	5	6	3	°3		3	3	29	25	6	6	16
20	6	°5	3	°3	°3	3	2	23	19	6	6	14
21	6	°5	3	°3		3	3	24	22	7	7	13
22	7	4	3	°3		5	7	16	30	7	6	13
23	5	4	3	°3	3	4	3	16	27	6	5	13
24	5	4	3	°3	2	4	6	16	24	8	6	9
25	7	5	3	°3	2	3	7	9	22	7	7	7
26	7	5	3	°3	2	3	6	15	20	9	7	6
27	7	5	3	°3	2	5	7	21	18	7	6	6
28	7	4	3	°3	2	6	9	20	17	7	6	6
29	7	4	3	°3		9	°10	18	15	8	6	5
30	5	°3	4	°3		7		13	13	7	6	
31	5		°4	°3		7		12		8	6	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	15	3	6.4	393
November	9	3	5.3	313
December	4	1	2.5	157
January	4	3	3.0	186
February		2	3.0	169
March	9	2	3.9	242
April		2	5.4	319
May	33	9	17.9	1,100
June	34	13	22.6	1,350
July	13	6	8.3	512
August		3	6.4	393
September	16	1	8.1	480
The year	34	1	7.8	5,610

° Estimated.



## NAMBE CANAL NEAR NAMBE, N.MEX.

LOCATION.—Water-stage recorder in Nambe Pueblo grant, about 300 feet below head of Nambe Canal, which diverts from Nambe Creek, and about 2½ miles southeast of Nambe, Santa Fe County.

RECORDS AVAILABLE.—May 1932 to September 1933.

DISCHARGE.—Maximum during period ending Sept. 30, 1932, 3.5 second-feet Aug. 21 (gage height, 0.93 foot); no flow during several periods.

Maximum during year ending Sept. 30, 1933, 5.8 second-feet Aug. 7 (gage height, 1.27 feet); no flow during several periods.

REMARKS.—Records good except those estimated, which are fair.

## Discharge, in second-feet, 1932-33

Day	1932							1933						
	May	June	July	Aug.	Sept.	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....		1.0	1.4	2.1	0.4	0.3	0.7	*0	0.7		1.5	1.1	0.8	1.6
2.....		1.3	3.1	2.1	.4	.3	.4	*0	.8		1.5	.7	1.9	1.5
3.....		1.4	2.3	2.0	.9	.4	.3	*0	.7	*0.4	.5	1.2	1.0	1.6
4.....	0.2	1.4	.7	2.4	.4	.5	.3	*0	.8		.5	1.0	.3	1.8
5.....	.2	1.4	.3	2.4	1.5	.4	.2	*0	.2		.5	1.4	.2	1.4
6.....	.1	1.4	.7	1.8	2.5	.3	.4	0	0	.2	.8	.6	0	1.2
7.....	.5	1.1	1.7	1.1	2.0	.2	.2	*0	0	.3	1.0	.2	2.1	1.0
8.....	.3	.5	1.7	1.2	2.2	.2	.2	*0	0	.2	1.1	.3	1.9	.9
9.....	.1	.5	1.8	.9	2.2	.4	.4	*0	0	.4	1.1	.2	1.7	.2
10.....	.6	.3	1.8	.9	2.0	.4	.5	*0	0	.5	1.0	.4	1.3	.2
11.....	.4	.3	.8		1.8	.3	.2	*0	0	.5	.9	1.5	0	.3
12.....	.8	.5	1.0		2.0	.3	.6	*0	0	.5	2.1	.2	0	.7
13.....	1.3	.6	.4	*.9	1.8	.4	.4	*0	0	.6	1.8	2.6	0	.7
14.....	.5	.1	1.4		.8	.4	.3	*0	0	.5	1.0	2.2	0	.7
15.....	1.2		.8	1.0	.6	.2	.2	*.6	.1	.6	.6	1.2	0	.7
16.....	1.4		.4	1.0	.5	.2	.2	1.2	.4	.6	.7	.6		.8
17.....	1.6	*.6	.4	.5	.4	.1	.2	.9	.6	.7	.5	.6	*.3	.5
18.....	1.7		1.0	.4	.4	.1	.3	.6	.6	.6	.4	.6		.3
19.....			1.1	.5	.4	.2	.1	.6	1.7	.5	2.0	1.5	.6	.4
20.....			1.1	.4	.3	.5	0	1.0	.9	.5	2.7	2.4	.6	.4
21.....		1.1	.9	.1	.4	.5	0	.7	.7	.3	1.7	.7	.5	.5
22.....		1.1	.6	.3	1.1	.4	0	.1	.7	.8	1.2	.5	.1	.5
23.....		.9	.5	.5	1.4	.3	0	.1	.7	.9	.7	.5	.7	.6
24.....	*.1	.6	.4	.4	.7	.3	.2	.1	1.0	.7	.5	1.3	.3	.6
25.....		.5	.4	.5	.5	.2	.1	.3	.7	1.7	.8	1.2	.6	.7
26.....		.9	.5	.4	.4	.2	0	.6	.7	1.8	1.1	.6	.9	.6
27.....		1.0	.7	.3	.4	.2	0	.6	.6	.7	1.2	0	.9	.7
28.....		1.0	.6	.1	.4	.6	0	.5	.8	.7	.7	.3	.9	.7
29.....		1.1	.9	.3	.4	.8	0	.5	.5	1.4	.5	.6	1.2	.5
30.....		.8	1.0	1.3	.4	.8	0	.8	*.5	1.8	1.1	.5	1.4	.5
31.....	.4		1.0	.5		.7		.2		1.7		.5	1.5	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
1932				
May 4-31.....			0.83	46
June.....	1.4	0.1	.81	48
July.....	3.1	.3	1.01	62
August.....	2.4	.1	.94	58
September.....	2.5	.3	.99	59
The period.....				273
1932-33				
October.....	.8	.1	.36	22
November.....	.7	0	.25	15
March.....	1.2	0	.30	19
April.....	1.7	0	.48	29
May.....	1.8	.2	.70	43
June.....	2.7	.4	1.06	63
July.....	2.7	0	.96	59
August.....	2.1	0	.73	45
September.....	1.8	.2	.76	45
The year.....	2.7	0	.47	340

\* Estimated.

NOTE.—No flow during December 1932, January-February 1933.

## SANTA FE CREEK NEAR SANTA FE, N.MEX.

LOCATION.—Water-stage recorder in SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 24, T. 17 N., R. 10 E., about 300 feet below upper storage reservoir of New Mexico Power Co. and 6 miles east of Santa Fe.

DRAINAGE AREA.—22 square miles.

RECORDS AVAILABLE.—October 1930 to September 1933. May to July 1910 at a site 3 miles downstream and April 1913 to December 1914 at a site 2 miles downstream from present site. Records 1915–30 published by State engineer.

DISCHARGE.—Maximum during year, 29 second-feet June 22 (gage height, 1.31 feet); minimum, 1.0 second-foot Dec. 7–22, Apr. 17–27, Apr. 30 to May 2.

1930–33: Maximum, 139 second-feet Sept. 19, 1931 (gage height, 2.35 feet); minimum, 0.5 second-foot Sept. 13, 1931.

REMARKS.—Records good. Flow regulated at dam immediately above station. No diversions above gage.

*Discharge, in second-feet, 1932–33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.6	* 1.8	1.2	1.5	1.6	1.5	4.6	1.0	9.8	11	4.2	1.7
2	1.3	1.7	1.2	1.5	1.6	1.7	4.6	1.0	9.8	11	4.2	1.6
3	1.3	1.7	1.2	1.5	1.6	1.9	5.3	1.5	9.4	11	4.2	1.6
4	1.3	1.7	1.2	1.5	1.6	2.0	6.0	4.4	9.1	11	4.4	1.6
5	1.4	1.6	1.2	1.5	1.5	1.9	6.0	7.1	9.1	10	4.4	1.7
6	1.5	1.7	1.2	1.5	1.5	1.9	6.0	6.8	9.1	11	4.4	1.7
7	1.5	1.7	1.0	1.4	1.6	2.0	6.0	6.8	8.8	9.4	4.4	1.7
8	1.7	1.9	1.0	1.4	1.7	2.0	6.0	6.6	8.5	8.8	4.4	1.7
9	2.2	1.9	1.0	1.4	1.5	2.0	6.0	6.6	8.2	8.2	4.4	1.7
10	2.2	1.9	1.0	1.6	1.5	2.0	6.0	6.6	8.2	7.9	4.4	1.9
11	2.0	1.9	1.0	1.4	1.5	2.0	6.3	6.6	8.2	7.9	4.4	1.9
12	1.9	1.7	1.0	1.4	1.3	2.2	6.3	6.6	7.9	7.7	4.4	1.9
13	2.0	1.9	1.0	1.4	1.3	2.2	6.3	6.6	7.9	7.4	4.4	1.9
14	2.2	2.0	1.0	1.4	1.3	2.2	6.3	6.6	7.7	7.4	4.4	2.0
15	2.2	2.2	1.0	1.4	1.3	2.0	3.0	6.8	7.9	7.1	4.4	1.9
16	2.0	2.2	1.0	1.3	1.3	2.0	1.2	6.6	7.7	6.6	4.4	1.9
17	2.0	2.2	1.0	1.4	1.4	2.2	1.0	6.6	7.9	6.6	4.4	2.0
18	2.0	2.2	1.0	1.7	1.4	2.2	1.0	6.6	7.9	6.6	4.6	2.0
19	2.0	2.3	1.0	1.6	1.4	2.3	1.0	6.6	11	6.3	4.6	1.9
20	1.9	2.3	1.0	1.7	1.4	2.2	1.0	7.1	17	6.3	4.4	1.9
21	1.9	2.3	1.0	1.7	1.3	2.2	1.0	7.4	19	6.0	3.0	2.0
22	2.0	2.5	1.0	1.7	1.2	2.0	1.0	8.2	28	5.8	2.0	2.2
23	2.0	2.0	1.6	1.7	1.2	2.0	1.0	9.4	26	5.5	2.8	2.2
24	1.9	1.5	1.6	1.7	1.2	1.9	1.0	9.8	22	5.3	5.3	2.2
25	1.9	1.4	1.6	1.6	1.3	1.9	1.0	9.4	19	4.8	5.3	2.0
26	1.9	1.4	1.5	1.7	1.4	1.7	1.0	9.4	17	4.8	5.5	2.0
27	2.0	1.4	1.5	1.6	1.4	1.7	1.0	9.4	16	4.8	5.3	2.0
28	1.9	1.3	1.5	1.6	1.4	1.7	1.2	9.4	14	4.8	5.3	2.0
29	2.0	1.2	1.5	1.7	1.7	1.9	1.2	9.8	13	4.6	3.0	2.2
30	2.0	1.2	1.5	1.6	1.7	3.7	1.0	9.8	12	4.6	1.7	2.2
31	* 1.9	1.5	1.6	1.6	1.6	4.6	9.8	9.8	4.4	1.7		

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	2.2	1.3	1.86	114
November	2.5	1.2	1.82	108
December	1.6	1.0	1.19	73
January	1.7	1.3	1.54	95
February	1.7	1.2	1.42	79
March	4.6	1.5	2.12	130
April	6.3	1.0	3.34	199
May	9.8	1.0	7.00	430
June	28	7.7	12.2	728
July	11	4.4	7.25	445
August	5.5	1.7	4.15	255
September	2.2	1.6	1.91	113
The year	28	1.0	3.83	2,770

\* Estimated.

## LA JARA CREEK NEAR LA JARA, N.MEX.

LOCATION.—Water-stage recorder in SE¼NW¼NE¼ sec. 23, T. 22 N., R. 1 W., 1,600 feet above first diversion and 4 miles northeast of La Jara.

RECORDS AVAILABLE.—June 1932 to November 1933 (discontinued).

DISCHARGE.—Maximum during year, 12 second-feet Sept. 21; maximum gage height, 1.62 feet May 19; minimum not determined.

1932-33: Maximum, 19 second-feet June 5, 1932; maximum gage height, that of May 19, 1933; minimum not determined.

REMARKS.—Records good for October and November; others poor. Stage-discharge relation affected by ice Nov. 16, 23-26, Dec. 3-8, Jan. 9-31, Feb. 1-28, Mar. 5, 6.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
1	0.4	0.6	0.5	0.7		0.5	1.2	1.8	9.3	1.6	1.3	0.8	0.6	0.6
2	.4	.6	.6	.7		.5	1.3	2.1	9.7	1.5	1.1	.8	.6	.7
3	.4	.6				.4	1.4	2.2	9.5	1.8	3.7	.7	.7	.6
4	.4	.6	a.6	.6		.4	1.7	2.3	9.7	1.8	3.5	.7	1.0	.6
5	.4	.6		.6		a.5	2.0	2.6	9.7	1.9	4.0	.7	1.0	.7
6	.4	.6		.6		a.5	2.9	3.0	9.5	3.1	2.4	.7	1.1*	.6
7	.4	.6	a.5	.6		.6	1.2	3.1	9.2	2.4		.7	.8	.6
8	.4	.6		.6		.6	1.2	3.4	8.5	2.1		.8	.7	.6
9	.4	.6	.5			.6	1.3	3.8	8.1	2.2		1.6	.7	.6
10	.4	.7	.5			.6	1.2	4.1	7.8	1.8	a.2	.9	.7	.6
11	.4	a.7	.5	a.6		.6	2.9	3.7	6.5	1.8		1.0	.7	.6
12	.4	a.6	.5			.6	1.8	3.5	5.7	1.9		.9	.7	
13	.4	.6	.5			.6	1.4	3.2	5.0	2.2		.8	.7	
14	.4	.6	.5			.7	2.2	3.0	4.0	1.7	1.4	.8	1.1	
15	.4	.6	.5		a.0.5	.6	1.7	3.1	3.1	1.6	1.4	.8	1.0	
16	.4	a.6	.5			.6	1.3	3.5	2.6	2.5	1.3	.7	.8	
17	.4	.6	.6			.6	1.4	5.2	2.4	2.7	1.3	.7	.8	
18	.4	.6	.6			.6	1.8	6.8	2.3	1.9	1.3	1.1	.7	
19	.4	.6	.6			.7	1.8	7.6	2.8	1.7	1.3	1.0	.7	
20	.4	.6	.6	a.5		.6	2.6	7.9	2.8	1.8	1.2	.8	.6	
21	.5	.6	.6			.8	2.4	8.1	2.2	1.8	1.1	3.2	.6	
22	.6	.6	.6			.6	1.2	7.6	4.0	1.8	1.0	2.2	.6	
23	.6	a.6	.6			.6	1.1	7.1	2.8	1.5	1.0	1.1	.6	
24	.7	a.6	.6			.6	1.2	6.8	2.4	1.5	1.0	.9	.6	
25	.6	a.6	.6			.7	1.4	6.9	2.2	1.3	1.1	.8	.6	
26	.6	a.6	.6	a.4		.6	1.4	6.9	2.1	1.3	1.2	.8	.6	
27	.6	.6	.6			.7	1.7	7.3	1.9	1.3	1.4	.7	.6	
28	.7	.6	.6			.8	2.1	7.9	1.8	1.1	1.2	.7	.6	
29	.7	.6	.6			.9	2.0	7.9	1.8	1.0	1.0	.7	.6	
30	.7	.6	.7			1.0	1.7	8.2	1.7	1.0	.9	.6	.6	
31	.6		.7	.4		1.0		8.9		1.2	.8		.6	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
1932-33				
October	0.7	0.4	0.48	30
November	.7	.6	.61	36
December			.57	35
January			.53	33
February			.50	28
March	1.0	.4	.64	39
April	2.9	1.1	1.68	100
May	8.9	1.8	5.15	316
June	9.7	1.7	5.04	300
July	3.1	1.0	1.77	109
August	4.0	.8	1.64	101
September	3.2	.6	.96	57
The year	9.7		1.63	1,180
1933				
October	1.1	.6	.72	44
Nov. 1-11	.7	.6	.62	13
The period				57

\* Estimated.

## BLUEWATER CREEK NEAR BLUEWATER, N. MEX.

LOCATION.—Water-stage recorder in SW¼ sec. 5, T. 12 N., R. 11 W., 2½ miles northwest of Bluewater and 8 miles below storage reservoir of Bluewater-Toltec Irrigation District.

DRAINAGE AREA.—235 square miles.

RECORDS AVAILABLE.—May 1912 to December 1914; October 1930 to September 1933. Records for 1915-19, 1921-30 published by State engineer.

DISCHARGE.—Maximum during year, about 322 second-feet July 21 (gage height, 4.34 feet); minimum not determined.

1931-33: Maximum discharge and stage, those of July 21, 1933; no flow Mar. 9, 1931.

REMARKS.—Records fair. Stage-discharge relation affected by ice Dec. 7, 8, 11-31, Jan. 1-14, Feb. 4-8. Flow regulated by storage in Bluewater Reservoir for irrigation.

## Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	11	8	8.4		7.0	6.7	6.5	36	54	3.6	56	12
2	11	8	8.0			6.7	8.2	26	53	5.3	56	11
3	11	8	8.0	5		6.7	8.0	26	53	8.8	57	
4	11	7.7	7.7			6.7	12	26	58	9.3	55	
5	11	7.7	7.7			7.4	12	24	59	16	56	
6	14	8.0	7.7	5.2	10	6.5	13	18	59	11	34	10
7	15	7.7				7.2	12	16	58	11	11	
8	15	8.0	7.5			7.0	12	15	59	13	8.0	
9	14	8.4	7.4			7.0	12	15	60	12	7	9.6
10	14	8.7	7.4			6.7	13	18	60	17	6	9.6
11	14	9.0		6.3	14	6.7	13	18	59	19	5	4.6
12	14	9.2			8.4	6.5	13	18	62	30	4.2	3.0
13	14				7.4	6.3	14	19	63	33	4.2	2.9
14	14				7.4	6.3	16	18	54	49	3.7	2.9
15	11		4	7.4	7.7	6.2	17	18	38	50	15	2.9
16	11	9			7.7	6.3	17	23	28	52	18	2.7
17	11				7.7	6.2	28	28	26	52	29	2.7
18	11			7.4	7.0	6.2	28	32	12	50	28	2.7
19	12		2.0		7.0	6.2	37	43	7.9	57	29	2.6
20	12	8.7			5.4	6.0	38	44	7.3	59	39	2.6
21	12	8.7		7.4	5.8	6.0	37	44	8.2	66	39	2.4
22	12	9.0			6.7	6.3	35	53	5.2	60	41	2.4
23	11	8.7			6.5	6.3	23	56	4.4	64	42	2.3
24	11	9.2			6.3	6.3	20	55	4.2	59	42	2.3
25	10	9.2	3		6.2	6.3	23	55	3.9	57	43	2.3
26		8.8	8.4	7.2	6.3	6.2	34	56	4.1	66	44	2.4
27		9.5	8.4		6.2	6.3	39	56	3.9	66	42	2.4
28		8.7	8.4		6.5	6.3	51	55	3.7	66	30	2.6
29		8.4	8.4			6.5	52	54	3.6	65	15	2.4
30	8		8.4			6.5	47	54	3.6	70	15	2.4
31	8					6.5		54		63	14	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	15	8	11.6	713
November			8.56	510
December	8.4		4.75	292
January			6.59	405
February		5.4	8.11	451
March	7.4	6.0	6.48	399
April	52	6.5	23.0	1,370
May	56	15	34.6	2,130
June	63	3.6	32.5	1,930
July	70	3.6	40.6	2,500
August	57	3.7	28.6	1,760
September		2.3	5.19	309
The year	70		17.6	12,800

\* Estimated.

## ALAMOSA RIVER NEAR MONTICELLO, N.MEX.

LOCATION.—Water-stage recorder in SW¼ sec. 31, T. 8 S., R. 7 W., just below mouth of Wildhorse Creek, Alamosa dam site, and old Fort Quitman and 15 miles northwest of Monticello.

DRAINAGE AREA.—470 square miles.

RECORDS AVAILABLE.—May 1931 to September 1933. Records October to December 1929 published by State engineer.

DISCHARGE.—Maximum during year, about 1,800 second-feet July 17 (gage height, 4.79 feet); minimum, 6.7 second-feet Sept. 15.

1931-33: Maximum, about 4,500 second-feet Aug. 5, 1931 (gage height, 6.30 feet); minimum, 5.2 second-feet Jan. 9, 1932.

REMARKS.—Records good below 15 second-feet; fair above. No diversions above station; entire normal flow diverted below for irrigation.

## Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12	8.7	8.7	8.0	7.4	7.4	7.2	7.1	8.1	8.9	8.1	11
2	9.6	8.7	8.7	7.8	7.4	7.4	7.1	6.9	8.3	8.5	8.0	8.7
3	8.7	8.7	8.7	7.8	7.4	7.4	7.1	7.1	8.5	8.1	7.8	8.0
4	8.3	8.7	8.7	7.8	7.4	7.2	7.1	6.9	8.3	8.0	25	7.8
5	8.3	8.9	8.7	7.8	7.4	7.1	7.1	6.9	8.7	7.4	68	7.8
6	8.1	8.7	8.7	7.8	7.4	7.1	7.1	6.9	8.7	7.4	57	7.8
7	8.1	8.7	8.7	7.8	7.2	7.1	7.1	6.9	8.9	11	8.3	7.8
8	8.1	8.7	8.5	7.8	7.1	7.1	7.1	6.9	8.7	9.3	7.8	7.8
9	8.3	8.9	8.5	7.8	7.2	7.1	7.1	7.1	8.7	7.6	7.8	31
10	8.3	8.9	8.3	7.8	7.2	7.1	7.1	7.2	8.7	7.4	8.1	*30
11	8.3	8.9	8.3	7.8	7.2	7.2	7.1	7.2	8.7	7.4	7.8	} *7
12	8.3	8.9	8.3	7.8	7.2	7.4	7.1	7.1	8.9	7.6	7.8	
13	8.3	8.9	8.3	7.8	7.2	7.4	7.1	7.1	8.9	7.6	7.8	
14	8.3	8.9	8.1	7.8	7.2	7.4	6.9	7.2	8.9	7.6	8.0	
15	8.5	8.9	8.3	7.8	7.2	7.4	6.9	7.2	9.2	8.0	8.0	6.7
16	8.5	8.9	8.1	8.0	7.2	7.4	6.9	7.2	8.9	7.6	8.0	6.9
17	8.5	8.9	8.0	8.0	7.2	7.2	7.2	7.2	9.6	33	8.1	6.9
18	8.5	8.9	8.0	7.8	7.2	7.4	7.2	7.2	9.4	8.5	8.5	33
19	8.5	8.7	8.0	7.8	7.2	7.4	7.2	7.2	9.6	7.6	8.0	8.5
20	8.5	8.7	8.1	7.8	7.2	7.4	7.4	7.1	9.2	7.4	8.3	7.8
21	8.7	8.7	8.1	7.8	7.2	7.4	7.4	7.1	9.4	27	7.8	7.6
22	8.5	8.9	8.1	7.6	7.2	7.6	7.4	7.1	99	8.9	8.0	7.6
23	8.5	8.9	8.1	7.8	7.4	7.6	7.4	7.4	10	8.1	8.1	7.4
24	8.5	8.7	8.1	7.8	7.4	7.6	7.4	7.6	13	8.1	8.5	7.2
25	8.5	8.7	8.1	7.8	7.4	7.2	7.4	7.6	12	7.8	8.5	7.2
26	8.3	8.7	8.1	7.8	7.6	7.2	7.2	7.6	12	8.1	9.4	7.2
27	8.5	8.7	8.1	7.8	7.4	7.2	7.2	7.6	11	8.0	8.1	7.1
28	8.6	8.5	8.1	7.8	7.4	7.2	7.1	7.8	10	7.6	8.0	7.1
29	8.5	8.5	8.1	7.8	-----	7.2	7.1	7.8	10	7.6	8.0	7.1
30	8.5	8.5	8.0	7.6	-----	7.2	7.1	8.1	9.6	17	8.0	7.1
31	8.7	-----	8.0	7.4	-----	7.2	-----	8.0	-----	10	9.2	-----
Month	Maximum			Minimum			Mean			Run-off in acre-feet		
October	12			8.1			8.57			527		
November	8.9			8.5			8.77			522		
December	8.7			8.0			8.28			509		
January	8.0			7.4			7.79			479		
February	7.6			7.1			7.29			405		
March	7.6			7.1			7.30			449		
April	7.4			6.9			7.16			426		
May	8.1			6.9			7.27			447		
June	99			8.1			12.4			740		
July	33			7.4			9.81			603		
August	68			7.8			12.2			749		
September	33			6.7			9.94			591		
The year	99			6.7			8.90			6,450		

\* Estimated.

## PECOS RIVER AT IRVIN RANCH, NEAR PECOS, N. MEX.

LOCATION.—Water-stage recorder in NE¼NE¼ sec. 17, T. 17 N., R. 12 E., at private road bridge on Irvin ranch 600 feet above mouth of Indian Creek, 2 miles below Canyon Espiritu Santo, and 11 miles north of Pecos.

DRAINAGE AREA.—175 square miles.

RECORDS AVAILABLE.—March 1910 to December 1914, published as "Pecos River near Cowles"; October 1930 to September 1933. Records for 1919-30 published by State engineer.

DISCHARGE.—Maximum during year, 387 second-feet June 24 (gage height, 2.78 feet); minimum not determined.

1930-33: Maximum, 1,390 second-feet Sept. 24, 1931 (gage height, 3.70 feet); minimum not determined.

REMARKS.—Records good except those estimated for period of ice effect, Dec. 8 to Feb. 22, which are poor. Diversions for irrigation above station.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1.....	56	42	30			30	45	58	173	156	85	58	
2.....	53	46	30			31	44	81	161	142	83	54	
3.....	54	44	28			30	45	80	153	156	96	52	
4.....	56	41	28			30	54	78	145	156	104	49	
5.....	54	41	28			22	49	90	140	167	94	49	
6.....	56	44	27		* 25	29	39	102	148	186	81	51	
7.....	54	42	28			37	42	96	112	135	74	49	
8.....	56	28				36	41	108	104	128	72	53	
9.....	54	40				40	49	123	96	128	67	47	
10.....	51	33				42	53	132	87	130	68	37	
11.....	46	21		* 25		45	45	132	80	126	68	36	
12.....	46	32				46	49	126	83	123	64	39	
13.....	45	37				44	52	114	106	119	60	39	
14.....	45	37				38	40	98	* 110	108	62	38	
15.....	38	29				39	41	90	112	104	60	37	
16.....	37	26			* 30	40	49	98	126	110	68	33	
17.....	36	26				36	49	119	148	102	67	29	
18.....	36	25				32	61	150	140	102	67	29	
19.....	44	26				32	70	186	142	87	70	29	
20.....	49	24				29	52	209	142	90	68	27	
21.....	61	24				30	47	226	186	89	62	27	
22.....	80	24				30	44	220	220	80	61	28	
23.....	56	21				27	38	180	250	90	62	27	
24.....	53	20				29	27	173	270	108	62	27	
25.....	47	20				27	24	57	153	230	102	80	27
26.....	47	23				27	28	54	170	220	96	72	27
27.....	49	24				28	31	64	173	206	90	68	26
28.....	51	32				30	40	83	173	183	80	67	25
29.....	48	30					47	78	173	167	76	61	26
30.....	48	28					49	62	167	161	73	60	27
31.....	44					39		164		81	61		

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	80	36	50.0	3,070
November.....	46	20	31.0	1,840
December.....			25.8	1,580
January.....			24.9	1,530
February.....			27.0	1,500
March.....	49	22	34.8	2,140
April.....	83	38	51.4	3,060
May.....	226	58	137	8,410
June.....	270	80	153	9,130
July.....	186	73	114	6,980
August.....	104	60	70.8	4,350
September.....	58	25	36.7	2,190
The year.....	270		63.3	45,800

\* Estimated.

## PECOS RIVER NEAR ANTON CHICO, N.MEX.

LOCATION.—Water-stage recorder in Anton Chico grant,  $1\frac{1}{4}$  miles southeast of Anton Chico and 4 miles below mouth of Tecolote Creek.

DRAINAGE AREA.—1,080 square miles.

RECORDS AVAILABLE.—April 1910 to December 1914; October 1930 to September 1933. Records 1915–30 published by State engineer. Prior to Jan. 11, 1929, station was located at four sites from  $3\frac{1}{2}$  miles above to  $1\frac{1}{2}$  miles below present location. Records believed to be comparable.

DISCHARGE.—Maximum during year ending Sept. 30, 1932, 2,890 second-feet Aug. 24 (gage height, 4.55 feet); minimum, 5 second-feet Aug. 6.

Maximum during year ending Sept. 30, 1933, about 12,900 second-feet July 16 (gage height, 8.0 feet); minimum, 5 second-feet Jan. 21 and Feb. 3.

1930–33: Maximum discharge and stage, those of July 16, 1933; minimum discharge, 4 second-feet July 31, 1931.

REMARKS.—Records good except those estimated, which are poor. Stage-discharge relation affected by ice Dec. 14–31, 1932, Jan. 1–3, 11–13, 22, 27, 29, Feb. 1, 7–24, 1933. Diversions for irrigation above station.

*Discharge, in second-feet, 1931–33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1931–32												
1.....	729	107	64	48	74	132	207	274	480	172	39	164
2.....	398	103	68	46	58	141	225	270	456	372	20	146
3.....	345	100	66	60	58	138	279	279	432	345	10	124
4.....	345	96	63	72	35	130	335	320	432	193	7	114
5.....	270	92	56	76	36	132	382	355	456	135	8	100
6.....	218	89	79	55	48	114	409	398	360	96	6	76
7.....	211	87	58	35	52	114	409	387	310	85	11	60
8.....	200	85	76	* 35	55	112	409	370	297	94	140	49
9.....	197	83	72	* 40	46	110	409	360	274	112	132	44
10.....	193	81	68	* 35	43	112	392	698	262	107	61	44
11.....	177	89	60	* 30	49	122	365	1,080	370	110	45	40
12.....	174	94	43	* 50	60	110	345	720	266	141	65	25
13.....	* 170	92	49	74	49	103	370	652	233	174	66	20
14.....	* 160	87	43	66	46	132	409	652	211	190	46	84
15.....	* 150	83	42	48	52	130	432	638	193	98	39	20
16.....	* 140	79	58	55	49	138	432	673	187	76	48	19
17.....	130	74	60	38	48	138	438	720	167	60	17	20
18.....	* 130	72	72	46	48	132	408	744	158	44	106	19
19.....	141	74	74	49	49	135	450	768	146	37	103	14
20.....	351	66	72	60	60	144	450	867	146	33	117	14
21.....	325	66	68	60	58	163	468	840	120	36	187	13
22.....	222	61	74	53	58	215	480	832	144	43	288	15
23.....	197	70	64	34	53	187	498	882	158	38	204	26
24.....	180	52	58		52	164	432	732	215	161	* 460	70
25.....	180	56	58		53	174	404	744	167	135	187	117
26.....	164	60	55		56	187	360	704	197	183	174	144
27.....	146	68	55	* 45	66	200	345	638	171	81	167	196
28.....	132	94	52		79	193	335	624	450	79	207	74
29.....	124	83	61		98	200	302	631	200	70	292	70
30.....	120	72	46			215	284	596	149	53	229	66
31.....	112		26			215		522		42	190	

\* Estimated.

Discharge, in second-feet, of Pecos River near Anton Chico, N. Mex., 1931-33—  
Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1932-33													
1.....	64	60	25	• 30	• 25	26	28	39	257	171	149	60	
2.....	66	55	24		25	23	23	23	130	144	138	50	
3.....	132	53	23		16	23	20	21	138	124	230	38	
4.....	79	52	23	31	16	22	17	45	127	214	584	29	
5.....	58	50	23	30	20	24	19	53	130	274	462	20	
6.....	58	48	23	28	27	29	26	49	110	180	• 240	14	
7.....	53	45	20	26		30	24	52	114	167	• 120	12	
8.....	49	45	15	26		28	23	• 61	105	158	96	16	
9.....	48	44	14	24	• 25	29	42	55	89	149	81	174	
10.....	50	37	17	25		30	28	61	81	135	72	229	
11.....	52	39	21	• 25		23	28	74	64	138	124	63	
12.....	48	40	17			18	26	85	76	110	96	39	
13.....	46	34	20			21	29	92	79	112	76	180	
14.....	46	31	20	23	• 30	30	34	100	83	107	55	246	
15.....	46	34		20		20	44	96	122	83	36	218	
16.....	44	37		17		19	26	74	308	1,820	48	34	
17.....	40	36	• 20	24	• 35	18	18	55	355	939	37	30	
18.....	39	34		24		18	23	55	340	498	110	24	
19.....	39	33		18		18	16	66	274	382	85	18	
20.....	39	33	• 25	14	34	18	23	92	254	310	52	14	
21.....	46	34		16		19	34	124	781	241	48	13	
22.....	89	31		• 20		12	26	152	568	258	33	11	
23.....	146	30	• 25	21	27	9	25	158	510	302	21	10	
24.....	107	27		22		10	26	138	596	258	29	9	
25.....	96	27		26		10	18	135	534	266	70	8	
26.....	87	24	• 25	25	32	12	18	127	392	254	168	7	
27.....	74	23		• 25	31	10	21	114	345	250	266	7	
28.....	70	24		25	27	13	16	122	297	233	83	7	
29.....	66	23	• 25	• 25	26	15	19	124	254	204	222	8	
30.....	64	24		26		14	35	114	207	177	197	8	
31.....	61			25		19		153		164	103		

Month	Maximum	Minimum	Mean	Run-off in acre-feet
1931-32				
October.....	729	112	217	13,400
November.....	107	52	80.5	4,790
December.....	79	26	59.8	3,680
January.....	76	30	49.2	3,020
February.....	98	35	54.8	3,150
March.....	215	103	150	9,230
April.....	498	207	394	22,900
May.....	1,080	270	612	37,600
June.....	490	120	260	15,500
July.....	372	33	116	7,130
August.....	460	6	118	7,280
September.....	196	13	66.2	3,940
The year.....	1,080	6	181	132,000
1932-33				
October.....	146	39	64.6	3,970
November.....	60	23	36.9	2,200
December.....			21.9	1,350
January.....		14	24.2	1,490
February.....			28.3	1,570
March.....	30	9	19.7	1,210
April.....	44	16	25.2	1,500
May.....	158	21	87.4	5,370
June.....	781	64	257	15,300
July.....	1,820	83	285	17,500
August.....	584	21	133	8,190
September.....	246	7	53.2	3,170
The year.....	1,820	7	86.8	62,800

• Estimated.

NOTE.—Records for year ending Sept. 30, 1932, supersede those published in Water-Supply Paper 733.



## PECOS RIVER AT SANTA ROSA, N.MEX.

LOCATION.—Water-stage recorder in sec. 3, T. 8 N., R. 21 E., at Santa Rosa, a quarter of a mile above highway bridge (former location of station),  $1\frac{1}{4}$  miles above mouth of Rio Agua Negra Chiquita, and near site of station maintained by U.S. Reclamation Service 1903-6.

DRAINAGE AREA.—2,880 square miles.

RECORDS AVAILABLE.—May 1903 to December 1906; February 1910 to July 1911; September 1912 to December 1914; October 1930 to September 1933. Records 1915-30 published by State engineer.

DISCHARGE.—Maximum during year, 7,760 second-feet Aug. 29 (gage height, 6.95 feet); minimum, 11 second-feet Apr. 29 (gage height, 0.05 foot). 1931-33: Maximum, that of Aug. 29, 1933; maximum gage height, 7.00 feet, July 6, 1932; minimum, 10 second-feet Jan. 21, 1931.

REMARKS.—Records fair except those for estimated periods, which are poor. Diversions for irrigation above station. Stage-discharge relation affected by ice Dec. 13-29.

## Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	133	52	27	22	22	18	22	12	79	133	39	447
2	119	46	26	22	25	18	20	12	158	100	39	281
3	119	39	25	21	26	18	18	12	97	81	462	° 100
4	238	35	25	20	22	17	18	13	76	66	1,050	
5	213	33	24	21		16	18	14	66	210	712	
6	190	32	23	22		17	18	14	54	255	630	° 30
7	° 130		22	20		19	17	14	42	169	281	
8	72	° 30	25	16	° 20	16	17	14	28	124	119	
9	64		26	15		16	16	14	27	92	.66	
10	55		26	20		15	17	14	22	66	42	° 100
11	49	26	23	18		15	17	14	22	46	44	242
12	44		22	18	20	15	18	15	19	34	194	176
13	42			18	26	14	18	15	22	24	130	124
14	40			20	28	14	18	15	20	19	43	50
15	35	° 27		23	24	15	19	18	18	20	22	259
16	34			23	20	16	18	32	18	° 500	16	202
17	35			25	21	16	18	32	151	° 1,500	15	66
18	34			24	22	16	18	23	242	° 600	15	34
19	35	28		19	21	18	18	18	229	344	15	27
20	35	29		29	21	19	18	17	303	255	18	22
21	38	28	° 22	23	22	19	18	17	591	435	16	20
22	43	29		20	20	18	19	16	888	172	14	19
23	38	30		26	18	18	18	18	517	146	15	19
24	° 95			24	18	20	18	43	560	329	15	20
25	136	° 28		24	18	22	17	52	511	291	15	19
26	100	27		24	18	22	16	.61	381	176	46	19
27	97	27		22	20	21	15	61	329	169	484	19
28	° 85	27		25	19	20	14	49	272	143	250	20
29	74	° 27		26		20	12	35	233	108	1,530	20
30	68		23	24		20	12	35	183	72	517	20
31	54		23	22		22		36		48	408	----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	238	34	82.1	5,050
November	52	-----	30.2	1,800
December	-----	-----	23.0	1,420
January	29	15	21.8	1,340
February	28	-----	21.1	1,170
March	22	14	17.7	1,090
April	22	12	17.3	1,030
May	61	12	24.4	1,500
June	888	18	205	12,200
July	1,500	19	217	13,300
August	1,530	14	234	14,400
September	447	-----	83.5	4,970
The year	1,530	12	81.9	59,300

° Estimated.

## PECOS RIVER NEAR GUADALUPE, N.MEX.

LOCATION.—Water-stage recorder in sec. 34, T. 5 N., R. 24 E., 500 feet below mouth of Alamogordo Creek, half a mile above Alamogordo dam site, and 4 miles north of Guadalupe.

DRAINAGE AREA.—4,470 square miles.

RECORDS AVAILABLE.—October 1912 to December 1914; October 1930 to September 1933. Records for 1915–30 published by State engineer.

DISCHARGE.—Maximum during year, about 9,450 second-feet Aug. 29 (gage height, 7.79 feet); minimum not determined.

1930–33: Maximum, about 27,000 second-feet Oct. 11, 1930 (gage height, 12.8 feet); minimum not determined.

REMARKS.—Records good except those estimated, which are poor. Stage-discharge relation affected by ice Dec. 10 to Jan. 2, Feb. 8–15. Diversions for irrigation above station.

*Discharge, in second-feet, 1932–33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....		128	104	° 100	95	90	82	66	° 250	192	° 100	406
2.....	° 180	122	107	° 110	95	88	85	70		139		563
3.....		119	104	116	98	85	82	66	° 150	119	° 1,100	245
4.....		116	101	116	104	80	80	72		375	2,680	156
5.....	° 270	110	98	119	104	82	75	75		° 300	789	° 120
6.....		107	90	122	110	88	82	72		° 250	712	
7.....	° 140	104	88	116	90	88	78	70		° 200	485	° 100
8.....		104	90	116		80	78	68		° 170	290	
9.....	° 120	104	90	113	° 80	82	78	70		° 150	172	
10.....		101		116		80	75	75		° 130	189	° 150
11.....		98		119		78	78	68	° 100	° 100	° 170	° 250
12.....	° 100	104		116		80	78	66		° 90	° 150	305
13.....		101		116	° 90	75	75	68		° 80	° 200	800
14.....		101		116		70	78	78		72	° 220	218
15.....		104		113		75	80	82		72		132
16.....	101	107		113	95	75	80	82	° 300	597	° 100	315
17.....	104	107		116	95	78	82	95		° 1,900		240
18.....	98	107		119	104	75	80	88	° 300	° 1,100	° 150	° 370
19.....	92	107		107	95	72	78	82		° 800		° 550
20.....	98	104	° 90	104	92	75	80	75		° 500	° 200	
21.....	113	101		113	98	80	82	72	° 800	° 500	° 100	° 100
22.....	168	104		101	98	78	92	78		° 350		
23.....	136	104		98	90	75	98	72	509	° 300		
24.....	110	107		104	92	80	92	72	545	° 350	° 170	
25.....	160	107		101	92	78	88	128	608	° 300	° 380	
26.....	180	104		107	98	78	82	128	521		° 250	
27.....	160	107		98	101	80	78	120	406	° 200	1,010	
28.....	156	107		101	98	80	72	° 110	310		979	
29.....	142	107		104		80	72	° 100	265		4,420	
30.....	132	104		104		78	66	° 100	227	° 150	712	
31.....	125			104		82		° 110			561	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....			143	8,820
November.....	128	98	107	6,360
December.....			92.0	5,660
January.....	122	98	110	6,780
February.....			93.7	5,200
March.....	90	70	79.5	4,890
April.....	98	66	80.2	4,770
May.....	128	66	83.2	5,110
June.....			275	16,300
July.....	1,900	72	329	20,200
August.....	4,420		544	33,500
September.....	800		214	12,700
The year.....	4,420		180	130,000

° Estimated.

## PEGOS RIVER NEAR ANGELES, TEX.

LOCATION.—Water-stage recorder in T. 26 S., R. 29 E., half a mile below mouth of Delaware Creek, 2 miles north of Texas-New Mexico State line, and 8½ miles northwest of Angeles, Reeves County.

RECORDS AVAILABLE.—May 1914 to September 1933.

DISCHARGE.—Maximum during year, 15,900 second-feet Oct. 1 (gage height, 12.73 feet); minimum not determined.

1914-33: Maximum stage, 21.5 feet Aug. 8, 1916 (discharge not determined); minimum discharge, 45 second-feet July 4, 5, 1925. Average, 17 years (1916-33), 355 second-feet.

REMARKS.—Records good except those estimated or partly estimated, which are fair. Large part of natural flow above Carlsbad, N.Mex., diverted for irrigation; considerable water is returned by seepage. Flow regulated to large extent by storage in reservoirs of the Carlsbad project.

## Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	15,300	483	375	408	397		130		128		92	374
2	12,500	483	380	402	386		138		109	89	112	368
3	9,980	483	380	420	380		120		104		109	205
4	6,180	489	397	420	386		114		109	92	111	179
5	4,000	483	402	414	386	300	125			111		156
6	1,740	472	408	425	380		125			114		145
7	1,130	442	397	420	386		135			142	72	132
8	746	442	386	420		286	132			125		135
9	734	478	391	420		273	138	140		81		138
10	734	454	408	420		265	120			92		140
11	728	431	402	420		248	118		87		95	148
12	710	431	386	408		295	128				73	138
13	704	420	391	414		244	130				89	148
14	827	420	414	408		244	118				94	1,150
15	746	425	420	408		300	140				89	2,510
16	740	448	425	408		324	150				83	514
17		431	414	414		324	118	150			83	282
18		420	402	420	350	328	130	130		68		192
19		420	397	414		324	142	109				179
20		615	397	414		314	116	140	132			164
21			386	391	408	328	138	109			75	199
22			397	402	391	314	142	100				199
23			391	442	375	273	138	96				202
24	489	386	431	391		244	138	98				192
25	483	364	397	391		237	135	148	116	162	111	189
26	495	364	386	380		252	140		94	132	148	179
27	489	359	386	386		237	132			116	136	192
28	466	364	386	391		199	150	114		111	192	179
29	472	380	391	408		156	138	132	89	104	188	179
30	472	380	397	414		167	140	142		98	138	162
31	478		386	408		145	120			98	132	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	15,300	466	2,120	130,000
November	489	359	424	25,200
December	442	375	399	24,500
January	425	375	408	25,100
February			359	19,900
March	328	145	272	16,700
April			129	7,680
May			138	8,480
June			95.9	5,710
July	162		90.2	5,550
August	192		97.8	6,010
September	2,510	132	309	18,400
The year	15,300		405	293,000

\* Partly estimated.

## GALLINAS RIVER NEAR MONTEZUMA, N.MEX.

LOCATION.—Water-stage recorder in Las Vegas grant, 2 miles west of Montezuma, San Miguel County.

DRAINAGE AREA.—86 square miles.

RECORDS AVAILABLE.—October 1930 to September 1933. Records 1915-30 published by State engineer.

DISCHARGE.—Maximum during year, 222 second-feet July 16 (gage height, 2.78 feet); minimum, 2.8 second-feet Sept. 25.

1930-33: Maximum, about 520 second-feet Oct. 1, 1930 (gage height, 4.25 feet); minimum, 2.2 second-feet Sept. 21, 1932.

REMARKS.—Records good except those estimated, which are poor. Stage-discharge relation affected by ice Dec. 10 to Feb. 28. Diversions for irrigation above station.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	15	11	6.7			5.1	9.9	12	10	11	13	8.8
2.....	13	10	5.9			4.8	8.4	12	9.2	* 11	11	7.0
3.....	13	9.9	6.2			4.8	9.9	12	7.3	* 11	12	6.2
4.....	14	9.9	6.2			5.3	13	13	8.0	* 40	15	5.6
5.....	14	9.9	5.9			5.3	13	14	7.7	47	16	5.3
6.....	13	9.2	5.6			5.1	11	14	7.7	43	14	5.1
7.....	11	8.8	5.9			5.6	13	13	5.6	35	11	4.3
8.....	11	7.3	5.1			5.3	11	12	5.9	30	9.5	4.3
9.....	9.9	8.0	4.8			5.3	9.2	13	5.1	26	8.8	9.9
10.....	9.2	7.3				5.3	12	15	4.3	26	8.4	7.3
11.....	9.5	6.7				5.6	10	14	4.1	24	8.8	5.6
12.....	8.4	7.0		* 6		6.5	10	13	4.5	23	6.7	5.1
13.....	8.4	7.7				6.5	11	14	4.5	19	5.6	7.0
14.....	8.4	8.4				5.6	9.2	14	13	16	5.6	9.9
15.....	7.7	7.3			* 5	5.6	9.9	14	19	23	9.9	10
16.....	7.3	7.0				6.2	11	14	18	36	20	8.4
17.....	7.0	7.0				5.9	10	13	17	32	10	7.0
18.....	6.5	7.0				5.9	8.4	11	16	23	13	6.2
19.....	6.5	7.3				6.2	9.5	13	13	19	10	5.1
20.....	6.5	7.0	* 5			5.6	11	15	16	18	10	4.5
21.....	9.5	6.7				6.2	10	15	29	23	11	4.1
22.....	30	6.7				6.5	11	13	42	23	8.8	3.7
23.....	20	6.7				6.2	9.9	13	33	22	8.4	3.4
24.....	17	6.2		6.2		6.2	9.9	13	31	22	8.4	3.2
25.....	15	6.7				5.3	9.5	13	29	20	12	3.0
26.....	15	7.3				5.9	8.4	13	24	27	13	3.2
27.....	15	8.0				5.6	8.8	13	21	23	11	3.2
28.....	13	7.3		* 6		6.5	11	11	18	18	15	3.4
29.....	12	7.0				6.7	13	11	16	16	14	3.4
30.....	11	6.5				8.0	12	11	* 13	15	11	3.2
31.....	11					7.3		10		13	10	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	30	6.5	11.9	730
November.....	11	6.2	7.76	462
December.....			5.24	322
January.....			6.01	369
February.....			5.0	278
March.....	8.0	4.8	5.87	361
April.....	13	8.4	10.5	623
May.....	15	10	12.9	795
June.....	42	4.1	15.0	894
July.....	47	11	23.7	1,460
August.....	20	5.6	11.0	676
September.....	10	3.0	5.55	330
The year.....	47		10.1	7,300

\* Estimated.

## GALLINAS RIVER AT MONTEZUMA, N.MEX.

LOCATION.—Water-stage recorder in Las Vegas grant, at highway bridge half a mile below Montezuma College, Montezuma, San Miguel County.

DRAINAGE AREA.—89 square miles.

RECORDS AVAILABLE.—August 1903 to December 1914; October 1930 to September 1933. Records 1914–30 published by State engineer.

DISCHARGE.—Maximum during year, 154 second-foot July 15 (gage height, 3.37 feet); minimum, 0.4 second-foot Oct. 21 and 22.

1930–33: Maximum, about 720 second-foot Oct. 1, 1930 (gage height, 4.81 feet); minimum, that of Oct. 21 and 22, 1932.

REMARKS.—Records good. Stage-discharge relation affected by ice Feb. 8–10. Flow regulated by reservoirs owned by Aqua Pura Co. Diversions for irrigation above station.

## Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	9.3	5.9	} • 2.8	2.9	2.6	2.6	2.2	10	7.2	6.3	10	8.9
2.....	7.2	5.9		3.3	4.0	2.9	5.9	10	8.5	5.9	9.3	8.0
3.....	9.3	5.9	2.6	2.9	4.0	2.2	13	10	6.3	6.8	11	4.4
4.....	10	5.2	2.2	2.6	4.4	1.7	14	10	7.2	36	17	2.2
5.....	7.6	5.2	2.2	2.0	5.5	1.5	14	10	6.8	42	15	1.7
6.....	7.2	6.3	2.9	2.0	5.5	1.7	14	12	7.2	36	8.9	2.0
7.....	6.3	4.8	2.2	2.0	4.0	1.7	13	11	5.9	25	7.2	2.2
8.....	5.2	3.7	3.3	2.2	2.0	2.0	12	10	6.3	21	6.3	2.6
9.....	5.2	3.7	2.9	2.2	} • 4.2	1.8	11	11	5.2	16	6.3	9.8
10.....	3.3	4.4	3.3	2.9		1.8	15	13	5.2	17	6.8	5.5
11.....	2.6	4.8	3.7	2.0	4.4	1.8	14	13	4.4	16	5.9	2.2
12.....	2.0	4.4	2.2	2.2	4.8	1.8	7.6	13	4.0	18	5.5	1.8
13.....	1.3	4.8	2.0	2.2	5.2	2.0	8.9	11	4.8	14	5.2	2.2
14.....	.9	5.2	2.2	2.6	4.4	1.5	8.0	11	14	11	4.4	2.9
15.....	.9	4.8	2.6	2.6	3.7	2.9	8.5	12	25	19	6.8	5.9
16.....	1.1	4.4	2.2	2.6	4.0	4.8	9.3	12	21	38	20	3.3
17.....	.9	4.4	2.6	2.0	3.7	5.5	9.3	10	23	25	12	2.6
18.....	.6	4.4	2.9	2.2	3.3	2.2	8.9	9.8	21	13	13	2.0
19.....	.9	4.8	6.3	3.3	3.3	1.8	8.9	10	16	21	11	2.0
20.....	.8	4.8	3.3	3.3	2.9	2.0	10	11	11	26	6.3	1.8
21.....	.8	4.4	3.3	3.7	3.7	2.6	9.8	11	30	• 22	8.9	1.8
22.....	.9	3.7	2.2	2.9	4.0	3.3	8.9	10	44	19	5.9	1.8
23.....	8.9	3.3	2.9	2.2	4.4	2.6	8.5	11	30	16	2.9	2.0
24.....	18	3.7	2.9	1.8	4.4	4.0	10	12	27	13	6.3	1.8
25.....	16	4.4	2.6	1.8	4.0	3.7	8.9	12	26	21	8.9	1.7
26.....	14	3.7	2.2	1.8	2.9	2.9	8.5	13	18	28	11	1.7
27.....	6.8	2.2	2.0	2.9	1.8	6.8	12	14	20	4.0	1.5	
28.....	16	2.2	2.6	2.6	2.6	1.8	8.9	10	12	12	9.3	1.5
29.....	15	} • 3.3	2.0	2.9	-----	2.6	11	9.3	9.3	9.3	12	1.3
30.....	12		2.6	2.2	-----	1.8	11	9.3	8.0	8.9	12	1.5
31.....	7.2	-----	2.2	2.2	-----	1.8	-----	7.6	-----	8.9	9.8	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	18	0.6	6.39	393
November.....	6.3	-----	4.47	266
December.....	6.3	2.0	2.73	168
January.....	3.7	1.8	2.45	151
February.....	5.5	2.6	3.97	221
March.....	5.5	1.5	2.42	149
April.....	15	2.2	9.99	595
May.....	13	7.6	10.9	668
June.....	44	4.0	14.3	850
July.....	42	5.9	19.1	1,170
August.....	20	2.9	9.00	553
September.....	9.8	1.3	3.02	180
The year.....	44	.6	7.41	5,360

• Estimated.

## RIO RUIDOSO AT HONDO, N.MEX.

LOCATION.—Water-stage recorder in NW¼ SW¼ sec. 4, T. 11 S., R. 17 E., a quarter of a mile above confluence with Rio Bonito to form Rio Hondo and half a mile southwest of Hondo.

RECORDS AVAILABLE.—October 1930 to September 1933. Records August to September 1930 published by State engineer.

DISCHARGE.—Maximum, about 1,140 second-feet July 23 (gage height, 7.90 feet); minimum recorded, 0.3 second-foot Aug. 19–22.

1930–33: Maximum, that of July 23, 1933; minimum recorded, that of Aug. 19–22, 1933.

REMARKS.—Records good below 100 second-feet, poor above. Diversions for irrigation above station.

*Discharge, in second-feet, 1932–33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	52	36	9.4	11	5.9	9.4	16	12	27	27	10	4.1
2.....	49	34	8.5	11	5.4	13	15	11	23	24	7.2	5.4
3.....	61	32	7.6	11	5.0	18	10	10	22	20	12	4.7
4.....	67	29	7.2	11	4.7	22	8.1	19	18	17	13	3.6
5.....	58	28	7.2	11	3.8	24	13	22	15	15	13	2.1
6.....	47	21	5.9	12	4.4	26	13	30	8.1	12	27	1.5
7.....	43	18	5.4	12	4.1	24	13	37	5.4	12	21	1.5
8.....	40	19	7.6	12	3.8	24	13	33	3.3	9.0	14	1.5
9.....		20	8.5		4.4	26	15	37	1.2	9.4	10	1.6
10.....	a 32	19	7.2		5.0	27	14	52	.6	11	7.2	2.1
11.....		18	6.8	a 12	5.9	30	12	64	a .9	12	5.0	4.1
12.....	25	18	6.8		9.4	29	12	67		13	3.0	5.9
13.....	25	19	5.9		10	30	13	67	1.2	16	2.4	6.8
14.....	24	19	6.3	13	7.6	27	13	60	1.2	16	2.0	8.1
15.....	21	17	6.8	13	10	28	15	51	2.0	21		15
16.....	20	15	7.2	13	9.0	20	20	35	2.0		a 1	12
17.....	19	15	7.2	12	8.5	16	16	30	3.3			13
18.....	16	15	8.1	13	9.0	15	13	33	23	4.4		11
19.....	17	17	9.0	12	9.4	14	17	34	34	4.4	.3	8.5
20.....	17	19	9.0	10	11	13	18	33	120	4.7	.3	8.1
21.....	21	18	8.5	9.0	8.1	11	18	37	52	3.8	.3	9.0
22.....	34	17	8.1	9.0	6.3	8.5	20	39	53	2.7	.3	8.1
23.....	57	16	8.5	6.8	6.3	7.6	21	34	54	110		5.9
24.....	51	16	9.4	6.8	7.2	11	16	33	56	54	a 1.5	4.7
25.....	50	15	11	7.2	8.1	10	9.4	28	52	24		1.8
26.....	45	14	11	7.6	9.0	10	8.1	27	50	25	2.7	.6
27.....	42	15	11	8.1	9.0	9.4	7.6	27	46	28	3.3	1.2
28.....	39	14	12	8.5	9.4	8.5	8.1	28	39	20	3.8	.8
29.....	38	13	12	8.5		12	10	26	33	15	3.0	1.5
30.....	37	12	12	8.5		14	15	22	29	13	2.1	4.1
31.....	37		11	7.2		18		28		12	1.8	
Month					Maximum		Minimum		Mean		Run-off in acre-feet	
October.....					67		16		37.0		2,280	
November.....					36		12		19.3		1,150	
December.....					12		5.4		8.45		520	
January.....							6.8		10.5		643	
February.....					11		3.8		7.13		396	
March.....					30		7.6		17.9		1,100	
April.....					21		7.6		13.7		818	
May.....					67		10		34.4		2,110	
June.....					120		.6		25.9		1,540	
July.....					110		2.7		18.8		1,150	
August.....					27		.3		5.59		344	
September.....					15		.6		5.28		314	
The year.....					120		.3		17.1		12,400	

• Estimated.

## RIO BONITO AT HONDO, N.MEX.

LOCATION.—Water-stage recorder in NE¼NW¼ sec. 4, T. 11 S., R. 17 E., at Hondo, half a mile above confluence with Rio Ruidoso. Prior to Feb. 4 at site a quarter of a mile upstream.

RECORDS AVAILABLE.—October 1930 to September 1932. Records August to September 1930 published by State engineer.

DISCHARGE.—Maximum during year, about 978 second-feet July 23 (gage height, 4.46 feet); no flow during several periods.

1930-33: Maximum, about 5,000 second-feet Sept. 17, 1931 (gage height, about 16.0 feet); no flow at times.

REMARKS.—Records fair except those estimated, which are poor. Diversions for irrigation above station.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Apr.	May	June	July	Aug.	Sept.
1.....	32	9.2	* 1	0	0	0	2.9	13	30	3.8	8.4
2.....	32	8.5		0	0	0	0	11	28	6.9	7.4
3.....	31	8.9		0	0	0	9.9	10	24	14	10
4.....	* 20	8.5		0	0	0	3.8	12	24	3.8	6.9
5.....		7.9	0	0	0	1.3	1.2	11	15	3.2	6.2
6.....		8.9	0	0	0	3.0	.3	6.2	15	3.2	5.2
7.....		9.9	0	0	0	1.0	4.8	1.3	26	0	0
8.....	8.5	10	0	* 0	0	0	6.9	0	26	0	0
9.....		10	0	* 0	.4	0	1.0	0	24	2.8	2.8
10.....	* 8.5	9.2	0	* 0	5.5	0	.2	0	22	* 1.5	5.0
11.....		* 9.5	* 1	* 1	3.8	0	.1	0	22		0
12.....		8.5			4.1	0	3.2	0	20		0
13.....		* 8.4			6.2	.3	21	.8	20		0
14.....	* 8.3	8.5	* 1	.1	4.8	4.6	20	4.1	* 10	.2	.2
15.....	8.2	8.2			.4	1.5	20	1.8	0	.3	.3
16.....	7.9	7.5	1.4	.1	6.6	.2	13	0	16	1.2	* 10
17.....		7.2	0	.1	1.7	0	5.8	.4	9.4	.3	
18.....		6.8	0	.1	0	0	7.4	26	7.9	.4	
19.....		6.5	0	.1	0	0	10	44	5.2	.4	
20.....	* 13	6.5	0	.1	.8	0	7.4	46	1.2	.5	6.2
21.....		6.2	0	.1	2.3	0	20	94	2.8	.6	32
22.....		18	6.5	0	.1	0	24	62	1.7	.7	* 5
23.....		12	6.8	0	.1	0	.7	23	68	.8	0
24.....	14	6.5	0	.1	0	.2	21	108	121	64	* 1
25.....		14	0	.1	0	0	16	86	59	127	
26.....		* 12	0	.1	1.7	0	11	64	37	77	
27.....			0	.1	1.8	.1	6.9	65	21	40	
28.....			0	0	0	.1	7.4	59	16	31	* 1
29.....			0	.1	0	.9	8.4	42	13	23	
30.....	11	0	0	0	2.6	8.9	32	8.9	16	16	
31.....	9.9	0	0	0	0	12	12	7.9	10	10	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....			14.2	875
November.....	10		7.36	438
December.....		0	.30	19
January.....		0	.06	4
February.....	6.6	0	1.43	80
April.....	4.6	0	.55	33
May.....	24	0	9.60	590
June.....	108	0	28.9	1,720
July.....	121	0	21.4	1,810
August.....	127		14.1	868
September.....	32	0	5.53	329
The year.....	127	0	8.66	6,270

\* Estimated.

NOTE.—No flow during March.

## RIO FELIX NEAR HAGERMAN, N.MEX.

LOCATION.—Water-stage recorder in sec. 3, T. 14 S., R. 26 E., a quarter of a mile below State highway 2, 1.5 miles north of Hagerman, and 1.6 miles above mouth.

RECORDS AVAILABLE.—March 1932 to September 1933.

DISCHARGE.—Maximum during year, about 6,120 second-feet June 1 (gage height, 10.14 feet); minimum, 7.9 second-feet Aug. 14–15, 27.

1932–33: Maximum, about 20,000 second-feet Sept. 24, 1932 (gage height, 19.5 feet); minimum, 6.4 second-feet Aug. 17, 1932.

REMARKS.—Records good below 70 second-feet, poor above. Diversions for irrigation above station.

*Discharge, in second-feet, 1932–33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	* 40	14	16	35	20	16	12	15	916	10	12	10
2.....	* 35	14	13	39	18	13	11	15	76	11	10	10
3.....	* 35	14	13	37	17	14	12	16	18	11	9.8	11
4.....	* 30	14	15	31	17	14	13	14	16	10	10	13
5.....	25	20	15	28	17	15	9.8	14	14	10	10	12
6.....	25	39	13	26	16	13	10	15	15	10	10	12
7.....	24	32	13	27	13	13	11	15	13	11	9.8	12
8.....	23	21	15	38	* 16	13	14	16	13	10	9.8	14
9.....	22	15	14	33	11	11	14	16	11	11	10	13
10.....	21	13	21	11	11	13	17	10	12	12	9.8	12
11.....	19	13	* 25	18	* 20	10	13	16	9.8	10	9.3	10
12.....	19	14	17	25	11	13	16	9.8	11	11	8.9	10
13.....	18	13	43	17	24	13	17	9.3	10	10	8.4	10
14.....	19	13	43	15	24	13	17	10	10	10	7.9	9.8
15.....	17	13	44	15	33	14	17	11	11	11	7.9	9.3
16.....	17	12	55	18	24	* 10	15	18	9.8	10	8.4	10
17.....	17	12	55	17	22	15	15	18	11	11	8.4	10
18.....	17	13	52	30	22	15	17	13	11	11	8.9	10
19.....	17	13	46	44	32	15	17	10	11	11	8.9	10
20.....	16	13	46	34	30	15	15	10	12	12	8.4	9.8
21.....	16	13	47	52	19	10	14	15	11	13	8.9	10
22.....	17	13	37	64	16	9.8	13	12	10	15	8.4	11
23.....	16	13	36	49	15	9.8	13	12	12	14	8.4	10
24.....	16	14	46	39	15	11	13	12	10	13	8.9	10
25.....	15	15	51	35	15	12	13	11	11	13	9.3	10
26.....	15	16	51	31	21	11	14	10	10	11	8.4	10
27.....	14	15	43	41	24	11	15	11	10	12	13	10
28.....	14	13	41	33	23	10	13	10	10	12	16	10
29.....	14	12	28	36	-----	10	15	10	11	11	11	10
30.....	15	14	24	42	-----	10	15	12	12	12	12	10
31.....	15	-----	28	30	-----	10	-----	13	-----	13	9.8	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	40	14	20.1	1,240
November.....	39	12	15.4	918
December.....	55	13	32.8	2,020
January.....	64	15	32.0	1,970
February.....	33	-----	20.5	1,140
March.....	16	-----	11.2	691
April.....	15	9.8	13.3	791
May.....	18	10	14.5	891
June.....	916	9.3	43.8	2,600
July.....	15	10	11.4	698
August.....	16	7.9	9.70	596
September.....	14	9.3	10.6	633
The year.....	916	7.9	19.6	14,200

\* Estimated.



## COTTONWOOD CREEK NEAR LAKE ARTHUR, N. MEX.

LOCATION.—Water-stage recorder in NE $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 22, T. 16 S., R. 26 E., 1½ miles above mouth and 3½ miles south of Lake Arthur.

RECORDS AVAILABLE.—March 1932 to September 1933.

DISCHARGE.—Maximum not determined; minimum, 0.6 second-foot Aug. 8-11. 1932-33: Maximum, about 1,070 second-feet Sept. 28, 1932 (gage height, 10.32 feet); minimum, 0.5 second-foot July 24, 1932.

REMARKS.—Records good below 50 second-feet, fair above. Diversions for irrigation above station.

## Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	* 80	29	22	21	11	14	10	14	5.4	3.4	0.9	5.3
2.....	* 75	28	21	21	12	14	9.6	12	5.4	3.2	.8	5.0
3.....	* 65	28	22	21	12	14	12	12	5.0	3.1	.8	4.2
4.....	* 60	28	21	21	11	14	12	13	4.9	2.7	1.0	3.9
5.....	61	28	22	20	12	13	12	13	4.6	3.0	.8	3.3
6.....	48	27	22	21	12	14	13	14	4.3	2.1	.8	1.9
7.....	44	27	22	21	12	13	11	12	4.1	2.1	.7	1.7
8.....	42	26	21	20	11	13	12	11	5.3	2.1	.6	1.5
9.....	40	26	* 21	20	13	13	12	13	5.3	2.8	.6	1.3
10.....	38	26	* 21	20	* 13	13	11	11	3.5	3.2	.6	1.3
11.....	36	25	* 21	20	15	13	10	11	3.1	1.8	.6	1.4
12.....	36	25	* 21	20	15	13	11	12	2.8	1.7	.7	1.4
13.....	36	25	21	19	15	* 13	9.3	14	3.8	1.6	.7	1.2
14.....	36	25	21	18	14	* 13	10	14	3.7	1.6	.7	3.6
15.....	36	25	22	18	14	* 13	15	15	5.4	1.7	.8	4.1
16.....	35	25	22	17	14	* 13	15	12	5.8	1.5	1.0	3.7
17.....	35	25	23	17	13	* 14	14	10	4.9	1.6	1.6	5.2
18.....	34	25	23	16	14	* 14	12	10	5.3	1.6	1.4	4.5
19.....	33	24	23	15	13	* 14	11	11	4.8	1.5	1.8	4.1
20.....	32	24	23	15	12	* 14	11	12	5.1	1.3	1.3	4.2
21.....	33	24	23	15	13	14	11	11	4.8	1.6	1.4	4.1
22.....	34	24	23	15	13	13	12	11	4.6	.9	1.4	4.0
23.....	33	23	22	15	13	13	13	9.3	4.6	1.0	1.6	4.0
24.....	33	22	23	15	14	13	14	10	5.6	1.4	3.1	4.1
25.....	32	22	23	15	14	12	16	8.8	5.6	1.5	4.5	4.3
26.....	32	22	22	14	14	12	13	6.0	4.4	1.1	4.6	4.3
27.....	31	22	22	13	14	12	11	6.0	4.1	1.0	4.6	4.1
28.....	31	22	22	14	14	12	11	6.6	4.1	1.5	4.9	4.2
29.....	30	22	22	13	-----	12	11	6.6	3.9	1.2	5.0	4.1
30.....	30	21	21	* 13	-----	12	15	5.8	3.5	1.0	16	4.2
31.....	29	-----	21	* 12	-----	12	-----	5.5	-----	1.0	5.9	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	80	29	40.0	2,460
November.....	29	21	24.8	1,480
December.....	23	21	21.9	1,350
January.....	21	12	17.3	1,060
February.....	-----	11	13.0	.724
March.....	14	12	13.1	803
April.....	16	9.3	12.0	714
May.....	15	5.5	10.7	660
June.....	5.8	2.8	4.59	273
July.....	3.4	.9	1.83	113
August.....	16	.6	2.30	141
September.....	5.3	1.2	3.47	207
The year.....	80	.6	13.8	9,980

\* Estimated.

## MADERA CANYON NEAR TOYAHVALE, TEX.

LOCATION.—Water-stage recorder in Jeff Davis County, 11 miles above confluence with Toyah Creek and 12 miles southwest of Toyahvale, Reeves County.

Prior to Dec. 14, 1932, staff gage at same location with same datum.

DRAINAGE AREA.—54 square miles.

RECORDS AVAILABLE.—July 1932 to September 1933.

DISCHARGE.—Maximum stage during period July 28, 1932, to Sept. 30, 1933, 8.00 feet Sept. 29, 1932 (discharge not determined); no flow at times.

REMARKS.—Records good below and poor above 100 second-feet except those for period July 28 to Dec. 14, 1932, which are poor. No diversions.

## Discharge, in second-feet, 1932-33

Day	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	June	July	Aug.	Sept.
1.....	0	21	530	2.1		1.1	0.2	0.5	0	3.5	0	102
2.....	0	34	141	2.1		.9	.2	.5	0	2.6	0	119
3.....	0	85	108	2.1		.8	.2	.4	0	2.0	0	44
4.....	0	38	51	2.1		.7	.2	.4	0	.7	0	24
5.....	0	42	40	2.1		.7	.2	.4	0	.2	0	19
6.....	0	87	40	2.1		.7	.2	.4	0	.1	0	13
7.....	0	659	30	2.1	1.4	.7	.2	.3	0	.1	0	9.1
8.....	0	351	22			.6	.2	.3	0	0	0	7.2
9.....	0	138	16			.6	.2	.3	0	0	0	6.9
10.....	0	138	11			.6	.2	.3	0	0	0	103
11.....	0	54	16			.5	.2	.2	0	0	0	104
12.....	0	30	16			.5	.2	.1	0	0	0	67
13.....	0	11	11			.5	.2	.1	0	0	0	58
14.....	0	14	7.5			.4	.2	.1	0	0	0	70
15.....	0	14	7.5		1.2	.4	.2	.1	0	0	0	39
16.....	0	14	16		1.1	.4	.2	.1	0	0	0	27
17.....	0	14	7.5		1.1	.4	.2	.1	0	0	0	19
18.....	0	14	7.5		1.1	.4	.2	.1	0	0	0	15
19.....	0	9.0	7.5	1.4	.9	.4	.2	.1	0	0	0	81
20.....	0	5.1	7.5		.7	.3	.2	.1	0	0	0	139
21.....	0	5.1	7.5		.7	.2	.2	.1	0	0	0	28
22.....	0	5.1	7.5		.8	.2	.2	0	0	0	0	16
23.....	0	9.0	7.5		2.3	.2	.1	0	0	0	0	11
24.....	0	9.0	7.5		2.1	.2	.1	0	0	5.3		7.9
25.....	0	9.0	7.5		1.8	.3	.3	0	0	24		5.6
26.....	0	9.0	7.5		1.6	.3	.4	0	0	11		4.4
27.....	0	9.0	7.5		1.3	.3	.5	0	0	124		3.5
28.....	27	134	4.4		1.3	.3	.5	0	17	0		78
29.....	321	2,190	4.4		1.2	.3		0	5.9	0		42
30.....	810	2,040	4.4		1.6	.3		0	5.8	0		213
31.....	94		4.4		1.3	.3		0		0		60

Month	Maximum	Minimum	Mean	Run-off in acre-feet
1932				
July 28-31.....	0	0	0	0
August.....	810	0	40.4	2,480
September.....	2,190	5.1	206	12,300
The period.....				14,800
1932-33				
October.....	530	4.4	37.5	2,310
November.....			1.56	93
December.....			1.35	83
January.....	1.1	.2	.47	29
February.....	.5	.1	.22	12
March.....	.5	0	.16	9.8
June.....	17	0	.96	57
July.....	3.5	0	.30	18
August.....	213	0	18.0	1,110
September.....	139	2.1	38.3	2,280
The year.....	530	0	8.28	6,000

NOTE.—No flow during April and May 1933.

*Discharge measurements of Madera Canyon to determine seepage from 13.3 miles above to 3.5 miles above Toyahvale, Tex., 1932-33*

Date	Stream	Location	Distance from initial point (miles)	Discharge (second-feet)			Total gain or loss
				Main stream	Tributary	Gain or loss in section	
1932							
Sept. 1	Madera Canyon	Gage	13.3	23.2			
1	do	Madera Springs road crossing	7.1	3.9		-19.3	-19.3
1	do	8.2 miles below gage	5.1	0		-3.9	-23.2
2	do	Gage	13.3	67.5			
2	do	Madera Springs road crossing	7.1	41.8		-25.7	-25.7
2	do	8.2 miles below gage	5.1	2.2		-39.6	-65.3
2	do	Duncan Kingston crossing	3.5	.5		-1.7	-67.0
3	do	Gage	13.3	41.8			
3	do	Madera Springs road crossing	7.1	16.1		-25.7	-25.7
3	do	8.2 miles below gage	5.1	8.3		-7.8	-33.5
3	do	Duncan Kingston crossing	3.5	4.5		-3.8	-37.3
3	do	Gage	13.3	28.7			
12	do	Mouth	11.3		0.5		
12	Madera Springs Creek	Madera Springs road crossing	7.1	7.2		-22.0	-22.0
12	Madera Canyon	8.2 miles below gage	5.1	2.5		-4.7	-26.7
15	do	Gage	13.3	14.5			
15	do	Madera Springs road crossing	7.1	.3		-14.2	-14.2
15	do	8.2 miles below gage	5.1	.2		-1.1	-14.3
21	do	Gage	13.3	5.2			
21	do	Rock outcrop	7.5	0		-5.2	-5.2
21	do	Madera Springs road crossing	7.1	.3		+3	-4.9
21	do	0.2 miles below Madera Springs road crossing	6.9	0		-3	-5.2
21	do	8.2 miles below gage	5.1	.6		+6	-4.6
24	do	Gage	13.3	6.7			
24	do	Mouth	13.2		.3		
24	do	1.5 miles below gage	11.8	6.7		-3	-3
24	do	2.5 miles below gage	10.8	1.0		-5.7	-6.0
24	do	3.5 miles below gage	9.8	.2		-8	-6.8
Oct. 6	do	Gage	13.3	37.3			
6	Madera Springs Creek	Mouth	11.3		1.5		
6	Madera Canyon	2.5 miles below gage	10.7	22.6		-16.2	-16.2
6	do	3.7 miles below gage	9.6	4.5		-18.1	-34.3
6	do	Limestone outcrop	9.3	0		-4.5	-38.8
1933							
Aug. 27	do	Gage	13.3	17.5			
27	do	Madera Springs road crossing	7.1	11.4		-6.1	-6.1
27	do	Duncan Kingston crossing	3.5	0		-11.4	-17.5

Discharge measurements of Toyah Creek to determine seepage from 1.2 miles above to 8.8 miles below Balmorhea, Tex., 1932-33

Date	Stream or diversion	Location	Distance from initial point (miles)	Discharge (second-feet)			Total gain or loss
				Main stream	Tributary	Diversion	
Nov. 6	Toyah Creek	Aloma settlement	1.0	13.6			
6	Project waste	0.9 mile above Balmorhea	3.9		0.3		
6	Saragosa Springs Creek	150 feet above mouth	4.7		9.9		
6	Toyah Creek	500 feet below Balmorhea Bridge	4.8	29.1			+5.3
6	do	500 feet below Moore Dam	3.8	30.7			+6.9
6	do	Saragosa Dam	3.8	28.0			-1.7
Jan. 23	do	1.3 miles above Balmorhea Bridge	4.7	0			
23	Saragosa Springs Creek	200 feet above mouth	4.7		8.2		
23	Toyah Creek	300 feet below Balmorhea Bridge	4.8	12.5			+4.3
23	do	300 feet below Moore Dam	3.8	12.8			+3.6
23	do	Saragosa Dam	3.8	10.5			-2.3
Mar. 14	do	United States Highway 200 crossing	1.2	2.5			
14	do	1.3 miles above Balmorhea	3.7	0			-2.5
14	Saragosa Springs Creek	200 feet above mouth	4.7		6.7		
14	Toyah Creek	500 feet below Balmorhea Bridge	4.8	9.4			+2.7
14	Moore Canal	150 feet below takeout	5.8			5.3	
14	Toyah Creek	500 feet below Moore Dam	3.8	4.8			+7
14	Saragosa Canal	50 feet below takeout	8.8			6.0	
14	Toyah Creek	50 feet below Saragosa Dam	8.8	.2			+2.3
May 16	do	1.3 miles above Saragosa Dam	8.0	0			
16	Saragosa Springs Creek	500 feet above mouth	4.7		6.4		
16	Moore Canal	500 feet below Balmorhea Bridge	4.8	9.2			+2.8
16	Toyah Creek	2,000 feet below Moore Dam	5.8			7.3	
16	Saragosa Canal	500 feet below Moore Dam	5.8	1.6			+2.5
16	Toyah Creek	50 feet below Saragosa Dam	8.8			4.0	
July 11	do	1.3 miles above Balmorhea Bridge	8.8	0			+4.9
11	Saragosa Springs Creek	200 feet above mouth	4.7		5.6		
11	Toyah Creek	500 feet below Balmorhea Bridge	4.8	8.3			+2.7
11	Moore Canal	2,000 feet below Moore Dam	5.8			7.0	
11	Toyah Creek	500 feet below Moore Dam	5.8				+3
11	Saragosa Canal	125 feet below Saragosa Dam	8.8	1.6			+3.0
11	Toyah Creek	50 feet below Saragosa Dam	8.8	0			+4.9

Discharge measurements of Little Aguja Canyon to determine seepage from 15.5 miles above to 2.2 miles above Toyahvale, Tex., 1932

Date	Stream	Location	Distance from initial point (miles)	Discharge (second-feet)			Total gain or loss
				Main stream	Tribu- tary	Gain or loss in section	
Aug. 17	Little Aguja Canyon	Temporary staff gage	15.5	1.3			
17	do	2.8 miles below staff gage	12.7	1.0		-0.3	-0.3
17	South Fork of Little Aguja Canyon	0.2 mile above mouth	11.5		0.4		
17	Little Aguja Canyon	5.5 miles below gage	10.0	.4		-1.0	-1.3
17	do	7.0 miles below gage	8.5	.6		+2	-1.1
17	do	8.5 miles below gage	7.0	.4		-2	-1.3
17	do	9.6 miles below gage	5.9	.2		-2	-1.5
17	do	300 feet above limestone bluff	4.3	.1		-1	-1.6
17	do	Upper end of limestone bluff	4.3	0		-1	-1.7
17	do	Lower end of limestone bluff	4.0	.2		+2	-1.5
17	do	Mouth	2.2	0		-2	-1.7
17	do	3 miles below gage	2.5	12.1			
Sept. 1	do	0.2 mile above mouth	11.5		6.4		
1	South Fork of Little Aguja Canyon	Mouth	2.2	0		-18.5	-18.5
13	do	50 feet below mouth of South Fork	11.3	22.8			
13	do	100 feet above limestone bluff	4.3	0		-22.8	-22.8
13	do	50 feet above limestone bluff	4.3	.1		+1	-22.7
13	do	0.1 mile below limestone bluff	3.9	0		-1	-22.8
14	do	50 feet below mouth of South Fork	11.3	11.2			
14	do	0.5 mile below white bluff	8.2	0		-11.2	-11.2
20	do	60 feet below mouth of South Fork	11.3	4.1			
20	do	150 feet above upper Durcan road	9.5	0		-4.1	-4.1
20	do	100 feet above white bluff	8.7	.6		+6	-3.5
20	do	600 feet below white bluff	8.6	0		-6	-4.1
20	do	Second white bluff	7.8	.6		+6	-3.5
20	do	0.1 mile below second white bluff	7.7	0		-6	-4.1
Oct. 6	do	200 feet below mouth of South Fork	11.3	26.8			
6	do	Lower Durcan road crossing	6.0	26.5		-3	-3
6	do	Limestone bluff	4.3		.2		
6	Wet-weather springs	50 feet below limestone bluff	3.9	2.2		-24.5	-24.8
6	Little Aguja Canyon	4,000 feet above mouth	3.0	0		-2.2	-27.0

*Discharge measurements of Big Aguja Canyon to determine seepage from 11.8 miles above to 2.2 miles above Toyahvale, Tex., 1932*

Date	Stream	Location	Distance from initial point (miles)	Discharge (second-feet)			Total gain or loss
				Main stream	Tributary	Gain or loss in section	
Sept. 1	Big Aguja Canyon.	Temporary staff gage.	11.8	18.7			
1	do.	Above mouth of Seven Springs Creek.	7.3	4.4		-14.3	-14.3
1	Seven Springs Creek.	Mouth.	7.2				
1	Big Aguja Canyon.	do.	2.2	0	0.5	-4.9	-19.2
3	do.	Temporary staff gage.	11.8	45.4			
3	do.	Above mouth of Seven Springs Creek.	7.3	35.7		-9.7	-9.7
3	Seven Springs Creek.	Mouth.	7.2		.4		
3	Big Aguja Canyon.	do.	2.2	19.2		-16.9	-26.6
13	do.	Temporary staff gage.	11.8	8.6			
13	Walnut Canyon.	Mouth.	7.5		.2		
13	Big Aguja Canyon.	Above mouth of Seven Springs Creek.	7.3	5.6		-3.2	-3.2
13	Seven Springs Creek.	Mouth.	7.2		4.8		
13	Big Aguja Canyon.	do.	2.2	0		-10.4	-13.6
Oct. 6	do.	Temporary staff gage.	11.8	10.3			
6	Break in Texas & Pacific pipe line.	Above pipe-line crossing.	9.6	5.6		-4.7	-4.7
6	Big Aguja Canyon.	Canyon crossing.	9.5		1.5		
6	Walnut Canyon.	Below pipe-line crossing.	9.5	7.1		0	-4.7
6	Big Aguja Canyon.	Mouth.	7.5		.6		
6	Seven Springs Creek.	Above mouth of Seven Springs Creek.	7.3	14.0		+6.3	+1.6
6	do.	Mouth.	7.2		6.1		
6	Big Aguja Canyon.	3 miles above mouth.	5.2	0		-20.1	-18.5
6	do.	1/4 mile above mouth.	2.7	0		0	-18.5
6	do.	0.4 mile above mouth.	2.6	.1		+1	-18.4
6	do.	Mouth.	2.2			0	-18.4

## PHANTOM LAKE SPRING NEAR TOYAHVALE, TEX.

LOCATION.—Water-stage recorder on outlet canal 800 feet below source of spring and 4 miles southwest of Toyahvale, Reeves County.

RECORDS AVAILABLE.—December 1931 to December 1933 (discontinued).

DISCHARGE.—Maximum during period Dec. 21, 1931, to Dec. 31, 1933, 116 second-feet Oct. 2, 3, 1932 (gage height, 2.02 feet); minimum, 12 second-feet during several periods in June, July, and August 1932.

REMARKS.—Records prior to Sept. 4, 1933, good; after that date fair.

*Discharge, in second-feet, 1931-33*

Day	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1931-32										
1.....		13	13	20	16	} ° 13		12	13	° 18
2.....		13	13	19	16			12	12	° 18
3.....		13	13	17	16			13	12	18
4.....		13	13	16	16		13	13	12	° 19
5.....		13	13	16	16		13	13	12	° 23
6.....		13	13	18	15	} ° 14	13	12	12	° 26
7.....		13	13	18	14		13	12	12	34
8.....		13	13	20	14		13	° 13	12	42
9.....		13	13	21	14		13	13	13	45
10.....		13	13	22	14		13	13	13	45
11.....		13	13	22	14	} ° 14	13	12	13	46
12.....		14	13	22	° 14		13	12	13	45
13.....		13	13	22			13	13	13	42
14.....		13	13	21			13	13	13	40
15.....		13	13	20			13	13	13	37
16.....		13	13	20		} ° 13	13	13	13	35
17.....		13	13	19			13	13	13	34
18.....		13	13	19			13	13	13	33
19.....		13	13	18			13	13	13	° 32
20.....		13	13	° 17			13	13	13	31
21.....	° 13	13	13	° 17	° 14	} ° 13	13	13	12	30
22.....		13	15	° 17			13	13	12	29
23.....		13	20	° 17			13	13	12	° 26
24.....		13	19	° 16			13	13	12	26
25.....	° 13	13	22	° 16			13	13	12	26
26.....		13	24	° 16		} ° 13	12	13	12	25
27.....		13	25	° 16			12	13	12	28
28.....		13	24	16			12	13	12	34
29.....	° 13	13	22	16			12	° 13	13	54
30.....	° 13	13		16			12	13	14	89
31.....	13	13		16				13	17	

° Estimated.

° Partly estimated.

Discharge, in second-feet, of Phantom Lake Spring near Toyahvale, Tex., 1931-33—  
Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1932-33												
1.....	104	31	21	18	17	16	16	16	15	• 15	14	} • 42
2.....	114	30	21	18	17	16	16	16	16	• 15	14	
3.....	114	30	21	18	17	16	16	17	• 16	15	14	
4.....	109	29	21	18	17	16	16	17	• 16	15	14	
5.....	102	28	21	18	17	16	16	17	• 16	15	14	
6.....	88	28	21	18	17	16	16	17	• 16	15	14	46
7.....	82	27	21	18	17	16	16	• 17	• 16	• 15	14	44
8.....	75	26	21	18	17	16	16	• 17	16	• 15	14	43
9.....	73	26	21	18	17	16	16	• 17	16	• 15	14	43
10.....	70	26	20	18	17	16	16	• 17	16	15	14	42
11.....	67	25	20	18	17	16	16	17	16	14	14	42
12.....	64	25	20	18	17	16	16	17	15	14	14	43
13.....	63	25	20	18	17	16	16	17	15	14	14	43
14.....	61	24	20	18	17	16	16	16	15	14	• 14	} • 36
15.....	60	24	20	18	17	16	16	16	15	14	• 14	
16.....	57	24	19	18	17	16	16	16	15	14	• 14	
17.....	55	24	19	18	17	16	16	16	15	14	14	
18.....	53	23	19	18	17	16	16	16	15	14	14	
19.....	51	23	19	18	17	16	16	16	14	14	14	} • 28
20.....	49	23	19	18	17	16	16	16	14	14	14	
21.....	46	23	19	18	17	16	16	16	14	14	14	• 28
22.....	44	23	19	18	17	16	16	16	15	14	14	• 28
23.....	43	23	19	18	17	16	16	16	15	14	14	27
24.....	42	23	19	18	17	16	16	16	15	14	14	26
25.....	39	23	19	18	17	16	16	16	15	14	• 14	25
26.....	38	22	19	18	16	16	16	16	15	14	• 14	24
27.....	37	22	19	18	16	16	16	16	15	14	• 14	22
28.....	35	22	19	17	16	16	16	16	• 15	14	14	21
29.....	33	21	19	17	16	16	16	15	• 15	14	16	21
30.....	32	21	19	17	16	16	16	15	• 15	14	} • 24	21
31.....	31		18	17	16	16	16	15		• 14		

Day	Oct.	Nov.	Dec.	Day	Oct.	Nov.	Dec.	Day	Oct.	Nov.	Dec.
1933				1933				1933			
1.....	20	16	} • 16	11.....	17	16	} • 16	21.....	16	16	• 16
2.....	20	16		12.....	17	15		22.....	16	16	16
3.....	20	16		13.....	17	15		23.....	16	16	16
4.....	19	16		14.....	17	15		24.....	16	16	16
5.....	19	16		15.....	17	16		25.....	16	16	16
6.....	19	16	} • 16	16.....	17	16	} • 16	26.....	16	} • 16	16
7.....	19	16		17.....	17	16		27.....	16		16
8.....	18	16		18.....	17	16		28.....	16		16
9.....	18	16		19.....	17	16		29.....	16		16
10.....	17	16		20.....	16	16		30.....	16		16
								31.....	16		16

Month	Maximum	Minimum	Mean	Run-off in acre-feet
1931-32				
December 21-31.....			13.0	284
January.....	14	13	13.0	799
February.....	25	13	15.3	880
March.....	22	16	18.3	1,130
April.....			14.4	857
May.....			13.5	830
June.....	13	12	12.8	762
July.....	13	12	12.8	787
August.....	17	12	12.7	781
September.....	89	18	34.3	2,040
The period.....				9,150

• Estimated.

• Partly estimated or interpolated.



*Discharge, in second-feet, of Phantom Lake Spring near Toyahvale, Tex., 1931-33—*  
Continued

Month	Maximum	Minimum	Mean	Run-off in acre-feet
<b>1932-33</b>				
October.....	114	31	62.3	3,830
November.....	31	21	24.8	1,480
December.....	21	18	19.7	1,210
January.....	18	17	17.9	1,100
February.....	17	16	16.9	939
March.....	16	16	16.0	984
April.....	16	16	16.0	952
May.....	17	15	16.3	1,000
June.....	16	14	15.2	904
July.....	15	14	14.3	879
August.....		14	14.7	904
September.....		21	35.1	2,090
The year.....	114	14	22.5	16,300
<b>1933</b>				
October.....	20	16	17.2	1,060
November.....			15.9	946
December.....			16.0	984
The period.....				2,990

## GIFFEN SPRINGS AT TOYAHVALE, TEX.

LOCATION.—Water-stage recorder 125 feet below source of springs and a quarter of a mile west of Toyahvale, Reeves County.

RECORDS AVAILABLE.—October 1931 to September 1933 (discontinued).

REMARKS.—Records good except those estimated, which are fair.

## Discharge, in second-feet, 1931-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
<b>1931-32</b>												
1.....		4.3	* 3.7	3.6	4.5	4.6	4.7	4.7	4.6	4.7	* 4.7	* 4.7
2.....		4.2	* 3.7	3.6	4.5	4.6	4.7	4.7	4.7	4.7	4.7	4.7
3.....		4.1	3.7	3.6	4.5	4.6	4.7	4.6	4.7	4.7	4.7	4.7
4.....		4.1	3.6	3.6	4.5	4.6	4.7	4.6	4.7	4.7	4.7	
5.....		4.1	3.6	3.6	4.5	4.6	4.7	4.6	4.7	4.7	4.7	
6.....		4.1	3.6	3.6	4.5	4.6	4.7	4.6	4.7	4.7	4.7	
7.....		4.1	3.6	3.6	4.5	4.6	4.7	4.6	4.7	4.7	4.7	
8.....		* 4.1	3.6	3.6	4.5	4.6	4.7	4.6	4.6	4.7	4.7	* 4.8
9.....		* 4.1	3.6	3.6	4.5	4.6	4.7	4.6	4.6	4.7	4.7	
10.....		* 4.1	3.6	3.6	4.5	4.6	4.7	4.6	4.6	4.7	4.7	
11.....		* 3.9	3.6	3.6	4.5	4.6	* 4.7	4.6	4.6	4.7	4.6	
12.....		* 3.9	3.6	3.6	4.5	4.6	* 4.7	4.6	4.6	4.7	4.6	
13.....		3.9	3.6	3.6	4.5	* 4.6	* 4.7	4.6	4.6	4.6	4.6	
14.....		3.8	3.6	3.6	4.5	* 4.6	* 4.7	4.6	4.6	4.6	4.6	* 4.9
15.....		3.8	3.6	3.6	4.5	4.6	* 4.7	4.6	4.6	4.6	4.6	
16.....		3.8	3.6	3.6	4.6	4.6	* 4.7	4.6	4.6	4.6	4.6	* 5.2
17.....		3.8	3.6	3.6	4.6	4.6	* 4.7	4.6	4.6	4.6	4.6	* 5.4
18.....		3.8	* 3.6	3.6	4.6	4.6	4.7	4.6	4.6	4.6	4.6	
19.....		3.8	* 3.6	3.6	4.6	4.6	4.7	4.6	4.6	4.6	4.6	
20.....		3.8	3.6	3.6	4.6	4.6	4.7	4.6	4.6	4.6	4.6	
21.....		3.8	3.6	4.1	4.6	4.6	4.7	4.6	4.6	4.6	4.6	
22.....		3.8	3.6	4.2	4.6	4.6	4.7	* 4.6	4.6	4.6	4.6	
23.....		3.7	3.6	4.3	4.6	4.6	4.7	* 4.6	4.6	4.6	4.6	
24.....		3.7	3.6	4.3	4.6	4.6	4.7	* 4.6	4.6	4.6	4.6	* 5.3
25.....	4.7	3.7	3.6	4.3	4.6	4.6	4.7	* 4.6	4.7	4.6	4.6	
26.....	4.7	3.7	3.6	4.5	4.6	4.6	4.7	* 4.6	4.7	4.6	4.6	
27.....	4.7	3.7	3.6	4.5	4.6	4.6	4.7	* 4.6	4.7	4.6	4.6	
28.....	4.7	3.7	3.6	4.5	4.6	4.6	4.7	* 4.6	4.7	4.6	4.6	
29.....	4.6	3.7	3.6	4.5	4.6	4.6	4.7	4.6	4.7		* 4.7	
30.....	4.6	3.7	3.6	4.5		4.7	4.7	4.6	4.7	* 4.6	* 4.7	
31.....	4.5		3.6	4.5		4.7		4.6			4.7	

\* Estimated, interpolated, or partly estimated.

Discharge, in second-feet, of Giffen Springs at Toyahvale, Tex., 1931-33—Contd.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1932-33												
1					4.9		5.1	4.9	• 5.0	4.9	4.9	• 5.3
2					4.9		5.1	4.9	• 5.0	4.9	4.7	• 5.4
3					4.9		5.1	4.9	• 5.0	4.9	4.7	
4					• 4.9		5.0	4.9	5.0	4.9	4.7	
5					• 4.9	5.0	5.0	4.9	5.0	4.9	4.7	
6					• 4.9		5.0	4.9	5.0	4.9	4.7	
7					• 4.9		5.0	4.9	5.0	4.9	4.7	
8					• 4.9		5.0	4.9	5.0	• 4.9	4.7	
9					• 4.9	5.1	5.0	4.9	5.0	• 4.9	4.7	
10					• 4.9	5.1	5.0	4.9	5.0	• 4.9	4.7	
11					4.9	5.1	5.0	4.9	5.0	• 4.9	4.7	
12					4.9	5.1	5.0	4.9	5.0	• 4.9	4.7	
13					4.9	5.1	5.0	4.9	5.0	• 4.9	4.7	
14					4.9	5.1	5.0	4.9	4.9	4.9	4.7	
15					4.9	5.1	5.0	4.9	4.9	4.9	4.7	
16	6.1	5.9	5.6	5.3	4.9	5.1	5.0	4.9	4.9	4.9	4.6	
17						5.1	• 5.0	4.9	4.9	4.9	4.6	
18						5.1	• 5.0	4.9	4.9	4.9	4.6	
19						5.1	• 5.0	4.9	4.9	4.9	4.6	
20						5.1	5.0	5.0	4.9	4.9	4.6	
21						5.1	• 5.0	5.0	4.9	4.9	4.6	
22						5.1	• 5.0	5.0	4.9	4.9	4.6	
23						5.1	• 5.0	5.0	4.9	4.6	4.6	
24						5.1	• 5.0	5.0	4.9	4.5	4.6	
25						5.1	• 5.0	5.0	4.9	4.3	4.6	
26						5.1	5.0	5.0	4.9	4.3	• 4.6	
27						5.1	5.0	5.0	4.9	4.3		
28						5.1	4.9	5.0	4.9	4.6		
29						5.1	4.9	5.0	4.9	4.9	4.9	
30						5.1	4.9	5.0	4.9	4.9		
31				4.9		5.1		5.0		4.9		

Month	Maximum	Minimum	Mean	Run-off in acre-feet
1931-32				
October 25-31	4.7	4.5	4.64	64
November	4.3	3.7	3.89	231
December	3.7	3.6	3.61	222
January	4.5	3.6	3.88	239
February	4.6	4.5	4.55	262
March	4.7	4.6	4.61	283
April			4.70	300
May	4.7	4.6	4.61	283
June			4.65	277
July	4.7	4.6	4.64	285
August	4.7	4.6	4.64	285
September			5.06	301
The period				3,010
1932-33				
October			6.10	375
November			5.90	351
December			5.60	344
January			5.29	325
February			4.94	274
March			5.07	312
April	5.1	4.9	5.00	298
May	5.0	4.9	4.94	304
June	5.0	4.9	4.94	294
July	4.9	4.3	4.81	296
August			4.70	289
September 1-2	5.4	5.3	5.35	21
The period				3,480

\* Estimated, interpolated, or partly estimated.

## SAM SOLOMON SPRINGS AT TOYAHVALE, TEX.

LOCATION.—Source of springs is 200 feet northeast of Toyahvale, Reeves County. Record is total flow of springs and is obtained by combining flow in three outlets to spring, each measured separately.

RECORDS AVAILABLE.—October 1931 to December 1933 (discontinued).

DISCHARGE.—Maximum during period, 71 second-feet Oct. 7-9, 1932; minimum, 30 second-feet Nov. 5-11, 1931, Jan. 22 to Feb. 23, 1932.

REMARKS.—Records good.

*Discharge, in second-feet, 1931-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.		
1931-32														
1.....		b 31	} a 37	}	30	b 36	34	b 32	b 32	32	b 34	b 42		
2.....		31			30	36	34	b 32	b 32	32	b 33	b 43		
3.....		31			30	36	34	b 32	32	b 32	32	b 43		
4.....		31			30	36	34	b 32	32	b 33	32	b 44		
5.....		30			30	35	34	32	32	b 33	32	b 48		
6.....		30	} a 37	}	30	35	b 34	32	32	b 33	32	b 49		
7.....		30			30	35	b 33	32	33	b 33	b 32	b 54		
8.....		b 30			30	35	33	33	33	33	b 32	b 58		
9.....		b 30			30	35	33	33	b 34	b 33	b 32	b 60		
10.....		b 30			30	35	33	33	b 34	33	32	62		
11.....		b 30	} b 35	}	30	35	b 32	32	b 34	33	b 32	63		
12.....					30	b 34	b 32	32	b 33	33	32	64		
13.....					30	b 34	b 32	32	b 33	b 33	32	64		
14.....	b 32				30	b 34	b 32	32	b 33	b 32	32	b 65		
15.....	32				30	34	b 32	32	b 33	b 32	32	b 65		
16.....	32	} a 38	}	}	30	34	b 32	32	b 33	b 33	32	b 64		
17.....	32				30	34	b 32	32	b 33	b 33	32	b 64		
18.....	32				30	34	b 32	32	b 33	b 33	32	b 64		
19.....	32				30	33	b 32	32	b 33	b 33	32	b 63		
20.....	32	b 38			30	33	b 31	32	b 32	b 33	32	b 62		
21.....	32	b 38	} a 36	}	30	33	b 31	32	b 32	b 33	33	b 57		
22.....	b 32				30	33	b 31	32	b 32	b 33	33	b 56		
23.....	b 32	} a 38			} a 30	30	33	b 31	32	b 32	33	b 33	56	
24.....	32					31	33	31	32	b 32	b 33	33	56	
25.....	32					32	b 33	31	32	32	b 33	b 33	55	
26.....	32	} a 37	} a 30	}	34	b 33	32	32	b 32	b 33	33	55		
27.....	32				36	33	32	32	b 32	b 33	33	54		
28.....	32				36	b 33	32	32	32	b 33	32	b 54		
29.....	31				b 35	30	36	b 33	32	32	22	b 34	b 32	b 60
30.....	b 31				a 35	30	-----	33	32	32	32	34	b 37	b 66
31.....	b 31	-----	a 35	30	-----	33	-----	32	-----	b 34	40	-----		

• Estimated.

• Partly estimated or interpolated.

Discharge, in second-feet, of San Solomon Springs, at Toyahvale, Tex., 1931-33—  
Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1932-33												
1.....	66	66	56	b 46	41	40	36	b 36		b 34	b 34	48
2.....	b 68	66	55	b 46	41	40	36	b 36		34	35	51
3.....	b 69	66	55	b 45	41	40	36	b 36		a 34	35	54
4.....	b 70	65	54	b 45	41	40	36	b 36			34	55
5.....	70	b 65	54	b 45	40	40	36	b 36		a 36	34	55
6.....	b 70	64	54	b 44	b 40	40	b 36	36			34	55
7.....	b 71	64	53	b 44	40	39	36	36		a 38	34	55
8.....	b 71	64	53	b 44	40	39	36	36		38	34	55
9.....	b 71	64	53	b 43	40	39	b 36	37	a 36	38	34	55
10.....	b 70	64	52	b 43	40	39	b 36	37		38	35	b 55
11.....	b 70	64	52	b 43	40	38	36	37		38	35	56
12.....	b 70	64	52	b 43	40	38	36	37		37	35	56
13.....	b 70	64	52	b 43	40	38	36	37		37	35	56
14.....	b 70	64	52	b 43	40	38	36	37		37	35	56
15.....	70	64	52	b 42	40	38	36	37		37	35	56
16.....	70	63	51	b 42	40	38	36	37		37	35	56
17.....	70	63	50	b 42	40	38	36	37	b 36	37	35	56
18.....	70	62	49	b 42	40	38	36	37	35	37	b 35	55
19.....	69	62	48	b 42	41	38	36	37	34	37	35	55
20.....	69	62	47	b 42	41	38	36	37	34	37	35	55
21.....	69	b 61	47	b 41	41	37	b 36	37	34	37	35	55
22.....	68	60	47	41	41	37	b 36	37	b 34	a 37	35	56
23.....	68	60	46	41	41	37	36	37	b 34	b 38	35	56
24.....	68	59	46	41	41	37	36	36	b 35	b 38	35	55
25.....	68	59	b 46	41	41	37	b 36	36	b 35	b 38	35	55
26.....	68	58	b 46	41	41	37	36	36	b 35	b 37	35	b 55
27.....	67	58	b 46	41	41	37	36	36	b 35	a 37	35	
28.....	67	57	b 46	41	40	b 37	36	36	b 35	a 36	35	
29.....	67	57	b 46	41		b 36	36	36	b 34	b 35	40	a 54
30.....	66	56	b 46	41		b 36	36	b 36	b 34	34	41	
31.....	66		b 46	41		b 36		b 36		34	44	

Day	Oct.	Nov.	Dec.	Day	Oct.	Nov.	Dec.	Day	Oct.	Nov.	Dec.
1933				1933				1933			
1.....		44	b 39	11.....		41	41	21.....	46	40	a 40
2.....		43	b 39	12.....	a 50	41	41	22.....	46	40	40
3.....		43	40	13.....		41	41	23.....	46	40	40
4.....		43	b 40	14.....	46	41	41	24.....	46	40	40
5.....	a 50	42	40	15.....	46	41	41	25.....	45	40	39
6.....		42	40	16.....	46	41		26.....	45	40	b 39
7.....		42	41	17.....	b 46	41		27.....	45	40	39
8.....		42	41	18.....	b 46	41	a 40	28.....	45	40	39
9.....		42	41	19.....	46	40		29.....	44	39	39
10.....		42	41	20.....	46	40		30.....	44	39	39
								31.....	44		38

Month	Maximum	Minimum	Mean	Run-off in acre-feet
1931-32				
October 14-31.....	32	31	31.8	1,140
November.....			35.0	2,080
December.....			36.2	2,230
January.....			33.3	2,050
February.....	36	30	30.9	1,780
March.....	36	33	34.1	2,100
April.....	34	31	32.3	1,920
May.....	33	32	32.1	1,970
June.....	34	32	32.5	1,930
July.....	34	32	32.9	2,020
August.....	40	32	32.7	2,010
September.....	66	42	57.0	3,390
The period.....				24,600

a Estimated.

b Partly estimated or interpolated.

*Discharge, in second-feet, of San Solomon Springs at Toyahvale, Tex., 1931-33—*  
Continued

Month	Maximum	Minimum	Mean	Run-off in acre-feet
<b>1932-33</b>				
October.....	71	66	68.9	4,240
November.....	66	56	62.2	3,700
December.....	56	46	50.1	3,080
January.....	46	41	42.6	2,620
February.....	41	40	40.5	2,250
March.....	40	36	38.1	2,340
April.....	36	36	36.0	2,140
May.....	37	36	36.5	2,240
June.....		34	35.3	2,100
July.....	38	34	36.6	2,250
August.....	44	34	35.4	2,180
September.....		48	54.8	3,280
The year.....	71	34	44.7	32,400
<b>1933</b>				
October.....		44	47.4	2,910
November.....	44	39	41.0	2,440
December.....	41	38	40.0	2,460
The period.....				7,810

*Discharge measurements of main canal of Reeves County Water Improvement District No. 1 to determine seepage from source to end, near Balmorhea, Tex., 1931, 1933*

Date	Stream or diversion	Location	Distance from initial point (miles)	Discharge (second-feet)				
				Main stream	Tribu- tary	Diver- sion	Gain or loss in section	Total gain or loss
1931 Oct.	Main canal.	300 feet below Solomon Spring	0	32.0				
	Carpenter take-out.		.8			2.81		
	Giffin Spring		1.4		1.34			
	Reservoir take-out.		1.4			2.83		
	Henry Jones take-out.		1.4			.40		
	North canal take-out.		2.2			.27		
	Gate leakage.					.12		
	Main canal.	Total leakage between points on main canal.	4.0	25.3			-1.6	-1.6
	Walker take-out.	Crenshaw garage, Balmorhea.	6.0			.61		
	Gate leakage.	Total leakage between points on main canal.				.10		
	Main canal.	Highway crossing	7.0	21.4			-3.2	-4.8
	Highway ditch take-out.		8.0			5.94		
	Sol Mayer take-out.		8.4		1.98	5.20		
	Saragosa canal.		8.4					
	Siphon ditch take-out.					8.98		
	Gate leakage.	Total leakage between points on main canal.				.60		
	Main canal.	150 feet below Siphon ditch.	8.4	1.42			-1.2	-6.0
	Gate leakage.	Total leakage between points on main canal.				.70		
	Main canal.	½ mile above end of system.	11.4	.38			-3	-6.3
1933 Jan.	Main canal.	500 feet below Giffin canal junction.		48.7				
	North spill.	Knapp's corner	1.8			26.3		
	Main canal.	Balmorhea Hotel.	3.1				-2.5	-2.5
	Gate leakage.	Total of 2 leaks.	4.7	19.9		.1		
	West Sandia canal.	Gage.			1.8			
	Main canal.	Brogado.	5.6					
	Lateral diversion.		6.0	22.2		.8	+6	-1.9
	Main canal.		6.6				-1.2	-3.1
	Gate leakage.	Total of 3 leaks.	7.1	20.2		.2		
	Main canal.		8.1	21.0			+1.0	-2.1
	Siphon ditch.	Weir 75 feet below main canal.	9.6			1.8		
	Main canal.		9.7	17.1			-2.1	-4.2
	do.		11.1	17.4			+3	-3.9
	do.	500 feet below Giffin canal junction.	1.8	11.3				
	do.	Wigley road crossing.	2.8	11.4			+1	+0.1
	Gate leakage.	Knapp's corner	3.1			.1		
Mar.								
13								
13								

13	Main canal.....	400 feet above Highway Garage.....	4.7	11.0	1.3	---	---	---	- 2
13	West Sandia canal.....	50 feet above highway.....	5.6	---	---	---	---	---	- 6
13	Main canal.....	1 mile below Bernalillo.....	6.3	11.9	---	---	---	---	- 6
13	do.....	Highway crossing.....	7.7	11.9	.6	---	---	0	---
13	Experiment farm spill.....	do.....	8.3	---	---	---	---	0	- 6
13	Main canal.....	Above Saragosa canal junction.....	9.6	12.5	---	---	---	---	---
13	do.....	1/4 mile below Siphon ditch.....	10.1	8.3	---	---	---	---	+
13	do.....	Saragosa road crossing.....	11.1	8.8	---	---	---	5	---
14	do.....	500 feet below Giffin canal junction.....	1.8	8.2	---	---	---	---	---
14	Gate leakage.....	do.....	3.0	---	---	---	---	---	---
14	do.....	do.....	3.7	---	---	---	.1	---	---
14	Main canal.....	400 feet above Highway Garage.....	4.7	7.8	---	---	---	---	- 2

Discharge measurements of laterals of Reeves County Water Improvement District No. 1, to determine seepage near Balmorhea, Tex., 1931

Date	Stream or diversion	Location	Distance from initial point (miles)	Discharge (second-feet)			
				Main stream	Diversion	Gain or loss in section	Total gain or loss
Oct. 27	Carpenter take-out.	Point of diversion.	0	2.81			
27	do.	Point of delivery.	1.0	2.73		-0.08	-0.08
27	Reservoir take-out.	Point of diversion.	0	2.83			
27	do.	Confluence with reservoir creek.	1.0	2.33		-0.50	-0.50
27	Highway ditch.	Point of diversion.	0	9.32	5.91		
27	Mills Ditch.	do.	.8				
27	Highway ditch.	Below Mills Ditch take-out.		3.80		+ .39	+ .39
27	do.	Point of delivery to Mayer farm.	1.3	3.84		+ .04	+ .43
27	Siphon ditch.	Point of diversion.	0	9.32			
28	do.	Point of delivery to Fane Down farm.	2.3	6.19		-3.13	-3.13
Nov. 16	Moore canal.	300 feet below Moore dam.	0	4.29			
16	do.	Pecos Valley Southern Ry. crossing.	.5	4.35		+ .06	+ .06
16	Sargoss canal.	1,000 feet below diversion dam.	0	1.97			
16	do.	Weir.	.5	1.63		- .29	- .29
18	Giffin Spring canal.	do.	0	3.80			
18	do.	Siphon.	.8	4.06		+ .26	+ .26



*Discharge measurements of reservoir outlet canal of Reeves County Water Improvement District No. 1 to determine seepage from release gate at reservoir to junction with main canal, near Balmorhea, Tex., 1932-33*

Date	Stream or diversion	Location	Distance from initial point (miles)	Discharge (second-feet)			
				Main stream	Diversion	Gain or loss in section	Total gain or loss
1932							
July 22	Outlet canal	0.1 mile below release gate	0.1	52.2			
22	Gate leakage	0.3 mile below release gate	0.3		0.4		
22	Outlet canal	3.5 miles below release gate	3.5	48.0		-3.8	-3.8
26	do	0.1 mile below release gate	0.1	42.1			
26	do	0.3 mile below release gate	0.3				
26	Gate leakage	0.3 mile below release gate	0.3				
26	Outlet canal	0.3 mile below release gate	0.3	40.9			
26	do	0.7 mile below release gate	1.7	41.1		-9	-9
26	do	1.7 miles below release gate	1.7	39.6		+2	+2
26	do	2.4 miles below release gate	2.4	39.6		-1.3	-2.0
26	do	2.4 miles below release gate	3.5	41.8		+1.7	-0.3
26	do	40 feet above main canal	0.1	1.8			
Aug. 17	do	0.1 mile below release gate	0.1	2.1			
17	do	0.4 mile below release gate	0.4				
17	do	2.6 miles below release gate	2.6	1.6		+3	+3
1933							
July 20	do	0.2 mile below release gate	0.2	14.2			
20	do	0.4 mile above main canal	3.1	17.6		-2.6	-2.6
26	do	0.2 mile below release gate	3.2	7.2			
26	do	0.6 mile above main canal	2.9	6.0		-1.2	-1.2

## WEST SANDIA SPRING AT BALMORHEA, TEX.

LOCATION.—Water-stage recorder on spring outlet 500 feet south of highway and half a mile east of Balmorhea, Reeves County.

RECORDS AVAILABLE.—November 1931 to August 1933 (discontinued).

REMARKS.—Records good except those for estimated periods, which are fair.

## Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1931–32												
1			° 1.1	1.1	} ° 1.1	1.3	1.3	1.2	} ° 1.1	1.1	° 1.1	° 1.1
2			° 1.1	1.1		1.3	1.2	1.1		1.1	° 1.1	° 1.3
3			1.2	1.1		1.3	1.2	1.1		1.1	° 1.1	° 1.4
4			1.2	1.1		1.4	1.2	1.1		1.1	1.1	° 1.4
5			1.2	1.1		1.4	1.2	1.1		1.1	1.1	° 1.4
6			1.2	1.1	° 1.1	1.3	1.2	1.0	} ° 1.1	1.1	1.1	° 1.5
7			1.2	1.1	° 1.1	1.3	1.2	1.0		1.1	1.1	° 1.5
8			1.2	1.1	° 1.2	1.3	1.2	1.0		° 1.1	1.1	° 1.6
9			1.2	1.1	° 1.2	1.3	1.2	° 1.0		1.1	1.1	° 1.7
10			1.2	1.1	° 1.2	1.3	1.2	° 1.0	1.1	1.1	1.1	° 1.7
11			1.2	1.1	° 1.2	1.3	1.2	} ° 1.1	1.1	1.1	1.0	} ° 1.7
12			1.2	1.1	° 1.2	1.3	1.2		1.1	° 1.1	1.0	
13			1.1	1.1	° 1.2	° 1.3	1.2		1.1	° 1.1	1.0	
14			1.1	1.1	1.2	° 1.3	1.2		° 1.1	° 1.1	1.0	
15			1.1	1.1	1.2	1.3	° 1.2	} ° 1.2	° 1.1	1.1	1.0	} ° 1.7
16			1.1	1.1	1.2	1.3	° 1.2		° 1.1	1.1	1.0	
17		1.1	1.1	1.1	1.2	1.3	° 1.2		° 1.1	1.1	1.0	
18		1.1	1.1	1.1	1.2	1.3	° 1.2		° 1.1	1.1	1.0	
19		1.1	1.1	1.1	1.2	1.3	° 1.2	} ° 1.1	° 1.1	1.0	1.0	1.7
20		1.1	1.1	1.1	° 1.2	1.3	° 1.2		° 1.1	1.0	° 1.0	1.7
21		1.1	1.1	1.1	° 1.3	° 1.3	° 1.2		1.1	1.0	° 1.0	1.7
22		1.1	1.1	1.1	° 1.3	1.3	° 1.3		° 1.1	1.0	° 1.0	1.7
23		1.1	1.1	1.1	° 1.3	1.3	° 1.3	} ° 1.1	° 1.1	1.0	° 1.0	1.7
24		° 1.1	1.1	1.1	° 1.3	1.2	° 1.3		° 1.2	1.0	1.0	° 1.7
25		° 1.1	1.1	° 1.1	° 1.3	1.2	1.2		1.2	1.0	1.0	1.6
26		° 1.1	1.1	° 1.1	° 1.4	1.2	1.2	} ° 1.1	1.2	1.0	1.0	° 1.6
27		° 1.1	1.1	° 1.1	° 1.4	1.2	1.2		1.2	1.0	1.0	° 1.6
28		° 1.1	1.1	1.1	1.3	1.3	1.2		1.2	1.0	1.0	° 1.7
29		° 1.1	1.1	1.1	1.3	° 1.3	1.2		1.2	1.0	1.0	° 1.7
30		° 1.1	1.1	1.1	1.1	° 1.3	1.2	} ° 1.1	1.1	° 1.0	° 1.0	° 1.7
31			1.1	° 1.1	1.1	° 1.3				° 1.0	° 1.0	

° Discharge estimated or partly estimated.

° May include some storm run-off or irrigation waste water.

Discharge, in second-feet, of West Sandia Spring at Balmorhea, Tex., 1932-33—Con.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	
1932-33												
1	• 1.8	1.8	1.7	• 1.7	• 1.7	• 1.6	• 1.3	• 1.2	• 1.2	1.1	1.1	
2		1.8	1.7		• 1.7	• 1.6	• 1.3	• 1.2		1.1	1.1	
3		1.8	1.6		• 1.7	• 1.6	• 1.3	• 1.2		1.1	1.1	
4		1.8	1.6		1.7	• 1.6	• 1.3	• 1.2		1.1	1.1	
5		1.8	1.6		1.7	• 1.6	1.3	• 1.2		1.1	1.1	
6	• 1.9	1.8	1.6	• 1.7	1.7	1.6	1.3	• 1.2	1.2	• 1.1	1.1	
7		1.7	1.6		1.7	• 1.6	1.3	• 1.2	1.2	• 1.1	1.1	
8		1.7	1.7		1.7	1.6	1.3	• 1.2	1.2	• 1.1	1.0	
9		1.7	1.7		1.7	1.6	1.3	• 1.2	1.2	• 1.1	1.0	
10		1.7	1.7		1.6	1.6	1.3	• 1.2	1.2	• 1.1	1.0	
11	• 1.9	1.7	1.7	1.7	1.7	1.6	1.5	1.3	• 1.2	1.2	• 1.1	1.0
12		1.7	1.7		1.7	1.6	1.5	1.3	• 1.2	1.2	1.1	1.0
13		1.7	1.7		1.7	1.6	1.5	1.3	1.2	1.2	1.1	1.0
14		1.7	1.7		1.7	1.6	1.5	1.3	1.2	1.2	1.1	• 1.0
15		1.7	1.7		1.7	1.6	1.5	1.3	1.2	1.2	• 1.1	• 1.0
16	• 1.9	1.7	1.7	1.7	1.7	1.6	1.5	1.3	• 1.2	1.2	1.1	• 1.0
17		1.7	1.7		1.6	1.6	1.5	1.3		1.1	1.1	• 1.0
18		• 1.7	1.7		1.6	1.6	1.5	1.3		1.1	1.1	• 1.0
19		• 1.7	1.7		1.6	1.6	1.5	1.3		1.1	1.1	• 1.0
20		• 1.7	1.7		1.6	1.6	1.4	1.3		1.1	1.1	• 1.1
21	• 1.9	• 1.7	1.7	1.7	1.6	1.6	1.4	1.3	• 1.2	1.1	1.1	• 1.1
22		• 1.7	1.7		1.5	1.6	1.4	1.3		1.1	1.1	1.1
23		• 1.7	• 1.7		1.5	1.6	1.4	1.3		1.1	1.1	1.1
24		• 1.7	• 1.7		1.5	1.6	1.4	1.3		1.1	1.1	1.1
25		• 1.7	• 1.7		1.5	1.6	1.3	1.2		1.1	1.1	1.1
26	• 1.9	• 1.7	• 1.7	1.7	1.6	1.6	1.3	1.2	• 1.2	1.1	1.1	1.1
27		1.7			1.6	1.3	1.2	1.1		1.1	1.1	
28		1.7			1.6	1.3	1.2	1.1		1.1	1.1	
29		1.9			1.7	1.3	1.2	1.1		• 1.1	---	
30		1.8			1.7	1.8	---	1.1		• 1.1	---	
31	1.8	---	1.7	---	1.3	---	---	---	• 1.1	---		
Month					Maximum	Minimum	Mean		Run-off in acre-feet			
1931-32												
November 17-30						1.1	1.1	1.10			31	
December						1.2	1.1	1.13			69	
January						1.1	1.1	1.10			68	
February						1.4	1.1	1.21			70	
March						1.4	1.2	1.29			79	
April						1.3	1.2	1.21			72	
May						---	---	1.11			68	
June						---	---	1.12			67	
July						1.1	1.0	1.06			65	
August						1.1	1.0	1.03			63	
September						1.7	1.1	1.61			96	
The period											748	
1932-33												
October						---	---	1.89			116	
November						1.8	1.7	1.72			102	
December						---	---	1.68			103	
January						---	---	1.66			102	
February						1.7	1.6	1.63			91	
March						1.6	1.3	1.47			90	
April						1.3	1.2	1.28			76	
May						---	---	1.20			74	
June						---	---	1.15			68	
July						1.1	1.1	1.10			68	
August 1-28						1.1	1.0	1.06			59	
The period											949	

• Estimated.  
 • Partly estimated.

*Discharge measurements of West Sandia Creek to determine seepage from 4,000 feet above to gage 0.8 mile east of Balmorhea, Tex., Oct. 17, 1932*

Stream	Location	Distance above gage (feet)	Discharge (second-feet)			
			Main stream	Tributary	Gain or loss in section	Total gain or loss
West Sandia Creek	300 feet above West Sandia spring	4,000	0.2			
Do	80 feet below West Sandia spring	3,620	.6		+0.4	+0.4
Canal wasteway	500 feet below West Sandia spring	3,200		0.1		
West Sandia Creek	Gage	0	2.2		+1.5	+1.9

**EAST SANDIA SPRING AT BALMORHEA, TEX.**

LOCATION.—Staff gage on spring outlet, 400 feet below source and 1 mile east of Balmorhea, Reeves County.

RECORDS AVAILABLE.—November 1931 to September 1933 (discontinued).

REMARKS.—Daily records too poor for publication; monthly records fair.

*Discharge, in second-feet, 1931-33*

Month	Maximum	Minimum	Mean	Run-off in acre-feet
<b>1931-32</b>				
November 23-30	1.1	1.1	1.10	17
December	1.1	1.0	1.06	65
January	1.1	1.1	1.10	68
February		1.1	1.22	70
March			1.27	78
April			1.20	71
May			1.20	74
June	1.2	.9	1.05	62
July			1.07	66
August		1.0	1.04	64
September			1.35	80
The period				715
<b>1932-33</b>				
October			1.35	83
November	1.3	1.2	1.23	73
December			1.21	74
January			1.28	79
February	1.4	1.2	1.34	74
March			1.32	81
April			1.30	77
May			1.16	71
June			1.09	65
July	1.0	1.0	1.00	61
August	1.1	.9	.92	57
September 1-23			1.10	50
The period				845

*Discharge measurements of Cherry Canyon to determine seepage from 1.5 miles above to 2.5 miles below gage near Toyahvale, Tex., 1932*

Date	Location	Distance from initial point (miles)	Discharge (second-feet)		
			Main stream	Gain or loss in section	Total gain or loss
Sept. 15	Gage	0	13.5		
15	500 feet above Kingston line fence	2.0	0	-13.5	-13.5
21	1.5 miles above gage	-1.5	1.2		
21	Gage	0	5.0	+3.8	+3.8
Oct. 7	Gage	0	31.2		
7	2.5 miles below gage	2.5	0	-31.2	-31.2

NOTE.—Gage is 10 miles above United States Highway 290 crossing.

Discharge measurements of Limpia Creek to determine seepage from 12.3 miles above to 40.2 miles below Fort Davis, Tex., 1932-33

Date	Stream or diversion	Location	Distance from initial point (miles)	Discharge (second-feet)			Total gain or loss
				Main stream	Tributary	Diversion	
1932							
Oct. 8	Limpia Creek	0.8 mile below Wild Rose Canyon	14.7	31.0			
8	Short Canyon	100 feet above mouth	15.8		1.8		
8	Limpia Creek	500 feet below old Limpia post office	18.2	46.0			+13.2
8	do	3 miles below old Limpia post office	27.2	41.8			+9.0
8	Horse Thief Canyon	Mouth	27.9		1.2		
8	Roney Canyon	do	27.9		1.5		
8	Limpia Creek	Jeff Ranch house	28.2	65.1			+20.6
8	do	9 miles below Jeff Ranch	37.2	4.2			-60.9
8	do	12 miles below Jeff Ranch	40.2	0			-38.5
18	do	12.3 miles above old Fort Davis lane	-12.0	0.1			
18	do	12 miles above old Fort Davis lane	-11.3	0.2			+1
18	do	11.3 miles above old Fort Davis lane	-11.0	0			+2
18	do	10.3 miles above old Fort Davis lane	-10.3	0.5			+5
18	do	9.8 miles above old Fort Davis lane	-9.8	0			+1
18	do	9.7 miles above old Fort Davis lane	-9.7	0.1			0
18	do	7.9 miles above old Fort Davis lane	-7.9	.6			+5
18	do	6 miles above old Fort Davis lane	-6.0	5.7		.5	+5.1
18	do	5.9 miles above old Fort Davis lane	-5.9				
18	Side canyon	3.7 miles above old Fort Davis lane	-3.7	5.7			-5
18	Limpia Creek	1.3 miles above old Fort Davis lane	-1.3	5.3			-4
18	Grayson diversion	Old Fort Davis lane	0		0.5		+4.7
18	Limpia Creek	First Fort Davis-Toyahvale crossing	1.2	3.8			-1.0
19	do	do	1.2	3.8			+3.7
19	Side canyon	2.1 miles below old Fort Davis lane	2.1			.4	
19	do	do	2.1			.2	
19	Limpia Creek	4.2 miles below old Fort Davis lane	4.2	8.0			+3.6
19	Side canyon	4.8 miles below old Fort Davis lane	4.8			.5	+7.3
19	Limpia Creek	7.2 miles below old Fort Davis lane	7.2	8.8			+7.6
19	do	10.2 miles below old Fort Davis lane	10.2	8.4			+3
19	do	Mouth	10.3			.4	+7.2
19	Frazier Canyon	Upper end of Wild Rose Canyon	11.7	9.4			+6
19	Limpia Creek	Lower end of Wild Rose Canyon	14.0	12.9			+3.5
19	do	Mouth	15.8		.1		+11.3
19	Short Canyon	Old Limpia post office	18.2	14.0			+1.0
19	Limpia Creek	do	18.2	8.2			-2.8
Nov. 1	do	3 miles below old Limpia post office	21.2	5.4			-8
1	do	5.9 miles below old Limpia post office	24.1	4.6			-3.6

*Discharge measurements of Limpia Creek to determine seepage from 12.3 miles above to 40.2 miles below Fort Davis, Tex., 1932-33—Continued*

Date	Stream or diversion	Location	Distance from initial point (miles)	Discharge (second-feet)				
				Main stream	Tribu- tary	Diver- sion	Gain or loss in section	Total gain or loss
1932	Limpia Creek.	Jeff ranch house.	28.2	6.2			+1.6	-2.0
Nov. 1	do.	1 mile below Jeff ranch house.	29.2	0			-6.2	-8.2
21	do.	Upper end of Wild Rose Canyon.	11.7	4.0				
21	do.	Lower end of Wild Rose Canyon.	14.0	6.1			+2.1	+2.1
21	do.	Old Limpia post office.	18.2	4.7			-1.4	+7
21	do.	3 miles below old Limpia post office.	21.2	2.0			-2.7	-2.0
21	do.	6 miles below old Limpia post office.	24.2	1.1			-9	-2.9
21	do.	Jeff ranch house.	28.2	2.4			+1.3	-1.6
21	do.	0.5 mile below Jeff ranch house.	28.7	0			-2.4	-4.0
1933								
Aug. 3	do.	75 feet below mouth of Short Canyon.	15.8	12.6				
3	do.	Old Limpia post office.	18.2	4.0			-8.6	-8.6
3	do.	0.5 mile below old Limpia post office.	18.7	0			-4.0	-12.6

## DEVILS RIVER NEAR JUNO, TEX.

LOCATION.—Water-stage recorder 500 feet below Walter Baker ranch house, 2 miles above mouth of Phillips Creek, and  $13\frac{1}{2}$  miles southwest of Juno, Val Verde County.

DRAINAGE AREA.—2,730 square miles.

RECORDS AVAILABLE.—May 1925 to September 1933.

DISCHARGE.—Neither maximum discharge nor maximum stage during year determined; minimum discharge, 116 second-feet Sept. 22–30.

1925–33: Maximum (determined by slope-area method) about 370,000 second-feet Sept. 1, 1932 (gage height, 31.3 feet); minimum, 48 second-feet June 4–6, 1930.

REMARKS.—Records excellent except those estimated, which are poor. No diversions above station.

*Discharge, in second-feet, 1932–33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....		255	215	185	173	162	153	146	146	134	<sup>b</sup> 124	122
2.....		255	218	185	173	162	153	144	144	134	<sup>b</sup> 123	121
3.....		253	218	185	173	162	153	146	143	134	<sup>b</sup> 122	121
4.....		255	218	185	173	160	153	144	143	134	<sup>b</sup> 122	121
5.....		266	215	185	173	162	153	144	143	134	122	119
6.....	<sup>a</sup> 422	253	215	183	173	160	153	144	143	134	122	119
7.....		247	213	183	173	160	153	143	143	133	122	119
8.....		242	211	183	169	160	153	143	141	133	122	119
9.....		242	213	181	169	160	153	143	141	133	122	119
10.....		240	213	179	169	160	153	141	141	133	122	119
11.....		235	211	179	169	160	151	141	141	133	122	119
12.....	<sup>b</sup> 362	230	211	179	169	160	150	141	139	133	124	119
13.....	<sup>b</sup> 355	230	211	179	169	160	151	141	141	131	124	119
14.....	<sup>b</sup> 347	230	209	177	169	158	150	143	143	131	122	119
15.....	<sup>b</sup> 340	230	209	177	169	158	150	143	139	131	122	119
16.....	<sup>b</sup> 333	225	206	177	167	158	150	141	138	131	122	117
17.....	<sup>b</sup> 326	225	202	177	167	158	150	139	138	<sup>b</sup> 131	122	117
18.....	318	223	200	177	166	158	150	139	138	<sup>b</sup> 130	122	117
19.....	315	223	200	177	166	158	150	139	138	<sup>b</sup> 130	121	117
20.....	315	223	200	177	166	158	150	139	138	<sup>b</sup> 130	121	117
21.....	299	223	200	177	164	158	150	139	138	<sup>b</sup> 129	121	117
22.....	292	223	202	175	166	158	148	139	138	<sup>b</sup> 128	121	116
23.....	289	223	209	175	164	157	151	139	138	<sup>b</sup> 128	121	116
24.....	289	220	206	175	164	157	150	139	136	<sup>b</sup> 128	121	116
25.....	283	220	198	175	164	157	148	146	136	<sup>b</sup> 127	119	116
26.....	275	220	195	175	164	157	148	246	136	<sup>b</sup> 126	119	116
27.....	272	218	193	173	164	157	148	226	136	<sup>b</sup> 126	119	116
28.....	269	218	193	173	162	157	148	155	136	<sup>b</sup> 126	119	116
29.....	269	215	191	173	-----	157	146	160	136	<sup>b</sup> 125	126	116
30.....	263	215	191	173	-----	157	146	150	136	<sup>b</sup> 124	124	116
31.....	263	-----	189	173	-----	155	-----	148	-----	<sup>b</sup> 124	124	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....		263	346	21, 300
November.....	266	215	233	13, 900
December.....	218	189	206	12, 700
January.....	185	173	178	10, 900
February.....	173	162	168	9, 330
March.....	162	155	159	9, 780
April.....	153	146	150	8, 930
May.....	246	139	149	9, 160
June.....	146	136	140	8, 330
July.....	134	124	130	7, 990
August.....	126	119	122	7, 500
September.....	122	116	118	7, 020
The year.....	-----	116	175	127, 000

<sup>a</sup> Estimated

<sup>b</sup> Partly estimated or interpolated.

## MIMBRES RIVER BASIN

## MIMBRES RIVER NEAR MIMBRES, N. MEX.

LOCATION.—Water-stage recorder in SE¼NW¼ sec. 33, T. 16 S., R. 11 W., 1½ miles northwest of Mimbres.

DRAINAGE AREA.—183 square miles.

RECORDS AVAILABLE.—October 1930 to September 1933. Records 1921-30 published by State engineer.

DISCHARGE.—Maximum during year, about 2,060 second-feet July 17 (gage height, 4.51 feet); minimum, 1.4 second-feet July 11, 12.

1930-33: Maximum, that of July 17, 1933; minimum, that of July 11, 12, 1933.

REMARKS.—Records good except those estimated, which are poor. Diversions for irrigation above station.

## Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		7.6	7.6	7.6	6.3	15	13	15	6.3		6.7	• 10
2		7.6	7.6	7.1	5.9	19	14	14	5.9		6.3	• 20
3		7.6	7.6	7.1	5.9	19	14	13	5.2	• 3	• 40	
4		7.6	7.6	7.1	5.5	26	14	13	5.5		• 4	
5	9.3	7.6	7.6	7.1	5.5	22	14	13	5.2	2.5	• 10	• 10
6	• 9.3	7.6	7.6	6.7	5.5	18	16	12	5.2	2.5	• 30	
7	9.3	7.6	7.6	6.7	5.5	17	13	12	5.2	2.3	24	8.8
8	9.3	7.6	7.6	6.7	5.5	21	13	10	5.5	1.9	13	8.8
9	9.3	7.6	7.6	6.3	5.5	24	15	10	5.2	2.1	9.8	8.2
10	9.3	8.2	7.6	6.3	5.5	25	15	10	5.2	1.9	11	8.2
11	8.8	8.2	7.6	6.3	5.5	28	15	10	5.5	1.4	8.8	7.6
12	9.3	8.2	7.6	6.3	5.5	36	16	9.3	5.5	1.4	7.6	7.6
13	8.8	7.6	7.1	6.3	5.5	36	15	9.8	5.9	4.0	6.7	7.1
14	9.3	7.6	7.6	6.3	5.5	34	14	10	6.7	• 5	6.3	7.1
15	8.8	7.6	• 8.2	6.3	5.5	30	15	9.3	6.7		5.9	22
16	8.2	7.1	8.8	6.3	5.9	26	16	8.8	6.7	6.7	5.5	9.3
17	8.2	7.1	8.8	5.9	5.9	24	16	8.2	6.7	114	6.7	8.2
18	8.8	7.1	8.8	6.7	5.5	22	13	8.2	6.7	• 130	7.1	16
19	8.8	7.1	8.8	6.3	5.5	22	13	7.6	6.7	3.6	6.3	9.8
20	8.8	7.1	8.8	6.7	5.5	21	13	7.6	15	4.4	7.1	8.8
21	8.8	7.1	8.2	6.7	5.5	17	14	9.3		7	7.1	8.2
22	9.3	7.1	8.8	6.7	5.9	15	14	9.3	• 30	8.8	6.7	8.2
23	8.8	7.1	8.8	6.7	5.9	13	15	9.3		13	7.1	7.6
24	8.8	7.1	8.8	6.7	5.9	13	14	7.6		8.8	7.6	7.6
25	8.8	7.1	8.8	6.7	6.7	12	15	7.1	• 15	7.1	9.8	6.7
26	8.8	7.1	8.8	6.3	16	12	15	6.3		6.7	9.3	6.7
27	7.6	7.1	8.2	6.3	13	13	14	6.7		7.1	8.2	6.7
28	7.6	7.1	8.2	6.3	14	13	15	7.1	• 3	7.1	9.8	6.3
29	7.6	7.1	7.6	6.3		13	16	6.7		7.1	18	6.7
30	7.6	7.6		6.3		16	16	7.1	• 3	7.1	25	8.2
31	7.6		7.6	6.3		14		5.9		7.1	18	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October		7.6	8.87	545
November	8.2	7.1	7.43	442
December	8.8	7.1	8.05	495
January	7.6	5.9	6.56	403
February	16	5.5	6.62	368
March	36	12	20.5	1,260
April	16	13	14.5	863
May	15	5.9	9.46	582
June			10.0	596
July	130	1.4	12.5	769
August	40	4	11.3	693
September	22	6.3	9.35	556
The year	130	1.4	10.5	7,570

• Estimated.



## MIMBRES RIVER NEAR FAYWOOD, N.MEX.

LOCATION.—Water-stage recorder in sec. 7, T. 20 S., R. 10 W., about 6 miles north-east of Faywood Hot Springs and 10 miles northeast of Faywood.

DRAINAGE AREA.—485 square miles.

RECORDS AVAILABLE.—April 1908 to December 1914; October 1930 to September 1933. Records 1915-30 published by State engineer.

DISCHARGE.—Maximum during year, about 5,640 second-feet July 17 (gage height, 6.10 feet); practically no flow at times.

1930-33: Maximum, about 6,900 second-feet Aug. 10, 1931 (gage height, 6.62 feet); practically no flow at times.

REMARKS.—Records good except those for August and September, which are fair, and July, which are poor. Diversions for irrigation above station.

## Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	* 30	4	3	11	13	21	9	4	3	6	4	25
2.....	35	4	4	11	13	27	8	4	3	6	2	5
3.....	24	4	5	11	12	32	7	5	2	6	60	11
4.....	16	4	5	11	12	38	7	6	2	6	5	6
5.....	13	5	6	12	13	43	6	6	3		14	4
6.....	10	5	7	10	14	44	7	5	3	* 5	62	4
7.....	2	4	8	10	13	40	7	4	3		45	4
8.....	0	4	9	10	13	36	6	4	3		25	5
9.....	0	4	9	11	11	35	6	4	3	4	15	10
10.....	0	3	7	12	8	34	* 5	4	3		8	11
11.....	0	3	4	12	8	37	4	3	3	* 6	7	6
12.....	1	3	4	12	7	41	6	4	3		4	3
13.....	2	4	2	11	7	43	7	4	3		7	2
14.....	1	4	0	11	7	42	7	5	3	* 7	2	4
15.....	0	5	0	11	7	40	8	5	3		2	44
16.....	0	4	* 10	12	7	36	5	5	3	7	1	9
17.....	0	4		16	6	36	5	6	5	276	3	2
18.....	0	5		14	8	32	3	7	5	* 30	3	2
19.....	1	7	13	15	9	28	4	5	10	* 3	3	1
20.....	1	6	13	16	10	27	5	4	43		3	1
21.....	5	6	13	16	13	25	6	5	68		3	1
22.....	6	6	14	16	11	25	6	5	86	* 4	3	1
23.....	6	6	14	16	9	25	4	4	106		6	3
24.....	5	8	14	15	11	20	2	4	39		6	4
25.....	5	10	13	15	14	20	2	4	26	* 4	5	1
26.....	4	9	14	14	18	18	3	4	22		4	0
27.....	4	8	14	15	20	17	3	4	16		3	1
28.....	4	7	14	15	19	13	3	3	9	0	3	1
29.....	4	7	13	15		9	5	3	7		3	1
30.....	4	3	11	15		8	5	3	7		0	3
31.....	3		10	14		8		3		1	3	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October.....	35	0	6.0	369
November.....	10	3	5.2	309
December.....	14	0	8.9	549
January.....	16	10	13.1	807
February.....	20	6	11.2	621
March.....	44	8	29.0	1,790
April.....	9	2	5.4	319
May.....	7	3	4.4	270
June.....	106	2	16.5	982
July.....	276	0	14.4	883
August.....	62	1	9.9	609
September.....	44	0	5.7	337
The year.....	276	0	10.8	7,840

\* Estimated.

## TULAROSA VALLEY

## RIO TULAROSA NEAR TULAROSA, N. MEX.

LOCATION.—Water-stage recorder in sec. 15, T. 14 S., R. 9½ E., 3¼ miles north-east of Tularosa.

RECORDS AVAILABLE.—October 1931 to September 1933. Comparable record at former station about 1 mile downstream December 1912 to December 1914.

DISCHARGE.—Maximum during year, about 950 second-feet June 16 (gage height, 4.68 feet); minimum, 0.3 second-foot June 12.

1931-33: Maximum not determined; minimum, that of June 12, 1933.

REMARKS.—Records fair except those estimated, which are poor. Diversions for irrigation above station.

## Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.2	12	7.3	12	14	17	14	12	8.6	19	16	17
2	8.2	12	6.8	13	15	17	15	10	8.6	19	20	17
3	7.8	11	6.8	13	15	17	14	9.6	8.0	19	20	19
4	8.2	11	6.4	14	14	17	13	11	7.0	19	22	17
5	8.2	11	6.4	13	14	17	13	13	5.0	19	29	17
6	8.2	12	6.4	14	15	16	13	14	10	19	25	17
7	12	6.4	14	15	17	11	12	10	21	23	15	15
8	12	6.4	15	14	17	12	10	11	36	20	15	15
9	11	13	15	18	17	9.1	11	13	34	19	24	15
10	11	16	16	17	17	10	13	11	27	19	20	15
11	10	11	17	16	15	17	12	13	12	22	15	20
12	13	10	17	15	16	17	13	13	8.4	19	14	15
13	13	10	16	16	16	16	14	14	6.4	17	14	15
14	13	10	16	16	16	15	14	13	8.8	15	13	16
15	13	10	16	16	16	15	14	13	1.9	32	14	15
16	13	9.6	15	16	16	15	14	13	10	48	15	15
17	13	9.6	14	16	16	14	14	13	42	15	15	15
18	13	9.6	14	17	17	15	13	12	24	15	15	15
19	13	9.1	13	15	17	15	11	10	23	15	14	14
20	12	9.1	14	15	17	14	13	10	27	15	14	14
21	34	9.1	14	15	16	14	11	10	25	15	14	14
22	39	8.6	14	15	17	14	10	9.1	26	17	12	12
23	14	8.2	14	14	18	14	9.6	11	30	25	19	14
24	13	8.2	14	14	17	13	8.2	13	30	26	19	13
25	11	8.2	13	14	19	14	9.6	13	26	22	18	12
26	11	7.3	14	15	16	14	11	14	24	29	17	14
27	13	7.3	13	15	17	15	12	13	21	18	30	14
28	14	7.3	11	16	17	14	13	13	20	17	15	14
29	14	7.3	11	15	15	13	13	8.8	19	16	14	15
30	14	7.8	11	15	15	14	13	8.8	19	16	14	15
31	13	11	15	15	15	13	13	7.0	14	14	14	15

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	39	-----	12.8	787
November	12	7.3	9.74	580
December	17	6.4	12.1	742
January	17	12	14.8	912
February	19	14	16.1	893
March	17	13	15.3	940
April	15	8.2	12.2	727
May	14	7.0	11.6	715
June	30	1.9	14.1	840
July	48	14	23.7	1,460
August	30	13	17.7	1,090
September	-----	12	16.0	950
The year	48	1.9	14.7	10,600

• Estimated.

## ALAMO CREEK AT WOOD RANCH, NEAR ALAMOGORDO, N.MEX.

LOCATION.—Water-stage recorder in sec. 4, T. 17 S., R. 11 E., 100 feet above road crossing at Wood ranch and 8 miles southeast of Alamogordo.

RECORDS AVAILABLE.—October 1931 to September 1933.

DISCHARGE.—Maximum during year, 7.7 second-feet July 17 (gage height, 1.55 feet); minimum, 2.0 second-feet Feb. 4-7.

1931-33: Maximum, that of July 17, 1933; minimum not determined.

REMARKS.—Records good.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.5	2.5	2.6	2.6	2.1	2.5	2.7	2.6	2.5	2.4	2.7	* 2.6
2	2.4	2.5	2.6	2.6	2.1	2.5	2.7	2.6	2.5	2.4	* 2.7	2.6
3	2.4	2.5	2.6	2.6	2.1	2.5	2.7	2.6	2.5	2.5	* 2.7	2.6
4	2.4	2.5	2.6	2.6	2.0	2.6	2.6	2.6	2.5	2.3	* 2.7	2.6
5	2.4	2.5	2.6	2.6	2.0	2.6	2.6	2.6	2.5	2.3	2.7	2.6
6	2.4	2.5	2.6	2.6	2.0	2.6	2.6	2.6	2.5	* 2.4	2.7	2.6
7	2.4	2.5	2.6	2.6	2.0	2.6	2.6	2.6	2.5	* 2.5	2.7	2.6
8	2.4	2.5	2.6	2.6	2.1	2.6	2.6	2.6	2.5	2.6	2.6	2.6
9	2.4	2.5	2.6	2.6	2.1	2.6	2.6	2.6	2.5	2.5	2.6	2.6
10	2.4	2.5	2.6	2.5	2.1	2.6	2.6	2.6	2.5	2.5	2.6	2.6
11	2.4	2.5	2.6	2.5	2.1	2.6	2.6	2.6	2.5	2.5	2.6	2.6
12	2.4	2.5	2.6	2.5	2.2	2.6	2.7	2.6	2.5	2.5	2.6	2.6
13	2.4	2.5	2.6	2.5	2.2	2.6	2.7	2.6	2.5	2.5	2.6	2.6
14	2.4	2.5	2.6	2.6	2.2	2.6	2.7	2.6	2.5	2.5	2.6	2.6
15	2.4	2.5	2.6	2.5	2.2	2.6	2.7	2.6	2.5	2.5	2.6	2.6
16	2.4	2.5	2.6	2.5	2.3	2.6	2.6	2.6	2.5	2.5	2.6	2.6
17	2.4	2.5	2.6	2.7	2.3	2.6	2.6	2.6	2.6	2.7	* 2.6	* 2.6
18	2.5	2.5	2.6	2.5	2.3	2.6	2.6	2.6	2.6	* 2.7	* 2.6	* 2.6
19	2.5	2.5	2.6	2.4	2.3	2.6	2.6	2.6	2.6	* 2.7	* 2.6	* 2.6
20	2.5	2.5	2.6	2.4	2.4	2.6	2.6	2.6	2.6	* 2.6	* 2.6	* 2.5
21	2.6	2.5	2.6	2.4	2.4	2.6	2.6	2.6	2.5	* 2.6	2.6	* 2.5
22	2.6	2.5	2.6	2.4	2.4	2.6	2.6	2.6	* 2.5	2.6	2.6	* 2.5
23	2.5	2.5	2.6	2.3	2.4	2.6	2.6	2.5	* 2.5	2.6	2.6	2.5
24	2.5	2.6	2.6	2.3	2.7	2.6	2.6	2.5	2.5	2.7	2.6	2.6
25	2.5	2.6	2.6	2.3	2.5	2.6	2.6	2.5	2.5	2.7	2.6	2.6
26	2.5	2.6	2.6	2.3	2.5	2.6	2.6	2.6	2.5	2.7	2.6	2.6
27	2.4	2.6	2.6	2.2	2.5	2.6	2.6	2.6	2.5	2.6	2.6	2.6
28	2.4	2.6	2.6	2.2	2.6	2.6	2.6	2.6	2.5	2.6	2.6	2.6
29	2.4	2.6	2.6	2.2	-----	2.6	2.6	2.6	2.5	2.6	2.7	2.6
30	2.4	2.6	2.6	2.2	-----	2.6	2.6	2.6	2.4	2.6	* 2.6	2.6
31	2.5	-----	2.6	2.1	-----	2.6	-----	2.6	-----	2.6	2.5	-----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	2.6	2.4	2.44	150
November	2.6	2.5	2.52	150
December	2.6	2.6	2.60	160
January	2.7	2.1	2.45	151
February	2.7	2.0	2.25	125
March	2.6	2.5	2.59	159
April	2.7	2.6	2.62	156
May	2.6	2.5	2.59	159
June	2.6	2.4	2.51	149
July	2.7	2.3	2.55	157
August	2.7	2.5	2.62	161
September	2.6	2.5	2.59	154
The year	2.7	2.0	2.53	1,830

\* Estimated.

## ALAMOGORDO WATER SUPPLY AT INTAKE, NEAR ALAMOGORDO, N.MEX.

LOCATION.—Water-stage recorder in NW¼ sec. 8, T. 17 S., R. 11 E., at head of intake to Alamogordo water system, 7½ miles southeast of Alamogordo.

RECORDS AVAILABLE.—October 1932 to September 1933.

DISCHARGE.—Maximum, 4.3 second-feet Aug. 7 (gage height, 0.67 foot); no flow at times.

REMARKS.—Records good. Water is diverted from Alamo Creek for use of town of Alamogordo.

*Discharge, in second-feet, 1932-33*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....		3.0	1.4	2.4	2.4	2.6	2.6	2.4	2.2	2.3	2.3	2.3
2.....		2.7	1.4	2.4	2.4	2.6	2.6	2.4	2.2	2.2	2.3	2.4
3.....		2.7	2.5	2.4	2.4	2.6	2.5	2.4	2.2	2.3	2.1	2.4
4.....		2.7	2.6	2.5	2.4	2.6	2.4	2.4	2.2	2.3	2.4	2.3
5.....		2.7	1.5	2.4	2.4	2.6	2.3	2.4	2.2	2.3	2.3	2.3
6.....		2.6	1.5	2.4	2.4	2.6	2.3	2.4	2.3	1.5	2.4	2.3
7.....		2.5	1.6	2.4	2.4	2.7	2.3	2.4	2.3	0	2.3	2.3
8.....		2.5	1.5	2.4	2.5	2.7	2.3	2.4	2.3	1.3	2.5	2.4
9.....		2.5	2.7	2.4	2.4	2.7	2.3	2.4	2.3	2.2	2.4	2.3
10.....		2.6	1.7	2.4	2.5	2.7	2.4	2.4	2.3	2.2	2.4	2.3
11.....	2.7	2.6	2.8	2.4	2.5	2.6	2.4	2.3	2.2	2.2	2.4	2.4
12.....		2.7	1.6	2.4	2.5	2.6	2.3	2.3	2.2	2.2	2.4	2.4
13.....		2.7	2.2	2.4	2.4	2.6	2.3	2.3	2.1	2.2	2.4	2.4
14.....		2.6	1.6	2.4	2.4	2.6	2.3	2.3	2.1	2.2	2.4	2.4
15.....		2.7	2.6	2.4	2.4	2.6	2.3	2.3	2.1	2.2	2.4	2.5
16.....		2.6	2.4	2.4	2.4	2.6	2.4	2.3	2.1	2.1	2.4	2.4
17.....		2.7	2.5	2.7	2.4	2.5	2.4	2.3	2.2	1.7	2.4	2.4
18.....		2.6	2.7	2.5	2.4	2.5	2.4	2.3	2.2	1.4	2.3	2.3
19.....		2.6	1.9	2.5	2.4	2.5	2.4	2.3	2.3	1.6	2.3	2.3
20.....		2.5	1.6	2.5	2.4	2.5	2.4	2.3	2.3	2.3	2.3	2.3
21.....		2.5	1.8	2.5	2.4	2.5	2.4	2.3	2.3	2.3	2.3	2.3
22.....		2.5	2.6	2.6	2.4	2.5	2.4	2.3	2.4	2.4	2.0	2.4
23.....	2.7	2.4	2.5	2.6	2.4	2.5	2.4	2.1	2.6	2.4	2.4	2.4
24.....	2.7	2.4	2.5	2.6	2.7	2.5	2.4	2.2	2.3	2.5	2.4	2.4
25.....	2.7	2.5	2.5	2.5	2.6	2.5	2.4	2.1	2.3	2.4	2.4	2.4
26.....	2.7	2.5	2.6	2.5	2.6	2.5	2.4	2.1	2.3	2.4	2.4	2.4
27.....	2.7	2.5	2.4	2.5	2.4	2.4	2.4	2.1	2.3	2.4	2.4	2.4
28.....	2.7	2.5	2.4	2.5	2.4	2.3	2.4	2.1	2.3	2.4	2.4	2.4
29.....	2.8	1.4	2.4	2.5	-----	2.3	2.4	2.1	2.3	2.4	2.4	2.3
30.....	2.8	1.8	2.4	2.5	-----	2.3	2.4	2.1	2.3	2.4	2.3	2.3
31.....	2.9	-----	2.4	2.5	-----	2.5	-----	2.2	-----	2.3	2.3	-----
Month	Maximum		Minimum		Mean		Run-off in acre-feet					
October.....	3.0		1.4		2.71		167					
November.....	2.8		1.4		2.53		150					
December.....	2.7		2.4		2.15		132					
January.....	2.7		2.4		2.47		152					
February.....	2.7		2.4		2.44		135					
March.....	2.7		2.3		2.54		156					
April.....	2.6		2.3		2.39		142					
May.....	2.4		2.1		2.28		140					
June.....	2.6		2.1		2.26		134					
July.....	2.5		0		2.06		127					
August.....	2.5		2.0		2.35		144					
September.....	-----		-----		2.38		141					
The year.....	3.0		0		2.38		1,720					

\* Estimated.

## MISCELLANEOUS DISCHARGE MEASUREMENTS

In addition to the records of flow obtained at the gaging stations and reported in the preceding pages, measurements were made at other points as shown by the following table:

*Miscellaneous discharge measurements in western Gulf of Mexico basins except Rio Grande Basin during the year ending Sept. 30, 1933*

Date	Stream	Tributary to or diverting from—	Locality	Discharge
				<i>Sec.-ft.</i>
July 24	Tenaha Creek	Sabine River	Near Joaquin, Tex.	• 117,000
24	Flat Fork Creek	Tenaha Creek	Near Center, Tex.	• 42,200
Oct. 2	Quicksand Creek	Sabine River	Near Bon Wier, Tex.	16.0
Jan. 16	do	do	do	54.9 <sup>a</sup>
Oct. 22	Irrigation canal	South Concho River	Head of canal, Christoval, Tex.	6.53 <sup>b</sup>
Jan. 7	do	do	do	7.63 <sup>b</sup>
Mar. 15	do	do	do	5.96
May 9	do	do	do	11.6
June 12	do	do	do	17.3
July 11	do	do	do	13.9
Aug. 11	do	do	do	11.9
Oct. 8	Barton Springs	Barton Creek	Near Austin, Tex.	• 22.7
Feb. 11	do	do	do	• 27.4
Mar. 20	do	do	do	• 32.2
Apr. 24	do	do	do	• 26.5
May 12	do	do	do	• 25.4
July 14	do	do	do	• 23.5
Aug. 26	do	do	do	• 25.9
Sept. 22	do	do	do	• 24.2
Oct. 6	San Marcos River	Guadalupe River	Austin-San Antonio highway crossing, San Marcos, Tex.	103
Feb. 14	do	do	0.3 mile below San Marcos-Luling highway crossing, San Marcos, Tex.	91.0
June 5	do	do	0.5 mile below San Marcos-Luling highway crossing, San Marcos, Tex.	102
July 20	do	do	Austin-San Antonio highway crossing, San Marcos, Tex.	111
June 8	Cold Spring	Medina River	4 miles southwest of Pipe Creek, Tex.	10.5

<sup>a</sup> Discharge determined by slope-area method.

<sup>b</sup> Includes flow of Old Mill Spring.

*Miscellaneous discharge measurements in Rio Grande Basin and interior basins in New Mexico and Texas during the years ending Sept. 30, 1932 and 1933*

Date	Stream	Tributary to or diverting from—	Locality	Discharge
				<i>Sec.-ft.</i>
1933				
Mar. 22	Rio Grande	Gulf of Mexico	Sec. 22, T. 33 N., R. 11 E., 8 miles above Colorado-New Mexico State line, 10 miles east of Lobatos, Colo.	359
June 27	do	do	do	948
1932				
Nov. 5	do	do	Former gaging station near El Paso, Tex.	452
1933				
Feb. 6	do	do	do	704
Apr. 12	do	do	do	1,200
Aug. 9	do	do	do	1,230
1932				
Nov. 3	do	do	Former gaging station at Tornillo Bridge, near Fabens, Tex.	237
1933				
Feb. 8	do	do	do	589
Apr. 14	do	do	do	392
Aug. 10	do	do	do	236

*Miscellaneous discharge measurements in Rio Grande Basin and interior basins in New Mexico and Texas during the years ending Sept. 30, 1932 and 1933—Con.*

Date	Stream	Tributary to or diverting from—	Locality	Discharge
1932				Sec.-ft.
Nov. 4	Rio Grande.....	Gulf of Mexico.....	Former gaging station below old Fort Quitman, near Finlay, Tex.	330
1933				
Feb. 7	do.....	do.....	do.....	127
Apr. 14	do.....	do.....	do.....	134
Aug. 10	do.....	do.....	do.....	768
June 10	Rio Lucero.....	Rio Pueblo de Taos.....	Sec. 11, T. 26 N., R. 13 E., above diversion dam, 2 miles southeast of Arroyo Seco, N.Mex.	59.6
28	do.....	do.....	do.....	62.3
July 14	do.....	do.....	Sec. 11, T. 26 N., R. 13 E., below diversion dam, 2 miles southeast of Arroyo Seco, N.Mex.	16.1
1932				
Dec. 21	Taos Pueblo Ditch.....	Rio Lucero.....	Sec. 11, T. 26 N., R. 13 E., at head, 2 miles southeast of Arroyo Seco, N.Mex.	3.16
1933				
July 14	do.....	do.....	do.....	10.6
Apr. 2	Rio Chiquito.....	Rio Grande del Rancho.....	NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 8, T. 24 N., R. 13 E., below head of Talpa ditch, 0.6 mile northeast of Talpa, N.Mex.	2.80
2	Talpa Ditch.....	Rio Chiquito.....	NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 8, T. 24 N., R. 13 E., at head, 0.6 mile northeast of Talpa, N.Mex.	1.0
2	do.....	do.....	SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 6, T. 24 N., R. 13 E., 1,300 feet below head, 0.6 mile northeast of Talpa, N.Mex.	1.33
Apr. 2	do.....	do.....	NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 6, T. 24 N., R. 13 E., 2,800 feet below head, 0.7 mile northeast of Talpa, N.Mex.	1.01
2	do.....	do.....	SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 6, T. 24 N., R. 13 E., 100 feet above reservoir no. 1, 1 mile northeast of Talpa, N.Mex.	1.19
2	Monte Ditch and Acequia Madre diversion.....	do.....	SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 6, T. 24 N., R. 13 E., at head, 0.6 mile northeast of Talpa, N.Mex.	3.17
2	Monte Ditch.....	Monte Ditch and Acequia Madre diversion.....	SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 6, T. 24 N., R. 13 E., at head, 0.6 mile northeast of Talpa, N.Mex.	.81
2	do.....	do.....	SE $\frac{1}{4}$ sec. 6, T. 24 N., R. 13 E., at bridge 0.7 mile north of Talpa, N.Mex.	.77
2	do.....	do.....	S $\frac{1}{2}$ NE $\frac{1}{4}$ sec. 6, T. 24 N., R. 13 E., 1 mile north of Talpa, N.Mex.	.77
2	Acequia Madre diversion.....	do.....	SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 6, T. 24 N., R. 13 E., at head, 0.6 mile northeast of Talpa, N.Mex.	1.80
2	do.....	do.....	SE $\frac{1}{4}$ sec. 6, T. 24 N., R. 13 E., 0.7 mile north of Talpa, N.Mex.	1.84
2	do.....	do.....	NE $\frac{1}{4}$ sec. 6, T. 24 N., R. 13 E., 0.9 mile north of Talpa, N.Mex.	1.74
June 8	Pueblo Ditch.....	Tesuque Creek.....	Sec. 24, T. 18 N., R. 9 E., 2.7 miles southeast of Tesuque Pueblo, N.Mex.	.31
8	do.....	do.....	Sec. 24, T. 18 N., R. 9 E., 2.4 miles southeast of Tesuque Pueblo, N.Mex.	.34
8	do.....	do.....	Sec. 14, T. 18 N., R. 9 E., 2.1 miles southeast of Tesuque Pueblo, N.Mex.	.81
Jan. 5	Santa Fe Creek.....	Rio Grande.....	Sec. 19, T. 17 N., R. 11 E., above upper reservoir and 6 $\frac{1}{2}$ miles east of Santa Fe, N.Mex.	.90
Mar. 11	do.....	do.....	do.....	2.35
Apr. 22	do.....	do.....	do.....	3.00
May 23	do.....	do.....	do.....	10.2
June 8	do.....	do.....	do.....	7.20
July 5	do.....	do.....	do.....	9.86
26	do.....	do.....	do.....	5.09
Aug. 11	do.....	do.....	do.....	2.72
23	do.....	do.....	do.....	2.16
1932				
Oct. 4	Rio Puerco.....	do.....	Atchison, Topeka & Santa Fe Ry. bridge at Rio Puerco, N.Mex.	8.48
Nov. 3	do.....	do.....	do.....	1.00
Dec. 10	do.....	do.....	do.....	.45
19	do.....	do.....	do.....	0

• Estimated.

*Miscellaneous discharge measurements in Rio Grande Basin and interior basins in New Mexico and Texas during the years ending Sept. 30, 1932 and 1933—Con.*

Date	Stream	Tributary to or diverting from—	Locality	Discharge Sec.-ft.
1933				
Jan. 6	Rio Puerco.....	Rio Grande.....	Atchison, Topeka & Santa Fe Ry. bridge at Rio Puerco, N. Mex.	0
15	do.....	do.....	do.....	90
Feb. 1	do.....	do.....	do.....	8.22
11	do.....	do.....	do.....	1.50
Mar. 18	do.....	do.....	do.....	.04
May 6	do.....	do.....	do.....	0
June 5	do.....	do.....	do.....	0
23	do.....	do.....	do.....	2,120
July 17	do.....	do.....	do.....	2,480
Aug. 15	do.....	do.....	do.....	6.77
Sept. 11	do.....	do.....	do.....	552
1932				
Oct. 4	La Jara Creek.....	San Jose Arroyo.....	SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 29, T. 22 N., R. 1 W., $\frac{3}{4}$ mile above old earth dam and $1\frac{1}{2}$ miles northeast of La Jara, N. Mex.	.07
Nov. 5	do.....	do.....	do.....	.05
Oct. 4	do.....	do.....	NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 32, T. 22 N., R. 1 W., 1,600 feet above old earth dam and 1 mile north of La Jara, N. Mex.	.08
Nov. 5	do.....	do.....	do.....	.07
Oct. 4	do.....	do.....	NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 32, T. 22 N., R. 1 W., 650 feet above old earth dam and 1 mile north of La Jara, N. Mex.	.08
Nov. 5	do.....	do.....	do.....	.09
Oct. 4	do.....	do.....	NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 32, T. 22 N., R. 1 W., 100 feet upstream from old earth dam and 1 mile north of La Jara, N. Mex.	.13
Nov. 4	do.....	do.....	do.....	.11
5	do.....	do.....	do.....	.12
Oct. 4	do.....	do.....	NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 32, T. 22 N., R. 1 W., at old earth dam 1 mile north of La Jara, N. Mex.	.11
Nov. 4	do.....	do.....	do.....	.12
Oct. 4	do.....	do.....	NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 32, T. 22 N., R. 1 W., 300 feet below old earth dam and 1 mile north of La Jara, N. Mex.	.12
Nov. 4	do.....	do.....	do.....	.11
1933				
Mar. 17	La Jara community ditch 1.	La Jara Creek.....	N $\frac{1}{2}$ sec. 23, T. 22 N., R. 1 W., at head, $4\frac{1}{2}$ miles northeast of La Jara, N. Mex.	.65
Apr. 2	do.....	do.....	do.....	1.60
May 9	do.....	do.....	do.....	4.17
1932				
Oct. 4	do.....	do.....	SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 28, T. 22 N., R. 1 W., $\frac{3}{4}$ mile above old earth dam and $1\frac{1}{2}$ miles northeast of La Jara, N. Mex.	.48
Nov. 5	do.....	do.....	do.....	.01
Oct. 4	do.....	do.....	SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 29, T. 22 N., R. 1 W., 2,000 feet above old earth dam and $1\frac{1}{2}$ miles northeast of La Jara, N. Mex.	.46
4	do.....	do.....	Line between secs. 29 and 32, T. 22 N., R. 1 W., 1,300 feet above old earth dam and 1 mile northeast of La Jara, N. Mex.	.50
4	do.....	do.....	NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 32, T. 22 N., R. 1 W., 300 feet above old earth dam and 1 mile north of La Jara, N. Mex.	.52
4	do.....	do.....	NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 32, T. 22 N., R. 1 W., 1,000 feet below old earth dam and 0.8 mile north of La Jara, N. Mex.	.50
Nov. 5	do.....	do.....	do.....	.03
Oct. 6	Las Palomas Creek.....	Rio Grande.....	Sec. 8, T. 14 S., R. 5 W., 0.8 mile above dam site and 6 miles northwest of Las Palomas, N. Mex.	4.74
30	do.....	do.....	do.....	4.93
Dec. 8	do.....	do.....	do.....	4.35

• Estimated.

*Miscellaneous discharge measurements in Rio Grande Basin and interior basins in New Mexico and Texas during the years ending Sept. 30, 1932 and 1933—Con.*

Date	Stream	Tributary to or diverting from—	Locality	Discharge <i>Sec.-ft.</i>
1933				
Jan. 8	Las Palomas Creek	Rio Grande.....	Sec. 8, T. 14 S., R. 5 W., 0.8 mile above dam site and 6 miles northwest of Las Palomas, N. Mex.	4.64
Feb. 22	do	do	do	4.37
Mar. 13	do	do	do	4.98
Apr. 7	do	do	do	4.70
May 20	do	do	do	3.30
June 7	do	do	do	3.80
July 11	do	do	do	3.40
Aug. 5	do	do	do	4.00
26	do	do	do	6.54
Sept. 16	do	do	do	4.71
1932				
Nov. 4	Tornillo drain	do	Mouth, $\frac{1}{4}$ mile southwest of Alamo Alto, Tex.	69.1
1933				
Feb. 8	do	do	do	57.9
Apr. 13	do	do	do	94.1
Aug. 10	do	do	do	95.2
9	Tornillo Canal	do	Just above head of Hudspeth Canal, 2 miles southeast of Alamo Alto, Tex.	187
1932				
Nov. 3	Hudspeth Canal	Tornillo Canal	Head, 2 miles southeast of Alamo Alto, Tex.	0
1933				
Feb. 7	do	do	do	0
Apr. 13	do	do	do	156
Aug. 9	do	do	do	154
1932				
Oct. 16	North drain of Fort Sumner irrigation district.	Pecos River	Line between secs. 10 and 15, T. 2 N., R. 26 E., at mouth, 6 miles southeast of Fort Sumner, N. Mex.	4.94
Nov. 12	do	do	do	3.94
Dec. 4	do	do	do	3.56
1933				
Jan. 27	do	do	do	2.17
Feb. 25	do	do	do	2.04
Mar. 29	do	do	do	2.73
May 3	do	do	do	3.59
20	do	do	do	6.57
June 24	do	do	do	4.39
July 15	do	do	do	5.99
1932				
Oct. 16	South drain of Fort Sumner irrigation district.	do	SE $\frac{1}{4}$ sec. 35, T. 2 N., R. 26 E., at mouth, 10 miles southeast of Fort Sumner, N. Mex.	3.12
Nov. 12	do	do	do	2.03
Dec. 4	do	do	do	2.39
1933				
Jan. 27	do	do	do	2.11
Feb. 25	do	do	do	2.31
Mar. 29	do	do	do	4.31
May 3	do	do	do	1.53
20	do	do	do	5.12
June 24	do	do	do	2.46
July 15	do	do	do	1.71
1932				
Nov. 3	Rio Felix	do	Sec. 4, T. 14 S., R. 26 E., 300 feet below old highway bridge and $\frac{1}{4}$ mile northwest of Hagerman, N. Mex.	7.04
Oct. 13	Cottonwood Creek	do	SE $\frac{1}{4}$ NW $\frac{1}{4}$ (NE $\frac{1}{4}$ sec. 7, T. 16 S., R. 25 E., at Worley farm, 10 miles southwest of Lake Arthur, N. Mex.	4.22
Nov. 1	do	do	do	<sup>b</sup> 3.46
Oct. 13	do	do	E $\frac{1}{4}$ lot 14, sec. 4, T. 16 S., R. 25 E., at O'Bannon farm, 7 miles southwest of Lake Arthur, N. Mex.	14.6
Nov. 1	do	do	do	<sup>b</sup> 12.5
Dec. 10	Farmers Independent Canal.	do	450 feet below head gates, 16 miles north of Pecos, Tex.	45.7

<sup>b</sup> Furnished by State engineer.



*Miscellaneous discharge measurements in Rio Grande Basin and interior basins in New Mexico and Texas during the years ending Sept. 30, 1932 and 1933—Con.*

Date	Stream	Tributary to or diverting from—	Locality	Discharge
1932				<i>Sec.-ft.</i>
Dec. 10	Farmers Independent Canal.	Pecos River.....	5.5 miles below head gates, 10.5 miles north of Pecos, Tex.	30.9
10	Spill from Farmers Independent Canal.	do.....	2.2 miles below head gates.....	9.35
Dec. 9	Barstow Canal.....	do.....	600 feet below head gates, 8 miles northwest of Barstow, Tex.	90.9
9	do.....	do.....	7.2 miles below head gates, 0.9 mile above no. 3 take-out canal, 3.5 miles northwest of Barstow, Tex.	86.9
1933				
Sept. 13	Dr. Gipson well.....	do.....	3 miles west of Pecos, Tex.....	2.60
21	Farnum well.....	do.....	¾ mile east of Barstow, Tex.....	2.50
1931				
Oct. 26	Madera Canyon.....	Toyah Creek.....	13.3 miles above Toyahvale, Tex.....	0
1932				
July 18	do.....	do.....	do.....	0
Sept 2	Toyah Creek.....	Pecos River.....	U. S. Highway 290 crossing near Toyahvale, Tex.	463
2	do.....	do.....	do.....	551
7	do.....	do.....	Old county steel bridge 3 miles below Balmorhea, Tex.	26,100
29	do.....	do.....	do.....	11,400
1933				
Aug. 8	do.....	do.....	Flow of springs in creek 2.5 miles east of Hoban station and 14 miles below Saragosa, Tex.	* 1.5
July 10	Little Aguja Canyon.....	Toyah Creek.....	18 miles above Toyahvale, Tex.....	*.05
1931				
Oct. 26	do.....	do.....	Odell ranch 15½ miles above Toyahvale, Tex.	0
1932				
July 18	do.....	do.....	do.....	0
29	do.....	do.....	do.....	0
Aug. 16	do.....	do.....	do.....	0
17	do.....	do.....	do.....	1.32
29	do.....	do.....	do.....	* 2,640
Dec. 16	do.....	do.....	do.....	*.06
1933				
Jan. 26	do.....	do.....	do.....	*.03
Mar. 9	do.....	do.....	do.....	0
Apr. 10	do.....	do.....	do.....	0
July 10	do.....	do.....	do.....	0
May 18	South Fork of Little Aguja Canyon.	Little Aguja Canyon.....	1½ miles above mouth, near Toyahvale, Tex.	.47
July 10	do.....	do.....	do.....	.24
1932				
Sept. —	do.....	do.....	1¼ miles above mouth, near Toyahvale, Tex.	1,410
1931				
Oct. 26	do.....	do.....	¼ mile above mouth, near Toyahvale, Tex.	*.2
1932				
Aug. 16	do.....	do.....	do.....	*.30
17	do.....	do.....	do.....	*.32
Sept. 1	do.....	do.....	do.....	6.45
Dec. 16	do.....	do.....	do.....	*.33
1933				
Jan. 26	do.....	do.....	do.....	*.16
Mar. 9	do.....	do.....	do.....	*.13
Apr. 10	do.....	do.....	do.....	*.20
May 18	do.....	do.....	do.....	*.15
July 10	do.....	do.....	do.....	0
Mar. 9	Big Aguja Canyon.....	Toyah Creek.....	200 feet below spring, 3 miles above Texas & Pacific Ry. Co. dam, 15.6 miles above Toyahvale, Tex.	1.02
9	do.....	do.....	500 feet above Texas & Pacific Ry. Co. reservoir, 13.6 miles above Toyahvale, Tex.	1.69

\* Estimated.

\* Determined by slope-area method.

*Miscellaneous discharge measurements in Rio Grande Basin and interior basins in New Mexico and Texas during the years ending Sept. 30, 1932 and 1933—Con.*

Date	Stream	Tributary to or diverting from—	Locality	Discharge
1933				<i>Sec.-ft.</i>
May 18	Big Aguja Canyon..	Toyah Creek.....	On spillway of Texas & Pacific Ry. Co. dam 12.6 miles above Toyahvale, Tex.	a. 14
July 10	do.....	do.....	do.....	a. 25
1931				
Oct. 26	do.....	do.....	¾ mile below Texas & Pacific Ry. Co. dam 11.8 miles above Toyahvale, Tex.	a d. 1
1932				
July 18	do.....	do.....	do.....	a d. 32
Aug. 16	do.....	do.....	do.....	a d. 3
Sept. 1	do.....	do.....	do.....	d 18.7
3	do.....	do.....	do.....	d 45.4
6	do.....	do.....	do.....	d 151
7	do.....	do.....	do.....	d 4,360
13	do.....	do.....	do.....	d 8.6
20	do.....	do.....	do.....	d 2.56
Oct. 6	do.....	do.....	do.....	d 10.3
Dec. 16	do.....	do.....	do.....	d 1.13
1933				
Jan. 26	do.....	do.....	do.....	d 1.36
Mar. 9	do.....	do.....	do.....	d 12
Apr. 10	do.....	do.....	do.....	a d. 15
May 18	do.....	do.....	do.....	a d. 09
July 10	do.....	do.....	do.....	d 17
May 18	Duncan diversion.....	Big Aguja Canyon..	Just below point of diversion, 11.8 miles above Toyahvale, Tex.	1.05
July 10	do.....	do.....	do.....	.95
1931				
Oct. 20	Seven Springs.....	do.....	State highway 17 about 7½-8½ miles south of Toyahvale, Tex.	a. 10
1932				
July 18	do.....	do.....	do.....	a. 13
Aug. 16	do.....	do.....	do.....	a. 15
Dec. 16	do.....	do.....	do.....	a. 09
1933				
Jan. 26	do.....	do.....	do.....	a. 16
Mar. 9	do.....	do.....	do.....	a. 04
Apr. 10	do.....	do.....	do.....	a. 36
May 18	do.....	do.....	do.....	a. 09
July 10	do.....	do.....	do.....	a. 14
1932				
Aug. 1	Madera diversion canal.	Toyah Creek.....	Bridge on State highway 17, ¼ mile south of Toyahvale, Tex.	a. 34
17	do.....	do.....	do.....	8.19
30	do.....	do.....	do.....	1,930
30	do.....	do.....	do.....	1,650
Sept. 1	do.....	do.....	do.....	3.22
2	do.....	do.....	do.....	81.2
1931				
Oct. 16	Phantom Lake Spring.	do.....	Source, near Toyahvale, Tex.....	a 12.6
17	do.....	do.....	do.....	f 10.8
19	do.....	do.....	do.....	f 11.3
21	do.....	do.....	do.....	f 10.9
21	do.....	do.....	do.....	f 10.0
22	do.....	do.....	do.....	f 11.0
22	do.....	do.....	do.....	f 10.9
22	do.....	do.....	do.....	f 11.1
22	do.....	do.....	do.....	f 10.9
22	do.....	do.....	do.....	f 11.3
19	Giffin Springs.	do.....	Source, Toyahvale, Tex.....	e 4.26
20	do.....	do.....	do.....	h 3.82
21	do.....	do.....	do.....	h 3.64
24	do.....	do.....	do.....	h 4.07
24	do.....	do.....	do.....	h 4.03
24	do.....	do.....	do.....	h 4.15

a Estimated.

d Does not include J. C. Duncan diversion 25 feet below section.

e Lake level normal.

f Lake level 1 foot above normal.

g Flow in low ditch.

h Flow in high ditch

*Miscellaneous discharge measurements in Rio Grande Basin and interior basins in New Mexico and Texas during the years ending Sept. 30, 1932 and 1933—Con.*

Date	Stream	Tributary to or diverting from—	Locality	Discharge
1931				<i>Sec.-ft.</i>
Nov. 10	San Solomon Springs.	Toyah Creek.....	Source, Toyahvale, Tex.....	<sup>a</sup> 30.9
20	do	do	do	<sup>a</sup> 37.7
21	do	do	do	<sup>a</sup> 37.6
21	do	do	do	<sup>a</sup> 38.0
Dec. 29	do	do	do	<sup>a</sup> 35.4
1932				
Jan. 28	do	do	do	<sup>a</sup> 31.2
1933				
July 13	do	do	do	<sup>a</sup> 28.6
24	do	do	do	<sup>a</sup> 37.6
26	do	do	do	<sup>a</sup> 36.9
1932				
Nov. 6	Saragosa Springs	do	½ miles west of Balmorhea, Tex.....	9.15
1933				
Jan. 23	do	do	do	8.22
Mar. 14	do	do	do	6.69
May 16	do	do	do	6.36
July 11	do	do	do	5.59
29	Stock streams	do	Released for stock water from Reeves County Water Improvement district No. 1 canal system near Balmorhea, Tex.	<sup>a</sup> .89
29	Sandia Creek	do	¾ mile east of State Experiment Farm, near Balmorhea, Tex.	<sup>a</sup> .45
1932				
Sept. 8	Reservoir north spillway.	Sandia Creek.....	2 miles southeast of Balmorhea, Tex..	225
17	do	do	do	<sup>a</sup> .72
Oct. 1	do	do	do	1,450
Aug. 2	Texas & Pacific farm well no. 2.	Toyah Creek.....	Hoban station, 16 miles south of Pecos, Tex.	2.26
2	Texas & Pacific farm well no. 1.	do	do	1.86
8	Texas & Pacific farm well no. 4.	do	do	1.95
July 18	Cherry Canyon	do	5 miles above Jeff Davis-Reeves County line, near Toyahvale, Tex.	0
Aug. 27	do	do	do	3.10
27	do	do	do	1.37
Sept. 15	do	do	do	13.5
21	do	do	do	4.98
27	do	do	do	5.66
29	do	do	do	<sup>a</sup> 5,320
Oct. 7	do	do	do	31.2
Dec. 15	do	do	do	<sup>a</sup> .10
1933				
Jan. 25	do	do	do	<sup>a</sup> .13
Mar. 12	do	do	do	<sup>a</sup> .08
Apr. 10	do	do	do	0
May 18	do	do	do	0
July 7	do	do	do	0
29	J. L. Moore stock stream.	Cherry Canyon.....	¾ mile above Balmorhea-Toyah road crossing, 6 miles northeast of Balmorhea, Tex.	<sup>a</sup> .16
1932				
Aug. 5	Youngblood south well.	Toyah Creek.....	75 feet east of Pecos Valley Southern Ry. 13½ miles south of Pecos, Tex.	3.99
5	Youngblood north well.	do	½ mile east of Pecos Valley Southern Ry. 13 miles south of Pecos, Tex.	3.04
5	J. H. Sudbrock well.	do	½ mile west of Pecos Valley Southern Ry. 13½ miles south of Pecos, Tex.	2.07
5	John Wendt well.	do	150 feet east of Pecos Valley Southern Ry. 11½ miles south of Pecos, Tex.	2.77
11	Balmorhea Live-stock Co. well.	do	1 mile east of Pecos Valley Southern Ry., 8 miles south of Pecos, Tex.	.65
8	W. A. Gardner well.	do	¾ mile west of Pecos Valley Southern Ry., 4½ miles south of Pecos, Tex.	.95
1933				
Aug. 2	Limpia Creek	Barrilla Creek.....	Lower end of Wild Rose Canyon, 14 miles below Fort Davis, Tex.	<sup>a</sup> .3

<sup>a</sup> Estimated.

<sup>a</sup> Determined.

<sup>a</sup> Flow in low ditch.

<sup>a</sup> Flow in high ditch.

*Miscellaneous discharge measurements in Rio Grande Basin and interior basins in New Mexico and Texas during the years ending Sept. 30, 1932 and 1933—Con.*

Date	Stream	Tributary to or diverting from—	Locality	Discharge
1932				<i>Sec.-ft.</i>
Sept. 26	Limpia Creek.....	Barrilla Creek.....	Old Limpia post office, 12 miles south of Toyahvale, Tex.	121
Aug. 13	Southern Crude Oil Co. flowing well.	-----do-----	About 25 miles southeast of Pecos, Tex.	1.96
Oct. 28	Humble Thompson flowing well.	Leon Creek.....	9 miles west of Fort Stockton, Tex.	3.33
Aug. 24	Leon Springs and flowing wells.	-----do-----	Just above Leon Springs reservoir, 7 miles west of Fort Stockton, Tex.	16.0
1933				
Aug. 18	-----do-----	-----do-----	-----do-----	18.0
1932				
Aug. 3	Comanche Springs..	Comanche Creek....	Main canal $\frac{1}{4}$ mile below diversion dam, at Fort Stockton, Tex.	40.9
24	-----do-----	-----do-----	-----do-----	* 45.0
Sept. 14	-----do-----	-----do-----	-----do-----	44.3
Oct. 10	-----do-----	-----do-----	-----do-----	46.7
26	-----do-----	-----do-----	-----do-----	47.7
Nov. 10	-----do-----	-----do-----	-----do-----	48.6
22	-----do-----	-----do-----	-----do-----	50.0
Dec. 14	-----do-----	-----do-----	-----do-----	49.1
1933				
Mar. 17	-----do-----	-----do-----	-----do-----	* 48.2
Apr. 11	-----do-----	-----do-----	-----do-----	47.8
May 16	-----do-----	-----do-----	-----do-----	47.0
July 2	-----do-----	-----do-----	-----do-----	48.0
19	-----do-----	-----do-----	-----do-----	* 47.8
27	-----do-----	-----do-----	-----do-----	46.8
Aug. 4	-----do-----	-----do-----	-----do-----	45.9
10	-----do-----	-----do-----	-----do-----	44.3
14	-----do-----	-----do-----	-----do-----	* 46.0
18	-----do-----	-----do-----	-----do-----	45.1
Sept. 29	-----do-----	-----do-----	-----do-----	* 43.4
1932				
Oct. 28	Adobe Springs.....	-----do-----	11 miles east of Fort Stockton, Tex.	.37
28	Miracle and two other flowing wells.	-----do-----	12 miles northeast of Fort Stockton, Tex.	1.39
28	Tourney no. 1 flowing well.	-----do-----	-----do-----	5.23
28	Trans-Pecos no. 1 flowing well.	-----do-----	12 $\frac{1}{2}$ miles northeast of Fort Stockton, Tex.	.97
26	Six Shooter Draw...	Pecos River.....	2 miles below Tunis Spring, 23 miles east of Fort Stockton, Tex.	2.34
26	Tunis Spring.....	Six Shooter Draw...	21 miles east of Fort Stockton, Tex.	1.73
Nov. 10	-----do-----	-----do-----	-----do-----	1.98
1933				
Jan. 13	-----do-----	-----do-----	-----do-----	1.71
Mar. 17	-----do-----	-----do-----	-----do-----	1.94
May 16	-----do-----	-----do-----	-----do-----	1.73
1932				
Oct. 11	Rio La Luz.....	Tularosa Valley Basin.	Sec. 28, T. 15 S., R. 10 E., at head of Alamogordo community ditch, 1 mile east of La Luz, N.Mex.	10.7
Nov. 6	-----do-----	-----do-----	-----do-----	10.9
Dec. 14	-----do-----	-----do-----	-----do-----	13.9
1933				
Jan. 13	-----do-----	-----do-----	-----do-----	13.2
Feb. 5	-----do-----	-----do-----	-----do-----	12.4
Mar. 7	-----do-----	-----do-----	-----do-----	11.9
Apr. 15	-----do-----	-----do-----	-----do-----	6.60
May 24	-----do-----	-----do-----	-----do-----	6.64
June 10	-----do-----	-----do-----	-----do-----	2.62
July 17	-----do-----	-----do-----	-----do-----	36.1
Aug. 11	-----do-----	-----do-----	-----do-----	8.21
12	-----do-----	-----do-----	-----do-----	6.54
31	-----do-----	-----do-----	-----do-----	3.54
Sept. 20	-----do-----	-----do-----	-----do-----	14.1

\* Well opened to full capacity 20 minutes before starting measurement.

† Well partly shut off.

\* Spring openings and channels being cleaned.

† Spring water backed up over spring openings by growth in creek channel.

*Miscellaneous discharge measurements in Rio Grande Basin and interior basins in New Mexico and Texas during the years ending Sept. 30, 1932 and 1933—Con.*

Date	Stream	Tributary to or diverting from—	Locality	Discharge
1933				<i>Sec.-ft.</i>
Aug. 12	Alamogordo community ditch.	Rio La Luz.....	Sec. 25, T. 15 S., R. 10 E., 100 feet below road bridge at La Luz, N. Mex.	7.40
Sept. 1	do.....	do.....	do.....	8.68
Aug. 12	do.....	do.....	SW $\frac{1}{4}$ sec. 5, T. 16 S., R. 10 E., at railroad bridge 3 miles north of Alamogordo, N. Mex.	6.56
Sept. 1	do.....	do.....	do.....	7.36
Aug. 12	do.....	do.....	S $\frac{1}{2}$ sec. 8, T. 16 S., R. 10 E., 1 $\frac{1}{2}$ miles north of Alamogordo, N. Mex.	5.71
Sept. 1	do.....	do.....	do.....	7.25



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